NASA
National Aeronautics and Space Administration
Langley Research Center

News Researcher

Bi-weekly Employee and Contractor Publication

Langley Scientist's Findings are Key to Understanding the Ozone Hole

-by Craig Murden

The internationally acclaimed research of a Langley atmospheric scientist has sharpened the world's focus on ozone loss as a major threat to the planet's health. For his work in designing measurement devices, then using them to open a new window to understanding polar "ozone holes," Dr. M. Patrick McCormick will receive the prestigious Jule G. Charney Award of the American Meteorological Society. He is the first NASA scientist to be so honored.

McCormick's long-standing reputation as a leader in pursuit of the forces that are changing the Earth's atmosphere has been dramatically enhanced with his discovery and definition of Polar Statospheric Clouds (PSCs). This formerly unknown upper atmosphere phenomenon is now recognized as a pivotal catalyst in the chemical reactions that are destroying the polar ozone curtain that protects us from the Sun's dangerous ultraviolet radiation

The role of PSCs in ozone destruction is linked to chlorine gas which is carried into the stratosphere as part of widely-used, man-made chemicals known as chlorofluorocarbons (refrigerants, aerosol propellants, fire suppressants, foam blowing agents, etc.).

There, the chlorine is normally "locked" in stable compounds, but in the presence of PSCs these compounds react on the surfaces of PSCs, releasing active chlorine which then attacks ozone. Chlorine has a voracious appetite—one molecule can destroy hundreds of thousands of ozone molecules. In addition, PSCs, in their formation as they condense, also remove nitrogen compounds that act to protect the ozone, further contributing to the vulnerability. "Without PSCs, I am convinced you would not have an ozone hole," McCormick says.

The satellite-borne measurement tools he developed use the solar occultation technique which involves measuring the amounts and characteristics of light in the atmosphere as the Earth passes between the Sun and the satellite. This study of the stratosphere from satellites began with the Stratospheric Aerosol Measurement (SAM) experiment flown on the Apollo-Soyuz mission of 1975--the historic collaboration between the United States and Soviets. The effort continued in 1978 with unmanned devices aboard the Nimbus 7 spacecraft (still operating), the Application Explorer Mission spacecraft from 1979 to 1981 and the second Stratospheric Aerosol and Gas Experiment (SAGE II) aboard the Earth Radiation Budget satellite still operating today after its launch from the Shuttle in 1984.

-photo by Carol Petrachenko

Charney Award winner for his work in charting the ozone hole, Dr. McCormick is also NASA's project scientist for LITE, Lidar In-Space Technology Experiment, scheduled for Shuttle deployment in 1993.

The SAM and SAGE experiments led McCormick to the discovery of PSCs whose presence are necessary for the alarming breakdown in the ozone shields of both Arctic and Antarctic regions. PSCs were first identified when his satellite measurements revealed there were extensive clouds in the coldest parts of the polar stratosphere, many more than previously thought. This finding was confirmed by laser detection from aircraft missions led by McCormick but, at that time in the late1970s and early 1980s, no wider notice was given the discovery. Later, as concern grew over ozone depletion and theories were advanced, analysis of these clouds became the paramount thrust of the international investigation in which McCormick played such a prominent part.

The Jule G. Charney Award is given in recognition of highly significant research or development achievement in the atmospheric or hydrologic sciences. It ranks as the second most prestigious among the many distinguished awards presented by the American Meteorological Society. The ceremony for McCormick will be a major event at the 71st Annual Meeting of the Society to be held January 16, 1991, in New Orleans.

Truly to Immediately Implement Two Committee Recommendations

NASA Administrator Richard H. Truly announced the immediate implementation of two recommendations made by the Advisory Committee on the Future of the U.S. Space program and planned "to move out aggressively across the board" on all the panel's recommendations.

Truly announced he was acting on recommendations to:

o Create a new Office of Exploration under an associate administrator. He said the initial duty of the office would be to lay out "well thought-out" options to meet the challenges of returning to the moon and exploring Mars.

o Create a new Office of Human Resources to ensure that NASA has the engineering, scientific and administrative talent necessary to fulfill its missions. These include the high priority space science program, the 75-year old aeronautical research environment, Mission to Planet Earth to help protect the environment and the planetary exploration program--the Mission from Planet Earth.

Truly pledged that NASA will seek ways to implement the committee report. He said that the agency would place considerble emphasis on initiating the committee's recommendations to develop a heavy lift launch vehicle and to ensure the robustness of the nation's entire civil space transportation system.

The committee recommended development of a heavy lift vehicle to ensure access to space. The backbone of U.S. access to space is the Space Shuttle, which will celebrate its tenth anniversary of flight next April. The advisory committee said that the United States will be "unalterably committed to the Space Shuttle for many years." Thus, "NASA must take those steps needed to enhance the Shuttle's reliability, minimize wear and tear, and enhance launch schedule predictability."

"The Space Shuttle is essential to America's civil space program for the next decade or more," the panel declared.

Truly also noted his appointment of Donald R. Puddy to "drop the other things he was doing" in order to head a small team to assist the Administrator in determining how best to implement the advisory committee's recommendations. Puddy currently is director of the Flight Crew Operations Directorate at the Johnson Space Center, Houston.

The advisory committee was headed by Norman R. Augustine, chairman of the board of Martin Marietta, and consisted of 11 other persons with distinguished records in the fields of engineering, science, business, government and education.

Truly pointed out to NASA employees that the committee declared in the report that "in spite of imperfections, by far the greatest body of space expertise in any single organization in the world resides within NASA."

"NASA, and only NASA, realistically possesses the essential critical mass of knowledge and expertise upon which the nation's civil space program can be sustained."

SCOUT TEAM PREPARES FOR FIRST LAUNCH. Members of Langley's Scout rocket launch crew are shown at the base of the Wallops Flight Facility launch tower. They are (first row) Russell Clickner, Robert Latta, John Bartley, Dick Urash, Jesse Hensley, Marion Seyffert, Jim Chacamaty, Woodrow Johnson, Eugene Cubit; (second row) Robert York, William Holmes, William Kilgore, Marvin Harriott, Dale Fielder, P.P. Powell, Keith Wray, Benjamin Bland, Ralph P. Parks, Richard Newman, R.J. Bosinski, E. Cook, Al Delong; (third row) Calvin Johnson, David Smith, J. Coburn, W. E. Shearhold, R.B. Schutz, Jerry Johnson, Eugene Young; (fourth row) C. M. Styles, Bill Moore, Bert Deis, J.A. McClammy, Herman Kopplin, C.L. Bailey, Frank Fromal, Ernest A. Gurganus, J.H. Soule, James Huggett and Paul Courter. For Scout Farewell, see page 7.

News Briefs

NASA Releases December 1990 Mixed Fleet Manifest --- NASA has issued a Mixed Fleet Manifest for both the Space Shuttle and expendable launch vehicles. Of the 27 Space Shuttle flights planned over the next three years, 19 missions will be for NASA payloads or joint NASA/international payloads with the Shuttle focusing on the performance of a variety of space science activities supporting life sciences, materials science and astrophysics investigations. The remainder of the flights during that time frame will support two international Spacelab missions, two flights of the commercially-provided Spacehab module and the retrieval and reboost of a stranded commercial communications satellite. On a calendar year basis, there are seven Space Shuttle launches planned in 1991, eight in 1992 and 12 in 1993. The Manifest also shows 13 launches of expendable vehicles over the next three years; three launches in the small vehicle class, seven in the medium category and three in the intermediate class.

Astronaut Springer Retires from NASA, Marine Corps --- Col. Robert C. Springer, selected an astronaut in 1980 and a mission specialist on two Space Shuttle flights, has retired from NASA and the U.S. Marine Corps. During his first space flight, STS-29 in March 1989, Springer and his crewmates deployed a NASA Tracking and Data Relay Satellite and performed numerous secondary experiments. He also flew on STS-38, a Department of Defense flight, which was launched November 15, 1990. Springer announced he will work for Boeing Aerospace and Electronics Division, Huntsville, Ala., as the manager of the Space Station Freedom's element integration.

NASA Selects Projects for Commercial Use of Remote Sensing --- NASA has announced the selection of 12 research projects to develop new private sector applications of space-based and airborne remote sensing technologies. Funding for the Earth Observations Commercialization Applications Program (EOCAP) projects represents a continuation of a program aimed at increasing broader use of NASA-developed technology for gathering and analyzing valuable information about Earth and ocean resources through remote satellite or aircraft observations. The program, sponsored by NASA's Office of Commercial Programs, will fund over $2 million of research annually. Investigator teams are required to provide substantial co-funding of proposed research as a contribution to the project.

Space Station Integrated Design Review Completed --- The Integrated System Preliminary Design Review for the Freedom Space Station, a major milestone leading to the construction, launch and assembly of the station, was completed on schedule marking the end of a year-long assessment of Freedom's preliminary design by the NASA centers, their prime contractors and the international partners involved in the space station project. Over the last 13 months, more than 80 separate design reviews were conducted at NASA centers and contractor facilities to ensure Freedom's preliminary design could satisfy requirements for safety, physical and functional compatibility and for its ability to be built, integrated with other hardware, and tested. During this time, every major component, subsystem and system, which together comprise the space station, were examined.

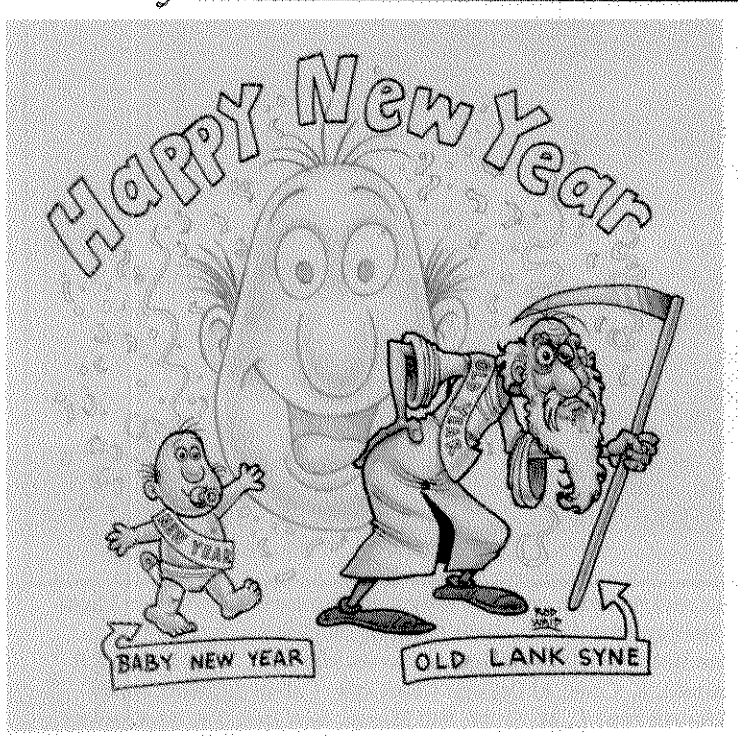
Senior Management Research Review

The Senior Management Research Review will be held Tuesday, January 22, from 9 to 11 a.m. in Building 1212, Room 200. All employees are invited to attend. Program accomplishments will be given by the following Langley scientists:

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:00	Brainmap Analysis Identifies Vigilant and Hazardous States of Awareness for System Monitoring Tasks	Alan T. Pope (FMD, Flight Systems)
9:15	Cloud Pumping Theory and the Global Simulation of Pollution	Robert C. Costen (SSD, Space)
9:30	Interference Flows About Missile-Sting Assemblies Near and Inside Cavities	Oktay Baysal (Old Dominion U.)
9:45	STOVL Exhaust System Internal Performance—Phase II	R. Re (AAD, Aeronautics)
10:00	Identification of Nonlinear Wave Interaction Using Bispectral Techniques	Michael K. Ponton (AcoD, Structures)
10:15	Facility Envelope Defined for Mach 7 Equilibrium Turbulent Boundary Layers in NASA LaRC 8-Foot HTT	Cindy Albertson (SMD, Structures)
10:30	Director's Comments	

Following these presentations, the program directors will give status reports.

Lankley

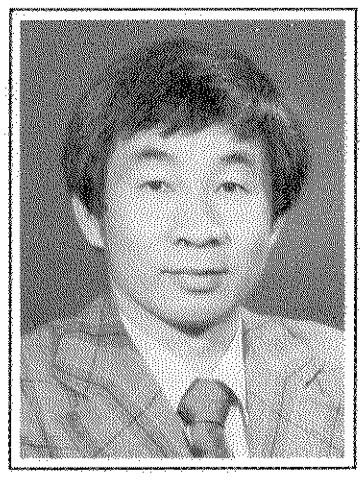


Weather Alert

Weather is an unpredictable factor in our lives and periodically creates hazardous driving conditions for our employees. Any decision to delay work hours or to close the Center due to inclement weather will be announced through the Langley Emergency Announcement System, 864-2111. Information on closings or delayed openings are also provided to local radio and television stations.

In Bad Weather . . . . DIAL 864-2111

Langley Scientist Awarded ASME Best Paper Honor



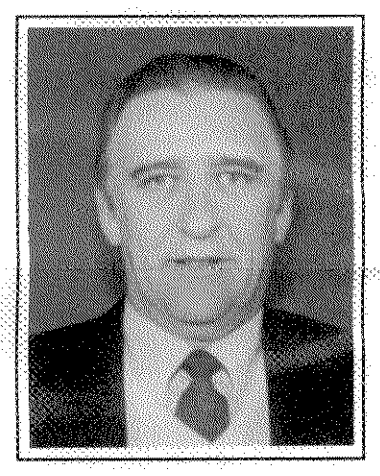
Dr. Jer-Nan Juang was presented the Procter and Gamble Award of Merit at the 1990 Design Conferences held recently in Chicago, Illinois.

Juang, principal scientist in the Spacecraft Dynamics Branch, was cited for his paper titled "Ground Based Testing of the Dynamics of Flexible Space Structures Using Band Mechanisms." The award-winning paper was co-authored by Dr. L. G. Yang of the University of Colorado, Boulder, and Dr. M. Chew of Old Dominion University, Norfolk.

The award of merit, offered for technical significance and the potential to enhance the public good, is contributed to the American Society of Mechanical Engineers (ASME) Mechanisms Conference by the Procter and Gamble Company of Cincinnati, Ohio, to encourage publication of original research. Juang's paper was selected from a field of 206 submissions.

Juang joined the Langley staff in 1982. He conducts analytical and experimental research in the fields of mechanical design, controller design and system identification for the control of flexible space structures, including robotics.

In Memoriam . . .



Allan H. Taylor, a senior research engineer in the Aircraft Structures Branch, Structural Mechanics Division, died in his home Wednesday, December 5, 1990. He was 51.

Taylor had been a NASA Langley employee since January 1981. He held seven patents, on two of which he was the sole inventor. One of his inventions, an experimental piston using carbon composites to increase fuel efficiency, earned him worldwide recognition. For his work on the composite piston, Taylor was a finalist in a professional magazine's "Excellence in Design" competition in 1990. He was a 1989 nominee for "NASA's Inventor of the Year." If the piston Taylor invented is applied to the automobile engine, for instance, it is estimated the piston will reduce fuel consumption by 10 percent, saving billions of dollars worldwide.

SCAN Recommendations Affect Shift in Award Announcement Procedure

Langley's Strategic Culture Assessment for the Nineties (SCAN) team assigned to look into Center communications has recommended that notifications of awards to Langley employees be published individually rather than collectively twice a year as has been the practice.

Communications team leader Rich Antcliff explained his team's findings, "Our employees are as interested in *why* the award has been conferred as who has been honored." Thus, awards such as special act or service awards will be published as close to the award date as possible and will also contain the award citation.

This issue of the **Researcher News,** as well as the January 25 issue, will contain Fiscal Year 1990 awards complete with citations. Subsequently, award announcements will follow SCAN recommendations--be printed individually, in an expanded format, and appear as close to the date of the award as possible.

Many thanks to Lahoma Hart and Linda Park of the Employee Relations Section who provided the citations for over 400 FY 90 awards and to Renee Reckendorf who inputted the information in time for immediate publication.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Special Achievement Awards

Over 430 Langley employees earned Special Achievement Awards in Fiscal Year 1990. These lump-sum cash awards are given for sustained superior performance or a special act or achievement. The honored will be recognized in this and the next issues of the **Researcher News**. Congratulations for many jobs well done.

Yvonne W. Beyer, Office of the Director for Management Operations, has been honored "for extra efforts in the operations of the directorate office, especially in the last quarter of the past year."

Roger A. Hathaway, Office of the Director, "for sustained significant impact over 10 years in advancing the Center's goals of equal opportunity for minorities and females in pursuing science and technology."

Jane S. Hess, Research Information and Applications Division, "for superior performance and personal achievements in hiring, mentoring, motivating, and advancing the Agency and Center ideals of equal employment opportunity."

Calvin C. Berry, Operations Support Division, "for personal dedication to advancing the ideals of EEO at the LaRC in general, and within the Operations Support Division in particular."

Richard A. Foss, Systems Engineering Division, "for authoring the SED 1989 Paper of the Year, an exceptional paper describing the innovative analysis, design, and testing of the HALOE instrument from concept to flight hardware verification testing."

Dewey M. Smith, Systems Engineering Division, "for authoring the SED 1989 Paper of the Year, an exceptional paper describing the innovative analysis, design, and testing of the HALOE instrument from concept to flight hardware verification testing."

Don E. Avery, Space Station Freedom Office, "for exceptional representation of the OAET in-space technology experiments effort to the Space Station Freedom Program."

Sherwin M. Beck, Space Station Freedom Office, "for exceptional program management of the Mid-Deck O-Gravity Experiment (MODE)."

Emedio M. Bracalente, Guidance and Control Division, "for superior performance through innovative research in the development of simulation modelling techniques for determining the feasibility of using airborne Doppler radar systems to detect hazardous wind shear."

Carolyn C. Eby, Information Systems Division, "for superior administrative support in the planning and execution of numerous technical meetings supporting Systems Architecture Branch research."

Sherry R. Ellis, Analysis and Computation Division, "for outstanding secretarial support to the Structural Acoustics Branch and for special support to the FAA/NASA En Route Noise Symposium and the Hypersonics Acoustic Loads and Response Workshop."

George G. Ganoe, Space Station Freedom Office, "for exceptional performance in leading evolutionary operations efforts and acting as the SSFO/Langley expert and representative to the DMS PDR."

Robert A. Golub, Analysis and Computation Division, "for excellence in team leadership in the development and validation of aircraft noise prediction programs."

James M. Howard, Operations Support Division, "for excellence in providing high- level support for modification to the 16-Foot Transonic Wind Tunnel."

William R. Jones, Guidance and Control Division, "for superior performance through innovative research in the development of simulation modelling techniques for determining the feasibility of using airborne Doppler radar systems to detect hazardous wind shear."

Jack D. Leatherwood, Analysis and Computation Division, "for planning, coordinating, and conducting the first research project on thermal-acoustic fatigue of carbon-carbon panels."

James C. Manning, Analysis and Computation Division, "for exceptional contributions to the development of jet noise research facilities, and the timely performance of aeroacoustic research."

Jesse C. Midgette, Operations Support Division, "for exceptional technical skill and creativity in support of the 8-Foot High Temperature Tunnel."

Arnold W. Mueller, Analysis and Computation Division, "for excellence in leadership in the area of aircraft noise reduction."

Felix L. Pitts, Information Systems Division, "for outstanding performance in conducting and documenting research on characterization of lightning phenomenon."

Frances E. Sabo, Advanced Vehicles Division, "for administrative contributions during the Non-Advocate Review Process."

Betty S. Walker, Fluid Mechanics Division, "for outstanding contributions to the high-lift research program at the Low-Turbulence Pressure Tunnel."

Tina L. Wallace, Information Systems Division, "for enthusiastic and capable secretarial assistance to the staff of the Information Systems Division."

Lynette Haynes, Guidance and Control Division, "for exceptional secretarial support for the Computational Controls Workshop and the Guidance and Control Division office."

Paul J. Hayes, Information Systems Division, "for contributions to development and test of the first distributed computer executing a petri-net based graph management operating system."

Janice L. McCollum, Operations Support Division, "for exceptional support to the 16-Foot Transonic Tunnel rehab improvements."

Michael P. Moore, Operations Support Division, "for exceptional suport to the 16-Foot Transonic Tunnel rehab improvements."

Stephen J. Katzberg, Information Systems Division, "for contributions to the definition phase of the Information Sciences Experimental System."

David E. Bowker, Information Systems Division, "for contributions to the definition phase of the Information Sciences Experimental System."

R. Gale Wilson, Information Systems Division, "for contributions to the definition phase of the Information Sciences Experimental System."

Pamela L. Howard, Facilities Engineering Division, "for outstanding performance in support of the administrative functions of the Facilities Engineering Division."

Earl H. Andrews Jr., Fluid Mechanics Division, "for leadership in the performance of the complex duties of facility safety head and for selfless dedication in furtherance of the goals and objectives of the Langley Safety Program in our research environment."

Colon R. McMath Jr., Management Support Division, "for recognition of leadership in the performance of the duties of facility safety head and for contributions in furtherance of the goals and objectives of the Langley Safety Program."

Fred M. Smith, Space Systems Division, "for recognition of leadership in the performance of the duties of facility safety head and for contributions in furtherance of the goals and objectives of the Langley Safety Program."

Willis H. Ward Jr., Operations Support Division, "for recognition of leadership in the performance of the duties of facility coordinator and for contributions in furtherance of the goals and objectives of the Langley Safety Program."

John T. Taylor, Facility Systems Branch, "for exceptional contributions in providing engineering measurement services to the 8-Foot HTT, NTF, and 30- by 60- Foot Tunnels and returning NTF to operation after the NTF mishap."

Deneace Manley Hines, Acoustics Division, "for excellence in the performance of secretarial and administrative services for the Applied Acoustics Branch."

James E. Gardner, Structures Division, "for exceptional performance in technical support of the Structures Directorate office."

Peggy H. Langford, Financial Management Division, "for outstanding effort in the design of models under very demanding and restrictive conditions."

Cassandra G. Favor, Financial Management Division, "for recognition of exceptional service in providing a superior example in the performance of multiple duties in a highly successful manner in the processing year."

Patricia L. Johnson, Financial Management Division, "for recognition of exceptional service and dedication within the Commercial Accounting Section."

Undrell B. Murphy, Financial Management Division, "for recognition of exceptional service and dedication within the Commercial Accounting Section."

William T. Freeman Jr., Structural Mechanics Division, "for outstanding performance in the coordination and technical direction of contracts in the Advanced Composites Technology Program."

Mark J. Shuart, Structural Mechanics Division, "for authoring an outstanding research paper in composite failure mechanics selected as the best paper published by the Structural Mechanics Division."

Cathy A. Dunn, Facilities Engineering Division, "for outstanding performance in the administration support for the Facilities Utilities Section and the Facility Systems Branch."

James M. Michael Jr., Programs and Resources Division, "for exceptional service in performing the duties as a technical resources analyst, in such a professional, diligent and thorough manner."

Margaret C. Pancoast, Research Information and Applications Division, "for outstanding photographic documentation of the Robot Manipulator and Automated Structure Assembly Laboratory (ASAL)."

Delores K. Poupard, Programs and Resources Division, "for exceptional service in performing ADP support in a professional, diligent and effective manner."

Harold W. Adams, Office of the Director for Management Operations, "for excellence in serving as the Center's acting patent counsel during the extended absence of the patent counsel."

John B. Anders, Fluid Mechanics Division, "for outstanding contributions in developing the Fluid Mechanics Division strategic plan and implementing the Division reorganization."

Angela B. Brown, Facilities Program Development Office, "for conscientious and dedicated contributions in preparation of Langley's yearly CoF budget documents and budget support related to the mission of the Facilities Program Development Office."

Paul F. Brown, Operations Support Division, "for exceptional high quality of support and dedication at the Drive Control Complex, Building 1241."

Marcus L. Brumfield, Long Duration Exposure Facility Project Office, "for exceptional performance in integrating the requirements for environmentally protecting the retrieved LDEF into the STS documentation and operations."

John R. Carlson, Applied Aerodynamics Division, "for outstanding effort in the development and verification of advanced nozzle/afterbody integration techniques."

Tamara L. Croom, Applied Aerodynamics Division, "for outstanding efforts in performing secretarial and administrative duties during a critical transitional period for the Subsonic Aerodynamics Branch."

Lise P. Crowe, Fluid Mechanics Division, "for outstanding clerical and administrative contributions to the Fluid Mechanics Division."

1990 Spe

J. David Dearing, Projects Division, "for superior performance in guiding the development of the MSAMS data base system leading to significant improvements in the management of data for elements of the microgravity program."

Rodney L. Duncan, Projects Division, "for superior effort and outstanding leadership which has contributed significantly to the continued success of the Scout Program."

Sherry B. Garzon, Structural Mechanics Division, "for outstanding administrative support of the Eighth DoD/NASA/FAA Conference on Fibrous Composites in Structural Design."

William F. Hampshire II, Projects Division "for superior effort and personal initiative which has contributed to the continued success of the Resource Analysis Branch."

Kenneth W. Hall, Fabrication Division, "for excellence in the performance of Quality Assurance assignments on the CETA Project."

Anne D. Holland, Facilities Engineering Division, "for exceptional performance in developing critical interface routines and methodology in support of the thermal/structural analysis of the fan/disk region of the National Transonic Facility."

David G. Kessler, Operations Support Division, "for recognition of exceptional research support provided to the test facilities of the Hypersonic Propulsion Branch, Building 1221."

Clyde C. Lane, Fabrication Division, "for excellence in the performance of Quality Assurance assignments on the LASE Project."

Marva J. Mabry, Projects Division, "for exceptional performance as secretary of the LDEF Project Office during LDEF operations at Kennedy Space Center."

Mary L. Mason, Applied Aerodynamics Division, "for outstanding effort in support of developing and implementing innovative data analysis methods."

Darlene R. Mays, Projects Division, "for superior accomplishment of responsibilities resulting in a significant monetary savings to the Scout Program."

Judy R. Neil, Facilities Program Development Office, "for proficient and dedicated clerical assistance in accomplishment of the mission of the Facilities Program Development Office."

Michael P. Nemeth, Structural Mechanics Division, "for outstanding research contributions to understanding the buckling and postbuckling behavior of composites plates with cutouts."

Robert J. Nowak, Structural Mechanics Division, "for outstanding contributions to the understanding of mass addition cooling effectiveness in the presence of shock waves for NASP scramjet engine combustors and leading edges."

George C. Olsen, Structural Mechanics Division, "for outstanding contributions to the understanding of supersonic film cooling effectiveness for NASP scramjet engines and coordination of industry and government research."

James W. Sawyer, Structural Mechanics Division, "for outstanding research contributions to carbon-carbon structures technology."

Warner W. Smith, Operations Support Division, "for outstanding achievement in the field verification and preparation of tunnel control systems for the Hypersonic Tunnels Project."

Jimmy D. Staples, Operations Support Division, "for exceptional technical and innovative modifications and improvements to the National Transonic Facility."

Frank C. Thames, Fluid Mechanics Division, "for outstanding management of the Fluid Mechanics Division infrastructure."

John W. Wainwright III, Systems Safety, Quality and Reliability Division, "for recognition of excellent planning and scheduling of construction inspection activities."

Rebecca W. Bales, Management Support Division, "for superior performance and outstanding support of the roles and missions of the Management Support Division."

Nannette D. Lloyd, Management Support Division, "for exemplary performance and exceptional service in support of the Institutional Support Branch."

Linda E. Edmundson, Structural Mechanics Division, "for outstanding achievement in support of the Structures Technology Program Office during 1989-1990."

Charles D. Harris, Applied Aerodynamics Division, "for publication of the best NASA formal publication prepared by personnel of the Applied Aerodynamics Division."

Richard L. Campbell, Applied Aerodynamics Division, "for proposing an innovative research concept on the application of the direct iterative design approach to supersonic flow."

Richard M. Wood, Applied Aerodynamics Division, "for proposing an innovative porous forebody concept which can be applied to a variety of aircraft."

Steven X. S. Bauer, Applied Aerodynamics Division, "for proposing an innovative porous forebody concept which can be applied to a variety of aircraft."

Marguerite F. Verlander, Technical Management Information Office, "for providing outstanding support to the Space Station Freedom Office in managing resources and contracts."

Mark A. Hutchinson, Instrument Research Division, "for outstanding performance in the design and application of advanced pressure instrumentation for the Center's hypersonic facilities complex."

Olaf O. Storaasli, Structural Mechanics Division, "for the development and demonstration of an advanced and highly efficient parallel/vector solver for simultaneous linear algebraic equations."

Judith J. Watson, Structural Mechanics Division, "for superior performance in leading and coordinating advanced astronaut construction testing methods."

Wilbur B. Fichter, Structural Mechanics Division, "for superior performance in the coordination and implementation of the PSR Truss testing program."

Dennis W. Bartlett, Advanced Vehicles Division, "for outstanding performance and leadership in advocating a new subsonic transport aircraft research initiative."

Robert J. Mack, Advanced Vehicles Division, "for outstanding performance in advancing the state-of-the-art in sonic boom methodology."

Anton Schuszler II, Materials Division, "for exceptional support in accomplishing the rapid relocation of and in maintaining materials laboratory analysis capabilities in preparation for the Building 1148 rehabilitation CoF project."

Robert A. Edahl Jr., Materials Division, "for exceptional support in accomplishing the rapid relocation of and in maintaining metallurgical laboratory analysis capabilities in preparation for the Building 1148 rehabilitation CoF project."

Marcia S. Domack, Materials Division, "for exceptional contribution in accomplishing the rapid relocation of the LaRC metallurgical and materials laboratory analysis capabilities in preparation for the Building 1148 rehabilitation resulting in minimal adverse impact on research."

Lisa C. Simonsen, Space Systems Division, "for significant contributions in advancing the technology for detailed analysis of radiation exposures for human exploration missions and for authorship of the Space Systems Division Best Paper for 1989-1990."

John E. Nealy, Space Systems Division, "for significant contributions in advancing the technology for detailed analysis of radiation exposures for human exploration missions and for authorship of the Space Systems Division Best Paper for 1989-1990."

Lawrence W. Townsend, Space Systems Division, "for significant contributions in advancing the technology for detailed analysis of radiation exposures for human exploration missions and for authoriship of the Space Systems Division Best Paper for 1989-1990."

John W. Wilson, Space Systems Division, "for significant contributions in advancing the technology for detailed analysis of radiation exposures for human exploration missions and for authorship of the Space Systems Division Best Paper for 1989-1990."

John J. Ferrainolo, Research Information and Applications Division, "for consistently exceptional performance in both the dissemination and the use of NASA Scientific and Technical Information."

Cecelia G. Grzeskowiak, Research Information and Applications Division, "for exceptional performance in increasing productivity within the inter-library loan functional area of the Technical Library Branch."

Effie L. Nicosia, Research Information and Applications Division, "for exceptional performance in support of the document cataloging effort and other database projects within the Technical Library Branch."

Marsha C. Ingraldi, Applied Aerodynamics Division, "for outstanding secretarial support of the Propulsion Aerodynamics Branch."

Carmen O. Torres-Nisbet, Business Data Systems Division, "for exceptional performance and significant contributions in defining the functional requirements for the Time and Distribution System."

Wayne H. Wells, Facilities Engineering Division, "for excellence in leading the review of specifications, technical contract administration and service on the NASA Specsintact Coordination and Configuration Control Board."

Jerry C. Hoerger, Business Data Systems Division, "for contributions to the Business, Administrative and Management Information Support Services (BAMIS) Source Evaluation Board (SEB)."

Ronald T. Lacks, Business Data Systems Division, "for contributions to the Business, Administrative and Management Information Support Services (BAMIS) Source Evaluation Board (SEB)."

Susan L. Lilly, Business Data Systems Division, "for contributions to the Business, Administrative and Management Information Support Services (BAMIS) Source Evaluation Board (SEB)."

Alice C. Massey, Business Data Systems Division, "for contributions to the Business, Administrative and Management Information Support Services (BAMIS) Source Evaluation Board (SEB)."

Howard R. Puckett Jr., Business Data Systems Division, "for contributions to the Business, Administrative and Management Information Support Services (BAMIS) Source Evaluation Board (SEB)."

Archer V. Vann Jr., Business Data Systems Division, "for contributions to the Business, Administrative and Management Information Support Services (BAMIS) Source Evaluation Board (SEB)."

Joseph W. Young, Business Data Systems Division, "for contributions to the Business, Administrative and Management Information Support Services (BAMIS) Source Evaluation Board (SEB)."

Gerri R. Edmonds, Business Data Systems Division, "for demonstrated initiative and extraordinary secretarial support to the Business Data Systems Division."

Harriet B. Machie, Research Information and Applications Division, "for superior performance in productivity."

Margaret P. O'Keefe, Research Information and Applications Division, "for superior performance in productivity and completion of high-quality complex tasks in a timely manner."

Jeanette W. George, Business Data Systems Division, "for exceptional performance and invaluable contributions during the design, development and implementation of Agency-wide systems."

Paula W. Chambers, Applied Aerodynamics Division, "for outstanding secretarial support of the Applied Aerodynamics Division during management transition."

Octavia C. Judge, Personnel Division, "for a superior high level of performance in the area of Occupational Health Services. In particular, Ms. Judge has excelled as a productive member of the Personnel Division. Her exceptional ability to train stay-in-school students has been recognized Center-wide. Ms. Judge has provided the Center with exceptionally trained secretarial co-op students."

Karen E. Ridlon, Personnel Division, "for recognition of her invaluable assistance with the redesigning and improvement of the tracking system into a highly effective, time-saving system."

ial Achievement Awards

Joseph N. Riss, Personnel Division, "for recognition of initiative and ingenuity in the redesign and improvement of the co-op tracking system into a highly effective and time saving system."

Marvin D. Scruggs, Fabrication Division, "for exceptional performance in the fabrication of an OH temperature measuring system."

Janice R. Wunder, Personnel Division, "for recognition of exceptional performance of duties in support of the NASA Personnel and Payroll System (NPPS)."

Harold D. Burks, Materials Division, "for exceptional effectiveness in improving the research facilities for the Materials Division."

John W. Connell, Materials Division, "for exceptional planning and coordinating of an interdisciplinary program in space polymers."

Margaret Foster, Systems Safety, Quality and Reliability Division, "for recognition of excellent support to the Program Assurance Manual revision and administrative support of an extraordinary travel schedule."

Charles M. McClish, Operations Support Division, "for exceptional technical contributions and skill in fabricating and installing model components at the Transonic Dynamics Tunnel."

Dreamie S. Newsome, Materials Division, "for exceptional efficiency and effectiveness in administrative support for the Polymeric Materials Branch."

Craig W. Ohlhorst, Materials Division, "for outstanding performance in operating, maintaining and upgrading the Multiparameter Mission Simulation Facility and for efficiently generating high-quality mission simulation performance data and arc jet data for oxidation-resistant carbon-carbon composite materials in support of the National Aerospace Plan Program."

Stephen S. Tompkins, Materials Division, "for outstanding efforts in leading the PSR materials development program at NASA LaRC and achievements in space materials research leading to the demonstration fabrication of a composite parabolic reflector panel and the selection of a LaRC-recommended material as a leading candidate material for PSR reflector applications."

Alan W. Henderson, Operations Support Division, "for recognition of outstanding efforts and contributions to improve the efficiency, quality and reliability of electrical component insulation test data."

Jeffrey C. Hyle, Operations Support Division, "for high quality performance and contributions for preparing and teaching the manual synchronizing of the 8-Foot T.P.T. Boundary Layer compressors."

Nolan S. Liddle, Fabrication Division, "for outstanding support on the Halogen Occulation Experiment Project."

James B. Miller, Systems Engineering Division, "for technical competence and outstanding support of Systems Engineering and Electrical Systems Section projects."

Maria Vallas Mitchum, Systems Engineering Division, "for developing an outstanding postprocessor code for the LATDYN computer program."

Floyd A. Phaup, Operations Support Division, "for providing excellent technical and facility coordination support to the Applied Materials Branch Laboratories, Buildings 1120, 1120A, and 1256A."

Ronnie R. Henk, Facilities Engineering Division, "for outstanding performance and contributions in support of research and institutional facilities project management, designs and construction."

Robert J. Wallis, Facilities Engineering Division, "for outstanding performance and contributions in support of research and institutional facilities project management, design and construction."

Thomas S. Bryant III, Operations Support Division, "for excellence in providing high level support to research facilities throughout LaRC."

Daniel J. DiCarlo, Flight Applications Division, "for outstanding technical and managerial leadership of the highly successful F-106B Vortex Flap Flight Experiment."

Grace M. Girton, Projects Division, "for unselfish, dedicated performance of expanded responsibilities during a period of reduced secretarial work force."

William D. Harvey, Advanced Vehicles Division, "for individual innovative achievement in developing a comprehensive study of the United States MANTECH program."

Kam W. Hom, Advanced Vehicles Division, "for outstanding performance in developing and implementing advanced geometry codes, analysis methods and diagnostic procedures on the Iris Computer System."

Stuart K. Johnson, Advanced Vehicles Division, "for outstanding performance in conceiving and executing a complex research program which has resulted in a much improved understanding of complex scaling phenomena."

Elijah C. Kent, System Safety, Quality and Reliability Division, "for recognition of excellent performance in implementing the Product Assurance requirements for PD/ADS, LITE, LASE and HALOE, and for implementation of GIDEP at LaRC."

Laura K. O'Connor, Structural Mechanics Division, "for outstanding and timely contributions to the identification and implementation of improved weld procedures and inspection criteria related to the 8-Foot HTT CofF project."

Anthony W. Robbins, Operations Support Division, "for exceptional support during the installation and checkout of the Electronically Scanned Pressure System in the Low-Turbulence Pressure Tunnel."

John D. Scholz, Operations Support Division, "for exceptionally high quality performance and personal initiative in support of the 8-Foot High Temperature Tunnel Complex."

Eric C. Stewart, Flight Applications Division, "for outstanding technical analysis leading to an enhanced understanding of an insitu wake vortex detection method."

Doris B. Williams, Advanced Aircraft Division, "for outstanding performance as secretary of the Advanced Aircraft Branch including preparation of LDTM's and other important contributions to the classified research programs in the branch."

Kenneth C. Young, Operations Support Division, "for exceptional support during the installation and checkout of the Electronically Scanned Pressure System in the Low Turbulence Pressure Tunnel."

Greg Draughon, Fabrication Division, "for excellence in the support of the Heat Transfer Studies Program."

Catherine A. McCargo, Fabrication Division, "for exceptional job performance and dedication to duty."

Peter Vasquez, Fabrication Division, "for diligent and creative work in the net-form casting of fused silica quartz models."

Michael C. Fischer, Office of the Director, "for outstanding technical and managerial performance as executive of the AGARD Fluid Dynamics Panel."

Sharon L. Padula, Interdisciplinary Research Office, "for innovative research and exceptional leadership in the development of integrated spacecraft optimization methods."

Thomas P. Charlock, Atmospheric Sciences Division, "for outstanding contributions to the understanding of the relationships between radiation budget parameters and meteorology variables for climate studies."

Brian J. Connor, Atmospheric Sciences Division, "for outstanding contributions in performing a critical error analysis for the UARS ISAMS experiment."

Robert H. Daugherty, Structural Dynamics Division, "for coauthoring the report selected by a committee of peers as the outstanding scientific paper written by SDyD employees in calendar year 1989."

April M. Malenfant, Structural Dynamics Division, "for providing outstanding secretarial and administrative services by maintaining efficient operations in the Structural Dynamics Division."

Sandy M. Stubbs, Structural Dynamics Division, "for coauthoring the report selected by a committee of peers as the outstanding scientific paper written by SDyD employees in calendar year 1989.

Wendell G. Adams, Operations Support Division, "for exceptional support to Laser Velocimeter Development."

Dean W. Sparks, Operations Support Division, "for exceptional support of the National Transonic Facility."

Stephen A. Mason, Operations Support Division, "for high quality technical support at the 14- by 22-Foot Subsonic Tunnel."

Warren C. Higgs, Operations Support Division, "for initiative and dedicated support of the NASP Rocketdyne Parametric Inlet Model."

Beverly Jones Anderson, Operations Support Division, "for exceptional and dedicated support to research and facility operations at the High Intensity Noise Facility, Building 1221A."

Arthur G. Ritter, Operations Support Division, "for recognition of outstanding efforts and contributions to restore power to Air Force and NASA NASP Facility."

John J. Cox, Personnel Division, "for exceptional service and leadership in developing and administering personnel programs at Langley Research Center."

Clarence F. Breen, Systems Safety, Quality and Reliability Division, "for recognition of dedicated and effective support to LaRC NPS Contractor Safety Program."

Michelle S. Cannon, Operations Support Division, "for exceptional performance and technical contributions in support of both the Polymeric Materials Characterization Laboratory and the Spacecraft Dynamics Laboratory, Building 1293."

Charles H. Greenhalgh, Fabrication Division, "for exceptional support and dedication to nondestructive inspection of ARC Model 0.6-KS-40 Spin Rocket Motors for Scout."

Alvin P. Lass, Facilities Engineering Division, "for outstanding performance and contributions in support of the design and installation of the Multiphase HVAC Rehabilitation, Facility 1268."

Alan H. Phillips, Systems Safety, Quality and Reliability Division, "for recognition of timely and effective safety engineering support to the 8-Foot High-Temperature Tunnel Modifications Project."

Joseph A. Poslik, Systems Safety, Quality and Reliability Division, "for recognition of timely and effective Safety Engineering support to LaRC Configuration Management Program."

Bernard J. Mlynzak, Flight Systems, "for significant contributions to improving the effective use of program funds in the Flight Systems Directorate."

Barbara A. Fryer, Space Station Freedom Office, "for exceptional administrative service during the establishment of the Langley Space Exploration Initiative Office."

Arthur G. Ritter, Operations Support Division, "for recognition of outstanding efforts and contributions to restore '1B' transformer to service."

Royce F. McCormick, Instrument Research Division, "for organizing, developing and conducting a magnetic tape recorder training program at the contractor's facility which improved the technical competence of their technician staff at a considerable cost savings to the Government."

Charmaine G. McLean, Materials Division, "for personal contributions to the Secretarial Co-op Training Program in addition to an outstanding performance as branch secretary."

Reginald C. Rose, Operations Support Division, "for exceptional technical contributions and fulfillment of Alternate Principal Facility Coordinator duties to the Hypersonic Propulsion Facilities, Building 1221."

Brenda H. Simpson, Fluid Mechanics Division, "for outstanding performance of secretarial duties in support of the Theoretical Aerodynamics Branch, the Experimental Flow Physics Branch, and the Computational Aerodynamics Branch."

Noel A. Talcott, Advanced Aircraft Branch, "for outstanding leadership in coordinating and directing the technical efforts of NASA and industry research teams developing Advanced Aircraft Technology."

John B. Warren, Operations Support Division, "for recognition of outstanding effort and contribution associated with the automation and computer controls of the Supersonic/Hypersonic Blowdown Tunnels in Building 1247D."

...awards

Kelli F. Willshire, Information Systems Division, "for outstanding performance as executive secretary of the Advanced Technology Advisory Committee during the preparation of ATAC Reports 8, 9, and 10."

Jeanne D. Covington, Acquisition Division, "for recognition of her outstanding pricing performance in developing the probable cost and negotiated position for the CERES project."

Anne S. Reed, Acquisition Division, "for recognition of superior accomplishments in the award and administration of grants and cooperative agreements."

Nancy M. Sessoms, Acquisition Division, "for recognition of outstanding achievements in the pre-award/SEP activities for the Computational Analysis and Programming Support Services (CAPSS) follow-on procurement."

Asa L. Shaw, Acquisition Division, "for recognition of outstanding service in writing a technical guide for procurement of information resources."

Beverly R. Thomas-Burse, Acquisition Division, "for recognition of superior accomplishments in the award and administration of grants and cooperative agreements."

Stanley W. Ward, Acquisition Division, "for recognition of outstanding achievements in the pre-award/SEP activities for the Simulation, Communication and Data Systems Support Services (SCADS) follow-on procurement."

Carolyn A. Wells, Acquisition Division, "for recognition of the professional and expeditious manner in which the Calligraphic/Raster Display System procurement was handled."

Wayne D. Geouge, Fabrication Division, "for outstanding contributions to the repair of the 31-Inch Mach 10 Tunnel nozzle throat section."

Carl A. Trexler, Fluid Mechanics Division, "for superior accomplishment in hypersonic inlet research."

Geraldine N. Pardue, Facilities Engineering Division, "for outstanding administrative support and exceptional performance as secretary to the 8-Foot High-Temperature Tunnel Modifications Project Office, the Hypersonic Facilities Project Office and the High Pressure Air Systems Project Office."

Gerald D. Boggs, Operations Support Division, "for exceptional technical support to the National Transonic Facility Mishap Recovery Program."

Kelly J. Brewer, Research Information and Applications Division, "for continued excellence of performance and contribution of craftsmanship rendered in the production of technical reports and other printing for LaRC and NASA Headquarters."

Jean W. Clough, Office of External Affairs, "for excellence in coordinating press operations for the Long Duration Exposure Facility retrieval mission STS-32 and spacecraft disassembly operations at Kennedy Space Center."

Alice E. Eley, Office of External Affairs, "for exceptional service during an unusually heavy workload related to the return of the Long Duration Exposure Facility (LDEF)."

Stephen K. Geissinger, Fabrication Division, "for outstanding contributions to the Cross Flow Vortex Experiment."

Ronald S. Geouge, Operations Support Division, "for exceptional technical and innovative support to the refurbishment of research model and support hardware in the National Transonic Facility."

Thomas W. Hogge, Flight Management Division, "for recognition of superior accomplishment in the design and development of a reconfigurable piloted workstation, in the timely interfacing of the workstation to collimation optics, and in the aggressive pursuit of the design and implementation of a trailer-based laboratory in support of HMD and stereo flight display research."

William L. Jones, Operations Support Division, "for exceptional technical support to the National Transonic Facility Mishap Recovery Program."

Stephen D. Patek, Instrument Research Division, "for exceptional effort and initiative in implementing an optimal stochastic control law to a multivariable control system."

Christine A. Ryan, Research Information and Applications Division, "for continued excellence of performance and services contributed in support of the Publications Section."

Catharine G. Schauer, Office of External Affairs, "for outstanding performance during contract transition."

Ronald Shaiken, Operations Support Division, "for exceptional technical and innovative support to the refurbishment of research model and support hardware in the National Transonic Facility."

John J. Snoha, Operations Support Division, "for exceptional performance in providing highly innovative and productive technical support to the Composite Fabrication Development Laboratory, Building 1293C."

Edward C. Taylor, Fabrication Division, "for exceptional support and dedication to ultrasonic C-scan inspection of composite materials at LaRC."

Charles H. Thatcher, Operations Support Division, "for exceptional technical support to the National Transonic Facility Mishap Recovery Program."

Carl J. Voglewede, Fabrication Division, "for excellence in the support of the Printed Circuit Laboratory and the Waste Water Treatment Facility."

Martin R. Waszak, Guidance and Control Division, "for superior performance in providing significant technical contributions for the Active Flexible Wing Program."

Stacey M. Crum, Research Information and Applications Division, "for outstanding performance to the Research Information and Applications Division and other divisions assigned in the Management Operations Directorate."

Richard A. Jones, Information Systems Division, "for efforts in completing the redesigned rotor simulator for use in Langley's AIRLAB facility."

Vernelle V. Robinson, Research Information and Applications Division, "for outstanding performance in support of the Research Information and Applications Division and the Langley Exchange."

Ralph W. Will, Information Systems Division, "for outstanding support for the Space Exploration Initiative Assessment Team and Advocacy of Langley Research Center Roles."

Christopher L. Rumsey, Fluid Mechanics Division, "for outstanding cooperative research with Lewis Research Center culminating in the Journal of Fluid Mechanics paper, 'A Natural Low-Frequency Oscillation of the Flow Over an Airfoil Near Stalling Conditions.'"

Nancy C. Rodgers, Office of Director for Electronics, "for exceptional performance and dedication in support of the Electronics Directorate office operations."

Joyce A. Clemens, Office of Director for Electronics, "for exceptional performance and dedication in support of the Electronics Directorate financial operations."

Charlotte W. Tyeryar, Office of Director for Structures, "for outstanding achievements in administrative support of the Structures Directorate office."

Patricia R. Whitehead, Office of Director for Aeronautics, "for superior performance of duties and contributions to the preparation of the Aeronautics Directorate Strategic Plan."

Elizabeth F. Buchan, Office of Director for Aeronautics, "for administrative contributions to the Aeronautics Directorate."

William T. Yost, Instrument Research Division, "for innovative scientific contributions that are making a significant impact upon NASA's mission safety and quality and for technology transfer efforts to the private sector."

Samuel Sokol, Flight Electronics Division, "for outstanding contributions to the management of the Electronics Branch and recovery of data from the Long Duration Exposure Facility."

Frederick L. Staggs, Flight Electronics Division, "for recognition of outstanding technical support and management of the transition of the Technical Support Services for Aerospace Research and Technology Contracts."

James A. McAdoo, Flight Electronics Division, "for recognition of contributions to the TRACER science detector requirements."

Laurie W. Andrews, Flight Electronics Division, "for recognition of outstanding administrative support provided to the Flight Electronics Division."

Jennifer J. Reilly, Flight Electronics Division, "for recognition of excellent performance in providing electronic design and analysis support for the TRACER Concept Design and Cost Review (CDCR)."

Franklin K. Harris, Flight Electronics Division, "for recognition of continuing excellent performance and flight instrumentation contributions to the Lear Jet Airborne Field Mill Flight Research Program."

John K. Diamond, Flight Electronics Division, "for recognition of excellent performance in providing electronic contributions to the Tethered Satellite and HALOE projects."

James Bene, Flight Electronics Division, "for recognition of excellent performance in providing lithium battery support for LDEF Spacecraft Recovery."

Carroll D. Lytle, Flight Electronics Division, "for recognition of excellent performance in providing instrumentation and electronic contributions to aeronautical flight research programs."

George M. Rowe, Flight Electronics Division, "for recognition of outstanding contributions to the design and development efforts and support to management of the Lidar In-Space Technology Experiment (LITE) Electronics Subsystem."

Michael P. Blythe, Flight Electronics Division, "for technical leadership and management contributions which led to exceptional progress in the development of the Lidar In-Space Technology Experiment (LITE) Electronics Subsystems."

Marvin E. Beatty, Flight Electronics Division, "for outstanding management of the Multi-processor Architecture Space Technology (MAST) 1750A Computer effort."

James B. Williams, Flight Electronics Division, "for lead technical role and contributions in the successful redesign of the Lidar Atmospheric Sensing Experiment Signal Processor Subsystem."

William C. Edwards, Flight Electronics Division, "for outstanding individual contributions to the LASE Ti:Sapphire breadboard demonstration."

Jane C. Leffel, Flight Electronics Division, "for outstanding individual contributions as secretary to the SAGE III Evaluation Panel."

Lewis G. Burney, Flight Electronics Division, "for outstanding individual contributions to DACOM measurements of CO and CH_4 during the ABLE-3B flight program."

Edward A. Modlin, Flight Electronics Division, "for outstanding individual contributions to excitation spectroscopy of rare-earth multi-doped laser materials."

William M. Hall, Flight Electronics Division, "for recognition of contributions to the LASE signal processor subsystem."

Dwayne E. Hinton, Flight Electronics Division, "for recognition of contributions to the LASE laser transmitter module."

Kenneth H. Cate, Instrument Research Division, "for exceptional effort and initiative in developing instrumentation for CETA and 30- by 60-Foot Tunnel."

Philip C. Kassel Jr., Instrument Research Division, "for leadership in the timely development of requirements for data analysis for the LDEF-IDE."

Natalie H. Shrader, Instrument Research Division, "for effecting the orderly transition from an NBI to the Macintosh IIcx word processing system."

Ray D. Rhew, Instrument Research Division, "for the development of a SEDS/Delta-II Three Component Tether Load Cell."

Mark T. Fletcher, Instrument Research Division, "for significant contributions to the execution of laser Doppler tests in the 20-inch Mach 6 Wind Tunnel and the velocity flow field surveys of solar pumped laser plasma tubes." *

**Remainder of Fiscal Year 1990 awards will appear in the January 25 issue of the Researcher News.*

People & Places

Tidbits from Training

Specialized Training Available

The Training and Education Section schedules various computer classes throughout the year, for example, VAX/VMS, "C" Language, Unix, etc.

In addition, some specialized (one of a kind) courses are scheduled on an as-needed basis. These courses are related to specific systems used in support of research projects.

Specific information is needed to secure one of these special courses. The requester should generate a memo to the head of the Training and Education Section justifying the need for the course. Included in the memo should be a suggested vendor able to provide the training (if known), the number of employees requiring training, a description of the course and a desired date/time for the class. When possible, allow at least two months for class scheduling.

Please remember that there must be nine NASA and/or Army participants in order to schedule a class. If there are not enough attendees, the Training and Education Section can assist by having the training coordinators canvass their areas for additional students.

Due to the limited training budget, any training associated with the purchase of new equipment should be included in the original purchase agreement.

For additional information on specialized training, contact Tony Maturo, ext. 42590.

Retirement Parties

C. T. Tiller will be honored at a retirement party Thursday, January 17, from 4:30 to 6 p.m. in the Langley cafeteria private dining room. Heavy hors d'oeuvres will be served and a cash bar will be available. Cost is $8 per person, gift included. Contributions for gift only are welcome. Please send reservations to Brian Luoto, 864-7232, or Bruce Bishop, 864-7229, at Mail Stop 435 by January 14.

James R. (Bob) Dinkins will be honored at a retirement party Tuesday, February 12, at the H.J.E. Reid Conference Center, Building 1222. Cash bar social will begin at 6 p.m.; dinner will be at 7 p.m. Cost is $11.25 per person. Gift contributions are welcome. Respond via check to Jackie Kallick, Mail Stop 114, by February 1.

Notes of Thanks

Noel A. Talcott Jr. writes: "My wife Nancy and I would like to thank those of you who kept us in your thoughts and prayers during the five months we were in Minneapolis for our daughter's bone marrow transplant. All of the cards, letters and gifts--especially the ones for Natalie--were most appreciated and made the long stay more bearable. I am also grateful to those who gave blood in Natalie's name and to those who donated leave so that I could be with Nancy and Natalie through this ordeal."

Pat Gates writes: "For almost 12 years NASA has been my home and all of you like my family. On January 29, I will return to Texas, my home state, to marry. I know I will miss all of my wonderful friends here at NASA and on the Peninsula; however, I am excited about the future that awaits me in Texas. Thank you all for the support and fellowship you have given me through the years. You'll always hold a special place in my heart."

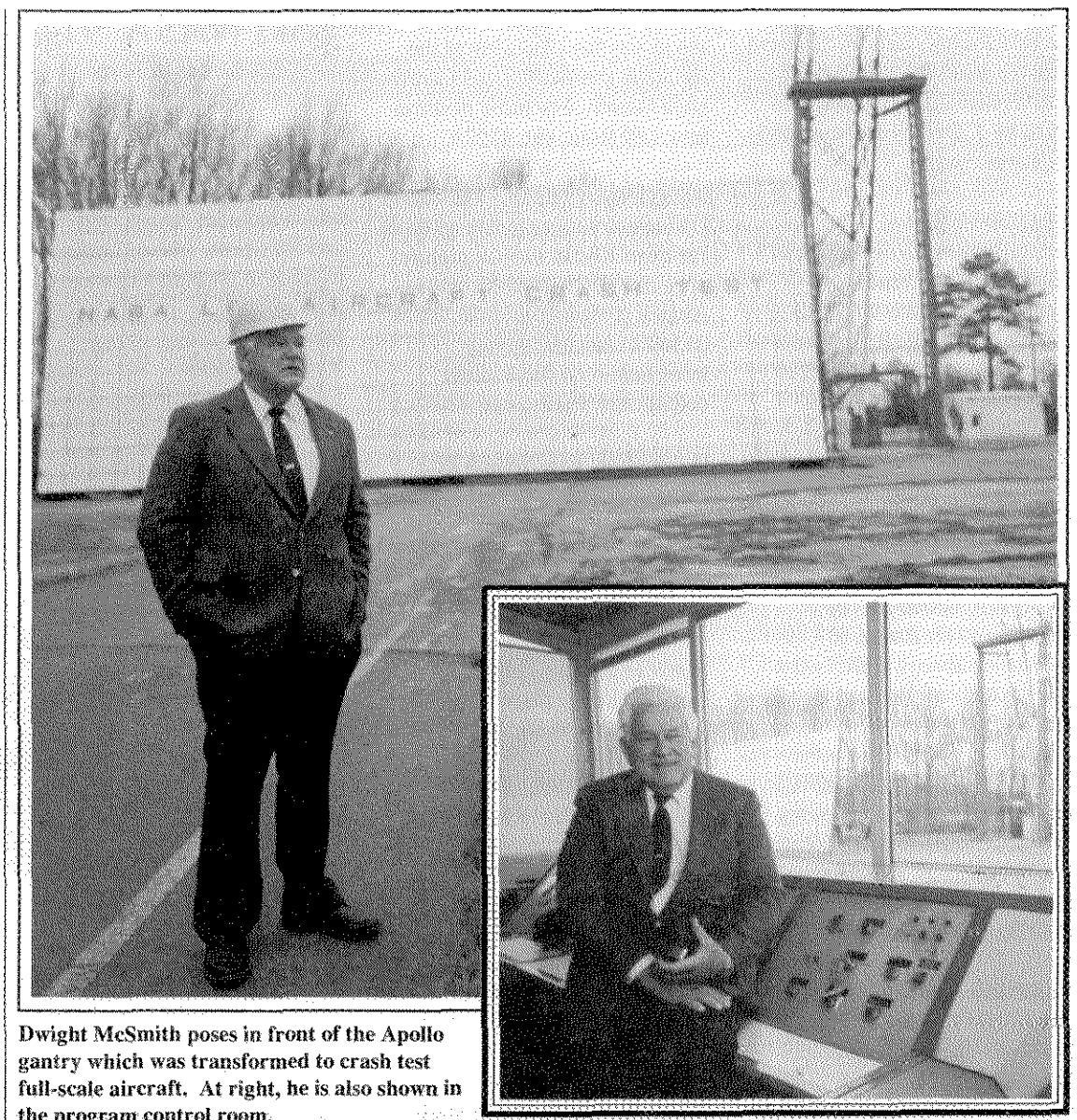
Farewell Planned

Scout Moves to Goddard

After more than 30 years, management of the Scout Project was moved from Langley to Goddard Space Flight Center January 1. All employees, retirees and contractors are cordially invited to attend the "Salute to Scout" ceremony Friday, February 1, 1991, in the H.J.E. Reid Conference Center, Building 1222. The program will begin at 2 p.m. and a reception will follow the ceremony. Time should be charged to Job Order A1980.

A "Salute to Scout" banquet will be held Saturday, February 2, 1991, at the Langley Air Force Base Officers' Club. The cash-bar social will begin at 5:30 p.m., followed by dinner at 7 p.m. and a short program. Dancing to music provided by Gator Allmond and the "Spice-of-Life" band from 9 p.m. to 1 a.m. will conclude the evening.

Cost of the prime rib banquet is $17 per person. Checks should be made payable to the NASA Langley Conference Center and be mailed to Ann Suit, Mail Stop 154, by January 18, 1991. Be sure to include complete names, addresses and phone numbers of attendees for badge purposes.



Dwight McSmith poses in front of the Apollo gantry which was transformed to crash test full-scale aircraft. At right, he is also shown in the program control room.

-photos by Carol Petrachenko

Retirement Has Not Reduced the Enthusiasm of Aviation Safety Advocate

During a career which spanned more than 40 years, he helped build a model of the original Mercury capsule. He worked on the ECHO communications satellite. He was part of the start-up team for Langley's Vertical Take-Off and Landing (VTOL) program. He helped develop the first polymeric materials for spacecraft. But Dwight McSmith becomes most animated when he talks about Langley's Aircraft Crash Test Program.

The topic of aircraft safety has consumed his life--his professional life during a long Langley career as well as ongoing volunteer activities. McSmith will talk of his passion for aeronautics safety at a Visitor Center lecture at 7:30 p.m. Thursday, January 24. His presentation, titled "The Men Behind the Crash," will detail the beginnings of the NASA Langley Crash Test Program and the events and activities that have progressed from it.

Researchers in a Langley structures lab in the late 1960s studied the compression of aluminum cylindrical shapes and noticed how the aluminum seemed to absorb energy during the compression. Out of this observation was born the Crash Test Program.

McSmith, who was supervisor of operations, hoped to acquire government surplus aircraft to test in controlled crash situations. He remembers how Mel Roche, after a flood at Piper Aircraft in Pennsylvania, negotiated for 14 fuselages and 11 sets of wings directly off the production line. Roche purchased the total for 10 percent of the production cost. Engineers at Langley adapted the parts to bring them up to dynamic weight in order to study the structure of aircraft through their parts.

"Technicians are the hands of engineers," says McSmith. "I have worked with some very fine, very talented engineers and technicians at Langley."

McSmith worked with engineer Vic L. Vaughn to adapt the Apollo Lunar Landing facility to study the crash dynamics of entire aircraft. Complete structures were suspended from the gantry and released in a controlled crash. The Langley staff had control over the attitude and velocity of the craft as well as the release of the airplane. The structure was instrumented to measure the loads imposed on the test object and record that valuable data.

"Technicians are the hands of engineers."

-McSmith

Another outgrowth of the program fitted the aircraft with seats to study the loads transmitted to airplane occupants. Load limiting seats and body restraints were tested on anthropomorphic dummies to determine parameters for crashworthy designs. While the established general aviation aircraft industry has been slow to apply this technology, the Jungle Aviation and Radio Service (JAARS)/Mission Aviation Fellowship has developed, tested and installed energy absorbing seats in several of their airplanes.

"Imagine my reaction," said McSmith, who has travelled to every continent as part of a volunteer aviation safety seminar team, "to travel in a Missionary Aviation plane outfitted with the energy absorbing seats I had spent a quarter of my career studying."

Missionary Aviation International flies to the remotest areas of the world and, in McSmith's opinion, has the highest intensity of concern for humans. "They refined and adapted NASA technology to their purposes," said McSmith. "The improved technology has been certified for use. In fact, seventy-five of their aircraft have been retrofitted with these much safer seats."

McSmith's career placed him in a strategic position to affect aviation safety; his volunteer activities continue that thrust. He is a consumate aviation safety advocate.

Happenings

SPECIAL LAA SOCIAL will be held Friday, January 18, from 4 to 8 p.m. in the H.J.E. Reid Conference Center. Entertainment by J. Quincy Brown Band. $1 cover charge.

BLOODMOBILE. The American Red Cross will hold a Bloodmobile Wednesday, January 16, from 9 a.m. to 3 p.m. in the H.J.E. Reid Conference Center. Share the gift of life--give blood.

TOASTMASTERS. The NASA Langley Toastmasters Club meets the second and fourth Wednesdays of the month. The next meeting is at 11:30 a.m. January 23 in Building 1218, Room 107. Guests are always welcome. For details, call Richard Booth, ext. 44657.

LOW-IMPACT AEROBICS classes are held each Tuesday and Thursday from 5 to 6 p.m. in the NASA gym. Cost is $12 per month or $30 for three months. First class is free.

ALUMNI ASSOCIATION annual meeting and election of board members will be held Wednesday, January 16, beginning at 6 p.m. in the H.J.E. Reid Conference Center. For more information, call 722-0443.

CONSERVATION CLUB meets the third Tuesday of the month in the H.J.E. Reid Conference Center. For more information, call Rom, ext. 41524.

MISSING: ITEMS. The Safety Office is trying to locate a 16mm Eastman Kodak motion picture projector, ECN 220261, and an Avatex computer modem, ECN 053690. Anyone having information on these items contact Ms. Perrin, ext. 47233.

WANTED: ROOMMATE. Female seeking working lady to share home in Hampton. Furnished bedroom, all house privileges. $250 per month. Call 826-3632.

WANTED: ROOMMATE. Non-smoker to share lake-front town home in Hampton. Private room and bath. Convenient to NASA and LAFB. $400 per month, which includes utilities. Call Sandie at 838-8582.

FOR RENT: APARTMENTS. New one and two BR luxury apartments, 15 minutes from NASA, just off I-64 Bridge Tunnel entrance. Call 722-5870.

FOR SALE: PIANO. Upright grand piano, $300. Call 599-4921 after 6 p.m.week days or anytime weekends.

Ski NASA '91

Ski the beautiful mountains of Virginia. Travel on modern, restroom-equipped buses--no worry about driving or road conditions. Cost is $43, which includes transportation and lift ticket. Make checks payable to Richard Bennett and send to Mail Stop 397 or 11 Bosch Lane, Newport News, Virginia, 23606.

Rental equipment is available at the ski slopes. To rent equipment, include $15 for rental fee in the check.

The bus arrives at Newmarket South (in front of Hechingers) at 4:30 a.m. and departs at 5 a.m. for arrival at the ski area by 9:30. Buses depart the slopes at 5 p.m. and should arrive in Hampton by 9:30 p.m.

Trips are open to all NASA employees, contractors and their friends. For additional information, contact Bennett at 599-5585.

Thursday Ski Trips

January 17 ..... Bryce
January 24 ..... Massanutten
January 31 ..... Wintergreen
February 7 ..... Bryce
February 14 ..... Massanutten
February 21 ..... Wintergreen
February 28 ..... Wintergreen
March 7 ..... Bryce
March 14 .....Massanutten

Mentors Needed for Summer Programs

Manpower at Langley undergoes a "summer surge" as students and educators take advantage of numerous NASA programs for on-site research.

In addition to on-going programs that operate year round, summer programs in 1990 brought more than 500 guest researchers to Langley. At least that many are expected this summer. These visitations are authorized and monitored by Langley's technical assistants.

Beyond the paperwork of attracting and processing talented individuals for research in areas related to Langley's mission, each visitor is also assigned a principal contact or mentor to guide his or her study on Center. Nearly 150 mentors are needed to maintain this summer's programs. Research will be conducted in the areas associated with aeronautics, electronics, flight systems, space, structures and systems engineering, so mentors are needed from all technical directorates.

"Our volunteer mentors are the key to making these outreach programs successful at Langley," said Dr. Samuel Massenberg, University Affairs Officer. "This mutually beneficial arrangement pairs a Langley researcher with a student or faculty member having a similar research interest. Everyone wins--NASA Langley, the employee and the visitor."

Employees who are interested in mentoring should discuss their plans with their immediate supervisors and directorate administrative or technical assistants by January 25. Questions about summer program offerings and mentor responsibilities should be directed to the Office of University Affairs, ext. 44000.

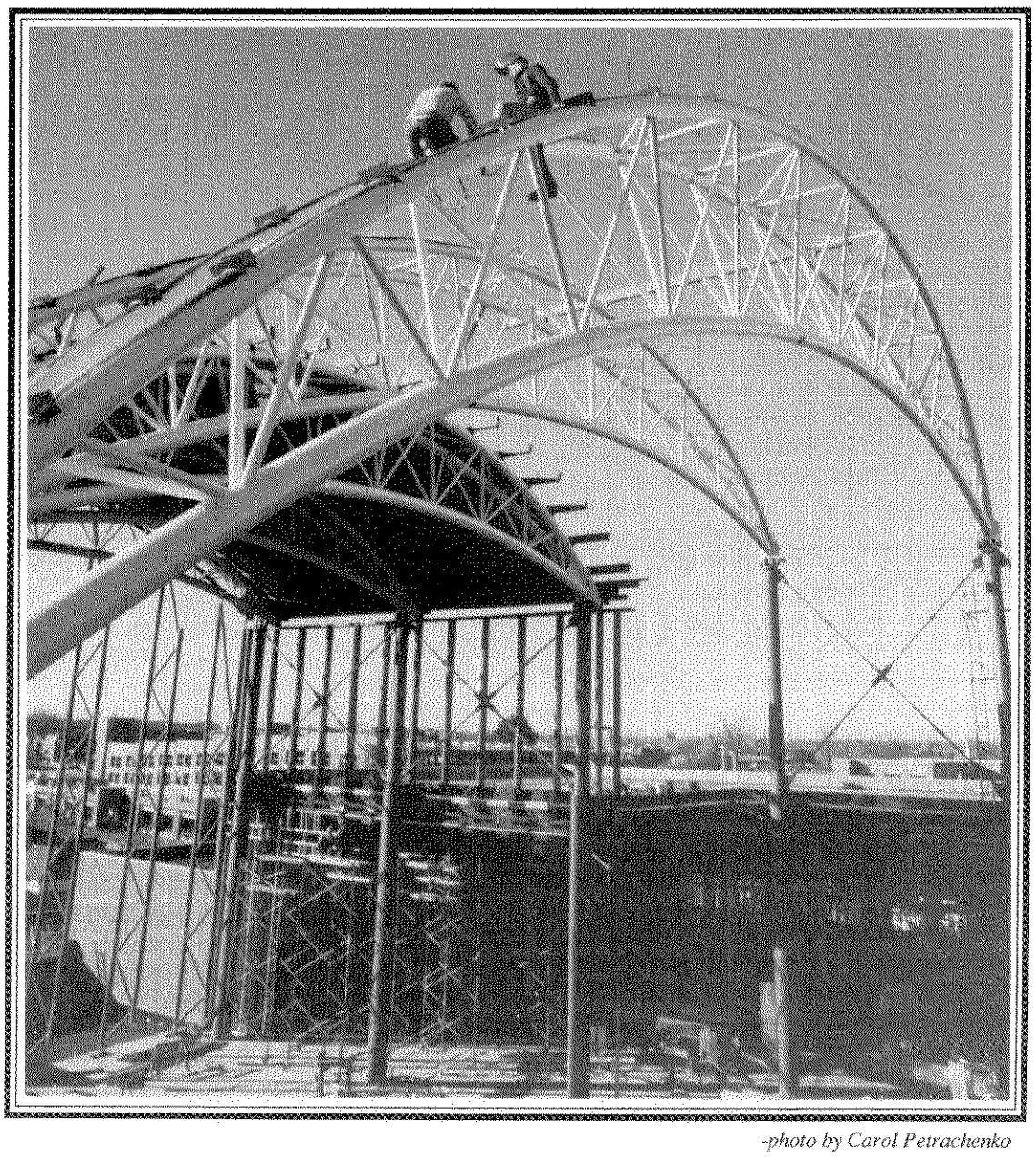
'Angels' Help Over Two Dozen Kids

Langley's Acquisition Division doubled last year's efforts in their Angel Tree project during the holidays.

"We raised over $700 which enabled us to outfit 27 children this year," said Stan Ward, project coordinator. This means twice the number of children had a very Merry Christmas thanks to the generosity that has swept the division each year since the project began in 1988.

Ward still contends that it is the 'Santas' who really benefit from the project. Good job.

VASC is Dramatically Changing Local Skyline



-photo by Carol Petrachenko

W. M. Jordan Co. workers sit atop a wing-shaped truss recently installed over the main exhibit area of the Virginia Air and Space Center, currently under construction in downtown Hampton. The trusses, which form the museum's unique roof line, are so large they were transported by barge from Chesapeake, via the Elizabeth River across the Hampton Roads and up the Hampton River, to the construction site.

Researcher News

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

402 ON-SITE NON-LARC
SKORA, MARY M.
MAIL STOP 115

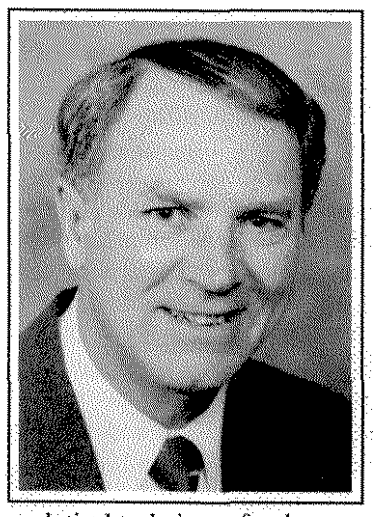
NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 2 January 25, 1991

Researcher News

Bi-weekly Employee and Contractor Publication

Harris Honored by President



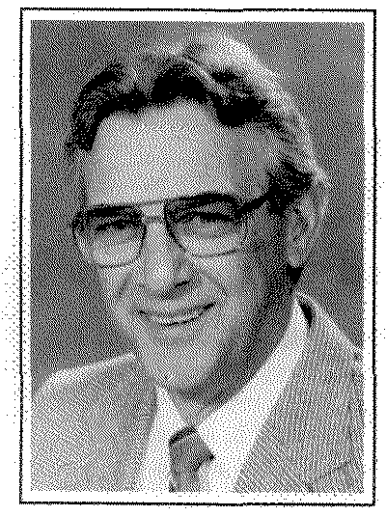
Roy V. Harris Jr., director for Aeronautics, was presented a Distinguished Presidential Rank Award by President George Bush at a special ceremony in Washington, D. C., Wednesday, January 9.

The President conferred on Harris the rank of Distinguished Executive in the Senior Executive Service (SES) for "sustained extraordinary accomplishment in management of programs of the United States Government and for leadership exemplifying the highest standards of service to the public, reflecting credit on the career civil service." Each year only one percent of SES executives may receive this prestigious award.

Harris is a nationally and internationally recognized authority in the field of supersonic aerodynamics. He has played a lead role in developing the technology for supersonic military aircraft, supersonic transport aircraft and the newest generation of advanced fighter aircraft.

He began his NASA career in 1958 at Langley where he made major contributions to the development and refinement of analytical techniques for the design and analysis of supersonic aircraft. He originated a program which is now providing new technologies for future military aircraft. Harris kept alive the hypersonic research effort which led to technical developments which now form much of the basis for the National Aero-Space Plane program. He also implemented a program which is aimed at environmental concerns for future supersonic transport aircraft and a new program which offers revolutionary levels of agility for future fighter aircraft.

Langley's Morin Receives Presidential Award



Maurice K. Morin, chief of the Analysis and Computation Division, was presented a Presidential Rank Award in a special ceremony Wednesday, January 16, in Melbourne, Florida.

Morin received the rank of Meritorious Executive in the Senior Executive Service (SES) for his outstanding contributions to the management of NASA programs. Each year only five percent of SES executives may receive this award.

Morin, an innovative manager during his 34-year career at Langley, has made technical contributions of national significance. He developed the first digital simulation system in NASA, which served as an industry standard for over 20 years. He developed and installed the first commercially available supercomputer, STAR, in the aerospace community. Morin also developed the Agency's first successful 10-year Automatic Data Processing (ADP) plan as well as a Center-wide fiber optic 10 million bits per second data communications network.

He most recently completed the installation of a major new supercomputing augmentation which has increased Langley's supercomputing capacity by a factor of five. His innovative management policies for software licensing and development of an advanced technology system for real-time simulation have resulted in a cost savings for the Government of over $8 million since 1984.

Morin began his career with NASA's predecessor agency, the National Advisory Committee for Aeronautics, in June 1955 as an aerospace technologist in the Instrument Research Division. In his present position, he manages and directs a staff of over 110 civil service and 260 contractor personnel covering five support service contracts, a Central Scientific Computing Complex and Simulation Facility valued in excess of $100 million and an annual budget of approximately $30 million.

Launch Vehicle Program Moves to Goddard

Since 1959, NASA Langley has managed one of the nation's most successful and reliable launch vehicles--Scout.

On January 1, 1991, Langley relinquished management of the Scout Project to the NASA Goddard Space Flight Center, Greenbelt, Maryland. Goddard is responsible for the 24-hour-a-day surveillance of a worldwide ground and space-borne communications network for a number of satellites in orbit.

Scout--Solid Controlled Orbital Utility Test system--is a four-stage solid fuel satellite system capable of launching a 385-pound satellite into a 500-mile orbit. There have been 113 Scout launches, and its overall 96 percent success rate has earned this workhorse a spot in the National Air and Space Museum, where it stands beside other veterans of America's space program, such as Jupiter, Aerobee and Vanguard rockets.

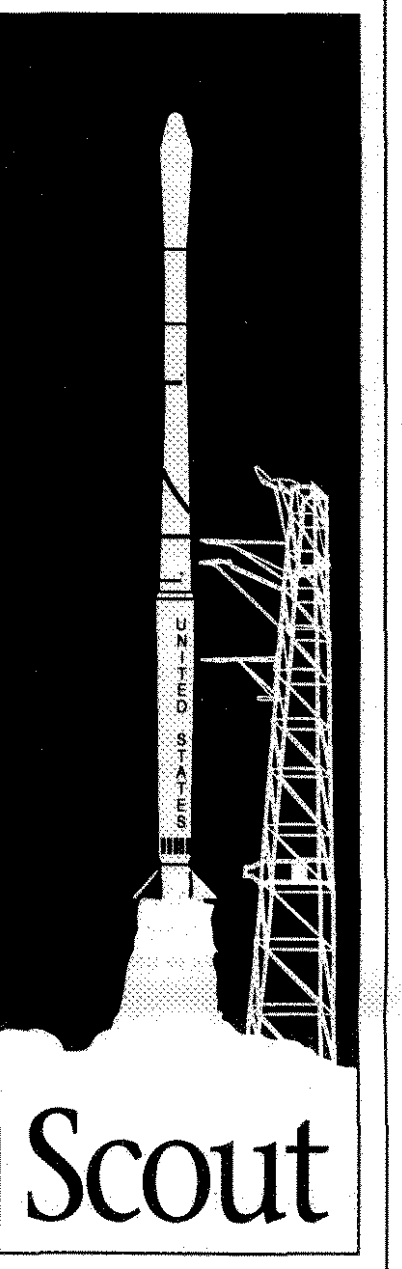
Scout's honor roll includes 23 satellites launched for international space organizations. Payloads have been launched for the European Space Research Organization, for Germany, for the Netherlands, for France, for Italy and for the United Kingdom. Through the years, Scout has launched 94 orbital missions, seven probe missions and 12 reentry missions.

Those who have worked on the Scout program have made a unique contribution to the U.S. space program. They have created a launch vehicle system that has set a standard for simplicity, productivity and reliability. They did it by establishing uncompromising standards of exactness and by an unwavering pursuit of excellence. In these accomplishments, they created an atmosphere of teamwork and mutual respect, that those who worked on Scout will never forget.

The Scout team has consisted not only of NASA Langley employees but a group of employees from the LTV Missiles and Electronics Group of Dallas, prime contractor for the development of Scout systems. In 1959, Langley awarded the contract to LTV to develop the airframe and launcher for Scout. This began a partnership between NASA and LTV that has lasted for over 30 years. Scout's reliability stems from a sense of teamwork and cooperation between government agency and contractor.

Scout's reliability also derives from standardized procedures and configuration control as well as from its simple, old-fashioned technology. The vehicle was built with off-the-shelf hardware, but this technology has made Scout reliable and predictable.

Since its early development, the configuration of Scout has continued to evolve. Each of the motors has been upgraded at least twice, and improvements in rocket engine design have enabled the rocket to carry larger payloads. Even so, the current Scout G-1 configuration is very similar in appearance to that of the original vehicle--a testimony to the soundness of the original design.



Langley will honor those who have worked on Scout at a special ceremony Friday, February 1 at 2 p.m. in the H.J.E. Reid Conference Center. A reception will follow the ceremony.

SCAN Recommendations Bring Changes to LaRC

In early 1990, after careful analysis of the results of the culture survey, three employee teams were empowered by the Center Director to examine "how we do things at Langley." They were directed to look into the areas of communications, career development, and rewards and recognitions. Called SCAN (Strategic Culture Assessment for the Nineties) teams, their goal was to make Langley an even better place to work.

"Langley senior management has already acted on 28 of the 61 recommendations made by the SCAN teams," said Associate Director Sid Pauls. "Assessment of all recommendations should be completed by the end of February. Shortly after that, we plan to issue to all employees the complete set of recommendations with the actions we have taken on each."

The following initiatives have been implemented since the last **Researcher News** report:

o The Center Director, program directors and division chiefs will hold employee forums at least bi-monthly for more direct communication with those under their supervision.

o Technical committees, modelled on the AIAA technical committee format, will be created in aeronautics and selected space disciplines.

o An Exemplary Performance Award has been established to reward those at Step 10 and at their promotion potential whose outstanding performance demands further recognition.

o The Promotion Point System has been abolished. Instead each program director will generate a promotion plan for the year.

In addition, a range of initiatives in the area of human relations are under study or in the process of being implemented. These include:

o MAST-type courses for all employees.

o An assessment course for all employees interested in management.

o A pre-management curriculum for aerospace technologists and administrative professionals.

o Competitive placement position descriptions for supervisors which include a human-resources-knowledge skill and ability factor.

o Annual formal human resource management training for supervisors.

"While it may appear that progress is slow, these recommendations we are looking into have significant, lasting impact on how we conduct business at this Center," summarized Pauls. "We are proceeding carefully and we're convinced that some very fine new directions are evolving because of this introspective look into our policies and procedures. The SCAN teams' hard work has been invaluable in this process."

News Briefs

NASA and ESA Sign Agreement For a Joint Saturn Mission --- NASA and European Space Agency (ESA) officials recently signed an agreement to cooperate in the development of the Cassini spacecraft to study Saturn. NASA Administrator Richard H. Truly and ESA Director-General Jean-Marie Luton signed the agreement. The Cassini spacecraft will explore the Saturnian system, which contains a host of volatile-rich bodies with a record of processes that have modified these bodies. The Cassini spacecraft will be composed of the Saturn Orbiter provided by NASA and the Huygens Probe System provided by ESA. It is scheduled for launch by NASA on a Titan IV/Centaur vehicle in April 1996.

Truly Announces Additional Actions to Implement Report --- NASA Administrator Richard H. Truly announced several more actions that reflect the agency's commitment to implement the recent recommendations of the Advisory Committee on the Future of the U.S. Space Program. Truly briefed the National Space Council on the status of NASA's thorough and expeditious review of the advisory committee's report. One, space science will remain as NASA's priority, an essential element of a balanced civil space program. Two, a special task force will be formed with the Department of Defense to assess development of an evolutionary heavy-lift launch vehicle. Three, Space Station Freedom restructuring activities, being conducted in concert with the international partners, will be extended to incorporate the recommendations of the advisory committee. And, fourth, NASA will move out with the Office of Personnel Managment to structure a personnel management system that recognizes NASA's special requirements for attracting and retaining top-flight scientists, engineers and other specialists.

Finarelli Named Head of External Relations --- NASA Administator Richard H. Truly has named Margaret G. Finarelli as associate administrator for External Relations. Truly also announced the appointment of John D. Schumacher as deputy associate administrator for External Relations. Finarelli, who has served as acting director since August, is responsible for the agency's interagency, international and industry relations, relations with state and local governments and educational activities. She joined NASA in 1981 as chief of the International Planning and Programs Office. Schumacher, who has served as acting deputy associate administrator, joined NASA in June 1989 as advisor to the Administrator.

Astronaut Fisher to Leave NASA --- Astronaut William F. Fisher, M.D., will resign from NASA effective January 31. He will return to the full-time practice of medicine as an emergency specialist at Humana Hospital-Clear Lake, Houston, Texas. Selected by NASA in 1980, Dr. Fisher was a mission specialist on the 20th Space Shuttle mission in August 1985.

COBE Maps Interstellar Material in Milky Way Galaxy --- For the first time, astronomers have mapped the distribution of nitrogen throughout our galaxy. The new observations were taken by an instrument on NASA's Cosmic Background Explorer, the Far Infrared Absolute Spectrophotometer. This all-sky survey, along with additional maps of carbon and dust, provides quantitative information that may enable scientists to understand better the heating and cooling processes that take place throughout the Milky Way. These accomplishments were reported at the American Astronomical Society meeting in Philadelphia by members of the COBE science team.

Editor's note: To obtain a copy of any of these NASA Headquarters News Releases contact Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request information summarized above by headline printed in bold.

Symposium Features Supercomputers for Structural Analysis

A gathering of nationally prominent scientists and engineers will focus on supercomputer applications for structural analysis when Langley convenes a symposium of wide ranging proportions February 5 and 6. Hosted jointly by NASA and the U.S. Air Force, the anticipated 150 attendees will be welcomed to the event's nine different sessions by Langley's Director Richard H. Petersen.

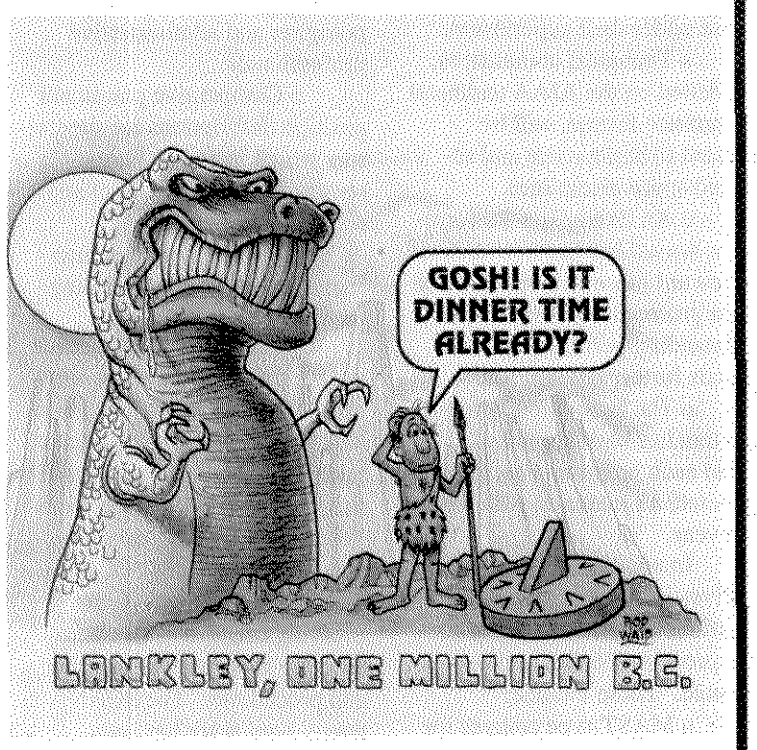
Delivering the keynote address will be Gerald Brost, vice president for engineering of Cray Research, which builds the world's most powerful supercomputer. Also keynoting, later in the activities, will be Dr. Louise Nielson, director of high performance computing for the IBM Corporation. The symposium organizing committee is under the chairmanship of Dr. Olaf Storaasli of Langley's Computational Mechanics Branch.

Special emphasis will be on methods which exploit both the parallel and vector capability of high performance computers to address these technical issues: load balancing, problem decomposition, robustness and generality of the alogorithm, efficient use of processors and memory, and problem and processor scalability.

Langley Officers' Club Invitation

For information on joining the Langley Air Force Base Officers' Club, call 766-1361.

Lankley



A Farewell . . .

Sympathy is extended to Ken and Sue Jones on the death of their son Timothy.

Timothy, who died at home January 7, touched the hearts of **Researcher News** readers after a story appeared in the December 1, 1989, issue.

In that story, Ken Jones, Subsonic Aerodynamics Branch, shared young Timothy's struggle with neuro-blastoma, a rapid-growing form of cancer. Jones needed to be away from his Langley job for months at a time during Timothy's bone-marrow transplant and other hospitalizations. "There was never any question that I would have to take off work and be with my family," he said in the 1989 story.

Jones credited Langley's Voluntary Leave Transfer Program with lessening the financial stress of the already difficult situation. This program allows employees to voluntarily designate annual leave to another employee, who is experiencing a medical emergency. Langley employees-- friends, co-workers, even many he had never met-- donated hundreds of hours of leave to Jones through the Leave Transfer Program.

"Timothy died at home in the midst of his loving family," said Jones. " I could be with my family throughout this ordeal largely because of the concern and support of my co-workers."

In Memoriam . . .

Sympathy is also extended to the families of:

Murray Edwards, who died September 8 in North Carolina. Edwards retired in 1967 from the Plant Maintenance Division, after 25 years of service.

James Marshall Hughes, who died September 12 in Riverside Convalescent Center. Hughes retired in 1985 after nearly 25 years of service.

Paul Kuhn, who died November 8 in Savannah, Georgia. Kuhn, a structural engineer, retired in 1970.

George M. Dudley, who died November 29 in Hampton. Dudley retired from NASA in 1972, after 33 years of service.

William R. Cofer, who died December 10 in Norfolk. At the time of his retirement from NASA in 1981, Cofer was deputy project manager of the National Transonic Facility.

David B. Ahearn, who died January 6 in Newport News. Ahearn retired from Langley in 1979 after 35 years of service.

Corrections

The following award recipients were misidentified by division in the Special Achievement Award listing in the January 11 issue. These Langley employees were part of the following organizations at the time the honor was bestowed:

Ronald T. Lacks, Acquisition Division;

Susan L. Lilly, Office of the Director for Management Operations;

Alice C. Massey, Programs and Resources Division;

Howard R. Puckett Jr., Office of the Director for Management Operations;

Archer V. Vann Jr., Acquisition Division; and

Joseph W. Young, Analysis and Computation Division, were cited "for contributions to the Business, Administrative and Management Information Support Services (BAMIS) Source Evaluation Board (SEB)."

CELEBRATE AN AMERICAN TRADITION
50 YEARS OF
U.S. SAVINGS BONDS

Retirement Parties

Dr. Nathan D. Watson will be honored at a retirement party Monday, February 4, in the H.J.E. Reid Conference Center, Building 1222. Festivities will begin with a cash bar and heavy hors d'oeuvres at 7 p.m.; a program will follow. Cost is $11 per person or $20 per couple. Contributions to gift only are welcome. Reply by January 30 to John Cox, Mail Stop 434, ext. 47171.

A retirement banquet honoring **Wilson W. Clark** will be held Wednesday, February 6, at 7 p.m., at Ryan's Family Steak House, Jefferson Avenue. Cost, including gift, is $10 per person or $20 per couple. Please respond by February 1 to Paul Roberts, Mail Stop 238, ext. 44704.

James R. (Bob) Dinkins will be honored at a retirement party Tuesday, February 12, in the H.J.E. Reid Conference Center, Building 1222. Festivities will begin with a cash bar social at 6 p.m., followed by dinner at 7. Send $11.25 per person to Jackie Kallick, Mail Stop 114, by February 1. Gift contributions are welcome.

Researcher News

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Space Shuttle Manifest

1991

Mission	39	37	40	43	44	48	42
Date	March	April	May	July	August	November	December
Orbiter	*Discovery*	*Atlantis*	*Columbia*	*Discovery*	*Atlantis*	*Discovery*	*Atlantis*
Payload	AFP-675 IBSS STP-01 MPEC	GRO CETA AMOS-08 APM-02	SLS-01 GAS BRIDGE	TDRS-E SSBUV-03, SHARE II, OCTW-01, TPC AMOS-09	DSP, IOCM, DOD M88-01, CREAM-A, AMOS-10	UARS	IML-01 IMAX-5 GAS BRIDGE
Inclination	57°	28.5°	39°	28.5°	28.5°	57°	28.5°
Altitude	140	243	150	160	195	292	165
Duration	8	5	9	9	10	5	7
Crew CDR	Michael L. Coats	Steven R. Nagel	Bryan D. O'Connor	John E. Blaha	Frederick D. Gregory		Ronald J. Grabe
PLT	L. Blaine Hammond, Jr.	Kenneth D. Cameron	Sidney M. Gutierrez	Michael A. Baker	Terence T. Henricks		Stephen S. Oswald
MS	Guion S. Bluford, Jr. Gregory J. Harbaugh Richard J. Hieb Donald R. McMonagle Charles Lacy Veach	Jerome Apt Linda M. Godwin Jerry L. Ross	James P. Bagian Tamara E. Jernigan Rhea Seddon	James C. Adamson G. David Low Shannon W. Lucid	F. Story Musgrave Mario Runco, Jr. James S. Voss		PLC Norman E. Thagard Manley L. Carter, Jr. William F. Readdy
PS			F. Drew Gaffney Millie Hughes-Fulford		TBD		Roberta L. Bondar Ulf D. Merbold

1992

Mission	46	45	49	50	51	47	52	53
Date	March	April	May	June	August	September	October	November
Orbiter	*Discovery*	*Atlantis*	*Endeavour*	*Columbia*	*Atlantis*	*Endeavour*	*Columbia*	*Discovery*
Payload	TSS-01 EURECA-1L IMAX-06 EOIM-III/TEMP2A-03	ATLAS-01 SSBUV-04	INTELSAT-VI-R ASEM	USML-01	ACTS CANEX-02 DXS	SL-J GAS BRIDGE	LAGEOS II EURECA-1R USMP-01 ASP	DOD
Inclination	28.5°	57°	28.5°	28.5°	28.5°	57°	28.5°	
Altitude	230	160	198	140	160	160	160	
Duration	7	9	8	13	7	7	9	TBD
Crew CDR	TBD	Charles F. Bolden				TBD		
PLT	TBD	Brian Duffy				TBD		
MS	PLC Jeffrey A. Hoffman Franklin R. Chang-Diaz Claude Nicollier TBD	PLC Kathryn D. Sullivan C. Michael Foale David C. Leestma				PLC Mark C. Lee N. Jan Davis Mae C. Jemison TBD		
PS	TBD (Italy)	Michael L. Lampton Byron K. Lichtenberg				Mamoru Mohri		

1993

Mission	54	55	56	58	57	59	60	61	62
Date	January	February	March	May	May	June	July	September	September
Orbiter	*Endeavour*	*Columbia*	*Discovery*	*Atlantis*	*Endeavour*	*Columbia*	*Discovery*	*Endeavour*	*Atlantis*
Payload	SPACEHAB-01 ORFEUS-SPAS GAS BRIDGE SHOOT	SL-D2	WSF-01 FTS-DTF-01 IEH Payload of opportunity	TDRS-F DEE	ATLAS-02 SPTN-02 SSBUV/A-01	SPACEHAB-02 CAPL HPE CMSE-01 Payload of opportunity	HST REV-01	SRAD/TPITS ISEM-01 OAET-01	LITE SPAS-III FLOATZONE-01 CTM MICROWAVE-01
Inclination	28.5°	28.5°	28.5°	28.5°	57°	TBD	28.5°	28.5°	28.5°
Altitude	160	160	160	160	160	TBD	TBD	160	TBD
Duration	7	9	7	5	9	TBD	5	5	5
Crew	7	7	5	5	7	TBD	5	5	5

Fiscal Year '94

1st QTR	2nd QTR	3rd QTR	4th QTR
SLS-02	GEOSTAR-01 SPACEHAB-03 CXM-02 ISEM-02	SATCOM WSF-02 CXM-03 CXH-09	USML-02
USMP-02 FROZENPIPE SPTN-03 CXH-08	IML-02	EURECA-2L SPACEHAB-04 CXM-04 SPTN-04	INMARSAT SFU-RETR FTS-DTF-02 CXH-10
SRL-01	CRISTA-SPAS ATLAS-03 SSBUV/A-02		USMP-03 OAET-FLYER

Fiscal Year '95

1st QTR	2nd QTR	3rd QTR	4th QTR
AAFE OAET-02 TANK VENT 2 PHASE FLOW BATTERY PL OPPTY	XTE EUVE RETR	SRL-D3	ATLAS-04 WISP SSBUVA/A-03 SPTN-05
	SPACEHAB-05 GEOSTAR-02 EURECA-2R	TDRS-G	WSF-03 SPACEHAB-06 OAET-03 SSS
SRL-02	SSF/MB-01(FEL)		SSF/MB-02

Fiscal Year '96

1st QTR	2nd QTR	3rd QTR	4th QTR
SSF/MB-03	TDRS-H	USMP-04 GEOSTAR-03 CONE	SPACEHAB-07 OAET-04
SSF/MB-04	SSF/MB-05		SSF/MB-07 (MTC)
SLS-03		SRL-03	SSF/OF-01
		HST REV-02	ATLAS-05
		SSF/MB-06	SSBUV/A-04

Glossary

AAFE	Aeroassist Flight Experiment
ACTS	Advanced Communications Technology Satellite
AFP	Air Force Payload
AMOS	Air Force Maui Optical Station
APM	Ascent Particle Monitor
ASP	Altitude Sensor Package
ATLAS	Atmospheric Laboratory for Applications and Science
CANEX	Canadian Experiment
CAPL	Capillary Pump Loop Experiment
CETA	Crew and Equipment Translation Aid
CMSE	Candidate Materials Space Exposure
CONE	Cryogenic Orbital Nitrogen Experiment
CREAM	Cosmic Radiation Effects and Activation Monitor
CRISTA	Cryogenic Infrared Spectrometer Telescope for Atmosphere
CTM	Collapsible Tube Mast
CXH	Commercial Cross-Bay Carrier
CXM	Commercial Cross-Bay for Materials Science Laboratory
DEE	Dexterous End Effector
DOD	Department of Defense
DSP	Defense Support Program
DXS	Diffuse X-Ray Spectrometer
EOIM	Evaluation of Oxygen Interaction with Materials
EURECA	European Retrievable Carrier
EUVE	Extreme Ultraviolet Explorer
FLOATZONE	Office of Commercial Programs Experiment
FTS-DT	Flight Telerobotic Servicer Demonstration Test Flight
GAS	Getaway Special
GEOSTAR	Interactive Radiodetermination Satellite
GRO	Gamma Ray Observatory
HPE	Heat Pipe Experiment
HST	Hubble Space Telescope
IBSS	Infrared Background Signature Survey
IEH	International Extreme-UV Far-UV Hitchhiker
IMAX	Large format motion picture camera
IML	International Microgravity Laboratory
INMARST	International Maritime Satellite
INTELSAT	International Telecommunications Satellite Organization
IOCM	Interim Operational Contamination Monitor
ISEM	ITA Standardized Experiment
LAGEOS	Laser Geodynamics Satellite
LITE	Lidar In-Space Technology Experiment
MICROWAVE	Office of Commercial Programs Experiment
MPEC	Multi-Purpose Experiment Canister
OAET	Office of Aeronautics, Exploration and Technology
OCTW	Optical Communication Thru Shuttle Window
ORFEUS	Orbiting and Retrievable Far and Extreme Ultraviolet Spectrometer
SATCOM	GE communications satellite
SFU	Space Flyer Unit
SHARE	Space Station Heat Pipe Advanced Radiator Experiment
SL	Spacelab
SHOOT	Super Fluid Helium On Orbit
SLS	Space Life Sciences
SPACEHAB	Commercially owned pressurized experiment module
SPAS	Shuttle Pallet Satellite
SPTN	Shuttle Pointed Autonomous Research Tool for Astronomy
SRAD	Shuttle Radiator Assembly Demonstration
SRL	Space Radar Laboratory
SSBUV	Shuttle Solar Backscatter Ultra-Violet Instrument
SSF/MB	Space Station *Freedom* Manned Base
SSS	Satellite Servicer System
STARLAB	DOD Spacelab
STP	Space Test Program
TDRS	Tracking Data Relay Satellite
TPITS	Two Phase Integrated Thermal System
TSS	Tethered Satellite System
UARS	Upper Atmosphere Research Satellite
ULYSSES	Formerly International Solar Polar Mission
USML	U.S. Microgravity Laboratory
USMP	United States Microgravity Payload
WISP	Waves in Space Plasma
WSF	Wake Shield Facility
XTE	X-Ray Timing Explorer

-Manifest courtesy of Space News Roundup

1990 Superio

Superior Accompl

Over 430 Langley employees earned Superior Accom
recognize contributions in tangible benefits or savings
The honored are recognized in this and the January 11
many jobs well done.

Luther R. Gartrell, Instrument Research Division, "for significant contributions in the development and application of laser doppler velocimetry techniques in the 20-inch Mach 6 Wind Tunnel and solar pumped laser research facility."

Scott M. Bartram, Instrument Research Division, "for contributions to the development and first successful application of the global particle image velocimeter technique to a Langley wind tunnel."

William M. Humphreys Jr., Instrument Research Division, "for significant contributions to the development and application of the particle image velocimetry technique."

Frederick J. Rosensteel, Instrument Research Division, "for outstanding contributions as lead engineering technician in support of the successful Shuttle Infrared Leeside Temperature Sensing experiment."

Cecil G. Burkett Jr., Instrument Research Division, "for exceptional proficiency, innovation and dedication in the performance of assigned duties supporting the development of an ASTM standard for sheathed thermocouple inhomogeneity."

Patricia P. Davis, Instrument Research Division, "for exceptional proficiency, innovation and dedication in the performance of assigned duties supporting research in the development and testing of high activity CO-O_2 recombination catalysts for space-based CO_2 lasers."

David W. Alderfer, Instrument Research Division, "for exceptional proficiency, innovation and dedication in the performance of assigned duties supporting research in infrared flow visualization of plumes and wing-tip vortices."

William H. Prosser, Instrument Research Division, "for the significant contribution to the understanding of composites through measurements of high order elastic coefficients and the development of a method to measure internal strains in anisotropic materials."

Min Namkung, Instrument Research Division, "for significant contributions to the development of residual stress measurements systems for steels and for methodologies to measure NiH battery materials and NASA's SSME heat exchanger welds on the Shuttle."

Renee S. Wallace, Financial Management Division, "for exemplary accounting support and excellent service in the performance of all assigned major accounting tasks for Langley Research Center."

Barbara A. Reed, Financial Management Division, "for recognition of exceptional service and dedication within the Payroll Section."

Paula D. Green, Financial Management Division, "for recognition of exceptional service in the performance of multiple duties during peak periods of increased workload in a highly successful manner."

Vasiliki N. O'Neill, Financial Management Division, "for recognition of exceptional service and dedication within the Travel Section."

Shirley T. Boswick, Financial Management Division, "for recognition of exceptional service and dedication within the Travel Section."

Ilona G. Gambill, Financial Management Division, "for recognition of exceptional service and dedication within the Travel Section."

Lisa M. Oliver, Financial Management Division, "for recognition of outstanding service in the performance of assigned duties, extra responsibilities and extra workload due to a vacancy in the Travel Section."

James B. Richardson, Operations Support Division, "for exceptional support for set-up and installation of modular housing units at LaRC."

Barbara S. Trippe, Aircraft Operations Branch, "for superior accomplishments in the development of Langley Management Instructions and associated software to aid in the management of NASA personnel traveling aboard NASA and non-NASA aircraft."

William R. Wiley, Operations Support Division, "for superior financial support of Systems Engineering and Operations Directorate budget and start-up phase of FESS Contract."

Alicia G. Allen, Flight Applications Division, "for outstanding secretarial support of the administrative and research operations of the Flight Applications Division."

Sharmon D. Scriven, Flight Applications Division, "for outstanding secretarial support of the administrative and research operations of the Flight Research Branch."

Michael A. Basnett, Flight Applications Division, "for outstanding performance and contribution to the Boeing 737 ATOPS research programs."

Dale R. Bowser, Flight Applications Division, "for outstanding performance and contributions to the Boeing 737, NASA 515, NASA ATOPS-Data Link Research Program."

Calvin C. Chandler, Flight Applications Division, "for exceptional contributions to the F-106B Vortex Flap and the Vortex Flap Flow Visualization projects."

Dwight E. Elliott, Flight Applications Division, "for exceptional contributions to the C-402 Biomass Burn Project."

Donna A. Gilchrist, Metallic Materials Branch, "for dedicated, conscientious service in providing organizational, administrative and logistical support for workshops, conferences, symposia and program reviews sponsored by organizations within the Structures Directorate."

Robert M. Thomas Jr., Aircraft Operations Branch, "for superior accomplishment in developing custom software that permits the tracking and documentation of Langley pilot currency."

Ralph M. Stephens, Fabrication Division, "for excellence in the fabrication of high density thin film arrays in support of the Cross Flow Vortices Studies."

Felix L. Pitts, Information Systems Division, "for recognition of outstanding performance in conducting and documenting research on characterization of lightning phenomenon."

Ajay Kumar, Fluid Mechanics Division, "for contributions to the 'Best Directorate Paper.' "

Dennis M. Bushnell, Fluid Mechanics Division, "for contributions to the 'Best Directorate Paper.' "

Robert C. Blanchard, Space Systems Division, "for contributions to the 'Best Directorate Paper.' "

Allan J. Zuckerwar, Instrument Research Division, "for contributions to the 'Best Directorate Paper.' "

John T. Batina, Structural Dynamics Division, "for contributions to the 'Best Directorate Paper.' "

David A. Seidel, Structural Dynamics Division, "for contributions to the 'Best Directorate Paper.' "

Samuel R. Bland, Structural Dynamics Division, "for contributions to the 'Best Directorate Paper.' "

Robert M. Bennett, Structural Dynamics Division, "for outstanding research into the use of advanced computational methods for unsteady aerodynamic and aeroelastic applications."

Harold L. Atkins, Fluid Mechanics Division, "for outstanding effort in developing a multi-block multi-grid method to solve the Euler and Navier-Stokes equations for flows over complex aircraft configurations."

John M. Bowman, Fabrication Division, "for exceptional fabrication performance on the ARES Housing and Motor Mount."

William A. Corlett, Applied Aerodynamics Division, "for exhibiting outstanding performance in managing the operations of the Unitary Plan Wind Tunnel with specific contributions to the National Aero-Space Plane Program."

Violet S. Hopkins, Fabrication Division, "for extraordinary dedication to the NTF Fan Blade Project."

Casimir J. Jachimowski, Fluid Mechanics Division, "for superior accomplishment in providing scientific leadership in high altitude propulsion research."

Gayle L. Johnson, Fluid Mechanics Division, "for effectively carrying out the branch office activities during the formation of the Theoretical Flow Physics Branch."

Bruce D. Little, Fabrication Division, "for exceptional fabrication performance on the NTF Stein Seals."

David S. Shaw, Applied Aerodynamics Division, "for outstanding performance in providing data acquisition and reduction for all facilities of the Supersonic/Hypersonic Aerodynamics Branch and for invaluable research contributions to the National Aero-Space Plane program."

Anne R. Cary, Fluid Mechanics Division, "for superior accomplishment in providing secretarial support to the Hypersonic Propulsion Branch research staff and management."

Robert L. Gage, Facilities Engineering Division, "for exceptional support of the scientific visualization effort."

Brenda F. Spencer, Management Support Division, "for outstanding performance and dedicated support of the Center's employee personnel moves."

Marvin C. Waller, Flight Management Division, "for his excellent research contributions from a most timely information exchange/data link simulation study."

David H. Williams, Flight Management Division, "for excellent and expeditious conduct of the joint Langley/Ames simulation tests to explore aircraft/ATC integration issues."

Earl H. Andrews Jr., Fluid Mechanics Division, "for recognition of leadership in the performance of the complex duties of facility safety head and for selfless dedication in furtherance of the goals and objectives of the Langley Safety Program in our research environment."

Charles R. Pruitt, Research Information and Applications Division, "for recognition of leadership in the performance of the duties of Facility Safety Head and for contributions in furtherance of the goals and objectives of the Langley Safety Program."

Timothy L. Weatherford, Information Systems Division, "for excellent and timely development of sensor guidance for automated assembly of space structures."

Kenneth L. Dudley, Guidance and Control Division, "for recognition of exceptional performance in the development of the Microwave Laboratory and performance simulation of the Aft Flow Ionization Experiment on the Aeroassist Flight Experiment."

Kendall W. Sherman, Guidance and Control Division, "for recognition of the dedicated support for the CSI Guest Investigator Program."

Robert H. Tolson, Interdisciplinary Research Office, "for outstanding leadership and continuous support of Army rotorcraft research efforts in the joint NASA/Army Optimization Program, resulting in productive and innovative research."

Vicki S. Parsons, Programs and Resources Division, "for outstanding leadership and continued support of the Army Aerostructures Directorate's financial management process."

Robert F. Schwartz, Operations Support Division, "for outstanding support of rotor experimental activities of the Rotorcraft Aerodynamics Group in the 14- by 22-Foot Subsonic Tunnel."

Donald R. Bennington, Analysis and Computation Division, "for designing, developing, and implementing the Interface Circuit Board which has greatly simplified the integration of diverse support computers into the Flight Simulation Facility."

Lee A. Lillard, Analysis and Computation Division, "for significant accomplishments in providing and enhancing workstation capabilities to support ACD and contractor secretaries."

Andrea L. Overman, Analysis and Computation Division, "for outstanding performance in the support of Parallel Processing on the CRAY-2."

Accomplishment Awards

hment Awards

ment Awards in Fiscal Year 1990. These awards
for intangible benefits to the Government.
es of the **Researcher News**. Congratulations for

William H. C. von Ofenheim, Analysis and Computation Division, "for exceptional achievement in developing new and unique software for interfacing video and computer systems."

John P. Weidner, Fluid Mechanics Division, "for superior research accomplishments in scramjet inlet and nozzle research technology and outstanding management of the National Aero-Space Plane Nozzle Team."

Mary Jo Dorsey, Personnel Division, "for significant contributions and administrative support of the Employee Development and Services Branch."

Lise P. Crowe, Fluid Mechanics Division, "for outstanding clerical and administrative contributions in support of the Fluid Mechanics Division."

Philip H. Glaude, Fabrications Division, "for recognition of his contribution to the HALOE MLI fabrication effort."

Jeffrey G. Gragg, Research Information and Applications Division, "for outstanding performance and contributions to the Center printing requirements."

Victor E. Jenkins, Operations Support Division, "for excellent surveillance of the piping and insulator crafts of the facility maintenance contract."

Robert H. Kyle, Operations Support Division, "for excellent technical support in assuring quality and reliability of oxygen systems Center-wide."

Christopher L. Rumsey, Fluid Mechanics Division, "for outstanding cooperative research with Lewis Research Center culminating in the *Journal of Fluid Mechanics* paper, 'A Natural Low-Frequency Oscillation of the Flow Over an Airfoil Near Stalling Conditions.' "

Donald F. Booth, Analysis and Computation Division, "for technical ability and demonstrated excellence in support of Langley Telecommunications System (LaTS) installations and maintenance."

J. Everette Brown, Operations Support Division, "for excellent performance in providing technical support to the Mechanics of Materials Laboratory."

Inez D. Byars, Analysis and Computation Division, "for exceptional performance during the branch transition period."

Susan L. Conry, Fabrication Division, "for excellence in performing ETB and Award Fee Board clerical duties."

Henry E. Freeman Jr., Operations Support Division, "for exceptional performance of assigned duties in support of Plant and Power Distribution Unit."

C. Diane Griffin, Operations Support Division, "for exceptional technical support to research in the Structures and Materials Laboratory."

James B. Hall, Analysis and Computation Division, "for technical ability and demonstrated excellence in support of Langley Telecommunications System (LaTS) engineering and operations."

Sonia S. Herndon, Analysis and Computation Division, "for extensive contributions to the efficient and productive operation of the Analysis and Simulation Branch."

Robert L. Huffman Jr., Programs and Resources Division, "for exceptional service in managing the program support function during the new OAST IPP budget process and developing a means for capturing R&D facility costs."

William H. Lane, Analysis and Computation Division, "for exceptional sustained technical support of the Central Digital Data Recording System."

Joseph D. Nolan, Analysis and Computation Division, "for exceptional accomplishments and demonstrated excellence in providing newtwork software for the Center's DEC/VAX Computers."

Amy C. Radford, Programs and Resources Division, "for excellent service in maintaining the program support table through a difficult fiscal year closeout and start-up."

Lynn R. Seals, Operations Support Division, "for outstanding technical support on autoclave, Building 1293."

Harold I. Simmons, Analysis and Computation Division, "for exceptional performance as group leader for Real-Time Data Communications and Video Systems."

Phillip T. Smith, Analysis and Computation Division, "for exceptional performance in the acceptance, integration and operation of several new Computer-Generated Image (CGI) System Compatible Display Systems."

Michael E. Tall, Fabrication Division, "for exceptional Fabrication performance on the large space structure joints."

Lanier Westbrook, Operations Support Division, "for exemplary technical support provided during installation of new 16-foot fan blades."

Yvonne M. Armstrong, Fabrication Division, "for recognition of efficient production of a series of seven Fabrication Division Resource Reports."

Paul R. Bagby, Research Information and Applications Division, "for outstanding color and black and white photographs of laser flow studies of the NASA F-18 High-Alpha Technology Program."

Gary R. Beasley, Fabrication Division, "for exceptional job performance and dedication to duty."

Jeffrey S. Brady, Fabrication Division, "for exceptional performance in support of the Laser Atmospheric Sensing Experiment (LASE) project."

Darlene K. Butler, Hypersonic Technology Office, "for assuming the responsibilities of the Conceptual Studies Office and managing it very efficiently."

Daniel J. Carey, Fabrication Division, "for exceptional performance in support of the Laser Atmospheric Sensing Experiment (LASE) project."

Benjamin E. Defendeller, Research Information and Applications Division, "for outstanding service and quality of film processing under reduced staffing conditions."

Jack F. Gayle, Fabrication Division, "for exceptional service performed in fabrication of the Systems Interface Pallet."

Emily E. Kornegay, Guidance and Control Division, "for proven expertise in the creation of computerized forms and maintenance of a purchase request data base."

Lisa F. Peckham, Information Systems Division, "for effectively incorporating the Macintosh computing environment into the SVM Branch operation."

Sharon H. Stack, Hypersonic Technology Office, "for outstanding performance of administrative and technical duties for the Hypersonic Technology Office."

Wendell K. Belvin, Structural Dynamics Division, "for significant contributions to research in the design of Controlled Flexible Spacecraft in support of the Controls Structures Interaction Program."

Robert M. Bennett, Structural Dynamics Division, "for outstanding research into the use of advanced computational methods for unsteady aerodynamic and aeroelastic applications."

Wayne L. Darnell, Atmospheric Sciences Division, "for major contributions to climate research through the development and application of methods for determining the surface radiation budget from satellite measurements."

Moses G. Farmer, Structural Dynamics Division, "for leadership in aeroelastic model testing in the Langley Transonic Dynamics Tunnel."

Robert L. Fox, Fabrication Division, "for excellence in the support of model deformation and position measurement."

Steven W. Gayle, Fabrication Division, "for exceptional performance on the fabrication of the Double Wedge Model."

Richard L. Hall, Fabrication Division, "for exemplary fabrication support in the development of the HALOE thermal blankets."

Jack B. Hester, Fabrication Division, "for exceptional contribution to the A-6 Wing Glove project."

Sherwood T. Hoadley, Structural Dynamics Division, "for the development, implementation, simulation and testing of the AFW wind-tunnel model digital controller."

Lucas G. Horta, Structural Dynamics Division, "for outstanding leadership of the Mini-Mast and Evolutionary Model Analysis efforts in support of the Controls-Structures-Interaction Ground Test Methods Research Program."

Raymond G. Kvaternik, Structural Dynamics Division, "for outstanding contributions and leadership in research of rotocraft structural dynamics."

Paul E. McGowan, Structural Dynamics Division, "for outstanding contributions to Space Station Technology Development during 1989."

Martin G. Mlynczak, Atmospheric Sciences Division, "for outstanding contributions to the EOS/SAFIRE experiment through determination of NLTE effects on remote sensing and through the development of science synergisms."

Martha P. Robinson, Structural Dynamics Division, "for outstanding success in the implementation and support of nonlinear finite elements codes for dynamic analysis on the LIDB MicroVAX computer system."

Lillian C. Ross, Research Information and Applications Division, "for major contributions to the efficient operation of the Graphics Section at NASA Langley Research Center."

Betty T. Sheets, Materials Division, "for outstanding performance in administrative support for the Advanced Aircraft Program, Materials Division."

Gerald D. Alexander, Operations Support Division, "for exceptional performance in providing technical, mechanical and operational support to the Aircraft Landing Dynamics Facility, Building 1262."

James G. Batterson, Guidance and Controls Division, "for superior performance in support of the Source Evaluation Board for technical support services for aerospace research and technology."

William C. Graveline, Instrument Research Division, "for developing an improved software program that provides monthly reports on contractor instrument repair, calibration and acceptance test activities."

Tammy K. Hopkins, Operations Support Division, "for exceptional performance in providing mechanical and operational support to the Mechanics of Materials Laboratory, Building 1205."

James S. Jarrell, Operations Support Division, "for recognition of outstanding contribution in maintaining and identifying safety concerns associated with the installation of high pressure systems and modifications throughout LaRC."

Margaret N. Mills, Guidance and Controls Division, "for recognition of innovative development of CSIO Resource Management Tools."

Shirley R. Morton, Atmospheric Sciences Division, "for significant contributions in providing support to major Atmospheric Studies Branch field experiments during a critical time period."

Robert J. Pegg, Hypersonic Technology Office, "for exceptional contributions and service to the CSO's hypersonic vehicle design and analysis activities and to the NASP program."

James A. Phillip, Operations Support Division, "for superior technical support of the design and construction of the Air Conditioning Repair Shop, Building 1198."

Dennis R. Williams, Operations Support Division, "for exemplary technical and operational support to the Hypersonic Propulsion Test Cells in Building 1221."

Clifford B. Williford, Operations Support Division, "for exceptional performance in providing mechanical and operational support to the Mechanics of Materials Laboratory, Building 1205."

...awards

Robert D. Braun, Space Systems Division, "for contributions providing insight into the major mission design requirements for the Human Exploration Initiative in a timely manner having positive impact in defining a role for Langley in this activity."

Edward V. Browell, Atmospheric Sciences Division, "for outstanding leadership and scientific achievement in atmospheric DIAL research."

James K. Charnock, Facilities Engineering Division, "for outstanding contributions in successfully completing several research-funded engineering and design projects, and for working diligently toward professional and academic development."

Michael L. Kelly, Fabrication Division, "for exceptional performance in supporting the Scramjet Strut Research Specimens."

Timothy J. Marshall, Facilities Engineering Division, "for outstanding contributions to the successful design and manufacturing of complex mechanical systems associated with the 16-Foot Tunnel, Hypersonic Facility Complex and Hypersonic CF_4 Tunnel Modifications."

Robert A. Mitcheltree, Space Systems Division, "for significant contributions in the preliminary assessment of thermochemical nonequilibrium for Earth aerobraking from Mars missions."

Douglas Morris, Space Systems Division, "for the development and implementation of an operations analysis capability for timely support of the Agency Advanced Manned Launch System and Personnel Launch System programs."

Chris Naftel, Space Systems Division, "for contributions providing insight into the staging issues for future launch vehicle concepts establishing feasibility for high dynamic pressure staging and booster glideback to the launch site."

Margarette Pitts, Space Systems Division, "for outstanding contributions to the efficient management and operation of the Spacecraft Analysis Branch office."

Joseph M. Price, Space Systems Division, "for significant contributions in the definition and implementation of an integrated graphics software package."

Douglas O. Stanley, Space Systems Division, "for contributions in providing performance analyses in support of the NASP rocket/airbreather comparison study."

George M. Summerfield, Facilities Engineering Division, "for outstanding technical leadership and management of the modifications to the 16-Foot Tunnel."

Robert J. Swaim, Fabrication Division, "for excellence in quality assurance and fabrication technology support."

Carolyn C. Thomas, Space Systems Division, "for outstanding contributions in the implementation, management and operation of the Spacecraft Analysis Branch interactive computer-aided design systems."

Michael D. Williams, Space Systems Division, "for the knowledge and tenacity which led to the initiation of a program on coherently combining beams from diode-laser arrays."

Harry L. Belvin, Operations Support Division, "for exceptional technical support to research conducted in the 31-Inch Mach 10 Tunnel."

Jay M. Brandon, Flight Applications Division, "for outstanding performance and significant contributions in dynamic stall research and the development and testing of in-flight vortex flow visualization techniques."

Larry E. Johnson, Advanced Transport Operating System Office, "for intense and dedicated effort in the implementation of several systems and subsystems in the TSRV in support of the Data Link Flight Experiment."

Major C. Lee, Advanced Transport Operating System Office, "for concentrated effort in preparing for and supporting the implementation of the Infrared Sensor as one of the first windshear flight experiments aboard the TSRV."

Nadine E. McHatton, Fabrication Division, "for exemplary performance in the implementation of the Fabrication Uniformed Filing System and Desk-Top Computer Publishing System."

Kemp L. Parrish, Operations Support Division, "for technical contributions and dedicated support to the advancement of cryogenic testing in the 0.3 Meter Transonic Cryogenic Tunnel."

Carlos S. Perez-Ramos, Facilities Engineering Division, "for excellence in the recertification of structural and pressure systems at LaRC."

Gerald C. Purgold, Atmospheric Sciences Division, "for significant contributions in support of the Space Radiation Budget and Shuttle Exhaust Particle Experiment missions during 1989."

Davis B. Wright Jr., Facilities Engineering Division, "for excellence in investigating the failure of the nozzle at the 20-Inch Supersonic Wind Tunnel."

Sandra M. Glenn, Acquisition Division, "for recognition of outstanding service and significant contribution to the management of the DEI Wind Tunnel Models Contract."

William P. Chu, Atmospheric Sciences Division, "for outstanding scientific contributions to the SAGE series of satellite experiments leading to the selection of SAGE III for EOS phase B studies."

Michael G. Fleck, Fabrication Division, "for excellence in establishing the BOA for Hypersonic Nozzles."

Richard B. Geissinger, Fabrication Division, "for outstanding contributions in support of the procurement of research test specimens."

Benjamin Guenther, Fabrication Division, "for extraordinary work and coordination of the One-Tenth LDEF Model Project."

Frederick D. Jones, Research Information and Applications Division, "for outstanding photographic support to the Landing and Impact Dynamics Programs at the Impact Dynamics Research Facility (IDRF)."

John J. Korte, Facilities Engineering Division, "for exceptional work in the development of the 'Axi-Symmetric Computational Fluid Dynamics Code for solving the PNS Equations' and excellent work in support of other projects."

James W. Mayhew, Facilities Engineering Division, "for exceptional work on the Modifications to the 30- by 60-Foot Tunnel and excellent work in support of other engineering assignments."

Dennis L. Mowrey, Fabrication Division, "for excellence in support of the Automated Structures Assembly Lab."

Mark C. Shipman, Atmospheric Sciences Division, "for outstanding leadership of the Global Tropospheric Experiment meteorological data acquisition team."

Ronald L. Weber, Fabrication Division, "for excellence in the support of LaRC research projects and the NTF Fan Blade Project."

Joseph M. Zawodny, Atmospheric Sciences Division, "for outstanding scientific contributions to the SAGE III experiment design leading to the selection of SAGE III for EOS phase B studies."

Forrest Dickinson, Facilities Engineering Division, "for outstanding leadership and technical excellence in the management, planning, implementation and installation of a new telecommunications system at the Langley Research Center."

Harvey D. Dameron, Operations Support Division, "for exceptional performance and technical contributions in support of the Atmospheric Controlled Combustion Apparatus."

Norman L. McRae, Operations Support Division, "for excellence in the design and installation of a networking system for the OSD Work Control Center."

Robert T. Neece, Guidance and Control Division, "for recognition of exceptional performance in the management of the Microwave Reflectometer Ionization Sensor Development for the Aeroassist Flight Experiment."

Krista D. Bullock, Flight Applications Division, "for outstanding secretarial-stenographic performance in the Flight Dynamics Branch."

Edwin J. Prior, Office of the Director, "for superior accomplishments as technical editor of the Langley Research and Technology annual report and other Langley technical information annual reports."

Daniel W. Banks, Applied Aerodynamics Division, "for outstanding efforts in defining, conducting, and reporting a comprehensive high angle-of-attack experimental research program."

Peter F. Covell, Applied Aerodynamics Division, "for exhibiting outstanding leadership and producing significant contributions in four major research programs."

James B. Hallissy, Applied Aerodynamics Division, "for outstanding performance as Principal Investigator for the F-106B Vortex Flap Flight Experiment."

Jeffrey S. Hill, Applied Aerodynamics Division, "for outstanding performance in providing team leadership for enhancements and repairs to the National Transonic Facility following the mishap in January 1989."

Marilyn E. Ogburn, Flight Applications Division, "for outstanding performance and significant contributions in the use of piloted simulation to conduct high-angle-of-attack flight dynamics research of advanced aircraft concepts."

Clinton J. Reese, Operations Support Division, "for excellent technical and operational support to Hypersonic Propulsion Facilities, Building 1221."

Michael T. Stubbs, Operations Support Division, "for providing excellent technical contributions in support of the Solar Laser Development Program at the Advanced Technology Research Laboratory, Building 1200."

William S. Syrett, Facilities Engineering Branch, "for exceptional support in final design of Facility Automation for FY-90 Wind Tunnel Revitalization Projects."

Janet C. Whipple, Instrument Research Division, "for providing outstanding interim technical monitoring of Wyle Labs' thermal/electrical calibration effort."

Dawn M. Winder, Office of the Director for Systems Engineering and Operations, "for conscientious and dedicated clerical assistance in the Office of the Director for Systems Engineering and Operations."

Gail L. Lanning, Management Support Division, "for exceptional dedication and performance in supporting the CLASSIC Source Board and the Support Operations Office in accomplishing their overall mission at Langley Research Center."

Helen I. Mason, Management Support Division, "for continued exemplary, dedicated, outstanding service to the Directives and Forms Management Office."

Patricia T. Redwood, Management Support Division, "for outstanding performance and dedicated support toward implementation and maintenance of the Center's NASA Property Disposal Management System (NPDMS)."

Loretta W. Watkins, Management Support Division, "for outstanding leadership, performance, and dedicated support and implementation of the Center's NASA Property Disposal Management System (NPDMS)."

Kimberly D. Duncan, Management Support Division, "for exemplary supply support to Langley Research Center."

Jane V. Gage, Management Support Division, "for superior performance and creative contribution in support of the Correspondence and Records Management Section."

Otto Youngbluth Jr., Atmospheric Sciences Division, "for significant contributions to the cloud lidar and auxiliary measurements during the ECLIPS field experiment."

David C. Woods, Atmospheric Sciences Division, "for significant contributions to the cloud lidar and auxiliary measurements during the ECLIPS field experiment."

David M. Winker, Atmospheric Sciences Division, "for significant contributions to the cloud lidar and auxiliary measurements during the ECLIPS field experiment."

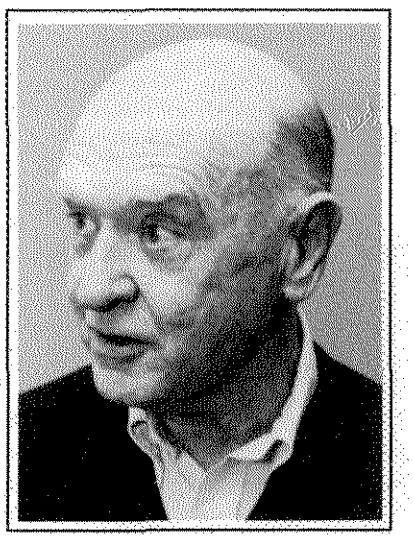
Bill R. Rouse, Atmospheric Sciences Division, "for significant contributions to the cloud lidar and auxiliary measurements during the ECLIPS field experiment."

Brian E. Kruschwitz, Atmospheric Sciences Division, "for significant contributions to the cloud lidar and auxiliary measurements during the ECLIPS field experiment."

Jose M. Alvarez, Atmospheric Sciences Division, "for significant contributions to the cloud lidar and auxiliary measurements during the ECLIPS field experiment."

The end of an era

Scout Moves To Goddard; Leaves Legacy of Camaraderie



In researching the Scout program, writer David Ferraro feels one of the most honest, poignant and useful interviews he conducted was with James R. Hall, operations manager for Scout in its formative years.

"In talking with Jim Hall, I got a sense of what it must have been like to be a part of Langley and Scout in the late 50s and early 60s. Langley historian James R. Hansen in* Engineer In Charge *notes the spirit of excitement and adventure that characterized the work of Langley engineers. To speak with Jim Hall," says Ferraro, "is to encounter this vitality. One gets a sense of the drive required to get the job done, and of the passion and dedication required to make the Scout vehicle a reality."

DF: How did you become involved with Scout?

JH: I was part of a group—I think there were six people—assigned to the Pilotless Aircraft Research Division (PARD). We did some preliminary work on the Scout concept. Management decided to set up a program office to focus the work and direct it to completion—then Scout became a real project.

DF: When did the people in PARD think about achieving orbit?

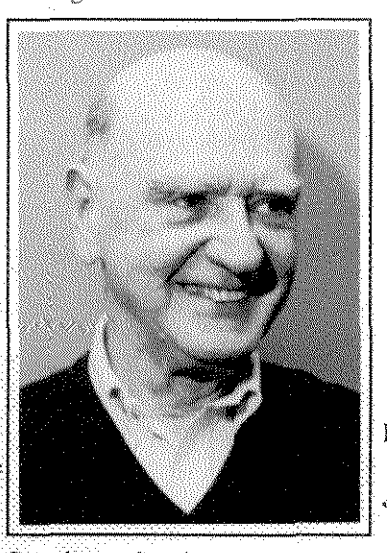
JH: Probably 1957. This was associated with the ballistic missile program the services were running. The Navy had the Polaris program and the Air Force had their Atlas program. They were not orbital, but would deliver a missile 5,000 miles—that required a velocity of Mach 15 or so. As you went past ballistic velocity to orbital velocity, heating phenomena became critical. That was one of the technical challenges that confronted this hypersonic velocity.

DF: How did people feel when the Russians launched Sputnik in 1957?

JH: Everybody was dismayed to think that our activities had been trumped by the Russians. You had to respect their ingenuity, but it was disappointing to realize we wouldn't be first. And it was a complete surprise because nobody suspected they were working on it.

DF: What did it mean to those of you who were working on Scout?

JH: It was disappointing but it was a motivation to do it better and to continue the work which already enjoyed a high priority at Langley. Scout was the first big project that Langley ran in-house. It was conceived, designed, built and tested at Langley. Then it was taken to Wallops, made ready for flight and launched at Wallops. It was a very tight Langley loop.



DF: Take me back to Scout's development.

JH: William Stoney was project manager, Gene Schult was guidance and control, and engineering you might say. I was the operations manager.

DF: How many people were working on the project?

JH: Scout was Langley's first big hardware project that I recall. We had six men in the program office. That probably grew to 12 in the next couple of years as specialists were assigned as appropriate. Overall at Langley there must have been 200 people working on Scout. They'd been drawn from the various research and support divisions. This was a very large segment of people to work on anything at Langley at that time.

DF: What was the atmosphere like at the time?

JH: It was schedule-driven. People worked very hard and long hours. This was such a dynamic program, people felt compelled to work however long it took. The closer to launch, the more demanding the schedule became. At the launch site, people would often go without sleep trying to make up time or make something work or correct a problem. People were consumed by the program's schedule.

DF: Was there excitement in developing these new technologies and this new project?

JH: Oh, yes! Everybody was excited. The concept of launching an orbital vehicle was a new and a really exciting technological challenge.

DF: In the time period before the first test launch of Scout, launch dates were set and slipped. Was there pressure from management to make something happen?

JH: We enjoyed a pretty remarkable level of freedom of operation on Scout. The boss at Langley at the time was Dr. Floyd Thompson. He gave us remarkable freedom. One of the best things about the program was that Center management gave us responsibility and authority, and let us operate independently.

I don't recall harrassment about maintaining launch dates. None of us liked to slip a commitment and slippages were relatively modest considering the complexity of the program. As things got down to deadline, completion of ground system checkout, completion of launch tower checkout and then the actual practice countdown and final launch countdown—those critical milestones—didn't slip that much, but people had to work 24 hours a day to hold them.

DF: Can you recount what was going on in the period leading up to the first test launch?

JH: The SX-1 was heavily instrumented but it was greatly reduced in scope from the real Scout. This test launch was a very important part of the test program to develop confidence in the systems. It was pretty hectic getting ready for that.

Whenever you light up the first stage, 100,000 pounds of thrust that burns for 80 seconds or so, that's an awesome amount of energy. The ground shakes and the fire and smoke appear. It's a very splendid thing, but the realization of its power is manifested in the pressure waves (you feel on) your chest. You're in an earthquake environment!

At the time we were relatively close to the launch site, a quarter-mile away in a little cinderblock building. Immediately after ignition, we rushed out to watch it. It wasn't long before they stuffed everybody in a blockhouse with 20 feet of concrete and sand on top and wouldn't let anybody budge for 20 minutes.

DF: Let's talk about the first official test launch: Scout Test 1.

JH: That launch was the culmination of two years of intensive work. We had a number of practice countdowns and dry runs. We got our timing down and got things all set up. In fact, we were almost wearing that thing out testing it. That's what you're up against in space. But you reach a point where you have to come down to the countdown.

I think the countdown lasted maybe 12 hours. As you count down you slowly withdraw from the vehicle. The last hour or so the launch team is isolated in this dinky little cinderblock building with three racks of switches, controls and displays—relatively simple and extremely crude by modern standards. But enough to do what we thought was necessary to light the fuse.

In the blockhouse with us was the range safety officer. He was looking at a plotboard that had the safe corridor plotted. Unfortunately, tracking picked up the vehicle on the side lobe of the radar which indicated that the vehicle was 50 degrees away from where it really was. That put it outside the control path. It appeared it was going outside the prescribed limits. The range control officer waited as long as he could, looked over to us and we had to concur. He hit the destruct button.

DF: How did people feel?

JH: Everyone was really crushed. You can't imagine how hard people worked as a group to bring this to the launch point. It was the culmination of at least two years of effort, and we were working on the Scout concept long before that. But after an hour, most people recognized there was only one thing to do. That was to work and build the next vehicle, which we did in three or four months.

DF: Looking back on your career with Scout, what are you most proud of?

JH: Recertification. We had a checkout line at the plant at LTV, a checkout line on the ground at Wallops and another in the tower, at the launcher. They used different equipment and different procedures. The most important thing I ever did on the Scout program was to sit down one day and write a specification—maybe an inch thick—that specified a single set of test equipment, a single procedure, and the standards to which that procedure would be developed. This became the basis for the recertification program.

DF: Are there any lessons we can learn from the way the Scout program has been run?

JH: You know I never thought about that. I think the Scout documentation and procedures processes is unrivaled. Other programs are full of changes and improvisations; borrowing from other missiles and assembling something to get it delivered on schedule. Not that some of that doesn't happen to meet a launch date, but it's minimal on Scout. The Scout program has matured beyond that point. The process is so meticulous and stereotyped.

The Scout project was a fast-track, schedule-driven project in its early days. The people who created Scout adapted existing technologies to their purposes and created new ones out of necessity, working against constant deadline pressure. The Scout project is a tribute to Langley and to NASA.

Happenings

LAA SOCIAL will be held Friday, February 1, from 4 to 6:30 p.m. in the H.J.E. Reid Conference Center, Building 1222. Join your co-workers to celebrate week's end.

LOW IMPACT AEROBICS classes are held Tuesdays and Thursdays from 5 to 6 p.m. in the NASA gym. Cost is $12 per month. First class is free.

NASA TOASTMASTERS meet the second and fourth Wednesdays of each month. Contact Myra Walton, ext. 44180, for further information.

BICYCLE RACING. Persons interested in joining a bicycle racing club are invited to James River Velo Sports' first meeting of the 1991 season at 7 p.m. Thursday, January 24, at Grissom Library, Denbigh. Call Mark Motter, 874-3247, for more information.

TELA TAX SERVICE. Individual, business, federal, state. Member National Association of Tax Practitioners. By appointment. Call 874-3121.

FREE TO GOOD HOME: Kitten, six months old, grey with while boots. Very affectionate. Call 898-5536 after 5 p.m.

WANTED: MANUALS for PAR 210A amplifier and PAR 281 power supply. Also any other PAR or Dynaco manuals. Will return quickly. Contact B. Hefner, ext. 44980.

NEEDED: CARPOOL from the Wards Corner area of Norfolk. 7:30 a.m. to 4 p.m. or 8 a.m. to 4:30 p.m. shift. Call Trish, ext. 46429.

FOR SALE: BED. Double bed with canopy, like new, box spring still encased in plastic. White with gold trim, French Provincial. $125 includes bedspread and matching canopy top. Call 877-2140 after 5 p.m.

FOR SALE: WASHER, reconditioned. $100. Call 898-5536 after 5 p.m.

Attention Retirees

The LAA Conservation Club invites your participation. Needs include persons to promote community awareness of conservation as well as help on special projects, such as Earth Day and Clean the Bay Day. The club is currently involved in several on-going activities. Any level of assistance is welcome. For more information, call Mike Palmer, ext. 42044, or Susan Palmer, ext. 47149.

Ski Lake Placid

The Peninsula Ski Club has limited space available on its Washington's Birthday trip to Lake Placid, New York, for three days of skiing. Cost is $257 and includes transportation, lodging, lift tickets, two dinners and three breakfasts. The bus will depart from Patrick Henry Mall at 6 p.m. Friday, February 15, and return at 6 a.m. Tuesday, February 19. For further information, contact Dave Hahne at 874-7414.

Computer Users Group Formed

The Peninsula Commodore Users Group (PCUG) holds monthly "hands on" meetings for face-to-face sharing. PCUG has a magazine/book library, a public domain library with thousands of programs, and a Disk-of-the-Month which includes some of the best public domain programs. Monthly meetings are free. One can join the club for a small annual fee.

PCUG meetings are held at 7 p.m. the second Friday of the month at Christopher Newport College Administration Building. For more information, contact Bill Petitt at 898-3855.

Eldred to Speak at NSS Meeting

Charles H. Eldred, manager of the Aerobrake Technology Project, will be the guest speaker at the next meeting of the Langley chapter of the National Space Society (NSS). Eldred will address "Aerobraking Systems in the Space Exploration Initiative" at 5:30 p.m. Tuesday, January 29, at the H. J. E. Reid Conference Center.

Langley is the lead center in the Aerobrake Technology Project (ATP), an intercenter project involving four NASA centers and six technology disciplines. Eldred is responsible for developing and validating technologies which provide significant aerobraking benefits for space exploration missions to the moon and to Mars. Langley aerobraking technology activities include the Space, Flight Systems and Structures Directorates.

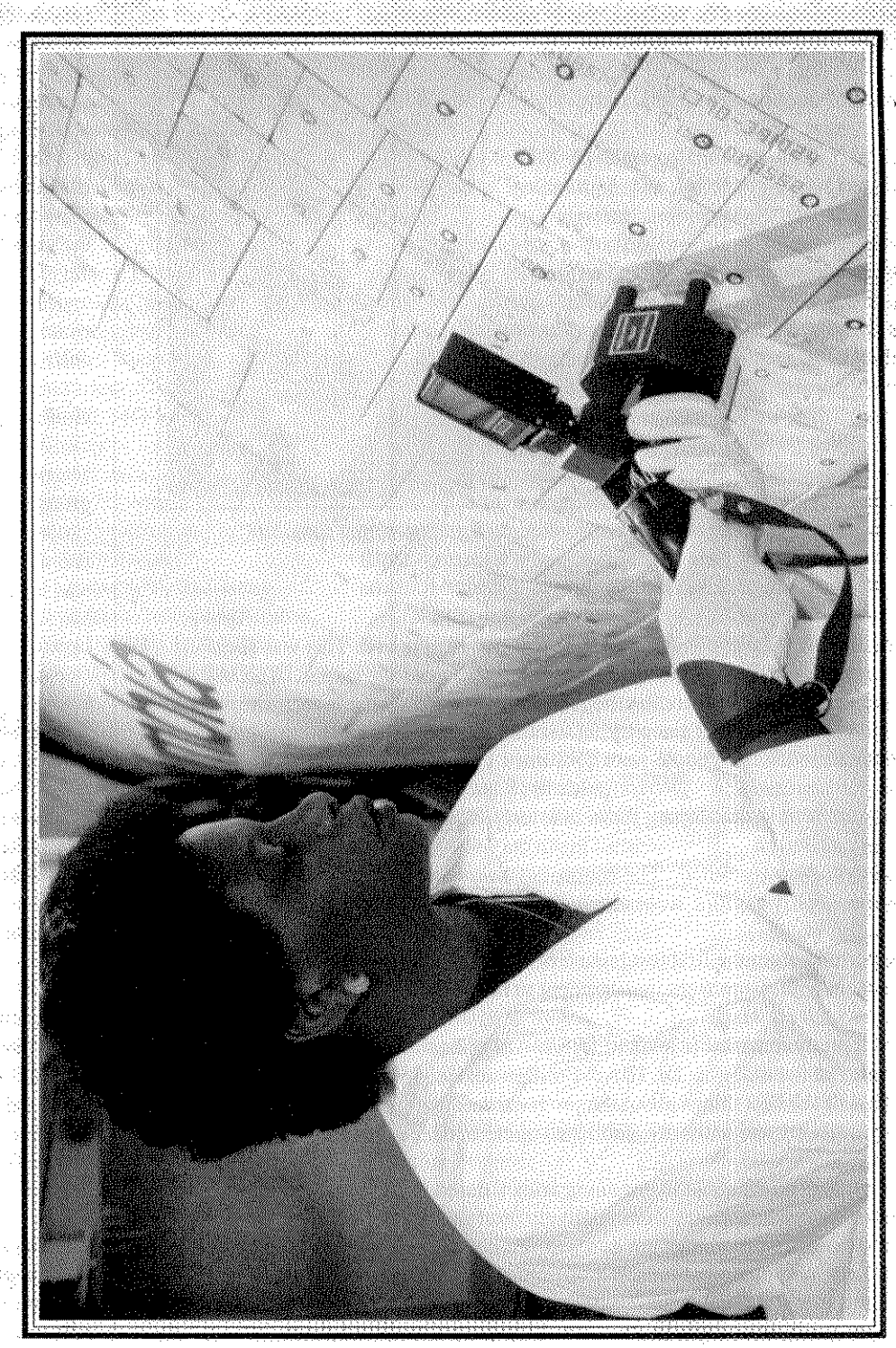
Manned exploration missions to the moon and to Mars show the potential of significant reductions in initial low-Earth orbit mass by the use of aerobraking systems. These potential benefits have made aerobraking one of the most critical technologies for the Space Exploration Initiative. Aerobraking benefits result from the reduction of propulsive requirements for space flight deceleration in the vicinity of a planet having an atmosphere. Three aerobraking cases are of primary mission and technological interest: return to Earth orbit from the moon; capture into Mars orbit from Earth; capture into Earth orbit from Mars.

Key technological challenges include both design and operational issues: packaging and assembly, accurate aerothermodynamic prediction, thermal protection materials, adaptive guidance and light-weight thermostructures.

Remembering . . . the man, the dream

Martin Luther King Jr. dreamed of peace and equality for all mankind. He believed everyone should have the freedom to reach for higher goals and the opportunity to climb to greater heights.

On the anniversary of his birth, we honor his effort and encourage others to take up the torch. In his memory, let all of us work for a better today and a brighter tomorrow.



-photo courtesy of *Lockheed Missiles & Space Company, Inc.*

ADVANCED LASER TOOL. A technician at Lockheed Missiles & Space Company, Inc. (LMSC), uses a laser tool which LMSC invented and built to measure gaps between individual tiles on the Space Shuttle orbiter. The tool automatically stores the measurements in a computer so technicians need not record them by hand and so that quality-control engineers know that they are accurate. The advanced tool simultaneously measures steps, gaps and recessions set at up to four locations around tile intersection.

Researcher News

National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

402 ON-SITE NON-LARC
SKORA, MARY M.
MAIL STOP 115

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

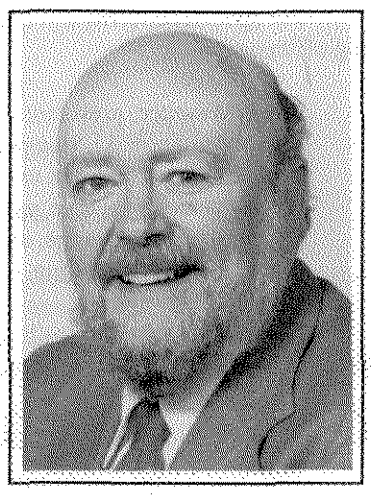
NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 3 February 8, 1991

Langley News Researcher

Bi-weekly Employee and Contractor Publication

Card Named Chief Scientist



Dr. Michael F. Card has been selected Langley's Chief Scientist, pending the approval of NASA Headquarters. "Working with the Langley senior staff represents a unique opportunity and challenge for me," said Card. "With the help of our researchers, I hope we can maintain the spirit of research at the Center."

In this position, Card administers the Center's university research programs and is the principal adviser to the director and deputy director on the needs and attitudes of the Langley research staff. He has operating responsibility for the Director's Discretionary Fund, the Distinguished Research Associate Program, the Fund for Independent Research, the Floyd L. Thompson Fellowship program, the Peer Review program, as well as the selection of the H.J.E. Reid Award recipient.

Prior to this appointment, Card had been chief of the Structural Mechanics Division since 1980. From October 1988 to September 1989, he worked at the Marshall Space Flight Center, Huntsville, Ala., on the Space Shuttle as assistant to the director of the Marshall Structures and Dynamics Laboratory.

Card joined the Langley staff in 1958 and was appointed head of the Structural Evaluation Section in 1970. He was selected by the President's Commission on Personnel Interchange in 1972 as one of three NASA employees to participate in the Executive Interchange Program. As a result, he worked at TRW Space Systems Division, Redondo Beach, Calif., for one year.

He became head of the Structural Mechanics Branch in 1974 and head of the Structural Dynamics Branch in 1979. He was team leader for interdisciplinary research in large space systems technology and has done research on advanced aircraft and spacecraft structures, dynamics of space payloads, nonlinear analysis techniques and dynamics of the Space Shuttle System.

National Engineers Week Focuses on Education; LaRC Staff Joins In

Center Director Richard H. Petersen has echoed the initiative of NASA Administrator Richard H. Truly to provide professional role models to area students.

Petersen has asked Center employees to join him in volunteering to go into our local schools and teach a class during National Engineers Week, February 17-23. The goal of this initiative is to stimulate student and teacher interest in technology and technical careers.

"National Engineers Week provides us with a great opportunity to inspire the creative genius of young Americans and excite them about careers in aeronautics and space," said Truly, who plans to teach a class in the Washington area. It is hoped that at least 10,000 engineers will participate in this outreach, which will impact more than one million students and teachers.

Langley employees who would like to speak to area students about science, engineering, mathematics, or careers in these fields, should contact Arlene Levine at ext. 43318. Levine stresses the importance of reaching students at the elementary and middle school levels before they channel themselves away from math, engineering or science career paths.

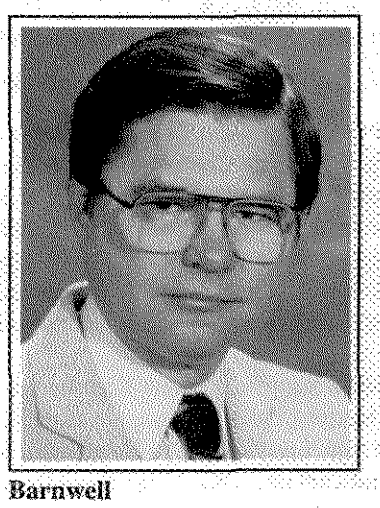
Other activities during National Engineers Week include Career Day to be held Wednesday, February 20. Career Day, co-sponsored by NASA Langley and the Peninsula Engineers Council, will give 350 area high school students the opportunity to discuss careers and related information with exhibitors from Langley's research and technical directorates, Newport News Shipbuilding and member societies of the Peninsula Engineers Council.

Concluding the educational thrust for National Engineers Week will be the annual MATHCOUNTS competition for area seventh and eighth graders to be held Saturday, February 23. MATHCOUNTS is a nationwide program designed to answer the problem of declining math skills among students at the precollege level. NASA Langley hosts this competition in cooperation with the Virginia Society of Professional Engineers.

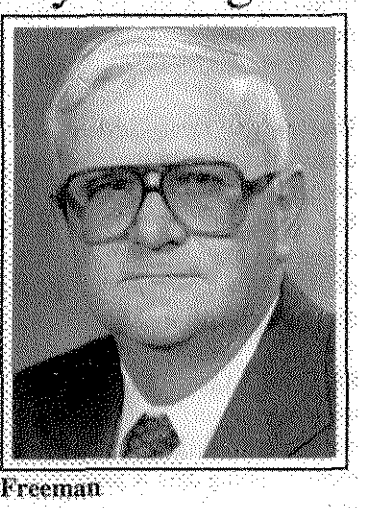
Space Systems Division Names Key Managers

Richard W. Barnwell has been chosen associate chief and Delma C. Freeman Jr. assistant chief of the Space Systems Division.

Pending NASA Headquarters approval, Barnwell, Langley's former Chief Scientist, will be responsible for overviewing the division's research in aerothermodynamics, experimental aerodynamics, high energy science and vehicle analysis, in addition to conducting research in hypersonic viscous flow.



Barnwell



Freeman

He began his NASA career in July 1964 as an aerospace technologist in the Theoretical Aerodynamics Branch. In 1980, he was selected head of the Transonic Aerodynamics Branch. In 1981, he became head of the NTF Aerodynamics Branch, where he directed and conducted research in transonic aerodynamics and was responsible for the research program for the National Transonic Facility. In January 1986, he was named assistant chief of the High-Speed Aerodynamics Division, where he directed research in supersonic aerodynamics, hypersonic propulsion, viscous flow and computational fluid dynamics; and, in July 1987, he became Chief Scientist.

Freeman assists the division chief in directing research and technology activities in support of the Space Shuttle, future launch and orbital transfer vehicles, space flight experiments, and laser and pulsed power systems.

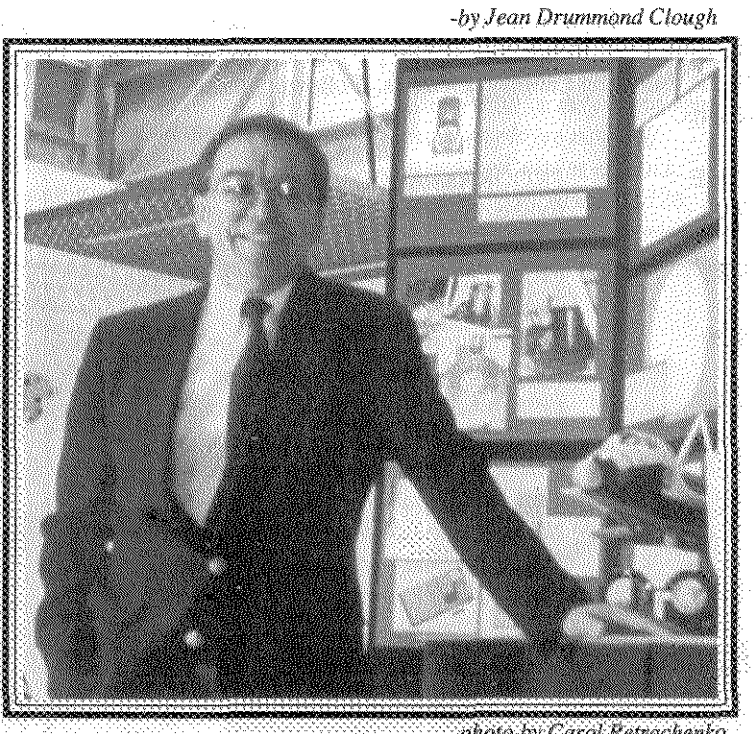
Prior to his selection as assistant chief, Freeman was head of Langley's Vehicle Analysis Branch, which assesses candidate vehicle concepts for future space transportation needs.

Freeman began his NASA career in 1959 as an engineering aid. He has since held several management positions in the areas of aerodynamics, stability and control, and space transportation systems analysis.

McCormick Opens Window to Understanding of Ozone Hole and Global Ozone Depletion

-by Jean Drummond Clough

The discovery of an annual "hole" in the ozone layer over Antarctica during spring startled atmospheric scientists and the public alike. No such phenomenon had been predicted theoretically, and even earlier satellite measurements of the ozone hole were discarded because they did not fit the pattern of being "geophysically reasonable." Ground-based and airborne missions to Antarctica were quickly organized, satellite data were scrutinized and theorists began to develop scenarios whereby such an event could occur.



-photo by Carol Petrachenko

During a colloquium Monday, February 11, Dr. M. Patrick McCormick, head of Langley's Aerosol Research Branch, will describe the environmental problems and Langley's significant contributions to understanding them. He will show data from satellites ans well as ground-based and airborne missions that have illustrated new atmospheric chemical mechanisms at play in the Antarctic and possibly on a global scale. His lecture, "The Ozone Hole and Global Ozone Depletion," will be held in the H.J.E. Reid Conference Center, Building 1222, at 2 p.m., followed by a question-and-answer session and informal discussion.

According to McCormick, the ozone activity followed the Vienna convention and Montreal protocol, wherein countries were agreeing to limit the production of chlorofluorocarbon-containing products in a scheduled fashion. The agreements were reached not because of the discovery of the ozone hole but rather due to pressures of the prediction of a possible global-scale ozone reduction at altitudes above where the ozone hole was appearing. McCormick will discuss the most recent predictions for the impact of the continued worldwide use of chlorofluorocarbons.

McCormick is an internationally recognized atmospheric scientist. He was recently presented the Jule G. Charney Award of the American Meteorological Society for his work in designing measurement devices, then using them to open a new window to understanding polar "ozone holes." He is the first NASA scientist to be honored with this award, ranked as the second most prestigious among the many distinguished awards presented by the society.

McCormick began his NASA career in August 1967 as an aerospace technologist. He has been a branch head since 1975, developing instrumentation and measurement techniques and performing studies and measurements on atmospheric aerosols and gases.

News Briefs

Superbowl Jumbotron Screen Employs NASA Technology Spinoff --- The huge television Jumbotron screen, that tracked the hotly-contested Superbowl XXV game in Florida at Tampa Stadium January 27, kept its cool thanks to a NASA technology spinoff. Sensors, originally designed as ingestible capsules to monitor core body temperatures of human patients, were used to monitor potentially damaging heat build-up in electronic circuits of the Jumbotron. The sensor and receiver within the jumbo screen were the result of a collaborative developmental effort between the NASA Goddard Space Flight Center, Greenbelt, Md., and the Johns Hopkins University Applied Physics Laboratory, Laurel, Md. The sensor, originally developed as a research tool under NASA's Technology Utilization's Applications Engineering program, has been used for research in the areas of hypo- and hyperthermia, sleep disorders, weight loss and sports medicine.

Underwater Tests Gather Data to Help Spacesuit Design --- Scuba divers exercising on a unique underwater treadmill at NASA's Ames Research Center, Mountain View, Calif., may help scientists design better spacesuits for future astronauts working on the moon or Mars. The tests hope to answer basic questions of how human movement and energy consumption will differ in the reduced gravity on the moon and Mars, as well as what speed humans change from walking to running and how much the joints move during various gaits. Another objective is to determine what kind of gait is most effective in different gravity flields and what energy expenditures are associated with those gaits.

Magellan Mapping of Venus Provides Significant New Knowledge --- The Magellan spacecraft mapping the surface of Venus with imaging radar has swept over nearly 55 percent of the planet, an area comparable on Earth to the distance from Los Angeles to New Delhi, India. Scientists report that the radar mapping data is providing significant new knowledge about the surface of Venus and its atmosphere. All of the areas mapped show widespread evidence of volcanism. Although Venus and Earth are the only planets in the solar system that have linear mountain belts, the mountains on Venus are not deeply eroded by rainfall and running water as are the mountains on Earth. Magellan also confirmed the number of Venus impact craters that scientists had expected to find, judging from early Earth-based radar data. There is also evidence that the poisonous, thick atmosphere of Venus was not formed recently, but may be from 400 million to 800 million years old, or even older.

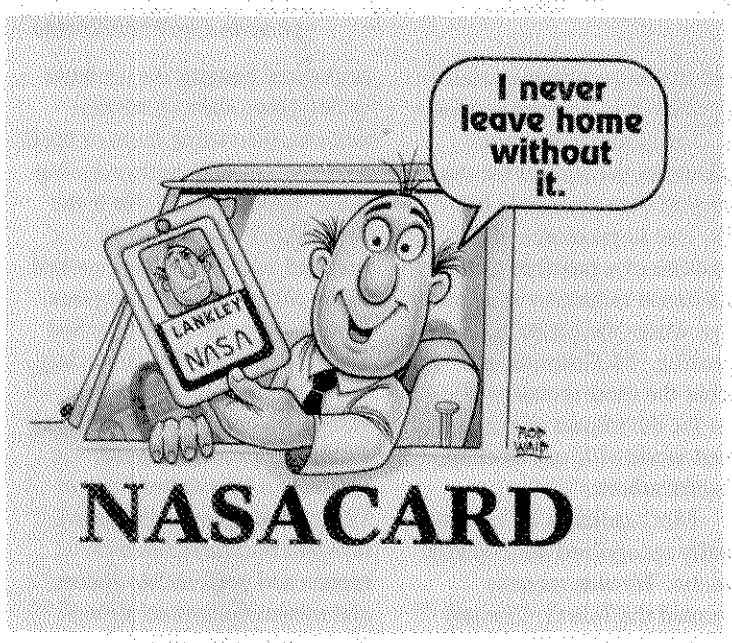
NASA, NSF to Develop Antarctic Space Analog --- The remote and barren continent of Antarctica will be used as a productive testbed for technologies and systems that may enable people eventually to build a permanent outpost on the moon and journey to Mars, thanks to an agreement recently signed by NASA and the National Science Foundation (NSF). The agencies have signed a Memorandum of Agreement which will benefit NSF's operations in Antarctica and enable NASA to prepare for future missions to the moon and Mars by conducting basic scientific research and testing technologies and systems to support human life. Scientists believe that Antarctica's climate, terrain, temperature and isolation provide an environment on Earth that most closely parallels the conditions of isolation and stress to be faced on long-duration human missions in space. The Antarctic space analog will thus provide a unique and accessible testbed to develop prototype lunar and Mars systems and technologies.

Senior Management Research Review

The Senior Management Research Review will be held Tuesday, February 19, from 9 to 11 a.m. in Building 1212, Room 200. All employees are invited to attend. Program accomplishments will be given by the following Langley scientists. Following these presentations, program directors will give status reports.

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:00	Evaluation of Aerobrake for Lunar Transfer Vehicle	Joe Rehder (Space/SSD)
9:15	ERBE Observations of the 1987 El Nino	Edwin F. Harrison (Space/ASD)
9:30	Computational Prediction of Three-Dimensional Assymetric Flows Around Cones	Osama A. Kandil (Aeronautics/FLDMD)
9:45	First Benchmark-Model-Program Test Successfully Completed	Jose A. Rivera (Structures/SDyD)
10:00	Demonstrations of a Development Methodology for Flight Critical Computer Systems	Carrie K. Walker (FlightSystems/ISD)
10:15	NASA Langley/Honeywell Integrated Global Positioning System Inertial Navigation System Flight Tests	Cary R. Spitzer (Flight Systems/ATOPS)
10:30	Director's Comments	

Lankley



Reminder:

Badges Should Be Clearly Displayed

All Langley employees--civil servant and contractor--are encouraged to wear their badges with photos prominently displayed.

In addition, during this time of heightened security awareness and I.D. checks, please have badges ready for security guards when entering the Center.

Applause to our security personnel who have made access to the Center flow smoothly in spite of additional requirements. The cooperation and patience of Langley employees have been very much appreciated.

Editorials

Sports News

Volleyball Clinics Planned

Rusty on the fundamentals, have not touched a volleyball since the fall season, or just want to know the rules? Volleyball clinics will be conducted in February: C-League clinic will be held on Tuesday, February 12, and D-League on February 19. Both clinics will start at 6:15 p.m. with free play after the clinic.

For special concerns and questions, contact one of the following officers:

Melvin Ferebee, president, ext. 44421
Tricia Romanowski, vice president, ext. 47020
Doug Stanley, treasurer, ext. 44518
Kay Wurster, B-League, ext. 44487
Gaudy Bezos, C-League, ext. 45083
Phil Robinson, D-League, ext. 41316

Volleyball free play is still available in the NASA gym every Friday from 6 to 10 p.m. for all those interested.

Golf Association Gears Up

The NASA Golf Association will hold an organizational meeting for the 1991 season Monday, February 11, in the H.J.E. Reid Conference Center.

The 7 p.m. meeting will be preceded by a social from 6 to 7 p.m. All interested golfers are invited to attend and participate in determining tournament schedules and locations.

Attention Rugby Enthusiasts

Newport News Rugby Football Club welcomes new players, no experience necessary. Practices are held Tuesdays and Thursdays at 7 p.m. at Warwick High School.

The first match will be March 2. For more information, call Rupert Laumann, 867-9379, or George Fiscella, 873-1321.

Notes of Thanks

Helen Anastasio writes: "A special thank you for the wonderful retirement party. The 'roasting' was fun. My family and I are very grateful to all who contributed to my gift and to the success of the occasion, as well as to all who attended and shared their time with me. I am looking forward to taking up golf with the clubs you gave me. I will miss you and you will always be in my thoughts."

Mercedes C. Reaves writes: "My husband Donald and I would like to thank those who donated leave for my recovery from surgery. We are very grateful for your generosity and wish you a New Year filled with many blessings."

Classes at GSFC

The following courses are scheduled at Goddard Space Flight Center, Greenbelt, Md.:

Polymeric Inspection to NASA Handbook (3J) March 7-8

Hand Soldering to NASA Handbook (3A-1) March 18-22

Crimp, Cabling and Harnessing to NASA Handbook (3G and H) March 25-29

Rework, Repair and Modification March 25-29

Electro-Static Discharge Awareness every 2 weeks

These courses run continuously throughout the year. Contact the Training Coordinator, UNISYS Corp., 4700 Boston Way, Lanham, Md. 20706 or call (301) 731-8632 to make reservations or express interest in a later course.

In Memoriam

Sympathy is extended to the families of:

Ennis Clay who died September 15, 1990, in Vero Beach, Florida. Clay worked for Langley for many years.

Dr. Manuel Stein, who died January 22. Stein retired in 1989 after 46 years of service, then returned as a Distinguished Research Associate in the Aircraft Structures Branch.

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough
Editor ..... Marny S. Skora
Photojournalist ..... Carol Petrachenko
Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

People & Places

Employees Support Bloodmobile

Langley civil servants, contractors and retirees donated 324 pints of blood at the January 16 American Red Cross Bloodmobile.

Achieving gallon status were:

20 gallons---James Fay;
14 gallons---James L. Leiffer;
12 gallons---Carroll A. Williams;
9 gallons---Marcella F. Hogge;
8 gallons---Edward E. Crum;
7 gallons---Michael T. Stubbs;
6 gallons---William D. Castle;
5 gallons---Donald Lansing, John R. Huffman and Fred L. Beissner;
4 gallons---Bradley L. Crawford, Aaron J. Ostroff and Sidney G. Allison;
3 gallons---Larry L. Harvey, John K. Quinn, Randy L. Simons and Michael S. Dashiell;
2 gallons---John R. Micol, David K. Burnette, Daniel D. Mazanek, Gerald Alexander, Jack B. Hester and Roger D. Martin;
1 gallon----Thomas M. Walker, Emitt D. Fuller, Mario F. Smith, Jeffrey W. Bullock, John D. McMinn, Vanessa G. Butler, Robert C. Wood and James S. Green.
First timers---Roberto J. Cano, Jocelyn Pritchard, Jason P. Shimshi, Donnie R. Strickland and Theodore J. Biess.

NASA coordinators for the Langley Bloodmobile were Annette L. Forrest and Peter J. Edgette; Barbara Thomas was the Red Cross coordinator.

Mark your calendar:

NASA Langley Bloodmobiles
will be held

Wednesday, **March 20**, 1991
Wednesday, **May 22**, 1991
Wednesday, **July 17**, 1991
Wednesday, **September 11**, 1991
Wednesday, **November 27**, 1991

Help Needed to Ensure Supply

The American Red Cross is appealing to the local community to support the blood program to ensure that local hospital blood supplies are maintained at an adequate level. Blood donations in the Tidewater Region have been on a decline since September due to military deployment to the Middle East.

"Military personnel have always contributed generously to the local community blood program," says Tom Indovina, Desert Shield coordinator for Tidewater. "Now is the time for even greater support from our civilian populations."

Mobile blood drives for the month of February will be held at the following locations:

Feb. 8	12 p.m. to 4 p.m.	City of Newport News
Feb. 11	4 p.m. to 8 p.m.	Sentara Health & Fitness Ctr.
Feb. 12	9 a.m. to 3 p.m.	Langley Air Force Base
Feb. 13	3 p.m. to 8 p.m.	Leggett's Patrick Henry Mall
Feb. 19	3 p.m. to 8 p.m.	Riverside Wellness Center
Feb. 20	11 a.m. to 5 p.m.	Riverside Regional Med. Ctr.
Feb. 21	3:30 to 8:30 p.m.	Jewish Community Center
Feb. 25	1 p.m. to 6 p.m.	Monogram Retailer Credit
Feb. 27	10 a.m. to 4 p.m.	Sentara Hampton General

For more information on these community blood drives, call the Hampton Roads Chapter of the American Red Cross at 838-7320.

Blood donations made at any of these community locations may be credited to NASA Langley by calling Annette Forrest, ext. 43194, to advise her of the site at which the donation was made. Blood--there is no substitute for it. Please give generously at your earliest convenience.

Peninsula Engineers Hold Banquet

The Peninsula Engineers Council will hold their National Engineers Week banquet Saturday, February 23, at the Wyndham Hotel, Williamsburg. The banquet will honor the Peninsula Engineer of the Year. Astronaut Kenneth Reightler will be guest speaker. The cost is $16 per person. Contact Dale Boyer, 688-3818 or 357-2452, for reservations.

Learn to Speak
Clearly,
Confidently,
Convincingly.
Learn to Think
On Your Feet,
and
Under Fire.

Toastmasters Elect Officers; Invite Participation

-by Myra Walton

The NASA Langley Toastmasters Club recently inducted officers for 1991. The club, chartered on July 9, 1985, serves NASA employees, retirees, Langley Air Force Base personnel and others interested in developing communication and leadership skills.

The newly-installed officers range from a recent NASA Langley retiree to several engineers, technicians, a graduate student, as well as contractor and Langley Air Force Base employees. NASA Toastmasters also include among their membership the Area Governor of Toastmasters International, Robert Miserentino, a NASA Langley engineer.

Toastmasters International is the world's foremost self-improvement club. Formed more than 65 years ago, Toastmasters is dedicated to improving leadership skills, self-confidence and effective communication through public speaking. Today more than 160,000 members are associated with 7,200 clubs located in the United States, Canada and 50 other countries.

Thousands of corporations and government agencies sponsor in-house clubs as communication training workshops for their employees. Specialized clubs meet at military bases, on college campuses, in churches, even in prisons. There are Toastmasters clubs for senior citizens, professionals, bilingual groups, singles and the visually impaired.

The NASA club has 25 members and is open to all NASA employees, contractors, retirees and LAFB personnel. Visitors are always welcome and, those who can dedicate the time to attend meetings on Center, are invited to join. The club meets the second and fourth Wednesdays of the month from 11:30 a.m. to 1 p.m. in the H.J.E. Reid Conference Center, Building 1222.

Of special interest to NASA employees is receipt of training credit for participation in the two-year program leading to the rank of Competent Toastmaster. This program requires completion of the first Communication and Leadership manual. The manual outlines 10 specific projects intended to strengthen public speaking and enhance listening and leadership skills. As an incentive to complete the outlined projects and attain the Competent Toastmaster award, a portion of the $18 annual dues is refunded during the process.

Improving through self-improvement is the Toastmaster motto. The next meeting of the NASA Toastmasters will be Wednesday, February 13.

*Editor's note: the **Researcher News** encourages submissions of feature articles on Langley programs and activities such as the one printed here. The editor is also seeking volunteers to serve as field reporters so that we may bring you more employee news. If interested, please contact Marny Skora at ext. 46126.*

NASA LANGLEY TOASTMASTERS 1991 OFFICERS. Recently installed were (L to R) Marco Egovil, secretary; Myra Walton, administrative vice president (public relations); Richard Booth, educational vice president; Christine Darden, past president; Sadie Boyer, president; Kurt Meyer, sargeant-at-arms; Regina Byrne, treasurer; and Anne Smith, administrative vice president (membership).

Amateur Radio License Exams Given

Examinations prescribed by the Federal Communications Commission in International Morse Code and rules, regulations, operating practice and radio theory will be given Saturday, March 2, 1 to 3 p.m., at St. Luke's United Methodist Church, 300 Ella Taylor Road, Grafton. The exams are under the supervision of the American Radio Relay League, with the examining team from the Southern Peninsula Amateur Radio Klub (SPARK) as the local coordinator.

All levels of exams will be given. Candidates who already hold an amateur license should bring a completed Form 610, a photocopy of their current license. The novice exam is free but there is a $5.25 administrative charge. Amateurs must bring their **original** license and photo identification; others must bring two identifications.

Happenings

LAA SOCIAL will be held Friday, February 15, from 4 to 6:30 p.m. in the H.J.E. Reid Conference Center.

CONSERVATION CLUB meets the third Tuesday of each month at 11:15 a.m. in the private dining room of the NASA cafeteria. For details, call Tim Collins, ext. 43113.

ALUMNI ASSOCIATION luncheon will be held Tuesday, February 12, at 11:30 a.m. in the private dining room of the NASA cafeteria. Dr. Jeremiah Creedon will speak on *Modern Electronics Systems for Aircraft*.

BIBLE STUDY GROUP meets Tuesdays, 4:30 to 5:30 p.m. If interested call Mike Scott, ext. 44347, or Roane Hunt, ext. 41352, for details.

PENINSULA COMPUTER USERS GROUP meets the second Friday of the month, at 7 p.m., in the Christopher Newport College Administration Building. For details, call Bill Petitt, 898-3855.

VA TECH ALUMNI Tennis Party will be held Friday, February 22, 8 p.m. till midnight at Centre Court & Racquet Club. Cost is $12. Call Frank Cowling, 722-7636, for sign-up.

PENINSULA YOUNG SINGLE PARENTS is an educational and social organization dedicated to the well-being and interest of single parents and their children. Membership is open to all single parents--divorced, widowed, separated or never married--who have children under the age of 21. Call 827-8408 for membership and orientation details.

TIDEWATER DINNER THEATER's production of *Move over Mrs. Markham* will run through March 3. Tickets are available through the Visitor Center Souvenir Counter. For more information and prices, call ext. 41585.

PROFESSIONAL TAX SERVICE. Senior citizen discounts, home service available. Call 851-9265.

TELA-TAX SERVICE. Individual, business, federal, state. Member National Association of Tax Practitioners. By appointment. Call 874-3121.

FOR RENT: CONDO. Professionally decorated 3 BR condo; LR w/FP, formal DR, eat-in kitchen. All appliances, private courtyard, large storage area, pool. $600 per month. Call 826-9437 after 5 p.m.

FOR RENT: GARAGE for storage of car or boat. $95 per month. Also, workshop/storage area, could be used by hobbyist. $145 per month. Call 898-5536 after 5 p.m.

WANTED: MANUALS for PAR 210A amplifier, PAR 200 Nim Bin, HP 1051A combining case, PAR 281 power supply. Also any other PAR or Dynaco manuals. Contact B. Hefner, ext. 44980.

WANTED: AUTO LICENSE PLATES from all 50 states. Contact Tom Luck, ext. 44220.

PENINSULA SKI CLUB has openings on its Silver Creek ski trip. Cost is $233 and includes transportation, two nights' lodging, lift tickets for three days of skiing and three breakfasts. The bus will depart Patrick Henry Mall at 11:30 p.m. Thursday, February 21, and return at midnight Sunday, February 24. For further information, contact Tricia at 825-1913 or Kay at 851-7903.

NASA TOASTMASTERS will meet Wednesday, February 13, at 11:30 a.m. in the H.J.E. Reid Conference Center, Building 1222. Contact Myra Walton, ext. 44108, for more information.

Ski NASA

Ski the beautiful mountains of Virginia. Travel on modern, restroom-equipped buses--no worry about driving or road conditions. Cost is $43, which includes transportation and lift ticket. Make checks payable to Richard Bennett and send to Mail Stop 397 or 11 Bosch Lane, Newport News, Virginia, 23606.

Rental equipment is available at the ski slopes. To rent equipment, include $15 for rental fee in the check.

The bus arrives at Newmarket South (in front of Hechingers) at 4:30 a.m. and departs at 5 a.m. for arrival at the ski area by 9:30. Buses depart the slopes at 5 p.m. and should arrive in Hampton by 9:30 p.m.

Trips are open to all NASA employees, contractors and their friends. For additional information, contact Bennett at 599-5585. Scheduled trips are:

February 14 . . . . . Massanutten
February 21 . . . . . Wintergreen
February 28 . . . . . Wintergreen
March 7 . . . . . Bryce
March 14 . . . . . Massanutten

FOR RENT: TOWNHOUSE in Poquoson, 3 BR, 2-1/2 BA, eat-in kitchen. Reasonable rent. Call Joan at 838-6000.

Ticket Sales

Discount tickets are currently being sold at the Visitor Center Souvenir Counter for the following local attractions:

AMC Theaters	$ 3.75
Colonial Wmsburg	
Adult	$20.00
Child	$12.00
Adult Governor	$23.00
Child Governor	$14.00
Adult Patriot	$26.00
Child Patriot	$16.00
Tidewater Dinner Theater	
Sun., Wed., Thurs.	$22.00
Fri., Sat.	$23.00

Effective February 1, tickets purchased with a charge card will be charged a fee of $.50 per purchase. During the recent period of limited access to the Center, tickets will also be sold at the NASA cafeteria from 11 a.m. to 2 p.m. for the convenience of NASA employees.

Retirement Party

Maywood Wilson will be honored at a retirement party Wednesday, March 6, at the H.J.E. Reid Conference Center. A cash bar social will begin at 6 p.m.; dinner will follow at 7. Cost is $12 per person or $23 per couple. Gift contributions are also welcome. Respond via check to Leland Bryant, Mail Stop 397, by February 27.

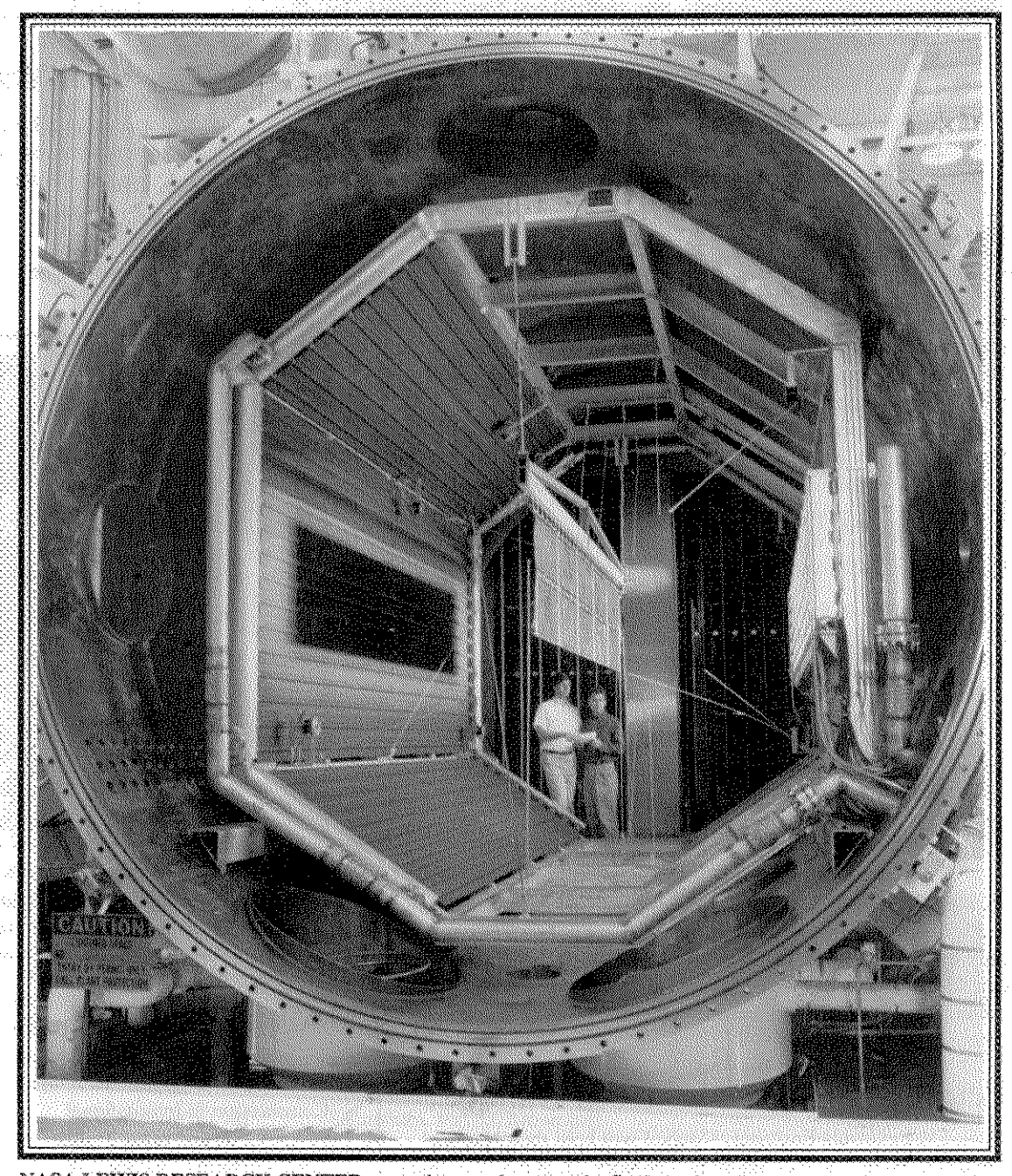
National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

27-01 RESEARCHER,NEWS
VANVALKENBURG, RANDAL L.,
MAIL STOP 125A BLDG 1268A

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

News Researcher



NASA LEWIS RESEARCH CENTER operations engineers make final checks prior to plasma interaction tests with Space Station Freedom solar array panels. A series of tests were conducted in the "space-like" environment of Lewis' vacuum chamber to evaluate the effects of space plasma on the solar panels. Tests results will be used to determine optimum panel design and operating parameters and to select an appropriate grounding mechanism for the arrays. The panels were developed for Lewis by Lockheed Corporation.

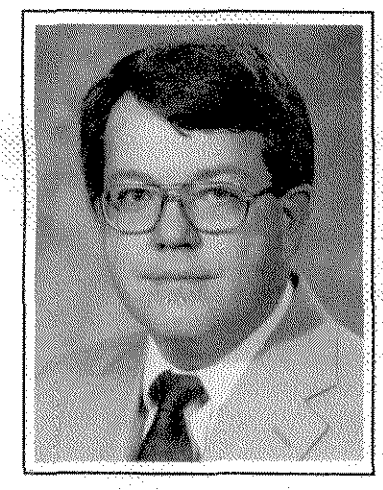
NASA
National Aeronautics and Space Administration
Langley Research Center

News Researcher

Volume 5, Issue 4 February 22, 1991

Bi-weekly Employee and Contractor Publication

Joplin Chosen Chief, Facilities Engineering Division



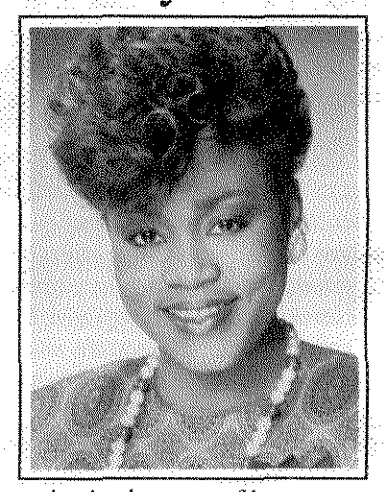
Sammie D. Joplin has been named chief of the Facilities Engineering Division, pending approval of the Office of Personnel Management.

In this position, Joplin is responsible for the development, design, construction and operation of aerospace research facilities.

He began his NASA career in February 1963 as an aerospace technologist. Prior to his recent appointment, he was head of the Facility Systems Branch, responsible for Langley facilities in the areas of mechanical design, fluid mechanics, heat transfer, hydraulic controls, cryogenics, vacuum, and high pressure-temperature systems.

In 1985, Joplin spent a year at the Massachusetts Institute of Technology as an Alfred P. Sloan Fellow. He is a specialist in mechanical and systems design for spacecraft, aircraft and facilities and a technical management specialist.

Local News Personality Views Gulf Crisis



WVEC-TV-13 anchor woman Barbara Ciara reports that local service men and women deployed to the Persian Gulf are adamant about keeping close ties to home.

In a presentation Wednesday, February 27, at the H.J.E. Reid Conference Center, Ciara will bring the Middle East to Hampton Roads as she shares videotaped interviews filmed in Saudia Arabia. The program will be presented at 11 a.m. by the NASA Langley Federal Women's Program Committee.

Ciara spent a week in Saudia Arabia at the invitation of the 1st Tactical Fighter Wing, headquartered at Langley Air Force Base. She experienced firsthand their living environment and can assure her audience that the Wing has maintained a sense of humor throughout their deployment.

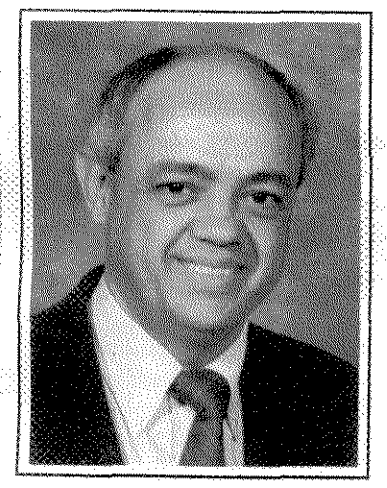
"Our troops have named their living quarters Bedrock—a complex of tents pitched in the desert's sand and rocky terrain," she said. Ciara interviewed personnel whose jobs run the gamut of needs in this co-located military base, from security personnel to kitchen help. She also spoke with Wing commander, Colonel John McBroom, who outlined the command's mission prior to the outbreak of Desert Storm.

Following the videotaped portion of her presentation, Ciara will give an update on conditions since the beginning of the war and will take questions from the audience. "I hope to immerse the viewer in the environment of Saudia Arabia—the living conditions, the attitude, the morale, the pride," she said.

Ciara is principle anchor of WVEC-TV-13 news at 6 and 11 p.m. Her presentation is a prelude to numerous activities planned for the month of March, designated by Congress as Women's History Month.

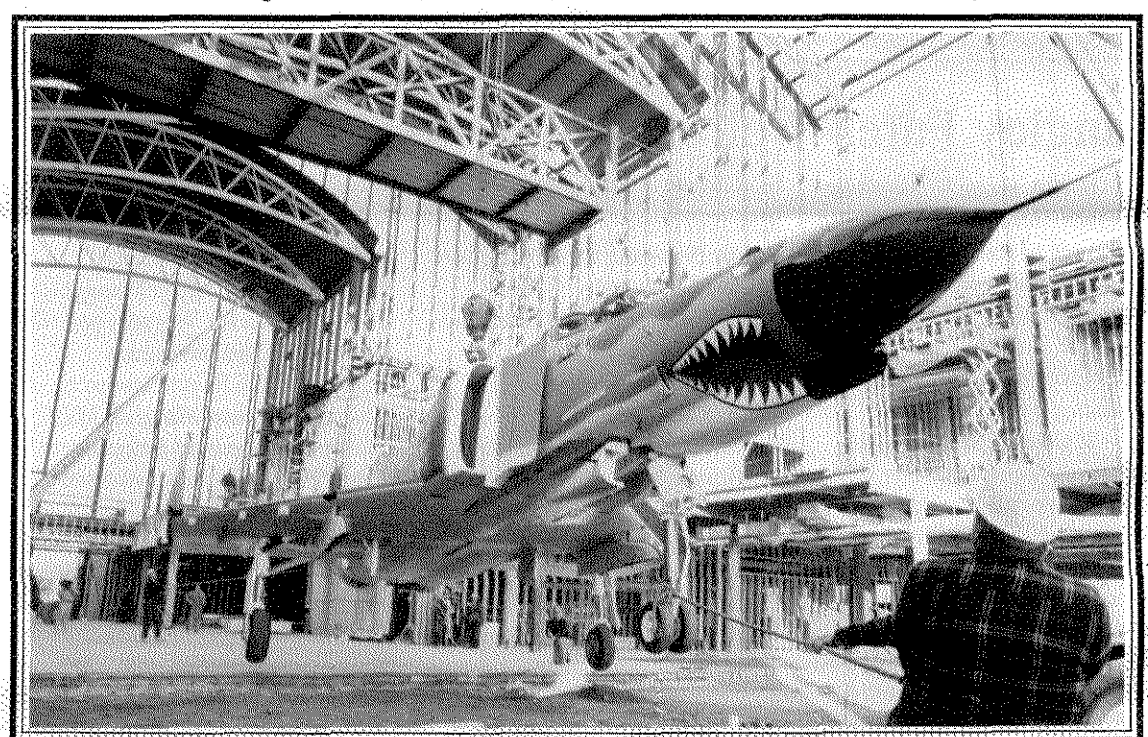
McMaster Selected Assistant Chief, Flight Electronics

Leonard R. McMaster has been selected assistant chief of the Flight Electronics Division.



In this position he will assist the chief in the division's research in solid-state lasers and electronics. In addition, he will assist in the development of advanced avionics systems for civil aircraft and new techniques for remote measurement of the environment from space.

McMaster joined the Langley staff in 1967. Before assuming his new position, he was assistant head of the Aerosol Research Branch, which studies the use of satellites and ground-based and airborne techniques to determine how aerosol particles and other constituents affect atmospheric processes and climate. He also served as science manager for SAM II, SAGE I and SAGE II satellite programs.



CATCH OF THE DAY. A restored F-4E Phantom II fighter is lowered into the shell of the Virginia Air and Space Center in downtown Hampton. Donated by Langley Air Force Base, the Vietnam-era plane is one of several aircraft to be suspended from a ceiling in the museum, scheduled to open in April 1992.

-photo by Carol Petrachenko

College Scholarships Available to NASA Dependents *-by Allan Hanrahan*

Three college scholarships in the amount of $1,500 each are available for the 1991-1992 academic year. The scholarships will be awarded by the NASA College Scholarship Fund, Inc., a non-profit organization established to aid qualified dependents of NASA and former NASA employees, agency-wide.

The NASA College Scholarship Fund is in its ninth year. Timothy Olin Jarrett, son of Olin Jarrett Jr., an aerospace engineer in Langley's Fluid Mechanics Division, won a NASA scholarship last year, the second consecutive year that a Langley dependent has been selected. Timothy attends the University of Virginia as an Echols Scholar majoring in physics. His goal is to earn a doctorate in physics, specializing in high energy particles research.

"I am honored that the organization I work for has chosen to recognize my son with this fine distinction," said Jarrett. "The vistas that are open to him by way of the scholarship --the opportunities offered and meeting many professional people--have been a tremendous eye-opener for him."

Contacted in Charlottesville, Timothy stated, "If you're training in science and engineering, it's a great thing to have (the scholarship). It presents tremendous opportunities. Of course, there's no substitute for the hard work and study required once you're here, but the scholarship eases the way."

Michael Fripp, son of Dr. Archibald L. Fripp, senior research scientist in Langley's Information Systems Division, won a NASA scholarship in 1989. Michael is a Presidential Scholar at Virginia Tech. He is enrolled in an engineering science and mechanics program and has an interest in medical research.

Dr. Fripp is highly supportive of the NASA scholarship program. "In very realistic terms, NASA's support allowed Michael to purchase a very fine computer that was most helpful during his first year, and the scholarship enabled him to upgrade the system this year." Fripp is convinced that his son feels a keen obligation to succeed, not only for himself but for those who have supported him.

Contacted in Blacksburg, Michael exclaimed, "You better believe it has!" when asked if the scholarship has been a help to his academic career. "Many of my projects involve a lot of computer crunching. I purchased a math co-processor to help me pursue my interest in nonlinear dynamics. There's a computer in that lab on campus, but it's a lot nicer if I can do the work on my own computer."

Applicants must be pursuing a course of study that will lead to an undergraduate degree in science or engineering at an accredited college or university in the United States. These scholarships are renewable each academic year to a maximun of $6,000 over six calendar years.

Completed application forms must be received at the Johnson Space Center no later than **March 29**. Late applications will be returned unopened.

The scholarship fund was established as the direct result of a substantial unsolicited gift offer by Pulitzer Prize-winning author James Michener. Many NASA employees have also contributed to the fund. Past recipients have been invited to a reception in Houston--tentatively scheduled for March 23--to meet with Michener and the other recipients.

W. Ray Hook, director for Space, encourages present and former employees to take advantage of this educational opportunity. "I hope qualified candidates will seriously consider applying. Langley candidates have done very well in the past competitions. It is an opportunity for recognition as well as financial support."

For more information on eligibility requirements and selection criteria or to receive application forms, contact Allan Hanrahan, ext. 42762.

News Briefs

NASA Releases February 1991 Mixed Fleet Manifest --- NASA has issued a February 1991 Mixed Fleet Manifest for both the Space Shuttle and expendable launch vehicles (ELV). Of the 26 Space Shuttle flights planned over the next three years, 18 missions will be for NASA payloads or joint NASA/international payloads with the Shuttle focusing on the performance of a variety of space science activities supporting life sciences, materials science and astrophysics investigations. The remainder of the flights during that time frame will support two international Spacelab missions, two flights of the commercially-provided Spacehab module, the retrieval and reboost of a stranded commercial communications satellite and three Department of Defense missions. The manifest shows 13 launches by ELVs over the next three years; three launches in the small vehicle class, seven in the medium category and three in the intermediate class. Among the payloads planned for launch on ELVs are the Extreme Ultraviolet Explorer and Geotail on Delta II vehicles in December 1991 and July 1992, respectively, and the Mars Observer on a Titan III in September 1992.

Truly Delivers NASA Budget Request to Congress --- NASA Administrator Richard H. Truly briefed members of the House Committee on Science, Space and Technology on the President's fiscal year 1992 budget request for NASA. The Committee is chaired by Representative George E. Brown Jr., (D-Calif.). The request is for $15.7 billion, a 13.6 percent increase from the current year appropriation. The majority of NASA's budget, 99 percent, supports already-approved programs, including almost $3 billion for space science programs. Among areas given special emphasis were: the new launch system to be jointly developed with the Department of Defense; LIFESAT, a reusable biosatellite which will help determine radiation protection requirements for long-duration space flight; the Mission to Planet Earth, NASA's contribution to the U.S. Global Change Research Program; and a 17 percent increase for NASA's educational activities.

Space Grant State Consortia Selected --- NASA announced the selection of 26 Space Grant State Consortia. These newly selected consortia represent 132 colleges, universities and industrial partners. This selection brings the total number of participating institutions to more than 300 in 46 states and the District of Columbia. The latest program grants were targeted to states with colleges and universities involved in nationally competitive aerospace research and educational programs. The four-year, $150,000-per-year grants will be used to initiate new programs and to strengthen existing capabilities.

Editor's note: To receive a copy of any of the Headquarters News Releases summarized above, contact Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request materials by the headline printed in bold.

Langley Fares Well in Fellowship Competition

NASA annually awards at least thirty fellowships, enabling employees to study various aspects of management at institutions of higher learning across the United States. This year, eleven of the awardees are from Langley.

Selectees include **James L. Raper**, deputy manager of the Space Exploration Initiative Office, who will participate in the Carnegie-Mellon University Senior Executive Seminar; **James Randy Rooker**, head of the Structural Design Branch, Harvard University's Program for Management Development; **Joseph B. Talbot**, manager of the Space Station Freedom Office, Harvard University's Senior Executive Fellows Program; **Karen R. Credeur**, head of the Office of Public Services, an alternate for Harvard University's Mid-Career Master in Public Administration;

Charles G. Miller III, head of the Experimental Hypersonics Branch, and **Carl E. Horne**, head of the Facilities Utilities Section, Penn State University's Scientist/Engineer as Manager Program;

Ann B. Carlson, aerospace engineer in the Thermal Analysis Section, Simmons College Program for Developing Managers; **Barry D. Meredith**, deputy manager of the Evolutionary Definition Office, MIT Sloan Fellows Program; **James C. Yu**, assistant chief of the Acoustics Division, Stanford University's Sloan Fellowship;

Pamela L. Rinsland, assistant head, Electronics Branch, Smith College Management Program for Women; and **Cynthia C. Lee**, aerospace engineer in the Flight Research Branch, Syracuse-Maxwell Mid-Career Development Program.

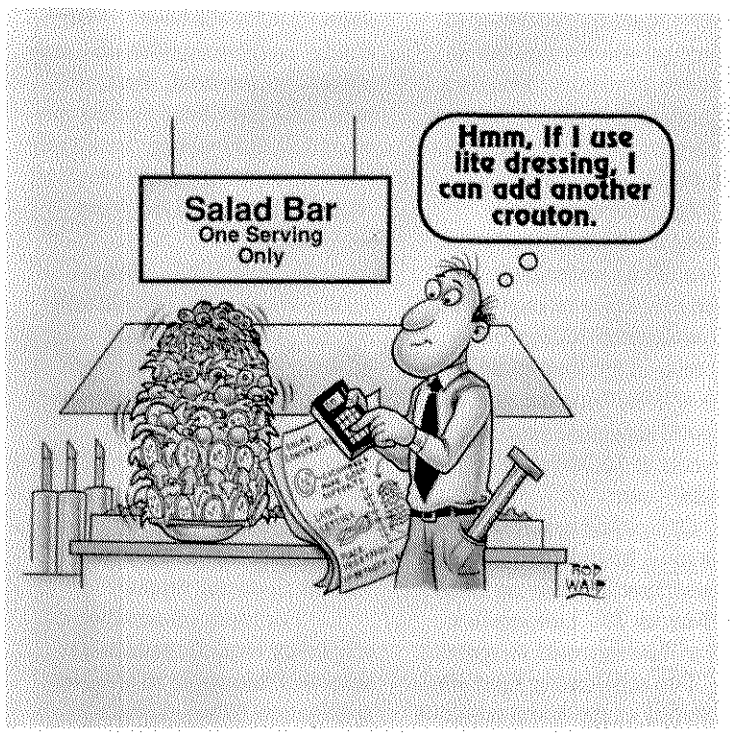
"Langley applicants have historically fared well in the selection process and gained both personally and professionally from the opportunities," said Director for Flight Systems Jeremiah F. Creedon. "We can once again be justifiably proud of Langley's success in the Agency-wide fellowship process." Creedon is a member of the Langley committee which recommends candidates and the intercenter panel which provides NASA Headquarters with a recommended slate of nominees.

The NASA management fellowships are varied in duration and focus. Time frames range from one week to one year, and eligibility requirements vary from GS-12 to Senior Executive Service (SES) level. Programs differ in focus from a public sector viewpoint to management in a business context.

"Langley supervisors at all levels should consider nominating their current and potential managers. Those who would like to become managers should consider applying for a fellowship that complements his or her interests," said Creedon.

For additional information about NASA management fellowships, contact Camille Summerlin, Training and Education Section, ext. 42549.

Lankley



Message from the Director

Center Street Address System to be Immediately Implemented

I am pleased to announce the implementation of an initiative which Langley senior management has endorsed and a dedicated planning committee has worked for five years to bring to fruition.

Within the next few weeks, the first of more than 70 new building signs will be installed, allowing us to make a transition to a standard street address system at Langley. In addition, new street signs at intersections and large, easily readable street address numbers on Langley buildings will soon appear, paving the way for a logical and systematic method of locating Langley facilities and people.

The current building numbering system has evolved over the last 74 years and--with the growth of the Center and its facilities--has become very confusing. In addition, signage on the field has deteriorated and is in need of repair. This seemed an appropriate time to take a close look at our building address system as well as the first impression we offer to our customers and visitors. The result of this five-year study is the implementation of a new street address system, utilizing new building and street signs.

The story and illustrations on the next page explain the thrust of the project. Then, within the next few weeks each employee will receive a package listing traditional building numbers and the new street address designations for these locations. Also enclosed will be a simplified street map of Langley Research Center. We are convinced that these two tools will enable you to find Langley facilities and Langley people with greater ease. Additionally, your visitors will be able to find you with less difficulty. To complete the package, the next phone book, which will include your new street address, is scheduled to come out in June.

All those who have worked so hard on this initiative are confident that you will be pleased with the new street address signs and other graphic improvements. Of course, there will be some initial confusion in converting from our 74-year-old building numbering system to the new street address system, but we ask your patience and your support.

I personally look forward to the changes and feel they are in the best interest of the Center, our employees and especially our many visitors.

Finally, I would like to thank the members of the planning committee who developed this system as well as the many employees who have helped create and implement these changes.

Pete Petersen

Richard H. Petersen
Director

Call for Papers

Papers are solicited for presentation in the Aeronautical and Aerospace Sciences Section at the annual meeting of the Virginia Academy of Science, May 23, at Virginia Polytechnic Institute and State University, Blacksburg. Authors should submit a proposed title to Naomi McMillin, Mail Stop 413, or to Leroy Spearman, Mail Stop 406, by February 25.

Interested in Teaching?

A qualified individual is needed to teach engineering mechanics--statics at Thomas Nelson Community College Monday and Wednesday evenings for the summer semester. Contact Gary Hicks, ext. 45706, about details.

LAFB O'Club

The Langley Air Force Base Officers' Club is a membership club. For information on joining, call 766-1361.

Retirement Party

Maywood L. Wilson will be honored at a retirement party Wednesday, March 6, at the H.J.E. Reid Conference Center. A cash bar social will begin at 6 p.m.; dinner will be at 7. Cost is $12 per person or $23 per couple. Gift contributions are welcome. Respond via check to Leland Bryant or Wayne A. Wright, Mail Stop 397, by February 27.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

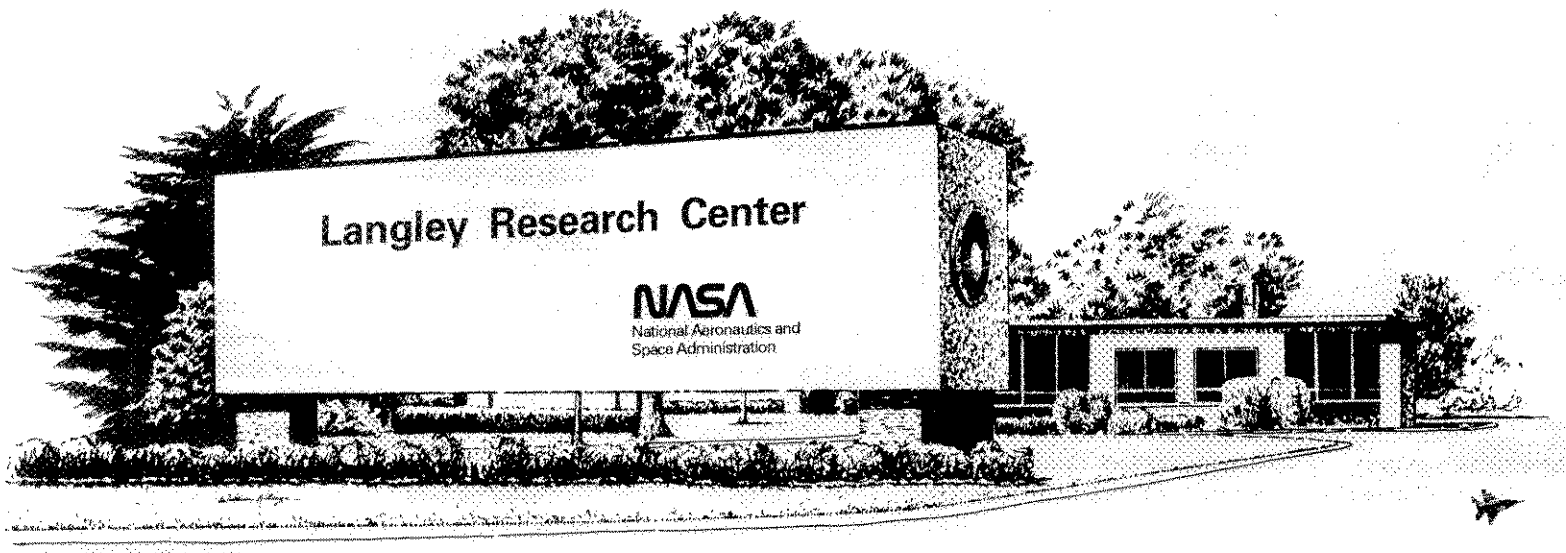
Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.



Visitors to Langley Research Center will be greeted by this view at the main gate. "The thrust for this initiative," said Center Director Richard H. Petersen, "is that Langley continue to project the most professional image, a positive first impression."

Director Authorizes 'New Look' for Langley in 1991

Center Director Richard H. Petersen has announced an initiative to adopt a corporate image for Langley Research Center equal to the high level of work performed here. After more than five years of planning, the project is set to be implemented this month.

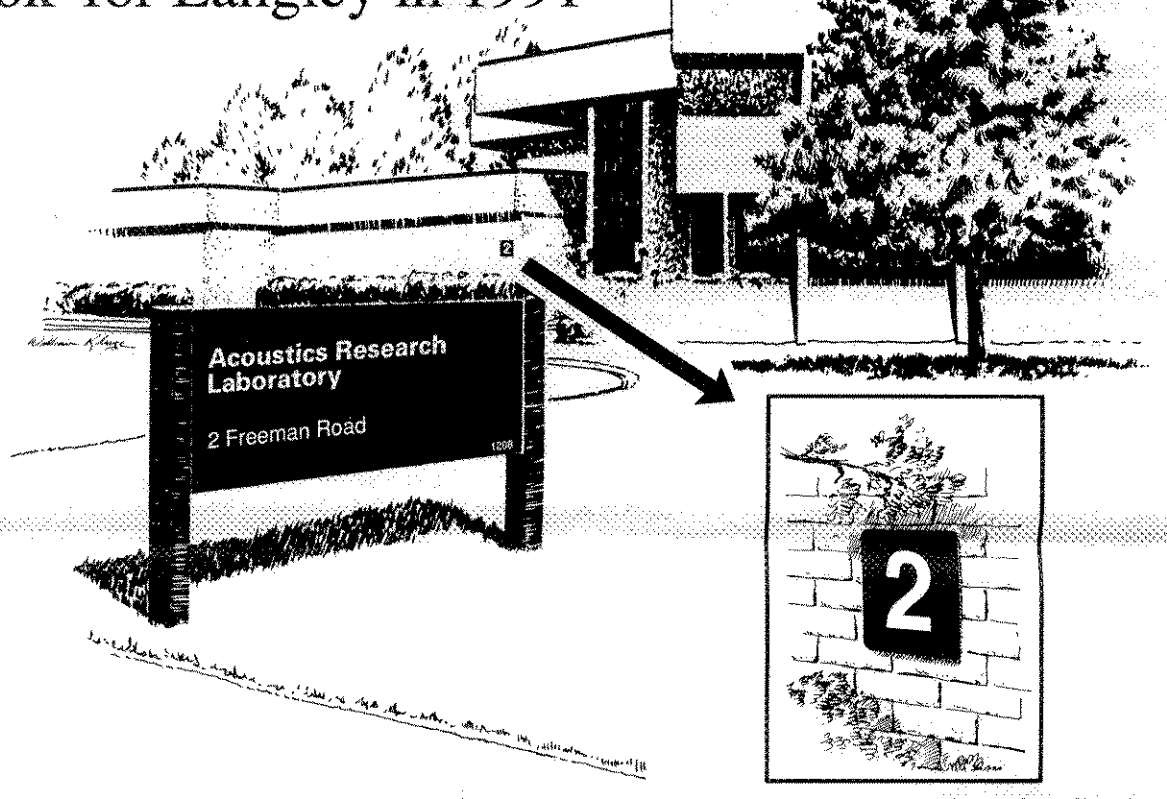
Very shortly, the first of over 70 facility signs will be installed at the road in front of Langley buildings, identifying the type of work performed therein. In addition to the building name, the street address and building number will also appear on each sign.

"I hope these graphic improvements will help our employees more easily locate fellow employees as well as our many facilities," said Petersen. "In addition, these attractive building signs will give visitors to the Center an idea of the scope of work in which Langley is involved."

Much like city planners, a planning committee has sought to standardize building identification signs, building numbers and street signs to make locating Langley facilities and Langley employees much easier.

"The thrust is to enable our employees as well as visitors to the Center to locate any building or facility on the complex without the aid of a detailed map," said Petersen. "It seemed logical to go to a standard street address system with which we are all already familiar."

"The challenge," explained John Mouring, Center master planner, "was identifying the location of out-of-the-way buildings and facilities on Langley's back roads, closed loops and woodland trails." This challenge has been met. Every access road has been named and placed on the map. "From this point, assigning building numbers by using the familiar odd number--left/even number--right convention was the most logical approach." Under this system, Langley's Badge and Pass Office at the main gate, for instance, will now be referred to as 1 Ames Road; the H.J.E. Reid Conference Center, 14 Ames Road; and the cafeteria, 16 West Taylor Road.



Visitors to Langley's Acoustics Lab, Building 1208, will be directed to 2 Freeman Road. The box shows a close-up of the 2; street numbers will be placed on the face of each building in phase 3 of the program.

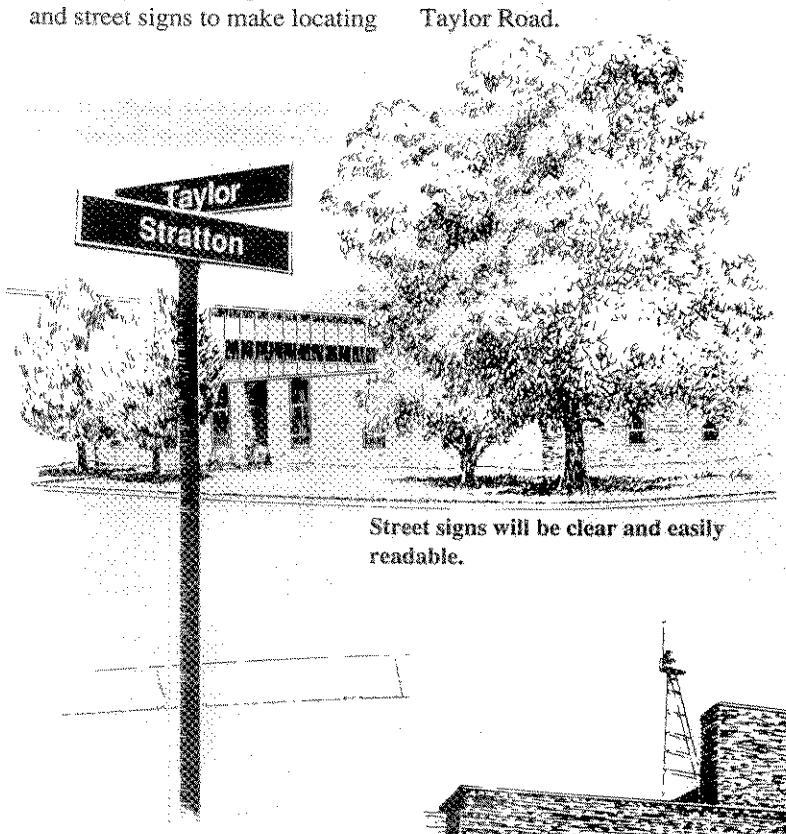
"Street signs will be larger and easier to read," said committee member and sign designer Elizabeth Fedors, head of Langley's Graphics Section. "In addition, building signs will be installed perpendicular to the road so that they can be easily read from either direction."

The building signs are 60 inches wide and 44 inches high, making them easily readable from the road. They are bronze with white vinyl letters and have been designed so that they can be readily updated. The signs have the street address prominently displayed below the building name. The original building number, which corresponds to existing engineering drawings, appears in the lower right hand corner.

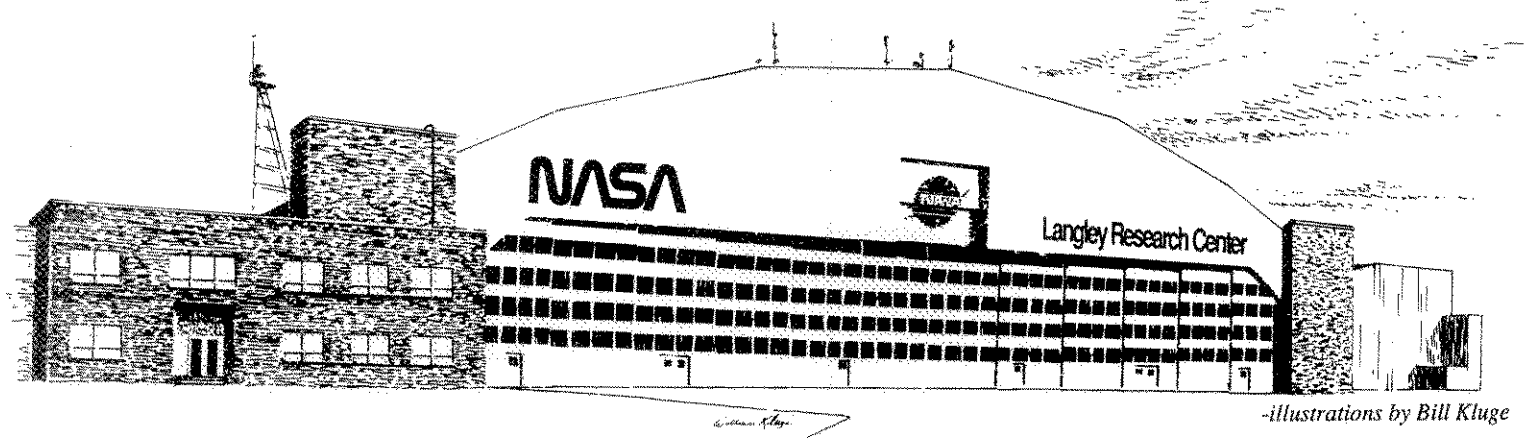
The design, construction and installation of the new building signs is phase one of the initiative. In addition, new signs will be placed at the Air Force gate and Wythe Creek entrances to the Center. Phase two will include new street signs--larger and more easily readable than the present signs at street intersections. These corner signs are presently in the design phase.

As soon as funding permits, phase three of the Center sign initiative will be implemented. This phase will place the street address number on the outside of each building--1 at the main gate; 14 on the H.J.E. Reid Auditorium; 16 on the cafeteria. The numbers will generally consist of one or two digits and will be approximately 10 inches high. In some cases, the number will be followed by a letter. For instance, Langley's Personnel Office, 1195 B and C, will be referred to as 9B and 9C Ames Road.

Completing the total new look for the 90s is a plan to repaint the graphics on the hangar and install a new sign at the main gate announcing entrance to NASA Langley Research Center.



Street signs will be clear and easily readable.



Langley's hangar, 6 East Taylor Road, will be repainted to welcome those approaching the Center by air.

-illustrations by Bill Kluge

Speakers Bureau Volunteers Tell NASA and Langley Stories

The Langley Speakers Bureau is composed of a volunteer staff of civil service and contractor personnel who provide informational and educational programs to groups across Hampton Roads and beyond.

Following is a list of programs given by Langley volunteers during the last half of 1990.

Frank Quinto and **Nettie Orie** spoke to students at Hunington Middle School, Newport News, on *Aerospace Careers.*

Scott R. Thomas, Randall T. Voland and **Earl H. Andrews Jr.** demonstrated a model of the *National Aero-Space Plane* at the Norfolk Naval Station's Air Show.

Leroy Spearman gave a presentation to the Newport News Rotary Club on the *Growth of Aviation.*

George Hickman lectured on *Aerospace Careers* at York High School.

Lance Bush and **Shelley Canright** presented *Physics: From the Classroom to Outer Space* to students in the Fairfax County Public Schools; gave a presentation titled *Spaced-Out Physics* at the Busch Gardens Physics Fair; and spoke to the Blackstone Rotary Club on *Influential Past Scientists of the Space Program*

Debbie Carraway gave an *Overview of NASA* to students at Indian Lakes Elementary School, Virginia Beach.

Dr. Joel S. Levine spoke to a Riverside Hospital seminar group, the College of William and Mary Governor's School, the Hampton Magnet School, and at the Blue Ridge Institute, Asheville, N.C., on *Global Atmospheric Change: An Uncontrolled Environment.* He presented *A Planet At Risk* for the Kiwanis Club of Williamsburg; the Christopher Newport College Chemistry/Biology/Physics Seminar; the Global Town Meeting on the Environment at Hollins College, Roanoke; a William and Mary Honors Program; the IEEE/Tidewater Chapter; Society of Sigma Xi, Norfolk State University; and spoke to Goochland County School Supervisors on *Science, Society and Education.* He also gave a presentation titled *On to Mars* at the NASA Visitor Center and spoke on *Exploration of the Solar System* at James River High School, Roanoke.

Dr. Robert Breckenridge gave presentations on the *Space Station* for an Air Force Association and the Williamsburg Rotary Club.

Bruce D. Fisher spoke to a Corporate Pilot Weather Safety Seminar group on *NASA Storm Hazards Lightning Research.*

Dr. M. Patrick McCormick gave a presentation to the Men's Club of Williamsburg Landing on *Langley's Atmospheric Sciences Research.*

Richard Wallsom spoke on *Large Space Structures* for the Newport News Kiwanis Club, the Oyster Point Exchange Club and at the College of William and Mary Governor's School.

Frank Quinto gave presentations at Hunt High and Lucama Elementary Schools, Wilson, N.C., on *Aircraft and Wind Tunnel Design and Construction* and on *Toys in Space.*

Larry Hunt gave a presentation on the *National Aero-Space Plane* to the Poquoson Kiwanis Club.

Dr. Robert Miserentino spoke to the San Franscisco Section of the AIAA and to the College of William and Mary Governor's School on *Large Space Structures.*

Lance Bush gave a presentation on the *Space Program* for Arlington Public School Administrators.

Steven Bauer presented a lecture titled *Waveriders* at the University of Maryland.

Weldon Staton spoke on *NASA Careers* at Career Day at Paul Burbank School, Hampton.

Lenwood Clark gave presentations on *Space Station* for a NASA Security Officers workshop; the Armed Forces Communications and Electronics Association; the U.S. Coast Guard, Elizabeth City, N.C.; the Langley Alumni Association; the Colonial Chapter of the National Association of Retired Federal Employees; and the Data Processing Management Association.

John Mouring spoke at a State Historic Preservation Conference on *Preserving High Tech National Historic Landmarks in Evolution.*

Brian Pritchard spoke on the *Space Exploration Initiative* for the Embry Riddle Aeronautical University graduation and the Suffolk Kiwanis Club.

Dr. Victor E. Delnore gave a presentation on *Solar Systems* at Woodstock Elementary School.

Charles M. Southall III gave a presentation on *NASA Programs* at the Surry Masonic Lodge.

Douglas O. Stanley spoke on *NASA's Future in Space* to the Thalia Lynn Baptist Church Royal Ambassadors for Christ.

Bob Pegg gave presentations on the *National Aero-Space Plane* for the Denbigh Lions Club, the Hampton Rotary Club and at Embry Riddle University and the NASA Visitor Center.

Dave Shuster presented a program on *Model Rocket Testing* for Virginia Living Museum Explorers.

Cathy Schauer spoke on *Marketing Educational Accomplishments Within Virginia* at New Horizons Technical Center, Hampton.

Joe Watts gave a presentation on the *National Aero-Space Plane* at the College of William and Mary Governor's School.

Scott Striepe spoke on *Future Space Exploration Missions* and the *Co-op Program* at the College of William and Mary Governor's School.

Gaudy Bezos presented *Flight Through Thunder Clouds* at the College of William and Mary Governor's School.

Bob Daugherty gave a presentation on *Shuttle Landing Gear Research* at the College of William and Mary Governor's School.

Marston Gould spoke to the Middlesex Lions Club and at the William and Mary Governor's School on the *Space Station.*

W. Edward Howell gave a presentation to the EEA, Hampton Roads Chapter 156, on the *Effect of Lightning on Composite Materials.*

Delma Freeman presented a program titled *Space Shuttle and Beyond* for the Engineers Club of the Virginia Peninsula and for the National Space Society.

Karen Jackson presented an *Overview of Impact Dynamics Research Program* for the Young Astronauts at Poquoson Middle School and at Embry Riddle University.

Bobby Braun gave a presentation on *Lunar and Mars Missions* at the College of William and Mary Governor's School.

Dana Dunham spoke on *NASA Careers* at the LAFB Summer Fling '90.

David Throckmorton spoke on the *Space Station* at the Virginia Aviation Museum, Richmond.

Brantley Hanks gave a presentation to the North Suffolk Rotary Club on *Future Spacecraft.*

Dr. Frank Farmer presented *Spinoffs from Aerospace Technology* at the William and Mary Governor's School.

Don Soloway spoke on *Robotics* at the William and Mary Governor's School.

Jim Byrd gave a presentation on the *Unitary Plan Wind Tunnel* for the Smithfield Kiwanis Club.

Harry Verstynen gave a presentation on *General Aviation* for the EAA, Hampton Roads Chapter 339, and spoke to Talented and Gifted Students, Hagerstown, Md., on *Aerial Navigation* and *Careers in Aviation.*

Dr. Christine Darden spoke to the Society of Women Engineers on the *Transition from Engineer to Manager.*

Shelley Canright presented *Toys in Space* at the Girls Club, Inc., Newport News, and spoke to At-Risk Students, Newport News, on *Aerospace Careers.*

Bill Kinard spoke to the American Nuclear Society, Richmond, on *LDEF and Experiments.*

Guy Kinnerly gave a presentation to Boy Scout Troop 364, Virginia Beach, on the *High Speed Civil Transport Research Program.*

David Hahne, Doug Stanley, Chauncy Wu, Dick Winning and **David Shuster** gave presentations on *Rocketry* at SCOUTARAMA, Newport News.

Philip Young spoke on *Polymeric Materials in Aerospace Applications* to the Thomas Nelson Community College Science Faculty.

George Hickman gave a presentation on *NASA Careers* at the Sedgefield Elementary School Career Day, Newport News.

Dr. Henry Jones spoke on *Aviation Science* at the EXTEND Center, Tabb Intermediate and Yorktown Intermediate Schools.

Doug Garner gave a presentation on the *Smart Compass* for the EAA, Richmond Chapter.

Jim Jones spoke to the Hilton Methodist Men's Organization, Newport News, on *LDEF.*

Robert Calloway gave a presentation to the Newport News Lions Club on *Aerobraking for Future Space Transportation.*

Dr. John Lamar presented a lecture titled *What Do Engineers Do?* at Denbigh Christian Academy.

Brian Jensen spoke to the CHROME Club, Denbigh High School, on *Composites for Aerospace Applications.*

Langley Research Center is proud of the efforts of these employees. The annual Speakers Bureau recognition ceremony is scheduled for March 28 in the H.J.E. Reid Conference Center.

Sports News

Runners Club Announces Race Results

The Interdirectorate 5 KM Race was won by the UNISYS team, with team members Steve Robbins, Steve Sudik, Chris Koval and Robert Tattle. The first place women's team was also from UNISYS, with team members Ann Cole and Pat Parker.

The first place runner was Erik Vedeler, Flight Systems, with a time of 16:39 minutes, and the first woman was Valerie Plyler, CSC, with a time of 18:40. The team results were:

Men

1. UNISYS	34 points
2. CSC	48 points
3. Electronics	51 points
4. Systems Engineering and Operations #1	57 points
5. Flight Systems	77 points
6. Structures	79 points
7. Systems Engineering and Operations #2	114 points

Women

1. UNISYS	69 points

Softball Meeting

The NASA Softball League will hold an organizational meeting in the H.J.E. Reid Conference Center, 14 Ames Road, on Thursday, March 14, at 5 p.m.

Prospective team captains and anyone interested should plan to attend. For additional information, contact Lou Glaab at ext. 41159.

THE ATTITUDES were regular season and playoff champions of the NASA Flag Football Association's first season. Team members are (front row, L to R) Joe Vega, Ken Wright, Robert Shephard, Keith Richards, Hector Rabell; (back row) Jimmy Adams, Scott Spencer, Karl "Madd" Maddox and John Wallace. Not pictured are Russell Wallace and Robert Redman.

Medical Corner

Smoking--It's A Killer

Each year 390,000 Americans die from diseases caused by smoking. This amounts to one of every six deaths in the United States.

Despite this risk, 50 million Americans smoked more than 500 billion cigarettes last year. The 1990 Surgeon General's report outlines the benefits of smoking cessation and reinforces its importance as a public health goal.

Compared with nonsmokers, men who smoke a pack or more of cigarettes per day have a 27 percent higher risk of dying from lung cancer; women have a 16 percent higher risk. This risk declines by about 45 percent six to ten years after quitting and by about 85 percent after 16 years.

Cessation of smoking has an almost immediate effect on cardiovascular disease. Smokers have a three- to four-fold increased risk of heart attack compared to nonsmokers, but half of this risk disappears within one to two years after quitting. Overall, smokers who quit before age 50 run half the risk of dying in the next 15 years as those who continue to smoke.

Elimination of smoking during pregnancy would prevent about 20 percent of low-birth-weight births, eight percent of preterm deliveries and five percent of fetal and early infant deaths. Yet, despite evidence linking smoking with poor outcomes, nearly 25 percent of pregnant women in the United States smoke during pregnancy.

Together, these data support the government's goal to reduce smoking prevalence from the current 29 percent to 15 percent by the year 2000.

February is Black History Month

Dr. Maxine Mimms, founder of Evergreen State College-Tacoma Campus, will speak Monday, February 25, at 1 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road. Mimms, a Newport News native and graduate of Hunington High School, will address the topic "Transformative Curricula."

An innovative educator, Mimms started the local college chapter in her kitchen. When it outgrew those bounds, she rented a storefront. It is now a campus comparable to our local Thomas Nelson Community College.

Mimms served in the Nixon Administration as assistant to the director of the Women's Bureau, Department of Labor. For 37 years , she has held consultancies in the field of educational administration in Seattle, Bellevue and Kirkland, Washington.

This presentation is sponsored by the Office of Equal Opportunity Programs. NASA employees should charge their time to JO A1980. Refreshments will be served following the lecture.

March is Women's History Month

Alveta Ewell, WAVY-TV-10 news journalist will speak Thursday, March 7, at 1 p.m. in the H.J.E. Reid Conference Center. Ewell will address the theme chosen for National Women's History Month, "Nurturing Tradition, Fostering Change."

For centruies, women have preserved cultural traditions and family unity within the private sphere. Because of their abiding concern for future generations, women have also often stepped into the public arena to address social and political injustices which affect the quality of life. By nurturing valued traditions and fostering necessary changes, women have contributed much to the development of our unique, pluralistic society.

Ewell's presentation is sponsored by theFederal Women's Program Committee.

Notes of Thanks

Wilson Clark writes: "It was a great retirement party. My family and I want to say a special thanks to all who shared in this time with me and for making the evening so enjoyable. Thank you for attending, for my gifts and especially for your friendship."

Alvin Lass writes: "I wish to thank those who arranged for my retirement luncheon as well as all who attended. The gifts were very nice and they mean a great deal to me. Thank you all."

Car Passes Available

Car passes for STS-39 are available on a first come-first served basis. To reserve a pass, contact Ann Suit, ext. 43305.

STS-39 CREW MEMBERS, wearing their partial pressure launch and entry suits, are (L to R) Astronauts Charles L. (Lacy) Veach, Donald R. McMonagle, Gregory J. Harbaugh, Michael L. Coats, L. Blaine Hammond Jr., Richard J. Hieb and Guion S. Bluford Jr. Coats is mission commander; Hammond, pilot, and the others are mission specialists.

Strategic Defense System Tests Highlight STS-39

Mission STS-39 is the first unclassified Department of Defense-dedicated Space Shuttle mission. It will be highlighted by around-the-clock observations of the atmosphere, gas releases, Shuttle engine firings, subsatellite gas releases and the Shuttle's orbital environment in wavelengths ranging from infrared to the far ultraviolet.

Carried aboard Discovery on its 12th flight, the 39th Shuttle mission, will be Air Force Program-675 (AFP-675); the Infrared Background Signature Survey (IBSS) mounted on the Shuttle Pallet Satellite-II (SPAS-II); the Critical Ionization Velocity (CIV) experiment; three Chemical Release Observation (CRO) subsatellites; the Space Test Payload (STP-1) and a classified payload in a Multi-Purpose Experiment Canister (MPEC).

Inside Discovery's crew cabin will be the Cloud Logic to Optimize the Use of Defense Systems-1A (CLOUDS-1A) experiment and the Radiation Monitoring Equipment-III (RME-III).

Work with these payloads during the flight will involve extensive maneuvering, rendezvous and close proximity operations by Discovery. STS-39 is scheduled for launch in early March. Landing is set for Edwards Air Force Base, Calif. The launch window extends from 3:50 to 6:50 a.m. EST and the mission is scheduled to last 8 days, 7 hours and 26 minutes.

The STS-39 Crew . . .

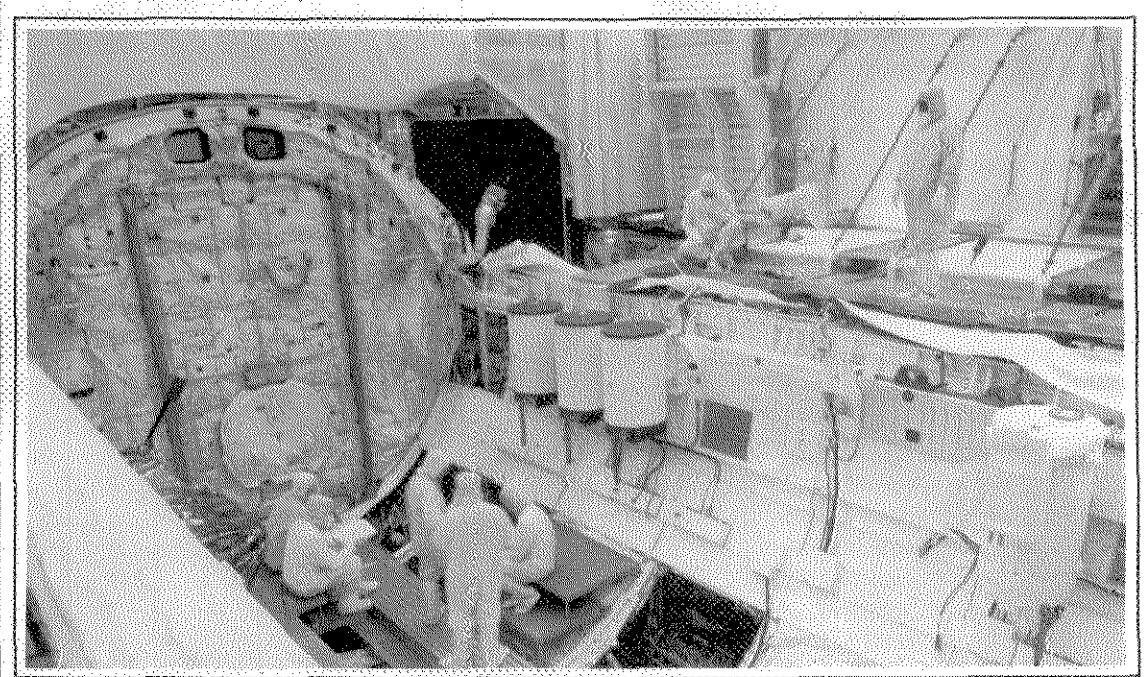
Commanding Discovery will be Navy Capt. Michael L. Coats. Air Force Major L. Blaine Hammond will serve as pilot. Mission specialists include Gregory J. Harbaugh; USAF Lt. Col Don McMonagle; USAF Col. Guion Bluford; C. Lacy Veach; and Richard J. Hieb.

The flight crew will operate in two teams to accommodate 24-hour-a-day observations aboard Discovery, with each team working a 12-hour shift. On the Red Team will be Hammond, Veach and Hieb. On the Blue Team will be Harbaugh, McMonagle and Bluford. Coats will keep his own hours, independent of any assigned shift.

The situation in the Middle East "is of great interest to all of us," said STS-39 commander Michael Coats. "We'll be looking for things like smoke plumes from burning refineries, ships in the gulf, that sort of thing."

The commander of Discovery's upcoming flight said in an Associated Press story that he and his crew hope to spot evidence of the Persian Gulf war as the Space Shuttle flies over the war zone on its first unclassified military mission.

The Defense Department has not asked the astronauts to take any additional cameras or to conduct special surveillance over the Middle East, said Commander Michael Coats, but "obviously, it's of great interest to all of us. But, based on my experience, we're not going to be able to see a whole lot. We will be looking for things like smoke plumes from burning refineries, ships in the gulf, that sort of thing."



KENNEDY SPACE CENTER, Fla. --- Inside the Orbiter Processing Facility high bay, workers install the Chemical Release Observation (CRO) experiment package in the orbiter Discovery's payload bay. CRO is part of the Infrared Background Signature Survey (IBSS) payload, one of several which will fly aboard the STS-39 Shuttle mission for the Department of Defense.

Happenings

LAA SOCIAL will be held Friday, March 1, from 4 to 6:30 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road.

LANGLEY RUNNERS CLUB will hold a Pick-Your-Distance event Thursday, February 28. Runners may run 5 KM, 10 KM or 15 KM. All races start at 5 p.m. on Doolittle Road next to the Activities Building. For more information on this event or the Runners Club, call Richard Shearer, ext. 47036.

VA TECH ALUMNI tennis party will be held Friday, February 22, 8 p.m. till midnight, at Centre Court & Racquet Club. Cost is $12. Call Frank Cowling, 722-7636, for information and sign-up.

PENINSULA COMMODORE USERS GROUP meets the second Friday of the month at 7 p.m. in the Christopher Newport College Administration Building. For details, call Bill Petitt, 898-3855.

BICYCLE RACING. Those interested in joining a bicycle racing club are invited to James River Velo Sport's meeting, 7 p.m., February 26, at the Grissom Library, Denbigh. For more information, call Mark Motter, 874-3247.

TELA-TAX SERVICE. Individual, business, federal, state. Member of National Assoc. of Tax Practitioners. Small business bookkeeping services. Call 874-3121.

PENINSULA YOUNG SINGLE PARENTS. Membership is open to all parents--divorced, widowed, separated or never married--with children under 21 years of age. Call 827-8408 for details.

NEEDED: ROOMMATE. Female roommate to share 2 BR, 1-1/2 B townhouse with washer and dryer. Close to NASA. $275 per month plus 1/2 utilities. Call 868-6557.

FOR SALE: DINING SET, table and six chairs. Glass top with brass legs. Upholstered chairs. $200. Excellent condition. Call 1-484-1907 and leave message.

FOR RENT: TOWNHOUSE in York Crossing; 3 BR. Never been lived in. Available April 1. $700 per month. Please call C. Tyeryar, 898-4553.

FOR RENT: ROOM with kitchen privileges. On water in Hampton's Merrimac Shores area. Call 722-2440 after 3 p.m.

Revised PR Form

A revised Purchase Request Form (form 1250) is now available from stock. The old form, dated October 1989, is obsolete.

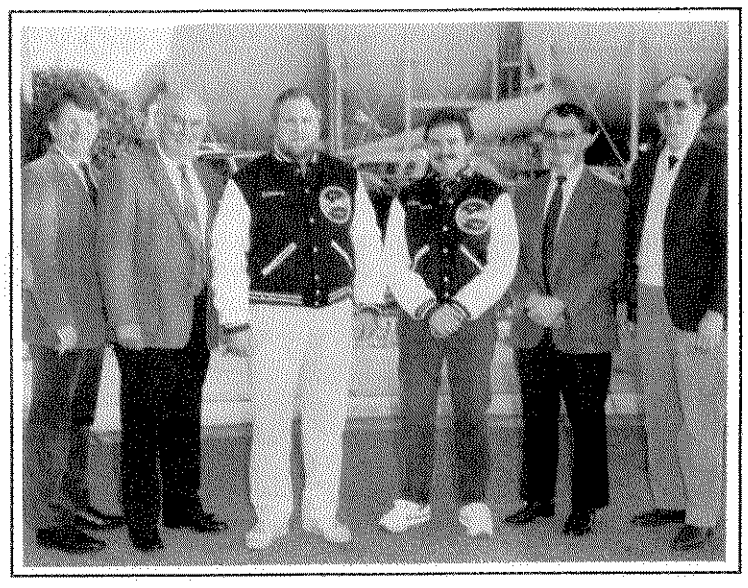
NASA Weekend Ski Trip Planned

A ski trip to Canaan Valley Ski Resort is planned for Saturday and Sunday, March 9-10. Leave Patrick Henry Mall at 5 p.m. Friday, March 8, arrive at Canaan Valley at midnight, ski Saturday and Sunday, arrive home by midnight Sunday.

Cost is $166 and includes two nights' lodging, two breakfast and one supper meal, and all skiing. For additional information, call Richard Bennett at 599-5585.

LOST: PRESCRIPTION GLASSES. Pair of woman's glasses in H.J.E. Reid Conference Center or ACD parking lot Friday afternoon, February 1. Call Shirley at 595-0623.

FOUND: MAN'S GLASSES. Metal rim bifocal glasses with grey/brown frames found in H.J.E. Reid Conference Center. Contact Security, 864-3416.



ACHIEVEMENT RECOGNIZED. The Exchange Council has provided apprentice jackets to Edward E. Lawless (center left) and William P. Chambers (center right), the top graduates of the 1990 Apprentice Class. The jackets were presented by R. L. Swain (far right), chairman of the Apprentice Advisory Committee. Present for the ceremony were (from left) Fred Thompson, coordinator of the apprentice program; Roy "Pat" Mason, chief, Operations Support Division; and Bruce Conway, chief, Instrument Research Division.

Top Apprentice Graduates Recognized

The Langley Exchange Council recognizes the top two graduates of the Langley Apprentice School each year with the presentation of an apprentice jacket. Recognized this year were Edward E. Lawless, Operations Support Division, and William P. Chambers, Instrument Research Division.

Lawless attended Tidewater Community College where he was selected to participate in the school's first co-op program with NASA.

Chambers entered the co-op program while attending Thomas Nelson Community College, where he earned an associate's degree in applied science.

Researcher News

National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

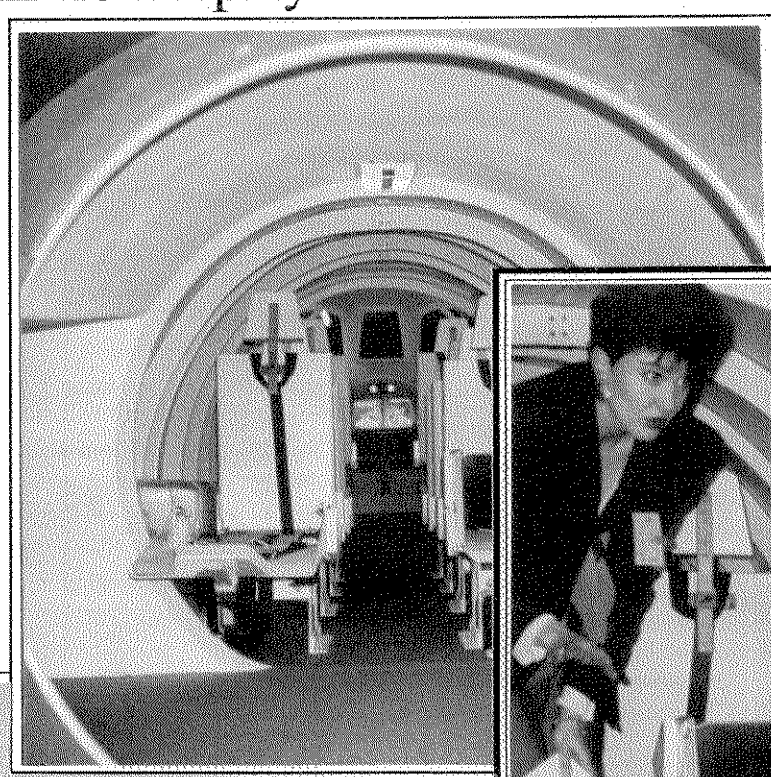
Official Business
Penalty for Private Use $300

27-01 RESEARCHER,NEWS
VANVALKENBURG, RANDAL L.,
MAIL STOP 125A BLDG 1268A

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

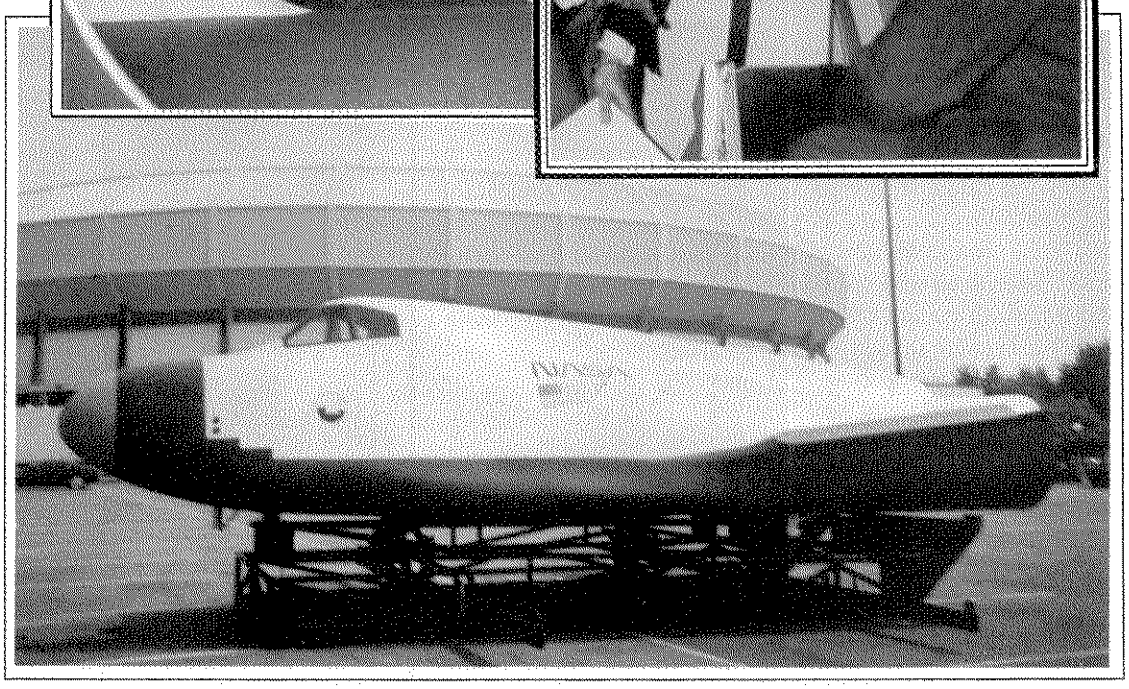
Langley salutes our engineers!
National Engineers Week, February 18-23.

HL-20 Displayed at ALS Conference



Kelly Wilshire explains Langley's human factors research program to NASA Administrator Richard H. Truly as he sits in the cockpit of the HL-20.

-photos by Bill Fogle



This full scale engineering model of the HL-20 represents Langley's technology for a small space vehicle which one day may be used to transport up to 10 astronauts and small cargo to and from low-Earth orbit.

NASA
National Aeronautics and Space Administration
Langley Research Center

News Researcher

Volume 5, Issue 5 March 8, 1991

Bi-weekly Employee and Contractor Publication

Scientists Find Rare Atmospheric Isotope on NASA Spacecraft

Scientists from several U.S. government and university laboratories have reported finding the rare atmospheric isotope Beryllium-7 present on the surface of NASA's Long Duration Exposure Facility (LDEF).

The isotope Beryllium-7 is radioactive and produced naturally by cosmic ray reactions in the Earth's atmosphere. Although very rare, the isotope is detectable by modern nuclear instrumentation and has been studied in the past as a means of tracing the distribution and transport of atmospheric gases in the lower atmosphere, said Dr. Gerald J. Fishman of the Marshall Space Flight Center, Huntsville, Ala.

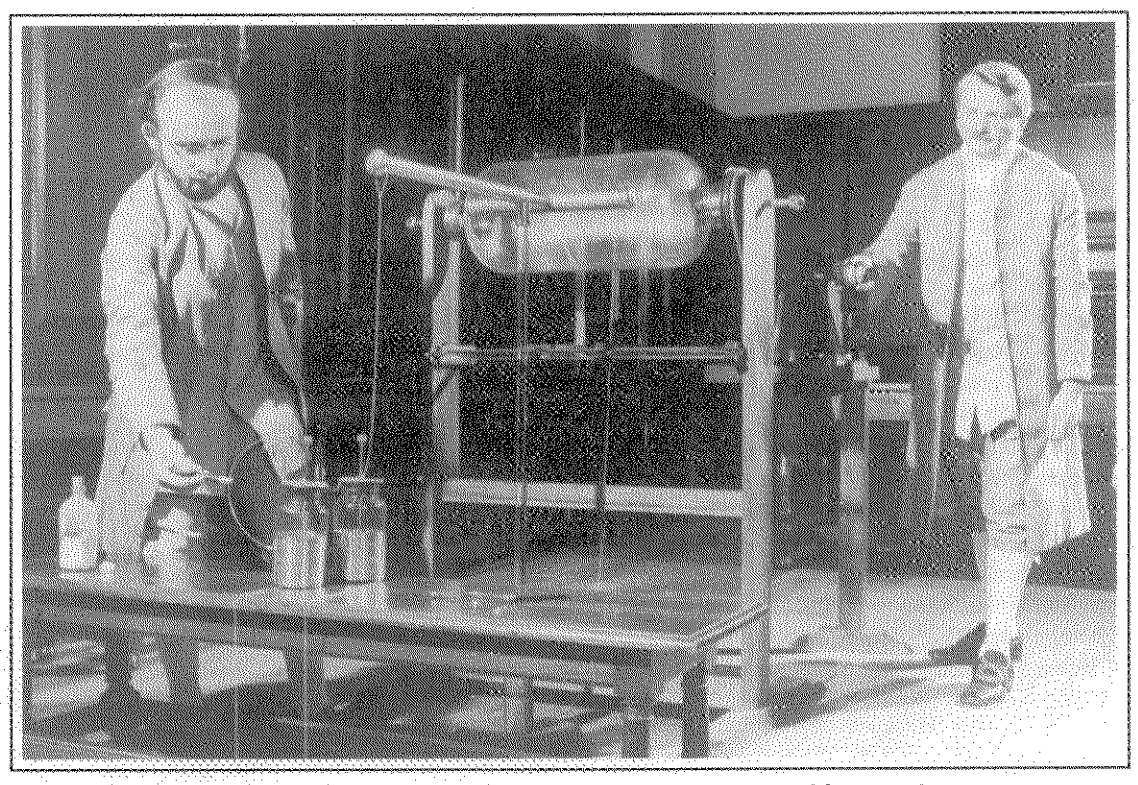
"The finding is thought to be significant from at least two different aspects," said Fishman. "First, it is known that the isotope is mainly produced at much lower altitudes in the atmosphere than where the LDEF was orbiting. The detection and measurements show that some, as yet undetermined, process efficiently carries it to high altitudes.

"Additional and more detailed measurements of this type may lead to a better understanding of the movement of rare atmospheric components over the globe at high altitudes," he said.

"Secondly, prior to this finding, there was only one atmospheric gas that was known to strongly interact with orbiting spacecraft. That gas, atomic oxygen, has been found to be very significant, leading to the degradation of various spacecraft surfaces. The detection of Beryllium-7 on the LDEF surface will allow scientists to study in greater detail the interaction of gases with spacecraft in low Earth orbit," said Fishman.

"A team of scientists found the isotope on the LDEF during measurements at the Kennedy Space Center shortly after its return. At approximately the same time, researchers working with removed external spacecraft components at the Marshall Space Flight Center and the University of Alabama, Huntsville, confirmed the Beryllium-7 presence and showed that it was confined to a very thin layer--the surface on the leading edge of the LDEF," said Fishman. The NASA scientist is part of a radiation group that is investigating materials and radiation data returned from LDEF.

The LDEF was returned from space by the Space Shuttle Columbia in January 1990 after nearly six years in Earth orbit. The spacecraft was designed to test the performance of spacecraft materials, components and systems that have been exposed to micrometeoroids, space debris, space vacuum, atomic oxygen, solar ultraviolet and space radiation for an extended period of time. Managed by Langley, LDEF carried 57 experiments and involved participation of several hundred scientists and engineers in the data analysis.



-photo by Clements Mayes

Eighteenth Century Science Relived

-by Jean Clough

Throughout Europe and America, the 18th century was a time of widespread interest and faith in science. Formal scientific societies and their journals flourished, and the public was involved in science to a much greater extent than today. Public lecturers, illustrating their talks with scientific instrument demonstrations, presented the wonders of the new science to eager audiences.

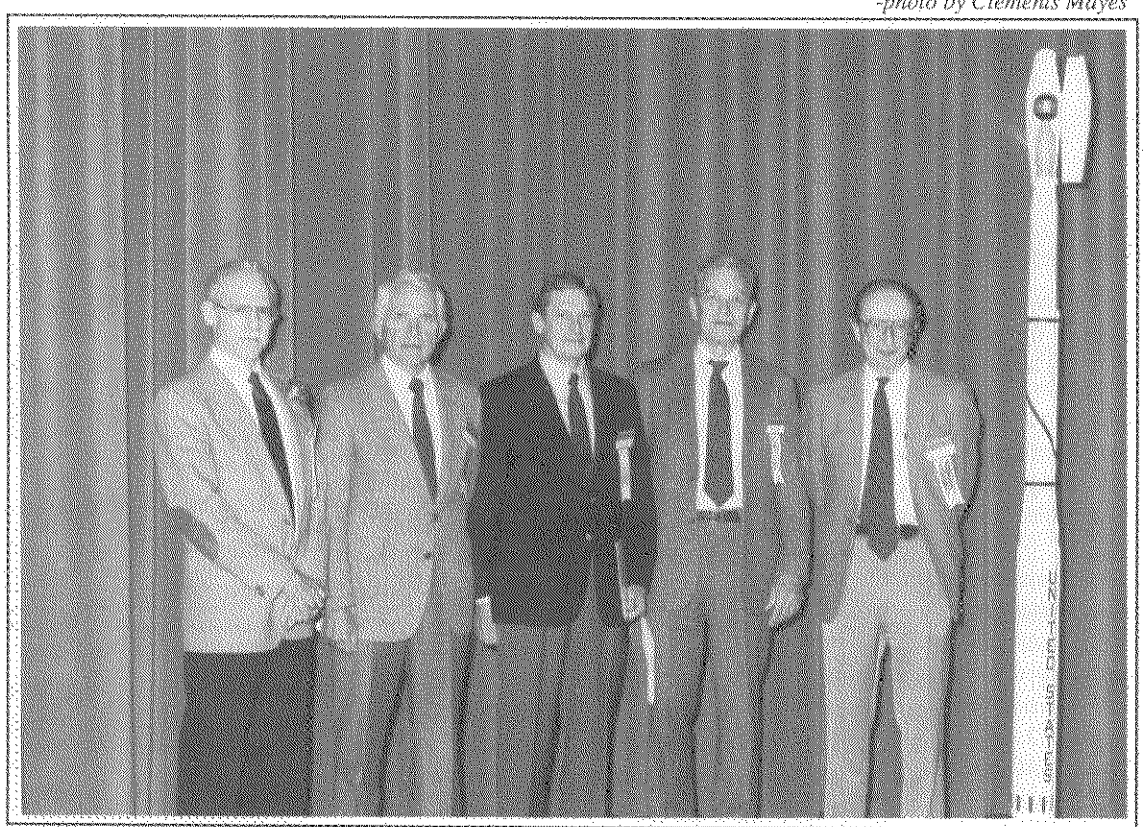
During two lectures on the Peninsula Monday, March 11, two William and Mary professors, dressed in period costume, will present a re-creation of such a lecture.

Drs. Hans C. von Baeyer and John L. McKnight will present "A Science Lecture of the 18th Century" to employees, retirees and contractors during a colloquium at 2 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road. At 7:30 that evening, von Baeyer and McKnight will give the same presentation at the Radisson Hotel in Hampton as part of The Sigma Series--free public lectures sponsored by the Virginia Air and Space Center, the Daily Press and NASA.

According to the professors, scientific societies and the community of those practicing scientific pursuits were small at the beginning of the 18th century, and scientific instruments were made to order by a small number of practitioners. The professionalization of science produced profound changes to these, and the growing societies greatly increased the demand for scientific instruments. Professional instrument makers had to employ many apprentices and other workers to produce the quantity of instruments needed to meet this demand. Moreover, because of the growth of the societies, science became more significant within the circle of those who considered themselves to be intellectuals. As a result, more educated persons chose to identify themselves with the pursuit of science, and some instrument makers and scientists eager to popularize science undertook a series of public lectures.

McKnight and von Baeyer are professors of physics at the College of William and Mary. They are supported in their work by a grant from the National Science Foundation. McKnight, who received degrees from the University of Michigan and Yale University, teaches courses in physics, astronomy, history of science and philosophy of science. He conducts research on the history of scientific instruments and their use, especially during the period 1650-1890. Previous research has resulted in papers on 18th century science and instruments and on the 1859 scientific instrument collection of William and Mary.

Von Baeyer, educated at Columbia and Vanderbilt universities, specializes in elementary particle theory and writing about physics for the public. His column "Physika" appears regularly in the popular science journal *The Sciences*, and his book *Rainbows, Snowflakes and Quarks* was published in 1984. In 1990, he received an outstanding faculty award from the Virginia State Council of Higher Education and a science writing award from the American Association for the Advancement of Science.



A PROPER FAREWELL. Five of the six Scout employees who served as head of the project during its 30 years at Langley attended the Salute to Scout celebration Friday, February 1, in the H.J.E. Reid Conference Center. From left are Jon L. Van Cleave, Lee R. Foster, Roland "Bud" D. English, Eugene D. Schult and William E. Stoney. Absent from the picture was George Rupp, who was the first project head.

Annual Honor Awards Ceremony Set

The Langley Research Center Honor Awards Ceremony will be held Friday, March 22, at 1:30 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road. NASA Assistant Deputy Administrator John E. O'Brien will deliver the address.

Forty-one individuals and 16 teams have been selected to receive Agency Honor Awards at this noteworthy event. Co-authors of Langley's "Outstanding Paper" for 1990 will also be recognized.

The ceremony will be broadcast on television monitors in the NASA cafeteria and to all buildings connected to the Langley video distribution system.

News Briefs

NASA Launches Search for Associate Administrator for Exploration --- NASA Administrator Richard H. Truly has announced a nationwide search for a senior official to direct NASA's activities to send people to the Moon and to explore Mars. The announcement followed Truly's announcement on December 18 to implement immediately two recommendations made by the Advisory Committee on the Future of the U.S. Space Program and seek ways to implement others. The initial duties of the office would be to formulate "well thought-out" options to meet the challenges of returning to the Moon and exploring Mars.

NASA Inventor of the Year Announced --- Johnson Space Center's Leo Monford, NASA's Inventor of the Year, is determined to make the Space Shuttle's robot arm even more useful that it is, and his inventions could revolutionize orbital docking and robotics use. The invention that earned him the award is a docking alignment system; Monford calls it the Targeting and Reflective Alignment Concept, or TRAC. By itself, the new precision system is a significant improvement. But used in concert with another of Monford's inventions, a Magnetic End Effector, it could change the shape of future robot arms, satellites and space stations. TRAC uses a television camera mounted inside the arm's end effector and a monitor on the Shuttle's aft flight deck, both with alignment marks and a flat, mirrored target marked with cross hairs on the target object. It has been tested extensively at Johnson's manipulator development facility and is able to routinely insert square pegs into square holes with only 0.03 of an inch clearance.

German Satellite to Begin U.S. Science Mission --- The German Roentgen Satellite (ROSAT) entered a new phase of science operation February 8 when it began pointed observations of what NASA project officials have called particularly interesting sources of X-ray emissions. Scientists are interested in X-ray images because they specifically highlight regions in all celestial systems where high energy phenomena occur. Particularly rich sources of X-ray emissions are supernova remnants, galaxy clusters, quasars, binary star systems containing neutron stars or black holes. The start of the pointed observations phase signals the beginning of the U.S. ROSAT guest observer program. The U.S. ROSAT Science Data Center will support guest investigators through the processing and distribution of the ROSAT pointed data and by providing facilities for the scientific analysis of the data.

NASA To Play Key Role in National Computing Initiative --- NASA will be a major participant in the multi-agency High Performance Computing and Communication (HPCC) program slated to begin in Fiscal Year 1992. This ambitious federal effort will extend U.S. leadership in state-of-the-art computers and communications, disseminate and apply HPCC technology to critical national challenges and will spur gains in U.S. productivity and industrial competitiveness. NASA has the lead role in coordinating interagency software and algorithm research and development. In addition, the agency's program has significant activities in all four components of the Federal program.

Senior Management Research Review

The Senior Management Research Review will be held Monday, March 18, from 9 to 11 a.m. in Building 1212, Room 200. All employees are invited to attend. Program accomplishments will be given by the following Langley scientists.

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:00	Analysis of Pilot Fault Diagnosis Capability Suggests Types of Information Desired from Intelligent Decision Aid	Kathy H. Abbott (Flight Systems, FLMD)
9:15	Comparison of Compression Properties of Multiaxial Warp Knit Composites with Tape Laminates	H. Benson Dexter (Structures, MD)
9:30	BVI Noise Prediction Validation	Casey L. Burley (Structures, ACoD)
9:45	An Adaptive Guidance Algorithm for Manned Mars Aerobraking Vehicles	Richard W. Powell (Space, SSD)
10:00	Possible Climatic Implications from Recent Solar Irradiance and Global Temperature Variations Derived from Satellite Measurements	Robert B. Lee III (Space, ASD)
10:15	Scramjet Mixing Establishment in a Pulse Facility	R. Clayton Rogers (Aeronautics, FLDMD)
10:30	Director's Comments	

Following these presentations, the program directors will give status reports.

Ask the Expert

Have Questions about Safety or Environmental Issues?

-by Bill Wessel

The communication of safety and environmental health issues at the Center is coordinated by our network of facility safety heads and coordinators and the contractor safety representatives.

All Langley facilities have a designated facility safety head responsible for the safety and environmental activities within that facility. The safety head is supported by a facility coordinator, responsible for implementation of policies and procedures. These designated individuals are listed in the Langley telephone directory on pages 117 through 122 according to the facility they support.

The contractor safety representative for each support service contract is in a role similar to that of the facility safety head. Safety and environmental program information is furnished to these individuals for dissemination to their work force as appropriate. Contract personnel can and should contact this representative when they have a safety or environmental question. These representatives can ensure prompt attention to concerns and/or provide answers to inquiries.

The "sick building" syndrome was featured in the December 1990 Safety Newsletter. Several facilities at the Center have been evaluated in this regard. In each case, a question to the Safety Engineering Branch through the facility safety head initiated these efforts. All actions resulting from this potential health issue have been resolved or are being worked.

At the next meeting with the Contractor Steering Committee, special attention will be given to wide distribution of safety and health-related documentation. Contractor safety representatives will receive all materials provided to facility safety heads, just as contract employees should receive all materials that are provided to the Center's civil service staff.

The Systems Safety, Quality and Reliability Division (SSQRD) maintains a safety awareness library, which contains video tapes on many safety and environmental health issues. The library is available to facility safety heads, facility coordinators and contractor safety representatives for use in on-going employee safety training programs. Materials may be requested from Queenella Perrin, ext. 4-SAFE.

Retirement

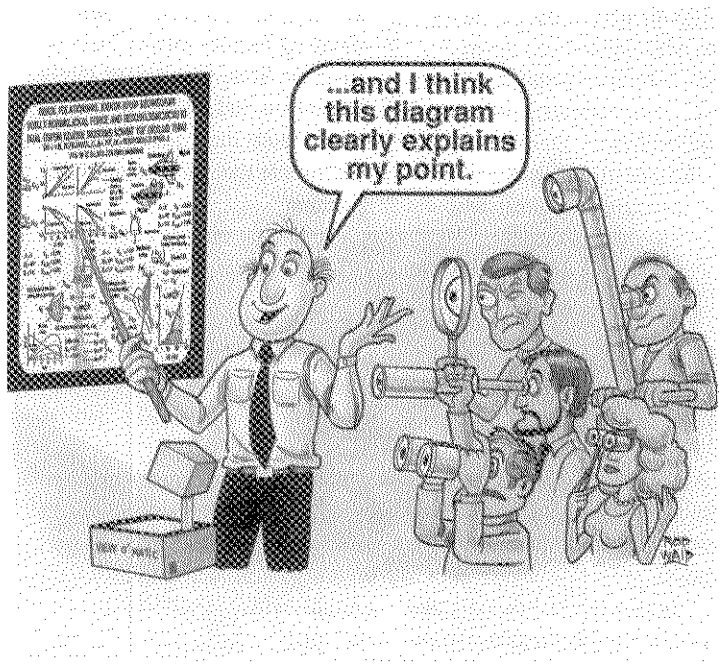
Marty Baxter has announced his retirement. To contribute towards a gift, contact Stella Harrison, ext. 43900, Mail Stop 255, by March 22.

Notes of Thanks

Ann Worth writes: ' My family and I wish to thank my many friends and co-workers at NASA Langley who have contributed leave to me through the leave sharing program. Your thoughtfulness will always be remembered."

Roxy Luthie writes: "I would like to thank everyone for the wonderful retirement party and gifts that you gave me. My family and I are extremely grateful to all who contributed to the success of the occasion and to all who attended and shared their time with us. NASA people will always have a special place in my heart."

Lankley



March is Women's History Month

Centering on the theme "Nurturing Tradition, Fostering Change," the Federal Women's Program committee will sponsor the following activities in celebration of Women's History Month:

March 14 — Panel of outstanding female achievers will share their paths to success.
Panelists: Lana Couch, Belinda Adams, Susan Voight, Christine Darden, Peggy Harmon, Karen Evans, and Gloria Champine.
9 a.m. - 10:30 a.m.
H.J.E. Reid Conference Center, 14 Ames Road

March 21 — "Enactments of Famous Women in History"
Video of NASA HQ Women's History Program
11:30 a.m. - 12:30 p.m.
NASA Cafeteria, executive dining room

March 26 — Organizational Meeting of LaRC Chapter of Federally Employed Women
11:30 a.m. - 12:30 p.m.
NASA Cafeteria, executive dining room

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Accent on Math and Science

Outreach Activities Highlight National Engineers Week at Langley

The ranks of Tidewater teachers swelled dramatically the week of February 18-23 as over 260 NASA Langley employees left their offices and laboratories to become "teacher-for-a-day."

Reacting to an initiative outlined by NASA Administrator Richard H. Truly, NASA employees all over the country were challenged to provide professional role models to area students during National Engineers Week.

"The response of Langley employees was overwhelming," said Center Director Richard H. Petersen who led the effort. Petersen taught a class of seventh graders at Eaton Fundamental School, Hampton. "I had to do some homework to prepare for the class, but it was an enriching experience."

Lessons ranged from fundamentals of flight and space exploration to computer applications and career opportunities. Each approach was different and every "lesson plan" unique, but the message was the same.

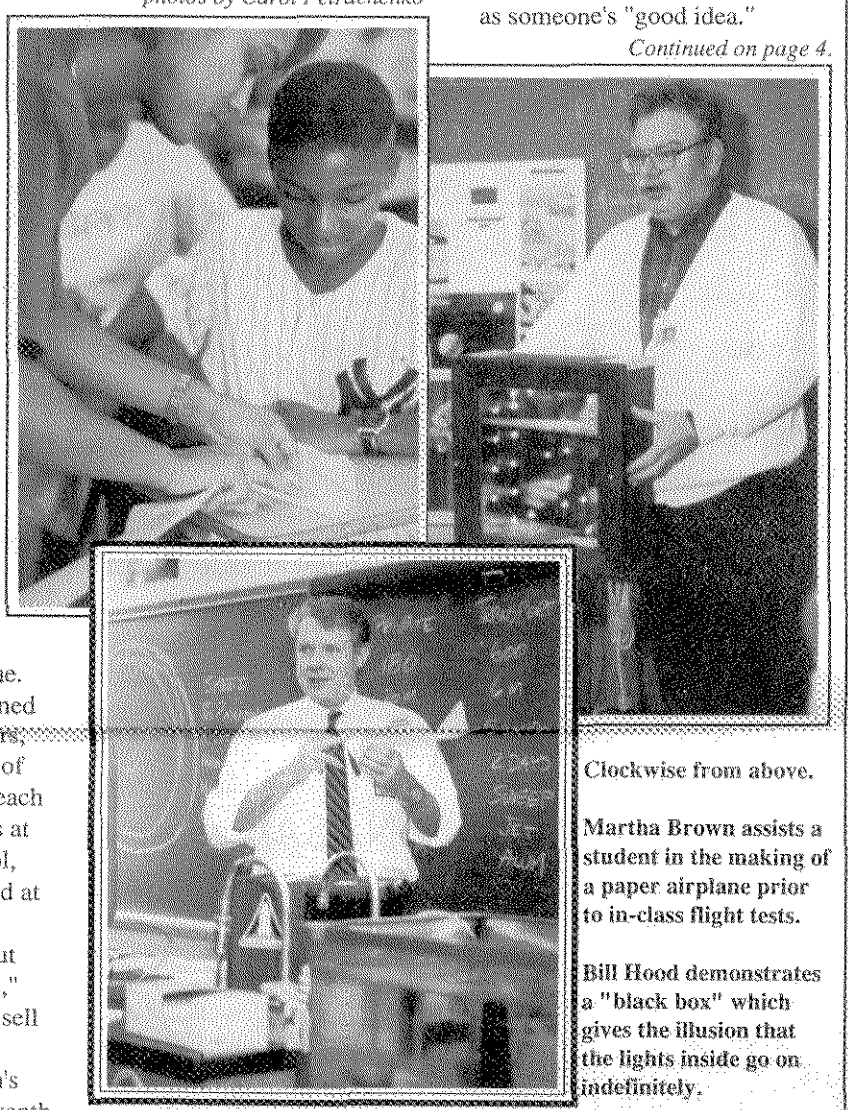
Allan Hanrahan, assigned to the Office of Public Affairs, aptly summarized the thrust of the initiative as he spoke to each of six classes of fifth graders at McIntosh Elementary School, Newport News. "I've worked at NASA since the day it was formed--October 1, 1958--but today I'm here as a salesman," said Hanrahan. "I'm here to sell you on math and science."

That was also Petersen's message to Gary Carter's seventh graders. Petersen introduced Langley's work in the field of aeronautics with a discussion of different kinds of aircraft, ranging from private airplanes to the National Aero-Space Plane. Using the analogy of time, the Center Director led the students through speed regimes by contrasting time, distance and mode of travel. He illustrated, for instance, that it would take two days nonstop travelling by car to reach California ; by private plane, only 17 hours; by commercial transport, five hours; by aerospace plane, just 50 minutes. "The Space Shuttle would make the pass in just 10 minutes," he remarked.

Petersen also contrasted the aircraft by structure, wing shape and engine type. Throughout the presentation he intertwined the need for competent math and science skills. The students, who thought they understood the duties of an engineer, expanded their understanding and, at the same time, their enthusiasm. "This was a very lively group," said Petersen. "I enjoyed talking with them and I think we may get some good engineers from this class."

Using another approach to the study of aeronautical principles, Martha Brown, Aeroacoustics Branch, began her presentation to each of three fifth grade classes at Smith Elementary School, Hampton, by promising they could do what they had probably never been allowed to do in school--make and fly paper airplanes.

-photos by Carol Petrachenko



Clockwise from above.

Martha Brown assists a student in the making of a paper airplane prior to in-class flight tests.

Bill Hood demonstrates a "black box" which gives the illusion that the lights inside go on indefinitely.

Center Director Richard H. Petersen assigns "homework"--to build and flight test a model airplane. He readies a model for demonstration at the conclusion of class.

Armed with a ream of white bond, Brown encouraged those who knew how to make paper airplanes *that would fly* to proceed; others should follow her detailed instructions. Soon there were numerous white configurations ready to be flight tested. Students row by row approached the simulated runway--formerly the wide aisle dividing the room--and took their chances at first flight.

Throughout the test flights Brown introduced the fundamentals of lift, drag, thrust and side force at work on all the designs tested. For some less successful flights, the configurations were analyzed and, much like real engineers, solutions proposed and tried. During these troubleshooting discussions, additional aeronautical motions such as roll, pitch and yaw were observed and compensating forces--such as a deftly placed paper clip--were applied.

Students gleaned from the presentation a respect for symmetry as well as for the trial and error process of research.

Bill Hood, Technical Support Section B, intrigued five classes of eighth grade students at Jefferson Davis Middle School, Hampton, with his laser/optics presentation. But his real message was that NASA is a fantastic place to work and the opportunities for broadening all kinds of talents are endless. A former test pilot with an electronics background, Hood assists engineers in the design and development of products and projects that, he suggests, started as someone's "good idea."

Continued on page 4.

Syms School Victorious in Math Competition

Students from Syms Middle School, Hampton, took first place in the Peninsula competition of the national MATHCOUNTS program held Saturday, February 23. Astronaut Kenneth Reightler Jr., a Virginia Beach native and pilot of STS-48 scheduled to be launched in October 1991, presented the awards. The Syms team advances to the state math finals in Richmond, March 9.

Finishing second in the competition was Gildersleeve Middle School, Newport News; third was Tabb Intermediate, York County; and fourth was Dozier Middle School, Newport News.

Members of the winning team were Andy Bell, Paul Storaasli, Bryan Bassett and Anthony Padula. The Syms team was coached by Joy Garrett.

Winners in the individual competition were Esther Mecking, Gildersleeve Middle School, first place; George Chiou, Tabb Intermediate School, second; Bryan Bassett, Syms, third; and Ming Maa, Tabb Intermediate, fourth place.

Included among this year's winners are children of NASA Langley employees Olaf Storaasli, Computational Mechanics Branch; Sharon Padula, Interdisciplinary Research Office; and Er-Woon Chiou, ST Systems Corporation.

MATHCOUNTS is a nationwide program designed to answer the problem of declining math skills among students at the precollege level. The seventh and eighth grade students are tested on probability, statistics, linear algebra and polynomials. The competition consists of written tests and fast-paced matches. NASA Langley Research Center sponsors this competition in cooperation with the Peninsula Society of Professional Engineers. Dr. Arlene Levine coordinates MATHCOUNTS for NASA Langley; Bob Dolecki is the Peninsula Society of Professional Engineers coordinator.

Area schools participating in the program were Davis, Eaton, Spratley and Syms Middle Schools, Hampton; Dozier, Gildersleeve, Hines and Washington Middle Schools, Newport News; Queens Lake, Tabb and Yorktown Intermediate Schools, York County; and James Blair Intermediate School, Williamsburg-James City County.

Pictured with Astronaut Ken Reightler Jr. are winning team members (L to R) Bryan Bassett, Andy Bell, Paul Storaasli, Anthony Padula, and coach Joy Garrett. *-photo by Abe Leiss*

Career Day Draws Area High School Students

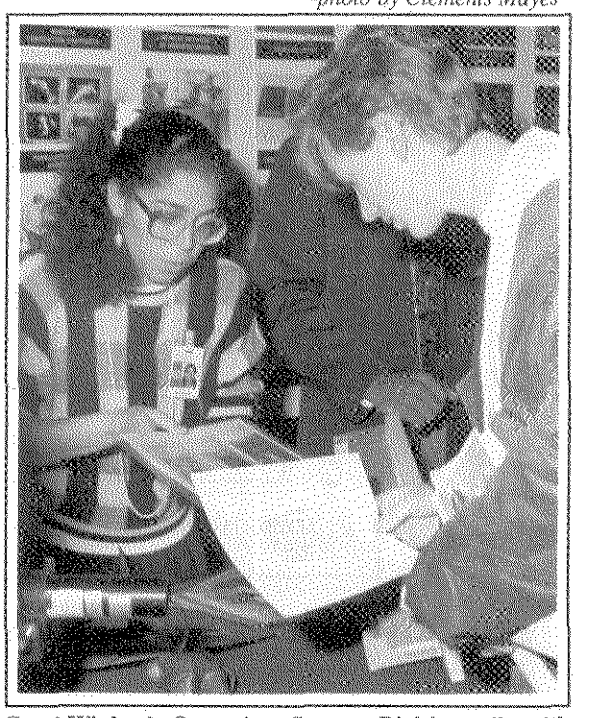
Nearly 350 selected high school students and teachers from the Greater Hampton Roads area attended Career Day, held February 20 in the H.J.E. Reid Conference Center.

Co-sponsored by the Peninsula Engineers Council and Langley Research Center, Career Day provides an opportunity for students to interact with aerospace engineers, scientists and technicians. In keeping with the educational thrust of National Engineers Week, one objective of this activity is to reinforce or broaden student career objectives.

During the interactive session, students had the opportunity to discuss careers and related topics with 41 exhibitors from Langley's research and technical directorates, Newport News Shipbuilding and member societies of the Peninsula Engineers Council.

Schools from Hampton, Newport News, Gloucester, Williamsburg-James City County, York County and the private sector participated in this year's event.

-photo by Clements Mayes



Carol Winbush, Operations Support Division, talks with a student about career opportunities at NASA.

Engineering: T

Thanks to Langley "teachers" William Adkins * Naval Agarwal * Elvin Ahl * David Aliff * George Allison * Ruth Amundsen * Richard Antcliff * Junilla

Karen Credeur * Catherine Croall * Juan Cruz * Eric Dahlstrom * Tom Daniels * Christine Darden * Pamela Davis * Richard Davis * L. J. DeRyder * Lar

* William Hood * John Hoppe * Julie Hudgens * Michael Hudson * Cheryl Jackson * Karen Jackson * Olin Jarrett * Kennie Jones * Sharon Jones

* Wendy Pennington * Richard Petersen * Carol Petrachenko * William Phaup * Alan Phillips * William Phillips * Bob Piascik * Jam

* Leroy Spearman * Cary Spitzer * Doug Stanley * Weldon Staton * Bill Stevens * Joe Stickle * Olaf Storaasli * Sharon Tanner *

* Mary Beth Wusk * Tom Yager * Steven Yaros * W. R. Young * Otto

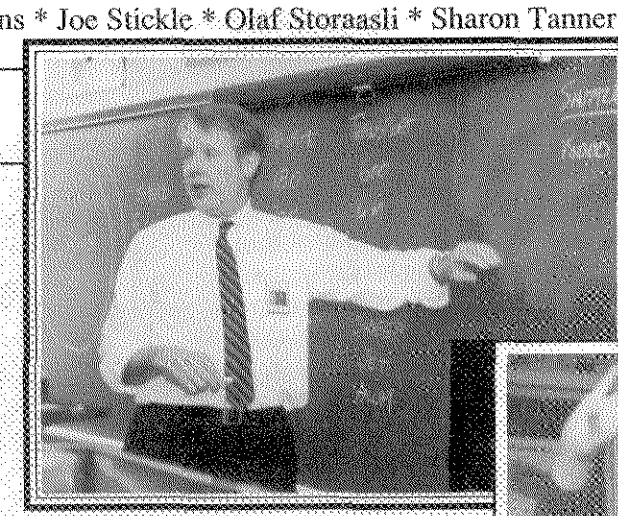
Charles Woerner * Richard Wood * Stan Woodard * Glenn Woodell * Kenneth Wright

* John Shoosmith * Mark Shuart * Milton Skolaut * Kelly Smith * Mary Ann Smith * Rudeen Smith-Taylor * Richard Snyder * Mark Sourek *

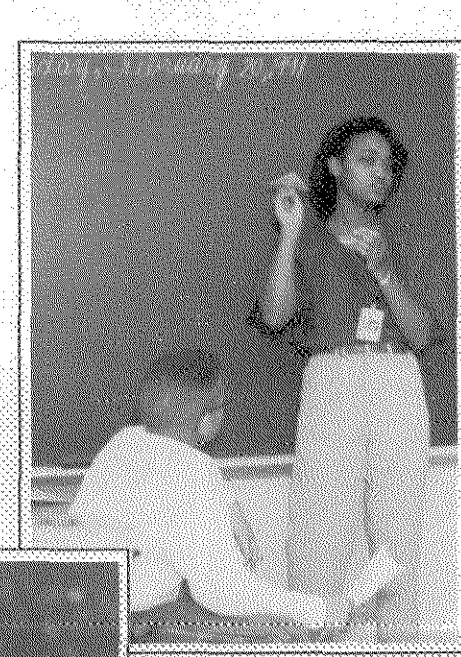
Clarke Morledge * Mark Motter * Vivek Mukhopadhyay * Mark Nataupsky * Kathy Neediemen * Charles Niles * Kevin O'Brien * Sharon Padula * Vickie Parsons

* Davy Haynes * Jennifer Heeg * Christine Heithoff * George Helfrich * Gloria Hernandez * Joanne Herring * Joseph Heyman * George Hickman * Edward Hogge * Bruce Holmes

* Arlen Carter * William Chalmers * Mike Chapman * Dianne Cheek * Otis Childress * Daniel Cler * Brent Cobleigh * Wesley Cofer * Bruce Conway * Victor Cooley * L. B. Cooper * John Cox

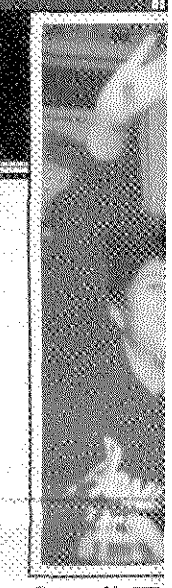


Center Director Richard H. Petersen poses a question to the seventh graders.

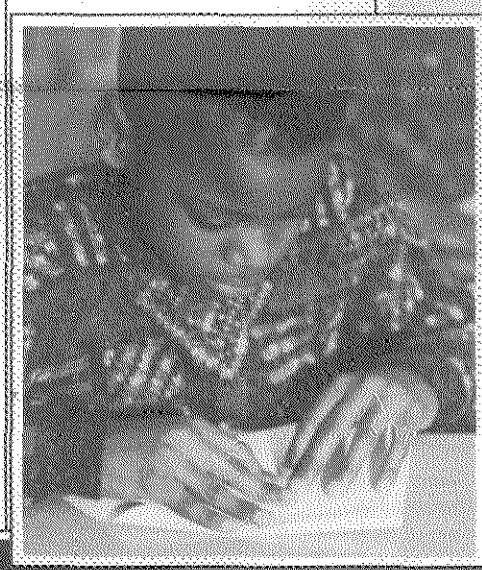


Martha Brown introduces the fundamental forces that act upon the aircraft--lift, drag, thrust and side force.

Great effort is taken to make the paper airplane perfectly symmetrical.



Students perform the calculation mentally and are eager to give the answer.



Not every flight is successful. An engineer must now evaluate the problem and pose a solution--maybe a paper clip!

NASA Langley Employees "Simulate" T

A demonstration of a simple electrical circuit initiated discussion of transformers and resistors and the basics of electricity. Hood invited a student to complete the wiring and test the circuit. This successful experiment was followed by a discussion of lasers. "Lasers are important to NASA," explained Hood, "as power sources for avionics and propulsion systems."

Light excited by electricity is the essence of a laser. "We find them today in such common uses as supermarket scanners, cable TV, walkmen, microwave ovens and computer disk drives," said Hood. Thus bringing laser technology into everyday experience. Hood proceeded to excite vials containing inert gases exposing a color output that helped identify the gas in each vacuum container. Hood's treatise on the application of laser technology to satellite communications opened a whole new area of communication for the eighth graders.

A number of employees took a team-teaching approach. Alfred Von Theumer, principal engineer for Lockheed, and his son Ronald, surveyor/draftsman for PRC, teamed up for presentations to three high school physics classes at Nansemond-Suffolk Academy. The elder Von Theumer presented an overview of his experiences on the aeroassist flight experiment (AFE), including testing in the plasma arc jet chamber at Johnson Space Center. The multi-media presentation centered on the materials used as well as on the air flow, pressures and thermal environment of the AFE and concluded with a viewing of actual test articles and a discussion of the test results. The younger Von

* Amy Witsil * Frederick Wilson * William Willshire * Bob Williams * Norman Willey * Woodrow Whitlow * John

* Floyd Shipman * David Shannon * Guatam Shah * Willis Scott * Michael Scott * Michael Scherner * Melvin Sawyer * L

* Anutaosh Moitra * James Miller * Stan Miley * Troy Middleton * Kurt Meyer * John Meyer * Naomi McMillin * Elaine McMahon * S

* Roger Hathaway * Earl Hastings (retiree) * Ron Harvey * Steve Harrah * Aaron Harcrow * Allan Hanrahan * David Guthrie * Donald Grigs

* Angela Carter * George Carson * Preston Carraway * Debra Carraway * Ann Carlson * Shelley Canright * Robert Calloway * Donald Cahoon * Lan

urning Ideas into Reality

plin * * Leon Arriola * Roger Bailey * Promode Bandygoodhyay * Ron Barnes * Tom Bastian * Jim Batterson * Robert Baucom * Willard Bauserman *

Dickinson * Glenn Diskin * Ben DiVito * Bill Dziedzic * William Edwards * Chuck Eldred * Marco Egoavil * Robert Fairbairn * Marta Fenn *

Stuart Jones * Sammie Joplin * Ron Joslin * Michelle Kattan * Brian Killough * Sue Kullero * Nick Lagan * Mark Lake * Robin Land *

Pike * Bill Pollock * Joe Posey * Damodar Prabhu * A.G. Price * Barry Price * Ed Prior * Brian Pritchard * Jim Puffenberger *

lward Taylor * Larry Taylor * Laurence Taylor * Geoffrey Tennille * John Thompson * Kris Torre * Clayton Turner

ungbluth * Glenn Yue * Sandra Zumbrun * Gail McQuigg * Mala Mehrotra and all who supported our "teachers."

Sal Bavuso * Janice Bayer * Harold Beazley * Celeste Belcastro * Christine Belcastro * Keith Belvin * Laurence Bement * Gaudy Bezos * Edwin Binder * Christina Bloehaum * Michael Mann *

Melvin Ferebee * Michelle Ferebee * George Ficklen * Theresa Flynn * Eddie Ford * Diane Forrest * Greg Fox * Robert Fox * Tom Freeman * Archie Fripp * James Garrison * Greg Gatlin

Andre Lavoie * Elizabeth Lee * Ja Lee * Robert Lee * Abraham Leiss (retiree) * Arlene Levine * Joel Levine * Michael Lewis * Robert Mack * Karl Maddox

* James Ramsey * James Raper * Larry Rash * Wilmer Reed (retiree) * Jennifer Reilly * Jim Ritter * Rob Rivers * Julian Roberson * Paul Robinson

* Michael Uenking * William Vance * Ann Van Orden * Harry Verstynen * Dan Vieroy * Susan Voight * Tom Vranas * Alfred Von Theumer

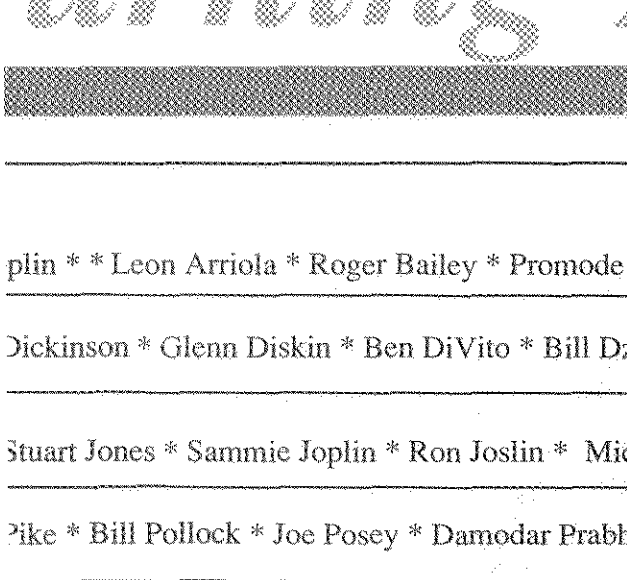
te * Raymond Whipple * Noel West * W. Allen Waters * Thomas Walker * Sue Vullero * Ronald Von Theumer *

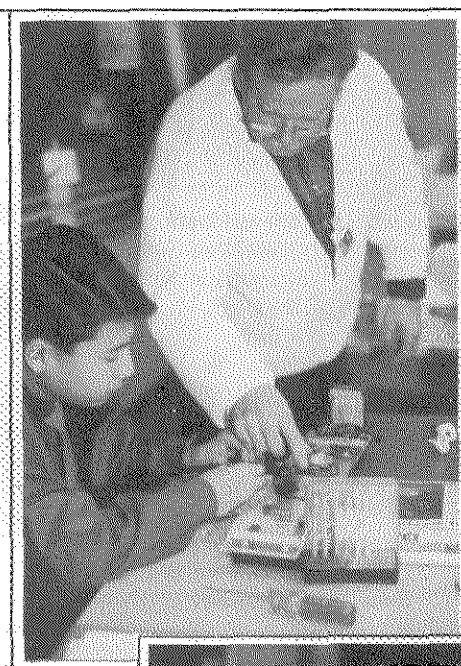
nders * James Russell * Dick Royster * Larry Rowell * Marshall Rouse * Melanie Romero * Jim Rogers * Kenneth Rock *

McCoy * Pat McCormick * Janice McCollum * Shane Mayor * Tony Maturo * Larry Matthias * Sam Massenburg * Veloria Martinson *

Michael Greenwood * John Greco * Dana Gould * William Gough * Guillermo Gonzalez * Peter Gnoffo * Vernon Gillespie * Wanda Gay *

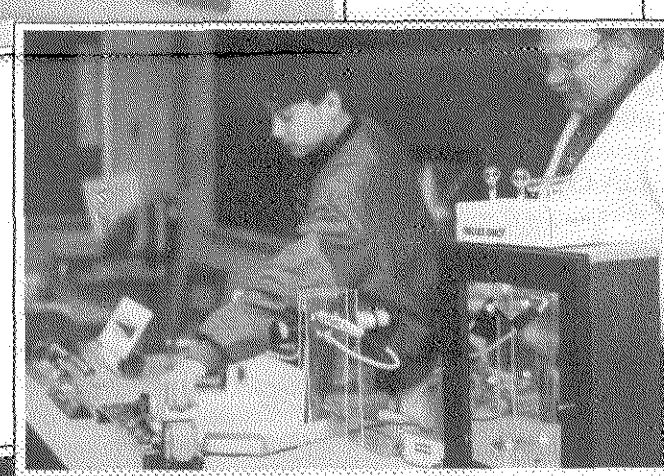
h * Rob Bryant * M. Larry Brumfield * Sherilyn Brown * Ronald Brown * C. A.Brown (retiree) * Bobby Braun * Clarence Breen * Martha Brown *





Bill Hood explains the elements of the basic electrical circuit.

The Smith eighth-grade student is invited to test his wiring skills



The presentations were many and varied. This local student was left with much to think about.

-photos by Carol Petrachenko

hers in Outreach Effort

Continued from page 3.

Theumer rounded out the class with a discussion of career opportunities and information on how to land a job with NASA.

Visitor Center lecturers took their in-house presentations on the road. Lecturer Tom Bastian, for instance, presented *Living in the Space Shuttle* to five fourth grade classes at Poquoson Elementary School. He discussed with the eager students the unique problems and opportunities of living in a near-zero gravity environment while on a mission in space or, in the future, aboard the Space Station. Bastian punctuated his presentation by showing the video "Astro Smiles" and outlining prerequisites for a career as an astronaut.

Even those who don't normally give lectures, like Visitor Center Director Dr. Mark Nataupsky, joined in on the National Engineers Week initiative. Nataupsky spoke to first graders at Nelson Elementary School, Newport News. His presentation, titled *Let's Talk Shuttle*, paved the way for many new sets of eyes to be focused on NASA when Discovery launches for the first unclassified Department of Defense mission. "These youngsters were incredibly bright," reported Nataupsky. "I hope the Shuttle countdown will have even greater meaning for the six-year-olds--just one more indication of the importance of math and science."

In all, 262 employees gave 661 presentations in 95 schools in 12 school districts impacting over 18,500 students in about a week's time. "That's quite an accomplishment," boasted Arlene Levine, who coordinated the effort with the help of Jolyn Rivenbark, public mail technician, and Jean Pohling, Teacher Resource Center coordinator.

For Your Health

NASA Issues Fitness Challenge

According to information gathered from the Presidential Sports Awards program, the number of Americans who exercise regularly over an extended period of time is steadily increasing. The National Aeronautics and Space Administration has issued a challenge to all field centers to ensure that NASA employees are well represented in that increasing number of health-conscious individuals.

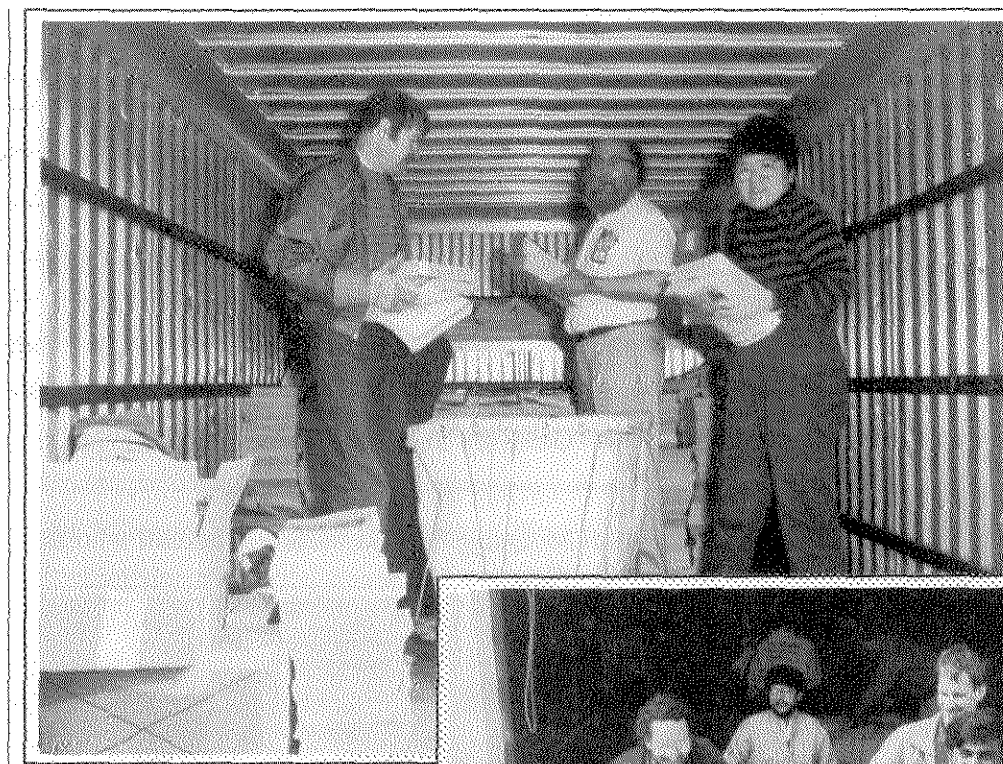
Termed "Exercise for the Health of It"--an Intra-Agency Challenge, NASA Headquarters is sponsoring a "friendly" competition between centers, utilizing the President's Council on Physical Fitness Sports Award as a model. The winner of the competition would be the center with the largest percentage of employees attaining eligibility for any category of the President's Award from March 1 through September 30.

While almost all physical activities would be eligible, the categories of Sports/Fitness, Fitness Walking, Jogging and Aerobic Dance will be the primary focus of this friendly competition. Other possible categories include swimming and weight training. Team and sports activities might include volleyball, basketball, softball and baseball.

The President's Sports Award **personal fitness log**--available at the fitness center, gym, cafeteria or clinic--will be used to document the individual's successful completion of his or her goals. The spirit of the program is to motivate individuals to exercise at least 50 hours during the four-month period. A completed, signed log must be submitted by October 1 to a fitness center staff member to help Langley win the competition.

Of course, the real winners will be the individual employees experiencing the positive effects of fitness and of an improved sense of well-being. NASA hopes to benefit as well, as a definite relationship has been demonstrated between fit employees and increased productivity, reduced absenteeism, fewer worksite accidents, lower turnover, improved morale and decreased health care costs.

Watch for more information on this intra-agency challenge. For specific details, call Mary Mitchell, fitness center coordinator, ext. 46387. Exercise--for the health of it.



Conservation Club members (from left) Bill Grant, Dan Giesy and Nee-Yin Chou stack outdated phone books in the truck.

Bringing in yet another load to add to the growing mountain of recyclable material are (L to R) Scott Bartram, Randy Voland, Zia-ur Rahman, Dean Eklund and Rom Narayanswamy.

-photos by Fred Jones

Tidbits from Training

Students Called to Active Duty

The decision to mobilize a substantial number of military reservists and members of the National Guard has or will affect an undetermined number of college students. The Training and Education Section has received general policy statements from local universities and colleges regarding this matter.

Any student registered for the semester who has been activated or who is called to active duty early in the semester will automatically be entitled to a full refund of all tuition and fees paid toward semester expenses. If notification of the call to active duty comes after mid-term exams or after other substantial graded work has been completed, the student will have the option of taking a full refund of tuition and fees or taking an incomplete in his or her courses with the privilege of returning to complete all required course work at some future date without payment of any further tuition and fees.

It is the responsibility of the student to present evidence of his or her activation to the Office of Student Accounts and to request the appropriate refund.

Liaison to Activated Employees

Peter J. Edgette, head of the Office of Occupational Health Services, will serve as liaison to the families of NASA employees who have been called to military duty. Family members with questions concerning pay, benefits or other Center activities, are encouraged to call Edgette at 864-3189. NASA commends the national pride and dedication to duty shown by these men and women.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing a period of unpaid leave as a result of a medical emergency.

The following employees are approved leave recipients:

- Linda E. Edmundson
- Gael M. Hawkins
- Steven C. Seider
- Noel A. Talcott Jr.
- Catherine B. Worth

If you wish to donate annual leave to these recipients, or wish more information concerning the Voluntary Leave Transfer Program, please contact Linda Park, Employee Relations Section, ext. 42610.

Club Makes A Mark to Improve Environment

The Langley Conservation Club has made a 9,120 pound donation to the environment. Rather than allowing them to fill up yet another landfill, 2,400 outdated telephone books were diverted to a rented U-Haul truck and targeted for recycling.

"The real heroes of this project," said Conservation Club president Tim Collins, "are our Langley mailroom personnel." They gathered the tons of recyclable material and brought it to a central location behind shipping and receiving. From there, club volunteers spent a couple of hours loading the truck and then transported the books to Tidewater Fiber Corporation's recycling plant in Chesapeake.

The Langley club undertook the project in cooperation with Farm Fresh supermarkets, WTKR-TV-3 and Tidewater Fiber Corporation. In addition to mail room assistance, the club was aided by Claude Watts and Management Support Division personnel, who temporarily stored the phone books during the six-day collection process. Thanks are extended to all employees who turned in their used phone books for recycling.

"We were hampered some by the February 2 deadline imposed on us by project organizers," said Collins. "We hope next year to have more lead time and collect even more books."

The purpose of the recycling project was to eliminate overcrowding in Peninsula landfills by the glued and glossed books that take decades to decompose. Recycling experts note that garbage studies show a landfill can be dated by phone books still intact and readable after 40 or 50 years.

-photo by Sandy Horsey

MAIL ROOM HEROES are (front row, L to R) Peggy Perrine, Theresa Deaver, Stephan Brown, Lee Malone, Brenda Dorsey, Elaine Heitman, Randy Voland, Conservation Club vice president; (back row) Vickie Page, Sharon Grauer, Virginia Sumpter, Frank Furby, Joe Hopson and Tim Collins, Conservation Club president. Not shown are Becky Johnson and Barbara Newton, head, Correspondence and Records Management Section.

An Appointment with History

Extraordinary Langley Teamwork Heralded First NASA Supercomputer

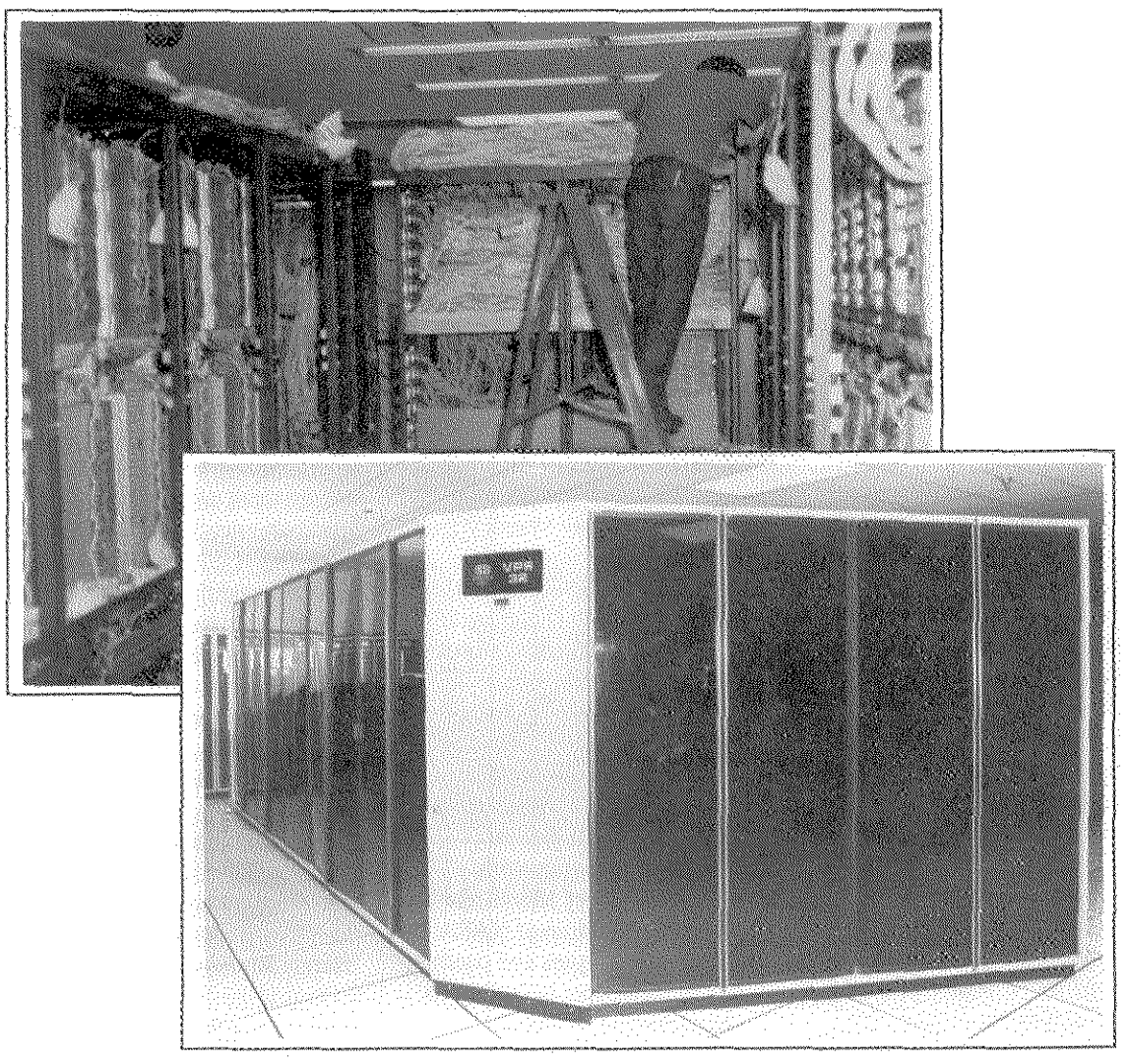
-by Craig Murden

This is not a story about how another old computer was overcome by new technology; nor about the latest improvements in an evolving line of supercomputers. It is about events of two decades ago when a small cadre of inventive Langley minds faced the challenges of proving that a major change in established computer architecture could provide NASA's aeronautic and space research community with a vehicle for solving computational problems of the next order of complexity. The core of that story is a remarkable spirit of cooperation which ushered in the era of supercomputers. This exclusive Langley event comes into focus as the VPS-32, the last descendant of that first supercomputer, the STAR-100, is retired.

The tale is less about the major increases in machine performance but more about the people who coped with the difficult conditions required to bring it about. Fortunately, there are people still at the Center who represent that tenacity, and it is through them that the events of 20 years past are shared. Three players who are representative of the larger group of Langley's STAR-100 cast are physicist-turned-computer-engineer Everett Johnson and math-graduate-turned-computer-programmer Lona Howser, both of the Analysis and Computation Division. Another participant who represents a third and vital part of the unique Langley team is Jim Weilmuenster, an aerospace engineer in the Space Systems Division.

In the mid-1960s, Langley had a contract with the Control Data Corporation (CDC) to provide large -cale research computers of increasing sophistication. CDC had been working with some new, relatively untried, technology involving vector processing techniques which allowed the computer to perform many more simultaneous operations than the old finish-one-operation-before-starting-another serial scheme. CDC offered this alternative to Langley as the world's first supercomputer. So began Langley's experience with the STring ARay or STAR supercomputer.

Everett Johnson remembers how the STAR project office head, Maurice Morin, passed him the system specifications saying, "What do you think?" What Johnson eventually came to think was that here was a system with great potential for Langley reseachers to expand their problem solving capabilities, but one that had very little software capability to take full advantage of its superior hardware characteristics.



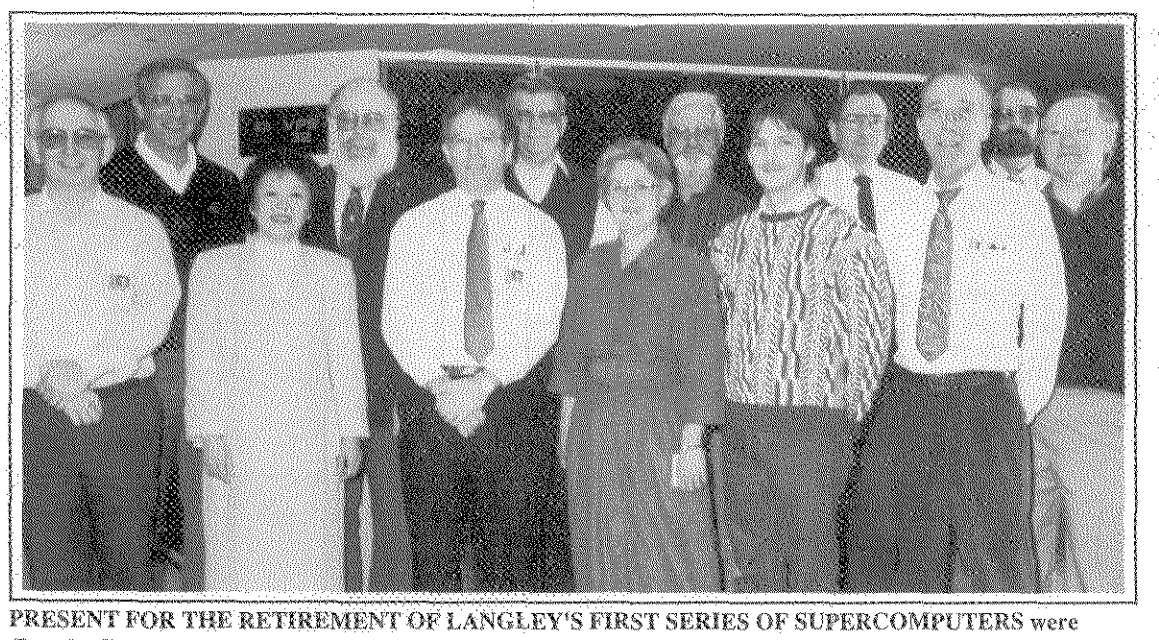
The Center's first supercomputer, the STAR-100, is being installed in 1975 (top) and is shown in its final upgraded version, the VPS-32, which was retired in January 1991.

This imbalance was to be the nexus of the Langley team effort when, in 1971, Morin began assigning computer engineers and programmers to begin dissecting the system's intricacies. The unknown nature of the job did not allow people like Johnson and Howser to simply perform their specialties of hardware tuning and software optimization independently. This project was an exploration of major proportions and each step had to be carefully viewed for how it supported or frustrated the highly interrelated objectives.

Getting the system to run right was hard enough, but it wasn't even the biggest problem. The larger objective was to have the system operate effectively while satisfying STAR's clients-- Langley's researchers-- who were anxious to expand their test horizons in response to growing initiatives in aeronautic and space ventures. But how could the testing requirements be integrated when the system's inner-workings were not even fully known to the automators? How could Langley's scientists and engineers, not schooled in the nuances of a complicated data system running on new hardware, communicate those needs?

The answer is the point of this story. It is how everyone put aside their personal agendas and said, What do we need to do to make this thing work? It is Johnson and Howser working closely with the researchers to help them understand how the architecture worked so they could relate this to their own user applications. In perhaps the greatest show of teamwork, it was the reciprocity of researchers like Jim Weilmuenster who then tailored their software to take advantage of these insights about the new hardware and helped define the operational aspects of the system.

That was the overall path to success which culminated in 1975 with delivery of the STAR-100 and paved the way for the VPS-32 that followed until January of this year when operations ceased. But the story still isn't complete. The handicaps imposed not only by an alien system but also by the tools and environment of the time warrant an appreciation.



PRESENT FOR THE RETIREMENT OF LANGLEY'S FIRST SERIES OF SUPERCOMPUTERS were (L to R) Geoffrey Tennille, Computer Applications Branch; Maurice Morin, chief, Analysis and Computation Division; Juliet Pao, Computer Systems Branch; Ken Evans, Control Data Corporation; Jay Lambiotte, head, CAB; Everette Johnson, CSB; Lona Howser, CAB; Mickey Rowe, assistant chief, ACD; David Cordner, CSB; Dwayne Riebling, CDC; Richard Hofler, head, CSB; Tom Seals, Unisys Corporation; John Kaiser, Unisys.

The contrasts are stark between the way we do business today and what the STAR team contended with. Today, our scientists and engineers input and receive test data largely through CRTs and printers at their desks, in the comfort of their offices. The computer networks they interact with are subject to their timetables and convenience. By contrast, the STAR people couldn't even do their work at Langley; they had to go to Minneapolis where CDC was building the system. Once there, for nine straight 18-hour days at a time, they probed the STAR with an extensive series of tests. But there were no work stations with endless screens of test results to be scrolled in comfort. Instead, test instructions were punched into individual paper cards at a facility that was a one-mile round trip from the main frame.

This primitive mode required thousands and thousands of such cards. Then, the cards were hauled back to the machine room and fed to the computer. Frequently, a change to only one card was necessary-- but that one-mile hike still had to be made each time. Again, there was no convenient way to review and analyze the test results; no friendly, glowing screen to peruse over morning coffee. The test outputs were on paper listings which took several hours to print and often achieved throw-weights in the hundreds of pounds regime. To add to the zest, much of this effort went on at night because that was the only time the CDC engineers could spare machine time. Then there was the workplace itself: winter in Minneapolis, 25 degrees below zero, frozen cars, snowbound airplanes, a windowless building that was never warm enough.

This level of effort went on for nearly four years of constant shuttling between Langley and Minneapolis. In that time, Johnson discovered two dozen design errors, wrote a sizing problem to judge performance of the operating system and designed an improved memory pager algorithm. At the same time Howser was busy rewriting the software so it matched the power of the hardware. In this effort, Jim Weilmuenster tells how she exploited the concept of virtual memory which manipulates the computer so that research problems larger than the machine's physical memory capacity could be accommodated. He concludes that it was this kind of team effort, providing highly tuned hardware and imaginative programming conceived in concert with Langley researchers, which raised Langley's threshold of research capability.

Happenings

SPECIAL LAA SOCIAL will be held Friday, March 15, in the H.J.E. Reid Conference Center, 14 Ames Road, to celebrate St. Patrick's Day. Festivities will be from 4 p.m. until 8 p.m. and there will be a $1 cover charge. *Foxfire* will entertain.

BLOODMOBILE. The American Red Cross will hold a Bloodmobile Wednesday, March 20, from 9 a.m. to 3 p.m. in the H.J.E. Reid Conference Center. Be generous--there is no substitute for blood.

ALUMNI ASSOCIATION luncheon will be held Tuesday, March 12, 11:30 a.m. in the private dining room of the NASA cafeteria. Dr. M. Patrick McCormick, head of the Aerosol Research Branch, will be the speaker.

CONSERVATION CLUB will meet Tuesday, March 19, at 11:15 a.m. in the private dining room of the NASA cafeteria. For more information, call Tim Collins, ext. 43113.

NASA TOASTMASTERS meet the second and fourth Wednesdays of the month in the H.J.E. Reid Conference Center. The next meeting is March 13 from 11:30 a.m. until 1 p.m. Guests are always welcome.

LOW IMPACT AEROBICS classes are held Tuesday and Thursday from 5 to 6 p.m. in the NASA gym. Cost is $12 per month. First class is free. For details, call ext. 42295.

SKI NASA. The final Thursday ski trip will be to Massanutten March 14. Cost is $43 which includes transportation and lift ticket. For additional information, contact Richard Bennett at 599-5585.

PENINSULA COMMODORE USERS GROUP meets the second Friday of the month at 7 p.m., in the Christopher Newport College Administration Building. For details, call Bill Petitt, 898-3855.

WANTED: ROOMMATE. Female to share new house off Big Bethel Road, Hampton. Five minutes to NASA. Private room. $200 per month plus 1/2 utilities. Non-smoker only, please. Available April 1. Call 595-4107.

FOR RENT: TOWNHOUSE in Summer Place, 2 miles from Langley. 2 master BR, 1-1/2 B, all appliances, fenced yard. $595 per month. Call 865-6043.

TELA-TAX SERVICE. By appointment. Call 874-3121.

Just for Family

Visitor Center Offers Programs for Employees

Due to the current restriction placed on public visitations to NASA Langley, the NASA Visitor Center (VC) has taken this opportunity to plan a series of special events for NASA employees and contractors only. The VC has dedicated the spring quarter to "our NASA family" by offering brown-bag lunch programs, children's activities and a very special "Happy Birthday, Shuttle" festival to celebrate the tenth anniversary of the Shuttle's first flight.

In March, the VC salutes Women's History Month with a special brown-bag program "Women Who Did Not Make the History Books." This program will be held Thursday, March 28, at noon in the Visitor Center theater. Dr. Beverly Golemba, a professor at Saint Leo College, will discuss the accomplishments of lesser known women from 1600 to the present.

In conjunction with Women's History Month, the VC invites the children of NASA Langley employees and contractors to participate in building a "Monumental Mountain" exhibit. The children are encouraged to create portraits on paper plates of the women they most admire. The portraits will be displayed on a three-dimensional mountain honoring the women chosen. Parents can pick up paper plates at the VC. They need to drop off the finished portraits at the VC by Monday, March 25. The "Monumental Mountain" will be on display Thursday, March 28, at the VC during the brown-bag program. The exhibit will be moved to the cafeteria on Friday, March 29.

During April, the VC will be celebrating both Earth Day and the tenth anniversary of the Space Shuttle. In recognition of Earth Day, Langley's Conservation Club and the VC will co-sponsor a brown-bag program on Thursday, April 25, at noon in the VC theater. Dr. Carl Hershner, Virginia Institute of Marine Science, will present "Environmental Impacts of an Oil Spill: From the Persian Gulf to the Langley Swamp Lands."

On Saturday, April 13, from 9 a.m. to noon, AIAA and the VC will sponsor a free "Happy Birthday, Shuttle" festival at the VC for families of employees, contractors and AIAA members. A space costume contest, computer space programs, family activities, party favors and a special Shuttle cake and other refreshments will be offered in celebration of the first launch of the Space Shuttle, April 12, 1981. Registration forms will be sent via distribution.

May is dedicated to aeronautics. On Thursday, May 23, at noon in the VC theater, Dwight McSmith will present "The Men Behind the Crash: Langley's Crash Test Program." This program has been rescheduled from a January date. As a special treat for children during May, employees and contractors can request a copy of "Sky's the Limit," a children's activity booklet for a home-based learning experience.

All NASA employees and contractors will be receiving a Visitor Center newsletter through distribution with additional details on these upcoming events. For more information, call the VC at ext. 46000.

VISITOR CENTER
NASA Langley

Vance Communicates in his Language

The opportunity to work at NASA Langley is a story this electronics technician wants to tell every chance he gets.

Hearing impaired employee Bill Vance joined the ranks of Langley scientists, engineers and technicians who volunteered to teach a class in a local school as part of a National Engineers Week thrust to interest students in math and science.

Vance's audience at the Virginia School for the Deaf and Blind was equally enthusiastic, regardless of the fact that not one of the students could hear his story. Their communication --via sign language--was lively and their enthusiasm for education and for career information was nearly insatiable. Vance promised to return with more lessons. They asked to visit him at his work site.

Many bonds were formed that week. Over 18,500 students were impacted by over 260 Langley volunteers who presented lessons on math, science or career-related topics. For the rest of the story, see page 3.

-photos by Carol Petrachenko

Researcher News

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 RESEARCHER,NEWS
NAGELE, JANET J.,
MAIL STOP 157 BLDG 1268A

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

NASA
National Aeronautics and Space Administration
Langley Research Center

News Researcher

Volume 5, Issue 6 March 22, 1991

Bi-weekly Employee and Contractor Publication

State-of-the-Center Address

Langley Director Richard H. Petersen will address Center employees, retirees and support contractors Wednesday and Thursday, April 10 and 11, in the H.J.E. Reid Conference Center.

April 10	1:30-2:15 p.m.	Office of the Director Aeronautics Directorate Fabrication Division
	3:00-3:45 p.m.	Electronics Directorate Management Operations Directorate
April 11	8:30-9:15 a.m.	Space Directorate Flight Systems Directorate Operations Support Division
	10:00-10:45 a.m.	Systems Engineering and Operations Directorate (except FD and OSD) Structures Directorate

Time should be charged to Job Order Number A-1980.

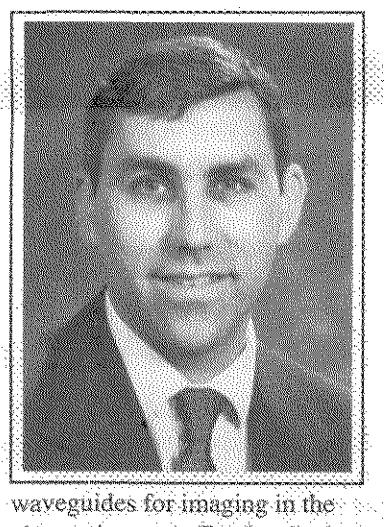
Madaras Presented National Space Club Award

The National Space Club has named Dr. Eric I. Madaras the 1991 Low Memorial Engineering Fellow for his "significant contributions to non-destructive evaluation research and development programs."

Madaras was recognized at the Space Club's thirty-fourth annual Goddard Memorial Dinner, held March 15 in Washington, D.C.

The Low award was established by the board of governors of the National Space Club in 1989 to provide for the further education, beyond the bachelor level, of a career NASA employee engaged in one of the engineering disciplines. The fellowship is awarded in the memory of Dr. George M. Low, whose distinguished career began at the Lewis Research Center in 1949. Dr. Low became NASA Deputy Administrator in 1969, a position he held until his retirement in 1976.

Assistant head of the Nondestructive Evaluation Sciences Branch, Madaras will spend an academic year at the Center for Space Construction (CSC) at the University of Colorado, Boulder. CSC is an interdisciplinary engineering research center which focuses on in-space construction. At Colorado, Madaras hopes to develop the use of multiple acoustic



waveguides for imaging in the ultrasonic range. By developing a "paint brush" made of sonic waves, he hopes to improve the imaging of complex surfaces as well as make possible more rapid scanning of a structure, even approaching video rates. This method would lead to significantly improved instrumentation capabilities for the non-destructive evaluation (NDE) of aerospace structures.

Madaras began his NASA career as an aerospace technologist and group leader in composites NDE in 1985. He was named assistant branch head in 1988.

Russell J. DeYoung, a senior research scientist in Langley's High Energy Science Branch, was the 1990 Low Fellow and the first recipient of this prestigious award.

TRW Awarded Contract to Build CERES Science Payload for Earth Observing System

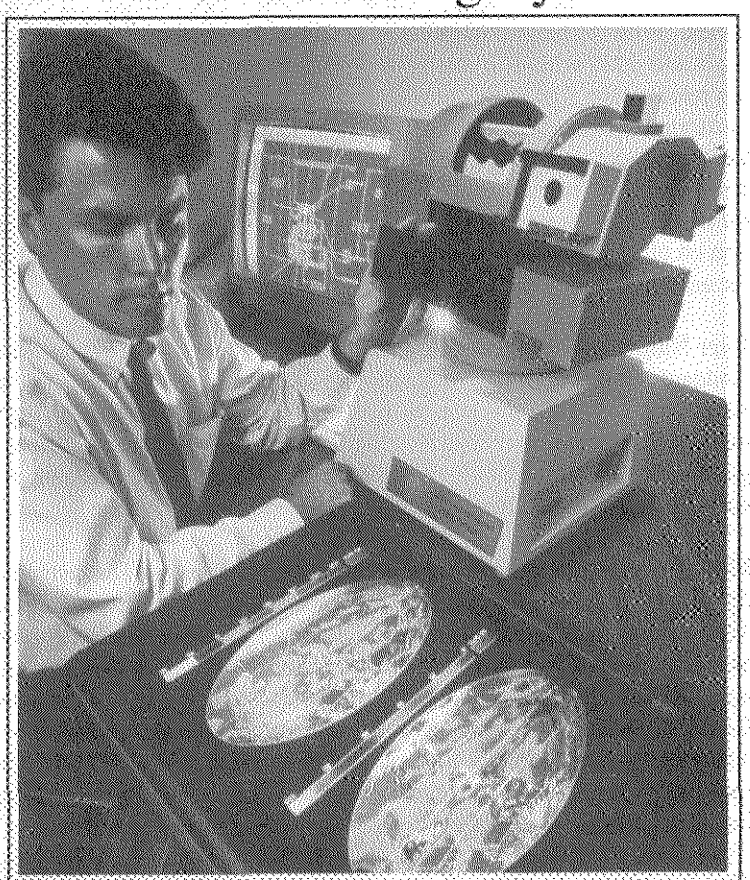
TRW's Space & Technology Group has been awarded a $24 million contract by NASA Langley to design, develop and produce two Clouds and the Earth's Radiant Energy System (CERES) instruments for the first Earth Observing System (EOS) satellite, EOS-A1. Launch is scheduled for December 1998.

TRW completed a 13-month, $900,000 Phase I study for CERES in January. Phase II runs for eight years and includes mission operations support. In addition to EOS-A1, CERES instruments are planned for several other spacecraft flights in Phase II, though no funding has yet been provided.

The EOS program consists of a variety of science instruments to be flown on a number of Earth-monitoring spacecraft launched by the U.S., Europe and Japan. The goal of EOS is to better understand the interactions of the Earth's land masses, oceans and atmosphere and how the Earth, as a system, is changing. CERES will continue measurements of the Earth's radiation balance through observations of both short and long wavelength radiation and provide information on changes in the radiation balance and the effects of clouds on the Earth's climate.

"Clouds reflect incoming solar radiation and absorb infrared, or thermal, energy emitted by the Earth," explained Steve Carman, TRW's CERES project manager. "They are both cooling reflectors and warming blankets. Scientists are just beginning to understand how these competing effects vary with time, geography and cloud type."

CERES' predecessor, the Earth Radiation Budget Experiment (ERBE), also built by TRW, showed that clouds are the dominant influence on climate. Six ERBE instruments, three non-scanning and three scanning radiometers, were launched in pairs on three satellites between 1984 and 1986. The ERBE scanners provided more than five years of data, well beyond their one-year design life.



A TRW employee works with a mock-up of the CERES instrument which will fly on the EOS satellite scheduled for launch in 1998.

"Because of ERBE, we know that the cooling effects of clouds are significantly greater than the heating effects of carbon dioxide in the atmosphere," Carman said. "This discovery makes studying clouds' influence on the Earth's climate one of the most important science goals of the Earth Observing System and places CERES at the top of a long list of science payloads."

CERES data will be combined with data from supporting imaging instruments that identify cloud conditions. Langley is responsible for CERES data reduction. The CERES science investigation will be conducted by an international team of scientists, led by principal investigator Dr. Bruce Barkstrom, Radiation Sciences Branch.

Nine Called to Active Duty

Nine Langley employees have been called to active duty as a result of activities in the Middle East.

James R. Anderson, an offset press operator in the Research Information and Operations Division, has been serving with the U.S. Army since January 8.

Vernet P. Boone, electrical engineering technician in the Operations Support Division, was activated February 6 and is serving with the U. S. Air Force.

Richard E. Cooper, quality assurance specialist in the Systems Safety, Quality and Reliability Division, was called to Air Force active duty February 1.

Timothy Harris III, engineering technician in the Operations Support Division, was activated with his Virginia Air National Guard unit December 4.

Vincent E. Houston, co-op engineering aid in the Fabrication Division, has been serving in the U.S. Navy since November 13.

William E. Lipford, co-op engineering aid in the Instrument Research Division, was called to active duty in the Navy February 19.

Keith I. Powell, co-op engineering aid in the Operations Support Division, has been serving with the U.S. Army since January 22.

Frederick M. Thompson, employee development specialist in the Human Resources Management Division, was activated February 22 and is serving in the U.S. Air Force.

Thomas N. Tortomasi, co-op engineering aid in the Fabrication Division, has been serving with the Air Force since February 4.

The announcement of a cease fire was good news to the families of these employees as well as to all of us, their NASA family. We are proud of their dedication to NASA and to the United States of America.

WELCOME HOME 1st FIGHTER WING

WELCOME HOME, NEIGHBOR. NASA Langley prepared for 'welcoming home' festivities by hanging a huge banner across the hangar. Our neighbors, the 1st Tactical Fighter Wing, were the first to be deployed to the Persian Gulf for Desert Shield, later Desert Storm, operations. Congratulations on a job well done!

News Briefs

Joust 1 Commercial Launch Set for March 29 --- The launch of Joust 1, a commercial suborbital rocket carrying 10 materials and biotechnology experiments, has been scheduled for 8:30 a.m. EST March 29 from Launch Complex 20 at the Cape Canaveral Air Force Station, Fla. Lifted approximately 400 miles into space by Space Data Division's Prospector launch vehicle, the one-stage rocket will provide about 13 minutes of microgravity for the experiments. Following reentry, the payload will splash down in the Atlantic Ocean about 200 miles downrange where it will be recovered by ship and returned to Cape Canaveral.

Space Age Learning Tools Available --- Although NASA has been sending humans into space for more than 30 years, spaceflight is still new to middle school children and basic questions are very much on their minds. With the help of the Astronaut Corps, NASA is producing space age learning tools to relate space flight and other scientific concepts to teachers and students at all grade levels and subject areas. NASA has released the first in this new series of educational video products, *Liftoff to Learning: Space Basics* illustrated orbital science. The 21-minute video filmed on location at NASA Johnson and Kennedy Space Centers as well as in orbit onboard Space Shuttle mission STS-41, is accompanied by an eight-page resource guide for teachers that provides background information on rockets and orbits and suggestions for hands-on classroom activities. Educators can contact NASA's Teacher Resource Centers for information on obtaining copies of the *Space Basics* videotape and resource guide. Call Jean Pohling, 864-3297, for an appointment.

Burr Named GSFC Deputy Director --- Peter T. Burr has been named deputy director of the NASA Goddard Space Flight Center, Greenbelt, Md. Burr had been director of flight projects at Goddard since August 1989. In that position, he had responsibility for the overall direction, development and management of a large number of satellite projects, including the Hubble Space Telescope, the Cosmic Background Explorer, ASTRO-1, the Tracking and Data Relay Satellites, weather satellites and the forthcoming Gamma Ray Observatory, scheduled for launch on the Space Shuttle in April.

First New Shuttle Main Engine Turbopump Tested --- Test personnel at NASA's John C. Stennis Space Center, Miss., conducted a 1.5-second ignition test on a new turbopump developed by Pratt & Whitney for the Space Shuttle Main Engine. The test occurred February 21, on the B-1 test stand at Stennis. The firing signaled the first engine test of Pratt & Whitney's new Alternative Turbopump Development Program for NASA. The pump was tested on a research and development Space Shuttle Main Engine (SSME). The pumps feature improvements in materials and in the fabrication process and take advantage of newer design technology. The new pumps differ from current SSME turbopumps in that they are manufactured using castings instead of sheet metal. This is expected to reduce maintenance and increase operational life of the pumps.

JSC Establishes Freedom Operations Project Office --- The Johnson Space Center, Houston, has established a project office for the development and implementation of Space Station Freedom flight operations. The Space Station Mission Operation Project Office resides within the Mission Operations Directorate, which has overall responsibility for the development and conduct of flight planning, training and operations for the Space Shuttle and SSF programs. The new office will be headed by former flight director Charles R. Lewis.

Magellan Completes Mapping of Venus Highland Region --- At least four competing theories about the nature of Aphrodite Terra, a continent-sized highland on Venus, are being tested by new Magellan data said a scientist at NASA's Jet Propulsion Laboratory, Pasedena, Calif. The Magellan spacecraft, which began imaging the surface of the planet September 15, has mapped more than 58 percent of Venus. Aphrodite Terra, the largest of the highland regions on Venus, extends nearly two-thirds of the way around the planet. Magellan has completed mapping of the region, but the process of producing image mosaics lags behind actual data acquisition. Still, scientists have been able to study radar images of the western portion of Aphrodite, called Ovda Regio.

NASA Confirms 1990 Ozone Hole Equalled Previous Lowest --- Continuing observations by the Total Ozone Mapping Spectrometer (TOMS) have confirmed that the depletion of the stratospheric ozone over Antarctica in 1990 matched the levels observed in 1987 and 1989, the lowest yearly ozone totals recorded. TOMS is an instrument aboard NASA's Nimbus-7 satellite, has monitored Antarctic ozone concentrations since 1979. The "ozone hole" is a large area of intense ozone depletion over the Antarctic continent that typically occurs between late August and early October and typically breaks up in mid-November.

Chief Scientist Forms Langley Technical Committees

In response to SCAN team recommendations, I have formed five committees to encourage technical interactions across the Center. The committees and the core members selected by the program directors are:

Active Structures, Garnett Horner, chairperson, and John Buckley;

Aerodynamics, Dennis Bushnell, chairperson;

Computer Systems, Billy Ashworth, chairperson;

Guidance and Control, Raymond Montgomery, chairperson;

Remote Sensing, Ira Nolt, chairperson;

Thermophysics, Obie Bradley, chairperson, and Johnny Alred.

I have asked the chairpersons to select committee members who have a demonstrated technical competence and are willing to work towards a Center technical contribution.

As a minimum, I have requested each committee to hold a Langley workshop on a topic of Center technical interest. In addition, by the end of a year, I have requested each committee to draft a technical paper which assesses the state of technology in a selected area and suggests opportunities for future research. These assessments will be published as a NASA TM.

I consider this effort to be an experiment that will succeed or fail in direct proportion to the enthusiasm and support given to it by the Langley community.

If you wish to contribute to the initiative in any of the designated areas, please contact the appropriate committee chairperson.

Michael F. Card
Chief Scientist

In the Spotlight

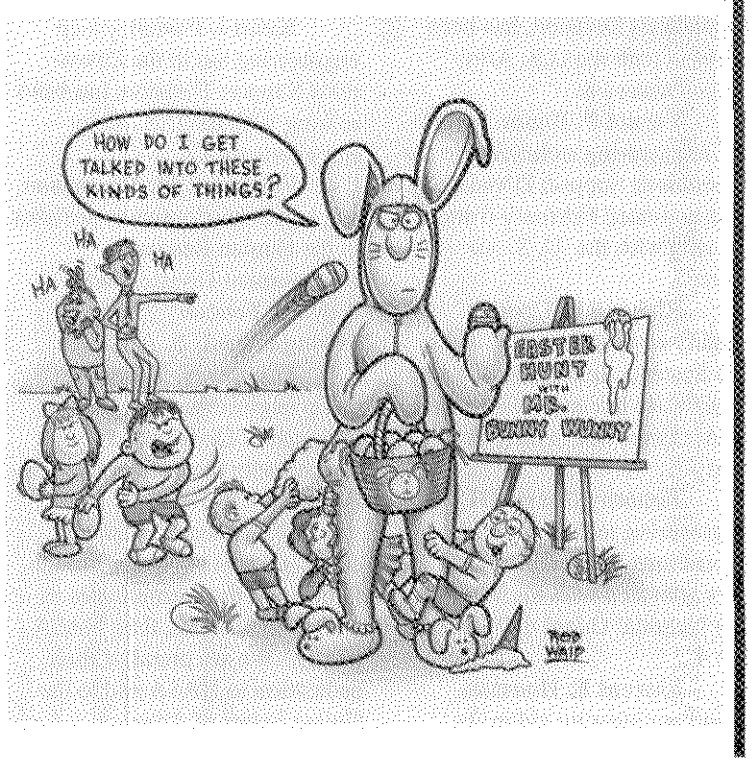
Employees Recognized for Superior Accomplishment

Robert E. Blakeslee, safety and occupational health specialist, Safety and Environmental Management Section, has been granted a superior accomplishment award "in recognition of his contributions to the Construction Safety Program."

Charles E. Cockrell, aerospace technologist in the Systems Engineering Division, has been recognized with a superior accomplishment award "for his outstanding engineering leadership in the design and fabrication of the HL-20 Full-Scale Research Model."

In response to a SCAN team recommendation, notification of such honors will be published as close to the time of the award presentation as possible. Congratulations to these super achievers.

Lankley



Call for Papers

Technology 2001 will be held in San Jose, Calif., December 2-4. Papers are requested in the areas of materials science, electronics, advanced manufacturing, computer technology and software engineering, as well as biotechnology and life sciences.

Please submit abstracts by April 11. Abstract forms may be obtained from the Technology Utilization and Applications Office by calling ext. 42484.

Note of Thanks

Tony and Kathy Trexler write: "The Trexler family wishes to express our appreciation to everyone for the prayers, visits, donations to Todd's memorial and acts of kindness shown to us during the loss of our loved one."

In Memoriam

Sympathy is extended to the families of:

Margaret T. Satterfield, who died November 12, 1990, in Newport News. Satterfield worked in the NASA dispensary.

John W. Wilkey Jr., who died November 26, 1990. Wilkey retired from the Systems Engineering Division in 1978 after 34 years of service.

Joseph A. Stowers who died February 4 in Newport News. Stowers retired in 1964.

M. Eloise McGehee, who died February 28. McGehee, head of the Secretarial Science Co-op Training Program, retired in 1982 with over 35 years of government service. A career advisor to NASA employees, she was also instrumental in organizing a group of retired NASA women.

CELEBRATE AN AMERICAN TRADITION
50 YEARS OF
U.S. SAVINGS BONDS

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

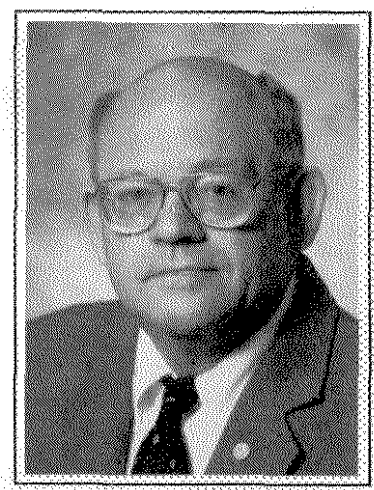
Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Annual Honor Awards

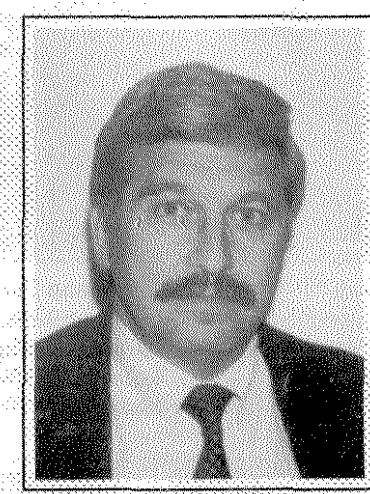
H.J.E. Reid Award

Langley's highest award, the H.J.E. Reid Award recognizes the outstanding scientific or engineering paper first-authored by a Langley Research Center employee or group of employees. The H.J.E. Reid Award is presented to Felix Pitts, Larry D. Lee, Rodney A. Perala and Terence H. Rudolph for the outstanding paper entitled "New Methods and Results for Quantification of Lightning-Aircraft Electrodynamics."

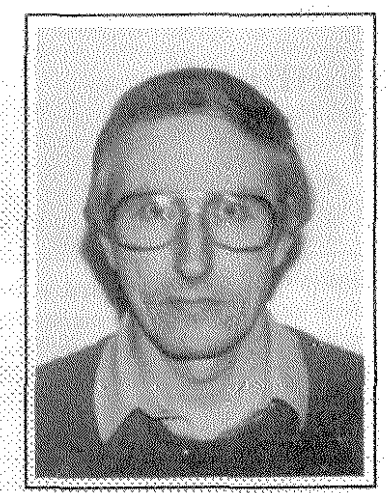


Felix L. Pitts
Langley Research Center

Larry D. Lee
Old Dominion University



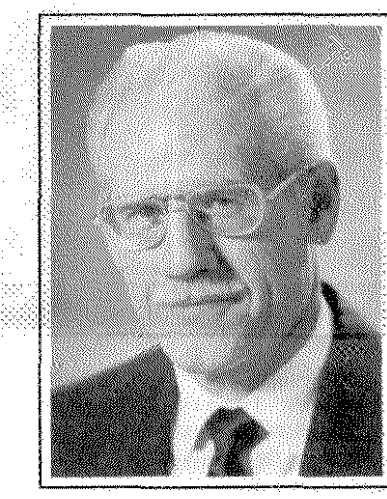
Rodney A. Perala
Electromagnetic Applications Inc., Denver, Colo.



Terence H. Rudolph
Electromagnetic Applications Inc., Denver, Colo.

NASA Honor Awards

Outstanding Leadership Medal



Jon L. Van Cleave
"For outstanding leadership of the Scout Program during a period of extreme program volatility and transition."

Annual Honor Awards Ceremony

Employees Recognized for Outstanding Achievements

Langley employees who have made outstanding contributions in aeronautics and aerospace research during the past year are being recognized for their accomplishments at the Annual Honor Awards Ceremony at 1:30 p.m. today in the H.J.E. Reid Conference Center.

NASA Assistant Deputy Administrator John E. O'Brien and Langley Director Richard H. Petersen will present the NASA medals. They will be assisted by Paul F. Holloway, Langley's deputy director.

Public Service Group Achievement Award

Advanced Turboprop (ATP) Interior Noise Flight Demonstration Team of Boeing Commercial Aircraft Company, Douglas Aircraft Company and Lockheed Aeronautical Systems Company, accepted by Norbert F. Smith, "for prediction, control and demonstration of acceptable interior noise within advanced turboprop-powered aircraft."

Group Achievement Awards

Advanced Aircraft Technology Model Construction Team, accepted by Ashley D. Page, "for outstanding contributions to development of highly specialized research models for the Advanced Aircraft Program."

Aerodynamics Team, accepted by Allen H. Whitehead Jr., "for exceptional effort in building aerodymanics technologies crucial to the National Aero-Space Plane Program."

Computational Fluid Dynamics Methods Team, accepted by Douglas L. Dwoyer, "for exceptional effort in computational fluid dynamics (CFD) technology crucial to the National Aero-Space Plane Program."

Digital Acoustic Measurement System Development Team, accepted by Kenneth D. Wright II, "for outstanding achievement in developing a New Field-Deployable, Digital Acoustic Measurement System."

F-106 Vortex Flap Flight Experiment Team, accepted by Daniel J. DiCarlo, "for superior accomplishments during the F-106 Vortex Flap Flight Experiment which validated the potential to significantly improve military and civil aircraft performance."

High-Reynolds-Number Hybrid Laminar Flow Control Flight Experiment Team, accepted by Richard D. Wagner, "for outstanding contributions to the High-Reynolds-Number Hybrid Laminar Flow Control (HLFC) Flight Experiment which demonstrated that HLFC can be achieved on the wing of a modern, commercial transport aircraft."

LaRC Facilities Engineering Division and Facilities Program Development Office, accepted by John E. Knemeyer, "for outstanding implementation of the Construction of Facilities Fiscal Year 1990 Minor Program, resulting in substantial increases in mission capability and quality of life."

LaRC Network (LaRCNET) Group, accepted by Edwin P. Riddle, "for development and implementation of an advanced, large-scale NASA computer network."

Laser Velocimetry Section, accepted by William W. Hunter Jr., "for outstanding contributions to the Nonintrusive Laser Velocimetry capabilities of Langley Research Center's research facilities."

Long Duration Exposure Facility (LDEF) Retrieval and Deintegration Team, accepted by E. Burton Lightner, "for outstanding accomplishment of the Long Duration Exposure Facility (LDEF) retrieval and deintegration."

Precision Segmented Reflectors Testbed Truss Development Team, accepted by Wilbur B. Fichter, "for timely design, fabrication and experimental verification of a robust, extremely accurate, fully erectable testbed truss structure for the Precision Segmented Reflectors Program."

Rotorcraft Blade/Vortex Interaction Noise Research Team, accepted by Michael A. Marcolini, "for implementing a comprehensive experimental and analytical research program for the understanding and prediction of rotorcraft blade/vortex interaction noise."

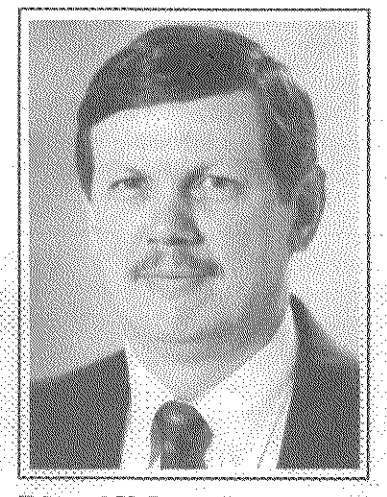
Scout Project Office, accepted by Jon L. Van Cleave, "for engineering excellence in the Scout Transition Program."

Shuttle Entry Air Data System (SEADS) Development, Flight and Data Analysis Team, accepted by Paul M. Siemers III, "for outstanding contributions to accomplishment of design, development, testing, flight and data analysis of the Shuttle Entry Air Data System."

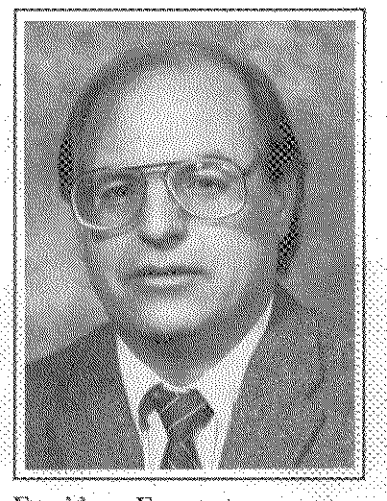
Structures Team, accepted by John G. Davis Jr., "for exceptional effort in building structural technologies crucial to the National Aero-Space Plane Program."

Awards

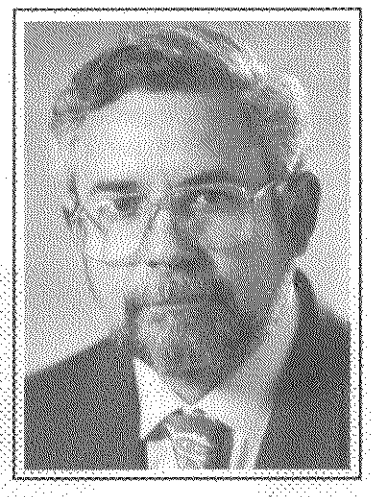
Exceptional Scientific Achievement Medal



Edward V. Browell
"For outstanding scientific achievement in the study of fundamental atmospheric gas and aerosol processes."

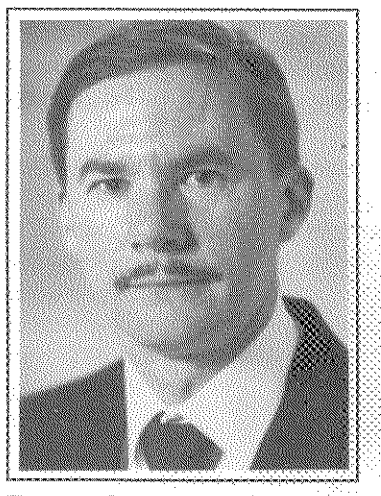


Fereidoun Farassat
"For contributions to the fundamental understanding of acoustics and unsteady aerodynamics of rotating blades."

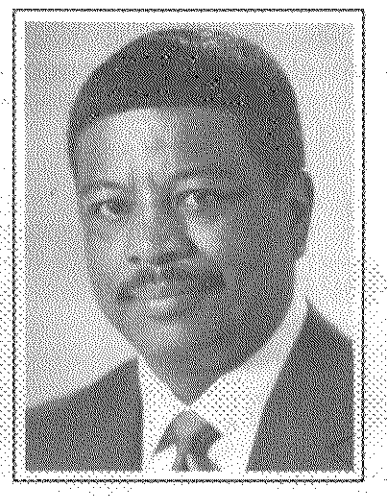


Manuel D. Salas
"For outstanding research contributions in theoretical and computational fluid dynamics."

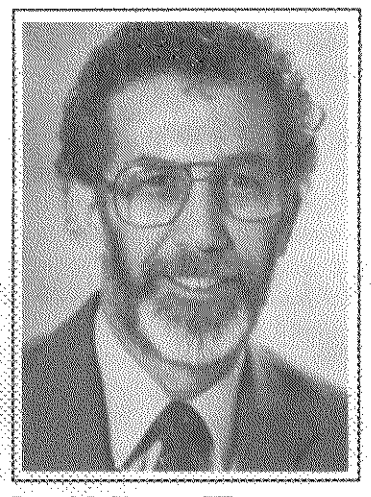
Exceptional Engineering Achievement Medal



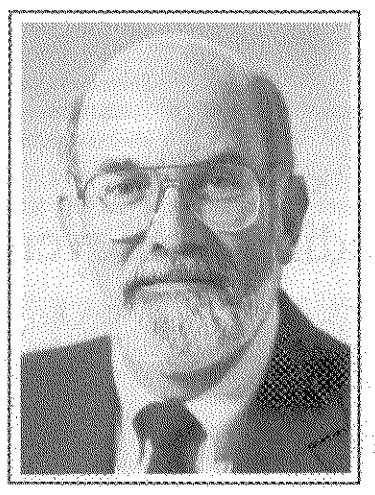
Terence S. Abbott
"For exceptional engineering achievement in developing the Engine-Monitoring and Control System (E-MACS), which significantly reduces pilot workload and improves aircraft operational safety."



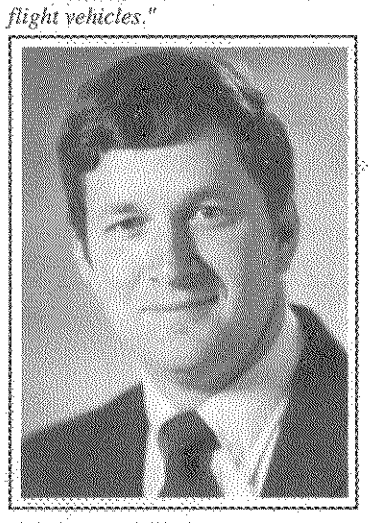
James C. Barnes
"For engineering excellence in providing Ti:Sapphire laser technology for NASA remote sensing applications."



Paul M. Siemers III
"For outstanding engineering achievement in development and demonstration of the Shuttle Entry Air Data System (SEADS), which has wide application to a variety of flight vehicles."



Richard D. Wagner
"For superior technical contributions, management and personal dedication to development of laminar flow control concepts which provide substantial benefits to aircraft efficiency."



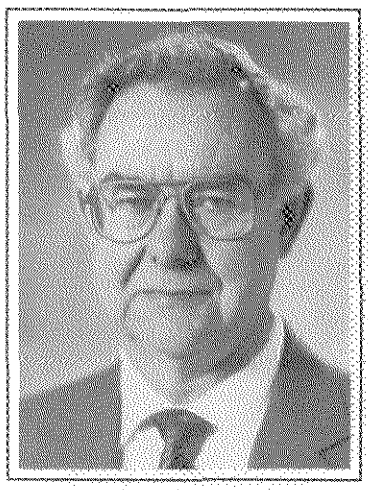
William P. Winfree
"For exceptional engineering achievement in developing a significant thermal nondestructive evaluation technique having strong potential application to aviation safety."

Equal Employment Opportunity Medal

Christine M. Darden
"For outstanding achievement in encouraging minority youth to pursue scientific and technical careers."

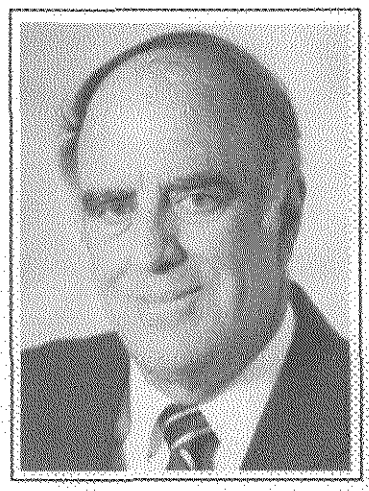
Exceptional Service Medal

...awards



Walter E. Bruce Jr.
"For outstanding contributions to development and checkout of the National Transonic Facility."

Marchelle D. Canright
"For significant, sustained, innovative performance yielding substantial increases in the number of students motivated to seek science and engineering education."

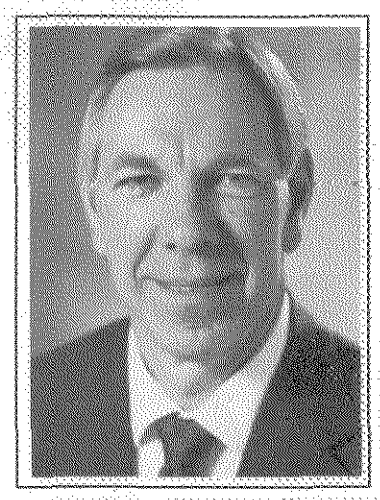


John J. Cox
"For exceptional service and leadership in developing and administering personnel programs at Langley Research Center."

Judy W. Evans
"For exceptional service in development and improvement of financial systems and services in support of the Langley and NASA missions."

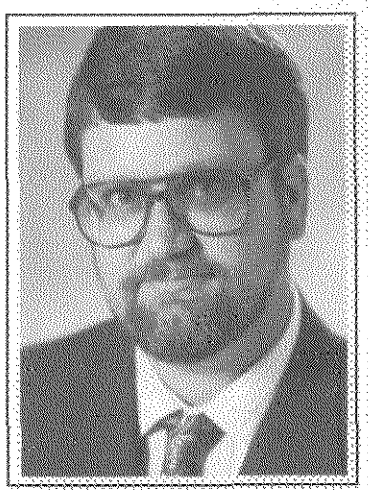
Anthony R. Fecondo Sr.
"For exceptional service in facility engineering support of the LaRC Central Scientific Computing Complex, a major NASA computing facility."

Nellie E. Freeman
"For sustained performance and dedicated service in support of NASA's equipment management goals."



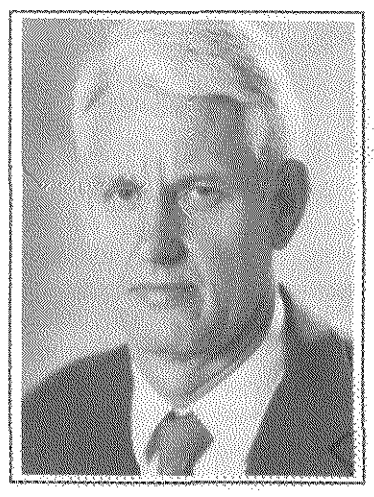
Robert A. Golub
"For outstanding contributions to the field of aircraft noise prediction."

William L. Grantham
"For exceptional service in conduct and leadership of significant research programs in electromagnetics, remote sensing and large space antennas that will enable future NASA missions."



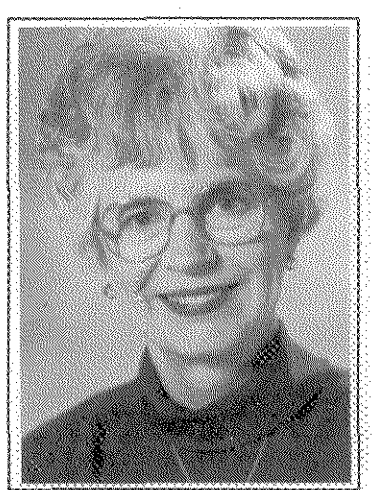
Joseph C. Hickman
"For exceptional service and dedication in manufacture, assembly and testing of the Halogen Occultation Experiment (HALOE) flight instrument, resulting in a precision, optically aligned, scientific instrument."

William F. Hunter
"For sustained exceptional performance in providing structural analysis, vibration and dynamic response support to NASA projects, facilities and the technical community."



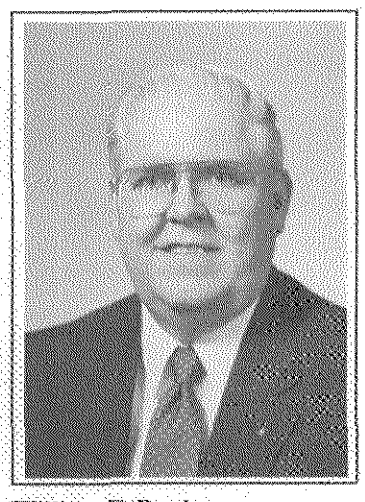
William S. Jones
"For exemplary contributions to advanced composites research."

Jacqueline T. Kallick
"For exemplary performance and dedicated service as staff assistant in the Systems Engineering and Operations Directorate."



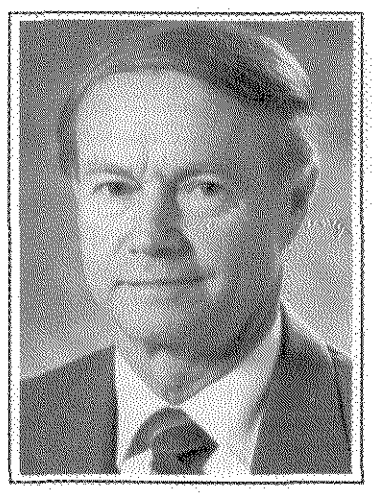
Charmaine G. McLean
"For exceptional service as secretary to the Mechanics of Materials Branch."

Goldie C. Pardue
"For sustained high level of productivity in the division office and efficient support of special activities."

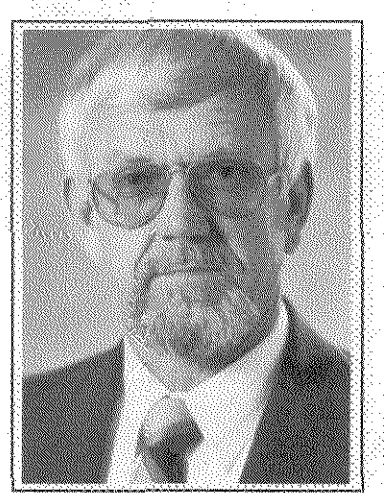


William F. Perdue
"For exceptional service in organization, management and daily operational conduct of the Center-wide automatic data processing equipment maintenance effort at Langley Research Center."

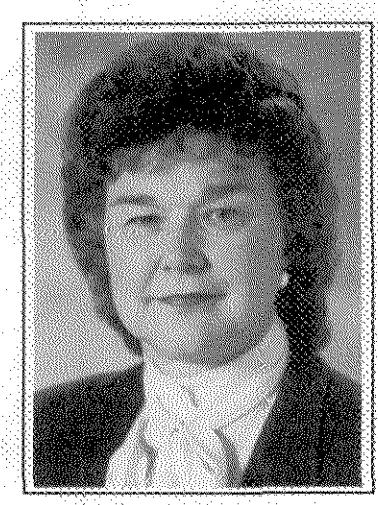
Anne S. Rockey
"For exemplary performance and outstanding dedication as secretary, Systems Development Branch."



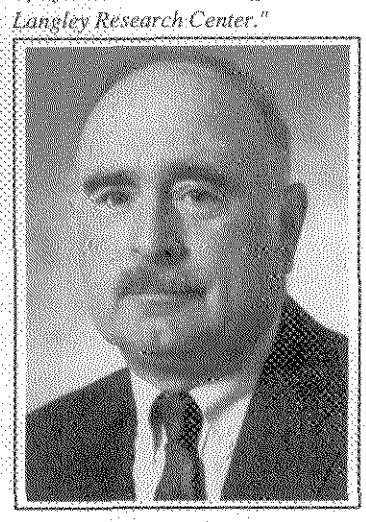
George M. Summerfield
"For exceptional service as an engineer, designer and project manager in facilities engineering."



Robert H. Tolson
"For exceptional performance in establishment and leadership of interdisciplinary research activities at Langley Research Center."



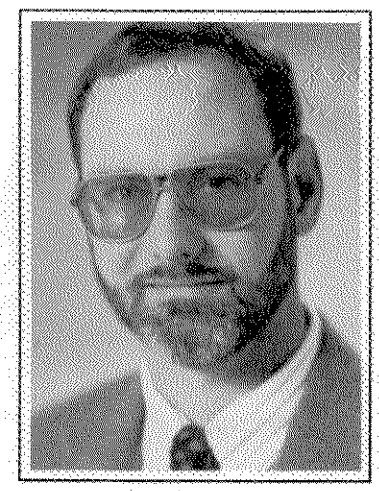
Carolyn C. Wilt
"For exceptional service as secretary in the Office of the Director for Flight Systems."



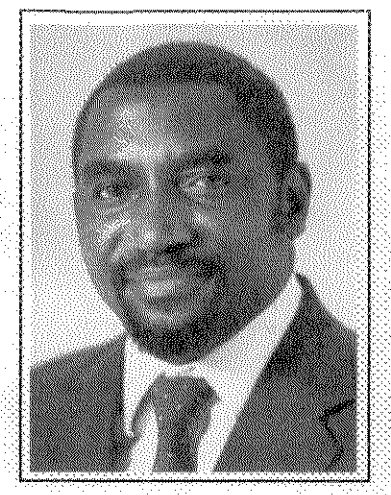
Kenneth R. Yenni
"For outstanding contributions as a research pilot to the formulation, conduct and analysis of flight research programs."

awards

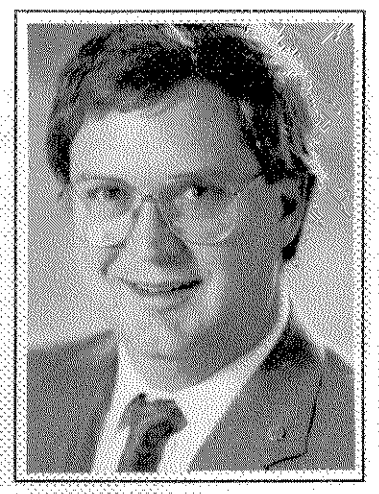
Exceptional Achievement Medal



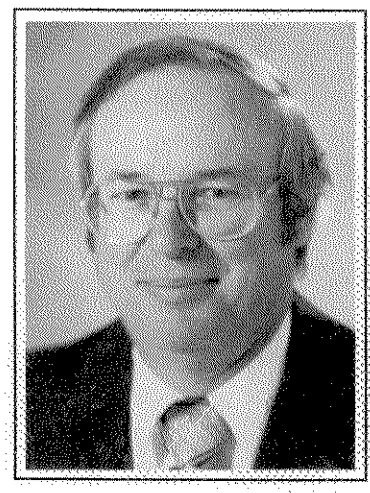
William B. Ball
"For dedication and excellence in the development of computer-aided design and drafting technology for facilities engineering."



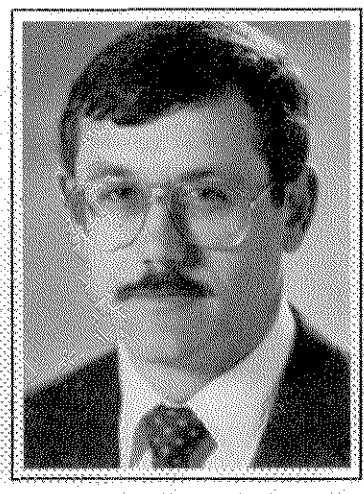
John T. Bowen
"For significant contributions to improving the graphics and services available to users of the Langley Supercomputing Network Subsystem, a major NASA supercomputing facility."



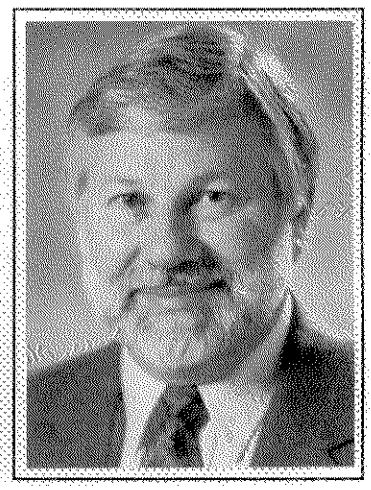
Delwin R. Croom Jr.
"For outstanding efforts in development of an advanced coordinate measurement system."



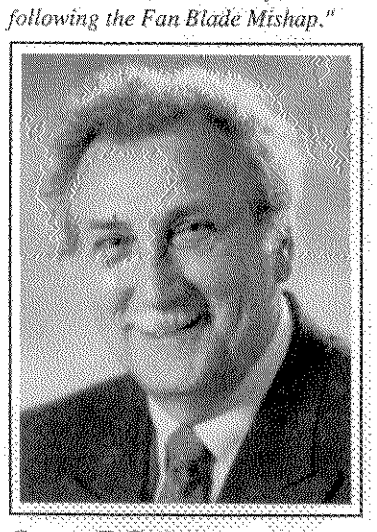
Thomas E. Deans Jr.
"For outstanding achievements in managing technical support for repair and enhancement of the National Transonic Facility, following the Fan Blade Mishap."



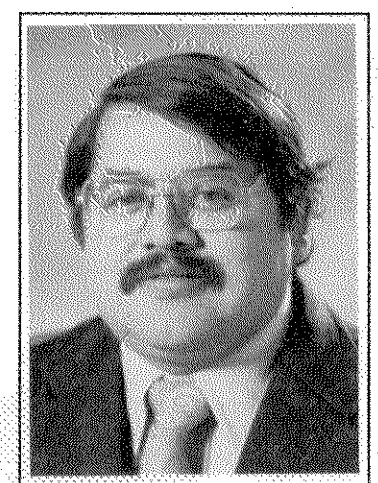
E. Thomas Hall Jr.
"For outstanding contributions in materials processing, development and application to the design and development of an ambulatory fetal heart monitor."



E. Burton Lightner
"For outstanding leadership as Long Duration Exposure Facility (LDEF) Project Manager responsible for the planning of orbital retrieval operations and facility experiment deintegration."

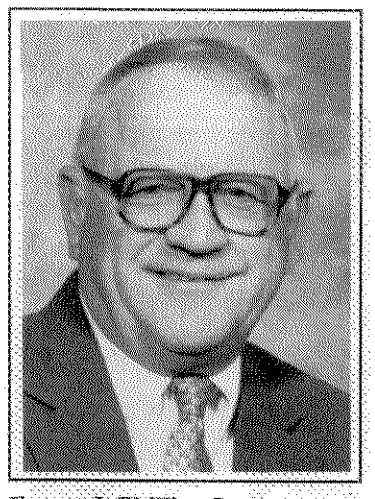


George F. Palko
"For exemplary leadership and guidance in management of the Facilities Maintenance Program at Langley Research Center."

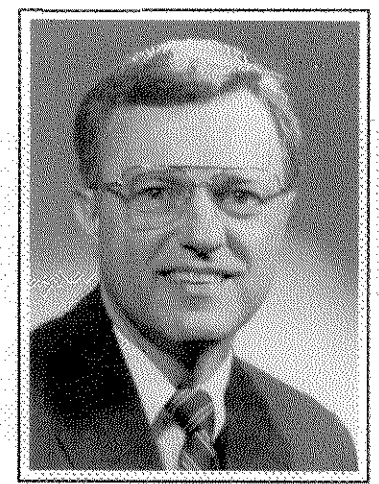


Peter Vasquez
"For outstanding contributions to development of ceramic casting technology."

Public Service Medal

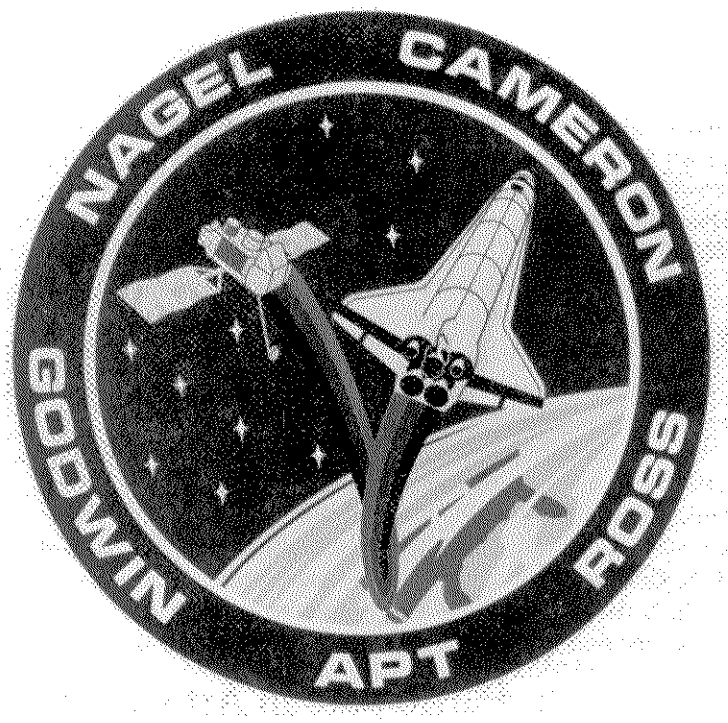


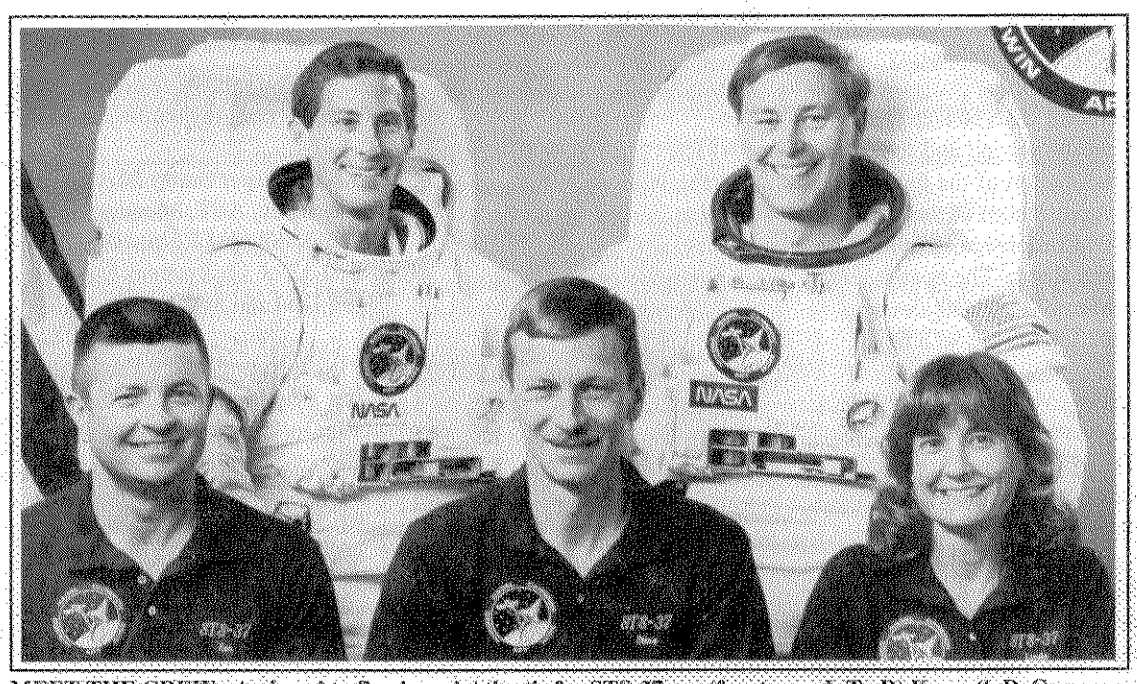
Ernest J. Phillips Jr.
Lockheed Engineering and Sciences Company
"For outstanding service and dedication in the planning and scheduling of Halogen Occultation Experiment (HALOE) Project activities, resulting in the on-time delivery of a flight-worthy scientific instrument."



Larry T. Taylor
Virginia Polytechnic Institute and State University

"For exceptional contributions to the development of advanced polymeric materials for aerospace use."





MEET THE CREW. Assigned to fly aboard Atlantis for STS-37 are (front row, L To R) Kenneth D. Cameron, pilot; Steven R. Nagel, mission commander; and Linda M. Godwin, mission specialist. Dressed in their EVA suits are (back, L to R) astronauts Jerome "Jay" Apt and Jerry L. Ross, mission specialists.

GRO Deploy, Spacewalk Highlight STS-37

Shuttle mission STS-37, the 39th flight of the Space Shuttle and the eighth flight of Atlantis, will be highlighted by deployment of the Gamma Ray Observatory (GRO), the second of NASA's four great space observatories. In addition, STS-37 will involve the first American spacewalk in more than five years.

The launch of Atlantis is currently scheduled for 9:20 a.m. EST April 4. Scheduled to be placed into a 243-nautical-mile-high orbit on the third day of the flight, GRO will complement the Hubble Space Telescope (HST) and attempt to unravel the mysteries of the universe through observations of gamma rays, which are among the highest frequency wavelengths of the spectrum. GRO is the second in four planned great observatories, including HST, the Advanced X-Ray Astrophysics Facility and the Space Infrared Telescope Facility.

On the fourth day of the flight, the Extravehicular Activity Development Flight Experiments (EDFE) will require the first spacewalk by American astronauts since Shuttle mission STS-61B in November 1985. The spacewalk will test the Crew and Equipment Translation Aids (CETA), three prototype cart designs that are part of an effort to develop a transportation device for use on the exterior of Space Station Freedom. Other spacewalk experiments include tests of the Shuttle's robot arm as a work platform for astronauts and instrumented evaluations of astronauts' ability to work with tools in weightlessness.

Commanding Atlantis will be Air Force Col. Steven R. Nagel. Marine Corps Lt. Col. Kenneth D. Cameron will serve as pilot. Mission specialists will be Air Force Lt. Col. Jerry L. Ross; Dr. Linda M. Godwin, Ph.D.; and Dr. Jay Apt, Ph.D.

The mission is planned to last five days and 12 minutes, concluding with a landing at Edwards Air Force Base at 10:32 a.m. EST April 9.

SPACE SCIENCE--ONE STEP AT A TIME. In the Payload Hazardous Servicing Facility at KSC, STS-37 crewmembers pose before the Gamma Ray Observatory (GRO). The massive GRO, the second of four great observatories planned by NASA, will study the celestial gamma rays believed to be a record of cosmic change and evolution.

EVA Scheduled for Mission Day Four

Astronauts will venture into the payload bay for the 14th time in the 10-year history of the Shuttle program, when mission specialists Jerry Ross and Jay Apt perform a six-hour extravehicular activity during flight day four. When Ross opens the airlock hatch, he will be the first astronaut to do so since he closed it during STS-61B.

During the STS-37 spacewalk, Apt and Ross will test several different translation devices which could be the predecessors of such instruments used on Space Station Freedom. The flight test will answer such questions as speed of translation, complexity of equipment required, ease of translation and crew loads applied to tools and equipment for future EVA experiences.

Ross is designated at EV1 and will have red stripes on his spacesuit; while Apt will be known as EV2. Pilot Ken Cameron will perform the functions of the intravehicular crewmember, monitoring the progress of the spacewalk from inside the orbiter.

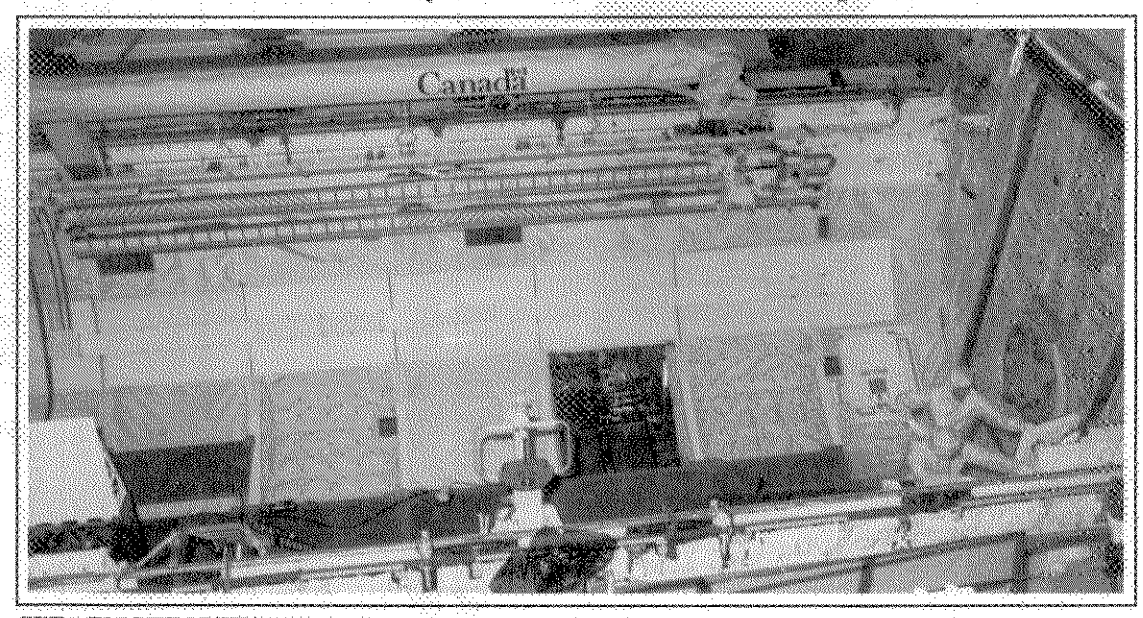
The EVA Developmental Flight Experiment is composed of three sets of evaluations: the Crew and Equipment Translation Aid (CETA); the Crew Loads Instruments Pallet (CLIP) Experiment; and the EVA Translation Evaluation (ETE). Langley is a key player in the CETA experiment, having designed and fabricated the track and associated hardware. Richard Russell, from the Langley Space Station Office, and John Gustafson and David Butler, from the Systems Engineering Division, led the Langley effort.

EDFE experiments require the use of a uniquely developed data recording system called the Portable Data Acquisition Package. The PDAP records 32 channels of analog data with each channel being sampled 150 times per second. The analog signals are digitized to 12-bit resolution, time tagged and recorded on a hard disk for retrieval after landing.

The three PDAPs flown on Atlantis will be stored inside the crew compartment and mounted on the EDFE experiments by Ross and Apt after the spacewalk begins. They will be brought back into the crew compartment at the completion of the EVA.

Shuttle Flag to Fly During Mission

As part of NASA's Manned Flight Awareness program, the orbiter flag will be flown during Space Shuttle missions in place of the NASA flag in front of Langley's Headquarters Building. The Atlantis flag will fly 24 hours a day, from the launch of STS-37 until landing. STS-37 is scheduled to last five days and 12 minutes.



CETA FLIGHT UNIT is installed in the payload bay of the Shuttle Atlantis below the Canadian arm. Langley is a key player in the Crew and Equipment Translation Aid (CETA) experiment, having designed and fabricated the track and associated hardware.

Happenings

NO LAA SOCIAL Friday, March 29, Good Friday.

NASA TOASTMASTERS meet the second and fourth Wednesdays of the month in the Langley Room of the H.J.E. Reid Conference Center, 14 Ames Road. The next meeting is March 27, 11:30 a.m. to 1 p.m. Guests are welcome.

LOW IMPACT AEROBICS classes are held Tuesdays and Thursdays in the NASA gym. Cost is $12 per month. First class is free.

BICYCLE RACING. Those interested in joining a bicycle racing club are invited to James River Velo Sport's meeting, March 27, at 7 p.m. in the Grissom Library, Denbigh. For more information, call Mark Motter, 874-3247.

MEET VA TECH. High school students and parents are invited to a program presented by VA TECH Admissions Dept., Sunday, April 7, 1-3 p.m., Sheraton Coliseum Inn.

TELA-TAX SERVICE. Individual, business, federal, state. Member National Association of Tax Practitioners. Small business bookkeeping services. By appointment. Call 874-3121.

LFCU ANNUAL MEETING 10 a.m., March 23, Holiday Inn, Hampton, featuring Jim Kincaid.

INFERTILITY SUPPORT GROUP provides support and education for couples facing this emotionally and physically challenging condition. Call 877-3094 or 249-8815.

WANTED: ROOMMATE. Female to share nice 2 BR, 2BA apartment minutes from NASA. Master bedroom with private bath. Non-smoker preferred; pets OK. $270 per month plus 1/2 utilities. Available immediately. Call 865-6442; if no answer, please leave message.

FOR SALE: AUTO. 1973 Camaro LT, V8, AT, 59,000 miles, original owner. $8,500. Call 220-3872.

FOR SALE: TYPEWRITER. Electric IBM "Executive." Excellent condition. $50. Call 595-1575 after 5:30 p.m.

WANT TO BUY: OLD CLOCKS, running or not. Call 838-7323.

FREE TO GOOD HOME. Female dog, spayed, 1/2 pit bull, 1/2 leopard cur, 10 months old, active--needs fenced yard. Call 874-7414, leave message.

Positions Open

The following positions are open to Langley employees:

91-19: Supervisory Mechanical Engineer, AST, Mechanical Experimental Equipment, GM-830-13 or 14; Systems Engineering Division. Closes March 25.

91-20: Supervisory Engineering Technician, GS-802-11 or 12; Operations Support Division. Closes March 25.

91-21: Payroll Technician, GS-544-5 or 6; Financial Management Division. Closes March 26.

91-22: Mechanical Engineering Technician, GS-802-9 or 10; Facilities Engineering Division. Closes March 25.

91-23: Secretary (Stenography), GS-318-6 or 7; Office of External Affairs. Closes March 22.

Note of Thanks

Betty Hughes writes: "Words cannot convey my appreciation for each and every one of my friends who were so supportive during the loss of my son. I wish to thank you all for your prayers, your love, and for being there during my time of need."

Upcoming at the VC

VC Offers March Brown-Bag Lecture

In recognition of Women's History Month, the Visitor Center (VC) is offering a special brown-bag lunch program on Thursday, March 28, at noon in the VC theater.

Dr. Beverly Golemba, an associate professor from St. Leo College, will present "Women Who Did Not Make the History Books." Golemba will discuss the accomplishments of lesser known women from 1600 to the present.

VC Previews "Astronomers" Episodes

In April, the Visitor Center will preview two episodes of "The Astronomers," a new PBS series exploring the lives and work of scientists who are revolutionizing our knowledge of the Universe.

On April 4 at noon in the VC theater, the first episode, "Where is the Rest of the Universe," will be previewed. Episode two, "Searching for Black Holes," will be shown on April 10 at noon in the VC theater. The series is narrarted by Richard Chamberlin. The showings have been arranged by the National Space Society, Langley chapter.

Children to Participate in Art Contest

The L.A.A. Conservation Club and the VC invite children to make a poster or drawing that shows how they can take better care of "Spaceship Earth." A description of 50 words or less should be inlcuded with the artwork.

Each entry must at least 8-1/2 by 11 inches but no larger than 24 by 36 inches. Limit one entry per child. All entries must contain name, address, age, grade of participant and a written description of the work on the back of the entry. Entries must be received by April 8.

Winners will be notified on April 22 and artwork displayed at the VC. The contest is targeted for, but not restricted to, dependents of NASA employees and contractors.

There are three entry categories: pre-kindergarten to grade 3; grades 4 to 6; and grades 7 to 12. First, second and third place winners in each category will be awarded prizes.

Send entries to Earth Day Art Contest, Mail Stop 169, or deliver to Building 1268A, Room 1148. For information, call ext. 46447 or 43113.

Ups and Downs

-photo by Fred Jones

UP WITH A WARM WELCOME. Calvin Chandler (left) and Dwight Elliott of the Research Aircraft Support Section hang a 'welcome home' banner on Langley's hangar to greet returning 1st Tactical Fighter Wing troops.

-photo by Petrachenko

DOWN WITH THE CLOSED SIGN. VC Director Dr. Mark Nataupsky and maintenance technician Sam Goodhope officially open the Visitor Center to the public. The VC had been closed since January 16 due to heightened security measures throughout the area.

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 RESEARCHER/NEWS
RHEW, RAY D.
MAIL STOP 238 BLDG 1230

National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

Researcher News

Mail Awareness Week, March 25-29.

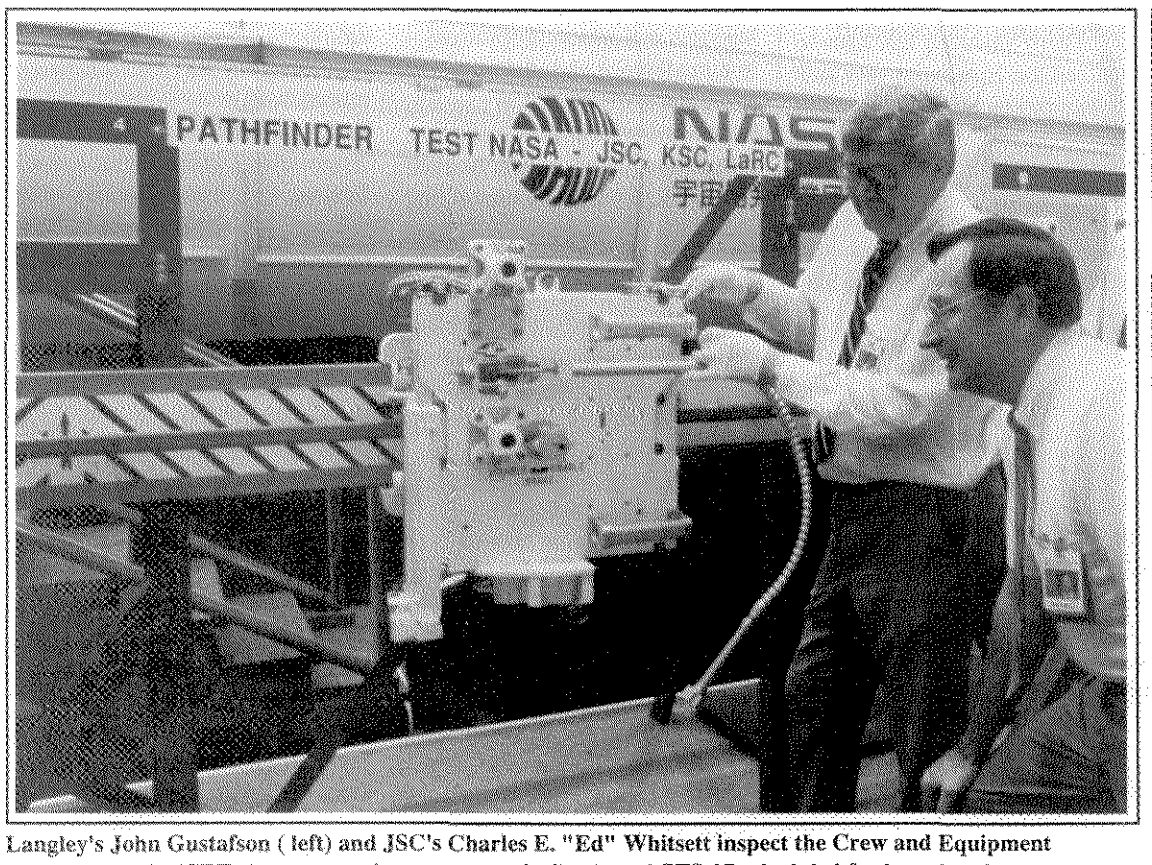
NASA
National Aeronautics and
Space Administration

Langley Research Center

News Researcher

Volume 5, Issue 7 April 5, 1991

Bi-weekly Employee and Contractor Publication



Langley's John Gustafson (left) and JSC's Charles E. "Ed" Whitsett inspect the Crew and Equipment Translation Aid (CETA) transporation cart that will fly aboard STS-37 scheduled for launch today.

Langley Supports STS-37 Spacewalk Experiment

-by H. Keith Henry

When astronauts Jerry Ross and Jay Apt step outside the Space Shuttle Atlantis for the first extravehicular activity (EVA) in more than five years, the first thing they will do is set up experimental hardware designed and fabricated at Langley.

Langley people and facilities from the Space, Systems Engineering, Electronics and Structures Directorates contributed to the joint JSC-LaRC experiment called CETA — short for Crew Equipment Translation Aid, a track and cart system designed to help astronauts move from Space Station habitation modules to the Station's truss structure using their own power. Space Station Freedom is scheduled for deployment in low-Earth orbit beginning in the mid-1990's.

Langley was asked in mid-1989 to work with Johnson on CETA. Richard Russell, from Langley's Space Station Freedom Office, and John Gustafson and David Butler, from the Systems Engineering Division, led the Langley effort.

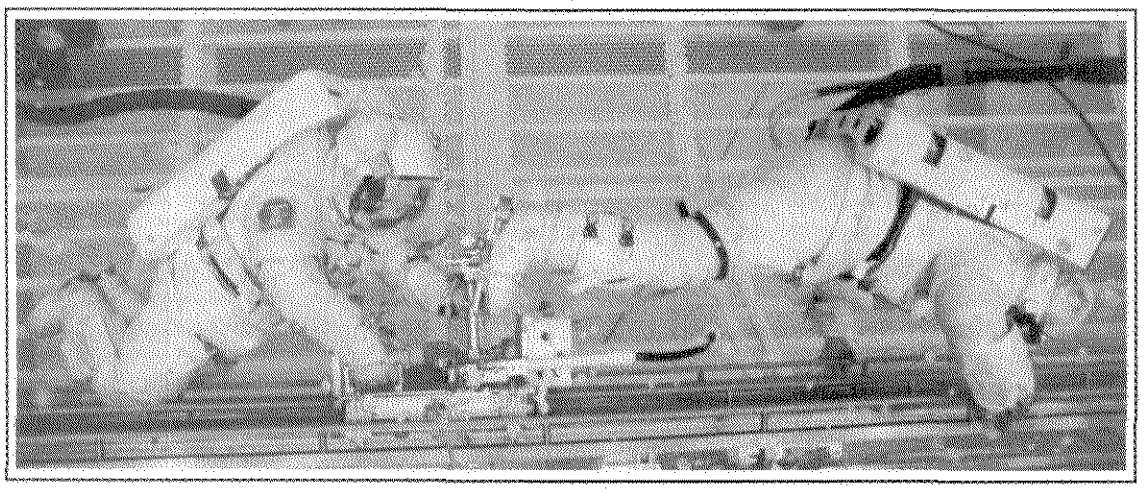
Nearly 400 people — including both civil service and contractors — provided support at Langley. Design analysis and certification of hardware was performed by SED and the Systems Safety, Quality and Reliability Division. The Instrument Research Division provided instrumentation, the Structures Directorate provided test facilities, and the Fabrication Division provided hardware. Lockheed Engineering & Science, Advex Corporation and Modern Machine were also valuable members of the Langley CETA team.

The schedule was tight, but in an intense three-month period from October through December 1989, "Fab" built the two track sections and associated hardware that will be deployed by Ross and Apt on the inside surface of Atlantis' payload bay. Certification hardware was delivered in December, with flight hardware delivered in January of 1990. (Originally CETA was to have flown in November of last year.)

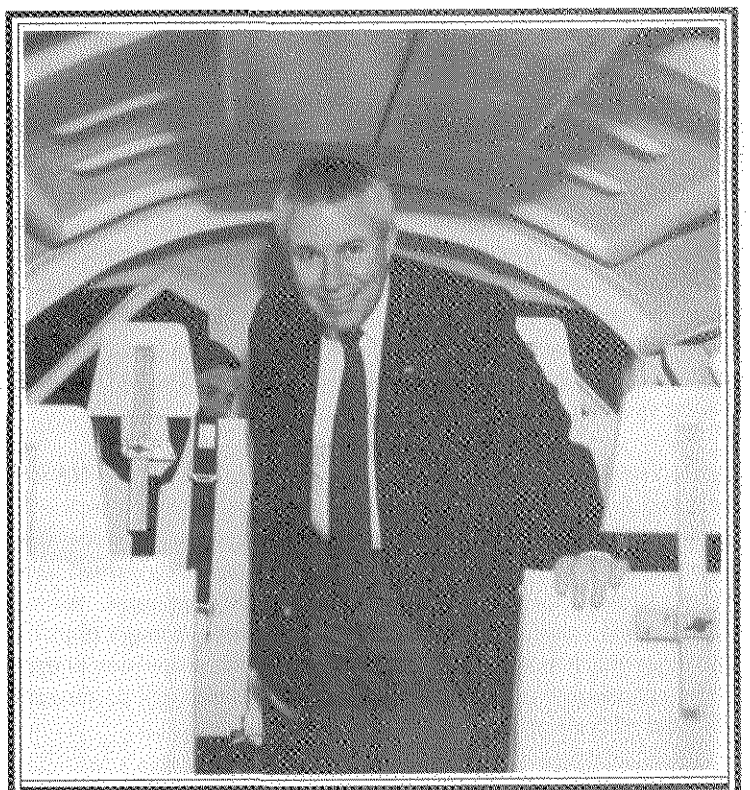
The 46.8-foot track will allow evaluation of three mobile carts designed by Johnson. Langley also designed and fabricated the hardware that will serve as the mobile base for each of the carts.

A Johnson-designed portable data acquisition package will acquire data on acceleration, velocities, forces and temperatures as the astronauts move along the track with each of the carts. Magnets have been installed by Langley in the track handrail every 12 inches, with a sensor in the mobile base to determine speed.

The six-hour EVA will begin early in the morning of day four on STS-37, two days after the Gamma Ray Observatory is deployed. The first three to four hours of the EVA will be devoted to CETA.



CETA TRAINING. Astronaut Jerry L. Ross prepares to test a hand-powered version of the CETA flight experiment in JSC's Weightless Environment Training Facility pool. Ross pulls the cart along hand-over-hand during the test while Astronaut Jay Apt holds onto the back. The goal of the experiment is to find the best method for astronauts to move around the exterior of Space Station Freedom.



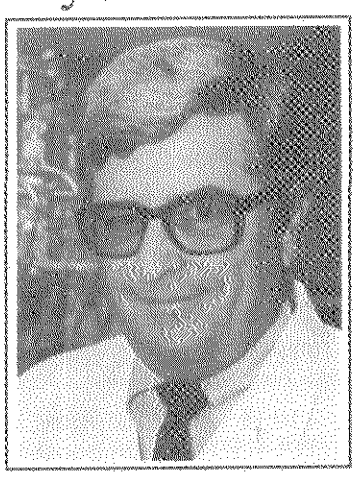
-photo by Carol Petrachenko

NASA Associate Deputy Administrator John E. O'Brien emerges from the HL-20 full-scale mockup housed in the Langley hangar. During his visit March 21, O'Brien was also briefed on Langley's robotics, large space structures, ATOPS and NTF programs

Langley Colloquium and The Sigma Series

Local Authority Looks at Kepone and the Bay

-by Jean Drummond Clough



Discovery of the pesticide Kepone in the James River in 1975 triggered the most extensive scientific investigation ever undertaken of hazardous chemical pollution in estuaries. Kepone in fish resulted in closures of commerical fisheries, and restrictions placed on fishing lasted until 1988.

"Kepone and the Bay" will be the topic of two lectures on the Peninsula Monday, April 8, 1991, by Dr. Robert J. Huggett, assistant director of the Virginia Institute of Marine Science (VIMS), Gloucester Point.

At 2 p.m., Huggett will speak to Langley employees, retirees and contractors during a colloquium in the H.J.E. Reid Conference Center, 14 Ames Road. At 7:30 that evening, Huggett will give the same presentation at the Holiday Inn Coliseum Hotel and Conference Center as part of The Sigma Series. Free public lectures, The Sigma Series is sponsored by the Virginia Air and Space Center, the Daily Press and NASA.

According to Huggett, the contaminated sediments have been diluted and covered enough by uncontaminated material that the presence of Kepone in the water column has diminished. Kepone concentrations in organisms inhabiting the river are finally below the U.S. Environmental Protection Agency and Food and Drug Administration acceptable levels. Biological, chemical, physical and geological aspects of the contamination indicate that remedial actions to remove Kepone would be expensive and environmentally unwise.

Kepone is but one example of chemical contamination in the Chesapeake Bay. During his lectures, Huggett will discuss some of the hundreds of man-made compounds that can cause chemically induced diseases, such as skin lesions, fin rot, cataracts, suppressed immune systems and cancer. Huggett says that perhaps such polluted systems can act as a warning of what could happen in the bay should toxic chemcial concentrations increase.

Huggett is a professor in the School of Marine Science at the College of William and Mary and is assistant director of VIMS and head of the Division of Chemistry and Toxicology. His research interests involve the effects of toxic chemicals in aqueous systems.

News Briefs

Maneuver to Target Galileo for Asteroid Flyby --- NASA's Galileo spacecraft executed a trajectory correction maneuver to help aim it for the first-ever flyby of an asteroid next October. In the maneuver, Galileo fired its small thrusters on and off during a three-and-a-half hour period resulting in a velocity change of about five miles per hour. This maneuver, together with three more planned in July and October, will shape Galileo's flight path for its flyby of Gaspra in the main asteroid belt on October 29. Galileo will be the first spacecraft to fly by an asteroid when it approaches within about 1,000 miles of the irregularly shaped, stony lump measuring nearly 15 miles access. During the encounter, the spacecraft will photograph and collect a wide variety of scientific data about the asteroid.

Names of Notable Women to be Proposed for Venus Features --- Scientists of NASA's Magellan Project, in association with the U.S. Geological Survey, are inviting the public to propose names of notable women for the many impact craters and large volcanic vents being discovered on Venus by the Magellan spacecraft's imaging radar. The impact craters on Venus are some of the most beautiful features in the solar system. They form randomly in time and space when an asteroid or very large comet collides with Venus' surface. For additonal information on criteria or to submit nominations, contact the Magellan Project Office, Mail Stop 230-201, Jet Propulsion Laboratory, 4800 Oak Grove Dr., Pasadena, Calif., 91109. Nominations will be compiled for the Working Groups for Planetary System Nomenclature, a committee of the International Astronomical Union. The IAU gives final approval to names for bodies in the solar system.

Arcjets Yield Better Performance, Longer Satellite Life --- NASA's Lewis Research Center, Cleveland, Ohio, has the lead role in developing the arcjet thruster technology recently selected for stationkeeping use on AT&T's Telstar 4 communications satellites. Arcjet systems offer a significant improvement in propellant use over chemical and other electrically-augmented thrusters. The savings realized can be used to increase a satellite's on-orbit lifetime or payload mass. Alternatively, launch mass can be decreased to that a smaller rocket booster can be used. A major objective in the Lewis arcject research and technology program was to bring advanced electric propulsion to operational status. This included component research necessary to demonstrate the required performance, life and integration issues associated with the arcjet system.

NASA Terminates Operation of Explorer Satellite --- The Dynamics Explorer (DE)-1 satellite, which acquired the first global images of the Aurora, was officially retired by NASA February 28 after nine years of collecting scientific data. Designed to operate for three years, DE-1 performed for nearly a decade in space.

Senior Management Research Review

The Senior Management Research Review will be held Monday, April 15, from 9 to 11 a.m. in Building 1212, Room 200. All employees are invited to attend. Program accomplishments will be given by the following Langley scientists:

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:00	Neutral Network Modeling of Dynamical Systems	Donald I. Soloway (Flight Systems/ISD)
9:15	Model Order Reduction Applied to a Hot Bench Simulation of an Aeroelastic Wind Tunnel Model	Carey S. Buttrill (Flight Systems/GCD)
9:30	Experimental Aerothermodynamic Characteristics of an AFE Engine/Ballute Concept	Scott A. Berry (Space/SSD)
9:45	Oxidation Characteristics of Titanium-Aluminide Alloys	Terryl A. Wallace (Structures/MD)
10:00	Static Temperature Surveys in a Scramjet Combustor	Michael W. Smith (Aeronautics/FLMDMD)
10:15	Aerodynamic Analysis of Complex Geometries Using Unstructured Grids	Paresh Parikh (Aeronautics/Vigyan)
10:30	Director's Comments	

Following these presentations, the program directors will give status reports.

NASA Shares Sponsorship of Technology-Based Business Forum

-by Craig Murden

The NASA Langley Research Center will join area business and eduction sponsors in a conference aimed at encouraging the start-up of new businesses which are based on existing and emerging technology. NASA's involvement in the event, to be held April 24 at the Newport News Ramada Inn, supports its objective of sharing aerospace research with private enterprise which can then take advantage of opportunities in the marketplace.

Aspiring entrepreneurs will hear from people who have created successful businesses and those who know how to finance a new enterprise. Existing companies seeking to expand their product lines or pursuing government contracts should also find the agenda useful.

Speakers will include presidents and CEOs of technologically oriented businesses, attorneys versed in the legal aspects of technology transfer and financing, a former NASA employee who now heads his own company and the recently retired head of Langley's Technology Utilization and Applications Office, John Samos. Conference participants will also include people who provide local support services, many without charge, for new technology-related businesses.

Partners with NASA in sponsoring the conference are the College of William and Mary, the Center for Innovative Technology, Thomas Nelson Community College-Center for Business and Community Service, Newport News Department of Planning and Development, and the Virginia Peninsula Economic Development Council. Additional information and a brochure are available from the Langley Technology Utilization Office at 864-2482.

Secretaries' Day Fashion Luncheon

The Peninsula Chapter of the American Cancer Society is sponsoring a Secretaries' Day Fashion Luncheon Monday, April 22. The luncheon will be held from 11:30 a.m. to 1 p.m. at the Hampton Holiday Inn Conference Center. The menu includes baked chicken on a salad, rolls, dessert and beverage. Fashions from the Main Street Smart Shoppe and Beecroft & Bull Ltd. will be modeled in a tea room manner.

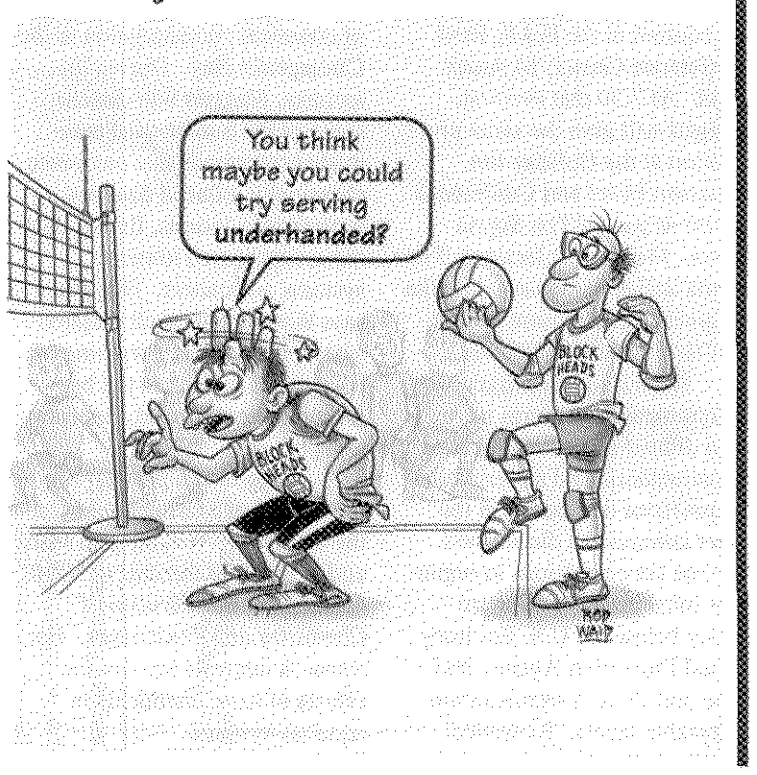
The cost is $15.00 per person. Organizations may choose to sponsor a table. A $200 donation will reserve a table with seating for 10 and entitle the business to recognition in the program. Businesses and bosses are encouraged to call the ACS office, 595-9793, for reservations and further information. Proceeds will benefit cancer research, education and patient service programs.

Traffic backups?
For information on Hampton Roads Tunnel, call 727-4864

Remember:

Eastern Daylight Time returns this weekend. Set your clocks **ahead** one hour Saturday night.

Lankley

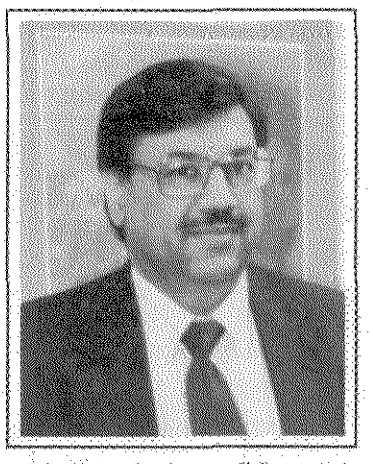


Langley Contractor Named SBA Minority Entrepreneur for 1990

Dr. Adarsh Deepak, president of Science and Technology Corporation, has been selected Virginia's Outstanding Minority Entrepreneur for 1990.

Science and Technology Corporation, a support services contractor to Langley, was established in 1979 with three employees. The firm currently employs 150 employees and provides high technology research, development and systems integration support to the government and private industry.

The firm specializes in providing research and development in remote sensing, a technology used to equip space satellites with the capability to



read atmospheric conditions and provide the interpretation of the data on a timely basis for use by field commanders.

Dr. Deepak is an internationally recognized scientist in the area of aerosols and remote sensing.

CELEBRATE AN AMERICAN TRADITION
50 YEARS OF
U.S. SAVINGS BONDS

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Remember when . . .

Looking back 10 Years to Shuttle's Beginning

First Shuttle Commander and Pilot Remember STS-1

-by James Hartsfield, JSC ***Space News Roundup***

Columbia launched the Space Shuttle program a decade ago, but for the two men who flew it, some of the strongest memories came later.

"Right about then, everybody was down on the United States. Two weeks before we launched, they (news reports) said the Space Shuttle was a lemon," STS-1 Commander John Young said recently. "But after we launched, it really changed everything. And after the flight, when we went all over the country and talked to everybody--we made about 400 appearances in about three months--you could see a lot of good spirit coming back. It was a shot in the arm to the patriotic spirit and to the get-up-and-go spirit that's inherent in the people in this country."

For STS-1 Pilot Robert Crippen, one of the strongest memories of the mission also comes not from space but from Earth.

"One thing that has really stuck in my mind wasn't during the flight or even right after the flight. It was the travels that John and I made," the Navy captain said. "Everywhere we went, we felt the sense of pride that the country had. People everywhere felt they were a part in it, not just in this country, but abroad as well, from Europe to Australia. It was out there, from small towns to big cities. When you see people react to something like that, it gives you a very good feeling, a good feeling of satisfaction."

Young had flown three different spacecraft and walked on the Moon on the next-to-last Apollo mission. But the beginning of the Space Shuttle era was surprisingly different.

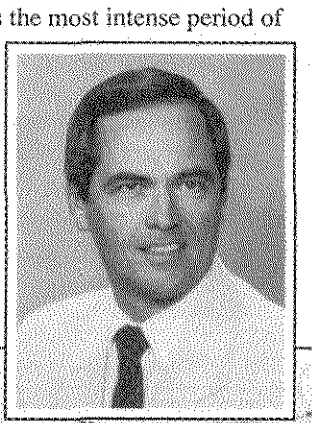
We had parades in Apollo where nobody came except the people who were in the parade," he said. "But we had parades all over the country after STS-1 and there were all kinds of people there."

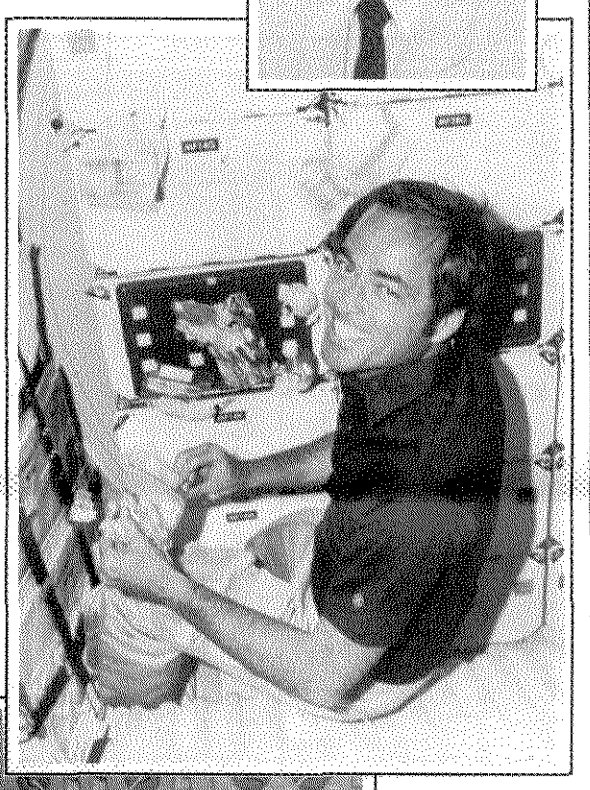
The biggest surprise for those aboard Columbia during its baptismal trip was that there were no surprises.

"We prepared for so many disaster scripts in simulations where everything went wrong. And so little went wrong, in terms of start to finish, that that is probably the most memorable thing," Young explained. "The whole mission was just like we planned it. We didn't run into anything we didn't expect. We did lose some tiles on the OMS pod, but that was about all we could see on board."

Although there were few problems apparent on board, the test flight did find unanticipated events. But the events were not seen until after landing. The fact that they posed no problems during the flight was testament to the forgiving qualities designed into the Shuttle.

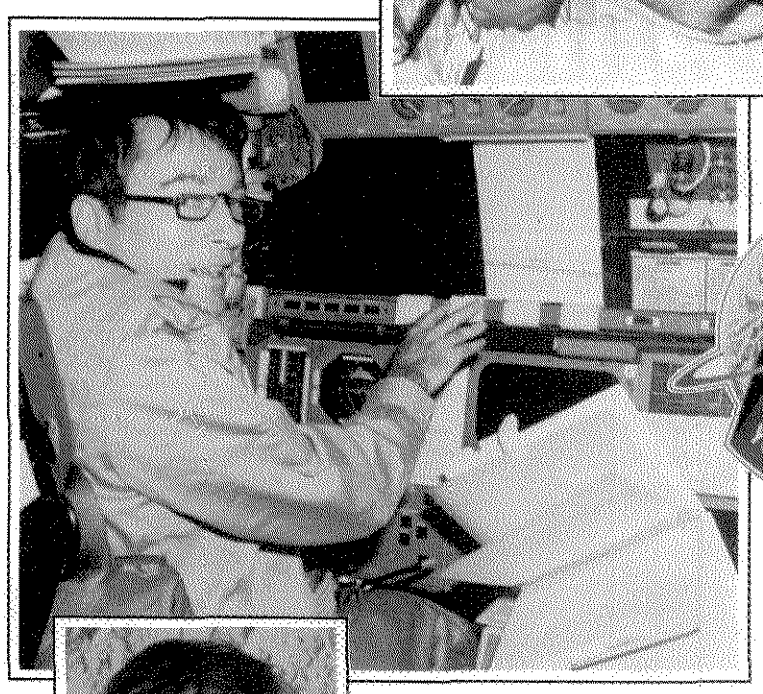
"Entry was a big unknown, but I didn't find it tense."
Robert L. Crippen

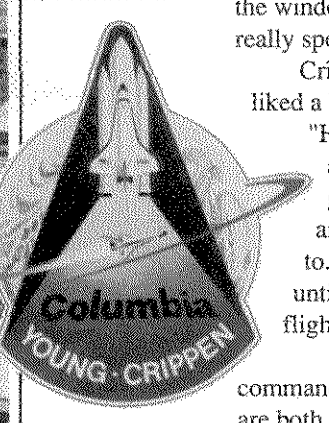




STS-1 pilot Robert L. Crippen prepares a meal aboard the Space Shuttle Columbia in Earth orbit.

Astronaut John W. Young mans the commander's station . A loose leaf notebook with flight activities data floats in Columbia's weightless environment.





"The biggest surprise was that there were no surprises!"
John W. Young

"There were a lot of things that people could see when we got back and looked at the data, On ascent, it pitched up and solid rocket booster staging was about 10,000 feet high, and, on entry, we had a bad side slip," Young said. "That's what we were supposed to be doing with the first mission, looking at those kinds of things. Fortunately, the control system was set so that you could do that kind of stuff and get away with it. It was very tolerant of not having to know the exact aerodynamics to fly properly."

For many of the Shuttle's designers, the reentry of STS-1 was the most intense period of the flight. But on board, confidence was high.

"Don't ask me why I knew reentry would work. I just had a feeling when we started reentering that it was going to go great," Young said. "But the Shuttle was working so well, I wanted to stay up there another two or three days and see how it really worked. Before we flew, there were ones who wanted to go around a rev and then land. So we thought we were very lucky to be up for two days or so. We could have done it (orbited longer), but nobody would let us."

"Entry was a big unknown," added Crippen. "But I didn't find it tense. In fact, one of the hardest things to do was to keep your mind on the job and not spend time sightseeing out the windows, because it was really spectacular."

Crippen also would have liked a longer first flight.

"Honestly, I was so busy all the time, that I didn't get a chance to sit back and enjoy it like I wanted to. I didn't get to do that until my subsequent flights." he said.

After 10 years, the commander and pilot of STS-1 are both at the top levels of management of the Shuttle program--Crippen directs the program and Young serves as a special assistant to JSC Director Aaron Cohen--and both are still inspired.

"I've always thought that the Shuttle was the real way to find out how to use space," Crippen explained. "I believe that it has proven itself to be a fantastic flying machine. Working on it is very satisfying to me personally. I'm proud of what the Shuttle has done, but I think it can do better."

"I think the Shuttle program is still new," Young added. "And there's great opportunity to improve the Shuttle, You could improve it tremendously from what we know now. There's a whole new suite of avionics out there that's been developed. It's a lot of fun to still be involved in the program. You learn something new every day. Each mission does have special contributions it's making to science and technology in the country. All of these things are really going to change the way that we live and it's really hard for people to see that."

Although the Shuttle program has had setbacks, they are a natural part of operating such a vehicle, Young said, and the future is bright.

"There are no slick management schemes in working the Space Shuttle. There just aren't." Young said. "You've got to figure out a way to do it and then just do it; it's plain old engineering.

"I think people (who provide) the maternal care and the attention to detail that everybody has to give to this program to make it work right are hanging in there and doing it. There's not anything magic about it. New technologies that allow you to do things lighter, and better engines, are really the key to the future."

The spirit and dedication of those involved with the Shuttle made STS-1 work, and they also are the key to its successes to come, Crippen said.

"The amount of teamwork that went into it then and now is exceptional. It is a marvelous flying machine, and there is a terrific team that built it. And there is a terrific team that flies it," he added.

Langley Contributions to Shuttle

-by Jean Drummond Clough

Having mounted a strong tradition of research into the performance of winged flying vehicles as well as pioneering work on hypersonic gliders, the X-15, and other typed of "space planes," it comes as no surprise that Langley made vital contributions to NASA's Space Shuttle program. In fact, Langley:

- Contributed to the technology base for a reusable space vehicle and developed preliminary Shuttle designs
- Recommended modified delta wing for vehicle rather than conventional straight wing
- Conducted wind tunnel tests (60,000 wind tunnel occupancy hours) and analysis; over one-half the Aerodynamic Design Data Book came from Langley wind tunnel tests results
- Conducted structures and materials tests to determine requirements for various areas of the vehicle
- Investigated and certified the Thermal Protection System for launch
- Developed simulations to solve problems in the Orbiter flight control and guidance systems
- Conducted landing tests on Shuttle main and nose gear tires and brake systems
- Conducted runway surface texture tests and recommended Kennedy runway modifications
- Participated in the redesign of solid rocket booster components
- Examined abort and crew bailout capabilities
- Defined ascent aerodynamic wing loads

Langley is looking to the future with advanced manned launch systems (Shuttle II), the personnel launch system and the assured crew return vehicle.

Health Corner

Lyme Disease--Should You Worry?

From April through September, the peak season for wood ticks, a relatively uncommon disease threatens to push even the highly publicized problem of AIDS out of the headlines.

Lyme disease is a bacterial infection transmitted by the bite of an infected wood tick, primarily the deer tick. The disease is named for the town of Lyme, Connecticut, where an unusual cluster of juvenile arthritis cases occurred in 1975 due to this disease.

The outbreak generated considerable publicity and raised physician awareness of the disease. The symptoms of lyme disease are so similar to other "flu-like" illnesses, it was probably frequently misdiagnosed prior to the mini-epidemic.

The unique indicator of infection is an expanding circular red rash with a clearing center located around the tick bite. This "bulls eye" lesion occurs in the majority of cases. Weeks or months later joint, heart or brain inflammation occurs as a complication. Early treatment with appropriate antibiotics is effective in the majority of cases.

Despite all the newspaper column-inches devoted to it, lyme disease is not common, probably because only a small proportion of ticks carry the infection. Regardless, anyone who spends time in grassy or wooded areas should take reasonable precautions against tick bites:

- o wear light-colored clothing so ticks will be easier to see;
- o tuck trousers into sock tops;
- o use tick and bug repellent;
- o check carefully for ticks before bedtime.

If a tick is found, remove it without squeezing or crushing on the skin. Should you note an expanding warm red ring with central clearing, consult your physician.

Sick Leave for Adoptive Parents

Public Law 101-509, the Treasury, Postal Service and General Government Appropriations Act for Fiscal Year 1991, provides for testing the feasibility of granting sick leave for purposes related to adoption.

The purpose of this measure is to allow adoptive parents more equality with biological mothers who currently use sick leave for prenatal visits to the doctor. A prospective adoptive parent may use sick leave for appointments with adoption agencies, social workers, attorneys, and to attend court proceedings. Other activities related to adoption may also be appropriate for sick leave as well.

The restrictions which apply to biological children with regard to the use of sick leave also apply to adopted children.

Such requests should be documented on Langley Form 54, "Request for Special Leave or Excused Absence," forwarded through line managment to the division level, and approved by John J. Cox, associate chief, Human Resources Management Division. This test period ends September 30, 1991.

Questions may be directed to Linda Park, ext. 42610.

Notes of Thanks

Sadie L. Boyer writes: "I want to thank all my NASA and non-NASA friends who contributed to and participated in my retirement social. The party was excellent and the gifts were great. I especially want to thank my husband Dale whose love and support over the years made the hard times easier and the good times better. I cherish my years at Langley and am proud to have had the opportunity to work with so many outstanding people."

David J. Carter Jr. writes: "On behalf of my family, I wish to thank all my friends and associates who made my retirement party a fun time for us to remember. Thank you for coming and honoring me with your stories, gifts and kind words. For those who arranged the party and participated, a special thanks. NASA has been good to me, and you have been wonderful! Thank you so very much."

Maywood L. Wilson writes: "A special thanks to all who made my retirement party a wonderful and memorable experience. My family and I are very grateful for the gifts, the jest and, most of all, for those who shared this 'once in a lifetime experience' with me. I will surely miss the old routines and the wonderful people with whom I have had the privilege to work over the years. I will certainly return to visit on special occastions."

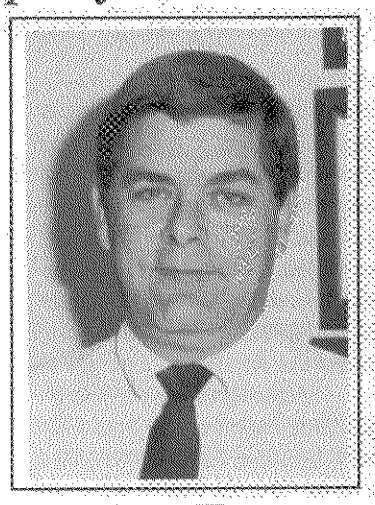
Linda E. Edmundsen writes: "Words cannot describe how I felt when you donated leave to me for my accidental injury. I want to thank you from the bottom of my heart. Thank you so much for keeping me in your thoughts and prayers. All of the cards, visits, gifts and food were most appreciated. You will never be forgotten. It's wonderful having friends like you. Life is so precious--take one day at a time."

Outstanding Property Custodians Named

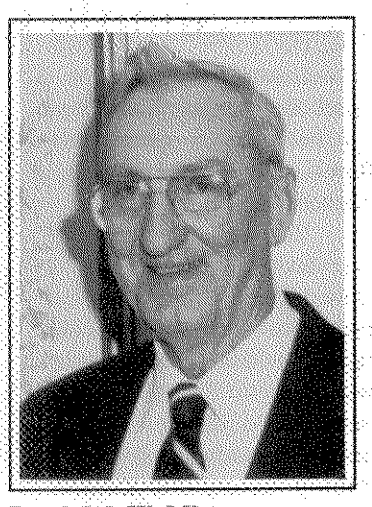
Langley's Equipment Management Section has cited two individuals for the outstanding manner in which each has performed his responsibilities as property custodian.

John H. Crosby III, supervisor, Technical Support Section B, Laboratories Operations Branch, was selected Outstanding Property Custodian of the Quarter, July-September 1990. He was presented a certificate of appreciation by Charles G. Evans, head, LMB, in a ceremony November 9.

Randolph W. Mixon, Automation Technology Branch, Information Systems Division, was honored for the quarter October-December 1990. Mixon was presented a certificate of appreciation by Ronald R. Krodel, chief, MSD, in a ceremony February 20.



John H. Crosby III



Randolph W. Mixon

Sports News

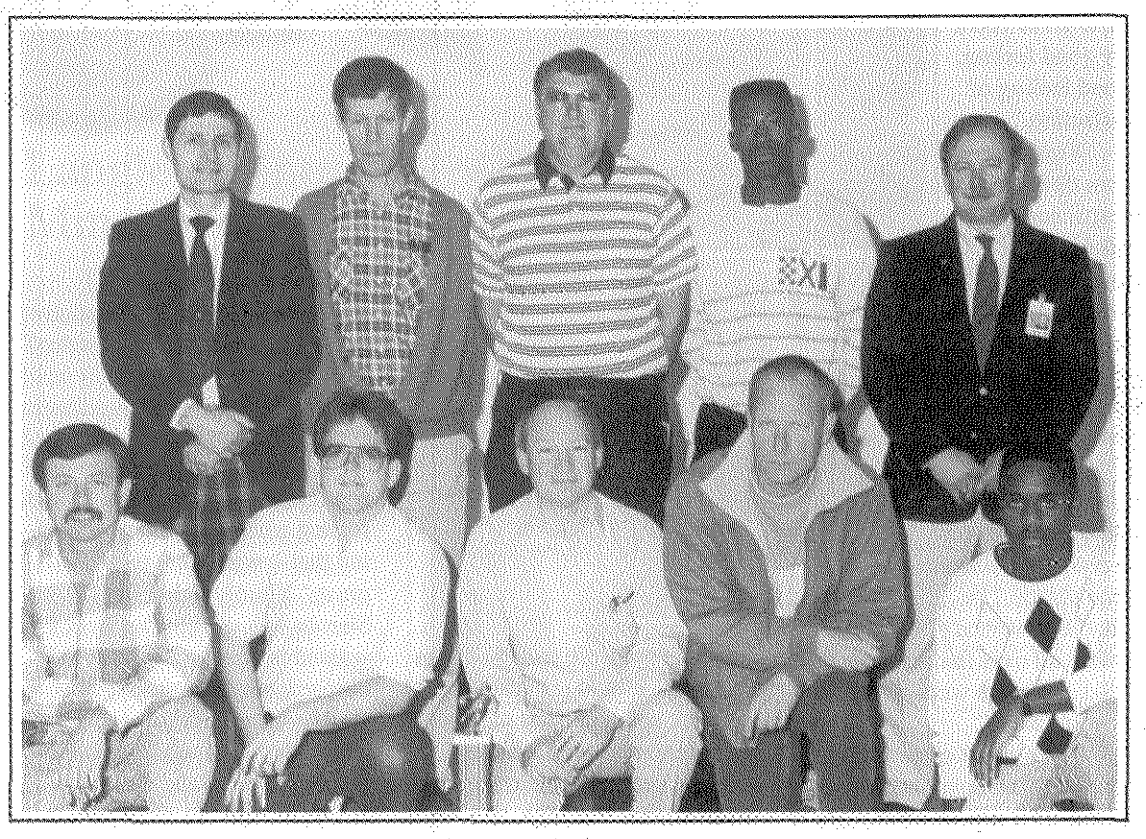
FALL D-LEAGUE VOLLEYBALL SEASON CHAMPS, "Night Court," are shown (kneeling, L to R) Melanie Long, Tim Berry, Lisa Jones; (standing) Reggie Brown, Tina Hawks, Phil Robinson and Tom Frasher. Not pictured are Carlito Barnes and Craig "Beef" Hyle.

Runners Club Announces Upcoming Races

NASA Spring Intercenter competition races are upcoming. The 10-km races will be held April 8, 18, 22 and May 2; the 2-mile races on April 11, 25 and 29. Races start at 5 p.m. on Doolittle Road. In addition, a 2-mile race will be held April 16 on the Bethel High School track starting at 12 noon.

All NASA employees, retirees, on-site contractors and co-ops at work earn points for Langley by participating. Walkers are welcome in all races.

For more information on the races or the Runners Club, call Richard Shearer, ext. 47036.



THE GOUGERS are the regular season and tournament champs of NASA D-League basketball for the 1989-90 season. They compiled a 16-0 record. Team members are (front row, L to R) Robert Fox, Craig Humes, Dale Bess, Drew Wallio, Raymond Haynes; (back row) Larry Bement, Larry Hoffman, Ron Weber, Troy Brown and Ed Yarrington. Team members not pictured are Don Humes, Ron Martin and Woodrow Whitlow.

People & Places

In the Spotlight

Employees Recognized for Superior Achievement

Pamala L. Howard, secretary, Facilities Engineering Division, has been granted a superior accomplishment award for her contributions in coordinating the Systems Engineering and Operations' strategic plan.

Robert N. Barnes, supervisory engineering technician, Acoustics Division, has been recognized "for exceptional leadership and technical contributions in upgrading the Supersonic Jet Noise Facility, Building 1221A."

John R. Gleason, engineering technician, Operations Support Division, has been cited "for exceptional performance in providing leadership and technical support to Low Pressure Physics Laboratories, High Energy Science Branch, Space Systems Division."

Robert E. Harris, engineering technician, Fabrication Division, has been recognized "for exceptional fabrication performance on the AXI Ejector Model."

Alesia L. Williams, clerk-stenographer student trainee, Space Systems Division, has been cited for "on-going dependability and diligent hard work in providing clerical assistance to the Vehicle Analysis Branch and the Space Systems Division office during a period of secretarial transition."

Willis P. Simmons, engineering technician, Operations Support Division, has been recognized "for exceptional performance in the timely establishment of a new silver brazing course of instruction for Facilities Operations and Apprenticeship personnel."

John C. Covington, electronics technician, Research Information and Applications Division, has been cited "in recognition of the effort extended in keeping the Video Section operational during the start-up phase."

Kevin A. Harris, computer clerk, Management Support Division, has been recognized "for exemplary performance and exceptional service in support of the Transportation and Warehousing Section, Logistics Management Branch."

Kathleen L. Hillard, technology utilization specialist, Research Information and Applications Division, has been cited "for outstanding contributions in administration of NASA's new technology and patent rights clauses and the development of the technology utilization network system software."

Andrew J. Hansborough, chief, Research Information and Applications Division, has been recognized "for exceptional contributions in effecting significant increases in the productivity of scientific and technical information support to the Langley Research Center mission."

Lois D. Collier, lead accounting technician, Financial Management Division, has been cited "for exceptional service and professionalism in the control of authority warrants and allotments for Langley Research Center which significantly contributed to the NASA mission."

Edward C. Williams, engineering technician, Fabrication Division, has been recognized "for exceptional performance in support of the 8-Foot High-Temperature Tunnel Project."

David R. White, engineering technician, Fabrication Division, has been cited "for exceptional performance in support of the Large Gap Magnetic Suspension System."

Brian J. Jensen and **Paul M. Hergenrother**, chemical engineers, Materials Division, have been recognized "for developing fundamental information on toughening of thermosets."

Jeffrey A. Parker, program analysis officer, Industry Relations Office; **Richard J. Bendura**, aerospace technologist, Science Missions, Atmospheric Sciences Division; **Jeanne D. Covington**, contract price/cost analyst, Acquisition Division; **Charles G. Evans**, supervisory logistics management specialist, Management Support Division; **Samuel A. McPherson III**, supervisory computer engineer, Analysis and Computation Division; **Barbara A. Pasternak**, head, Visual and Printing Services Branch; and **Richard J. Siebels**, contract specialist, Acquisition Division; have been cited "for outstanding contributions to the Consolidated Logistics, Security and Scientific Information Contract Source Evaluation Board."

In response to a SCAN team recommendation, notification of such honors are being published as close to the time of the award presentation as possible. Congratulations to these super achievers.

Discount Tickets at Souvenir Counter

Discount tickets to the following area attractions are available for purchase at the Visitor Center Souvenir Counter: AMC movie theaters, Busch Gardens, Colonial Williamsburg, Kings Dominion, Tidewater Dinner Theater. Magic Kingdom Club membership cards are also available.

Coming soon are discount tickets for Water Country U.S.A., Hampton Dinner Theater and Hampton Comedy Club. For further details and prices, call 864-1585.

Profile of a Volunteer

Visitor Center Honors Volunteers in April

-by Christine Heithoff

Mary Levin, a Visitor Center volunteer, greets everyone who walks in with her gentle smile, warm wit and keen intelligence. As a lobby aide on Thursday afternoons, Mary is always eager to help visitors by answering their questions, discussing the local area and its history or even suggesting a good seafood restaurant. Whether they're young children, adults or foreign visitors, Mary enjoys meeting them all, which is one of the reasons she decided to volunteer at the Visitor Center.

With a yearly attendance of over 200,000, Visitor Center attracts visitors from all over the world in addition to the local area. Mary says it is not unusual to get quite a variety of people at the Center. A normal afternoon may include a military reunion group comprised of members from many different states, a school group from Newport News, a retired couple from England and even an Australian visitor offering her a "G'day."

"Mary is a dedicated, people-oriented volunteer who always puts the visitor first. She never fails to personally greet each visitor and has that special talent for making our guests feel welcome," says Tom Bastian, volunteer coordinator. "She also helps by working extra hours and has logged over 235 hours since last April."

Originally from Sault Ste. Marie, Mary and her husband L. Ross Levin graduated from the University of Michigan in 1942 and then moved to Hampton where Levin began his NACA/NASA career. Together, they raised three daughters and a son and now have seven grandchildren and one great grandson. Their son, Tom Levin, graduated from the Langley Apprentice School and currently works in the Operations Support Division.

Mary lost her husband in October 1989. She cherishes the wonderful memories of their years at NASA. Because of her husband's strong dedication to NASA, Mary feels she continues his commitment by representing NASA as a volunteer. "I'm very proud to be helping at the Center," says Mary.

Besides her work at the Visitor Center, she is also a volunteer for the American Cancer Society. For the past 17 years as part of the "Reach for Recovery" program, she counsels cancer patients who have recently undergone surgery. In addition to her volunteer work, she is a member of the Women's Club of Hampton, the Golden Thimble Needlecraft Club and is church historian and a member of the building committee for Wesley United Methodist Church in Hampton.

When Mary is relaxing at her Riverdale home, you will often find her tending her herb garden or making handicrafts. An easy way to her heart is an invitation for her favorite meal, Chinese food.

Mary Levin goes above and beyond what is expected to ensure that visitors have an enjoyable experience at the Center. Her genuine concern for people is apparent in all her dealings with our visitors. It is because of volunteers like Mary Levin that the NASA Langley Visitor Center is one of the most popular attractions in the state.

Celebrate an American Tradition

This year marks the fiftieth anniversary of the U.S. Savings Bond Program. Throughout those 50 years, savings bonds have afforded millions of Americans an opportunity to save for themselves and for their families. At the same time, savings bonds help the government meet its financial obligations.

Savings bonds have become the most widely held security of average Americans. They are a tradition--because bonds are flexible, within the reach of the small saver and because they are guaranteed by the U.S. government.

Savings bonds earn market-based interest rates, currently 7.19 percent, if held five years of more. Bonds earn a guaranteed minimum rate of six percent.

There is no easier, automatic way to save than through the payroll savings plan at NASA Langley. Simply fill out the allotment card and include the amount you want put towards the purchase of savings bonds. Bonds begin to add up while the average saver hardly misses the money put aside automatically. After six months, bonds are available to be cashed.

Tax liability on the interest on U. S. savings bonds can be deferred from federal income tax and is totally exempt from state and local income tax.

Savings bonds have an added tax benefit that can make higher education more affordable. Bonds purchased after January 1, 1990, can earn interest totally tax-free if cashed the year in which tuition charges and expenses for a college education are incurred.

The LaRC Exchange Council is sponsoring a drawing to promote the 1991 Savings Bond Campaign at Langley. Two $100 U. S. savings bonds will be awarded--one bond to a new participant and one bond for an increase in allotment. To be eligible for the drawing, simply complete the enrollment card you will receive in the mail. Winners will be announced in the **Researcher News**.

Every financial decision includes considerations such as risk, taxes and eventual return on the investment. Consider the advantages of savings bonds. Celebrate an American tradition --buy bonds.

LaRC 1991 U. S. Savings Bond Campaign
April 15 through May 18
Celebrate a 50-Year-Old Tradition--Buy Bonds

Happenings

SPECIAL LAA SOCIAL will be held Friday, April 12, from 4 to 8 in the H.J.E. Reid Conference Center, 14 Ames Road. Music for the Spring Fever Social will be provided by disc jockey Bill Lawrence. There will be a $1 cover charge.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, from 5 to 6 p.m., in the NASA gym. Cost is $12 per month. First class is free.

NASA TOASTMASTERS meet the second and fourth Wednesdays of the month in the H.J.E. Reid Conference Center. Next meeting is April 10 from 11:30 a.m. to 1 p.m. Guests are always welcome.

INTERESTED IN NASA GARDEN CLUB? For new member information, call Bill Lassiter, ext. 47022, or Mac Jackson, ext. 47654.

ANNUAL ALUMNI DANCE will be held at 8 p.m., Saturday, April 27, in the H.J.E. Reid Conference Center. All NASA employees are welcome. The dance is free but reservations are suggested. Call Abe Leiss, 877-2939.

ALUMNI ASSOCIATION luncheon will be held Tuesday, April 9, in the executive dining room of the NASA cafeteria. Former employees Robert Boswinkle and Bill Reed will speak on "Education Outreach."

MEET VA TECH. Program for high school students and their parents, Sunday, April 7, 1 to 3 p.m., Sheraton Inn Coliseum, Hampton.

PENINSULA COMMODORE USERS GROUP meets the second Friday of the month at 7 p.m. in the Christopher Newport College Administration Building. For details, call Bill Petitt, 898-3855.

INFERTILITY SUPPORT group provides emotional and educational assistance to couples facing this challenge. Call 877-3094 or 249-8815 for more information.

TELA TAX SERVICE. Individual, business, federal, state. Member National Association of Tax Practitioners. Small business bookkeeping. By appointment. Call 874-3121.

LAFB OFFICERS' CLUB is a membership club. Call 766-1361 for more information.

FOR RENT: TIME SHARE at Ocean Landings, Cocoa Beach. Week of May 12 or 19 or any week in December. $300 per week. Call Abe Leiss, 877-2939.

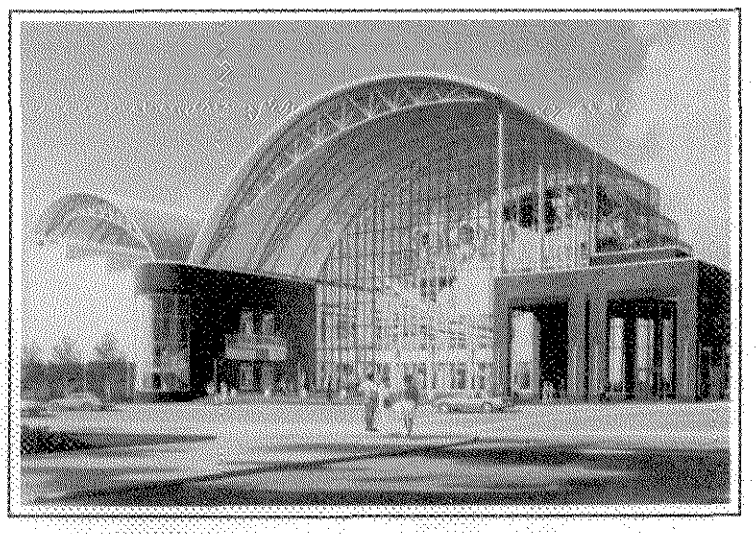
FOR SALE: GUITAR. Black Univox electric solid body guitar with case; Humbucking pickups; excellent condition. $100 or best reasonable offer. Call 249-1866 after 5:30 p.m.

FOR SALE: AUTO. 1986 Isuzu IMARK, AT, AC, cassette player, 76,000 miles. $1,000 or best offer. Call 723-4939.

WANTED TO BUY: OLD CLOCKS, running or not. Call 838-7323.

Retirement Party

Snowden "Dick" Mills will be honored at a retirement dinner Tuesday, April 16, at 6 p.m. at Fisherman's Wharf, 14 Ivy Home Road, Hampton. The buffet will be served at a cost of $19 per person, including gift. There will be a cash bar. Contributions for gift only are graciously accepted. Please make check payable to Susan Price and send to Mail Stop 424 by April 10.



VASC Celebrates "Topping Out"

The Virginia Air and Space Center and Hampton Roads History Center invites NASA employees and contractors to their "Topping Out" celebration Saturday, April 27, from 6 p.m. to 8 p.m. This sneak preveiw will be the first event held in the Center at 600 Settlers Landing Road in downtown Hampton.

"Topping Out" occurs when the highest piece of material is placed on a building and is traditionally celebrated with a party. Ann Phillips, a Center board member who is chairing the "Topping Out" celebration, agrees. "There's a real feeling of life in the building now. It's going to be especially exciting to be part of the first event ever held in the Center."

A spectacular seafood buffet, cocktails, live entertainment and door prizes will be part of the celebration. Tickets to the "Topping Out" are $35 per person and may be reserved by calling (804) 727-0800. Free parking will be available in the new parking garage across the street from the Center.

The Center, currently under construction, is scheduled to open in April 1992 and will be the official NASA Langley Visitor Center.

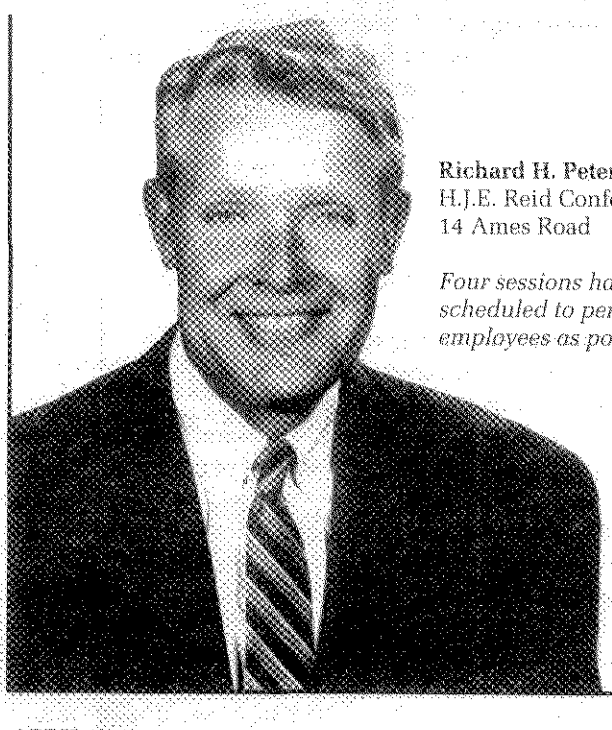
BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

Researcher News

State Of The Center



Richard H. Petersen
H.J.E. Reid Conference Center
14 Ames Road

Four sessions have been scheduled to permit as many employees as possible to attend.

APRIL 10

1:30 - 2:15 p.m.	Office of the Director Aeronautics Directorate Fabrication Division
3:00 - 3:45 p.m.	Electronics Directorate Management Operations Directorate

APRIL 11

8:30 - 9:15 a.m.	Space Directorate Flight Systems Directorate Operations Support Division
10:00 - 10:45 a.m.	Systems Engineering and Operations Directorate **except Fabrication Division and Operations Support Division* Structures Directorate

This invitation is also extended to all retirees and support services contract personnel. These individuals are encouraged to attend the session scheduled for the directorate they support(ed).

NASA
National Aeronautics and Space Administration
Langley Research Center

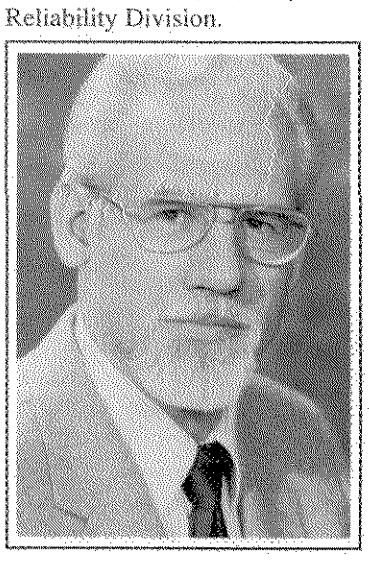
Volume 5, Issue 8 April 19, 1991

Researcher News

Bi-weekly Employee and Contractor Publication

Van Cleave Named Assistant Division Chief, SSQR

Jon L. Van Cleave has been named assistant chief of the Systems Safety, Quality and Reliability Division.



He assumed the position April 1 when management of the Scout Project transferred to the Goddard Space Flight Center.

Van Cleave assists in the direction, development and implementation of Center policy for safety, quality and reliability activities, encompassing ground and flight hardware, as well as environmental health and environmental compliance.

Van Cleave began his NASA career in June 1964 as an engineer working on the Scout Project, assigned to the Langley Mission Support Office at Vandenberg Air Force Base, Calif. He became head of Langley's Resident Engineering Management Office at Dallas, Texas, in June 1964; head of the Scout Project Reliability and Quality Control Office at Langley in April 1974; and was deputy manager of the Scout Project Office from June 1980 until he was named manager in June 1988.

Dwoyer Key Part of Special Live NASP TV Production

-by Craig Murden

A NASA manager pursuing new technology that can make the National Aero-Space Plane a reality was featured on a unique satellite television program beamed live to industry and academic audiences around the country April 9. Appearing as one of the major presenters in the broadcast, "The National Aero-Space Plane--A National Challenge," was Langley's Chief of the Fluid Dynamics Division Douglas L. Dwoyer.

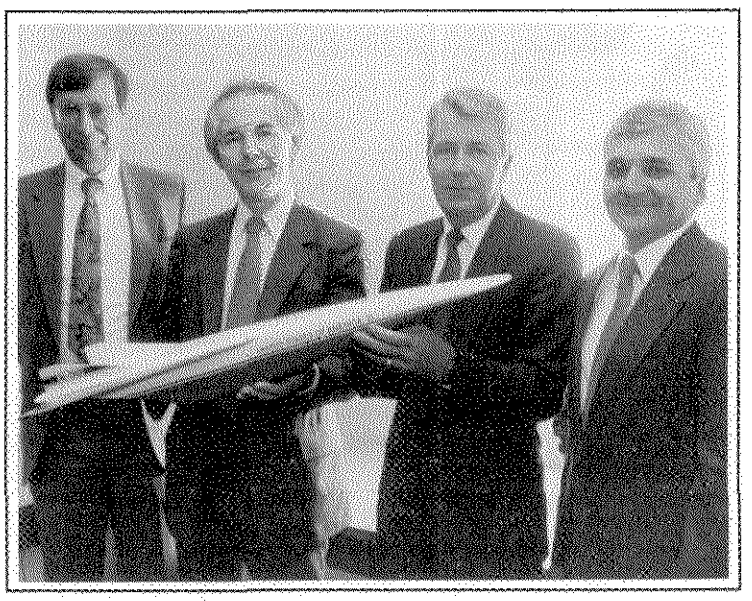
Dwoyer covered the challenges facing designers of NASP technology in the computational fluid dynamics area. His presentation, and the interactive questions from engineers, professors and students across the nation that followed, examined the hurdles and progress in such basic problem regimes as achieving hypersonic airplane performance using airbreathing engines, the difficulties of using traditional wind tunnel approaches at high Mach numbers and the physics of hypersonic airplane flow fields.

More specifically, he covered problems in code validation using wind tunnel data at Mach numbers near 20 and for hypersonic compression corner flows-to-flows about a NASP-like configuration. The flow complexities of forebody/inlets, combustors and nozzle/afterbodies were similarly highlighted. He also pointed out the critical role that supercomputers play in dealing with the large-scale computational requirements generated by this cutting-edge research. He said that, without the enormous power of machines like the Cray Y-MP whose parallel and vector processing capabilities handle billions of mathematical operations each second, the NASP research could not go forward.

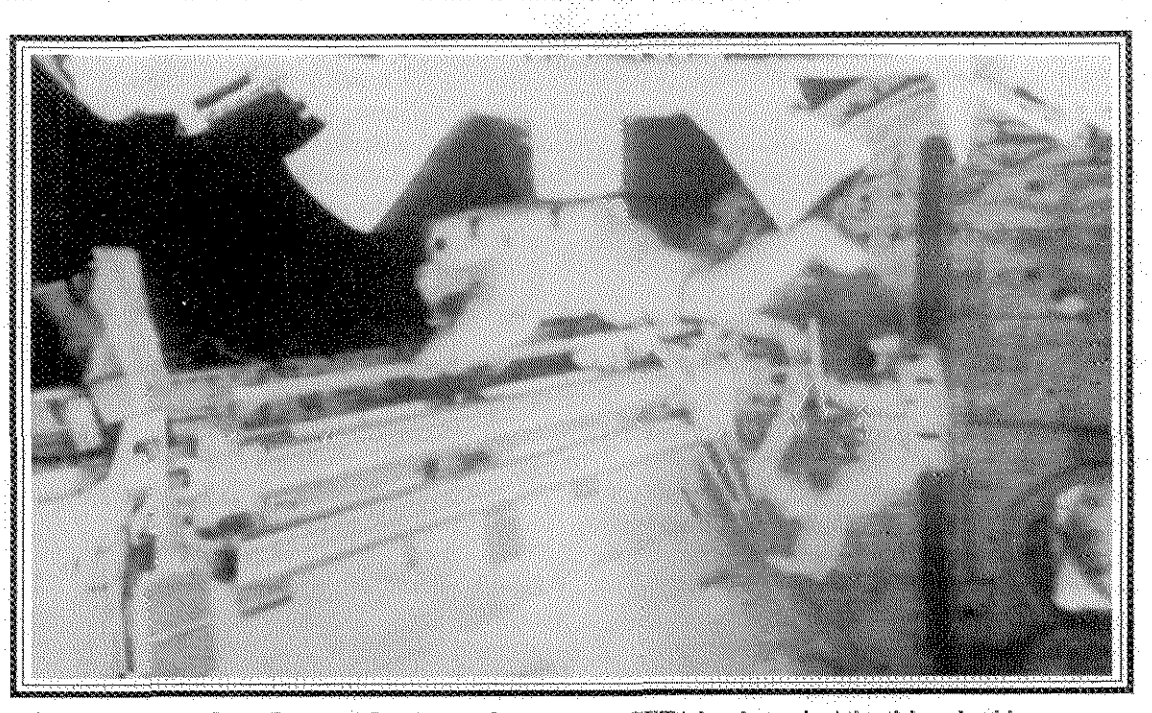
The broadcast, which aired to a national audience of industrial concerns, colleges, universities and secondary schools, was introduced by Dr. Robert Barthelemy, director of the NASP Joint Program Office. He oriented viewers to the NASP concept and identified the major technological challenges faced by the project, which is jointly managed by NASA and the Department of Defense. He also outlined the three broad areas that were developed during the broadcast: flight systems, materials and structures, and computational fluid dynamics.

This introductory portion was telecast as a public service and was expected to have reached several hundred thousand viewers. Joining Langley's Dwoyer, and presenting the first two of these subjects in the subscription portion of the program, were Kevin L. Petersen, chief of the Dynamics and Controls Branch, Ames/Dryden, and Dr. Terence M. F. Ronald of the NASP Program Office, Wright-Patterson AFB.

The special three-hour presentation was sponsored by NASA, the Institute of Electrical and Electronics Engineers and the Virginia Space Grant Consortium (VSGC). The program was produced by Old Dominion University from studios at the Peninsula Graduate Engineering Center in Hampton, home of the VSGC. VSGC Director Mary Sandy said, "Because the technology developed for the NASP program is expected to lead to a new class of future aerospace vehicles, this is an excellent program to share with students. We hope many of those who viewed the program will be motivated to become scientists, engineers and technicians of the 21st century."



NASP TELECONFERENCE PARTICIPANTS are (L to R) Dr. Douglas L. Dwoyer, Dr. Terrence M. F. Ronald, Dr Robert Barthelemy and Kevin L. Petersen.

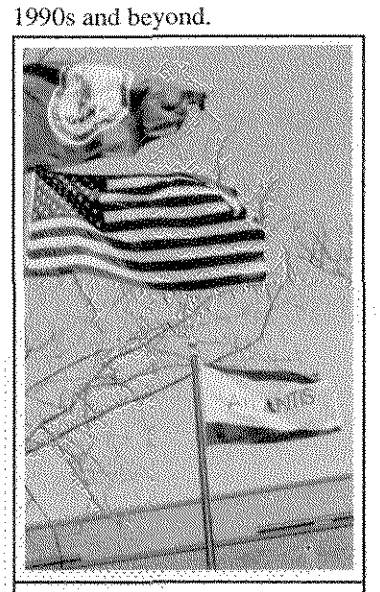


STS-37 Astronauts Jerry Ross and Jay Apt perform tests on CETA hardware in Atlantis' payload bay.

They Rode the Rail that Langley Built

*Special to the **Researcher News** by H. Keith Henry on location at Mission Control, Johnson Space Center*

In the second of their historic spacewalks last week, astronauts Jerry Ross and Jay Apt rode the rail that Langley built and smoothed the way for human movement outside Space Station Freedom in the mid-1990s and beyond.



The Atlantis flag joins the U.S. and Virginia flags in front of Langley Headquarters. The orbiter flag flew 24-hours-a-day during the STS-37 mission.

Lessons learned from the spacewalk will be applied to the design of Freedom, now scheduled for on-orbit construction beginning in 1996.

The rail (or track), mobile base and associated hardware--all provided by Langley--performed flawlessly. The hardware was part of CETA (see March 8 and 22 issues), an experiment to evaluate concepts for human-powered movement along the truss structure of Freedom.

The two EVA astronauts attached themselves to various carts and easily powered their way up and down the track attached to the inside wall of Atlantis' payload bay. In fact, they moved through the tests so effortlessly that they made up time lost earlier in the day. Each of the carts--manual, mechanical and electrical--appeared to almost float down the track at speeds up to six feet per second. The carts were provided by Johnson Space Center, which also provided overall CETA project management.

During the six-hour spacewalk, half of which was devoted to CETA, Ross commented that very little effort was needed to propel or stop the carts. Each of the astronauts favored the manual cart, where the astronaut pulled himself along using a handrail built into the track. The manual cart is the smallest and simplest of the three cart concepts.

After the CETA experiment, the EVA continued with other tests also related to crew movement and work in space.

Ross set a Shuttle record for the longest total EVA time in space. With his EVA time from a previous flight, Ross now has logged 23 hours, 9 minutes on-orbit spacewalking--more than any other Shuttle astronaut but slightly less than the all-time U.S. record of 24 hours, 14 minutes logged by Gene Cernan during his Gemini and Apollo flights.

-photo by Fred Jones

News Briefs

Endeavour Rollout Scheduled for April 25 --- The rollout of NASA's newest Space Shuttle orbiter, Endeavour, is scheduled for April 25 at a ceremony at Rockwell International's Space Division Facility, Palmdale, Calif. The rollout will be the centerpiece of a ceremony set for 2 p.m. EDT. NASA Administrator Richard Truly and members of Endeavour's first mission flight team will participate . Endeavour is then scheduled to be mated to NASA's new 747 Shuttle Carrier Aircraft and flown to Kennedy Space Center, Florida, staying overnight at Ellington Field, near Johnson Space Center, enroute.

NASA to Feature Space Station Freedom at Paris Air Show --- The Space Station Freedom will highlight the NASA exhibit at the 39th Paris Air Show, Le Bourget, France, June 13-23. The centerpiece of the 7,000-square-foot exhibit will be a full-scale mock-up of a Space Station Freedom module. Visitors will enter a module that combines the space station's habitat and laboratory facilities into one. They will view the crew quarters, the personal hygiene and exercise facilities and the galley. In the laboratory portion, there will be a furnace facility, protein crystal growth facility, modular containerless processing, life support system "salad machine" and gas grain simulation facility on display. Japan, Canada and the European Space Agency are partners with NASA in Space Station Freedom.

Hot Spot, Volcanic-Like Features Identified on Venus --- Venus may be venting interior heat through giant hot spots on the surface of the planet. Magellan geologist Dr. Ellen Stofan says these hot spots, and other circular and oval-shaped features found on Venus, are all associated with volcanism. These features range in size from 100 miles in diameter to over 650 miles across. NASA is releasing the first computer compact disk containing Magellan radar mosaics of Venus. The National Space Science Data Center will distribute the CD versions of the Magellan data to other investigators and to the public.

Smithsonian Astrophysical Observatory Wins AXAF Contract --- NASA's Marshall Space Flight Center, Huntsville, Ala., has selected the Smithsonian Astrophysical Observatory, Cambridge, Mass., for negotiations leading to award of a contract to design, develop and operate a science support center for the space-based Advanced X-ray Astrophysics Facility (AXAF). Scheduled for launch in 1998, AXAF will be the third in NASA's series of Earth-orbiting Great Observatories. The primary role of the science center will be to provide a service to the international scientific community by developing and overseeing an observation program for the X-ray telescope and by managing reception and distribution of the data it collects.

Magellan Achieves Primary Mission Objective Early --- The Magellan Project at NASA's Jet Propulsion Laboratory, Pasadena, Calif., claimed an early victory and announced that the spacecraft had achieved its objective for the primary phase of the Venus mission more than a month before the end of the first 243-day mapping cycle. That is one Venus rotation beneath the orbiting spacecraft. Project Manager Tony Spear said because of the quality of the radar images and the excitement they have generated in the scientific community, an extended mission for a second 243-day mapping cycle has been approved by NASA and will begin May 16. Magellan reached its goal of mapping 70 percent of the planet on April 3; by the end of the first mapping cycle May 15, the spacecraft will have acquired 84 percent of the planet's surface.

Teacher-In-Space Flight Decision Delayed Until 1992 --- NASA Administrator Richard H. Truly decided, based on a recent policy review, that NASA's Space Flight Participant Program will be held in abeyance for another year. Under this program, NASA would provide space flight opportunities for persons outside the professional categories of NASA astronauts and payload specialists. NASA previously has indicated that when it resumes the program, the first priority will be given to a teacher in space in fulfillment of space education plans.

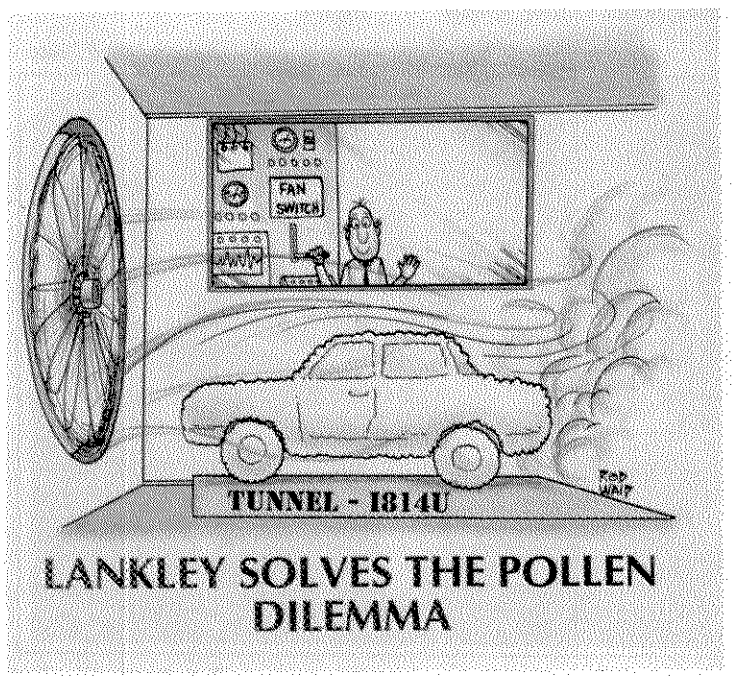
Petersen to Speak at Space Roundtable

The Virginia Space Business Roundtable will hold a dinner briefing meeting Tuesday, May 14, at the Holiday Inn, Coliseum. The 7 p.m. dinner will be preceded by a social at 6 p.m.

Keynote speaker will be Langley Director Richard H. Petersen, who will present an overview of Langley Research Center, highlighting the programmatic division between the Center's aeronautical and space projects.

The cost is $17. For more information, contact Steve Cooper, Virginia Space Business Roundtable, Thomas Nelson Community College, 825-2709.

Lankley



Position Open

The following vacancy is open to LaRC employees presently serving under permanent civil service positions:
91-22: Mechanical Engineering Technician, GS-802-9 or 10. Facilities Engineering Division. Closes April 24.

NASA Issues Modifications to Space Shuttle Manifest

NASA managers have announced adjustments to the February 1991 Mixed Fleet Manifest. The modifications were necessary after the STS-39 mission, scheduled for March with Space Shuttle Discovery, was postponed due to cracks on the orbiter's external tank door drive mechanism.

The flights scheduled for calendar year 1991 began with Space Shuttle Atlantis and the Gamma Ray Observatory which flew in early April. Following repairs to the door drive mechanism housing, Discovery will fly the STS-39 mission in May. The projected date for STS-40/ Spacelab Life Sciences mission aboard Shuttle Columbia also remains in May. Columbia will be taken off line, as planned, for structural inspections and modifications for Extended Duration Orbiter capability following completion of the STS-40 mission.

The Tracking Data Relay Satellite mission originally scheduled to fly on Discovery in July is now on Atlantis in August. The Defense Support Program mission remains on Atlantis but will move from August to December. These two adjustments preserve the Agency's capability to fly Discovery with the Upper Atmosphere Research Satellite payload during its required science window with launch projected now for October.

The International Microgravity Laboratory mission which was planned for December 1991 will become the first flight in calendar year 1992. The mixed cargo flight of the Tethered Satellite System and the European Space Agency's European Retrievable Carrier originally scheduled for Febraury on Shuttle Discovery will move to August 1992 and will fly on Space Shuttle Atlantis.

Flights in the mid-1992 time frame remain in their original manifested positions with Atlas-1 in April, the Intelsat reboost mission in May which will involve the first flight of Space Shuttle Endeavour and the U.S. Microgravity Laboratory in June. Spacelab-J and the mixed cargo flight of the U.S. Microgravity Payload and the Laser Geodynamics Satellite also remain as scheduled for September 1992. The Canadian Experiment payload also is joining this mission.

Adjustments to the manifest beyond September 1992 are still being examined and will be announced at a later date.

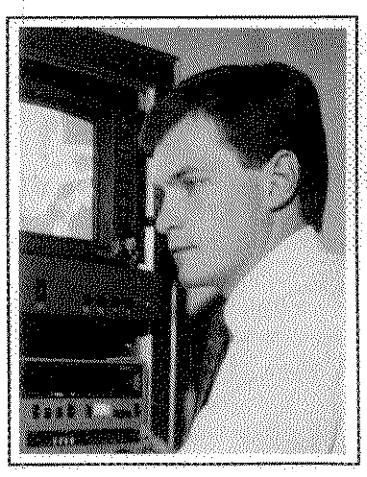
Updated Space Shuttle Manifest

Mission	Date	Vehicle	Payload
1991			
STS-39	May	Discovery	AFP-675/IBSS
STS-40	May	Columbia	SLS-1
STS-43	Aug.	Atlantis	TDRS-E
STS-48	Oct.	Discovery	UARS
STS-44	Dec.	Atlantis	DSP
1992			
STS-42	Feb.	Discovery	IML-1
STS-45	Apr.	Atlantis	ATLAS-1
STS-49	May	Endeavour	INTELSAT-R
STS-50	June	Columbia	USML-1
STS-46	Aug.	Atlantis	TSS-1/EURECA
STS-47	Sept.	Endeavour	Spacelab-J
STS-52	Sept.	Columbia	USMP/LAGEOS/ CANEX

Weatherford Named Student of Year

Timothy L. Weatherford, Langley computer science co-op from the University of Kentucky, has been named Cooperative Education Division Student of the Year by the Cooperative Education Association and the Cooperative Education Division of the American Society for Engineers and Education.

Weatherford was nominated by Evelyn D. Harris and was presented a cash award at the Cooperative Education Co-op Conference in Denver.



Timothy L. Weatherford

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Space Station Restructuring Plan Completed

NASA has delivered the "restructuring" report to the Congress, outlining an extensive redesign of the Freedom space station. The new design is cheaper, smaller, easier to assemble in orbit and will require fewer Shuttle flights to build.

Major new features of the redesigned space station--shorter U.S. laboratory and habitat modules that can be outfitted and verified on the ground and a pre-integrated truss that can be assembled on the ground and tested with all of its subsystems intact--will significantly reduce intravehicular activity (IVA) and on-orbit extravehicular activity (EVA) needed to build and maintain Freedom.

"This new design for Space Station Freedom accomplishes every major goal we set for ourselves when we kicked off this effort last November," said William B. Lenoir, associate administrator for Space Flight. "We took the directions from Congress and the Augustine Commission recommendations to heart, and the program we are announcing addresses each and every one of their requirements.

"We've cut costs, simplified the design and reduced the complexity of the project. At the same time, Freedom will be a quality facility, providing a research laboratory unsurpassed in the world for life sciences and microgravity research, and a stepping stone into the future, enabling NASA to conduct the research and planning necessary for human exploration of the solar system. And, we have maintained our international commitments," he continued.

The rationale . . .

A fiscal year budget shortfall of more than $550 million, along with Congressional directions to significantly reduce out-year spending, prompted NASA to begin the restructuring of Freedom. Congress told NASA to expect no more than eight to 10 percent growth over the next five years (FY 1992-1996), with peak spending for Freedom not to exceed $2.5-2.6 billion. The budgetary ground rules, including the cut for FY 1991, represent a $5.7 billion shortfall from what NASA had planned to spend for Freedom over that same time period.

The directive . . .

NASA directed the review in November 1990 with instructions to the Freedom project team to: develop a phased approach with quasi-independent phases; protect life and materials science; maintain international agreements and capability; limit assembly flights to no more than four annually; and achieve first element launch, man-tended capability and permanently manned capability as early as possible.

The restructured program calls for the first element launch of the space station to be made in the second quarter of FY 1996 (January-March 1996), and man-tended capability to be achieved in the third quarter of FY 1997. (April-June 1997).

Man-tended . . .

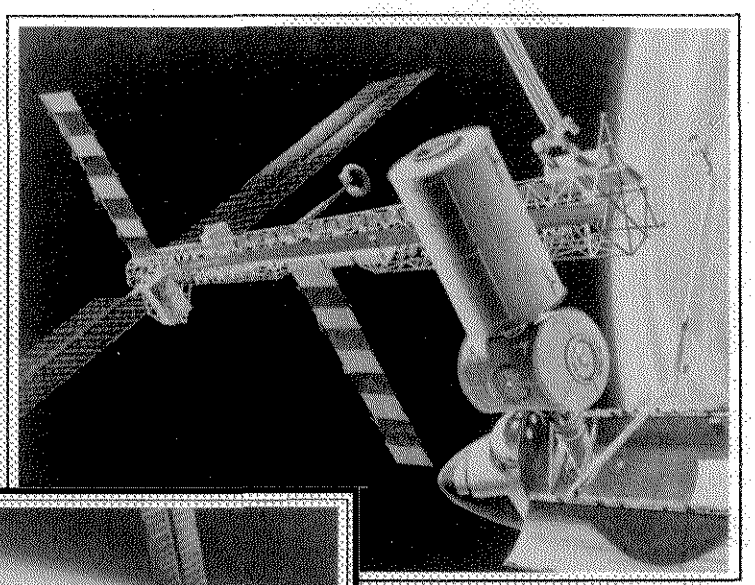
In the man-tended phase, astronauts brought up to Freedom by the Space Shuttle will be able to work inside the U.S. laboratory for periods of two weeks. They will return to Earth with the Shuttle. At this stage, one set of Freedom's solar arrays will generate about 22 kilowatts of power, with a minimum of 11 kw available to users. Six Shuttle flights will be required to achieve the man-tended configuration.

Permanently manned . . .

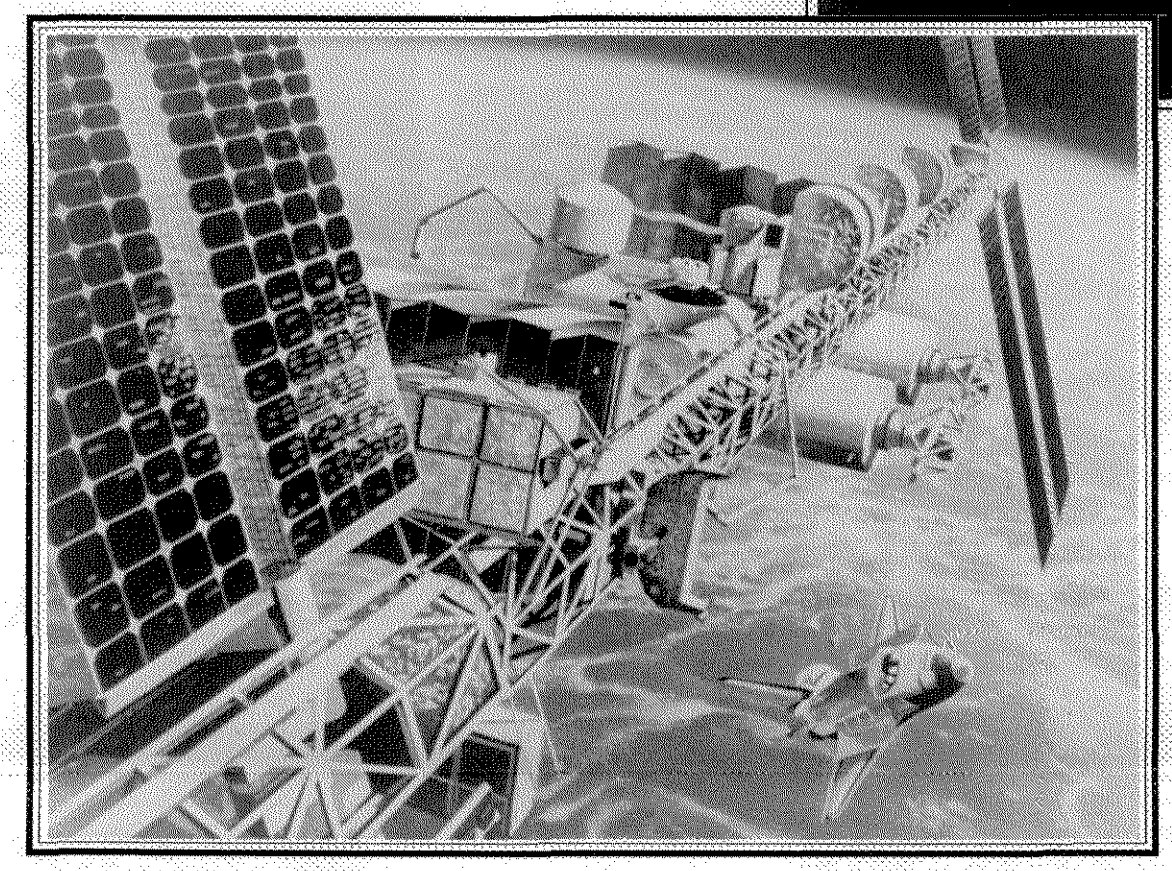
Freedom will achieve a permanently manned configuration in Fiscal Year 2000. This configuration will consist of the U.S. laboratory and habitat, as well as the European and Japanese laboratories; the Canadian Mobile Servicing System; accommodations for a live-in crew of four; and three sets of solar arrays furnishing 65 kw of electrical power, with a minimum of 30 kw going to the users and the remainder to housekeeping chores.

A new requirement before permanently occupying the station will be the availability of an Assured Crew Return Vehicle to return space station crew members to the Earth in an emergency. Seventeen Shuttle flights will be needed to build the permanently manned configuration.

Provisions to expand the space station have been maintained. The follow-on phase of the Freedom program will include another solar array to achieve 75 kw, provisions for four additional crew members and could include additional capabilities such as a second pre-integrated laboratory and additional nodes. This phase would use the new launch system for launch and assembly if the launch system is available.



ARTIST'S CONCEPT OF FREEDOM IN THE MAN-TENDED CONFIGURATION. One of the two nodes, and the U.S. laboratory module, provide pressurized work space for visiting astronauts carried to Space Station Freedom aboard the Shuttle. This configuration is scheduled to be achieved in late 1996.



ARTIST'S CONCEPT OF FREEDOM IN THE PERMANENTLY-MANNED CONFIGURATION. This configuration consists of U.S., European and Japanese laboratory modules, the U.S. habitation module and three sets of solar arrays. Freedom, in its permanently-manned configuration, can support a crew of four and is scheduled to be achieved in late 1999.

Redesigned flight hardware . . .

The redesigned U.S. lab and hab modules are 27 feet long and 14.5 feet in diameter, about 40 percent shorter than the previous design. The smaller size allows the modules to be fully outfitted and tested on the ground prior to being launched into orbit. The U.S. lab module will hold a total of 24 eight-foot wide racks, 15 of which initially are devoted to scientific work. At permanently manned capability, 28 experiment racks will be available to U.S. investigators: 12 in the U.S. lab, 11 in the ESA lab and five in the Japanese lab.

The redesigned truss segments will be built, pre-assembled and checked out on the ground. Formerly, the truss was to have been assembled, like a massive erector set, by astronauts performing space walks. NASA estimates the pre-integrated truss will cut assembly EVA by more than 50 percent.

While work on the Attached Payload Accommodations Equipment (APAE) suitable for large external payloads has been stopped, utility ports for small external payloads will be placed along the truss. The overall width of the station has been reduced from 493 feet to 353 feet.

Complexity of other station systems also has been reduced and, where possible, hardware already flying on the Space Shuttle will be used in place of developing new hardware for the Station. Also called for in the plan is the transfer of the Flight Telerobotic Servicer to NASA's Office of Aeronautics, Exploration and Technology. This, together with the deferral of the APAE, has eliminated the Goddard Space Flight Center's Work Package 3 from the Freedom program.

Ground facilities . . .

In addition to changes to the flight hardware, a number of changes to ground facilities are planned. The Space Station Processing Facility to be built at the Kennedy Space Center will not be fully outfitted, and a new hazardous processing facility has been deleted in favor of using an existing facility. The size of planned facilities at the Johnson Space Center--the control center and crew training facilities--have been scaled back. Payload facilities at Marshall Space Flight Center are being deferred and existing facilities will be used in the interim.

Manpower . . .

Due to funding cutbacks and hardware changes in the program, some layoffs of prime and subcontractor personnel have already taken place, and more are expected. At Work Package 1, no layoffs at the prime contractor, Boeing, are expected, but more than 500 people will be reduced from the subcontractor rolls, some of which will be accommodated through transfers and attrition.

At Work Package 2, prime contractor McDonnell Douglas has already reduced its work force by about 160, with half that number being layoffs. Major subcontractors to McDonnell Douglas will be reduced by about 470, with layoffs accounting for approximately half of that, and another 200 will be reduced from supporting development, with about 65 of that total coming from terminations. At Work Package 4, no layoffs are expected, but as many as 40 people in support jobs at Lewis Research Center will be reassigned. Layoffs of about 30 percent of the work force at the Space Station Engineering and Integration Contractor, Grumman, were announced earlier this month.

1990 was another good year for Langley Research Center. We had many outstanding accomplishments in aeronautics and space research. Our budget grew moderately and we had small increases in manpower.

STATE OF THE AGENCY

NASA had a number of disappointments in 1990 and the media seemed to delight in emphasizing them. However, there were also many major accomplishments which received much less attention. I agree with our Administrator, Dick Truly's, assessment:

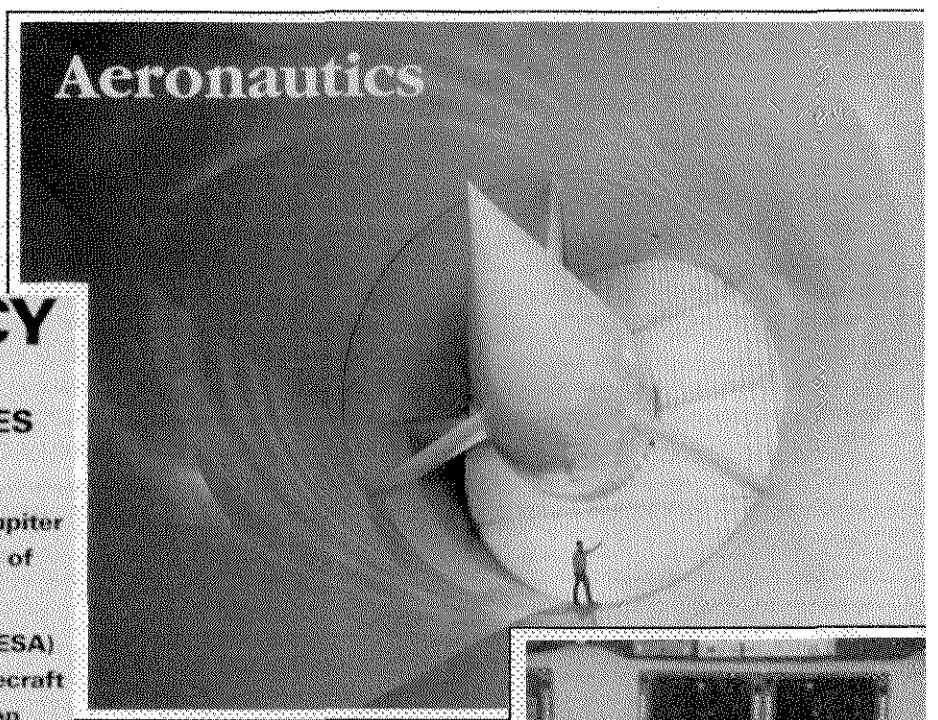
CHALLENGES

- Shuttle leaks
- Hubble lens deficiencies
- Space Station EVA Reports

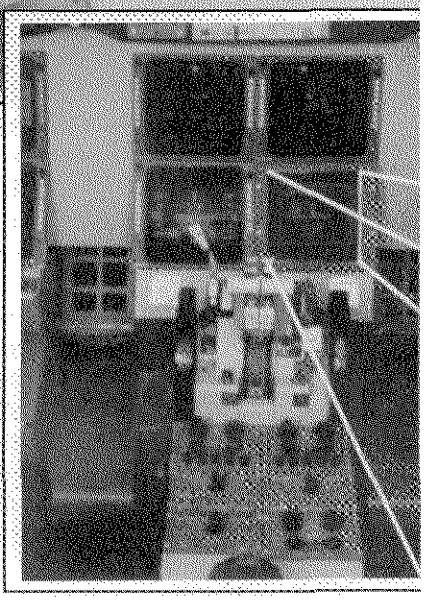
SUCCESSES

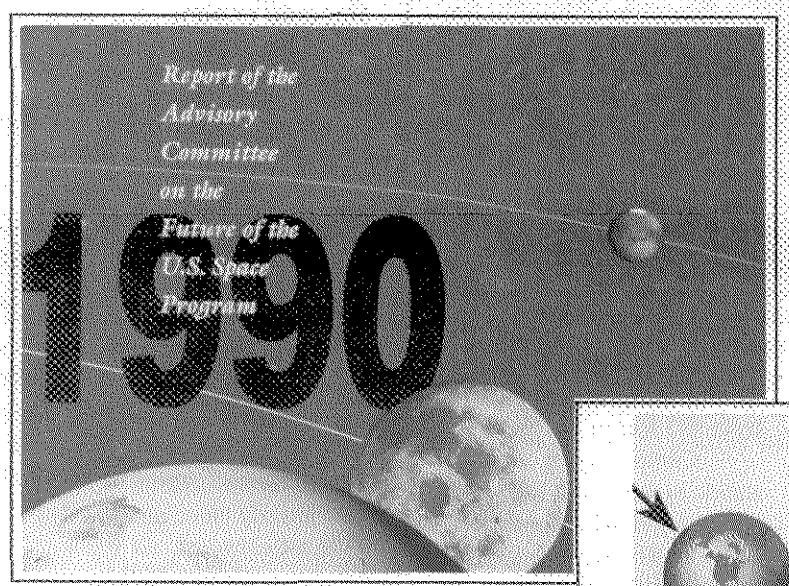
- 6 Shuttle missions
- Galileo to Jupiter
- Deployment of HST
- Ulysses spacecraft (ESA)
- 2 DoD spacecraft
- Astro Mission
- Magellan mapping Venus
- COBE - Milky Way
- Voyager - Solar System

"In 1990 we launched six safe and successful Space Shuttles, we successfully guided the Galileo spacecraft past Earth on its way to Jupiter, we deployed the Hubble Space Telescope, the Ulysses spacecraft for the European Space Agency, two DoD spacecraft, and the Astro mission. We made progress mapping the surface of Venus as a result of the Magellan mission, and we produced unprecedented images of the Milky Way--thanks to Cosmic Background Explorer--and of our solar system--thanks to Voyager."

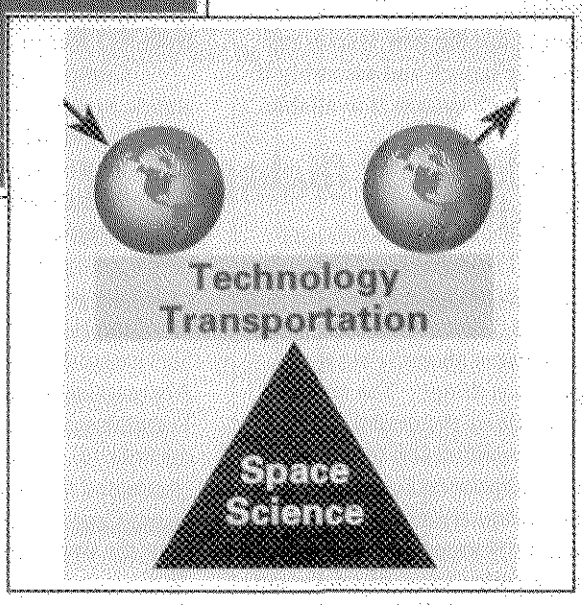


During 1990, Langley contributed to improving technology for subsonic transports. Tests of the digital data link for aircraft ATC information exchange shows voice communication errors and message repeats reduced by 84 percent. The research cockpit of our Boeing 737 is shown with an exploded view of the data link display.





As media attention and other concerns about NASA peaked last August, Truly took a bold step. With the support of the Vice President and the Space Council, he formed a committee to review the future of the civil space program and make recommendations for implementing future civil space goals.

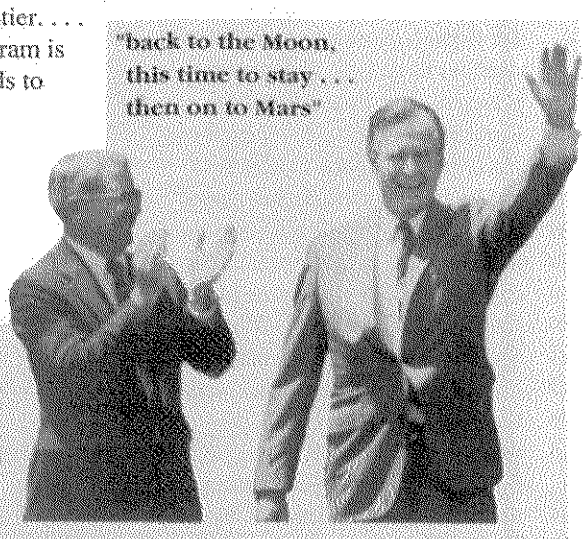


In 120 days, the Augustine Committee heard from hundreds of witnesses, debated and deliberated, and produced a comprehensive report with 15 formal recommendations.

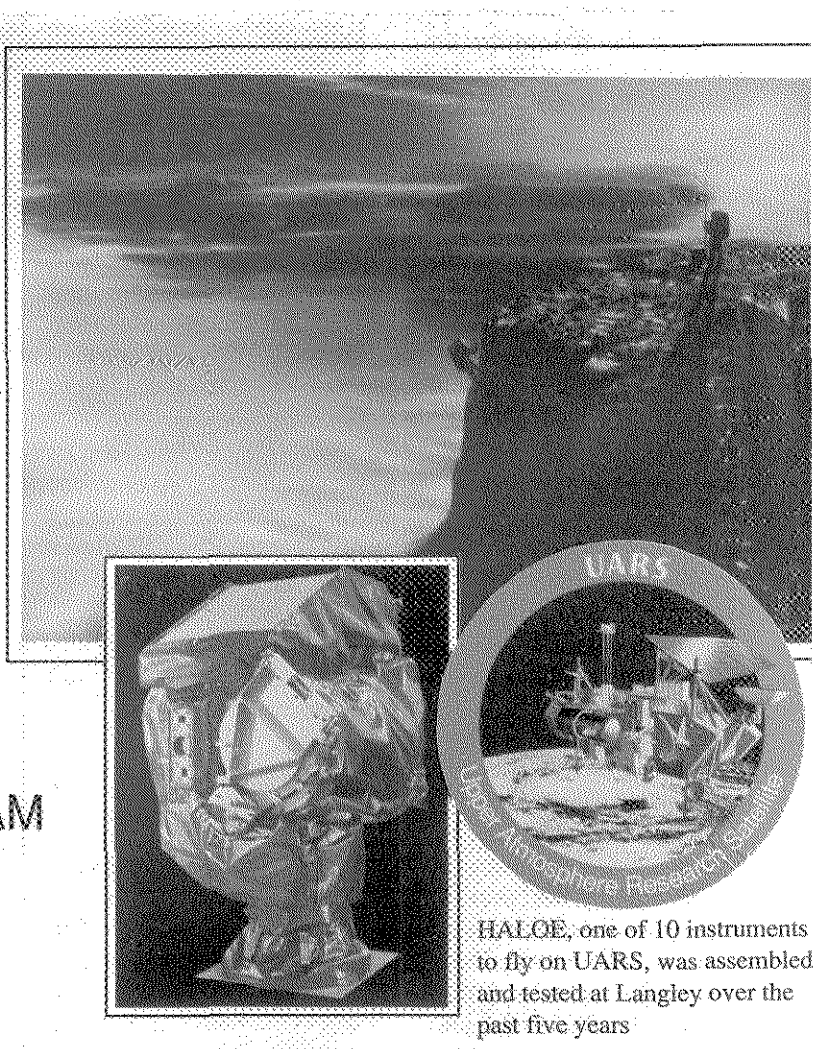
The report has five major program recommendations leading to a balanced space program for America.

A BALANCED SPACE PROGRAM FOR AMERICA

We have the support of our President who said, "It's time to open up the final frontier. . . . America's space program is what civilization needs to begin this journey."

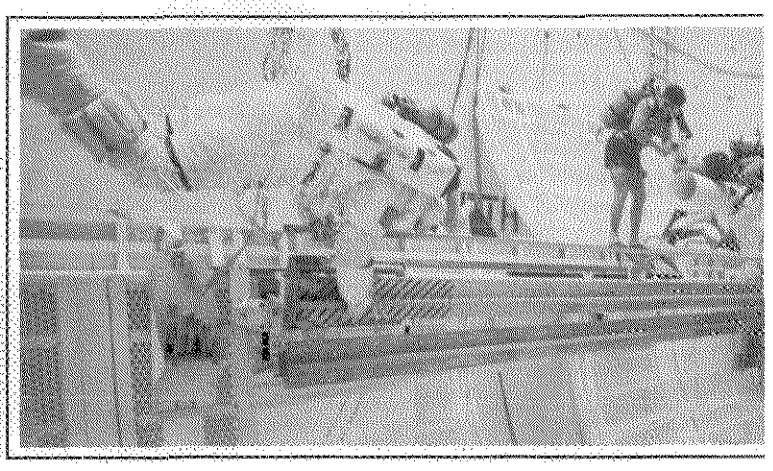


"back to the Moon and to Mars . . . because American society needs the sense of purpose, American students . . . the inspiration, American business . . . the technology, and the world needs the new knowledge."



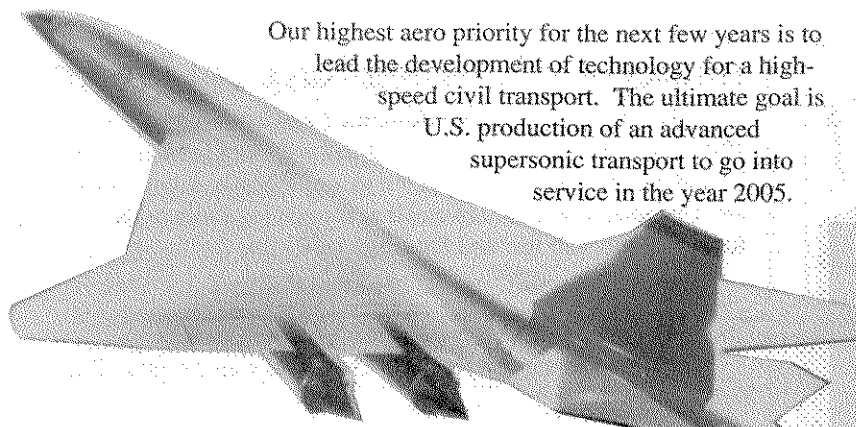
HALOE, one of 10 instruments to fly on UARS, was assembled and tested at Langley over the past five years

An outstanding Langley achievement in 1990 was the design and in-house fabrication of the Crew and Equipment Translation Aid. CETA, shown in the water tank at JSC, was tested in space several days ago.



Editor's note: The State-of-the-Center Address was videotaped for the convenience of Center employees and retirees unable to attend the presentations. Copies may be checked out of the technical library.

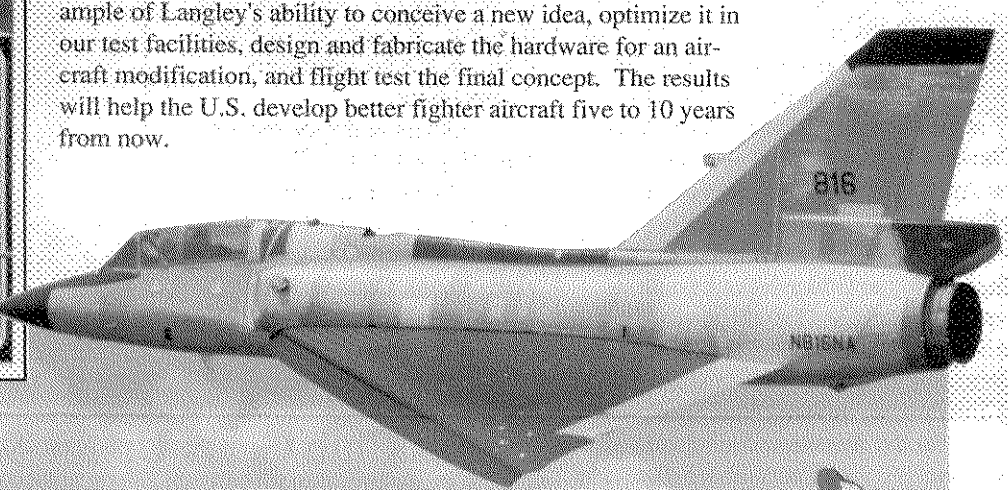
ate-of-the-Center Address

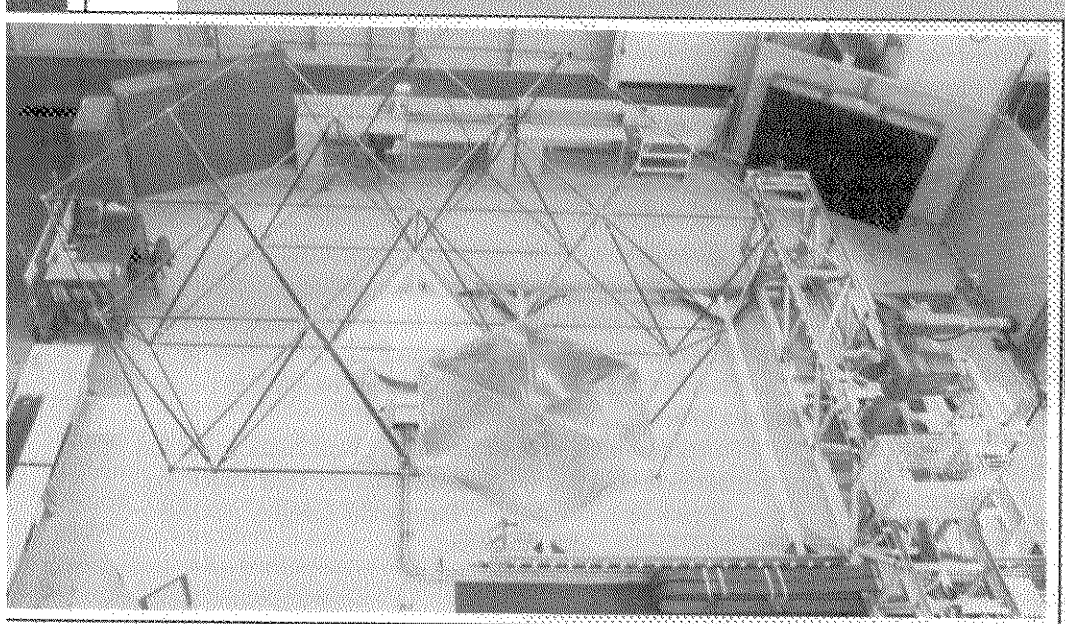


Our highest aero priority for the next few years is to lead the development of technology for a high-speed civil transport. The ultimate goal is U.S. production of an advanced supersonic transport to go into service in the year 2005.

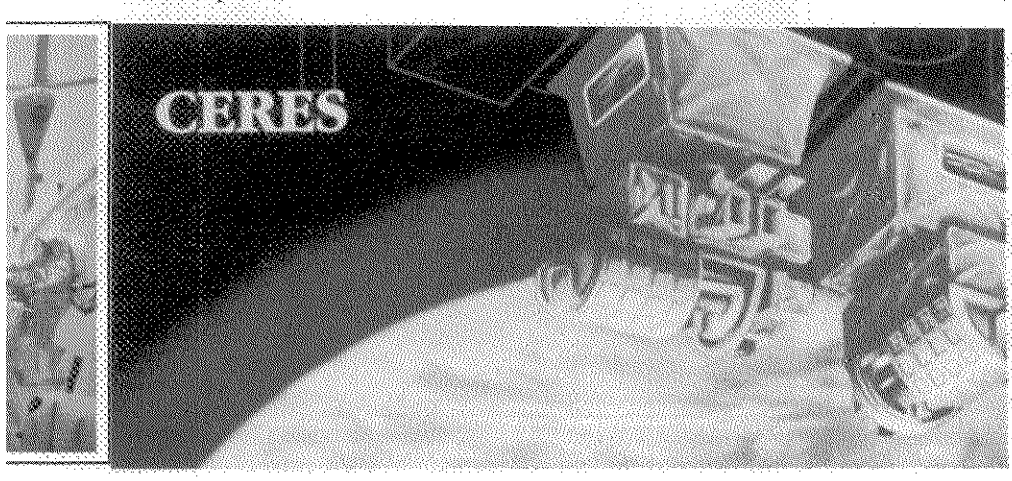
For several years we have been hard at work on Phase I of high-speed research which is focused on meeting environmental concerns. Supersonic transports are currently prohibited from flying at supersonic speeds because of the sonic boom disturbance they create. We are studying ways to reduce and alter the character of the sonic boom and determine what level of sonic boom would be acceptable for overland flight.

We also have continued our research for military fighter aircraft. The F-106B with the vortex flap experiment was a showcase example of Langley's ability to conceive a new idea, optimize it in our test facilities, design and fabricate the hardware for an aircraft modification, and flight test the final concept. The results will help the U.S. develop better fighter aircraft five to 10 years from now.

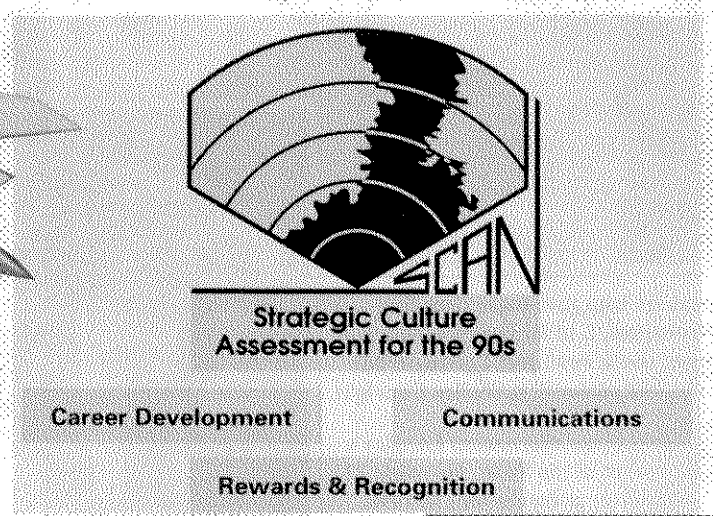




Our Flight Systems and Structures Directorates took the initiative to obtain resources and to work with our designers and shops to create an automated assembly research laboratory where several complete assembly and disassembly operations of the tetrahedral truss have been completed.

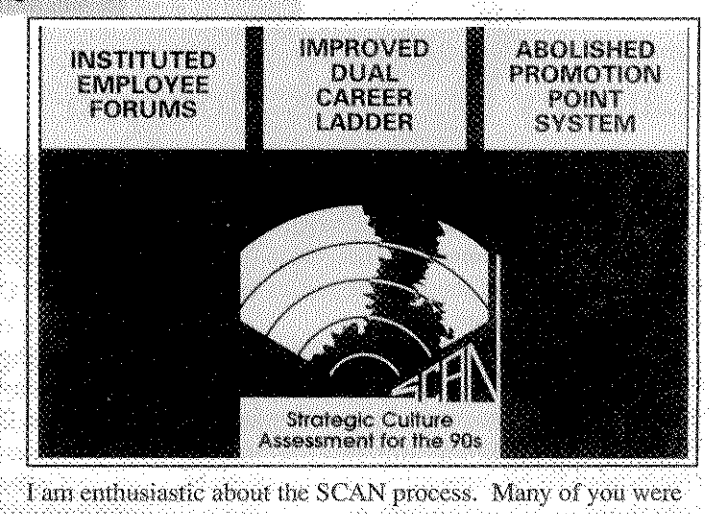


I believe that most of us at Langley are proud not only of our technical accomplishments but of the fact that Langley is a good place to work. Yet I know we can do better and we set out in the last year to do just that--through a process called SCAN.

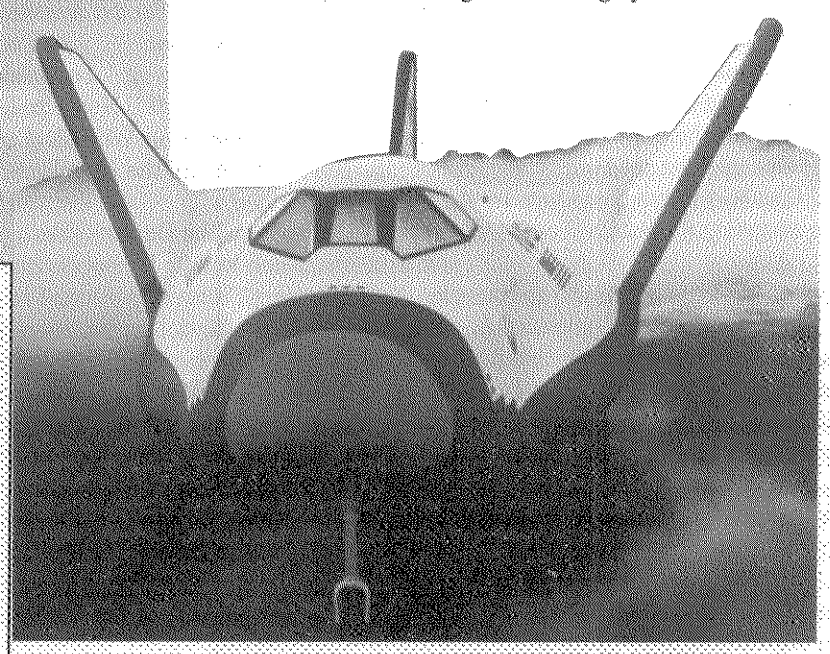


Employee teams were chosen to investigate three major areas--career development, communications and rewards and recognition--and to make recommendations for improvement.

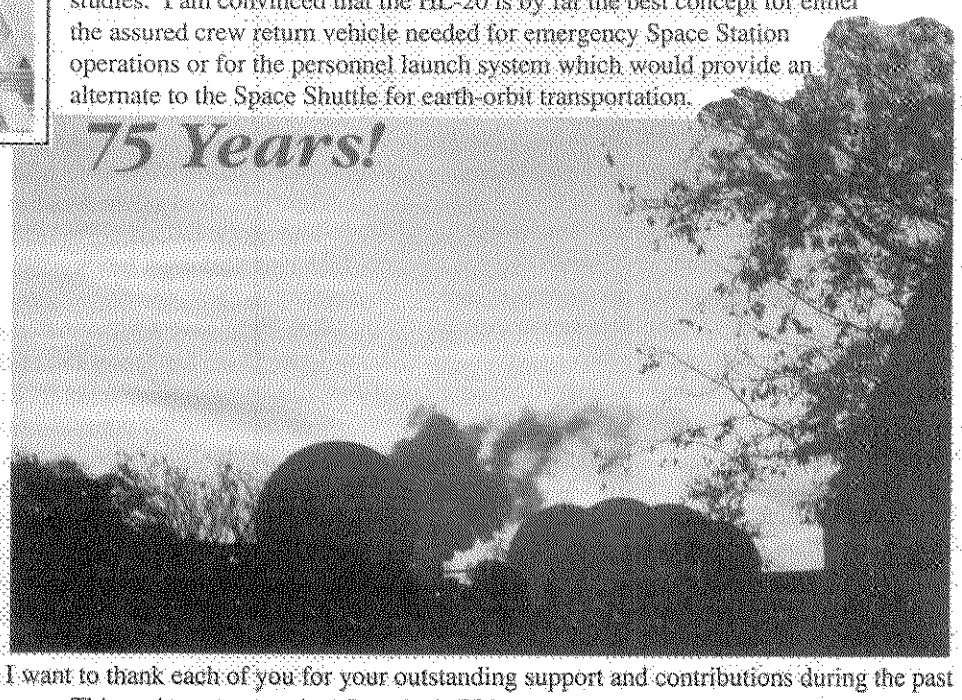
The SCAN teams presented their list of over 60 recommendations in October 1990. In most cases, explicit actions are being taken. Three of the many suggestions that have already been implemented are shown below.



I am enthusiastic about the SCAN process. Many of you were involved and excellent recommendations were made to improve our standard of living here at Langley.

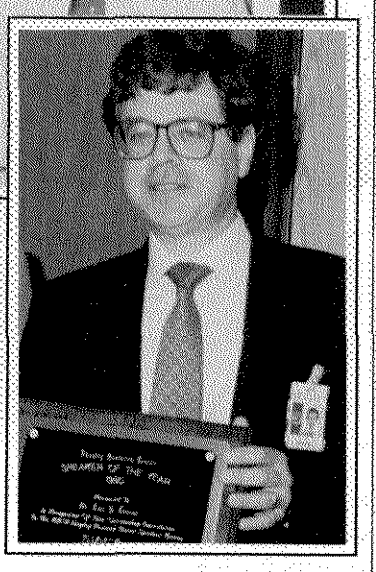


Langley's HL-20 full-scale model has been outfitted with accommodations for two pilots and eight passengers and is now being used for human factors studies. I am convinced that the HL-20 is by far the best concept for either the assured crew return vehicle needed for emergency Space Station operations or for the personnel launch system which would provide an alternate to the Space Shuttle for earth-orbit transportation.



I want to thank each of you for your outstanding support and contributions during the past year. This spring we move into Langley's 75th year as a premier aerospace research center. Working together, I know we will continue to attain great achievements.

SPEAKERS HONORED. Langley Speakers who gave more than five presentations during 1990 are shown (front row, L to R) Henry Jones, Bob Miserentino, Lenwood Clark, Lance Bush; (back row) Joel Levine, Frank Farmer, Bob Pegg and Richard Wallsom. Not pictured is Shelley Canright.



Joel Levine was named Langley's Speaker of the Year. He made 23 volunteer presentations in 1990.

Levine Named Speaker of the Year

Langley Speakers Honored

Center Director Richard H. Petersen praised the efforts of the 170 employees who comprise Langley's Speakers Bureau when he presided at the March 28 awards ceremony. These employees help spread the word about the important work Langley and NASA are doing.

Petersen presented the Speaker of the Year award to Dr. Joel S. Levine, senior research scientist in the Atmospheric Sciences Division, who gave 23 presentations in 1990. Levine was commended for his commitment to the volunteer project.

"Never has there been a more urgent need for NASA to tell its story far and wide," said Petersen. "We expect the 1990s to be a competitive decade. If we want to maintain the leadership in advanced technology, we must have resources to support our goals. In addition to having funding, good facilities and good people, we need public support behind us. Speakers Bureau members are the vehicle for educating the public about NASA programs."

Membership increased by 50 speakers in 1990 and support service contractors are encouraged to become active participants in telling the Langley story.

Following is a list of programs given by Langley speakers during the first quarter of 1991:

Frank Quinto spoke on Wind Tunnel Testing at Kraft Elementary School, Hampton and on Space Shuttle and Astronauts at South Morrison Elementary, Newport News.

Lenwood Clark gave a presentation on Space Station for the American Association of Retired Persons, Inc., Williamsburg.

Jerry Newsome gave an Overview of Current CSI Challenges and Future Research Directions in the Aerospace Community at Old Dominion University.

Irwin Schauer presented Workforce Issues for the 90s at the Human Resource Roundtable, New York City.

Gloria Hernandez spoke on Supersonic Design Work at James Madison University.

Shelley Canright gave a presentation titled Space Exploration and Human Presence at Dutrow Elementary School, Newport News.

Cary Spitzer presented Aircraft Automatic Landings Using Global Positioning System Satellites.

Joel S. Levine spoke on The Greenhouse Effect and Global Warming at the College of William and Mary and to the Warwick Ruritan Club on A Planet at Risk.

Nettie Faulcon gave a presentation on Career Opportunities in Physics at the National Conference of Black Physics Students.

Janice West gave a Science Demonstration at Poquoson Middle School.

George F. Helfrich gave a presentation titled How Engineers and Scientists are Involved in Protection of Inventions and Other Forms of Intellectual Property at the Governor's School for Science.

Jeff Cleveland spoke at Norfolk State University on Application of Computers to Real-Time Flight Simulation at NASA Langley.

Leroy Spearman gave presentations on Careers in Engineering at Gildersleeve Middle School, Newport News.

Cathy Schauer spoke to Marlbank Cove children on Working in Space.

Harry Verstynen presented Navigation and Aviation Careers for the American Association of University Women.

Bland Stein spoke on Initial Observations of LDEF at the SAMPE Northern California 17th Annual Composites Workshop and for the Hampton Roads Chapter of the American Society for Materials.

Christine Darden gave a presentation at Poquoson Middle School on Black History and Engineering Careers; spoke on Technologies for the 90s--Their Impact on Society at the 5th Annual Black Engineer of the Year Awards Conference, Baltimore, Md.; and presented a Women's History Federal Women's Program titled Nurturing Tradition--Fostering Change for the Naval Mine and Warfare Engineering Activity.

Sharon Tanner spoke on Aerospace Careers at Girl Scout Leaders Training.

Tammi Moat gave a presentation on Model Making and Science and Math Careers at Thomas Eaton Middle School, Hampton.

M. Patrick McCormick presented The Ozone Hole and Global Ozone Depletion at a NASA Langley Retiree Luncheon. and spoke on The Ozone Hole for the Peninsula Engineers Club and science classes at Menchville High School, Newport News, and Poquoson High School.

Robert Daugherty spoke at Loudoun Valley High School, Purcellville, on NASA Careers.

Henry E. Jones gave Aviational Science Workshops at the Extend Gifted Education Center for Tabb and Yorktown Intermediate School students.

Bob Pegg gave a presentation on the National Aero-Space Plane for Troop 158 of the Boy Scouts of America.

Bob Miserentino presented Space Station for the Visitor Center Noontime Lecture Series.

Ira Nolt spoke on SAFIRE: The First Far Infrared Experiment for the Hampton Roads Section of the IEEE.

Kevin Osborne gave a presentation on Intellectual Property Law at the Lindsay Middle School Invention Convention.

Arlene Levine spoke at the Virginia School Boards Association Tidewater Regional Forum on NASA Education.

Sports News

Intercenter Running Races in Process

The NASA Intercenter Running Competition continues with 10-km races on April 22 and May 2 and with 2-mile races on April 25 and 29. These races start at 5 p.m. on Doolittle Road. Walkers are welcome. For more information about these races or the Langley Runners Club, call Richard Shearer, ext. 47036.

Club Announces Race Results

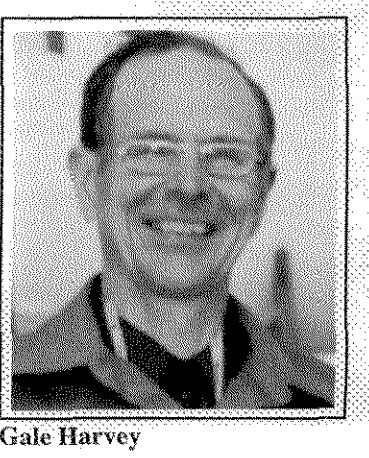
Top finishers in the Runners Club Pick-Your-Distance Race held February 8 are:

	Men		Women	
15 Km	Steve Sudik	1:00:10		
	Steve Robbins	1:00:22		
10 Km	Bill Tomek	47:52	Renee Reckendorf	51:10
5 Km	Bill Rogers	17:09	Nicole Breivik	22:03
	Erik Kielin	18:27	Bernice Becher	30:12
	H. Chambers	20:51		

LaRC Runner of the Year Announced

Gale Harvey has been named Langley 1990 Runner of the Year. Harvey earned 50.64 points in NASA Intercenter Competitions.

Others in the top ten are John Hoppe (46.14), Chuck Engle (44.14), Elizabeth Filer (39.64), Steve Sudik (39.64), Bob Ferguson (38.48), Joe Kubalak (36.64), Chris Overton (27.32), Kathy Powell (27.32), and Bill Rogers (27.32).



Gale Harvey

Tennis Club Gears Up for '91 Season

The NASA Langley Tennis Club 1991 membership drive is currently underway. Annual dues are $5 and application forms may be picked up at the LAA office, the sign-up board by tennis court #2, or by contacting Carol Wieseman, ext. 42824, or Tom Yager, ext. 41304.

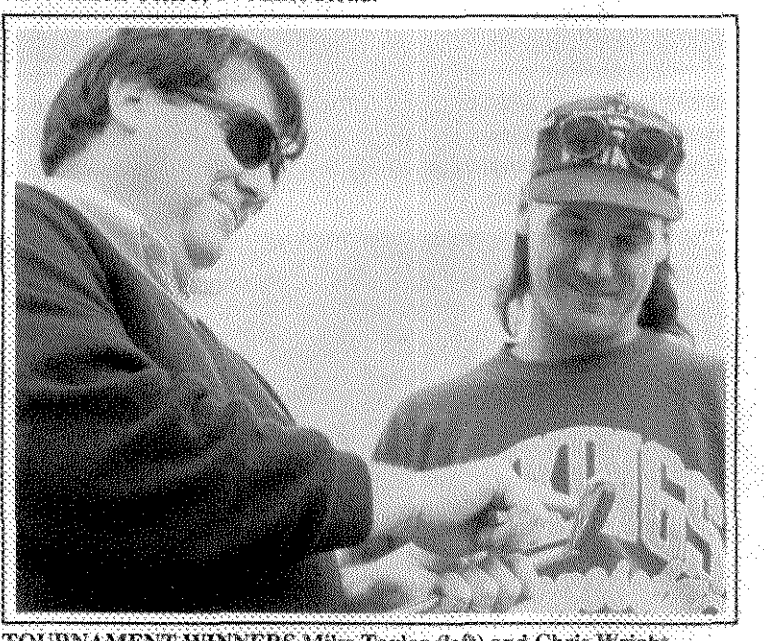
The spring ladder tournaments will be held soon to establish player positions for challenge matches throughout the summer. There are several additional tournaments scheduled this summer together with tennis instruction classes, leagues and team play. Join the fun and keep fit doing it!

Golfers Name Tournament Winners

Individual winners in the NASA Golf Association first tournament of the year played at Ford's Colony on March 11 are announced. Mike Taylor and Joe Talbot tied for low gross with a score of 83. Chris Wright took low net honors with a 58.

The next tournament is scheduled for Honey Bee course in Virginia Beach on April 26.

To become a member of the NASA Golf Association and participate in several fun tournaments, contact Tom Yager, ext. 41304, or pick up a membership form at the Langley Activities Association Office, 14 Ames Road.



TOURNAMENT WINNERS Mike Taylor (left) and Chris Wright confer following the first golf tournament of the year.

Health Corner

Employees Support Bloodmobile

NASA employees, contractors and retirees donated 311 units of blood at the March 20 Bloodmobile.

Achieving gallon status were:

15 gallons---Charles Hudson;

14 gallons---Raymond E. Midden;

11 gallons---Joseph Powers and Harry Heyson;

9 gallons---James A. Dorst;

8 gallons---Walter L. Wade;

7 gallons---Lemuel Meetze, Rodney Russell and Frank Boyer;

6 gallons---Cadd T. Moore III, Mark Lord, James Ellison and Don Avery;

5 gallons---Glenn Woodell, Henry Freeman Jr. and Edward N. Kerlin;

4 gallons---Charles Stanley, Vance Overbay and Brenda Sullivan;

3 gallons---Ronald Staples, Daniel Carey and George King Jr.;

2 gallons---Ronald Joslin, Mark Trybe, John Leonard and James Carbonneau;

1 gallon---Steven Clukely and Donald Kepley.

First Timers---Andrea Lewis, Thomas Lash, Brent Weathered, Steve Seider, Anthony Cook, Beverly Byars, Sharon Podbielski, David Hayes, Robert Scott and William Sellers III.

NASA coordinator for the Bloodmobile was Annette Forrest; Red Cross coordinator was Marilyn Asby. The next Bloodmobile is scheduled for May 22 in the H.J.E. Reid Conference Center, 14 Ames Road. Mark this date on your calendar.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program is designed to permit employees to donate annual leave to other employees who are experiencing a period of unpaid leave as a result of a medical emergency.

The following employees are approved leave recipients:

- o Linda E. Edmundson
- o Gael M. Hawkins
- o Noel A. Talcott Jr.
- o Catherine B. Worth

If you wish to donate annual leave to these recipients, or wish more information concerning the Voluntary Leave Transfer Program, please contact Linda Park, Employee Relations Section, ext. 42610.

Tidbits from Training

Late Cancellations Make Training Courses Unduly Expensive

The goal of the Training and Education Section (TES) is to provide top-quality training and development services to the employees of Langley Research Center.

This fiscal year more requests for training have been received than could be accommodated. With a limited budget, TES is committed to meeting the Center's needs in the most cost effective way posssible. For this reason, TES is concerned with the marked increase in late cancellations by participants scheduled for training courses. It is extremely difficult to place alternates in classes when they are given less than a 24-hour notice; therefore, some courses are being conducted with below capacity enrollments.

TES would like to take this opportunity to reinforce the Center's policy on late cancellations. As stated in LMI 3410.1, "Students who attend only a portion of the class meetings or fail to notify the training coordinator of his or her inability to attend a course in time for a suitable replacement to be named may be requested to send a written explanation for nonattendance to the head, TES, through the appropriate division/project office.

Noon-Time Striders

Fitness Center Starts Walking Club

Put a spring into your step. Join NASA's noon-time striders.

A WALKING club has been organized and meets Tuesdays and Thursdays during lunch time, from 12:00 to 12:30 p.m. Join the group in front of the H.J.E. Reid Conference Center, 14 Ames Road. The club is open to all NASA employees and contractors, so bring a friend.

Walkers can participate in the NASA Challenge Presidential Sport Award contest and help Langley amass points, while

- * Enjoying the great outdoors
- * Meeting new friends
- * Improving health and fitness
- * Having fun while exercising

For more information on the Walking Club, sponsored by the Langley Fitness Center, call ext. 46387.

Conservation Club Celebrates Earth Day 1991

The beginnings of what we know today as Earth Day were rooted in 1960 when a group of College of William and Mary students and faculty built a dam to prevent pollution from entering Lake Matoaka on campus. Those grassroots efforts eventually led to the Clean Air and Water Acts and the formation of the Environmental Protection Agency.

While the original Earth Day was initiated largely due to concerns about air and water pollution and pesticides, today there are a host of new problems which need attention--the mountains of solid waste we generate, a hole in the ozone layer, and global warming to name a few. From a group of concerned college students and teachers thirty years ago to last year's participation of nearly 100 million people, Earth Day has become a national event.

The NASA Langley Conservation Club will celebrate the 21st anniversary of Earth Day during the week beginning April 22. A wide range of activities designed to generate awareness and spread information about conservation and the environment has been planned for Langley civil service and contractor employees.

A main attraction will be an informative display located in the cafeteria April 22-26, which will include pamphlets and flyers on topics ranging from disposal of used oil to environmental activities for children. Information about the club, its purpose and its current activities will also be available.

The Conservation Club and Visitor Center are co-sponsoring the second annual Earth Day Student Art Contest. Students of all ages have been encouraged to submit posters or drawings detailing their ideas about how we can better take care of "Spaceship Earth."

Winning students will be awarded savings bonds. All participants will receive a tree seedling to plant as a constant reminder to be mindful of the Earth's environment. Judging is now taking place. Look for winning entries on display in the cafeteria during Earth Week.

The Conservation Club and Visitor Center will also co-sponsor a brown bag luncheon Thursday, April 25, at noon in the VC theater. Dr. Carl Hershner from the Virginia Institute of Marine Science will present "Environmental Impacts of an Oil Spill: From the Persian Gulf to the Langley Swamp Lands."

Hershner will detail the impact of an oil spill, compare and contrast the conditions of the Persian Gulf to the Chesapeake Bay and discuss the effects of an oil spill if one were to occur in the bay. He will also address the current concerns of oil and gas exploration and the political concerns about the future management of the bay.

Join the Conservation Club as well as other local and national groups in support of Earth Day 1991 by tying a green ribbon to your car antenna during Earth Week. Don't have a green ribbon? The Conservation Club will be giving them away during Earth Week--pick one up in the cafeteria.

Langley's Conservation Club was formed in November 1989 on the premise that individuals, particularly Langley employees, can make a difference. The four main objectives of the club are to initiate recycling at Langley, to educate NASA and contractor employees about conservation and recycling, to encourage center-wide conservation of energy and resources, and to serve as a model to the local community.

Formed with the initial goal of establishing an aluminum recycling program at Langley, the club has to-date collected nearly 9,000 pounds of aluminum. The club publishes a newsletter to keep its members informed and to provide general information related to conservation, recycling and the environment. Currently 130 members strong, the club has also been involved in beach clean-ups and the promotion of 100 percent white paper recycling. Several landscaping projects are upcoming and plans are underway to plant 75 trees around the field in honor of Langley's 75th anniversary.

The Langley Conservation Club has been recognized for its volunteer service by the Hampton Clean City Commission and the City of Newport News. The number of potential projects is endless and the club is always looking for new ways to have an impact. In addition, volunteers are still needed to help collect alumnium cans from several Langley buildings.

The success of club efforts has been due largely to the enthusiasm and support of Langley employees. Those interested in club activities, or who would simply like to be on the mailing list for the club's newsletter, should contact club president Tim Collins, ext. 43113, or stop by the club's Earth Day display in the cafeteria.

Happenings

LAA SOCIAL will be held Friday, April 26, from 4 to 6:30 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road.

NASA TOASTMASTERS meet the second and fourth Wednesdays of the month. Next meeting is April 24, 11:30 a.m. to 1 p.m., in the H.J.E. Reid Conference Center. Guests are always welcome.

LOW IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m., in the NASA gym. Cost is $12 per month. In addition, Saturday classes in "bench step" will be held in May, 9:30 to 10:30 a.m. Cost for Saturday classes is $6 per month.

TELA TAX SERVICE. Individual, business, federal, state. Member of National Association of Tax Practitioners. Also small business bookkeeping services. By appointment. Call 874-3121.

FEEL THE NEED FOR SPEED? Try bicycle racing. James River Velo Sports club will meet April 29 at 7:30 p.m. in the Grissom Library, Denbigh. For more information, call Mark Motter, 874-3247.

ANNUAL ALUMNI DANCE will be held Saturday, April 27, at 8 p.m. in the H.J.E. Reid Conference Center. All NASA employees are welcome as guests. The dance is free but reservations are required. Call Abe Leiss, 877-2939, for details.

ENGINEERS CLUB of the Virginia Peninsula will tour the Amoco Refinery May 8. Langley employees are welcome to join the tour at 3 p.m. For reservations, call Rod Harvey, 249-2322, or Abe Leiss, 877-2939.

TAKE THE CHALLENGE. The 11th annual MS-150 Bike Tour will be held May 18-19. Novice through professional bikers are invited to participate in this weekend of fun, fitness and pride that comes from completing a 150-mile ride to benefit multiple sclerosis research. Help find a cure for this chronic disease of the central nervous system.

PENINSULA YOUNG SINGLE PARENTS is an organization open to all single parents who have children under the age of 21. Call 827-8408 for membership and orientation details.

INFERTILITY SUPPORT group meets the second Monday of the month. For more information, call 877-3094 ot 249-8815.

LAFB OFFICERS' CLUB is a membership club. For details, call 766-1361.

CALLING CLASSMATES. Menchville High School class of '81 will hold their 10-year reunion. For information, call Larry, 877-7090.

FOR RENT: CONDO. Snowshoe. Unlimited summer use for June, July, August. $85 per month. Call 1-463-9074.

FOR SALE: HOME by owner in Denbigh South. 3-BR brick rancher, LR, 1-1/2 BA, FR w/ FP, eat-in kitchen, attached garage, fenced backyard, storage shed. $81,900. Call 874-6045.

FOR SALE: DINETTE. New solid wood table and 4 decorative arrow back chairs, antique maple finish. $300. Chairs sold separately, $38 each. Call Patricia at 877-2140 or 865-1725 after 5 p.m.

WANTED TO BUY: DESK suitable for a 13-year-old girl. Call Reeder, 596-0628.

Women in Aerospace

Willshire to Discuss HL-20 Human Factors Study

Dr. Kelli Willshire, human factors engineer in the Automation Technology Branch, will conduct a human factors discussion and tour of the HL-20 Personnel Launch System model Monday, April 29, at 7 p.m. in the Langley hangar, 6 East Taylor Road. This program is sponsored by the NASA Langley chapter of Women in Aerospace and is open to anyone who would like to attend.

Willshire is leading the human factors evaluation of the HL-20 model along with Lisa Simonsen, Vehicle Analysis Branch. In her discussion, Willshire will present some of the procedures used in evaluating the human factors of the HL-20 model, including determination of anthropometric fit, subjective acceptability, pilot viewing capabilities, and emergency egress procedures and completion times. Following the discussion, Willshire will conduct a "walk-through" of the HL-20 model.

Women in Aerospace (WIA) is a non-profit organization founded in Washington, D.C., in 1985. Currently, WIA's membership includes over 400 women and men. The Langley WIA chapter is the first NASA chapter with others forming at NASA Goddard and NASA Johnson.

WIA provides a network for the exchange of professional ideas and information among women working in aerospace and related fields. Through activities and programs, WIA creates an environment wherein women can meet and maintain ties with peers. Most importantly, WIA provides a forum to recognize outstanding women and helps to promote a positive public attitude toward the role of women as leaders in the aerospace and related fields.

The local chapter of WIA is open to both women and men who hold professional technical or non-technical positions in the Hampton Roads area. For more information about WIA, please contact Jessica Woods, ext. 42829 or Mail Stop 243.

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

Official Business
Penalty for Private Use $300

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

002 ON-SITE NON-LARC
BILL, KAREN
MAIL STOP 146

News Researcher

Bond Drive Kicks Off at the Top

-by Barbara Rollins Reed

CELEBRATE AN AMERICAN TRADITION
50 YEARS OF
U.S. SAVINGS BONDS

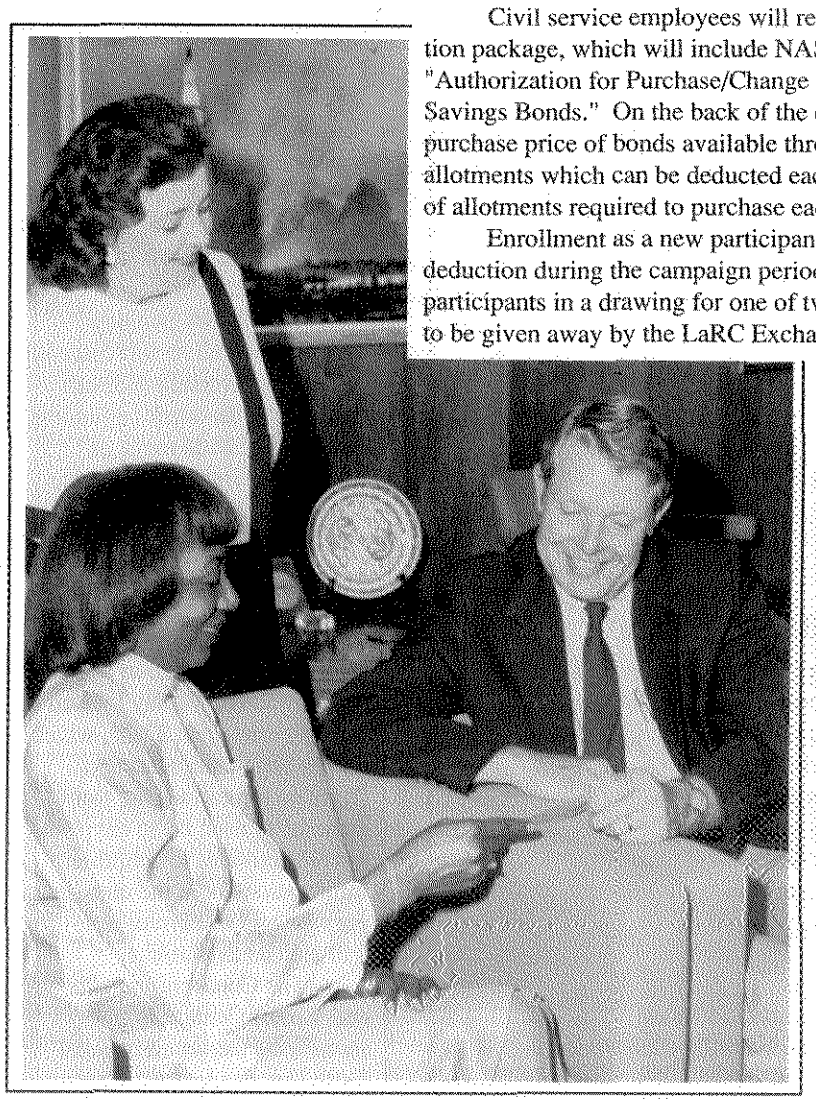
Center Director Richard H. Petersen knows the importance of saving for the future. He also realizes how easy it can be. Petersen purchases savings bonds through the payroll deduction plan.

The LaRC 1991 U. S. Savings Bond Campaign is being held April 15 through May 17. Savings Bond regional representative Robert Maachia will be at the Center April 23-24 and May 1-2 to hold employee information meetings and answer questions about the program.

Civil service employees will receive a savings bond information package, which will include NASA Langley Form 30, "Authorization for Purchase/Change of United States Series EE Savings Bonds." On the back of the card is a chart showing purchase price of bonds available through payroll deduction, allotments which can be deducted each pay period, and the number of allotments required to purchase each bond.

Enrollment as a new participant or an increase in a current deduction during the campaign period will automatically enter participants in a drawing for one of two $100 U.S. Savings Bonds to be given away by the LaRC Exchange Council.

Take the effortless way to help insure your financial future. Join your Center Director in celebrating a 50-year-old tradition--Buy Bonds!



To officially kick off the 50th anniversary of the U.S. Savings Bond Campaign, Center Director Richard H. Petersen gives his pay technician Ethel Wescott a completed savings bond card. Assisting in the campaign is Joyce Fly (standing), payroll supervisor.

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 9 May 3, 1991

Researcher News

Bi-weekly Employee and Contractor Publication

NASA Langley Director Presented AIAA Reed Aeronautics Award

Any discussion of hypersonic research spans the coasts of the United States from Virginia's NASA Langley Research Center to NASA Ames in California. It comes as no surprise, then, that the 1991 winner of the prestigious Reed Aeronautics Award, is a leader in the development of high-speed flight, began his career at Ames and is now Langley Director.

Recognized for "outstanding leadership and contributions in aeronautical science and engineering significantly impacting the scope and direction of the nation's aeronautical capabilities in the continuing move to hypersonic speeds," Richard H. Petersen joins a distinguished list of winners, among them Hugh L. Dryden, Theodore von Karman and Clarence L. "Kelly" Johnson.

Award's significance . . .

The American Institute of Aeronautics and Astronautics' (AIAA) Reed Award is one of the highest honors an individual can receive for achievements in the field of aeronautical science and engineering. The award is named for Dr. S. A. Reed, aeronautical engineer, designer and founding member of the former Institute of Aeronautical Sciences, which later joined with the American Rocket Society to form AIAA. Reed was the first to develop a propeller system composed of metal rather than wood. His aluminum alloy propeller gave the Curtiss Racer, Jimmy Doolittle's plane, the speed needed to win the 1925 Schneider Cup race. This quest for speed has stimulated a great many careers.

"The first major catalyst to U.S. manned space flight was not the Sputnik crisis, as many historians have suggested," says Langley historian James R. Hansen. "It was the dramatically sudden recognition by professional engineers that experimental hypersonic aircraft could be built to carry a man into space and back." A fascination with hypersonics has been a constant thread in Pete Petersen's success.

A few experimenters to many . . .

Petersen began his NASA career at Ames in 1957 where he conducted experimental research to measure supersonic and hypersonic wing-body lift interference or "wave-rider" effects. A short time later he led a group in the activation and calibration of the Ames 3.5-Foot Hypersonic Wind Tunnel, a key facility which was recently reactivated for X-30 testing.

A faithful and consumate advocate of high-speed research for over 30 years, Petersen has been instrumental in establishing Langley as NASA's lead center for the National Aero-Space Plane program and for hypersonic aircraft technology. In fact, under his direction over 200 Langley personnel are presently working with industry to develop the X-30 research aircraft for flight in the mid-1990s.

Looking back . . .

The history of hypersonics, a term coined in 1946 to designate speeds in excess of five times the speed of sound, began with the first test runs in the Langley 11-Inch Tunnel. After an exploratory decade, this technology underwent an explosive period of growth as a result of the X-15 and the international race to put a man in orbit. "Langley took the lead in the X-15 program," Petersen remembers. Technical benefits such as the pilot's space suit, the attitude control systems and the widespread use of ground-based simulators fed directly into the ensuing Project Mercury and following space programs.

In the late 60s, research emphasis began to shift to hypersonic airbreathing systems, an area Petersen was studying at Ames. His involvement with the Hypersonic Facilities Study (HYFAC) and the hypersonic research engine (HRE) brought him into contact with former chief of the Langley Hypersonic Vehicles Division John V. Becker, B. Z. Henry, Ken Pierpont and other Langley researchers.

Another perspective . . .

A Reed Award winner in 1960 for his leadership of hypersonic advances, Becker remembers conferring with Petersen and his Ames' colleagues in the quest to promote air-breathing, flight research vehicles in the Mach 6 to 10 range. "We also debated actively-cooled vs. passively-cooled hypersonic structures. A letter from Petersen in the 1970 time-frame announced he had joined our camp," reminisces Becker. "We both promoted the delta-wing concept for the X-15." Like Petersen, Becker believes that the delta-wing configuration would have provided a great deal of data not now available that only the NASP will provide.

Research alive at Langley . . .

In 1977, when the Agency terminated hypersonic research aircraft studies at Ames, Langley's Space Systems and High-Speed Aerodynamics Divisions managed to keep low-profile research programs alive in airbreathing propulsion and fundamental structures and materials for transatmospheric vehicles and hypersonic missiles. The Hypersonic Propulsion Branch even intensified supersonic combustion research. Named Deputy Director in 1980, Petersen gave strong support to Langley's high-speed research. "Hypersonics is something I have been involved in and strongly believed in all my life," he admits.

In contrast to the national trend, Petersen maintained Langley's research program in hypersonic technology, leading to pioneering advances which formed the basis for the initiation of the NASP program. He also led the advancement of Langley's hypersonic ground-test facilities as well as significant

Continued on page 2.

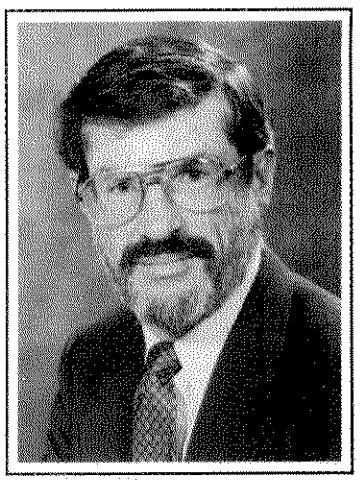
AIAA Names Fellows and Associate Fellows

Twenty NASA Langley employees have been selected for the rank of Fellow or Associate Fellow by the American Institute of Aeronautics and Astronautics.

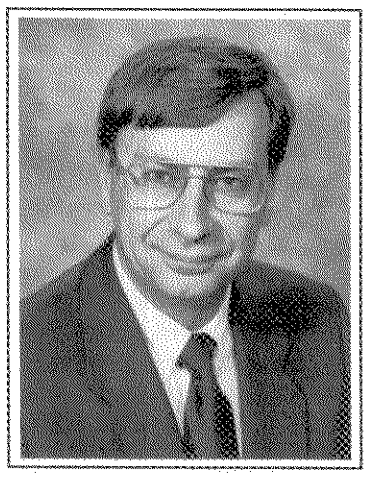
Elevated to the rank of Fellow were Dr. H. Lee Beach Jr., deputy director for Aeronautics; Dr. Jeremiah F. Creedon, director for Flight Systems; Dr. Douglas L. Dwoyer, chief of the Fluid Mechanics Division; Dr. Jer-Nan Juang, principal scientist, Structural Dynamics Division; Dr. James D. Lawrence Jr., chief of the Atmospheric Sciences Division; James N. Moss, research engineer in the Space Systems Division; and Dr. James H. Starnes Jr., head of the Aircraft Structures Branch. New Fellows were presented at the Annual Meeting held May 2 in Arlington, Va.

Named to the rank of Associate Fellow were Laurence Bement Jr., Wayne Bryant, Daniel J. Crawford, Dr. Peter A. Gnoffo, Edwin F. Harrison, Dr. Jerrold M. Housner, James D. Keller, Charles G. Miller III, Samuel A. Morello, William M. Piland, Dr. Robert E. Smith Jr., Dr. James C. Townsend and Dr. William E. Zorumski. Associate Fellows were honored at the annual AIAA Hampton Roads Section awards banquet.

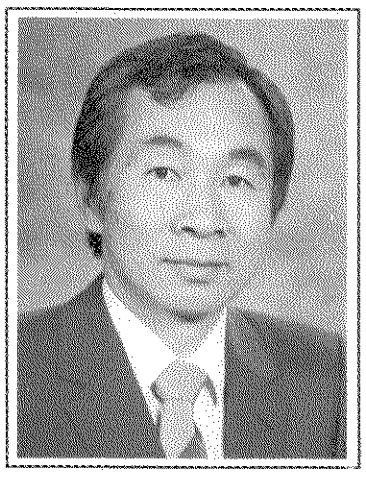
Dr. H. Lee Beach Jr.



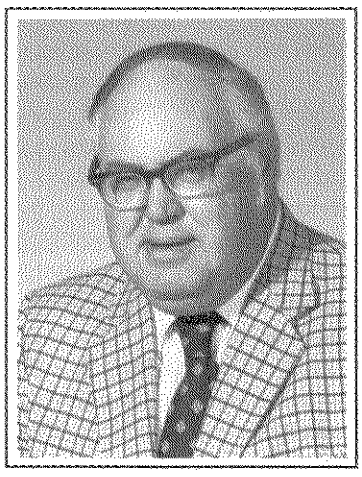
Dr. Jeremiah F. Creedon



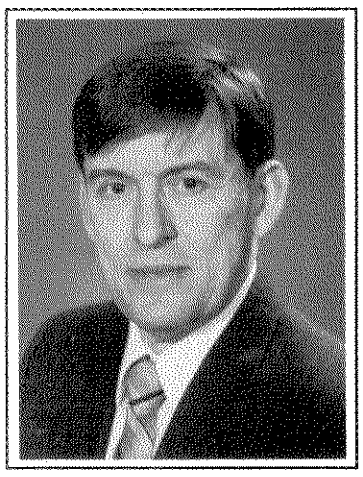
Dr. Douglas L. Dwoyer



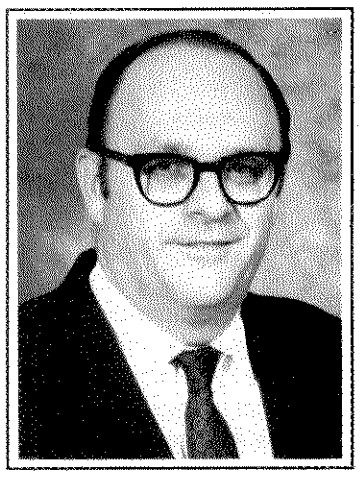
Dr. Jer-Nan Juang



Dr. James D. Lawrence Jr.



James N. Moss



Dr. James H. Starnes Jr.

News Briefs

NASA, Industry to Develop Remote Sensing Firefighting Aid --- NASA's Ames Research Center and Terra-Mar Resource Information Services, Inc., both of Mountain View, Calif., will jointly develop a system to allow firefighters to merge elevation and vegetation data with live pictures of forest fires to enable the firefighters to quickly "see" through a smoky forest fire and plan their strategy. The system will give firefighters a picture of the fire intensity and borders, overlaid with drawings of roads, water sources and map coordinates. The data will be available to firefighters in a matter of minutes, compared with current systems which take six to 12 hours to obtain similar data. The disaster assessment system also could be used during floods, earthquakes, oil spills and similar events.

Joust 1 Launch Set --- The launch of Joust 1, a commercial suborbital rocket carrying 10 materials and biotechnology experiments, has been reset for 8:30 a.m. EDT, May 6, from Launch Complex 20 at the Cape Canaveral Air Force Station, Fla. The Joust 1 mission is sponsored by the University of Alabama in Huntsville's Consortium for Materials Development in Space (UAH CMDS), a NASA Center for Commerical Development of Space. Space Data Division, under a contract with UAH CMDS, is providing the Prospector rocket and launch services.

Proposals Requested for Technology Transfer Centers --- NASA has issued a request for proposals to establish six Regional Technology Transfer Centers (RTTC), each funded at about $1 million annually, to replace 10 Industrial Applications Centers (IAC), whose contracts expire this year. The deadline for receiving proposals is June 17. Selections for negotiation for contract awards is targeted for late summer, with the RTTCs expected to become operational in early 1992. The restructuring of the IAC program represents an effort by NASA's Office of Commercial Programs, Headquarters, Washington, D.C., to upgrade and revitalize the current network and is intended to accomplish several objectives.

Loral Awarded Atmospheric Sounder Contract --- NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., has awarded Loral Infrared & Imaging Systems, Lexington, Mass., a unit of the Loral Corp., a $145 million contract to design and build the Atmospheric Infrared Sounder (AIRS) instrument to be flown on the first of the Earth Observing System (EOS) satellites. Under terms of the contract, Loral will design, develop and produce the first atmospheric sounder for delivery to JPL in 1996. AIRS will be a global thermometer in space and will be one of the world's premier monitors to study the effects of increased "greenhouse" gases in the Earth's atmosphere when the EOS-A series is launched.

Editor's note: For copies of the NASA News Releases summarized above, contact Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request copies by the release headline printed in bold.

Senior Management Research Review

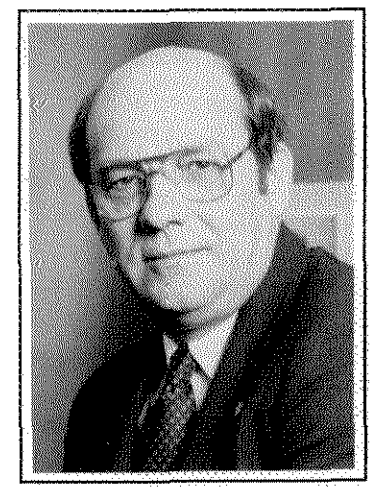
The Senior Management Research Review will be held Monday, May 20, from 9 to 11 a.m. in the Subsonic Tunnels Conference Room, 17 West Taylor Road, Room 200. All employees are invited to attend. Program accomplishments will be given by the following Langley scientists.

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:00	Faultfinder Concept Successfully Validated Using Flight Recorder Data from British Midland Airways Boeing 737-400 Accident	Paul C. Schutte (Flight Systems, FMD)
9:15	Design and Experimental Validation of Control Laws for CSI Evolutionary Model	Kyong B. Lim (Flight Systems, GCD)
9:30	Porosity for Transonic Airfoils with a View Toward Multipoint Design	Peter M. Hartwich (Aeronautics, AED)
9:45	Effect of Oxygen Dissociation on Hypersonic Combustion	Griffin Y. Anderson (Aeronautics, FLDMD)
10:00	LDEF Environmental Effects on Polymeric Matrix Composite Materials	Wayne S. Slemp (Structures, MD)
10:15	Comparison of Heating Rate Calculations with Experimental Data on a Modified Shuttle Orbiter at Mach 6	H. Harris Hamilton (Space, SSD)
10:30	Director's Comments	

Following these presentations, the program directors will give status reports.

Langley Colloquium

NASA Deputy Administrator Addresses Contracting Out



For a number of years, it has been difficult for NASA to maintain the civil service workforce complement necessary to keep pace with the increasing level of program activity. Further, Administration pressure to convert critical functions to contractors has become a serious threat to NASA's management and supervision abilities. The Agency is currently addressing this issue and evaluating the alternatives to remedy deficiencies in its civil service core capabilities.

During a Langley colloquium, Monday, May 13, NASA Deputy Administrator James R. Thompson Jr. will discuss "Contracting Out: Has NASA Gone Too Far." The talk will be given to NASA employees, retirees and contractors at 2 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road.

Thompson became Deputy Administrator of NASA on July 6, 1989, following 33 months as Director of the Marshall Space Flight Center, Huntsville, Ala. During that period, the Marshall center oversaw the redesign and testing of the critical Space Shuttle solid rocket boosters. The success of that effort was a prerequisite to NASA's "return to flight" on September 29, 1988, when the Space Shuttle Discovery was launched on the first Shuttle mission in almost three years.

Petersen Presented Aeronautics Award

Continued from page 1.

achievements in computational fluid dynamics, both of which are essential for a successful high-speed aircraft.

"Petersen made contributions to hypersonic research as well as good management decisions at Headquarters that benefitted hypersonics. I feel he is largely responsible for NASA's participation in the NASP project," Becker contends. "In my view, what we were trying to do at Langley between 1965 to 1975 has come to fruition under Petersen's direction."

Agency directive . . .

NASA has charged Langley to lead the study of the technological feasibility of a hypersonic "aerospace plane" or "transatmospheric vehicle." This plane, whose success hinges on the development of a powerful air-breathing propulsion system known as the "scramjet," will be capable of accelerating to speeds in excess of Mach 20, blast into orbit and return to Earth via a conventional runway. This hypersonic dream is being fostered and is prospering under Petersen's direction.

In the Spotlight

Accomplishment Rewarded

Anna H. Jackson, personnel staffing and class specialist in the Human Resources Management Division, has been granted a superior accomplishment award "for exemplary and dedicated personnel classification and staffing support to the Systems Engineering and Operations Directorate."

Viking Reunion Planned

A 15th anniversary Viking Project reunion is scheduled at NASA Langley's H.J.E. Reid Conference Center and grounds Saturday, July 20, from 3 p.m. until dark.

The reunion, which celebrates the landing of the first Viking spacecraft on Mars, is open to all Viking project members, their families and friends as well as NASA employees. Cost is $13 per person for a seafood buffet. Blue grass music will be provided by the Kentucky band. The event is hosted by the Langley Alumni Association.

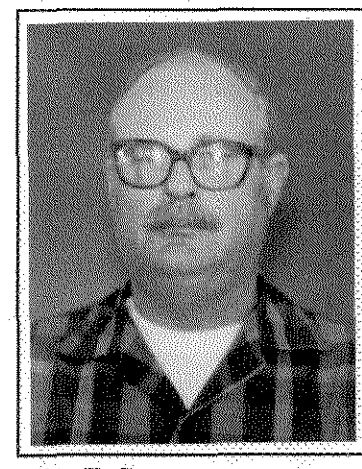
For reservations and additional information about the reunion, call (804) 864-3309. Deadline for reservations is July 1.

The reunion is being held in conjunction with the Mars Symposium--*Mars Exploration, Past, Present and Future*--July 17-19 at the Williamsburg Lodge, Williamsburg, Va. The symposium is sponsored by the American Institute of Aeronautics and Astronautics and NASA Langley, which managed the Viking program from its inception to its successful completion in 1978.

In Memoriam

Sympathy is extended to the family of Allen T. Gray, who died April 18 in Manning, S.C. Gray was a bindery machine operator in the Publications Section for over 12 years. Gray retired as a master sergeant from the Air Force and was a veteran of the Korean and Vietnam wars. In total, he had accumulated over 36 years of government service.

"Allen was our most highly skilled bindery operator and did most of our training in that area," said Harold Orr, head of the Publications Section. "He was a good worker and a friend to everyone in the Section. His death is a great loss to us."



Allen T. Gray

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Remember when . . .

Anniversary of First Manned Flight Recalls Langley's Place in History

-by Craig Murden

The 30th anniversary of America's first man in space is also a reminder of the key role Langley played in Alan B. Shepard's flight aboard the Freedom 7 spacecraft on May 6, 1961. For, when NASA was established in 1958, it was Langley which had the initial responsibility for the nation's first manned space venture--Project Mercury.

The project became an official NASA program when a Space Task Group was formed under Langley management in November of 1958. Then, after the original seven astronauts were selected in April 1959, the intensive training they received here carried them into the six manned Mercury missions, the Gemini program which followed and on to the high drama of the flights of Apollo. And, when in 1961, the Manned Spacecraft Center was established near Houston, Langley people comprised much of its original cadre of scientists and engineers.

Project Mercury

The Mercury program, which spanned a period of nearly five years, saw major government agencies and much of the aerospace industry combine skills, initiative and experience in a successful national effort. Langley's early work and leadership contributed to each of the accomplishments of Project Mercury:

o Development of a NASA management system that could carry out more advanced manned space flights.

o Exploration of the fundamentals of spacecraft reentry.

o Starting a family of launch vehicles from existing rockets that led to new booster designs.

o Setting up of an Earth-girdling space tracking system that was later modified for the Gemini and Apollo projects.

o Training a pool of astronauts that could be augmented to meet the requirements of future space exploration programs.

American in Space

The historic mission of Freedom 7 was to begin on May 2 but heavy clouds over Cape Canaveral forstalled the launch. In the meantime, the identity of the pilot, which NASA had not planned to announce until the vehicle was aloft, leaked out to an eager nation. Thus did Navy Commander Alan B. Shepard, Jr., 37, become the focus of the collective expectations and trepidations of the country. With the skies clear on May 5, Shepard again entered the capsule he had named to stand for the seven astronauts, and the count-down resumed. Then, at 9:34 a.m. the Redstone Booster blasted away from Canaveral's Complex 5, propelling the Naval officer and his nation's space program into 15 minutes of history as Freedom 7 soared 116 miles into space. Around the country, eyes and minds were skyward and important meetings in the nation's capitol were suspended to await his safe recovery. Shepard and his mount were delivered from the Atlantic by a Marine helicopter to the deck of the U.S.S. Champlain where he told the crew, "Boy, what a ride."

Alan Shepard

The career of America's first astronaut began when he graduated from the United States Naval Academy in 1944. He then served on a destroyer in the Pacific. After the war, he became a pilot and held a variety of flying posts including duty with Fighter Squadron 42 at Norfolk. In 1950, he graduated from the Navy's Test Pilot School and participated in high altitude flight test work and suitability trials of new aircraft. He then served two tours aboard an aircraft carrier in the Western Pacific before returning to the Test Pilot School where he engaged in extensive flight testing and later became an instructor. After attending the Naval War College in 1957 and completing an assignment on the staff of the Commander-In-Chief, Atlantic Fleet, he was selected as a Mercury astronaut in 1959. In 1963, Shepard was designated chief of the Astronaut Office and, in 1971, went on to command the Apollo 14 mission which was man's third lunar landing. He holds the Congressional Medal of Honor (Space). Shepard retired from NASA and the Navy in 1974 as a Rear Admiral.

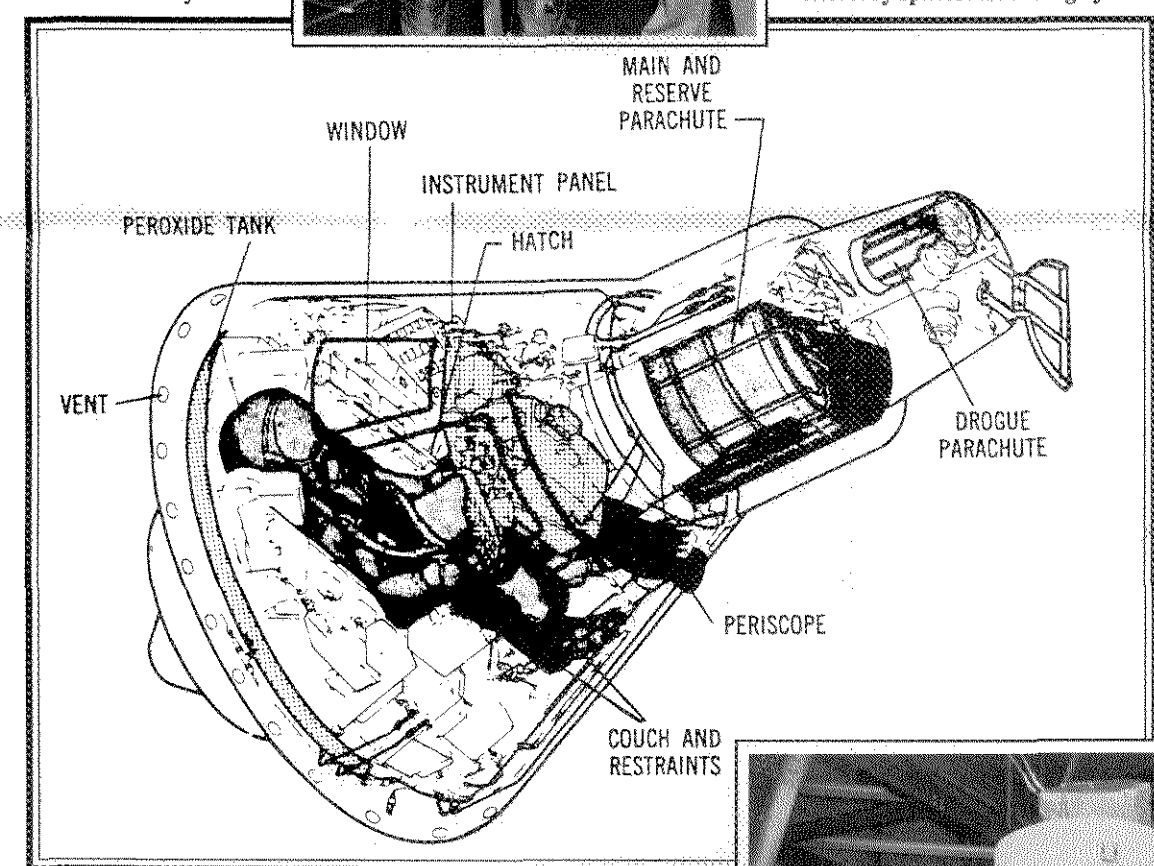
Alan B. Shepard is fitted for his Mercury spacesuit at Langley.

The Langley Legacy

Shepard's first manned ride into space, for which Langley can be immensely proud, set the strong tone of success for the whole Mercury project. Its six manned flights were made with complete pilot safety and showed that man could function ably as a pilot-engineer-experimenter in space. And, as longer duration flights were made in the project, the growing body of new scientific and technical information provided the underpinning for the Gemini and Apollo successes which have, in turn, brought America to the threshold of Lunar and Martian adventures.

The Machine

The one-man Mercury spacecraft, built by McDonnell Douglas, set the trend for U.S. space vehicle design in the first decade of manned activity. Shaped somewhat like a bell, the capsule was 9 feet tall (26 feet with the astronaut launch escape tower) and 6 feet 2-1/2 inches wide across the bottom. It had a maximum orbiting mass of about 3,200 pounds and the blunt end was covered with an ablative heat shield to protect against the 3,000-degree reentry heat. The Redstone Booster under Freedom 7 produced 78,000 pounds of thrust. By contrast, the solid rocket boosters which power the Shuttle in its first two minutes of flight, generate 5.8 million pounds of thrust.



Project Mercury: by the numbers

There were a total of 25 major Mercury flight tests in a 45-month period. Launch preparations and flights were from two sites--Cape Canaveral and Wallops Island. Twenty-three launch vehicles were used: seven Little Joe, six Mercury-Redstone and 10 Mercury-Atlas rockets. Fifteen production capsules were used for unmanned and manned flight, some for more than one test, and one was used solely as a ground-test item. At the height of Mercury activity, there were 11 major contractors, 75 subcontractors and 7,200 vendors working to produce the equipment needed in the effort. Also included in this endeavor were Department of Defense forces--ships, planes, medical assistance, and flight and recovery operations support. Colleges and universities also investigated many different and significant facets of Project Mercury. The program's total cost was $392,600,000. Of that, $135.3 million was for spacecraft, $82.9 million for launch vehicles, $71.9 million for tracking operations and equipment, $53.2 million for facilities, and 49.3 million for operations.

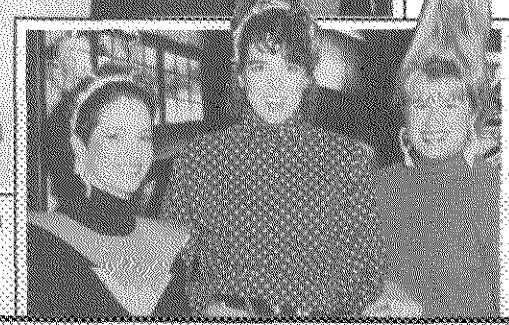
Shepard peers from the Mercury capsule.

-photos by Sandie Horsey

The occasion held no lack of enthusiasm. Here's the welcoming committee!

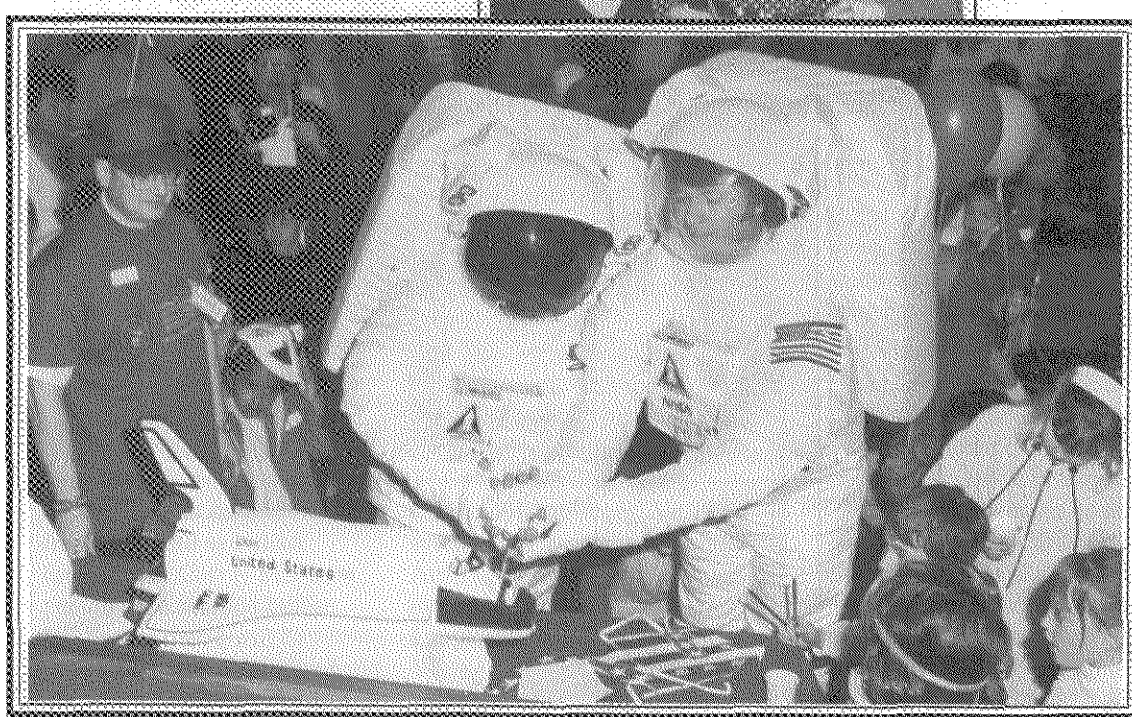
Activities included testing materials, project egg loft and UFO--unidentified flying objects. Above, a willing participant tests "oobleck" with some surprising results. UFO aloft, the father-daughter team at the right cushions an egg for a later flight.

The Costume Contest Winners



The Judges!

Children ages 2 to 12 were invited to dress in costume. Space alien judges, shown at the right, led the Shuttle birthday parade.



Under the watchful eye of Visitor Center Director Mark Nataupsky, "astronauts" Shelley Canright (center) and Tom Prothro cut the Shuttle cake on the occasion of the tenth anniversary of STS-1. Co-sponsored by the Visitor Center and the AIAA, the Shuttle birthday party drew a crowd of over 600 children and adults.

Tidbits from Training

National Guardsmen Granted Credit for Pre-1969 Service

Public Law 101-530, enacted November 6, 1990, grants civil service credit for pre-1969 service as National Guard technicians, even though the individuals did not have subsequent service as a National Guard technicians after December 31, 1968. Applicants must submit a certified copy of their service history.

Federal employees will receive credit for pre-1969 service under both Civil Service Retirement System (CSRS) and the Federal Employees Retirement System (FERS) **if** two requirements are met:

1. They separate from a position in which they were covered by CSRS or FERS on or after November 6, 1990; **and**

2. They make a deposit equal to the deductions to the retirement system that would have been made if covered, plus interest.

To apply for this credit, current employees should contact the Employee Relations Section, ext. 42605.

Credit is allowed for pre-1969 National Guard technician service to individuals who retired after December 31, 1968, and before November 6, 1990. In order to receive credit, retirees must:

1. Apply in writing to the Office of Personnel Management (OPM) Office of Retirement Programs, Correspondence and Death Claims Branch, Employee Service and Records Center, Boyers, Pa. 16017, by **November 5, 1991, and**

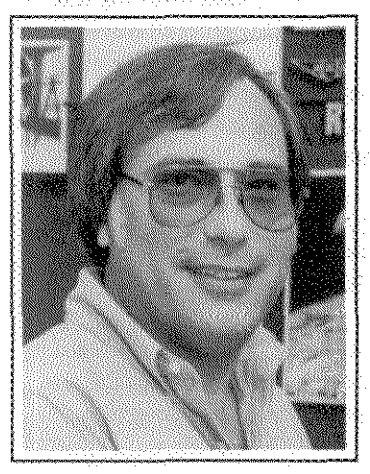
2. Make the necessary deposit in a lump sum, or in monthly payments to be completed no later than 24 months after the date of application.

The written request for credit should also include certification of the dates of service and rates of basic pay from the Adjutant General of the state where the pre-1969 service was performed.

NACA-NASA Pins Available

The Visitor Center Souvenir Counter has a limited supply of NACA/NASA 75th Anniversary commemorative pins for sale. The cost is $4.00 for the antique brass replica of the above design.

Meyers Recognized for Invention



James F. Meyers, Instrument Research Division, was presented a certificate of recognition and cash award for his invention titled "Frequency Laser Velocimeter Signal."

The invention is a signal processor for measuring the oscillating frequency contained in a laser velocimeter signal burst or bursts. The award was presented by Center Director Richard H. Petersen.

EG&G Names "Good Egg"

From a field of 22 nominations, Luckey L. Thomas was named "Good Egg" of the Year by EG&G, Langley Operations Division. Support services contractor to Langley, EG&G looked for an employee who best exemplified a concern for quality, productivity, teamwork and safety.

Thomas worked effectively within and outside his department on the half-scale NASP model, which resulted in EG&G receiving a commendation for excellence from NASA. In addition, he submitted suggestions which have been implemented to improve efficiency, productivity and safety in the workplace.

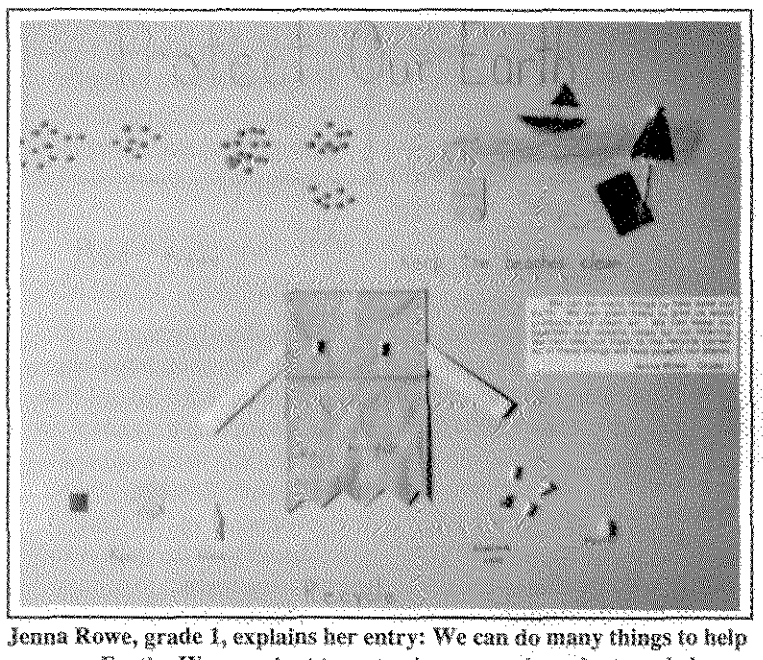
People & Places

Conservation Club Chooses Earth Day Art Contest Winners

The Langley Conservation Club and the Visitor Center co-sponsored the second annual Earth Day Student Art Contest. Students of all ages were encouraged to submit posters or drawings detailing their ideas about how we can better take care of "Spaceship Earth."

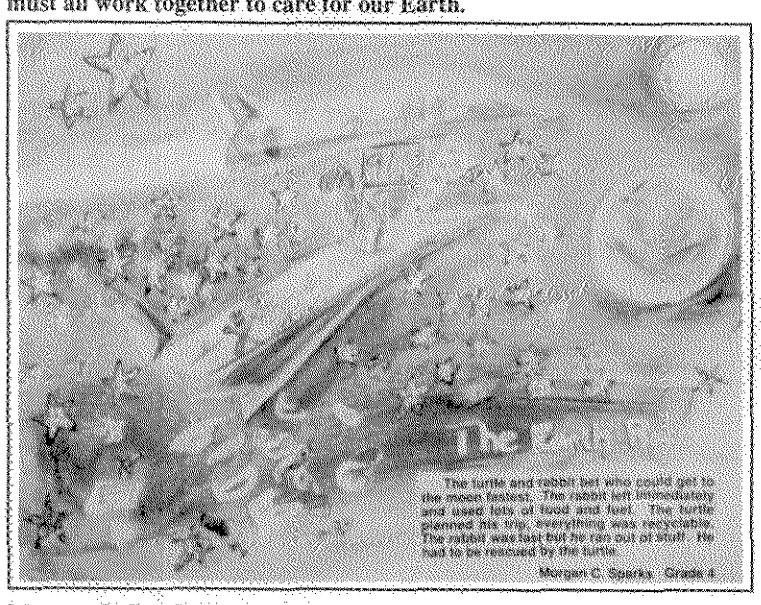
All participants were awarded a seedling to plant as a constant reminder to be mindful of Earth's delicate environment.

Winning entries in each of the three main age groups are shown below. The artists were awarded a savings bond for their environmental effort. Entries are on display in the Visitor Center.



Jenna Rowe, grade 1, explains her entry: We can do many things to help save our Earth. We can plant trees to give us wood products and clean air. We can keep our beaches and oceans clean by not littering. We can take our trash to the recycle center. All of these things will help protect our planet.

Catherine Winfrey, grade 9, explains: Whether replanting the world's forests, recycling to conserve our natural resources, reducing the amount of fossil fuels used, or residing peacefully with our precious wildlife, we must all work together to care for our Earth.



Morgan C. Sparks, grade 4, writes: The turtle and rabbit bet who could get to the moon fastest. The rabbit left immediately and used lots of food and fuel. The turtle planned his trip, everything was recyclable. The rabbit was fast but he ran out of stuff. He had to be rescued by the turtle.

Langley Newsmakers

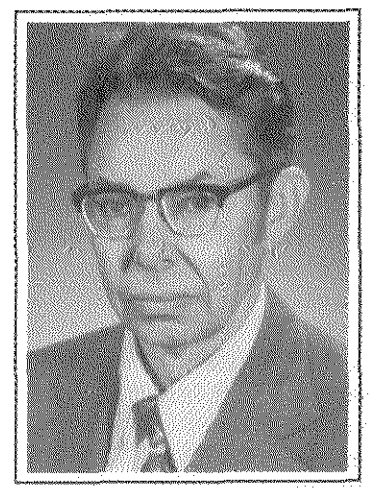
Phillips Elected to Academy of Engineering

W. Hewitt Phillips, a Langley distinguished research associate (DRA) , has been elected to membership in the National Academy of Engineering. Phillips was nominated by Dr. Christopher C. Kraft, former director of NASA's Johnson Space Center, Houston, Texas.

Academy membership recognizes important or unusual personal contributions or accomplishments in engineering theory and practice and/or the pioneering of new and developing fields of technology. Phillips is cited for "exceptional theoretical and practical contributions which have substantially advanced aircraft stability, control, guidance, flying qualities and simulation technology for the benefit of mankind."

Phillips has made significant contributions to the development of aerospace science and mentored many of its leaders from 1940 through the present. He conceived and conducted research programs in the areas of navigation and guidance, stability and control, and flying qualities for air and spacecraft. Possessing an unusual ability to anticipate future needs, Phillips has repeatedly led research--frequently developing unique facilities required for specific study--to address future problems. He is particularly noted for his contributions to the Gemini and Apollo programs in the areas of navigation and guidance systems, orbital rendezvous and docking, and lunar landing simulations and astronaut training.

Phillips joined NASA's predecessor, the National Advisory Committee on Aeronautics, NACA, in 1940 as an aeronautical engineer. He advanced to the position of chief



of the Flight Dynamics and Control Division. After retirement in 1979, he became a DRA researching and consulting in the areas of propeller and airfoil design, gust alleviation systems, solar-powered and ultralight aircraft, sailing yacht design and Space Shuttle operations.

Carlson Chosen for Simmons Program

Dr. Ann B. Carlson, aerospace engineer in the Aerothermodynamics Branch in the Space Systems Division , has been selected to attend the Simmons College Program for Developing Managers.

The Simmons Program is an intensive three-week program which provides managers with the necessary accounting, financial and managerial skills for informed decision-making.

Carlson is studying rarefied flow effects for entry vehicles using the direct simulation Monte Carlo technique. This technique has been valuable in investigating the atmospheric heating affecting the Aeroassist Flight Experiment and shock/shock interactions impacting the National Aero-Space Plane.

Carlson came to NASA as an engineer in the Thermal Analysis Section in 1981. She performed the thermal analysis of the Shuttle bolted-joint concept to be used for the advanced solid rocket motors. She was the lead thermal analyst for TRACER, a major orbiting satellite experiment proposed to

study the chemistry of the atmosphere.

Visitor Center Honors Corps of Volunteers

The NASA Langley Visitor Center honored over 40 volunteers during the Volunteer Recognition Programs on Wednesday, April 17. Langley Director Richard H. Petersen gave the keynote address and Ralph T. Johnston, director of the Virginia Air and Space Center/Hampton Roads History Center, spoke on the progress of the new museum in downtown Hampton.

The volunteers, representing a multitude of ages and backgrounds, share a common bond in their commitment to aeronautics and space. They fill several key positions, such as front desk receptionist, aerospace lecturers and Visitor Center tour guides, as well as educational assistants in the Teacher Resource Center. With the help of these dedicated volunteers, over 200,000 visitors from all over the world trace man's achievements from the Wright brothers' primitive "Flyer" to the space program.

Volunteers from Hampton are William Beczakalo, Mary Burtnette, Maxine Copeland, Judith Curtis, Ken Curtis, Doris Eagle, Dean Floyd, Michael Fremaux, Gladys Hardrath, Susie Himes, Frank Jenkins, Seiiche Kawabe, Suellen Lansell, Randy Lassiter, Mary Levin, Kristine Lynch, Maria Millen, Frank Quinto, Tammy Robinson, Willie Session, Miranda Stellmach, Lisa Williams and June Williamson.

Volunteers from Newport News are Neil Bates, Susan Grasso, Ray Grasso, Peggy Hewes, Marolyn Parker, Robert Winger and David Workman.

York County volunteers are Betty Brummer, Carl Kosch and Carol Smith.

Southside volunteers are Dolores Fulgaro, Margaret Gray, Betty Harless, Raymond Heineman, William Spencer, Randy Wagner and Diane Warnell.

-photo by Pilar Kitchen

VIGOROUS VOLUNTEERS. Honored by Center Director Richard H. Petersen (second from left) for extraordinary service to the Langley Visitor Center are (L to R) Marjorie Stafford, Maxine Copeland, Ken Curtis, Lisa Williams, Mary Levin, Seiiche Kawabe and Doris Eagle. Curtis was named Volunteer of the Year for contributing the most hours since April 1990.

Happenings

SPECIAL LAA SOCIAL will be held Friday, May 10, from 4 to 8 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road. Join your co-workers for Summertime Fun, featuring entertainment by Gator Allmond and *Spice of Life*. $1 cover charge.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m. in the NASA gym. Cost is $12 per month. First class is free. In addition, during May, classes in bench-step will be offered Saturday mornings, 9:30 to 10:30 a.m. Cost is $6 per month.

NASA TOASTMASTERS meet the second and fourth Wednesdays of the month in the H.J.E. Reid Conference Center. The next meeting is May 8, 11:30 a.m. to 1 p.m.

AIAA MEETING, Wednesday, May 8, in the H.J.E. Reid Conference Center will feature Mark P. Gorton speaking on Hovercraft Technology. The program will be preceded by a social at 4:30 p.m.

VOLUNTEERS NEEDED for Desert Storm July 4 celebration. Call Abraham Leiss, 877-2939.

AIAA AWARDS BANQUET will be held Tuesday, May 14, at the H.J.E. Reid Conference Center. The dinner meeting is open to the public and costs $15 for non-AIAA members, $10 for students. Reservations are required by May 10. Call Linda Bangert, 864-3022 or 249-2237, or Del Freeman, 864-4502 or 868-0802.

ENGINEERS CLUB of the Virginia Peninsula will tour the Amoco Refinery May 8. LaRC employees are welcome to join the tour at 3 p.m. For details or reservations, call Rod Harvey, 249-2322, or Abe Leiss, 877-2939.

ENGINEER'S CLUB Annual Student Award Banquet will be held at 6 p.m., May 15, at the Ft. Eustis Officers' Club. Awards will be presented to the outstanding science student of 16 high schools. All NASA employees are invited to help congratulate the winners. Dinner is $10. Contact Chris Malami, 838-4784, or Abe Leiss, 877-2939, for reservations.

LAFB OFFICERS' CLUB is a membership club. Please call 766-1361 for details.

FEDERAL WOMEN'S Program Committee will meet Wednesday, May 8, at 8:15 a.m. in the executive dining room of the NASA cafeteria.

BEEKEEPING short course sponsored by LaRC Apiculture Club and the Va. Co-op Extension Service, May 11, 8 a.m. to 5 p.m. at VIMS Waterman's Hall, Gloucester Point, Va. Cost is $10. For course details, contact Gale Harvey, ext. 46742.

SCUBA DIVERS, the Peninsula River Rats meet the third Tuesday of the month at 5 p.m. at the Langley Air Force Base Yacht Club. The next meeting will be held May 14. For details, contact Cathy Stafford or Rob Myer, 764-3740.

PARENTS WITHOUT PARTNERS is open to all single parents with children under 21. Call 827-8408 for membership and orientation details.

TIDEWATER DINNER THEATER will present Annie, Get Your Gun April 17 through June 23. Discount tickets are available at the Visitor Center Souvenir Counter.

CALLIGRAPHY EXHIBIT, sponsored by the Calligraphers Guild of the Peninsula, Sunday, May 5, from 2 to 4 p.m. at the Peninsula Fine Arts Center, Newport News. Free.

NEEDED: ROOMMATE. Woman in mid-20s with 8-month-old child needs room from Aug. 17 to Sept. 15 while working at NASA. Rent negotiable. Call Martha Brown, ext. 46217

FOR SALE: HOME by owner. 3 BR brick rancher in Denbigh South; LR, 1-1/2 bath, FR w/fpl, large eat-in kitchen, attached garage, fenced back yard. $81,900. Call 874-6045.

FOR SALE: HOME in Buckroe, 3BR brick ranch, gas heat, ceiling fans, large fenced back yard. Convenient to I-64 and bases. Well-maintained starter home. $69,000. Call 728-9454, leave message.

FOR SHARE: TIMESHARE. One week at Sea Ranch II, Kill Devil Hills, N.C. Beach front. Nov. 30-Dec. 7. Heated enclosed pool, tennis courts, health and fitness room, restaurant, lounge and dancing. $2,500 or best offer. Please call 877-5815.

Retirement Party

Friends and associates of **Merle S. Ott** are cordially invited to a retirement party in her honor as part of the F-106 retirement ceremony May 17, at the Langley hangar, 6 East Taylor Road, from 2:30 to 4:30 p.m. Anyone wishing to contribute to Merle's gift may contact Pat West, ext. 46399, Mail Stop 246A, or Bettie Messier, ext. 43857, Mail Stop 247.

May is Hypertension Month
Be smart--have your blood pressure checked annually.

Golf Association Announces Winners

Individual winners in the NASA Golf Association Langley golf tournament held April 5 are **Dale Croom Sr.**, with a low net score of 63 (23 handicap) and **W. "Breezy" Bressette**, with a low gross score of 75. Congratulations to these golfers and the winning teams.

The next NASA Golf Association tournament is scheduled for Deer Run, Newport News, on May 24.

For more information, call Tom Yager, ext. 41304.

National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

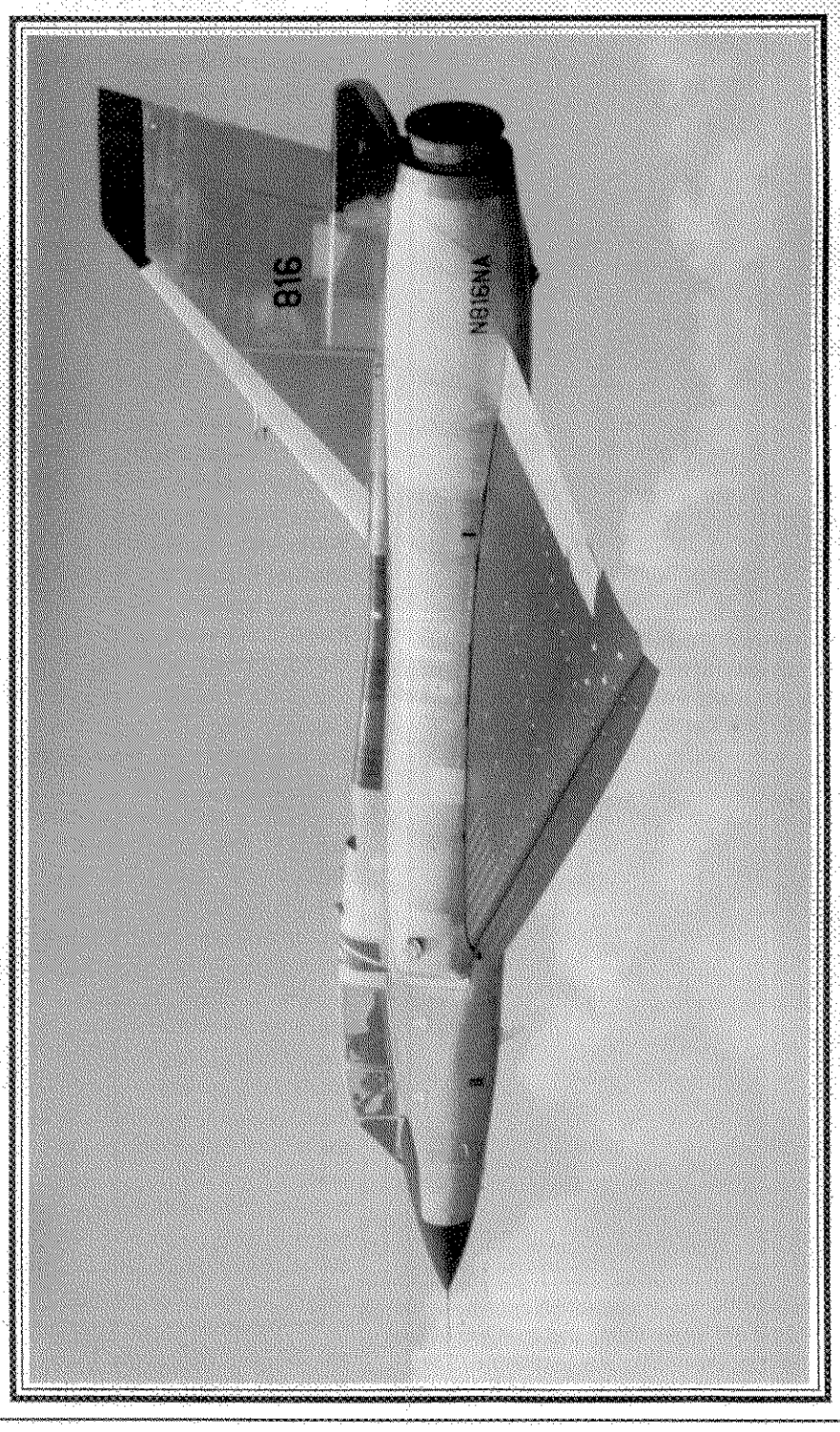
Official Business
Penalty for Private Use $300

402 ON-SITE NON-LARC
SELLY KAREN
MAIL STOP 146

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

News Researcher

Celebrate Public Service Recognition Week, May 6-12



FAREWELL FOR A HISTORIC PERFORMER

All active and retired Langley employees interested in taking part in a significant aviation event are invited to an informal ceremony May 17 marking the retirement of NASA 816, Langley's F-106B research aircraft and the last known manned F-106 still flying. The historic aircraft--which has logged more than 30 years of unique research contributions, including being struck by lightning more than 700 times--will be transferred to the Virginia Air and Space Center at the conclusion of the ceremony. The 2:30 p.m. ceremony will take place in the Langley hangar, 6 East Taylor Road. Attendees will be treated to a souvenir brochure on the many facets of NASA 816's career, a slide presentation reviewing its history and accomplishments, and the sharing of stories about the aircraft by those who have worked most closely with it over its long career with the Air Force and two NASA centers. To join in the ceremony, contact Patricia West, (804) 864-6399.

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 10 May 17, 1991

News Researcher

Bi-weekly Employee and Contractor Publication

Historic Aircraft Retired, Slated to Star in New Museum

It took off one last time. Not for a joy ride--like most would think it had coming after 33 years of hard work--but for one more probe, one more bit of information, one more honest day's work its ground-bound masters had devised for it.

If NASA 816 were capable of feeling joy, it surely would have on this last flight, knowing that no other F-106 had even come close to experiencing the same mix of distinguished service and--yes--even some excitement along the way.

And when it landed and rolled up to the Langley hangar, the sleek, delta-winged warrior from another era stood silent while the traditional dousing of pilot, flight engineer and program managers took place in lighthearted celebration.

-by H. Keith Henry

A unique and historic aircraft has retired.

NASA 816, until recently sporting an unusual wing modification designed to help fighters gain the advantage in battle and still showing the subtle scars of more than 700 lightning strikes, made its last flight April 30. It was the last known manned Convair F-106 still flying.

In a ceremony set for today, May 17, at the Langley hangar, NASA 816 will be symbolically transferred to the new 110,000 square-foot Virginia Air and Space Center in downtown Hampton.

The storied aircraft will be moved to its new home this summer and placed on permanent display along with other civilian and military aircraft in time for the Center's grand opening in the spring of 1992.

In its 30-plus years of service, NASA 816 was flown in support of research and development testing for the U.S. Air Force, research in support of the U.S. supersonic transport program of the 1970's at the NASA Lewis Research Center, Cleveland, and research in storm hazards and vortex flap programs at NASA Langley.

The F-106 design has special significance to Langley. Dr. Richard Whitcomb, a distinguished Langley retiree, was instrumental in reshaping the aircraft that would eventually become the F-106, resulting in a revolutionary advance in aircraft design that made it practical to achieve supersonic speeds at level flight. An F-106 set the world speed record of 1,525 mph in 1959 and still holds the record as the fastest single-engine turbojet-powered airplane.

NASA 816 is a two-seater --an F106B. The second seat allowed flight test engineers to ride along, operating test equipment and making observations.

For the Air Force, the F-106B that would later be called NASA 816 was used to test new modifications before being applied to the F-106 fleet. Assignments were to Edwards, McClellan, Tyndall and Holloman Air Force Bases, Geiger Field, Spokane, Wash., and to Convair/General Dynamics, Fort Worth.

At Lewis, NASA 816 was a one-of-a-kind workhorse. Under the left wing, it carried an extra engine for studies of how the propulsion system interacts with the highly-swept wing of a supersonic airplane; under the right wing, a comparison engine. In more than 300 flights, from 1966 to 1979, valuable information was collected that would contribute to the understanding of supersonic aerodynamics and supersonic engine noise.

At Langley, NASA 816 was "lightning hardened" and purposely flown into thunderstorms in hopes of being struck by lightning. Much was learned about the fundamental nature of in-flight lightning that will benefit designers of future aircraft. Present day aircraft are relatively immune from the effects of lightning, but future aircraft may be more susceptible due to increasing use of nonconductive composite materials for aircraft structure and increasing use of lightning-sensitive electronic control and display systems.

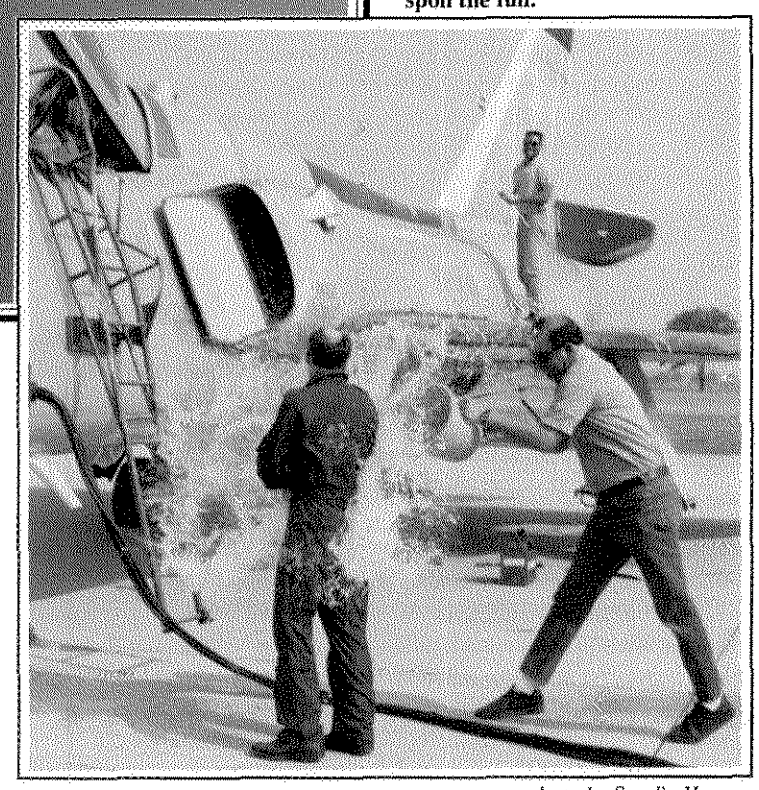
For the next series of flights, NASA 816's wings were reshaped for optimum aerodynamic performance at times when a supersonic airplane must fly slower than supersonic speeds. These times can be critical for a military airplane in aerial combat or for a supersonic transport attempting an efficient, relatively-quiet takeoff. The NASA-developed modification, a thin downward pointing flap added to the wing leading edge, greatly reduced drag and proved the "vortex flap" concept.

NASA 816 was manufactured in 1958 by the Convair Division of General Dynamics. In all, 277 F-106A and 63 F-106B airplanes were built at a cost of about $5 million each. Each F-106 "Delta Dart" was powered by a single Pratt and Whitney J75-P-17 turbojet engine. Developed as a Mach-2 interceptor, its mission was to intercept unidentified aircraft as they entered U.S. airspace. The F-106 served with the USAF Air Defense Command, Tactical Air Command and Air National Guard.

The Air Force has retired the F-106, once called the "ultimate interceptor," from active squadron service after a long and distinguished career dating from the late 1950's. The aircraft are used as drone targets during air-to-air missile training for the current generation of fighter aircraft.

-photo by Jay Brandon

LAST FLIGHT. NASA 816 flies over the Chesapeake Bay in its last flight before retirement. Oil, applied to the left wing before takeoff, is beginning to spread over the wing and reveal airflow patterns.



-photo by Sandie Horsey

JUST IN CASE. NASA 816 crew chief Calvin Chandler douses research pilot Philip Brown while crew member Dwight Elliott looks on. The dousing is traditional after the last flight of an airplane. The flight turned out to be the next-to-last-flight--but that didn't spoil the fun.

Apollo Lunar Excursion Module Simulator Unveiled

-by Allan C. Hanrahan

The refurbished Apollo Lunar Excursion Module Simulator (LEMS), used to help train every astronaut who set foot on the moon, was unveiled Friday, May 10, at New Horizons Technical Center, Hampton. The ceremony recognized the accomplishments of New Horizons' students and all others associated with the restoration.

U.S. Senator Charles S. Robb and state and local officials attended.

The LEMS was carefully transported from Langley to New Horizons in September 1989. Students restored the historic landmark and prepared it for display in the Virginia Air and Space Center in downtown Hampton. New Horizons performed the work in partnership with NASA Langley, the National Historic Landmarks Commission and the Virginia Air and Space Center.

The module was part of the Lunar Landing Research Facility, an essential structure that allowed NASA to train Apollo astronauts to fly in a simulated lunar environment. Neil Armstrong, Buzz Aldrin and 22 other astronauts used the facility to train for the last 150 feet of descent to the surface of the Moon.

News Briefs

Magellan Scientists Study Surface of Venus --- Magellan scientists of NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., are studying the surface features on Venus caused by wind in the planet's dense atmosphere. The movement of dust and sand is an important geological process on planets with atmosphere. The surface pressure of Venus' atmosphere is 90 times that of the Earth. Many large craters on Venus have nearby wind streaks that may have been caused by the violent winds generated during the impact event or that may be the result of a slower process of subsequent wind movement of the fine impact debris. Magellan had mapped more than 84 percent of the planet at the close of the primary mission cycle May 15.

Rollout of New U.S. Space Shuttle Endeavour --- The United States' new Space Shuttle orbiter, the Endeavour, was rolled out at a ceremony April 25 at Air Force Plant 42 in Palmdale, Calif., where the orbiter was assembled by Rockwell International Corporation's Space Systems Division. NASA Administrator Richard H. Truly called Endeavour NASA's finest Space Shuttle yet and praised the efforts of tens of thousands of people on the NASA/industry team across the nation who contributed to the new orbiter's construction. Endeavour is the fifth operational orbiter Rockwell has built for the U.S. Shuttle program.

Endeavour Fund to be Used for Teacher Fellowships --- During the rollout ceremony of the new Space Shuttle orbiter Endeavour April 25, NASA Administrator Richard H. Truly announced that he has created the NASA Endeavour Teacher Fellowship Program with the generous and heartfelt gifts donated to NASA by the public for the replacement orbiter. The program will award scholarships to American undergraduates studying to be teachers. Congress provided full funding for Endeavour. Therefore, Truly announced NASA's plan to invest the generous contributions--sent as a tribute to and a show of support for the space program--in America's future, establishing the Endeavour Teacher Fellowship Program.

NASA Lewis Research Center Deputy Director Named --- The NASA Administrator has announced the appointment of Dr. J. Stuart Fordyce as deputy director of NASA Lewis effective immediately. Fordyce has been director of aerospace technology at Lewis since 1984 and has had senior management responsibility for Lewis' efforts in aeropropulsion materials and structures research, space power, propulsion, communications and advanced electronics technologies, energy technology and microgravity materials science. Fordyce joined the Lewis staff in 1966.

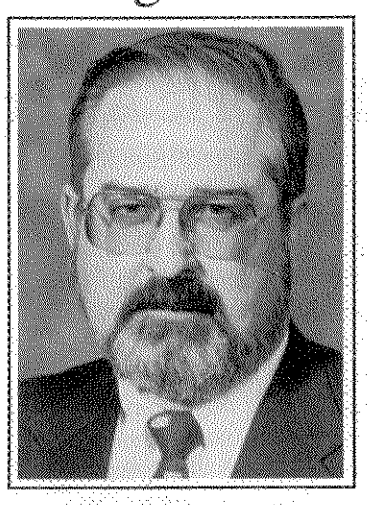
NASA Selects Payload Specialists for Spacelab Mission --- NASA has announced the selection of Dr. Lawrence J. DeLucas of the University of Alabama at Birmingham and Dr. Eugene H. Trinh of the Jet Propulsion Laboratory, Pasadena, Calif., to fly as payload specialists on the first U.S. Microgravity Laboratory mission. USML-1 is a 13-day Spacelab mission scheduled for flight aboard the Space Shuttle in June 1992. NASA has also designated Dr. Joseph Prahl of Case Western Reserve University, Cleveland, and Dr. Albert Sacco Jr., of Worchester Polytechnic Institute, Mass., to serve as alternates. During the mission, Trinh and DeLucas will conduct more than 30 scientific and technological investigations in materials, fluids and biological processes in the orbiting laboratory. They will be supported by Prahl and Sacco, who will serve as key control team members in the Spacelab Mission Operations Control facility at the Marshall Space Flight Center, Huntsville, Ala.

New Astronaut Candidates Sought by NASA -- NASA conducts astronaut candidate selections on a two-year cycle and has scheduled the next class of candidates for July 1992. Interested individuals may apply until the cut-off date of July 1, 1991. There are two types of astronaut candidate positions--mission specialists and pilot. Successful pilot applicants typically have extensive piloting experience in high-performance jet aircraft and flight test experience. Successful applicants for the mission specialist positions typically have significant backgrounds in the sciences or engineering. This year, because of the requirements of some future payloads and experiments, NASA is particularly interested in individuals with backgrounds in medical sciences research, microgravity research and materials processing. An application package may be obtained by writing to NASA Johnson Space Center, Attn: AHX Astronaut Selection Office, Houston, TX, 77058. Applicants for the Astronaut Candidate Program must be U.S. citizens.

Astronaut Mary Cleave Joins NASA Environmental Project --- Astronaut Mary L. Cleave, Ph.D., P.E., will become deputy project manager for SeaWiFS, Sea ViewingWide Field Sensors, at the NASA Goddard Space Flight Center, Greenbelt, Md., effective May 19. SeaWifs is a joint NASA and commercial project to learn about the biological mass in the ocean by studying the chlorophyll content to determine how much plankton is produced. Information on whether plants in the ocean can absorb enough carbon dioxide and produce necessary oxygen to prevent global warming will be one focal point for this research.

Editor's Note: To obtain copies of NASA News Releases summarized above, contact Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request releases by headline printed in bold.

Raper Selected for Carnegie Mellon Executive Program



James L. Raper, deputy manager of the Space Exploration Initiative Office, has been selected to attend the Senior Executive Seminar at Carnegie Mellon University, Pittsburgh, Pa. Raper was selected for the seminar in a NASA-wide competition.

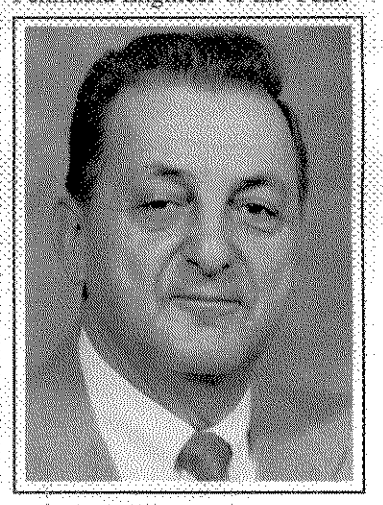
The seminar is an intensive graduate-level program for a select group of men and women in policy-making positions in the government, corporations and other organizations concerned with the interaction between the public and private sector.

The three weeks at the School of Urban and Public Affairs involves the participants in an integrated sequence of classes, practical work and discussions of key issues in political economy, management sciences and other disciplines relevant to policy-making and administration in large organizations.

Raper began his NASA career in June 1959 as an aeronautical engineer. Since that time he has served as the assistant manager for the Scout Reentry Project, manager of the Viking Decelerator Test Project, assistant manager of the Environmental Quality Program at NASA Headquarters, assistant head of the Experiment Analysis Branch, and manager of the HALOE project. In his current position, he is responsible for defining, developing and coordinating Langley's participation in the NASA program for developing a permanent Moon base and an expedition to Mars.

Maglieri Named Engineer of the Year

Domenic J. Maglieri has been selected by the Peninsula Engineers Council as the 1991 Peninsula Engineer of the Year.



Maglieri's professional career spans 39 years--35 years with Langley Research Center and four years as Director of Projects for the Hampton Division of Eagle Engineering.

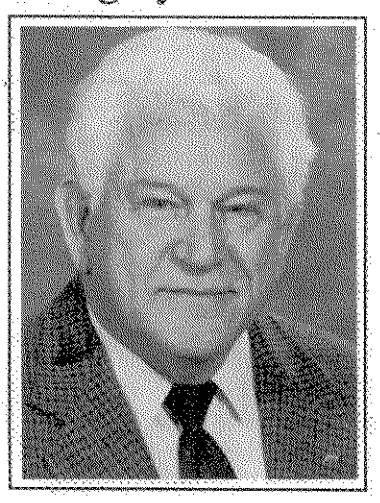
Maglieri is internationally recognized for his service on national and international committees studying airplane community noise and high-speed commercial transport sonic boom. He has been a leader in the acquisition of sonic boom measurements for all supersonic aircraft in the U.S. inventory since 1960. These measurements are fundamental to the understanding of acceptable levels of sonic boom for overland flight.

Upcoming LDEF Conference

The first LDEF Post-Retrieval Symposium will be held June 2-8 at the Hyatt Orlando, Kissimmee, Fla. For more information, contact Arlene Levine, LDEF Office, ext. 43318.

At the Visitor Center

McSmith to Discuss Langley's Crash Test Program



Dwight McSmith will discuss "The Men Behind the Crash" Thursday, May 23, at noon in the Visitor Center theater. This program, originally scheduled in January, was postponed due to the Visitor Center closing.

McSmith, retired supervisor of operations for Langley's Crash Test Program, will detail the beginnings of the program and describe the Impact Dynamics Facility.

Children's Program--10 a.m., May 25--"Wind Tunnel Wizardry," featuring Tom Vranas. Call 864-6000.

In Memoriam

Sympathy is extended to the families of:

Helen Shaw Edwards, who died March 27 in Yorktown. Edwards retired as an engineer technician from NASA Langley in 1976.

Robert E. Forrest, who died March 29 in Poquoson. Forrest retired as a metal fabricator from Langley in 1972 after 34 years of service.

Philip Donely, who died May 3 in Williamsburg. Donely retired from NASA as chief of the Flight Research Division in 1972 after 41 years of service. He received the NASA Exceptional Service medal and the Langley Research Service award.

Call for Papers

The Fifth Annual NASA/DOD Controls-Structures Interaction (CSI) Technology Conference will be held in Lake Tahoe, Nevada, March 3-5, 1992. Abstracts (400-600 words) and one-page poster session summaries are requested by July 15, 1991. Contact Jerry R. Newsome, ext. 46488, for detailed information.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

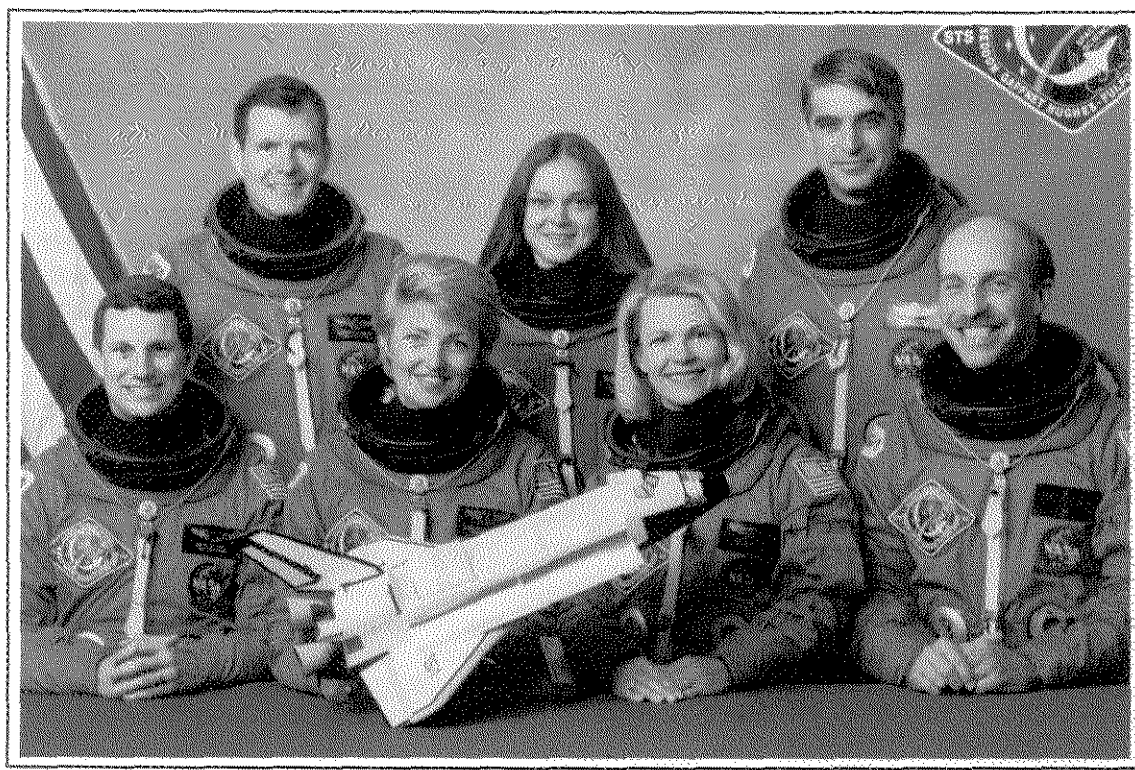
Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

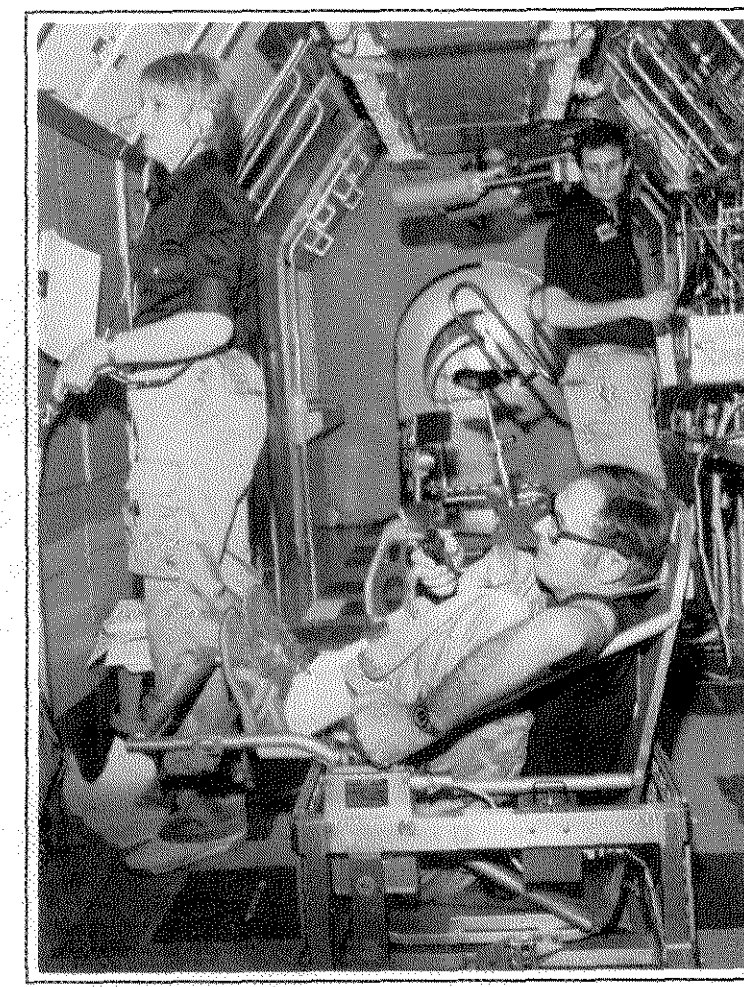
Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

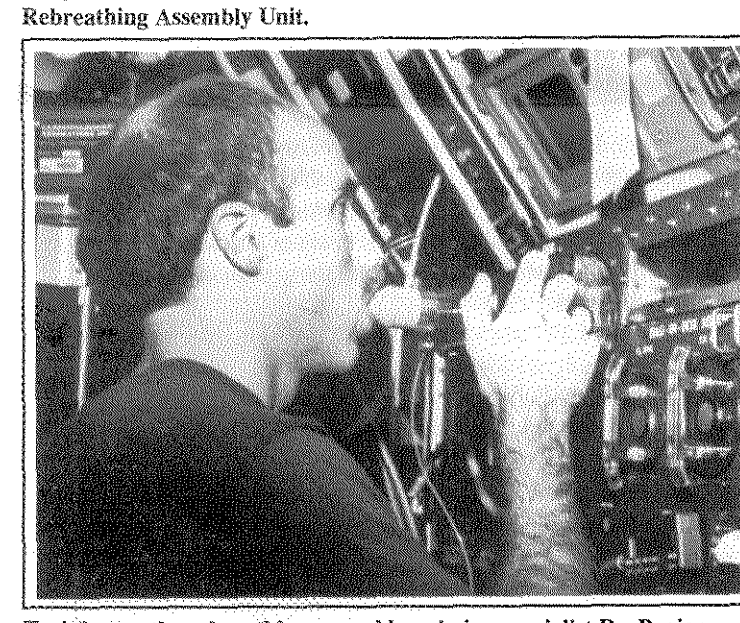
The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.



STS-40 CREW. Five NASA astronauts and two scientists serving as payload specialists have been named to fly aboard Columbia for NASA's STS-40 mission. Astronaut Bryan D. O'Connor (rear left) is mission commander; astronaut Sidney M. Gutierrez (rear right) is pilot; others (front, L to R) are payload specialists F. Drew Caffney and Millie Hughes-Fulford; and astronauts Rhea Seddon and James P. Bagian, mission specialists; and astronaut Tamara E. Jernigan (rear center), mission specialist.



SLS-1 payload specialists check out the equipment for three experiments during integrated experiment training in this high-fidelity mockup of the Spacelab at Johnson Space Center. Dr. Hughes-Fulford (left) calibrates the baroflex hardware; Dr. Philips (center) calculates his mass in the Body Mass Measurement Device; and Dr. Gaffney (right) prepares the Rebreathing Assembly Unit.



Training on the rebreathing assembly, mission specialist Dr. Bagian inhales a predetermined gas composition. A gas analyzer mass spectrometer determines the composition of the gases he exhales. The rebreathing assembly and gas analyzer system are part of an investigation that explores how lung function is altered in space.

Life Sciences Spacelab Highlights STS-40

Shuttle mission STS-40, the 41st flight of the Space Shuttle and the 11th flight of Columbia, will conduct the Spacelab Sciences (SLS-1) mission, the first spacelab dedicated to life sciences research. The launch of the SLS-1 mission is currently scheduled for no earlier than 8:00 a.m. EDT May 22.

During the SLS-1 mission, the STS-40 crew will perform experiments which will explore how the heart, blood vessels, lungs, kidneys and hormone-secreting glands respond to microgravity; the causes of space sickness; and changes in muscles, bones and cells during the micro-gravity environment of space flight and in the readjustments to gravity upon returning to Earth. The experiments performed by Columbia's crew will provide the most detailed and interrelated physiological measurements acquired in the space flight environment since the Skylab program flights in 1973 and 1974.

Other payloads on the SLS-1 mission include 12 experiments being flown under NASA's Get Away Special program. The experiments, enclosed in canisters on a bridge in the Shuttle's cargo bay, will investigate such topics as materials science, plant biology and cosmic radiation.

The NASA Orbiter Experiments program will fly seven experiments on the STS-40 orbiter that will provide an opportunity for researchers to gather data on a full-scale lifting vehicle, the STS-40 orbiter, during atmospheric entry.

The mission is planned to last nine days, three hours and 30 minutes, concluding with a landing at Edwards Air Force Base, Calif., at 12:50 EDT, June 2. The commander for this flight of Columbia will be Marine Corps Col. Bryan D. O'Connor. Air Force Lt. Col. Sidney M. Gutierrez will serve as pilot. Mission specialists for STS-40 are James P. Bagian, M.D.; Tamara E. Jernigan, Ph.D.; and Margaret Rhea Seddon, M.D. The payload specialists are Francis Andrew Caffney, M.D., and Millie Hughes-Fulford, Ph.D.

Following the STS-40 mission, Columbia will return to Kennedy Space Center, Fla.., where the spacelab will be removed. The orbiter will then go to Palmdale, Calif., for nearly six months to undergo major modifications and inspections at Rockwell International Corp. Columbia is next scheduled to fly on STS-50, the U.S. Microgravity Laboratory mission, in June 1992.

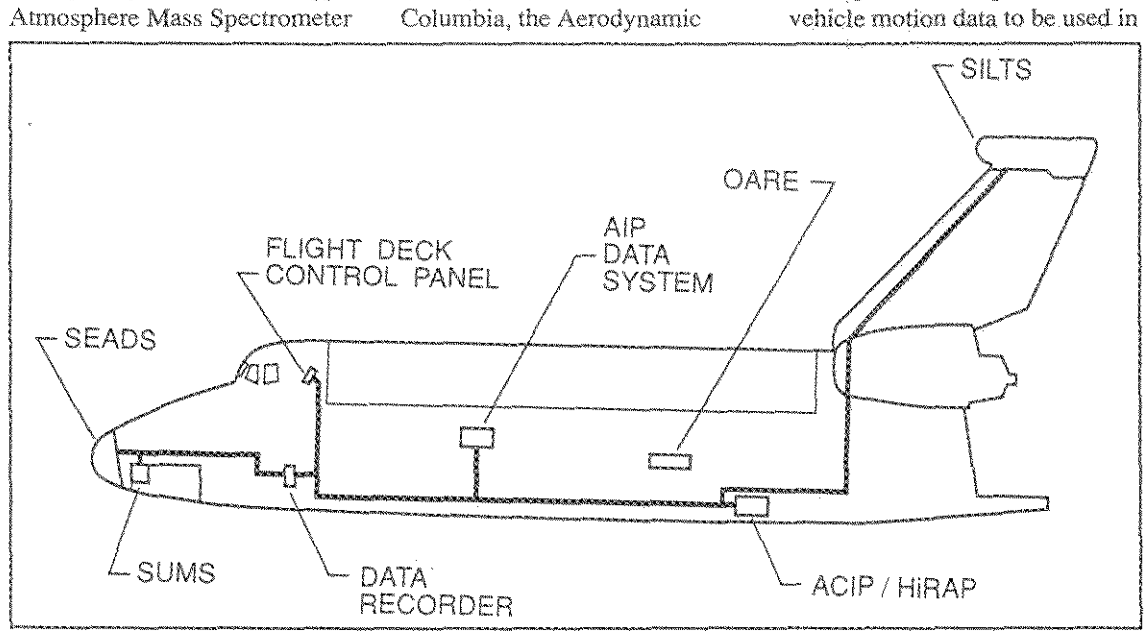
STS-40 Flies Seven OEX Experiments; Six from Langley

-by Jean Drummond Clough

The Space Shuttle has proven to be not only a unique transportation vehicle but also a "flying test bed," carrying research experiments to measure orbiter flight performance during various stages of flight.

These flight experiments, called the Orbiter Experiments (OEX) Program, provide a means of collecting a complete and accurate assessment of orbiter performance during launch, boost, orbit, atmospheric entry and landing. These data are necessary to confirm the accuracy of predicted simulation and wind tunnel tests made prior to flight compared to the actual flight-accumulated data. Seven OEX experiments will be flown on the STS-40 mission. Included among this group will be six experiments developed at Langley.

The Shuttle Entry Air Data System (SEADS) measures the distribution of air pressure around the orbiter's nosecap during entry. The Shuttle Upper Atmosphere Mass Spectrometer (SUMS) experiment complements SEADS by gathering atmospheric density information at altitudes above 300,000 feet. Two instruments on board Columbia, the Aerodynamic Coefficient Identification Package (ACIP), developed at Johnson Space Center, and the High Resolution Accelerometer Package (HiRAP), provide the vehicle motion data to be used in conjunction with SEADS and SUMS. The Orbital Acceleration Research Experiment (OARE) complements the ACIP and HiRAP instruments by extending the altitude range over which vehicle acceleration data can be obtained to orbital altitudes. The Shuttle Infrared Leeside Temperature Sensing (SILTS) experiment obtains high spatial-resolution infrared images of the upper (leeside) surfaces of the orbiter's port wing and fuselage during entry through the atmosphere. The Aerothermal Instrumentation Package (AIP) comprises some 125 measurements of aerodynamic surface temperature and pressure at discrete locations on the vertical tail and the upper surface of the orbiter's left wing and fuselage.



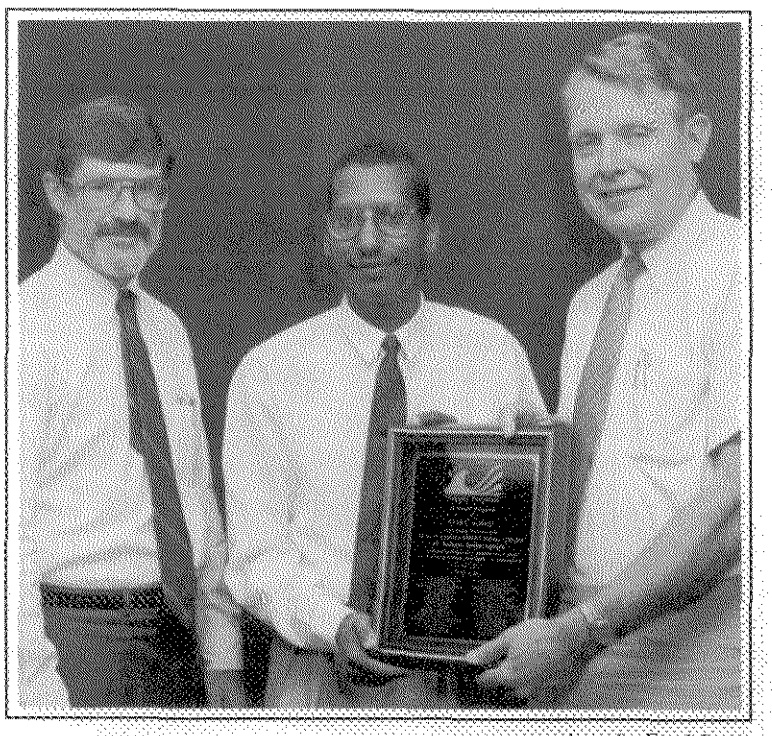


photo by Fred Jones

Center Director Richard H. Petersen (right) presents Terry Morris with a plaque honoring his contributions to the 1990 Combined Federal Campaign (CFC) as Director for Flight Systems Dr. Jeremiah F. Creedon (left) looks on. The 1990 Peninsula CFC raised $1.4 million.

Morris Honored for CFC Leadership

The Peninsula Combined Federal Campaign has honored Terry Morris, electrical engineer in the Information Systems Division, "for outstanding campaign leadership in the face of deployment to Operation Desert Shield and the threat of furloughs and layoffs." The 1990 CFC raised $1,435,162, exceeding the goal by 2.5 percent.

Abused and abandoned as a child, Morris was featured in last year's promotional video distributed by the CFC and United Way campaigns. He logged more than 25,000 miles in support of campaigns nationwide, recounting his beginnings and recalling the care and support a CFC-funded United Way agency provided him.

Morris told his story at several NASA field centers, military bases across the country and numerous federal agencies in Washington, D.C. He even spoke to NASA Headquarters at the invitation of Administrator Richard H. Truly and to employees of the White House.

"Terry Morris is truly a unique person--full of hope and positive energy despite his shocking experiences," said Jack Clough, government campaign manager. "His life was changed because someone cared. And Terry firmly believes that each one of us has the power to change lives through love and generosity. He has been a wonderful example of CFC/United Way philosophy--*it brings out the best in all of us.*"

This year marks the thirtieth anniversary of the Combined Federal Campaign--30 hears of helping others is something to brag about!

Why do you give to the CFC?

CFC campaign statistics indicate that givers fall into three categories:

- those who are convinced helping others is important
- those who have themselves been helped
- those who volunteer for funded agencies

If you fall into any of these three categories, the **Researcher News** is interested in your story. Please contact the Editor at 864-6126. If you contribute to the Combined Federal Campaign for any other reason, we would like to know that also.

Awards Presented for Superior Accomplishment

Carlton G. Pike, engineering technician assigned to Technical Support Section C, Tunnels Operations Branch, has been cited "for exceptional achievements in support of the Fighter Interceptor Test in the 8-Ft. Transonic Pressure Tunnel."

Hoa H. Luong, engineering technican, Technical Support Section B, Laboratories Operations Branch, has been recognized "for exceptional technical support to the High-Speed Civil Transport Project, Building 1205," Fatigue and Fracture/High Temperature Materials Laboratory.

Karen L. Freidt, visual information specialist in the Graphics Section, Visual and Printing Services Branch, has been rewarded "for outstanding graphics support of the Salute to Scout ceremony held at Langley Research Center."

Howard E. Price, engineering technician assigned to Technical Support Section C, Tunnels Operations Branch, has been cited "for exceptional support to research activities conducted in the 1247B Complex, " Hypersonic Facilities Complex West Wing.

Robert J. Swaim, electronics technician assigned to the Electronics Packaging and Development Group, has been recognized "for excellence in printed circuit layout design and electronic packaging."

Mark W. Wynkoop, electronics technician in the Electronics Fabric ation Development Section, has been rewarded "for excellence in support of the Wind Shear Radar Project.

Sherwood T. Hoadley, **Boyd Perry III**, **Vivek Mukhopadhyay**, **Carey S. Buttrill** and **Stanley R. Cole**, aerospace engineers in the Structural Dynamics Division, have been cited for "coauthoring the report selected by a committee of peers as the outstanding scientific paper documenting Structural Dynamics Division-sponsored, in-house research in calendar year 1990."

Michael T. Harrell, engineering technician in the Mechanical Equipment Support Section, has been recognized "for exceptional technical support provided during set-up of Optical Sensing Test Fixture, Building 1299-F," the Experimental Test Range.

Sandra L. Strickland, secretary (stenography) in the Flight Management Division, has been rewarded "for excellent administrative support contributions during preparation of Terminal Area Productivity non-advocate review."

Brian J. Jensen, chemical engineer in the Materials Division, and **Stuart G. Flechner**, aerospace engineer in the Applied Aeronautics Division, have each been cited "in recognition of leadership in the performance of the duties of facilities safety head and for contributions in furtherance of the goals and objectives of the Langley Safety Program."

Barry K. Lawhorne, engineering technician in Technical Support Section A, Laboratories Operations Branch, has been recognized "for exceptional performance in support of the Hypersonic Propulsion Branch facilities accelerated test operations and the 70-Ft. Vacuum Sphere C of F project."

Daniel J. Milburn, production controller in the Contractual Resources Section, has been rewarded "for excellence in monitoring and coordinating the manufacture of research hardware."

Louis E. Simmons, engineering technician assigned to the Advanced Machining Development Section in the Numerical Control Group, has been cited "for exceptional job performance and dedication to duty."

Sandy R. Webb, engineering technician assigned to the Advanced Machining Development Section, Metals Applications Technology Branch, has been recognized "for exceptional job performance and dedication to duty."

William D. Castle, engineering technician in the Composites Section, Models and Materials Technology Branch, has been rewarded "in recognition of exceptional performance on the ACB-182 Model Project."

Vincent B. Cruz, electronics technician, Microelectronic Development Group, Microelectronics and Technical Support Section, has been cited "for excellence in microelectronic fabrication support of the Model Deformation and Position Measurement System."

Ben M. Copeland Jr., electronics technician in the Microelectronic Development Group, Microelectronics and Technical Support Section, has been recognized "for superior performance and significant technical contributions in microelectronic fabrication."

William C. Alexander, lead engineering technician in Technical Support Section D, Tunnels Operations Branch, has been rewarded "for exceptional technical leadership skill in developing and implementing critical facility inspections at the National Transonic Facility."

Grace A. Gleason, engineering technician in Technical Support Section C, Tunnels Operations Branch, has been cited "for exceptional support to research conducted in the 12-Ft. Low-Speed Tunnel."

James J. Fay III, engineering technician assigned to Technical Support Section D, Tunnels Operations Branch, has been recognized "for exceptional technical and dedicated support to research conducted in the Unitary Wind Tunnel."

Mickey R. Gardner, supervisory engineering technician, Technical Support Section B, Laboratories Operations Branch, has been rewarded "for exceptional performance and contributions in support of the Advanced Technology and Environmental Effects Laboratories."

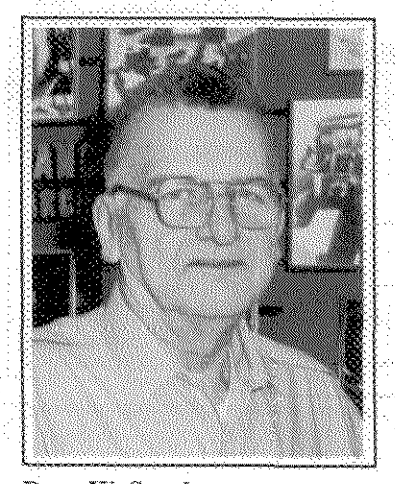
Robin K. Land, computer program analyst in the Resources Control Section, has been cited "for innovative computer programming efforts which greatly increase the efficiency of the Fabrication Division management information system."

Shirley M. Jones, engineering technician assigned to Technical Support Section D, Tunnels Operations Branch, has been recognized "for exceptional technical contributions in support of laser light sheet flow visualization technology in the 7- by 10-Foot High-Speed Tunnel."

Congratulations to these super achievers.

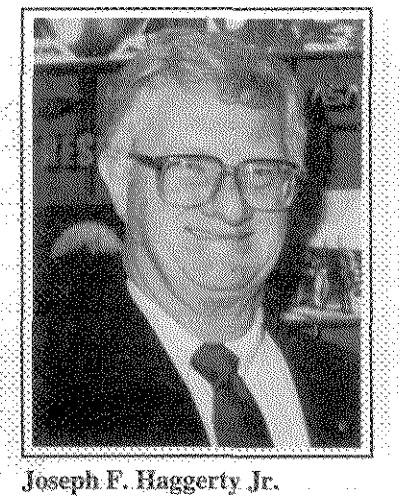
40-Year Service Awards

Ernest A. Mackley



Dean W. Sparks

John T. Benthall Jr.



Joseph F. Haggerty Jr.

Loretta Watkins

People & Places

MSD Offers New Service

The Management Support Division (MSD) has three portable fax machines that may be checked out under a short-term loan (30 days or less) for use by NASA Langley employees. These machines may be used when a fax machine is not accessible but required for official business under the following criteria:

- An employee is attending an off-Center retreat or conference
- An employee is on extended TDY
- An employee is on extended sick leave and able to work at home (Loan can be extended.)

To borrow a fax machine, submit NASA Form 892, Property Pass, to MSD, Mail Stop 123, Attention: Nannette Lloyd. The portion of the form stating the reason for the loan must be completed.

Instructions on operating the fax machine will be provided by MSD at the time the machine is loaned out. Any questions regarding this new service should be directed to Nannette Lloyd, ext. 46753.

Tidbits from Training

No More Certificates

The Training and Education Section will no longer issue training certificates. This change is in response to the SCAN team recommendation to reduce paperwork. Instead, an annual listing of classes completed by each individual will be provided to participating employees at the end of the fiscal year.

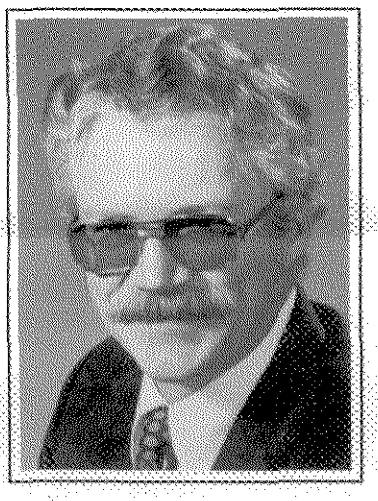
-photo by Fred Jones

HEALTH FOR LIFE participants join for one last session in the Langley Fitness Center before "graduation" from the twelve-week pilot program designed to help NASA Langley employees control their weight through nutritional behavior modification and exercise.

National Space Society

Eldred Gives SEI Recommendations

Charles H. Eldred, manager of the Aerobrake Technology Project in the Space Exploration Initiative Office, will speak at the May meeting of the Langley chapter of the National Space Society. The meeting will be held at 5 p.m., May 22, in the H.J.E. Reid Conference Center, 14 Ames Road.



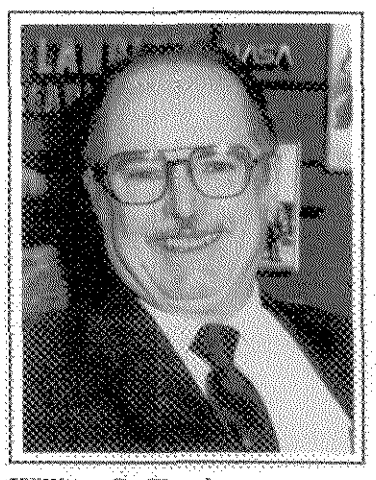
Eldred will report on the recommendations of the Space Exploration Initiative Synthesis Group, formed last year to recommend exploration mission architectures, technology priorities and early milestones for the exploration of the Moon and Mars. The Synthesis Group, chaired by former astronaut Lt. Gen. Thomas P. Stafford, USAF (retired), solicited ideas from many sources, including the Outreach Program designed to collect new and innovative ideas, systems and technologies to carry out the nation's Space Exploration Initiative. The formal report from the Synthesis Group is scheduled to be released in May.

Interested members of the Langley community and the community-at-large are invited to attend this free meeting. For further information about the May meeting or the National Space Society, contact Doug Stanley, ext. 44518.

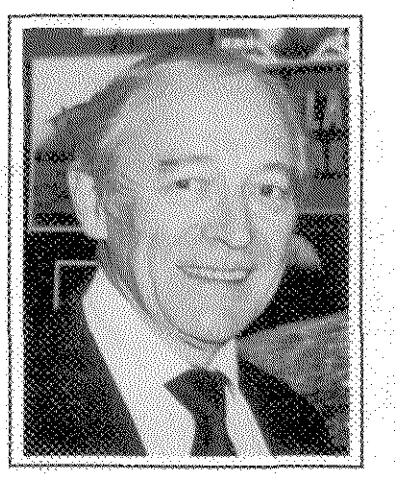
Note of Thanks

Pat Kelliher, wife of Warren Kelliher of the Facilities Engineering Division, wishes to thank all those who gave blood in her name at the recent NASA Bloodmobile. Mrs. Kelliher is recuperating from a liver transplant and appreciated the many donations of blood for use before and during surgery.

45-Year Service Awards



William G. Chapin



William I. Scallion

In Some Cases, Less is Better

Program Nets Big Losses; Participants Pleased

Collectively, they are 275-1/2 pounds lighter. And they are the self-proclaimed happiest bunch of losers on Center!

A group of 22 employees participated in Langley's pilot program, **Health for Life**, at the Fitness Center. Targeted at overweight individuals, the 12-week weight loss program promised to be a total approach to healthy dieting. "This has been the most successful program I have ever tried," said Gary Carl, Safety and Environmental Management Section. "I attribute my success to the fact, that for the first time, I understand how to make the right food choices."

In addition to two exercise sessions per week, the group met each Wednesday for a brown bag lunch seminar. These sessions were designed to give participants the tools to practice a lifetime of proper nutrition and exercise. It is important to understand the relative composition of foods in order to be able to choose food high in nutrients and low in fat. "The Wednesday sessions helped me look at my menu carefully, but with an educated eye," said Joyce Tracy, Technical Library Branch. "I have improved my diet, but still feel like I'm eating like everyone else."

The group approach helped participants bolster each other as well as maintain their own motivation. Humor permeated the program as Cynthia Morris was presented the "My Dress Fits" award in addition to being the winner of the Most Improved Diet. Morris reduced her daily fat intake 30 percent and in so doing improved the fit of her wedding dress. "Most importantly," said Fitness Center coordinator Mary Mitchell, "Cynthia learned to not skip meals--which can be detrimental to the metabolism--but to eat three well-balanced meals a day, choosing foods lower in fat and cholesterol and higher in complex carbohydrates."

A Losing Combination:

Nutritional Diet
+
Exercise
+
Group Support

The **Health for Life** program provides the keys to sustained motivation--behavior modification with group support. Encouraged to get a healthy start on 1991, 22 participants who met the entry requirements were chosen on a first come-first served basis from a group of nearly a hundred applicants. The chosen were given individual assessments and evaluations. In addition to height/weight ratio, parameters such as heart rate, blood pressure, percent of body fat, flexibility and abdominal strength were measured in January. Complete blood and nutritional analyses were also performed. The same parameters were again measured at the end of the 12-week session--and the results were staggering.

Average weight loss for the class was 12.5 pounds, with Mac Jackson's 51-pound loss setting an unprecedented goal for future losers! "Mac was truly motivated and, undoubtedly, our most goal-oriented participant," said Mitchell. Jackson, Facilities Program Development Office, reduced body fat mass by 42 percent.

"Our accent on a healthy approach to weight loss was verified in a decrease of almost 10 percent in the total class cholesterol level; low density lipoproteins (LDL or bad cholesterol) decreased by 10.39 percent and triglycerides decreased by eight percent overall," Mitchell continued. In addition, abdominal strength increased by over 200 percent--there were 143 more sit-ups accomplished overall, with an average increase of eight per person. "We are extremely proud of the fat mass lost in the class. Over 200 pounds of fat were left behind," said Mitchell.

Excess body weight and inactivity are known factors which can lead to high blood pressure, diabetes and heart disease. Despite today's overwhelming publicity on the benefits of a more healthy, "holistic" lifestyle, many individuals still fight the battle of the bulge. While some are simply overweight by a few pounds, many more are on the road to obesity and are risking their health. The **Health for Life** program is a step toward helping Langley employees gain control of their weight through nutritional modification and exercise.

"I feel so much better," said Dave Dearing, Space Station Freedom Office. "I have so much more energy."

"**Health for Life** has given me the motivational start I needed," said Mac Jackson. "It was a balanced approach, with group support, that produced rapid results."

Happenings

LAA SOCIAL will be held Friday, May 24, from 4 to 6:30 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road.

AMERICAN RED CROSS BLOODMOBILE will be held Wednesday, May 22, 9 a.m. to 3 p.m. in the Reid Conference Center, 14 Ames Road. Help others with the most precious gift of all--the gift of life. Give blood.

NASA TOASTMASTERS meet the second and fourth Wednesdays of the month in the Reid Conference Center. The next meeting is May 22 from 11:30 a.m. to 1 p.m.

BODY DYNAMICS --high energy-low impact aerobics classes will be held Mondays, Wednesdays and Fridays at 6:30 a.m. in the NASA gym, 14A Ames Road. Classes began May 13 and are open to civil service employees.

LOW IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m., in the NASA cafeteria, 16 West Taylor Road. Cost is $12 per month. First class is free. In addition, during May, classes in bench-step will be offered Saturday mornings, 9:30 to 10:30 a.m., Cost is $6 per month.

FEDERALLY EMPLOYED WOMEN, Langley chapter, will meet Wednesday, May 29, at 11:30 a.m. in the executive dining room of the cafeteria.

WOMEN IN DEFENSE, a professional organization for women and men who work in the defense arena, has formed a local chapter. For details, call Darla Krupski, membership chairman, 873-1185.

LANGLEY AFB COMMUNITY APPRECIATION DAY, Saturday, June 1, will feature the Thunderbirds. Also exhibits, live entertainment, aircraft static displays. Admission is free. Gates open at 9 a.m. The NASA Langley Disabled Persons Group will join the Langley AFB Disabled Group to man a booth to distribute literature on group programs at both facilities.

VA CHORAL SOCIETY will present their eighth annual *Just For Fun* concert May 17. A special *Tribute to the Military* concert will be presented May 18. Special patriotic music will be featured. Both concerts will begin at 8 p.m. in the auditorium at Hampton Roads Academy, Newport News. For further information and ticket prices, call 591-0439.

LANGLEY YACHT CLUB will offer summer sailing lessons at the LAFB Marina Area. Windsurfing, adult basic sailing, and junior sailing are available. Open registration will be May 18 and June 8, 9 a.m. to noon at the Club. For more information, call Dave Arnold, 851-1709.

INFERTILITY SUPPORT GROUP meets at the Jewish Community Center, Newport Avenue, Norfolk, on the second Monday of the month. For more information, call 877-3094 or 249-8815.

ON LOAN: BOOK. Borrower please return *Aerodynamic Heating* by R. W. Truitt and folder containing Oshkosh airfoil and streamline programs, Apple II manual and floppy disks for above, to Penland, Mail Stop 285, ext. 45996.

LAFB OFFICERS' CLUB is a membership club. Please call 766-1361 for more information.

FOR SALE: TIMESHARE. One week at Sea Ranch II, Kill Devil Hills, N.C. Beach front. Nov. 30-Dec. 7. Heated enclosed pool, tennis courts, health and fitness room, restaurant, lounge and dancing available. $2,500 or best offer. Please call 877-5815.

WANTED: ROOMMATE. Female to share 2BR townhouse, washer/dryer. 10 min. from NASA. Call 868-6557.

FOR RENT: ROOM. Share townhouse in Poquoson, 5 min. from NASA. Rent negotiable. Telephone in bedroom, full kitchen privileges. Call 868-8802 anytime. Leave message.

FOR SALE: CLARINET. Wooden Selmer Signet clarinet, Model 100. Excellent condition. $300. Call 898-3768 or 220-9644.

FOR SALE: AUTO. '89 Honda Prelude S, light blue, 5-speed, 38,000 miles, AC, sun roof, cruise control, AM/FM cassette. $11,400 negotiable. Call 599-6977.

FOR SALE: CONDO. 2 BR, 2 BA brick and cedar condo in excellent condition. All appliances, two ceiling fans, balcony with storage. For sale by owner. $53,000. Call 877-2735.

COMPUTER SHOW. FOSE Information Technology Showcase (FITS) will be held May 21, from 10 a.m. to 3 p.m. in the H.J.E. Reid Conference Center. FITS will highlight latest innovations in microcomputers, laptops, software, etc.

Discount Tickets
available at
VC Souvenir Counter
for

AMC Theaters
Busch Gardens
Colonial Williamsburg
Kings Dominion
Tidewater Dinner Theater
Water Country USA
Hampton Dinner Theater
Hampton Comedy Club

Call 864-1585
for details and prices.

Retirement Party

Barry Shrout will be honored at a retirement luncheon from 11 a.m. to 1 p.m., Friday, June 21, at the H.J.E. Reid Conference Center, 14 Ames Road. Cost is $8 per person or $15 per couple. Gift contributions are welcome. Make checks payable to Noel Talcott, Mail Stop 411, ext. 45292. Reservations are requested by Friday, June 14.

Shape Up:
May
is Fitness Month

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

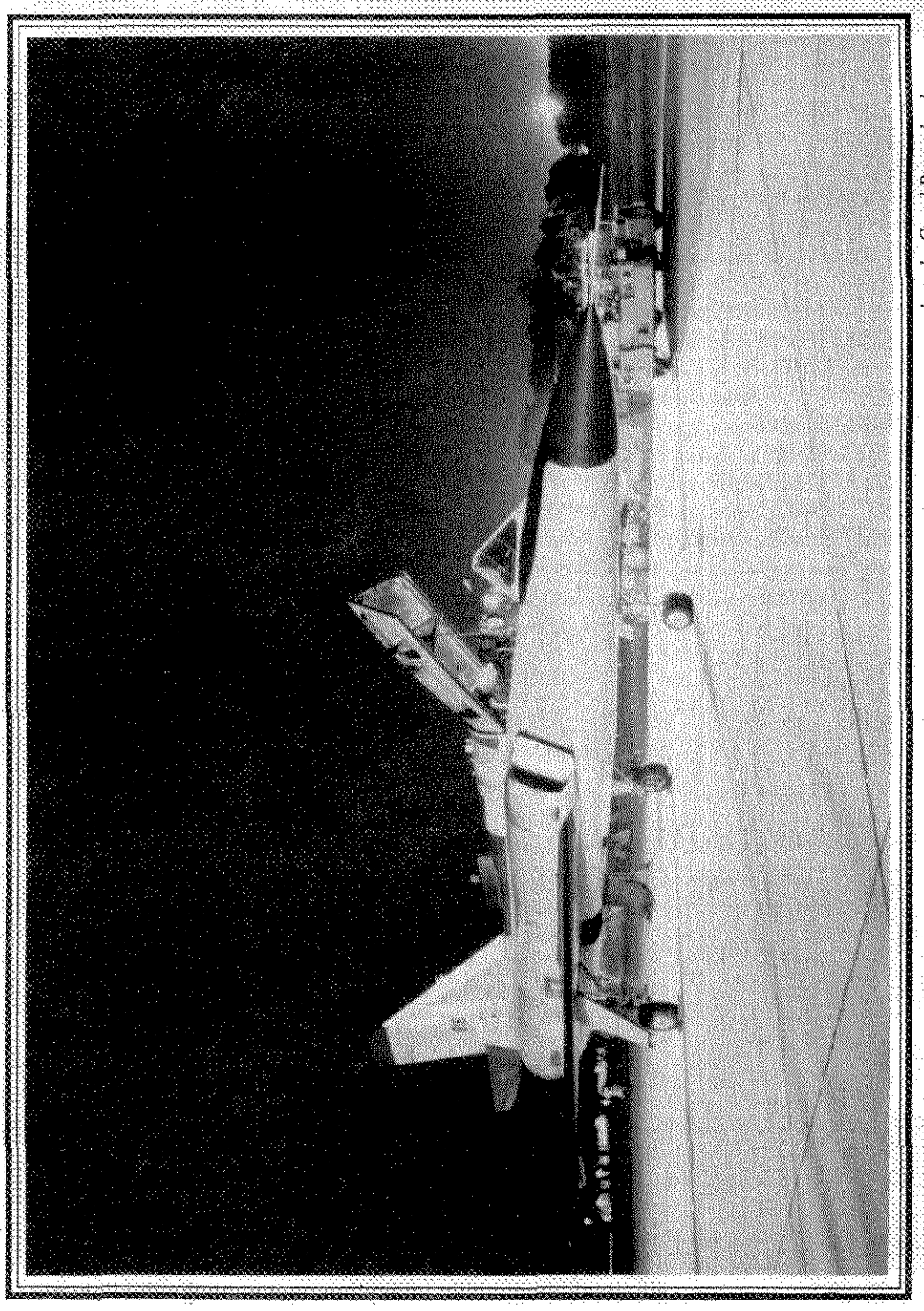
National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

402 ON-SITE NON-LARC
SKORA, MARY M.
MAIL STOP 115

News
Researcher



-photo by Carol Petrachenko

IN THE NIGHTTIME OF ITS CAREER. Illuminated by runways lights, NASA 816, Langley's F-106B, taxis to a halt in front of the hangar after its final night flight. This historic aircraft will be retired today after more than 30 years of unique research contributions.

See retirement story on page 1.

NASA
National Aeronautics and Space Administration
Langley Research Center

News Researcher

Volume 5, Issue 11 May 31, 1991

Bi-weekly Employee and Contractor Publication

NASA to Test Flight-Weight Aero-Space Plane Component

-by H. Keith Henry

NASA is preparing to test a structural component made of advanced carbon-carbon composite material as part of the X-30 National Aero-Space Plane (NASP) program. Carbon-carbon is an advanced heat-resistant, non-metallic material that may be used on the NASP flight research vehicles in the mid-1990s.

The NASP mission profile demands much greater performance from its structures and materials than does the Space Shuttle, which travels through the atmosphere in a relatively short time. Engineers expect that the X-30 will experience structural loads at extreme temperatures and sustained high temperatures in high-altitude cruise through the atmosphere.

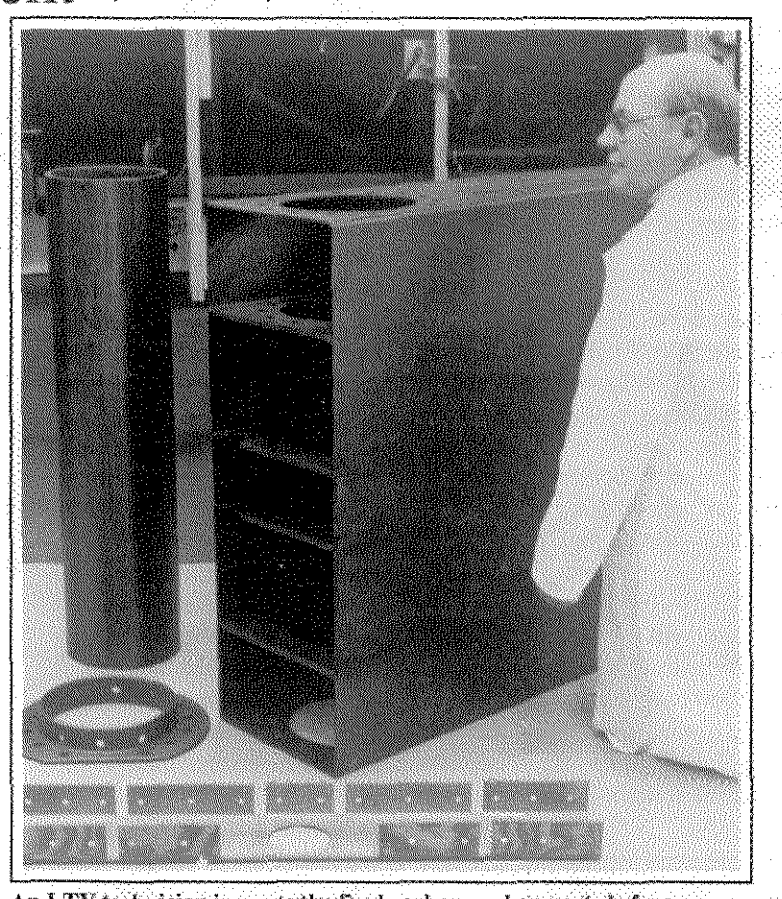
Design and fabrication of this major NASP flight-weight component follows years of technology development. The carbon-carbon material is stronger than metal at high temperatures. It is also lighter than aluminum, making it a good alternative in areas where active cooling can be avoided.

The component is part of a full-scale wing control surface from a generic NASA aerospace plane design. The structure was shipped to NASA's Ames-Dryden Flight Research Facility, Edwards, Calif., earlier this month for extensive tests to begin this Fall. The flap-like component first will be tested for its ability to withstand mechanical loads similar to those on a vehicle that takes off from a runway like an airliner and flies into orbit.

Thermal trials are scheduled to start in Fall 1992. Initial tests will be limited to state-of-the-art strain measurement capabilities—about 600 degrees Fahrenheit. Researchers hope to achieve test temperatures exceeding 2000 degrees F. by 1993.

The Missile Division of LTV Corp., Grand Prairie, Texas, designed and built the NASP test component under contract to NASA Langley. LTV's successful fabrication of the somewhat stiff composite represents a major milestone in materials technology development.

"The fabrication was challenging," said Dr. Wayne Sawyer of Langley's Structural Mechanics Division. "It is a big part that requires a series of fairly high-temperature thermal cycles in the fabrication process. These thermal cycles result in material deformations in some way or another. It shrinks and expands and tends to warp. Just being able to make a big part or several big parts that will fit together is very tough and requires good control of the tolerances and the fabrication process."



An LTV technician inspects the final carbon-carbon parts before assembly. The completed control surface test component has been shipped to Dryden Flight Research Facility for testing in the Fall.

The rib-stiffened NASP component is about 56 inches long, 39 inches wide, 14 inches thick at the leading edge and 6 inches thick at the trailing edge. It is patterned after part of a flight control surface called an elevon, which is mounted at the back of some aircraft and the Space Shuttle orbiter to provide pitch and roll control.

"To our knowledge the component is made of some of the most complicated carbon-carbon parts ever fabricated," said Langley's Dr. Don Rummler, also of the Structural Mechanics Division. The need for a load-bearing tube with multiple layers and many holes and cutouts complicated the fabrication task. High-temperature requirements dictated that even simple parts like fasteners were made of carbon-carbon.

Extra care was taken to overcome the potentially serious problem of delamination of the materials, which is almost impossible to repair. Technicians built up the test structure one thin layer at a time; it has 42 layers, or plies, at its maximum thickness.

The component parts were heated to high temperatures several times and densified to increase their strength, in a process Rummler likens to "burning toast." Strength went up with each processing cycle, as epoxy-like material was used to densify the material by filling tiny voids in the carbon matrix between heat treatments. A final coating protected exterior surfaces against oxidation.

Just where, how and if advanced carbon-carbon will be used in the X-30 has yet to be decided. "The material and the advanced fabrication procedures developed to make the elevon structure represent an option we did not have at the beginning of the National Aero-Space Plane program," explained Rummler. "It is a design-efficient, lightweight alternative."

HALOE Completes Ocean Trip

-by Jean Drummond Clough

NASA's Upper Atmosphere Research Satellite (UARS), carrying the Langley Halogen Occultation Experiment (HALOE), arrived at the Kennedy Space Center (KSC), Florida, on May 12. UARS was shipped by barge down the Atlantic coast from Salem, New Jersey, on May 7. UARS is scheduled to be launched aboard the Space Shuttle Discovery this Fall on STS-48.

The shipment came after the successful conclusion of an intensive 20-month integration and test activity at General Electric's Astro-Space facility at East Windsor, New Jersey. GE Astro-Space is the integration contractor for UARS. HALOE also made a trip back to Langley last summer for hardware modifications and final end-to-end testing.

At KSC, UARS arrived at the barge turn basin adjacent to the Vehicle Assembly Building. The spacecraft was offloaded and taken to the Payload Hazardous Servicing Facility (PHSF) located in the KSC Industrial Area where it will begin final preparation and testing for launch.

UARS will spearhead a long-term, national program of space research into global atmospheric change and it is a leading element of NASA's Mission To Planet Earth. UARS will provide the comprehensive data base needed for an understanding of changes in the upper atmosphere and for informed policy decisions to address the human role in such changes.

HALOE is one of ten experiments to be launched on UARS. It will provide important data needed to study the effects of chlorine, nitrogen and hydrogen-related compounds, as well as chlorofluoromethane, on the ozone layer. The long-term near global observations provided by HALOE will allow assessments to be made of the importance of the man-made versus natural sources of these componds in the upper atmosphere.

HALOE is a solar tracking instrument designed to monitor the vertical distributions of temperature and the key upper atmosphere trace gases, such as ozone, hydrogen chloride, hydrogen flouride, nitric oxide, methane, water vapor and nitrogen dioxide. Measurements will be made during the sunrise and sunset time of each orbit throughout the UARS mission, providing semi-continuous observations and nearly global coverage for the experiment.

UARS was designed and built by the GE Astro-Space Division, East Windsor, New Jersey, and Valley Forge, Pennsylvania. The UARS mission is managed by NASA's Goddard Space Flight Center for NASA's Office of Space Science and Applications (OSSA). Langley has responsiblity for management of the HALOE experiment for OSSA, including fabrication, assembly and testing of the HALOE instrument, reduction of flight data, retrieval of geophysical data and supervision of scientific investigations. Dr. James M. Russell, Atmospheric Sciences Division, is the HALOE principal investigator. Dewey M. Smith, Systems Engineering Division, is project manager.

-photo by Fred Jones

TAKING ITS FINAL BOW. Langley's F-106B serves as a background for retirement ceremony participants (L to R) Ralph Johnson, director of the Virginia Air and Space Center; Center Director Richard H. Petersen; Thomas Chisman, president of the VASC board of directors; and City of Hampton Mayor James Eason.

News Briefs

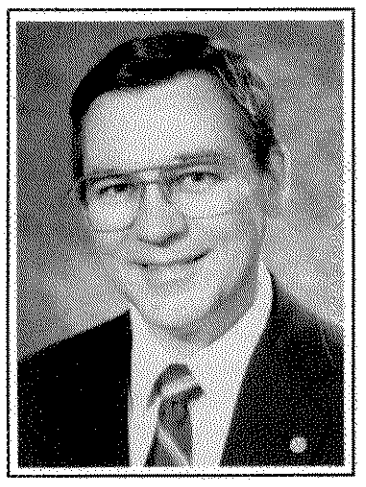
NASA Discovers Impact Likely Tied to Dinosaurs' Demise --- The first surface evidence of a buried impact crater formed by a comet or asteroid which may have caused the extinction of the dinosaurs has been discovered by NASA researchers. The scientists believe a ring of sink holes in the northwestern corner of the Mexican state of Yucatan outlines the largest known impact crater on Earth. The crater, which is more than 125 miles in diameter, is a prime candidate in the search for an impact that may have caused the planet-wide extinctions of dinosaurs and other species about 65 millions years ago. Some scientists believe that such an impact pushed so much dust and debris into the atmosphere that it blocked sunlight, interrupting the growth of plants, starving dinosaurs and other animals and freezing much of the Earth.

Systems Analysis Office Created in Line with Augustine Report --- NASA Administrator Richard H. Truly has announced the establishment of a new Systems Analysis and Concepts Office at NASA Headquarters and designated James D. Bain as its director. The creation of the office is another step in NASA's implementation of recommendations made last December by the Advisory Committee on the Future of the U.S. Space Program. The committee recommended the office be established to provide independent and non-advocate decision support to the NASA Administrator and his immediate office. The group would focus on policy alternatives, conceptual and formulative stages of new programs, and systematic review of the requirements and benefits of new and ongoing programs.

Eight Firms Named George M. Low Trophy Finalists -- Eight finalists have been chosen for the 1991 George M. Low Trophy, NASA's Quality and Excellence Award. Finalists are EG&G Florida, Inc., Kennedy Space Center, Fla.; Grumman Technical Services Division, Titusville, Fla.; Honeywell Inc., Space and Strategic Systems Operations, Clearwater, Fla.; Computer Sciences Corp., Applied Technology Division, Houston, Texas; Cray Research, Inc., Manufacturing Division, Chippewa Falls, Wisc.; Thiokol Corp., Space Operations, Brigham City, Utah; TRW Space and Technology Group, Redondo Beach, Calif.; Unisys Space Systems Division, Houston, Texas. The award recognizes both NASA's prime contractors, subcontractors and suppliers for outstanding achievements in quality and productivity improvement and total quality management.

Astro Mission to Refly --- NASA has announced that the second Astro mission will fly aboard the Space Shuttle. The success of the earlier mission and the demonstrated ability of the instruments to acquire high-quality scientific data are among the major reasons for reflight of the Astro payload. Astro-2, like Astro-1 which flew in December 1990 aboard Columbia, will be dedicated to a single scientific discipline --astrophysics. The Hopkins Ultraviolet Telescope, the Untraviolet Imaging Telescope and the Wisconsin Ultraviolet Photopolarimeter will fly on Astro-2 and observe energetic objects in space in the ultraviolet portion of the electromagnetic spectrum.

Cantrell Named Thompson Fellow



Dr. John H. Cantrell

I am pleased to announce that this year's winner of the Floyd L. Thompson Fellowship is Dr. John H. Cantrell, senior research physicist in the Nondestructive Measurement Science Branch. Under the auspices of the fellowship, named in memory of Dr. Floyd L. Thompson, Langley Director from 1960 to 1968, Cantrell will spend an academic year at Cambridge University, England.

In exploratory acoustic measurements on materials which have been damaged by fatigue, Cantrell has observed a significant change in a nonlinear measurement parameter. He has proposed to team with members of the Cavendish Laboratory at Cambridge to investigate the feasibility of using the acoustic measurement as an indication of the fatigue damage state in aluminum alloys. The possibility of detecting damage states has exciting applications in monitoring the health of the nation's aging aircraft fleet as well as in future aircraft systems such as supersonic transports.

The Thompson Fellowship, established in 1977 to encourage the development of research potential among the Langley staff, is an excellent opportunity to pursue creative research. It is frequently viewed as an opportunity to perform research in an academic environment. In a broader sense, the fellowship has the latitude of being performed at another government laboratory, a university or with industry.

Moreover, the senior staff has recognized that many researchers may be less mobile because of dual-income family commitments. To alleviate this situation, we have expanded the program to permit researchers to stay in the local area and selectively visit other organizations as required.

Over the next year, I hope some of you will give serious thought to the new research possibilities offered by the Floyd Thompson Fellowship. Feel free to call me at ext. 46061 about this exciting and expanding opportunity.

Michael F. Card
Chief Scientist

Meredith Named Sloan Fellow; to Study at MIT

Barry D. Meredith, deputy manager of the Advanced Programs Office, Space Station Freedom Office, has been selected an Alfred P. Sloan Fellow. Meredith will follow a 12-month course of study leading to a master of science degree in management at the Massachusetts Institute of Technology School of Management, Cambridge.

MIT has selected 54 mid-career executives from the United States and abroad as Sloan Fellows. This will be the 60th year of the program, the first executive education program in the world. Over half the members of the 1991-92 class will come from U.S. industry. The others represent a wide range of activities in the private and public sectors, in such fields as government and health care.

Meredith began his NASA career in 1967 as an apprentice electronics technician, and has served as an electrical engineer and aerospace technologist. In his present position, he is responsible for directing the performance of mission analyses and trade studies which generate requirements for space station systems. Langley's Advanced Programs Office has Agency-wide responsibility for the definition and evaluation of Space Station Freedom evolutionary capabilities and configurations.

Meredith was presented a NASA Exceptional Service Medal June 5, 1990, for his work "in establishing Space Station Freedom evolution configurations to meet future national needs; particularly, to support missions to the Moon and Mars."

Five Presented NASP Awards

Five Langley employees were awarded honors at the Tenth National Aero-Space Plane (NASP) Symposium held April 23-26 in Monterey, Calif.

Presented Gene Zara Awards were Dennis H. Petley, Conceptual Studies Office; Griffin Y. Anderson, Hypersonic Propulsion Branch; John G. Martin, Lockheed Engineering and Sciences Co.; Charles G. Miller III, Experimental Hypersonics Branch; and Dr. George C. Olsen, Aerothermal Loads Branch.

Formerly called the Outstanding National Team Member Award, the Zara Award is named for Gene Zara, who headed the NASP Subsystem Technology Team before his death. The Zara Awards are presented at each symposium by the NASP Joint Program Office for outstanding contributions to the NASP program.

Training Notice: Advanced Degrees

NASA employees, who have not already notified the Training and Education Section and have completed or will complete the requirements for a graduate degree in fiscal year 1991, are urged to report this information to George D. Allison, TES, ext. 42594.

Upcoming Seminar

A one-day seminar on a new government-owned general purpose pre- and post-processor for finite element analysis, called MOVIESTAR, will be held Wednesday, June 26, from 8:30 a.m. to 3:30 p.m. in the auditorium of the David Taylor Research Center, Bethesda, Maryland. To attend and facilitate entry onto the Center, contact Pete Matula at (301) 227-1936 at least one day prior to visit.

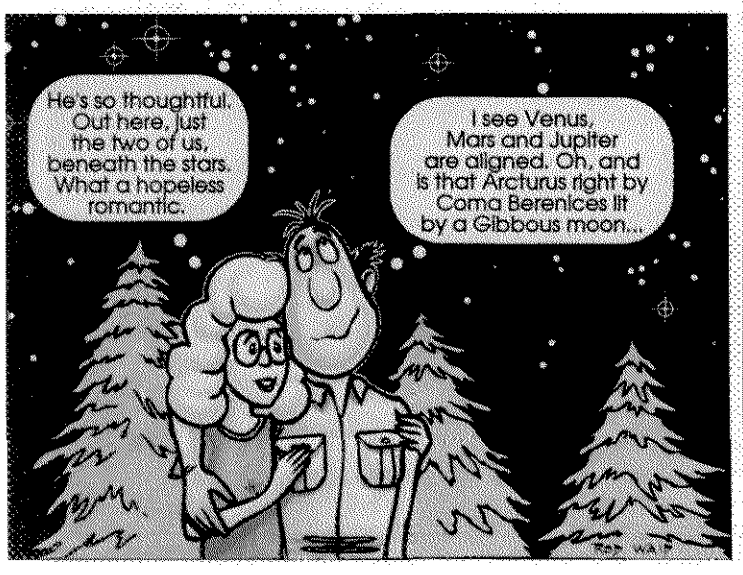
Competitive Placement Positions Open

The following position vacancies are open to LaRC employees presently serving under permanent civil service positions:

91-30: Employee Relations Specialist, GS-230-11 or 12. Human Resources Management Division. Closes June 3.

91-34: Secretary (Typing), GS-318-6 or 7. Space Exploration Initiative Office. Closes June 3.

Lankley



News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

LEMS Refurbishment: An Adventure in Teamwork

-by Allan C. Hanrahan

Between its illustrious past as a training vehicle for moon walkers and other astronauts and its promising future as an exhibit "in an honored position" in the Virginia Air and Space Center slated to open April 5, 1992, in downtown Hampton---the Lunar Excursion Module Simulator (LEMS) went through a transition period of refurbishment at the New Horizons Technical Center (NHTC).

On Friday afternoon, May 10, the restoration advisory committee and NHTC faculty and students (past and present) were recognized for their contributions as the refurbished LEMS and an accompanying National Historic Landmark plaque were unveiled.

NHTC Director Dr. Ralph Johnson welcomed those present with a brief history of the four-way partnership formed to accomplish the restoration challenge. Johnson confessed humorously that, when he was approached with the proposal, he answered immediately and with conviction: "Yes, we can restore the LEMS," and, after a pause, thought it prudent to ask, "What is it?"

"Thank you, NASA Langley Research Center, for putting your trust in the New Horizons Technical Center," he concluded.

Center Director Richard H. Petersen offered his "heartfelt thanks and the thanks of the Langley Research Center," to the students and faculty of NHTC before introducing the keynote speaker. He explained the "what" and "why" of the LEMS and remarked that NHTC was a valuable extension of classroom work.

"They learned about teamwork," Petersen said of NHTC students and faculty, and, in the broader realm of the LEMS's role in the Apollo project, they learned about " . . . the teamwork of an entire nation."

"I know of schools that have wood shops and metal shops," observed United States Senator Charles S. Robb during his delivery of the keynote address, "but I don't know of any other school anywhere that has a spacecraft shop!" Later he noted that this opportunity " to preserve history . . . was for them (the students) a labor of love."

In a formal response to Robb's address, Karena Ragsdale, an electronics student spoke for NHTC students, "I am proud and honored to be one of the students selected to work on this project."

Following the ceremony, other students expressed in word, attitude and attendance the same sentiments. Chris Koskinas, for example--a graduate invited back for the ceremony-- remembered that "That sheet metal got polished a lot . . . but it was a lot of fun working on it, the painting and the finishing." Electronics students David Smith and Chad Huffman and machinist Jay Wismer spoke with quiet pride about their roles in the project as they were interviewed regarding their contributions to the LEMS refurbishment.

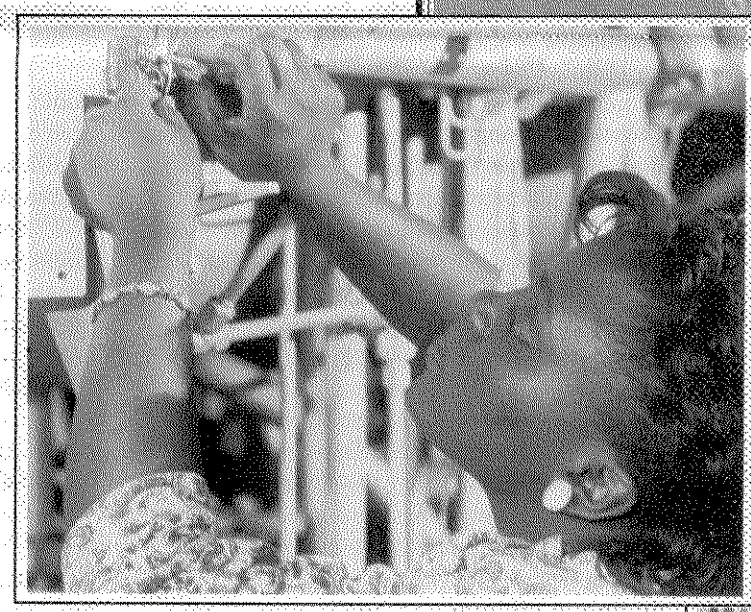
NHTC faculty, too, expressed pride and satisfaction in a job well done. Francis Chestney, electronics teacher, stated that "More than anything else I was impressed by the interaction of the coordinators--students, faculty and NASA. Each group was attuned to the relevance of their job, where and when they fit in. It took a lot of coordination between all the disciplines."

Terry Smith, auto body instructor, talked of the system of assigning and checking work and concluded that "the project built a lot of self-confidence in the students."

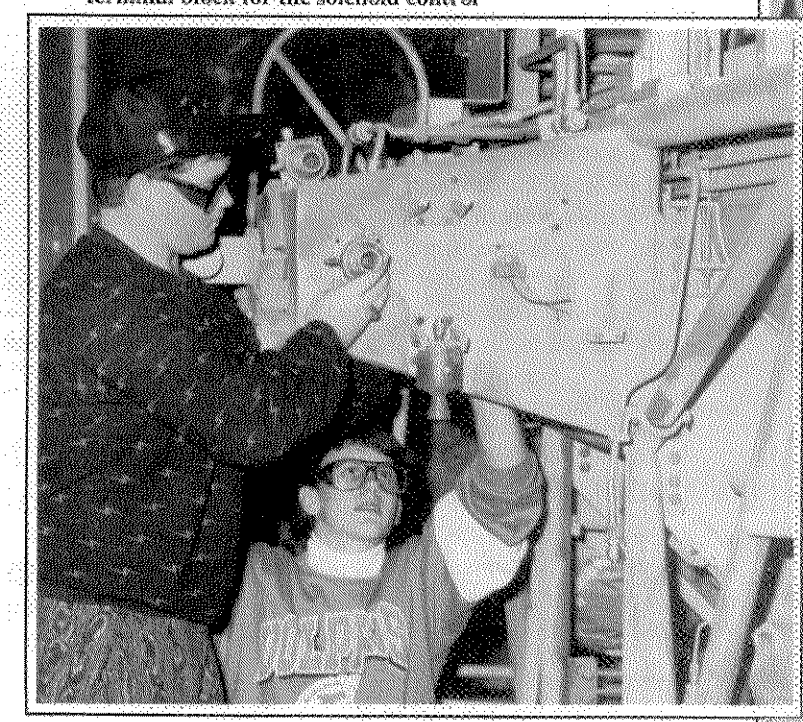
John Riddle, who teaches welding, said, "The project was good for the student's perspective. They felt like they were part of the original work--particularly when NASA Langley retirees and present employees were available to bring things together." Later Michael Alderman, the air conditioning and plumbing instructor whose students worked on the LEMS fuel system piping, reflected that "the real treasures were the retirees and engineers that came out. They would talk about 'Neil' and 'Buzz' and the students would stop to listen--it was history."

Dr. Harry Butowski, historian with the National Park Service, said "While we honor the students . . . we also honor the scientists, engineers and technicians of the Langley Research Center."

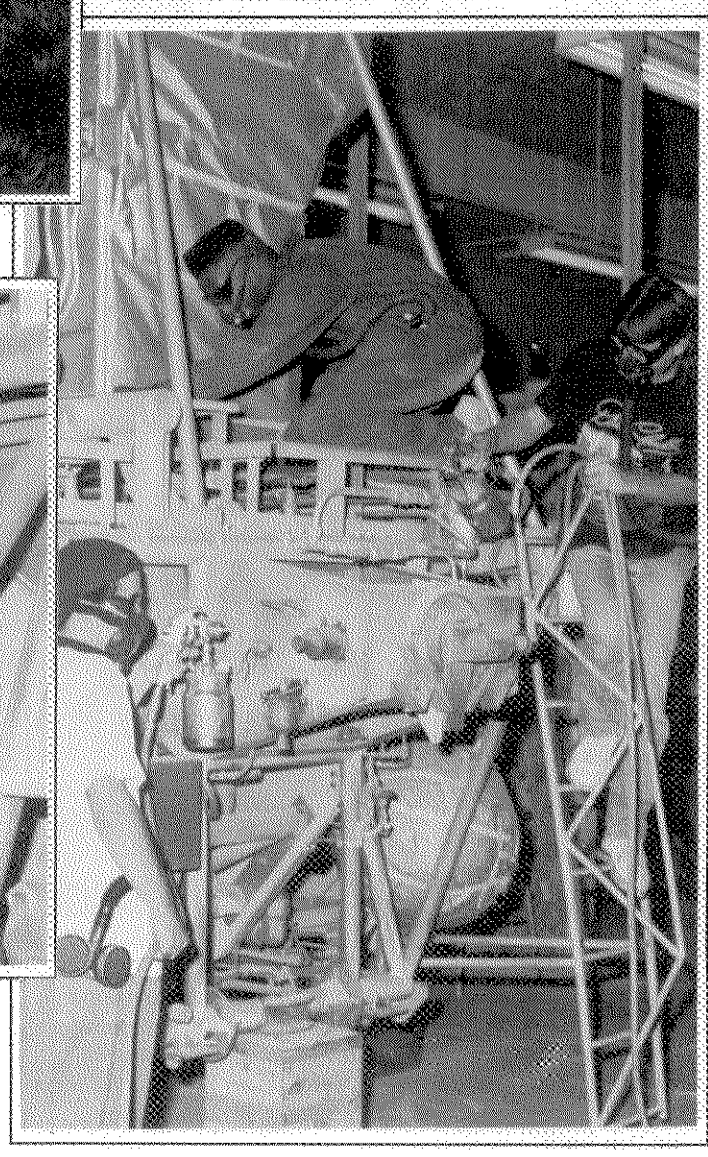
FINAL INSPECTION OF THE REFURBISHED LEMS is performed by New Horizons Technical Center students (clockwise from top) Karena Ragsdale, Chad Huffman, Alvena Carson, David Smith, Kristen Stark, Ron Dziechciarz, Scott Morgan and auto body instructor Terry Smith. In a partnership with NASA Langley, the Virginia Air and Space Museum and the National Park Service, the Apollo Lunar Excursion Module Simulator (LEMS) was restored and prepared for exhibition in the new museum.



Karena Ragsdale, electronics student, connects wires to a terminal block for the solenoid control

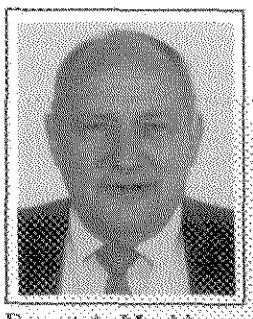


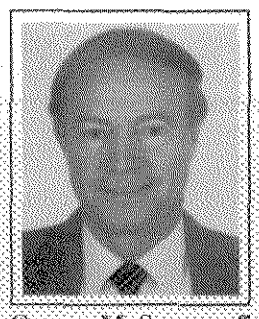
Above, sheet metal students Chris Belcher (standing) and Cliff Lambright work on the attitude thrusters.

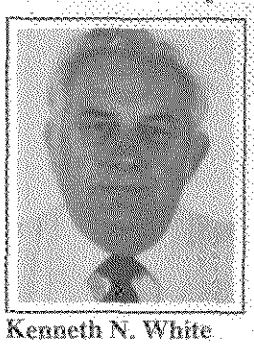


At right, in preparation for painting the LEMS, Tory Wood, top, applies masking tape while fellow auto body students Ron Dziechciarz, left and John Harwood spray the primer coat.

Langley Retirees


Ernest A. Mackley


George M. Summerfield


Kenneth N. White

Alvin P. Lass

Darlene R. Mays

Ernest A. Mackley, Fluid Mechanics Division, retired December 19.

Kenneth N. White, Facilities Engineering Division, retired December 28.

Charles A. Hardesty, Flight Electronics Division, and **Alvin P. Lass**, Facilities Engineering Division, retired December 31.

Laurence R. Bradshaw, Operations Support Division, and **Stanley L. Pearce**, Facilities Engineering Division, retired January 3.

George M. Summerfield, Facilities Engineering Division, retired January 12.

Willis H. Ward Jr., Operations Support Division, retired February 28.

William G. Witte Jr., Materials Division, retired March 22.

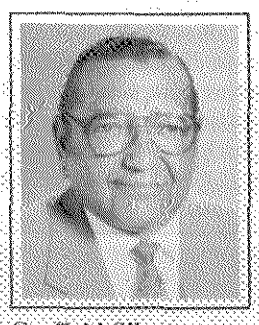
Darlene R. Mays, Projects Division, and **Priscilla V. Balanis** and **Grace M. Girton**, Scout Project Office, retired March 29.

Jeanne P. Huffman, Research Information and Applications Division, and **Martin M. Mikulas Jr.**, Structural Mechanics Division, retired April 3.

Virginia R. Dale, Financial Management Division, retired April 30.

Betty S. Burnes, Human Resources Management Division, and **Coefield Silver** and **Edith K. Spritzer**, Management Support Division, retired May 3.

Stanley L. Pearce


Coefield Silver

Edith K. Spritzer

Sports News

THE AIRBALLS are the regular season and tournament champs for NASA DD-League basketball for the 1990-91 season. They compiled a 15-2 record. Team members are (front row, L to R) Jeff Viken, Bill Debnam and J.D. Smith; (back row) Bill Rosch, Gary Halama and Steve Woessner. Team members not pictured are Bill Edmonds, Jimmy Leiffer and Don Smith.

Awards Presented for Superior Accomplishment

Michael E. Raiford, engineering technician in the Mechanical Equipment Support Section, has been rewarded "for outstanding technical support provided during NTF LN_2 nozzle fairing installations."

James A. Gayton and **Robert T. Harris**, engineering technicians assigned to Technical Support Section D, Tunnels Operations Branch, have been cited "for exceptional technical support to research conducted in the Unitary Wind Tunnel."

Jacob A. Houck, aerospace engineer in the Analysis and Simulation Branch, has been recognized for "coauthoring the report selected by a committee of peers as the outstanding scientific paper documenting Structural Dynamics Division-sponsored, in-house research in calendar year 1990."

Johnny E. Ellis, engineering technician in Technical Support Section C, Tunnels Operations Branch, has been rewarded "for exceptional technical contributions in support of the Mach 6 High Reynolds Number Tunnel."

Paul D. Aronsohn, electrical engineering technician in the Electrical Drives and Systems Operations Section, has been cited "for excellence in providing high level support to research facilities throughout LaRC."

Michael L. Walker, engineering technician in the Fluid Systems Section, has been rewarded "in recognition of outstanding contributions in the installation of the High Pressure Hydraulic System in support of the ATB Machine in the 1205 facility."

Robert C. Hudgins, engineering technician in the Fluid Systems Section, has been cited "for leading and coordinating PCB/PCT data gathering for LaRC's Research Hydraulics Systems."

Ricky L. Clark, engineering technician in Technical Support Section C, Tunnels Operations Branch, has been rewarded "for exceptional technical and mechanical support to research conducted in the the Mach 6 High Reynolds Number Tunnel."

Carl Thomas Weih, co-op in the Services Group, Acquisition Division, has been cited "in recognition of outstanding performance while employed as a student trainee in the Research and Services Contracts Branch."

Joseph Powers, engineering technician in the Composites and Models Development Section, has been recognized "for exceptional contributions to wind tunnel fan blade design and repair."

Teresa J. Joyner, clerk in the Safety Engineering Branch, has been cited "in recognition of timely and effective secretarial support to the LaRC Safety Engineering Branch."

Donald G. Buhl, electronics technician in the Analysis and Simulation Branch, has been rewarded "for exceptional achievement in the design and development of an audio communications system for flight simulation."

Patricia K. Deyerle, secretary in the Communications and Network Systems Branch, has been recognized "for outstanding performance in support of the formation of the new branch."

Randall D. Grove, aerospace engineer in the Analysis and Simulation Branch, has been cited "for outstanding performance in support of the flight simulation research efforts."

Aileen O. Biser, computer engineer in the Computer Systems Branch, has been rewarded "for outstanding performance in integrating the SNS CRAY Y-MP supercomputer into production operation."

Donald Creig Humes, computer engineer in the Computer Systems Branch, has been recognized "for outstanding performance in providing the transition from the MVS-based mass storage system to the UNIX-based STK mass storage system."

Lona M. Howser, mathematician in the Computer Applications Branch, has been cited "for outstanding contributions in support of the VPS-32."

Mary P. Schuler, electronics engineer in the Flight Software and Graphics Branch, has been rewarded "for exceptional achievement in the development of CSI mission software and promoting the use of modern software engineering practices on LaRC flight projects."

Joseph M. Drozdowski, mathematician in the Computer Management Branch, has been recognized "for exceptional technical accomplishment in achieving productivity gains for the supercomputing network subsystem."

Donald F. Booth, electronics engineer in the Communications and Network Systems Branch, has been cited "for outstanding performance resulting in significant improvements to LaTS installation and maintenance services."

Arthur L. Gooden, mathematician in the Flight Software and Graphics Branch, has been rewarded "for exceptional achievement in the provision of reliable, high resolution graphics hardcopy devices to LaRC computer users."

Kemper S. Kibler, aerospace engineer in the Analysis and Simulation Branch, has been recognized "for outstanding performance on the Advanced Concepts Simulator Development Project."

Chuck L. Carpenter, computer engineer in the Flight Software and Graphics Branch, has been cited "for exceptional technical leadership in the design and development of flight and ground software systems for the LITE experiment."

Golf Champs

Individual winners in the NASA Golf Association Honeybee golf tournament held April 26 are **R. H. Huffman**, with a low gross score of 74, and **L. Curtis**, with a low net score of 58 (27 handicap). The next NASA Golf Association tournament is scheduled for Sleepy Hole on June 7. For details, contact Tom Yager, ext. 41304.

Note of Thanks

Edith Kopp Spritzer writes: "Thank you, dear friends, for making the countdown of my NASA career a wonderful memory. A special thanks to my many associates who made my retirement party so meaningful and to all my friends who attended. God bless and thank you for everything."

Have You Seen?

The following items have been reported missing. If you have seen any of them, please contact the Equipment Management Section, ext. 42056.

- o Multimeter, digital, ECN 0404305
- o Recorder, chart, strip, ECN 0464499
- o Microscope, ECN 0464503
- o Surface, plate, metal, ECN 0470045
- o Flowmeter, ECN 0527713
- o Microscope, ECN 0531792

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program is designed to permit employees to donate annual leave to other employees who are experiencing a period of unpaid leave as a result of a medical emergency.

The following employees are approved leave recipients:

- o Linda E. Edmundson
- o Kdean Hargrove
- o Gael M. Hawkins
- o John R. Hefner Jr.
- o Noel A. Talcott Jr.
- o Catherine B. Worth

If you wish to donate annual leave to these recipients, contact Linda Park of the Employee Relations Section at ext. 42610.

CELEBRATE AN AMERICAN TRADITION
50 YEARS OF
U.S. SAVINGS BONDS

People & Places

NASA Holds LDEF Symposium

The first examination of the Long Duration Exposure Facility and its 57 science and technology experiments and supporting hardware has revealed a wealth of information on radiation, meteoroids, man-made debris, contamination, vacuum, atomic oxygen impingement, and ultraviolet radiation. This information is invaluable in the design of future spacecraft which must operate many years in space.

To disseminate preliminary information to members of the international science and technology community, NASA will hold the First LDEF Post-Retrieval Symposium June 2-8, 1991, at the Hyatt Orlando Hotel in Kissimmee, Florida.

Participants will include LDEF investigators and members of the Special Investigation and Supporting Data Groups. Also attending the conference will be potential users of the information within the general aerospace community.

Over 125 papers will be presented on ionizing radiation, meteoroids and debris, space environmental effects on materials and systems, and Space Exposed Experiments Developed for Students (SEEDS).

Summer Program Offerings Announced

The NASA Visitor Center is offering a series of brown-bag lectures that take a look into the past and peek into the future of the Langley Research Center. All programs will be at noon in the Visitor Center theater.

On Thursday, June 27, uncover the hidden past of the land of NASA Langley with Dr. Frank Farmer. Farmer will trace the history of the land and discuss its historical significance to John Laydon, a Jamestown settler, Benjamin Syms and George Wythe. His presentation will include interesting stories, old pictures and artifacts.

In recognition of the 30th anniversary of Project Mercury, Virginia Biggins, a Daily Press reporter since the 1940s, will share a "Personal Remembrance of Langley's Mercury Astronauts" on Thursday, July 25. Included in her program will be one-of-a-kind photos and personal insights about the astronauts, their families and their training.

On Thursday, August 29, Ralph Johnston, director of the Virginia Air and Space Center, will give an update on the new Center now under construction in downtown Hampton. He will discuss the future facility, exhibits and programs. The Center, scheduled to open April 5, 1992, will be the new home of NASA's Visitor Center.

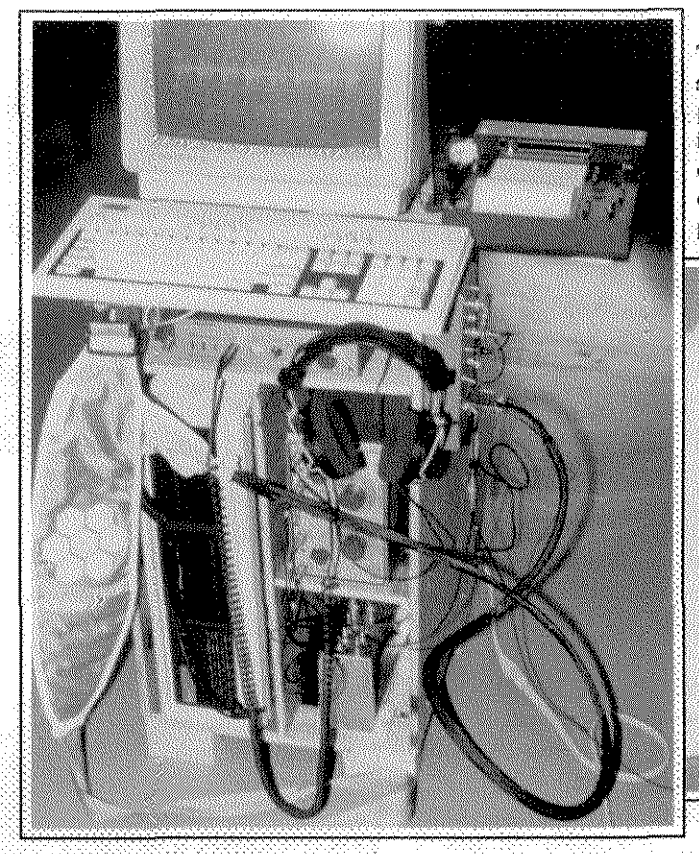
Don't miss this exciting line-up of programs. Guests are encouraged to bring their lunch. For more information on activities during the summer quarter or to receive a copy of the Visitor Center newsletter, call Chris Heithoff at ext. 41579.

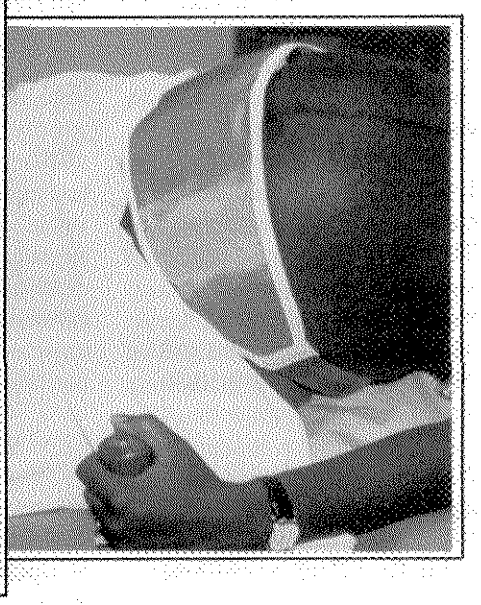
FWP Committee members (L to R) Sandra Zumbrun, Sandra Chaney, Lois Breen and June Howell present a customized coffee mug to Gloria Evans, secretary in the Operations Support Division.

Secretaries Recognized as Valuable and Important Team Members

-by Patsy Campbell

In a "Salute to Secretaries," the Federal Women's Program Committee sponsored a morning social April 24 at the H.J.E. Reid Conference Center. All Center secretaries (NASA and contractor) were invited to attend. Refreshments were prepared by the conference center staff. The FWPC presented to each secretary coffee mugs, customized with the FWP logo designed by Brian Harrell of the Graphics Section. Funds to support this networking session were provided by the Langley Exchange Council, the Programs and Resources Division and the Office of External Affairs.





The fetal heart monitor belt with its seven sensors is shown at the left with the prototype test equipment. Below, the belt is worn by an expectant mother. When commercially produced, the belt will be connected to a "portablized" signal processing unit containing the alarm.

Langley Team Key Contributor to Prenatal Care Technology

-by Craig Murden

The creative application of sensor technology to an invention aimed at identifying problem pregnancies has placed a Langley team, headed by Dr. Allan J. Zuckerwar, in the forefront of an innovative transfer of NASA science to a medical initiative. The device is a fetal heart rate monitor designed to be portable so the expectant mother can oversee the health of her developing baby daily in her home.

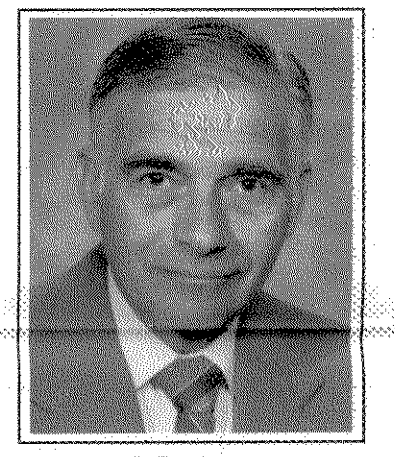
Zuckerwar got involved when the Langley Technology Utilization (TU) and Applications Office was contacted by Donald A. Baker, M.D., of Spokane, Washington, who had developed the concept but needed help with its practical implementation. Baker's interest stemmed from his experience in treating difficult pregnancies involving women who could not or would not get adequate prenatal care--hence the idea of providing something that would signal the need for medical attention.

The fetal heart is an excellent barometer of the baby's health since its beat rate changes measurably in response to such influences as maternal smoking, anemia, drug abuse, alchohol abuse, choking the umbilical cord, high blood pressure, extended gestation, diabetes or maternal infection. In many of these situations, the baby could be healthy one day and in a life threatening condition 24 hours later. A daily monitor would sound an alarm and alert the mother to call her clinic for help.

Zuckerwar's challenge was to adopt sensors and signal processing equipment into a package that was small enough to be portable, yet easy to apply and operate. He also needed to avoid existing instrumentation which uses pulsed Doppler ultrasound that is highly sensitive to abdominal position and is bulky. Zuckerwar decided upon passive, film-type acoustical sensors which are flexible, rugged, chemically stable and which produce voltage when loaded by pressure. These sensors have been used by Langley researchers to measure surface pressures on aircraft in flight and on wind tunnel models. In developing this approach, he points to the help he got from E. Thomas Hall Jr. and Timothy D. Bryant, both of Langley's Fabrication Division, who overcame extraordinary fabrication problems in supporting the effort.

Zuckerwar's approach uses a center sensor surrounded by six more in a circle. This array is mounted on a belt worn by the mother. It is designed to do five things: detect pressure pulses arriving at the abdominal surface of the mother, cancel signals due to rigid body motion of the mother, shield against radiostatic interference, insulate the sensors from environmental noise, and isolate the mother electrically from the signal processing equipment.

The signal processor itself is the manager of the whole system. For this sophisticated technology, Zuckerwar relied on the expertise of two Old Dominion University colleagues, electrical engineers Dr. John W. Stoughton and Robert A. Pretlow, M.D. The system they devised uses a computer which has been "trained" to recognize ideal fetal heart beat tones. It is also able to select which of the seven sensors is receiving the strongest signal. Then, the computer discriminates, in real time, between normal signals from the baby's heart and those that do not fit ideal parameters. In the final commercial version, when an abnormal signal is detected, an alarm would be sounded for the mother to seek assistance.



Dr. Allan J. Zuckerwar

The Langley effort to support the Spokane doctor's commercial interests in marketing the monitor is part of the NASA program to transfer the agency's space age technology to the private sector, according to Dr. Franklin H. Farmer of the Center's TU office. He adds that most of these transfers are to the medical community and that this fetal heart monitor program was funded by the TU office.

Zuckerwar, an electronics engineer in the Instrument Research Division, is known internationally as an expert in acoustics, aerodynamics and structural dynamics instrumentation research programs. He is currently leading a NASA/industry/university effort to develop high temperature fiber optic technology which will be applied to advanced sensors for use in hypersonic research in wind tunnels and on future hypersonic aerospace vehicles. Zuckerwar holds bachelors and masters degrees in electrical engineering from the Carnegie Institute of Technology and a doctoral degree from the Technische Hochschule in Stuttgart, Germany. He also did postdoctoral work at Columbia University and was an associate professor of electrical engineering at Youngstown State University until 1973 when he joined NASA. He has 11 patents issued or pending.

Happenings

LAA SOCIAL will be held Friday, June 7, from 4 to 6:30 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road.

BODY DYNAMICS. High energy-low impact aerobics classes will be held Mondays, Wednesdays and Fridays at 6:15 a.m. in the LAA gym, 14A Ames Road. Classes are open to civil service employees.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m., in the LAA gym. Cost is $12 per month. First class is free. In addition, bench step class will be offered Saturdays, 9:30-10:30 a.m. Cost is $6 per month.

NASA TOASTMASTERS meet the second and fourth Wednesdays of the month in the H.J.E. Reid Conference Center. The next meeting is June 12, 11:30 a.m. to 1 p.m.

FEDERAL WOMEN'S PROGRAM COMMITTEE will meet Wednesday, June 12, at 8:15 a.m. in the executive dining room of the NASA cafeteria.

LAFB OFFICERS' CLUB is a membership club. Please call 766-1361 for details.

DISABLED PERSONS SATELLITE COMMITTEE meets the second Thursday of the month from 8:15 to 9:30 a.m. in the NASA cafeteria, 16 West Taylor Road. The next meeting is June 13. The Communication and Network Systems Branch will demonstrate telephone amplifiers for the hearing impaired. This includes not just severly impaired but also those who have a slight impairment and may need a small boost in sound. Attendance is open to anyone on Center. The amplifier exhibit will remain in the cafeteria until June 21 for anyone who cannot attend the meeting.

PENINSULA COMMODORE USERS GROUP meets the second Friday of the month at 7 p.m. in the Christopher Newport College Administration Building. For details, call Bill Petitt, 898-3855.

HAMPTON ROADS INFERTILITY SUPPORT GROUP meets the second Monday of the month at the Jewish Community Center, Newport Avenue, Norfolk. For more information, call 877-3094 or 220-1440.

NACA/NASA RETIRED WOMEN meet the first Thursday of the month. The next meeting is June 6 at noon in the Sword and Kilt restaurant, Thalhimers, Coliseum Mall. For additional information, contact Mary Mesic, 247-1714.

WANTED: ROOMMATE. Male to share two bedroom apartment with AC, W/D. Two miles from NASA. $170 per month plus half utilities, deposit and weekly chores. Non-smoker only. Available July 1. Contact Claudio, 766-2494. Leave message.

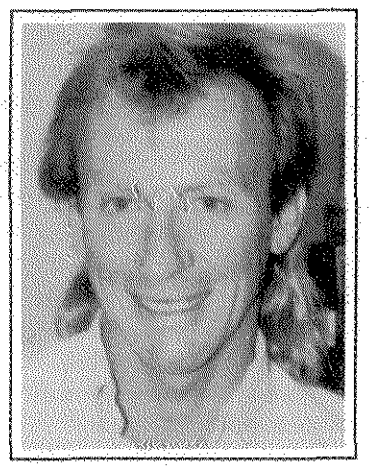
FOR RENT: ROOM. Share townhouse in Poquoson, 5 min. from NASA. Rent negotiable. Telephone in bedroom, full kitchen privileges. Call 868-9524 anytime. Leave message.

LOST: TENNIS RACKET. Prince Pro, possibly left in LAA gym, adjacent to the Fitness Center, lost May 5. Contact Bruce Outlaw, ext. 46653.

FOR SALE: AUTO. 1983 Pontiac 2000, navy blue, 5-speed, AC, PB, PS, hatchback, AM-FM cassette. Good condition. $950. Call 865-6245. Ask for Sylvie.

Langley Colloquium

Former LaRC Engineer Discusses Intelligent Material Systems



Interest in "intelligent" material systems has dramatically increased over the past few years. These systems are loosely defined as materials with embedded distributed sensors and actuators directed by an "intelligent" controller. The systems are designed to have the ability to sense incoming disturbances and react in "real time" in a manner dictated by the control format. Much of the inspiration for the design of "intelligent" systems has come from examining various natural life forms.

During a NASA Langley colloquium Monday, June 10, Dr. Chris R. Fuller, professor of mechanical engineering at Virginia Polytechnic Institute and State University, will discuss "Control of Sound and Vibration with 'Intelligent' Structural Systems." The talk will be held in the H.J.E. Reid Conference Center, 14 Ames Road, at 2 p.m.

In his lecture, Fuller will discuss the concepts and choices for distributed actuators, sensors and adaptive controllers and demonstrate how these systems are integrated within the material matrix. Fuller will also discuss the applications of "intelligent" material systems to a number of problems related to control of sound and vibration.

At VPI, Fuller's research interests are in active control of sound and vibration, adaptive structures and applications of artificial neural networks to problems in acoustics and vibration. Formerly a Langley Research Center aircraft noise control engineer, Fuller directs research projects from NASA, the Office of Naval Research and the Defense Advanced Research Projects Agency.

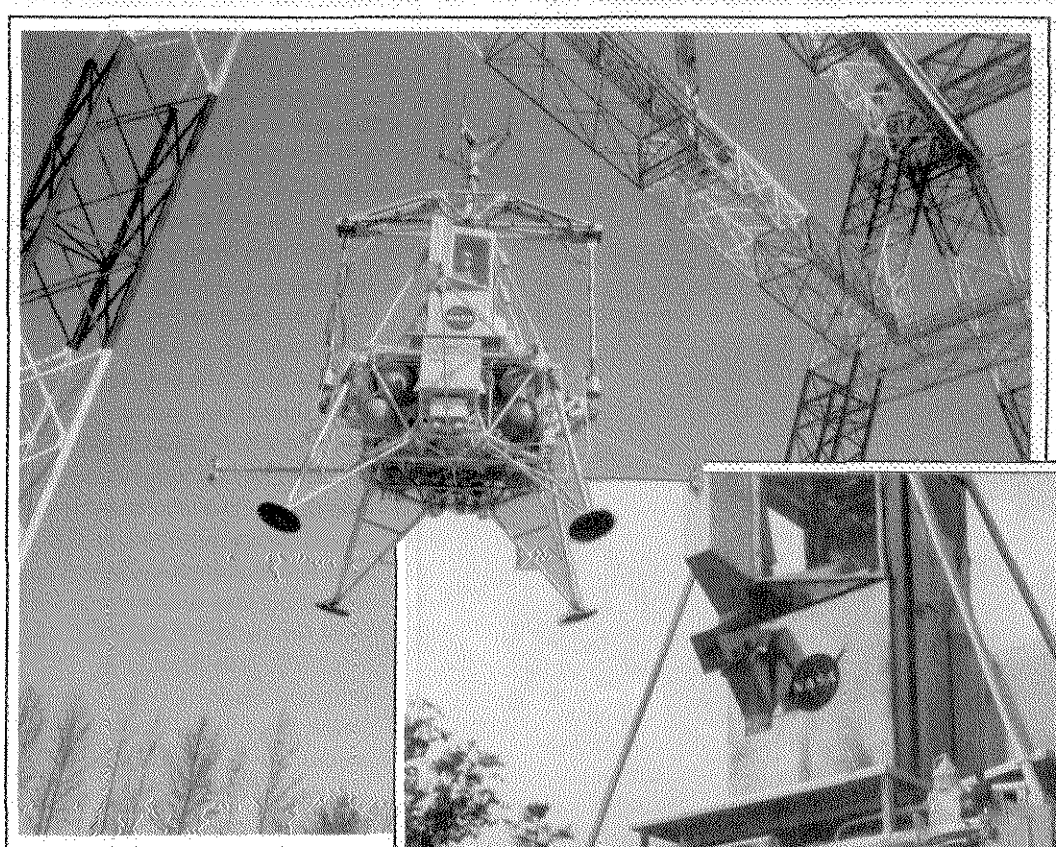
BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

Official Business
Penalty for Private Use $300

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

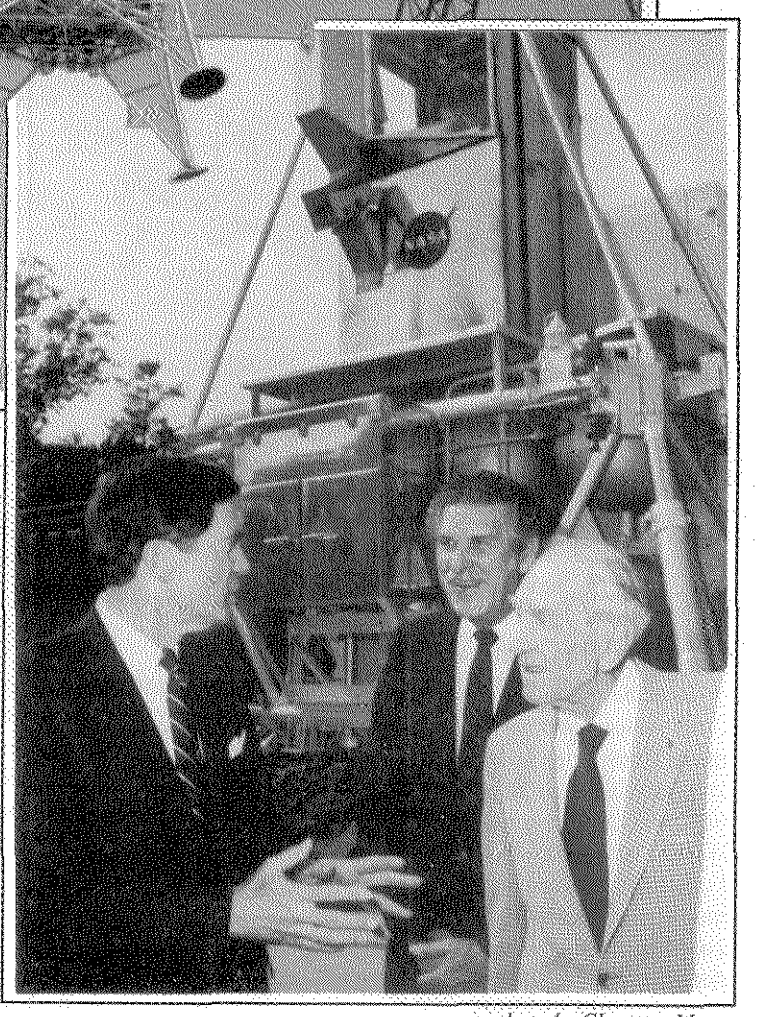
402 ON-SITE NON-LARC
SKORA, MARY M.
MAIL STOP 115

News Researcher



The Lunar Excursion Module Simulator (LEMS) was used to help train every astronaut who set foot on the moon.

Langley's LEMS was refurbished by students at the New Horizons Technical Center in Hampton. The restoration was accomplished through a partnership between NASA Langley, New Horizons, the Virginia Air and Space Center and the National Historic Landmarks Commission. See LEMS story on page 3.



U.S. Senator Charles Robb (left), keynote speaker at the LEMS unveiling ceremony May 10, talks with NASA retirees Dale Gwaltney (center) and Carl Baab.

-photo by Clements Mayes

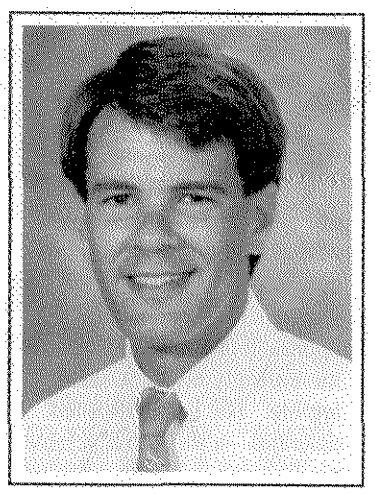
NASA
National Aeronautics and
Space Administration

Langley Research Center

Volume 5, Issue 12 June 14, 1991

News Researcher

Bi-weekly Employee and Contractor Publication



Monroe Selected for ISU Fellow

Charles A Monroe Jr., a mechanical engineer in the Facilities Engineering Division, has been chosen to attend the International Space University (ISU) summer session.

The 1991 ISU program will be conducted from June 22 to August 31, at Ecole Nationale de L'Aviation Civile in Toulouse, France.

The ISU is an innovative educational concept designed to educate future leaders in specific areas of space research and development. At ISU, the students participate in a broad interdisciplinary curriculum, meet and work with their colleagues from many nations and sharpen their skills through an intensive design project experience.

"I'll have a chance to study a wide-range of space-related disciplines under lecturers from around the world." said Monroe. "I am also looking forward to working on the design project with team members from different nations."

During the ten-week session, Monroe will concentrate on Space Architecture. The focus of this course area will include reviewing space structures and interiors through conventional blueprint design and modern computer-aided design.

Monroe is currently working on development of experimental research facilities. He began his career at NASA in 1987.

Langley Employees Awarded Silver Snoopy

STS-37 Commander Nagel Presents Awards

Twelve Langley employees received the coveted Silver Snoopy Award from Astronaut Steven Nagel, commander of STS-37. The STS-37 mission crew visited Langley on May 31 to brief employees on the flight of Atlantis and its mission of deploying the Gamma Ray Observatory and to evaluate the Crew Equipment Translation Aid (CETA).

CETA, designed, developed, manufactured and qualified at Langley, is a 47-foot monorail mounted on the right side of the Shuttle payload pay.

Those honored for their various contributions to a variety of NASA programs were James P. Arrington, Ronald D. Brown, Robert H. Daugherty, Delma C. Freeman, Jr., Walter L. "Doug" Heard, Jr., Thomas H. Leffel, Jr., James C. Newman, Jr., W. Pelham Phillips, Richard Powell, Howard W. Stone, Jr., Sandy M. Stubbs and William C. Woods.

James P. Arrington, NASP Joint Program Office, was cited "for outstanding contributions to the understanding of Shuttle configuration aerodynamics and the development of the Orbiter Aerodynamic Design Data Book."

Ronald Brown, Mechanics Division, was selected "for innovative, pioneering development of the certification tests for the Shuttle thermal protection materials which has resulted in the design of safe, reliable thermal protection for over a decade of Shuttle flights.

Robert H. Daugherty, Structural Dynamics Division, was honored "for exemplary dedication and performance in providing critical data which has significantly improved the safety of Space Shuttle landings and operations.

Delma C. Freeman, Space Systems Division, was recognized "for exceptional support of the Shuttle development program and providing realistic prediction of the orbiter dynamic stability and flight characteristics."

Walter L. "Doug" Heard, Jr., Structural Mechanics Division, was cited "for a dedicated effort in establishing a pioneering EVA assembly testing activity for erectable space structures, which permitted the Astronaut Corps to receive EVA training not available otherwise."

Thomas H. Leffel, Jr., Space Engineering Division, was selected "for exceptional service in the design, development, testing, flight preparations, and post-flight system verification for the SILTS Space Shuttle experiment and for significant contributions as a member of the LDEF retrieval team."

James C. Newman, Jr., Materials Division, was honored "for conducting fracture mechanics analysis and developing damage tolerance procedures for maintaining the fracture integrity of the Shuttle external tank."

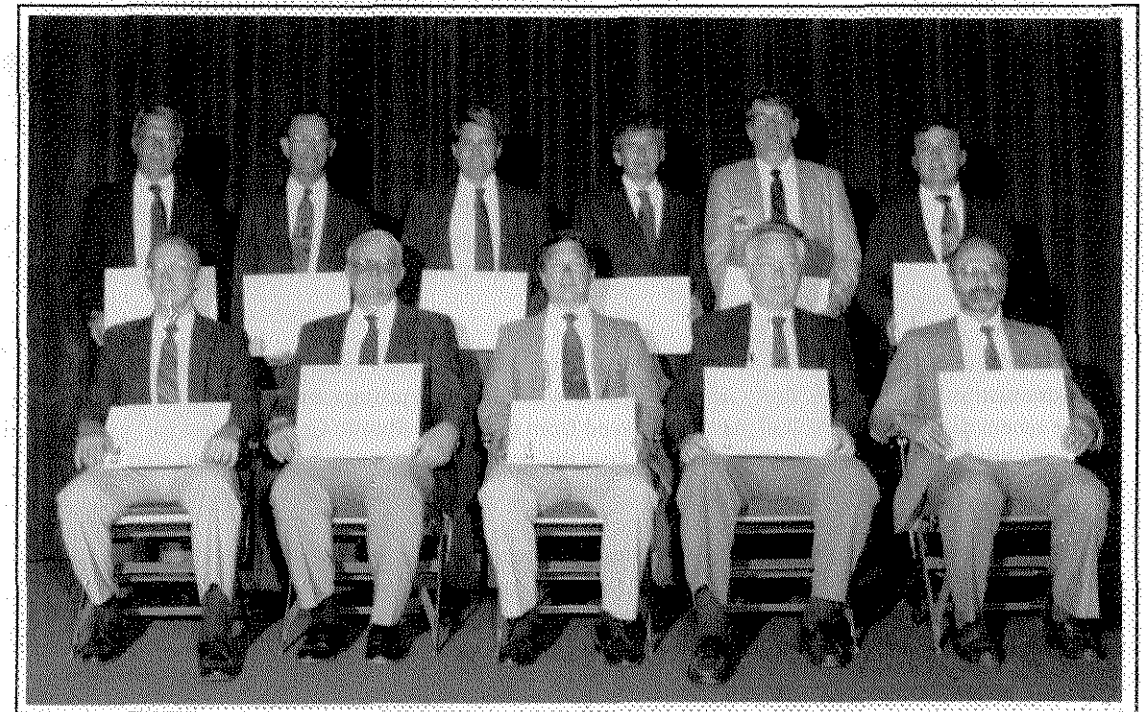
W. Pelham Phillips, Space Systems Division, was recognized "for significant contributions in determining Shuttle Orbiter aerodynamics from hypersonic entry to subsonic landing."

Richard W. Powell, Space Systems Division, was cited "for outstanding contributions to the Shuttle entry flight control system design and evaluation and for studies leading to major improvements in orbiter flight performance."

Howard W. Stone, Jr., Space Systems Division, was selected "for outstanding contributions to the design of the Shuttle orbiter entry flight control system and the development of the Re-entry Flight Dynamics Simulation Facility."

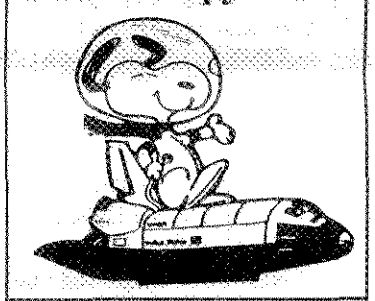
Sandy M. Stubbs, Structural Dynamics Division, was honored "for exemplary dedication and performance in providing critical data which has significantly improved the safety of Space Shuttle landings and operations."

William C. Woods, Space Systems Division, was recognized "for contributions to the aerothermodynamic evaluations of Space Shuttle concepts and the conduct of critical orbiter hypersonic aerodynamic performance studies."



Top Row: (left to right) William C. Woods, Sandy M. Stubbs, Howard W. Stone, Jr., Richard W. Powell, W. Pelham Phillips and James C. Newman. Bottom Row: (left to right) Walter L. "Doug" Heard Jr., Delma C. Feeman, Jr., Robert H. Daugherty, Ronald Brown and James P. Arrington. Not Shown: Thomas H. Leffel, Jr.

Silver Snoopy Award



The award is a replica of Snoopy in space garb. A silver pin and certificate are presented personally by an astronaut for outstanding performance in support of manned space flight activities.

The Silver Snoopy Award is one facet of NASA's Manned Flight Awareness (MFA) program. While stressing the criticality of crew safety, quality workmanship and mission success, MFA emphasizes and encourages a "team" concept by bringing together government and industry management, members of the Astronaut Corps, and outstanding employees throughout the workforce.

Gnoffo, Bushnell to Receive AIAA Awards

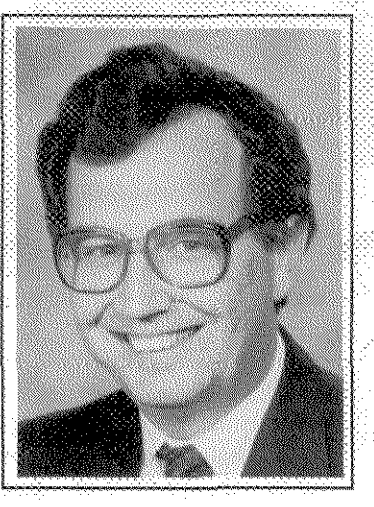
The American Institute of Aeronautics and Astronautics (AIAA) will recognize two outstanding NASA Langley Research scientists. Dr. Peter A. Gnoffo has been selected by AIAA to receive the 1991 AIAA Thermophysics Award. Dennis M. Bushnell will receive the 1991 AIAA Fluid and Plasmadynamics Award. Both will be presented their awards on June 25th at AIAA conferences in Honolulu, Hawaii.

Gnoffo is cited "for his pioneering contributions to the development of computational techniques for the analysis of complex hypervelocity flows in chemical and thermal nonequilibrium."

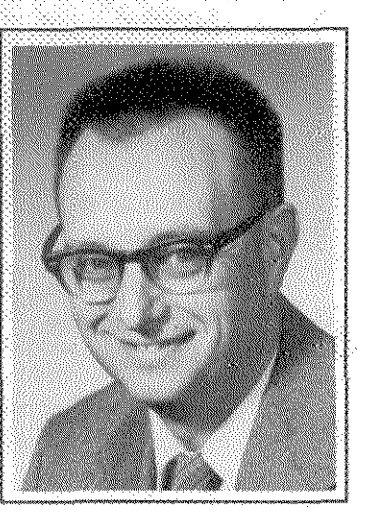
Gnoffo, senior research engineer in the Aerothermodynamics Branch, Space Systems Division, is responsible for the development and application of mathematical computer simulations of airflows.

Bushnell is recognized "for his exceptional leadership and inventiveness in turbulence control of drag reduction and for supersonic low-disturbance wind tunnels, and for significant pioneering work in high Mach number turbulent boundary layers, slot injection and turbulence modelling."

Bushnell, associate chief of the Fluid Mechanics Division, assists the chief in overseeing engineers and scientists engaged in activities, such as inventing methods to reduce turbulent skin friction drag on aircraft.



Dr. Peter Gnoffo



Dennis M. Bushnell

News Briefs

Artificial Aurora Experiment Results To Be Presented ---Scientists, whose experiments produced brightly colored clouds in night skies over the Americas and triggered artificial Earth auroras thousands of miles away, discussed their findings in a May 28 session of the American Geophysical Union's spring meeting in Baltimore, Md. The experiments were conducted during January and February of this year with the Combined Release and Radiation Effects Satellite (CRRES). This joint NASA-Air Force effort studied the Earth's magnetic fields and the effects of space radiation on spacecraft components. NASA, Air Force and participating scientists successfully completed eight experiments involving releases of small amounts of barium and lithium from the satellite. The releases allowed scientists to study the response of the space environment to the injection of artificial clouds of charged particles.

Spring Planting and Crop Harvest Time Underway at NASA --- Spring is not only planting time at Johnson Space Center, Houston, it also is harvest time in the Engineering Directorate's Crew and Thermal Systems Division (CTSD). The crop harvested will give scientists and engineers vital information that could impact human self-sufficiency on the Moon and Mars. CTSD scientists and engineers harvested their first research crop of Waldman's Green Lettuce grown in a specially outfitted chamber at Johnson. This marks an important milestone in studies on Regenerative Life Support Systems (RLSS). These studies are focusing on recycling air and water and the production of food, all critical elements to NASA's future long duration missions.

NASA To Review Sensor Problem--- Senior management of NASA's space flight and safety programs and Administrator Richard H. Truly said the agency will conduct a prompt and thorough review concerning the recent discovery that a fuel sensor removed from the Space Shuttle Columbia last fall was cracked. "We have appointed an expert panel to review how the sensor problem was handled from start to finish," Truly said. "NASA will continue to place the greatest emphasis on mission safety and reliability."

NASA Science Instrument Observing Gamma-ray Bursts --- The Burst and Transient Source Experiment (BATSE), one of four instruments on NASA's Gamma Ray Observatory, is detecting gamma-ray bursts with a greater sensitivity than previous instruments, according to the principal investigator. "We are detecting gamma-ray bursts at a higher rate and in much greater detail than ever before," said Gerald Fishman, a NASA astrophysicist at the Marshall Space Flight Center. "Gamma-ray bursts are being observed by the BATSE at the rate of five per week or an extrapolated rate of 250 per year."

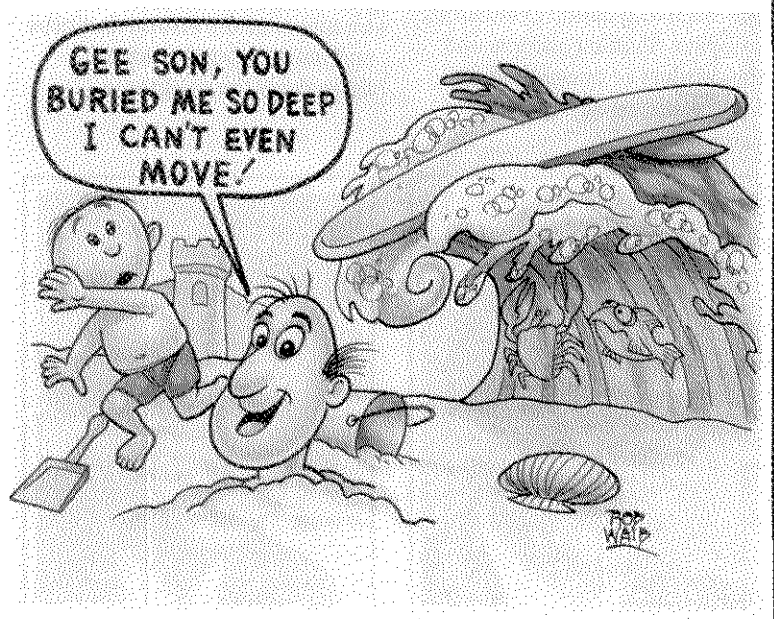
Senior Management Research Review

The Senior Management Research Review will be held Monday, June 17, from 9 to 11 a.m. in building 1212, Room 200. All employees are invited to attend. Program accomplishments will be given by the following Langley scientists:

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:00	The Infeasibility of Experimental Quantification of Life-Critical Software Reliability	Ricky W. Butler (SVMB, ISD, Flt Sys)
9:15	Titanium Based Metal Matrix Composites Technology for Hypersonic Airframe Structures	Dennis L. Dicus (MMB, MD, Structures)
9:30	Improved Fuel Injector for 8-Ft. High Temperature Tunnel Developed	Richard L. Puster (EFTS, SMD, Structures)
9:45	Improved Focusing Schlieren for Examining Complex Flows	Leonard M. Weinstein (EMB, FLDMD, Aero)
10:00	CFD Analysis of GAS/Hypulse Mach 17 Rectangular Combustor	Robert D. Bittner (HTO, NAO, Aero)
10:15	Radiation Exposure Analysis for High-Altitude Aircraft Crew-Members	John E. Nealy (VAB, SSD, Space)
10:30	Director's Comments	

Following these presentations, the program directors will give status reports

Lankley



Traffic Information
Hampton Roads
Bridge Tunnel
727-4864

Telephone Directory Valuable Link to Center's Internal Communications

The Langley Research Center telephone directory is published semi-annually to facilitate easy and accurate internal communications. The June 1991 edition encompasses our "new look for the 90s" and contains some very important changes.

You will note immediately that it is devoid of color and the standard coated cover. These changes have been made to address environmental concerns raised by a number of employees. The new directory is now recyclable.

A great deal of attention and planning was required to ensure this recyclability. The document is saddle stitched rather than *perfect* bound with glue. This type of binding necessitated that the document not exceed 144 pages, so contents were severely screened.

In addition, you will note that employees are listed by the new street address designations. This completes another phase of transition to the standard address system announced by the Center Director earlier this year. The updated directory and new street address signs are working together to provide a logical and systematic method of locating Langley facilities and people.

The June telephone directory is a product of the Management Operations customer survey and is the first step in a two-step phased approach to a document that is increasingly utilitarian and legible. The issues deemed essential—a totally recyclable product and inclusion of street addresses—were the focus of this first step. The goals for the December 1991 directory are increased automation in production and increased legibility.

A committee composed of representatives of the Business Data Systems, Management Support, Human Resources Management and Research Information, and Applications Divisions have taken an in-depth look at this important internal communications tool. In order to make the two-step approach most successful, the committee welcomes your comments and suggestions. Address ideas for the December directory to Ron Krodel, Management Support Division, Mail Stop 123.

Employees Support Bloodmobile

Langley civil servants, contractors and retirees donated 333 pints of blood at the May 22 American Red Cross Bloodmobile.

Achieving status were:

14 gallons---Stanley L. Pearce, William G. Chapin;
12 gallons---John B. Kovtun, Robert Weston;
11 gallons---Glen A. Parker, Karen A. Burch;
10 gallons---Richard L. Chattin, Frank L. Jones;
6 gallons---Edgar L. Collier, Jr., Kathryn E. Wurster;
5 gallons---Ronald G. Hermansderfer, Douglas S. Johnson;
3 gallons---John Hopkins, James K. Adams, Michael F. Harrell, Augustus D. Scott, Bobby A. Kessler, Robert Weston, Wayne A. Davis, Tammi S. Moat, Cindy W. Albertson, Jimmy C. Case;
2 gallons---Gregory S. Hogge, Earl J. Mathis, Jr., Bradley D. Leighty, David R. Barnes, Steven K. Bene, Ronald S. Geouge, Lynne W. Eklund, Carla D. Simmons;
1 gallons---Harriet R. Dismond, Keith L. Woodman, Anh T. Trinh, Jesse C. Midgett, Sam Pollard;
First Timers---Edward G. Smith, Paula McPhee, Robert West, Hector Rabell, Jr., Sandra C. Lemons, Susan M. Price, Ralph G. Jordan, Dominic Trombetta.

The NASA coordinator for the Langley Bloodmobile was Annette L. Forrest; Barbara Thomas was the Red Cross coordinator.

Summer Computer Expo

Langley's Summer Computer Expo will be held Friday, June 28, from 10 a.m. to 2 p.m., in the H.J.E. Reid Conference Center.

The one day showing of advance computer technologies will include more than 35 exhibitors displaying the latest in engineering capabiliites, office automation, lab automation, graphics, CAD/CAM, workstations, OCR, and scientific computing

Some of the exhibitors will be: Aldus Corp., Astro Med, CE software, Enable, Frame Technolgy, KMS, Micromagnetics, Sequent, Video & Telecom, Alliant, Applix, C3, CadKey, Egghead Software, Ioline, Mercury, NEC Technology, Structural Research & Analysis and National Instruments.

All personnel, support staff and contractors are invited to attend. The event is sponsored by the National Small Business Council and the Evaluation and Information Center.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

People & Places

Health Corner

Adult Weight Gain - Is It Inevitable?

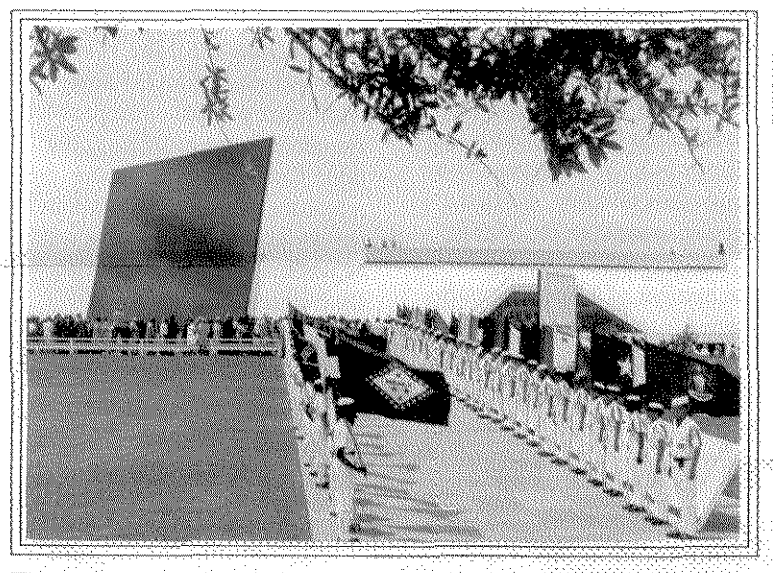
The middle-age spread or creeping obesity as it is now called, is so common in our society it is usually expected to happen. It occurs for a number of reasons. First, as an adult, activity level diminishes and we become more sedentary. Second, basal metabolic rate (BMR) decreases but our eating patterns are maintained which results in a positive caloric balance (intake exceeds output). Third, weight gained after the age of 25 is almost always stored as fat because of excessive caloric intake. Fourth, while not gaining any weight as an adult, the amount of fat tissue still increases because lean body tissue decreases as a result of a sedentary lifestyle.

However, this process can be prevented. Exercise or physical activity, no matter how slight, will increase the total metabolic rate beyond the BMR which will burn extra calories.

Diet also plays an important role. Consume foods that are high in carbohydrates versus those that are high in saturated fat. When consuming foods high in saturated fats, you take in twice as many calories than carbohydrates or proteins. That means you would have to exercise twice as long to burn off a steak versus a piece of broiled chicken or pasta salad.

Adult weight gain and creeping obesity do not have to be inevitable. They can be prevented by regular exercise, resistance training and a low-fat, high carbohydrate diet. These factors will deter the age-associated decrease in BMR or metabolism.

Remembering Our Pioneers

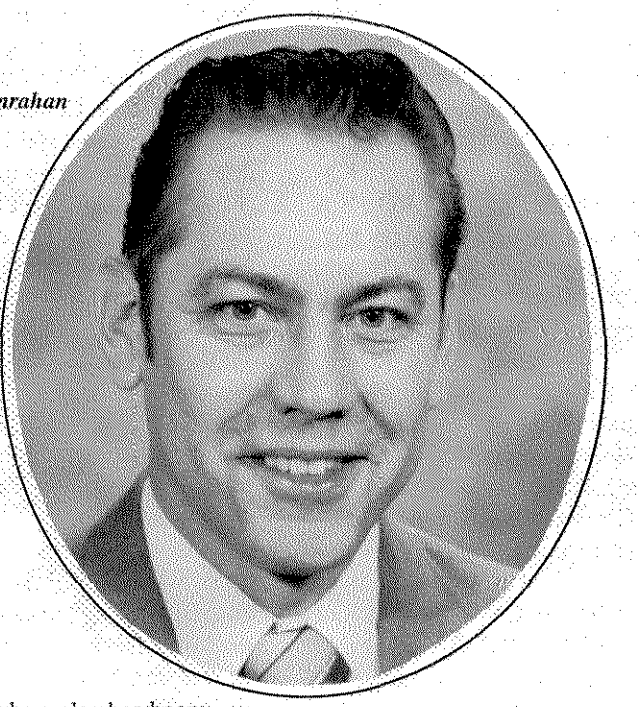


The Astronauts Memorial, honoring all U.S. astronauts who lost their lives in the line of duty, was dedicated in May at the Kennedy Space Center. The dedication ceremony featured a keynote address from Vice President Dan Quayle and remarks by Eugene Cernan, commander of the final Apollo mission, Florida Governor Lawton Chiles, KSC Director Forrest McCartney, and NASA Administrator Richard Truly. The memorial, which is located beside a lagoon near the KSC Visitor Center, is a striking slab of mirror-finished black granite with the names of the 14 astronauts cut through its surface. The 42-by-50-foot mirror-surface is angled to reflect the sky, and, because the names are cut through the granite, presents an ethereal image of the astronauts' names floating in and among the clouds.

Personnel Profile

Heroes Among Us

-by Allan C. Hanrahan



A climb through the windswept and shifting sand to the top of the dune and a gaze to the north and west — away from the roiling surf — rewards the explorer with a glimpse of the memorial to the brothers Wright, a memorial to those early - day heroes of manned flight.

Heroes come along at all times and in various places. It was just about a year ago when Franklin O. Mayhew was awarded a NASA Outstanding Volunteer Service Award at the 1990 Honor Awards Ceremony "for dedicated public service through volunteer efforts, spanning local and national interests, in areas of youth and adult programs."

The award recommendation was endorsed by Senator John Warner in an official letter to the Metals Technology Development Section of the Fabrication Division where Mayhew serves as an engineering technician.

It was five years ago when Mayhew began his extensive volunteer association with the Newport News Elks Lodge Number 315 as Drug Awareness Chairman. Since that time he has donated 160 to 200 hours per year, working with the Newport News School Board helping to educate fourth, fifth, and sixth graders in the dangers of drug use. Each year a contest is held giving the children the opportunity to enter their essays regarding their perception of the dangers of drugs. The awards ceremony and banquet is usually attended by members of the Newport News School Board, the Chief of Police, the Mayor of Newport News, Congressman Herbert Bateman, and State Senator Bobby Scott. Mayhew began his work with a $0 budget which has grown to a $2,000 budget.

Mayhew also has been very active with the Elks Lodge volunteer program for the Veterans Administration. He was appointed by the Elks Grand Lodge as their Veterans Administration Volunteer Service representative four years ago. This involves coordinating programs for the veterans in the VA Hospital in Hampton. Mayhew donates 150 to 200 hours per year which includes arranging bingo games, cookouts for the veterans, a Veterans Day dinner at the lodge, a Christmas party at the hospital, and a Fair Day which is held at the hospital.

Frank is also past chairman of the Youth Camp program for the Newport News Elks Lodge. This is a camp that is sponsored for underprivileged youth from the community. The Youth Camp required him to donate about 200 hours per year. This involved interviewing families of the youth in their homes. The budget for this endeavor was also $0 and grew to $1,800 by the end of Frank's term of office.

In addition, Frank was cited by the Elks as the Outstanding Elk for 1988 for his district, and for 1990-1991 served as Exalted Ruler.

A native of Thomasville, N.C., Frank lived in Georgia before moving with his family to the Peninsula. He served in the U.S. Navy from 1961 to 1962.

Frank began his NASA career in May 1987. Prior to that he was an airframe and power plant mechanic and owner of F & M Enterprises, as well as the chief mechanic working on safety for the aircraft superchute being developed by the late H. W. "Rocky" Jones, Jr.

"I spent eight years with Rocky; I got to know him real well," stated Frank with obvious admiration for the deceased aviation entrepreneur."

Frank has one daughter, Lori Hinsinger, who just graduated — with a 4.0 grade point average — from travel agent school in Greenburg, Pa. and has a six-year-old grandson.

Frank's spirit of volunteerism is seen in his distinguished community service in which he gives his time, talents and knowledge to youths and adults on the local and state levels. We are happy to acknowledge the selflessness of spirit in which he volunteered his services.

Farmer to Uncover the Hidden History of the Land of NASA Langley

The rich heritage of the land that NASA Langley sits upon goes beyond the great technological firsts that Langley has seen over the past 75 years. The whole story can be traced back to a young and struggling nation and the brave men and women who helped shape it. As a tribute to the land that continues to nourish high ideals and innovation, Dr. Frank Farmer will give a historical presentation, "Uncovering the Hidden Past of the Land of NASA Langley," on Thursday, June 27, at noon, in the NASA Visitor Center theater.

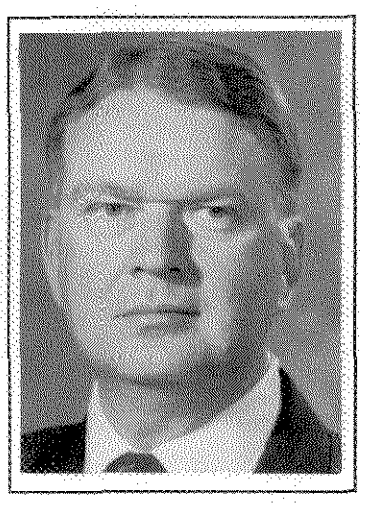
Farmer, a NASA Technology Utilization Specialist and a member of the NASA Langley Historical and Archaeological Society, will give a historical overview of Langley's plantation areas. To help bring the past alive, Farmer will include interesting stories, old photos and artifacts. He will discuss the more famous land owners and their signfiicance in history.

During the seventeenth century, John Laydon, an original Jamestown settler, received a patent (grant) of 500 acres of land located in Elizabeth City County (now the City of Hampton). Laydon later married Anne Burras, who arrived in 1608, and in 1609 they became the parents of Virginia Laydon, the first child of English parentage born in Virginia. It's believed that the Laydon family lived on the land that now is occupied by NASA Langley until he sold a portion of the land to John Hewit in 1648.

After passing through three other owners, that portion of land was bought in 1693 by Thomas Wythe, George Wythe's great grandfather. In 1755 George Wythe inherited Chesterville plantation and in 1773 he built a house that may have been designed by his friend Thomas Jefferson. George Wythe later became famous as a signer of the Declaration of Independence, the first professor of law in English America at the College of William and Mary and the law mentor of Thomas Jefferson. Wythe's primary legacy to America was the many early leaders of our country whose high ideals, strong character and thorough understanding of the fundamental principles of law were greatly influenced by Wythe's tutorage.

The land was also home to the first free school in English-speaking America. In 1635 Benjamin Syms bequeathed 200 acres of his land and eight milk cows to support a free school. In essence, this was the first trust established for education with the purpose of educating poor children. The Syms free school opened in 1638. It was built, maintained and supported by selling cattle, milk and produce.

Currently, Langley's many buildings and research facilities reside near these historical areas which are being protected and recognized with small monuments. In 1972 a portion of the land was recognized as a Virginia Historic Landmark and in 1975 it was entered in the National Register of Historic Places.



Happenings

LANGLEY CHAPTER, FEW will meet Wednesday, June 26, at 11:30 a.m. in the executive dining room of the NASA Cafeteria.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m., in the LAA gym. Cost is $12 per month.

NASA TOASTMASTERS meet the second and fourth Wednesdays of the month in the H.J. E. Reid Conference Center. The next meeting is June 26, 11:30 a.m. to 1 p.m.

PENINSULA COMMODORE USERS GROUP meets the second Friday of the month at 7 p.m. in the Christopher Newport College Administration Building. For details, call Bill Petitt, 898-3855.

WANTED: ROOMATE. Male to share two bedroom apartment with AC, W/D. Two miles from NASA. $170 per month plus half utilities, deposit and weekly chores. Non-smoker only. Available July 1. Contact Claudio, 766-2494. Leave message.

LAFB OFFICERS' CLUB is a membership club. Please call 766-1361 for details.

NASA SCIENCE FICTION CLUB will have a meeting on Tuesday, June 18 at 7:30 p.m. in the H.J.E. Reid Conference Center. The guest speaker is Jeannette Petrolia from the Virginia Air and Space Center. For more information, call John Kaiser at 47380.

FOR SALE: RIVERDALE HOUSE. 3 bedroom, 1 bath, attached garage and screened porch. Close to LAFB/NASA. Great neighborhood/location. $71,900 negotiable. Call 838-4813 after 7 p.m.

FOR SALE: HOUSE. Large executive house located in exclusive Beverly Hills section of Newport News. Four bedroom, 3 full baths, large den with wet bar, screened porch, custom-built fence and outbuilding, garden plot and much more. $179,900. Call owner/agent Frankie Ward at 596-8471 for appointment.

MINIATURE RAILROAD GROUP has been formed for the construction and operation of a large scale miniature railroad and equipment, including live steam, in the Hampton Roads area. Interest and willingness to participate is more important than experience. For details, call 867-8403 or 865-7862.

FOR SALE: BOWLING BALL. Brand new, never been used or drilled. 14 lbs. AMF-The Edge. Retail for $95; will sell for $65. Call 838-0912.

BAHAMA CRUISE. Cruise to Nassau, Freeport and CoCo Cay in the Bahamas in September 1992. Special group prices range from $560 to $850 per person all-inclusive for a 5 day/4 night cruise. Budget payment plan available. Call 890-0959 for details.

NOTE OF THANKS

Lahoma Hart. I wish to thank the many friends and co-workers who contributed so much to my career at Langley. A special thanks, too, to those who planned and participated in my retirement luncheon. It was a perfect ending to a rewarding career.

In Memoriam

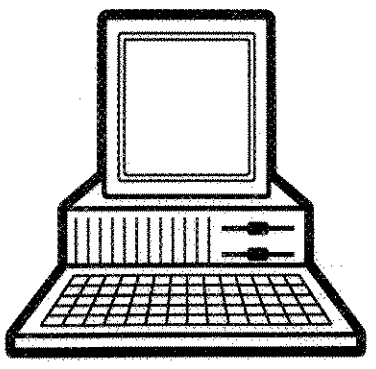
Sympathy is extended to the family of:

Alverta H. Barnes who died on May 13 in Vero Beach, Florida. Barnes worked as a supervisor at Langley. Following her retirement from NASA, she worked for Klate Holt Engineering Co. for 10 years.

New CD-ROM Databases Available in Library

-by S.A. Motley

Imagine taking only seconds to produce a comprehensive database of aircraft armed with Exocet missiles. **Jane's All the World's Aircraft on CD-ROM**, now available in the Technical Library, can access its storehouse of records and retrieve this specific data in less than three seconds. Along with a detailed written description, **Jane's** also displays images of each aircraft.



Recognized as the most dependable and comprehensive source of information in this field, the 1990-91 edition on CD-ROM enables the user to search **Jane's** relational database in full text mode. Search results may be sorted by fields such as country or manufacturer

In addition to traditional queries which combine the subject terms, **Jane's** incorporates a hypertext function which allows browsing at random. An initial search of fighter aircraft armed with Exocet missiles would retrieve a record for the Mirage F-1. With the use of a single function key, another dataset specific to the Mirage can be created and examined for the number of Mirage aircraft owned by various countries.

Jane's is a versatile information product, providing downloading and post-processing capability. Individual records or whole datasets may be printed or saved as an ASCII file. Photographs and line drawings are viewed directly from within or easily accessed and edited by using PC Paintbrush IV Plus which can rotate, shrink, enlarge or color an image.

Visit the library and explore **Jane's All the World's Aircraft on CD-ROM** along with other compact disc products available in the growing collection. Consult the third floor reference desk for an intorduction to searching **Jane's** as well as **Dissertation Abstracts on Disc** which dates back to 1861 and the CD version of **Science Citation Index** from 1985.

Researcher News

National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 RESEARCHER,NEWS
VANVALKENBURG, RANDAL L.,
MAIL STOP 125A BLDG 1268

Endeavour Arrives at her New Home

The newest addition to the Space Shuttle orbiter fleet, Endeavour, glides onto KSC's Shuttle Landing Facility, Runway 15. Endeavour is flying atop the new Shuttle Carrier Aircraft, also making its debut at KSC. For the first time since January 1986, a full complement of four orbiters are now in flow at KSC. Endeavour boasts many new features, including a drag chute to increase landing safety and equipment enhancements for extended on-orbit stay. Maiden flight of OV-105 is scheduled for May 1992.

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 13 June 28, 1991

Langley Researcher News

Bi-weekly Employee and Contractor Publication

Return of Spacelab Highlights Past LaRC Roles

-by Craig Murden

The first Spacelab payload to fly in six years carried experiments focused on ensuring the prolonged health of astronauts during future long-duration space activity, such as on a space station or a voyage to Mars. The Spacelab Life Sciences-1 (SLS-1) aboard Space Shuttle mission STS-40 was aimed at answering many important questions about how the human body functions under weightless conditions in space and how it readapts upon return to Earth. Several of those experiments involved two Langley engineers whose paths have crossed and recrossed over the past years.

Richard E. Campbell, a senior electronics design engineer in the Flight Electronics Division, joined NASA in 1966, left the agency to become the vice president of a Newport News high technology design and development firm in 1985, and returned to his current job last year. Dr. Ross L. Goble, president and CEO of that same firm--Engineering Development Laboratory, Inc.--was chief of Langley's Research Facilities Engineering Division until 1978.

Between them, the two collaborated on some of the SLS-1 life science experiments which were designed and manufactured for NASA by the local space science company. One of the most ambitious of these was to develop a device for continuous, direct measurement of central venous pressure (CVP) during space flight. CVP is an important element in cardiovascular medicine because it shows both central blood volume and heart filling pressures. Even very small variations in these filling pressures have major effects on the performance of the heart.

It is already known that zero gravity causes a shift of body fluids from the lower to the upper body. It is speculated that this shift might raise the central blood pressure and increase the filling of the heart. But what will really happen is unknown because CVP has never before been measured directly in zero gravity. The variety of medical questions which may be answered by direct measurement of blood movement may provide new insights about how cardiovascular control mechanisms work and about diseases which affect the heart's ability to pump adequately.

Langley's Richard E. Campbell (second from left) assists Dr. J. Buckey, University of Texas, in fitting astronaut Jim Bagian, M.D., with the venous pressure measurement equipment. Campbell is currently serving as project manager for the development of a tunable solid-state laser system for use in the LIDAR Atmospheric Sensing Experiment.

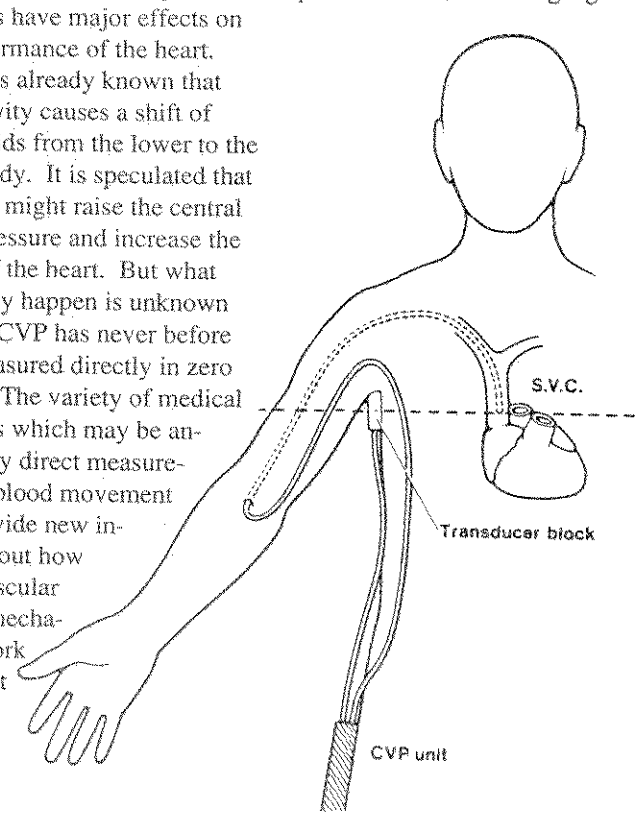
NASA's specifications for this measurement capability were strenuous. In addition to being highly accurate, the instrument was required to be sensitive enough to detect very small shifts in pressure, since even these changes could be physiologically significant. Since it was required that CVP be measured continuously from shortly before launch until about 20 hours into the mission, the instrument had to be portable, small, self-contained and not restrict mobility. It should also require little crew operation and maintenance effort, and be able to provide a digital display of pressures with an analog signal for use with standard recorders. Finally, the device must pass stringent NASA tests involving shock, temperature, vibration, electrical hazard and toxic fumes.

The design which Campbell, Goble and other EDL engineers developed, provides for direct connection of measurement hardware with the venus system of the astronaut. This is done by inserting a catheter through the arm directly into the central vein which returns blood from the head and upper portion of the body (superior vena cava) to the heart. The catheter tube leads to a transducer which converts the difference between blood pressure and cabin pressure to an electrical signal that is connected to the CVP electronics module. The signal is then amplified and sent to an analog-to-digital converter where the digital readout is provided. A sensor triggers an alarm when the pressure exceeds a pre-established limit.

The electronics module and its transducer are powered by a single nine-volt battery which provides 28 hours of measurement capability. A separate battery drives a specially developed fluid pump that supplies saline solution to the catheter to prevent the clotting action of the blood from closing the tube during operation. The instrument is worn in a pocket on the outside of the flight suit and is connected to the transducer and catheter assemblies through a pressure port within the pocket. This port allows the astronaut to remove his flight suit after reaching orbit without interrupting operation of the CVP monitor. Astronaut Drew Gaffney, M.D., wore the system during the SLS-1 mission.

Spacelab is an international resource for scientific investigations in space. Built by the European Space Agency for NASA, it is mounted in the Shuttle's payload bay. For the SLS-1 mission, the long module version was used which is a little over 23 feet long and nearly 17 feet wide. It is a pressurized cylindrical module that is connected to the airlock in the orbiter's middeck by a tunnel. The inside of Spacelab is arranged with two long racks of scientific apparatus and support equipment that stretch along the walls on either side.

A total of ten experiments explored the limits and capabilities of the human body in space; each using STS-40 crew members as subjects. In addition to the venus pressure experiment, for which the University of Texas was under contract to NASA for the conceptual phase, EDL designed and built two other bio-medical experiments for SLS-1. They were a device to characterize cardiac baroreflex response and a means to accurately measure limb circumference during constriction of veins in flight.



This diagram shows how the venous pressure measurement system is arrayed on the body.

Truly Lauds House Vote to Save Space Station

NASA Administrator Richard H. Truly expressed appreciation for Space Station Freedom supporters in the U. S. House of Representatives who beat back an attempt to kill the space station.

"The totally bipartisan vote in the House of Representatives to continue development of Space Station Freedom was a big victory for all America," said Truly. "It was a vote to remain the leader in space exploration, to inspire and challenge our young people to do better, to reassert our technological leadership, to make an investment in America's future, and set the stage for discovery and breakthroughs in medicine, materials, transportation and energy."

The House Appropriations Committee has passed a funding bill that would have taken the $2 billion targeted for Freedom by the administration and given it to science, housing and the veteran's care program. On June 6, the House voted by a 240-173 margin to fund Freedom for fiscal year 1992.

"I am confident that Freedom will win support in the Senate," Truly continued. "Much work remains to be done to provide a final FY 1992 budget for NASA that is well balanced between science, manned space flight and exploration, aeronautical research, earth observation and technology development. I remain committed to work toward that end."

Ever wonder what disabled kids do while other children are playing baseball? Are kids that cannot walk, talk or see destined to serve as ceremonial mascots? "Not a chance," says Langley's Ross Phillips, (right) test manager for flight hardware in the Mechanical Systems Section. Thanks to his determination and compassion, these kids are suiting up, and they are playing baseball! For the story, see page 3.

News Briefs

New Transport Vehicle Allows More Timely Orbiter Egress --- A new transport vehicle, designed to improve egress for Shuttle crewmembers after space flight, was introduced to the landing operations when the STS-40 crew returned from their nine-day flight. The new Crew Transport Vehicle (CTV) joins the landing convoy to permit safer, more efficient crew egress and will facilitate medical investigations that take place immediately after landing. The CTV is a renovated "people mover" acquired from the Baltimore-Washington International Airport earlier this year.

Planet-Altering Impacts Revise Theory on Origin of Life --- A revised theory of the origin of life on Earth has been developed from new findings by NASA about the frequency and sizes of colossal impacts on the planet. The work proposes that life may have begun more than once. It suggests that ancient organisms, much like those still found in the deep oceans, may be ancestors of all life on Earth. NASA scientists and other researchers say that life may have begun and then been completely wiped out several times by very rare, planet-melting super impacts on the Earth. Without these super-impacts, life could have begun in the time periods between the more frequent, medium-sized impacts through an origin-of-life process on the Earth's surface. Scientists have come to these conclusions by using the Apollo data, which shows the history of impacts on the moon.

Astronaut Lounge to Leave NASA --- Astronaut John M. "Mike" Lounge left NASA June 21 to become director of Houston Operations for SPACEHAB, Inc. SPACEHAB is providing a pressurized module to be flown in the orbiter's payload bay beginning in late 1992 to augment NASA's ability to carry middeck experiments. Lounge is currently chief of the Space Station Support Office in the Flight Crew Operations Directorate, dealing with Space Station design and operation. Hired by Johnson Space Center in 1978 as an engineer, he was selected as an astronaut candidate in 1980 and has flown three missions.

NASA Scientists Discover Metal Asteroid Near Earth --- A team of radar astronomers who have been observing asteroids from the giant Arecibo radar/radio telescope in Puerto Rico have identified a near-Earth metal asteroid for the first time. Orbiting the Sun from just beyond Earth to just inside Jupiter's orbit every 4.7 years, the 1.6-mile-wide object called 1986 DA shows a radar brightness far greater than any of the five dozen asteroids observed before or since. This supports the hypothesis that it is a large lump of iron, nickel and other metals.

GRO Spacecraft Grabs First Target of Opportunity --- NASA's Gamma Ray Observatory (GRO) was maneuvered June 7 to point at its first scientific target of opportunity, the Sun. The 17-ton observatory was repositioned by controllers at the Goddard Space Flight Center, Greenbelt, Md., to gather data from two X-class solar flares that occurred on June 7 and 10. While much is known about the composition and magnitude of solar flares, surprisingly little is known about the thermonuclear processes of these dynamic solar phenomena. The repositioning of GRO demonstrates not only the flexibility of the spacecraft, but also the efficiency of the planned target of opportunity program, which allows the scientific community to position spacecraft toward significant celestial events that cannot be predicted.

Full-Scale Aircraft Tested in World's Largest Wind Tunnel --- Tests are underway on an F/A-18 fighter aircraft in the 80- by 120-foot wind tunnel at NASA Ames, Moffett Field, Calif., making it the first full-scale aircraft to face the winds in the world's largest wind tunnel. The 135,000-horsepower motors that turn the tunnel's six fan drives roared to life beginning a series of investigations designed, among other things, to understand how a modern fighter like the F/A-18 performs at high angles of attack, or "high alpha." The tests are scheduled to run 12 weeks, with a second entry planned next year. The wind tunnel tests are part of NASA's High Alpha Technology Program, a cooperative research program at Ames, Langley and Lewis Research Centers.

Editor's note: Copies of Headquarters News Releases summarized above are available by contacting Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request materials by headline printed in bold.

Call for Papers

The International Symposium on Magnetic Suspension Technology will be held August 19-23 in the H.J.E. Reid Conference Center, 14 Ames Road. One-page abstracts of proposed presentations are requested. For registration information, contact Emily Kornegay, administrative chairman, ext. 46606.

A Reminder

Foreign Visits Governed by NASA Policy

Requests for visits to Langley Research Center by foreign nationals must be channeled through the respective country's embassy in Washington D. C. A foreign national is any person who is not a citizen of or an immigrant to the United States.

Foreign embassies coordinate all visit requests with the International Relations Division, NASA Headquarters. A minimum of six weeks is recommended to facilitate this coordination.

All visit requests should include the name and position of the visitor; dates of visit; visitor's area of technical expertise; subject mattter to be discussed; agency affiliation; buildings to be visited and a justification statement.

Each visit request should be followed with a supporting statement from a NASA employee, with Center management concurrence, citing the expected value to the NASA program. A copy of this letter should be submitted to Langley's Security Services Branch, Mail Stop 182.

The Center Director is the approving official for all requests for visits of nationals from the U.S.S.R., China and designated areas before NASA employees extend an invitation to the foreign national. While at the Center, NASA employees must ensure the visitor wears and prominently displays the appropriate NASA identification badge.

In the case of visits from foreign nationals of countries mentioned above, a complete report of the visit on Langley Form 109 must be submitted to the International Relations Division at Headquarters within 15 working days after the visit. For additional information, refer to NASA Management Instruction (NMI) 1371.3A and 1371.4 or contact the Security Services Branch, ext. 43420.

Job Opening

The following position is open to NASA-wide employees presently serving under permanent civil service appointments:

91-39: Supervisory Employee Development Specialist, GM-235-14, Human Resources Management Division. Will serve as Training Officer and head, Employee Development Branch. Closes July 8.

In Memoriam

Sympathy is extended to the family of **Sara L. Watkins**, who died May 23. Watkins retired in 1977 as a staffing clerk in Personnel Records.

CELEBRATE AN AMERICAN TRADITION
50 YEARS OF
U.S. SAVINGS BONDS

GWU Announces Masters Program

The George Washington (GW) University's School of Engineering and Applied Science at NASA Langley Research Center plans to offer a new set of courses leading to the Master of Engineering Management degree beginning in the Fall Semester 1991. Interviews at NASA Langley will be arranged for Thursday, August 15, and Friday, August 16. Those interested in entering the program or who may desire further information on the GW programs, call the GW-NASA Office at 864-1982.

Lankley

Lankley interfaces with his computer

Deadline-Distribution Dates

For your convenience, **Reseacher News** deadline and distribution dates for the second half of 1991 are listed below. Please clip and save.

Deadline	Distribution Date
July 1*	July 12
July 16	July 26
July 30	August 9
August 13	August 23
August 27	September 6
September 10	September 20
September 24	October 4
October 8	October 18
October 23	November 1
November 5	November 15
November 18*	November 29
December 4**	December 13

*Monday deadlines due to July 4 and Thanksgiving holidays.

December 13 is the last **Researcher News issue of the year. Please note the December 4 deadline when making holiday plans.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Beyond limitations

Langley Manager Feels Every Kid Deserves the Chance to 'Play Ball'

-by Kristina Murden

A Little League Baseball task force led by U.S. Senator Robert Dole spearheaded the formation of the Little League Baseball Challenger Division for disabled boys and girls in 1990. This division is structured for children with a wide range of disabilities.

The Challenger program spread across the nation. Langley's Ross Phillips, a Little League advocate, brought it home. In September, he distributed information to every school in the area. At first, his efforts generated little interest, but he was persistent. He wanted these kids to play ball. It took seven months of hard work but, thanks to Phillips, children who had only dreamed about--and some who had never even heard of baseball--are now sliding and rolling across home plate, pitching, stealing bases, and cheering each other.

"The Challenger Program has changed the lives of both the children and their families," said Phillips. "It has little do do with teaching kids about baseball, though. The value is found in the proven therapeutic and social benefits of participating in sports--the strengthening of the player's self esteem, the opportunities to mainstream into other divisions of play, and the disciplines of teamwork, citizenship and fair play, which are the hallmarks of the Little League program."

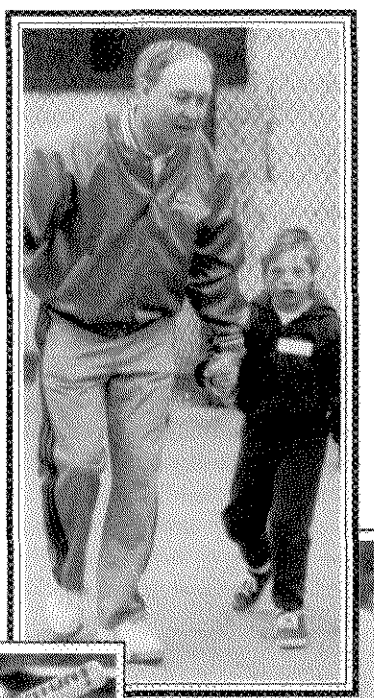
Challenger games are emotionally charged events. Local games begin when little Chris, who has Down's Syndrome, runs up to Phillips in the press box. A hush covers the field as if on cue, the kids--many in wheelchairs--line up at the edge of the baseball diamond, hold their caps over their hearts, and listen attentively to Chris recite the Pledge of Allegiance. Next he commands "Play ball!" and everyone who can, cheers.

The emphasis for these kids is not on winning, but on fun. Over the loudspeaker, Phillips highlights each child at bat by noting a nickname and offering words of encouragement that makes each one feel like a star.

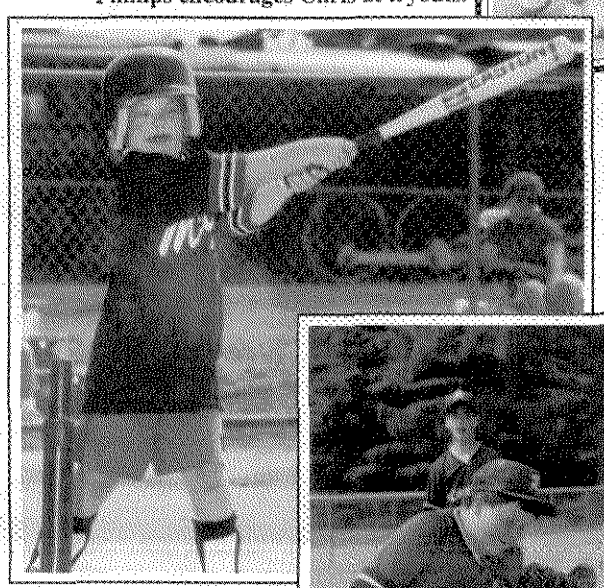
Umpire Steve Woss says that Phillips "makes the game," with his colorful, play-by-play description of action on the field. Whether it's "Jason slugs another one," or "another man down on the field," laughter and excitement abound for the kids, parents, and "buddies."

Under Challenger rules, each inning lasts until every team member gets a chance at bat. Each player plays defensively for at least half of every game, and has a buddy who plays with him or her to assist in the outfield or at bat. The buddy system affords many parents and siblings a unique opportunity to play baseball with the kids. Kiki, who cannot walk, and her sister and "buddy" get so excited rolling around the bases that Kiki had to have a seatbelt installed in her wheelchair so she wouldn't laugh herself right out of it.

According to Phillips, the games are difficult to describe. "You've got to see these kids actually playing baseball to appreciate the magnitude of their accomplishments." And he is right.

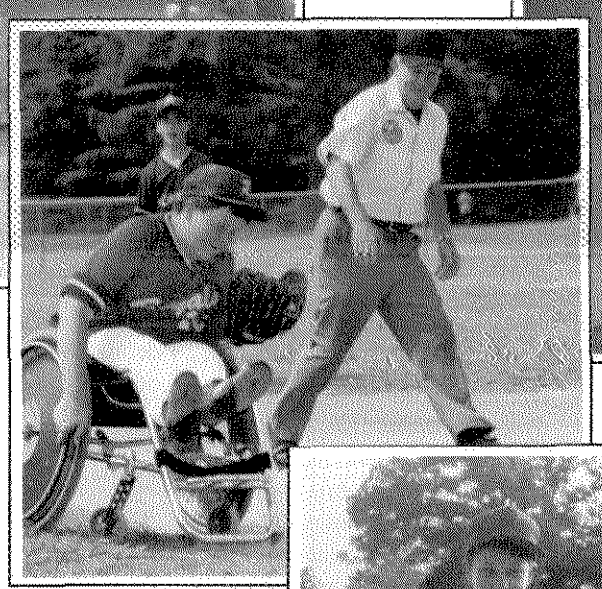


Phillips encourages Chris at tryouts.

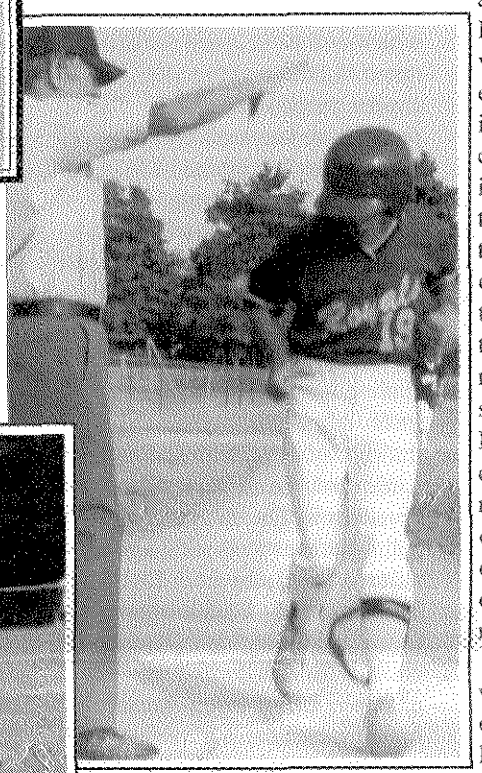


Chris is up at bat; the hit is good.

Play Ball!



Russell is poised to scoop up the grounder.



Craig Marshall is safe at home!

Jason Fishman is ready at third base.

There have been many "firsts" for these children since baseball has become a part of their lives. Doug's mother Kathy wept as she watched her son run around the bases at his first game. At age 16, he was running in public for the first time and smiling the whole way.

"Craig has learned how to slide and does it every chance he gets," said dad Vernon Marshall, a designer in Langley's Systems Engineering Division. "My son Craig has always been around baseball and it's great that he is finally playing. He even shows up early for practice to help the other kids." Craig has also participated in Special Olympics track, basketball and soccer.

Eleven year-old Robbie Perry cannot walk, can barely move his arms and cannot speak. But when he has his uniform on, he and his buddy hit the ball, steal bases, and are cheered across homeplate. An unprecedented accomplishment for him, Robbie even reaches up to adjust the bill of his Mets cap like the others when he goes up to bat.

The buddies make it possible for children like Robbie to play baseball. They stand behind wheelchairs, place the player's hands on the bat, swing, and push the players around the bases. In the outfield, the buddies help stop grounders for the kids to throw.

When Chris plays first base he greets all of his "opponents" with a handshake or a big hug. Everyone celebrates when a hit is made, and no one cries when there is an out, they are too busy encouraging the next batter. "These kids are good for each other," said Phillips. "It's gratifying to see kids so happy. Take a look at little Jimmy Melchionna, who will never grow. He is pitching a baseball and loving every minute of it.

Some kids, like Russell, do just fine on their own. Born without kneecaps, he has played sports, including basketball and baseball for most of his life. His dad is his buddy and plays alongside him.

Parents have seen changes in their children both socially and physically after just three weeks of playing baseball. A few children have made their first friends. Stephen Dudley and Kyle Richardson were introverted, untrusting and had no interest in making friends.

Since they have been teammates, Stephen and Kyle chat on the phone and make plans to sleep over. They are even going to spend a week away from home together at a Muscular Distrophy camp. Two other kids have improved so much that they will be playing on a standard Little League team next year. "To feel the full impact of the progress that's been made, you had to have been there since that first day at tryouts," said Phillips.

Many of the parents have become friends through this program. According to Phillips, they share their feelings and offer each other support. They compare notes. "The parents are very happy," said Phillips. "They think it's the best thing that has ever happened." Where else could these children experience such excitement and camaraderie?

Langley's Dr. Jack Fishman, senior research scientist in the Atmospheric Sciences Division, has two sons that play for the Royals. Jason, 11, and David, 14, play alongside buddies dad and sister Melissa. "This program is just wonderful for the kids," said Fishman. "Ross has put a tremendous amount of time and energy into making the games possible. In my opinion, he is the star."

Phillips has a special relationship with each of the 30 kids who make up the Mets and the Royals. He always has a special story about each one as they go to bat. The kids that can, turn to him in the press box to make sure he is watching. And he is. "The kids and their parents are the stars here," Phillips insists.

"These are honest, true, and open children," said Phillips, " but they are very vulnerable." It is a very big event for them when the game is over and they head for the coolers for their Pepsis. This is when they visit. Many of them have never experienced this type of interaction with other children before. "After these kids play ball together, they develop a bond and feel more comfortable about socializing," said Phillips. Baseball has become a confidence builder for them, and made them more fully aware of what they can do physically. A whole new world is open to many of them as a result of baseball.

The youngsters play with the same equipment and on the same fields as other Little League teams. Each player receives a participation award at the end of the season. In addition, there are the coveted team pictures and buttons for the parents. "These are other ways to heighten the child's self esteem," said Phillips.

The Challenger Division, launched with five pilot programs last spring, now boasts 317 leagues in 34 states, involving an estimated 10,000 disabled children. There are 30 players in District 7, of which Phillips is the administrator, a position he has held for the past five years. The two teams play twice a week at Huntington Park in Newport News. The kids are from Newport News, Hampton, Williamsburg, and the counties of York, James City, Gloucester, Mathews, Middlesex, Lancaster and Northumberland.

Baseball is an American legend. Ross Phillips is a local legend--particularly in the eyes of the Mets and the Royals.

Everybody wins! says Jimmy. That's true for more than just this baseball game.

Langley's Long Duration Exposure Facility Reveals a Harvest of Space Sc

Scientists are probing the wealth of information on radiation, atomic oxygen, meteoroids, contamination, materials and space systems obtained from the 69-month-long space sojourn of Langley's Long Duration Exposure Facility (LDEF). This harvest of space science, invaluable in solving the mysteries of space and in designing future spacecraft, was aired recently at the First LDEF Post-Retrieval Symposium in Kissimmee, Fla.

LDEF, a Langley-built spacecraft, is a space system designed to study and understand the effects of the space environment. NASA has never before had the opportunity to retrieve a spacecraft that had been exposed to space for so long a period and then return it to Earth for extensive laboratory analyses.

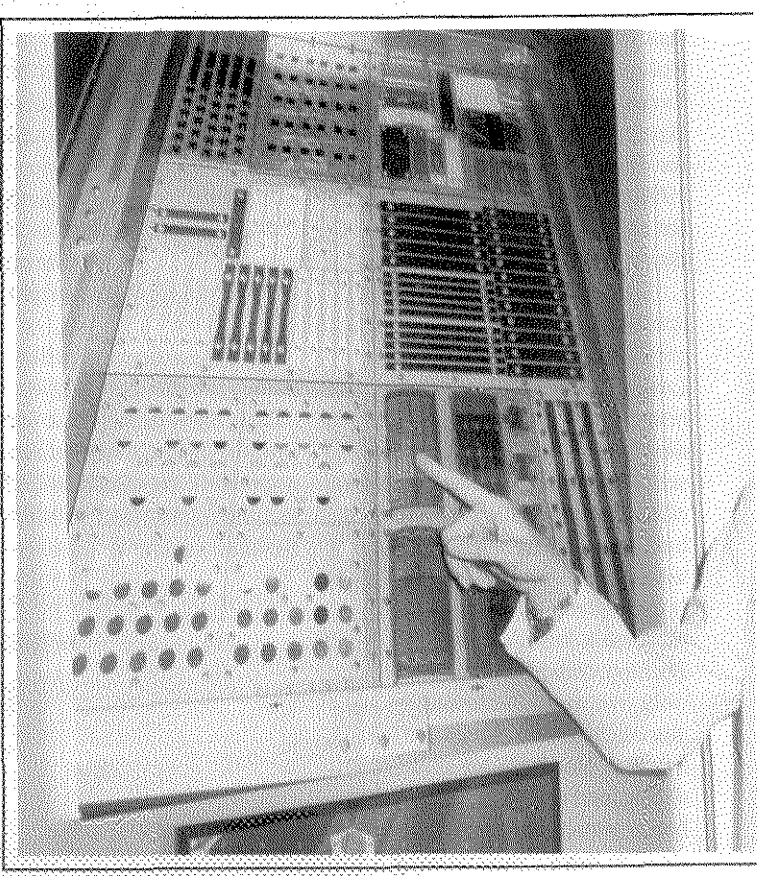
The variety of experiments flying together on the LDEF had great influences on each other. LDEF connects them all to form a family of space science applications. This mutually complimentary feature fostered the interaction among team members and made the LDEF mission so challenging to the investigators and members of the special investigation groups and the data analysis teams.

"It's imperative that these investigators in highly specialized disciplines come together to integrate, synthesize and disseminate this information into the community to see just what did happen to LDEF, the space system, and why," said Sally Little, liaison between the LDEF Science Office and the Space Station Freedom community at NASA Headquarters, Washington, D.C. "That's what the symposium was all about. We must translate this scientific information into terms that people in other disciplines can understand. In order for us to know how the electronics survived, for example, we have to understand radiation and its effects."

Little explained that some of the LDEF investigators are also Space Station Freedom principal investigators and designers who are seeking information that can be used in the design of Freedom or, perhaps the Earth Observing System, which will be in space for a long time. "LDEF and Freedom have similar purposes in terms of research and technology advancements," explained Little. "They are long duration exposure facilities; they are international; and they have certainly undergone trials and tribulations of a project.

"One very important finding from LDEF is how incredibly stable it remained during its 5.9 years in space," Little said. "And, Space Station Freedom will be designed to remain stable as well, although its altitude will differ from LDEF. That information alone allows us to feel more confident in making choices for Freedom. For example, LDEF brings home how important it is to protect the leading surfaces of a space system. We are using that information to help us determine how much shielding we need against the debris environment. We are confident now, however, that we do not need as much meteoroid and debris shielding on the trailing side of Freedom. We can save weight, reduce the maintenance requirements and ultimately save money--a direct result of the LDEF experience."

Dr. William Kinard, head of the LDEF Science Office, said that one meteoroid experiment on LDEF recorded the direction and precise time of more than 15,000 impact events. Future analyses of these data will provide clues to the origin and evolution of both natural meteoroid and man-made debris. Detailed chemical analysis of the residues of the impacting particles that are left in the craters will be studied for other clues to the origin of the particles. Kinard said that exobiologists will attempt to identify the molecular chemistry of the impactor residues looking for evidence of chemistry in space that may have led to the evolution of life.



Sallie Little, liaison between the LDEF Science Office and Space Station Fr
Deputy Administrator J. R. Thompson examine the pre-flight photograph
Space Flight Center Solar Array Materials Passive LDEF Experiment.

The inset shows how the Kapton covers have e
the solar cell arrays became loose during the s

Some Early Scientific Findings . . .

Several "firsts" have been achieved in the analysis of the LDEF data. These include the detection of beta meteoroids, which are small particles affected by solar radiation and accelerated from the direction of the sun, as well as successful real-time monitoring of the dynamics of the meteoroid and debris environment, including identification of debris clouds from the Space Shuttle and apparently from other launch vehicles. Tom See, a principal investigator for meteoroid and orbital debris, said, "Several investigators reported the detection of debris impacts on the trailing edge of the LDEF, showing for the first time that debris particles exist in elliptical orbits."

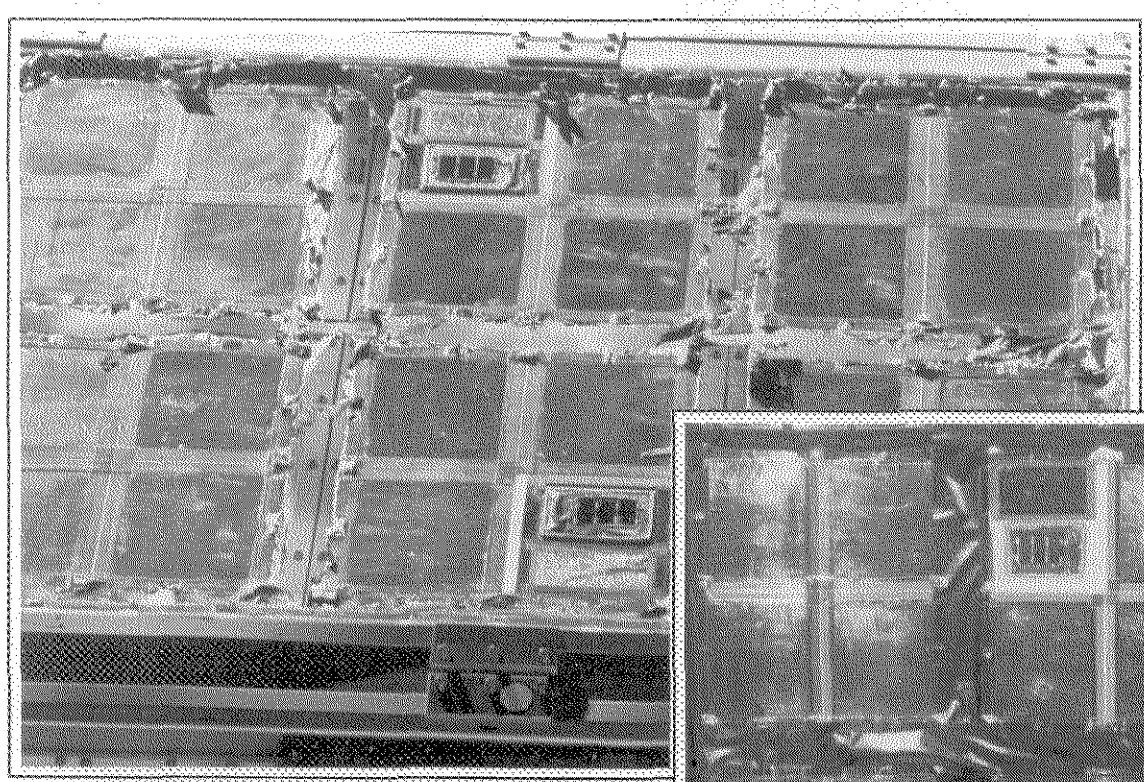
LDEF scientists found that white polyurethane paint on LDEF darkened dramatically after ultraviolet exposure. In some cases, the atomic oxygen continually eroded away paint on the leading surfaces before they could darken and these surfaces still looked freshly painted. Many of the polymers which were exposed on the leading surfaces of LDEF were eroded and some Kapton thermal blankets completely eroded away from their experiments.

Effects observed on the silvered Teflon adhesive-backed thermal blankets include erosion due to atomic oxygen, a decrease in mechanical properties due to ultraviolet irradiation, and darkening and delamination around impact sites. Cracking of the metallized layers in the blanket, caused by normal installation handling, resulted in ultraviolet exposure and subsequent darkening of the underlying acrylic adhesive.

NASA is looking at a fiberglass material called beta cloth, which is used in the Space Shuttle payload bay and on the Hubble Space Telescope, as a candidate for thermal control for Freedom. Beta cloth, which flew on several NASA Marshall experiments on LDEF, was extremely dependable, according to the investigators.

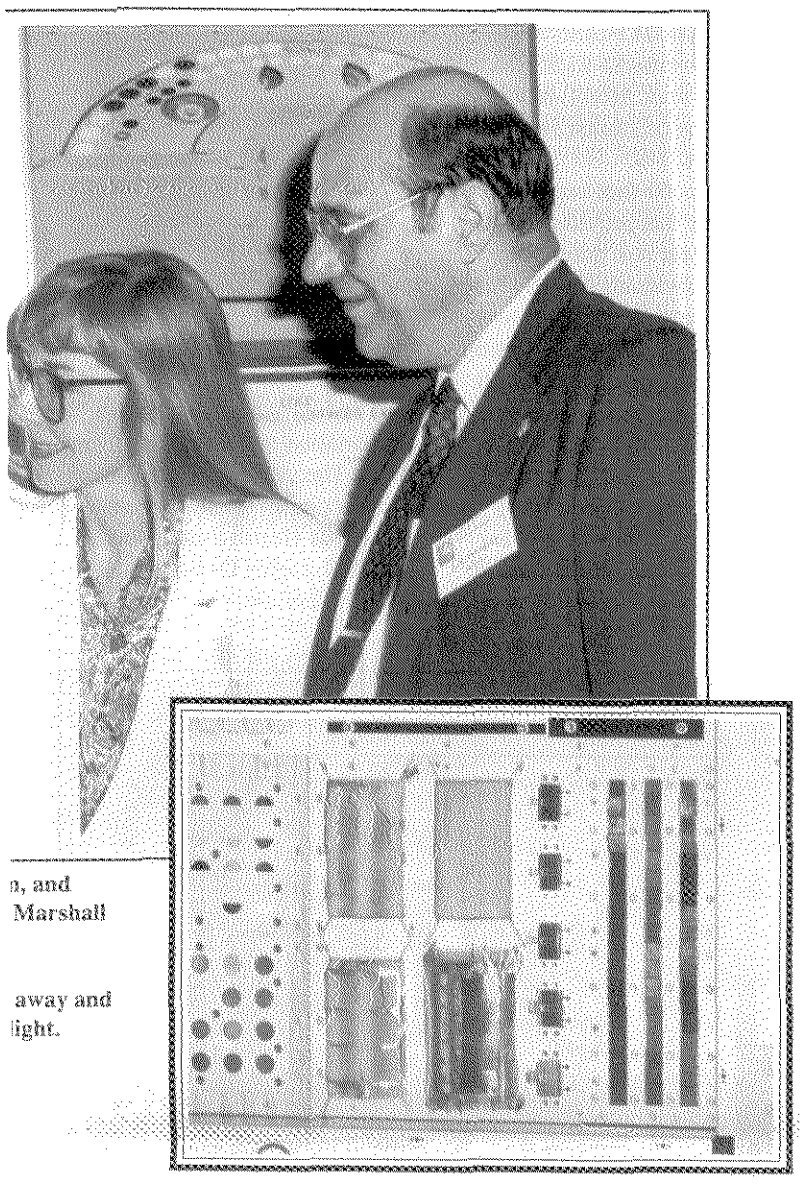
Kinard said that the binders and the fibers of many composite material specimens on LDEF were also eroded severely. "On the other hand, a number of materials were found to be unaffected by atomic oxygen impingement, for example, silicones and anodized aluminum," he explained.

LDEF radiation investigators have gathered a large body of data on induced radioactivity in spacecraft and experiment samples, such as aluminum, stainless steel, titanium, lead, copper, and nickel. Tom Parnell, chairman of the radiation special investigation group from Marshall Space Flight Center, said, "This provides a data base of considerable interest to gamma ray astronomers, whose experiments are usually limited by background. It also provides a benchmark for calculation methods and environment models. Data of this scope and quality will not be available



The High Voltage Drainage Experiment from TRW shows a tray on the leadding edge and one on the trailing edge of LDEF. The leading edge (above) reveals polymer films which have been eroded awary by atomic oxygen. The trailing edge (right) is undamaged after nearly six years in Earth orbit.

nce -by Jean Drummond Clough



n, and
Marshall

away and
light.

again from any currently scheduled mission."

Members of the radiation team also found radioactive beryllium-7 on the leading surface of the LDEF in all materials examined, but none on the trailing surfaces, according to Parnell. Beryllium-7 is known to be produced by cosmic ray bombardment of the atmosphere. This is the first known evidence for accumulation of a radioactive isotope onto an orbiting spacecraft. "Its concentration on the LDEF is small but is about 1000 times the quantity that can be explained by simple atmospheric diffusion," Parnell said.

No radiation effects have been observed in LDEF surface materials. However, possible radiation effects were reported in uncovered solar cells, electronics and quartz crystal resonators. The effects of directional properties of trapped protons were clearly observed in aluminum tray clamps and stainless steel trunnion layers. "These data will provide a high precision test of new directional models of trapped protons," Parnell explained. "Due to LDEF's long exposure and stability, the data base is unique and important for planning radiation shielding for future space systems."

Three experiments on the LDEF were designed to measure rare particles in low energy and ultra heavy cosmic rays. These experiments showed results indicating good detector sensitivity and resolution. The LDEF measurements are six times more sensitive than any previous measurements.

The LDEF had several life sciences experiments on board. Kinard said that initial tests have established that most of the living specimens remained alive after their journey in space. The space-flown shrimp had shortened life spans and a few genetic mutations were evident, such as shortened extremities and the growth of a second abdomen. Mutations were also obvious in some plant material. "The mutations mostly affected the leaves and blossoms," said Dr. Jim Alston of the Park Seed Company, Greenwood, S.C. "Some plants developed variegated leaves and flower buds. In these plants, some leaf parts were a normal green; others were white, totally lacking in chlorophyll.

The life science experiment that probably received the most attention was the SEEDS (Space Exposed Experiment Developed for Students) experiment, which involved distributing 12.5 million tomato seeds to over 3.5 million students. Reports showed that space-flown seeds had slightly higher germination rates than unflown seeds. This may indicate that space can be used to store seed material in the future. "The stimulus, however, that this experiment has provided to student interest in science may prove to be the most important contribution," Kinard said.

Revelations in Hardware and Materials . . .

Tests have been performed on a mix of LDEF and individual experimenter systems. Very few electrical or mechanical system failures, attributed to the spaceflight environment, have been detected. Some low-cost electrical components were used successfully, although relays were a continuing problem. The tape recorders on board functioned well, and the data tapes played with no loss of stored information. Mechanical galling has been observed, unexpectedly, but no evidence of cold welding has been identified. Cold welding is the solid state metallic bonding between atoms on opposing surfaces. Kinard said that the components and systems flown on the LDEF have given designers added confidence that they can design future spacecraft and instruments to function reliably for many years in space.

Bruce Banks, tasked with finding the appropriate protective coating for Freedom's solar arrays, said, "We have looked at various silicones, such as the SiOx coating and silicone-filled Kapton, and conventional Kapton that could be used on the solar arrays. We think that the SiOx coating on either side of two sheets of polyimide Kapton will be sufficient to withstand the atomic oxygen influence on the solar arrays." Banks, who is an LDEF principal investigator from the NASA Lewis Research Center, Cleveland, Ohio, explained that the two sheets are clad together with fiberglass netting and silicon, producing a sandwich effect. This coating should meet the 15-year materials requirement for Freedom.

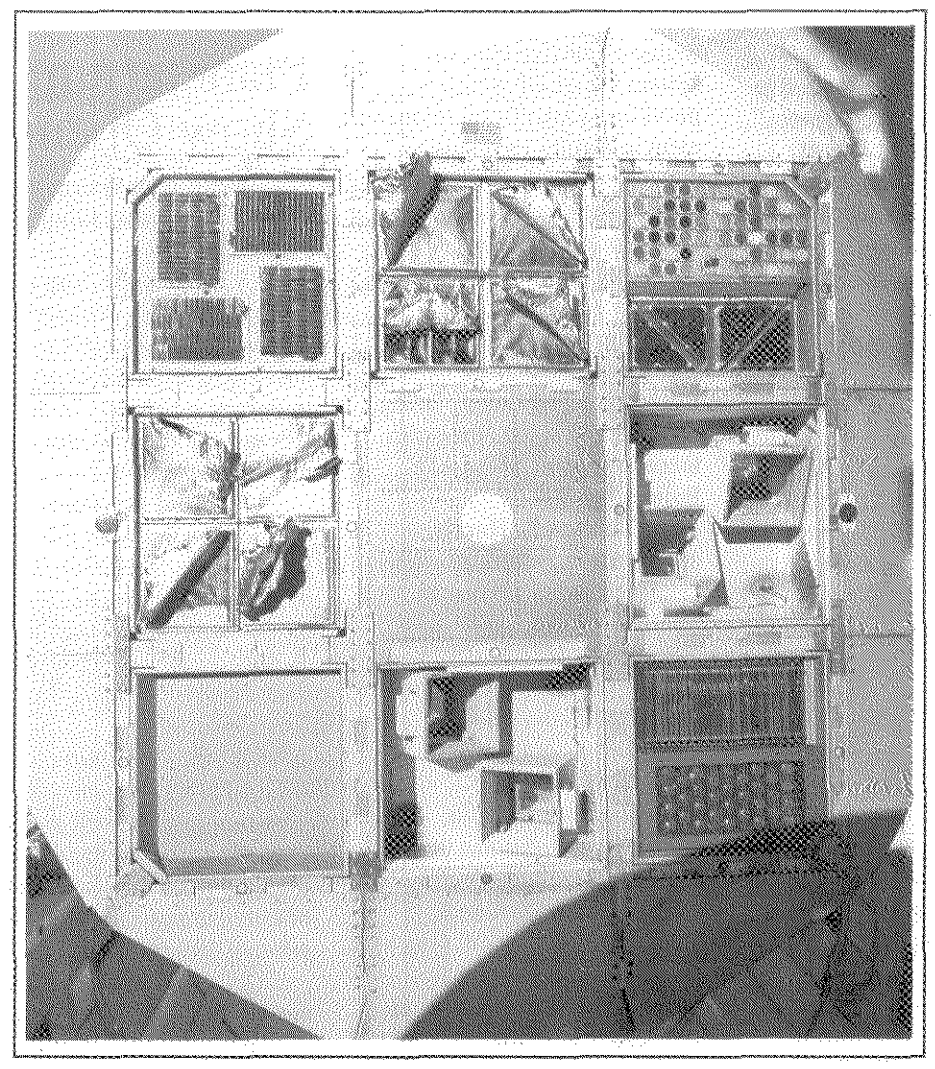
Investigators are looking at the integrity of LDEF systems data and preliminary results to compare different coatings available to protect the radiators on Freedom. Banks said that one such coating, a black paint called Z-93, held up very well on the Marshall Space Flight Center experiments. Its aerial density is lower; it is significantly lighter; it is a high-performance, durable coating; it has good, long-term performance properties; and it showed little darkening.

Z-93 has a good track record. It flew on Apollo and Skylab, and investigators have reasonable confidence in it. "We realize that you can reduce the amount of power needed on Freedom and save considerable weight--1200 pounds if compared to Teflon-- on the radiator surfaces with Z-93. You would need a fairly thick coating of silver Teflon on the radiators to have them survive for 15 years," Banks said. "Z-93 is now considered the baseline candidate on the restructured Space Station Freedom."

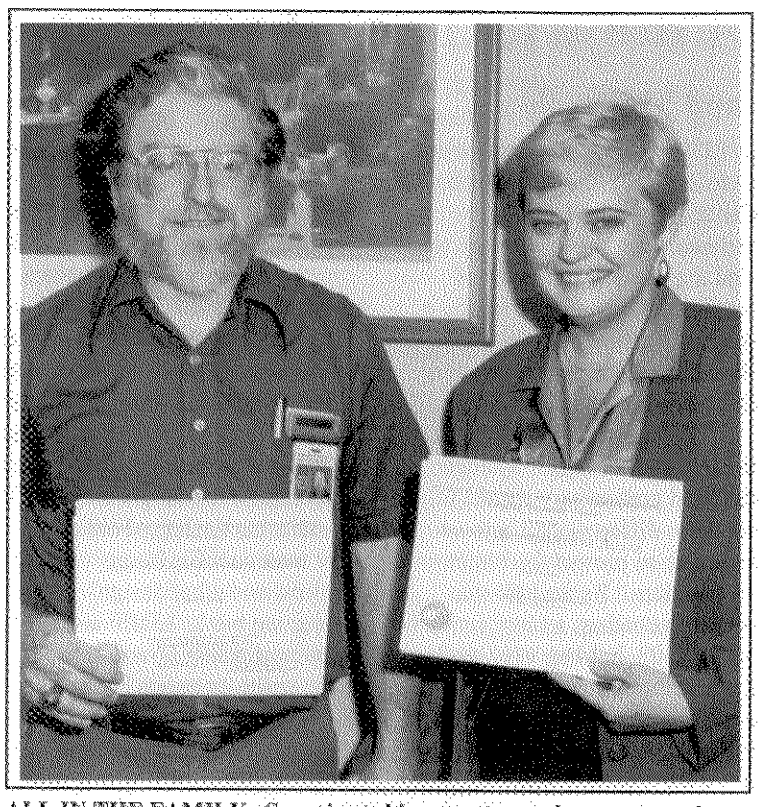
In conclusion . . .

"It's so important to have a mission like LDEF," Little said. "With ground-test or laboratory measurements, we favored Teflon. Flight-test data have turned us to Z-93. LDEF is allowing us to extrapolate data and compare it with ground data to determine the life of many other materials for future missions and what design choices we have. LDEF is definitely confirming how detrimental the space environment can be. A seven-day Space Shuttle mission is one thing; a six-year LDEF mission is something else. We have to translate the flight and ground data into 30 years of life for Freedom."

The LDEF mission will contribute to building the right space infrastructure. It's up to the science community to help develop the technology needed to build the long-lasting space systems, such as Freedom or Earth Observing System, so that space exploration can continue and the mysteries of space can be solved.



The space end of LDEF shows the painted Mylar thermal blankets curled back due to shrinkage from moisture in the material in the Heavy Ions Experiment (top center and left center) from the Naval Research Laboratory. Areas of contamination on the Interstellar Gas Experiment from the University of Utah are revealed on two panels (right center and bottom center).



ALL IN THE FAMILY. Superior achievement awards were recently presented to John R. Gleason, engineering technician in the Laboratories Operations Branch and his wife Grace A. Gleason, engineering technician in the Tunnels Operations Branch. Congratulations to this dynamic Langley team.

Employees Recognized for Superior Achievement

Sharon V. Jones, secretary, has been presented a superior accomplishment award "for outstanding secretarial support to the Unsteady Aerodynamics Branch program."

Jessica A. Woods, research engineer in the Aeroservoelasticity Branch, has been recognized "for outstanding performance in designing, analyzing, simulating and successfully testing rolling maneuver load alleviation systems in support of the active flexible wing wind tunnel test."

Dr. Kenny B. Elliott, research engineer in the Spacecraft Dynamics Branch, has been cited "for outstanding achievement in developing an interim large scale dynamic data acquisition and analysis capability for the Controls-Structures Interaction Ground Test Methods Research Program."

Granville L. Webb, facility manager in the Impact Dynamics Branch, has been rewarded "for outstanding management of the Aircraft Landing Dynamics Facility during simultaneous testing of the Surface Traction and Radial Tire Program and the Simulated Heavy Rain Program."

Jose A. Rivera Jr., aerospace engineer in the Configuration Aeroelasticity Branch, has been recognized "for outstanding leadership in testing of the Instrumented NACA 0012 PAPA Model in the Langley Transonic Dynamics Tunnel."

Bryan E. Dansberry, aerospace engineer in the Structural Dynamics Division, has been cited "for outstanding performance in the development of surface pressure measurement instrumentation methods for the Benchmark Models Program."

Gary L. Giles, aerospace engineer in the Interdisciplinary Research Office, has been rewarded "for outstanding innovativeness and leadership in the development of accelerated structural analysis methods for use in the optimization process."

Robert H. Daugherty, research engineer in the Landing and Impact Dynamics Branch, has been recognized "for outstanding performance in the design of the dynamic yaw system for ALDF which is providing a significant improvement in facility productivity."

Eleanor C. Wynne, acting technical assistant, has been cited "for outstanding administrative support to the Structural Dynamics Division."

Harry G. Walthall, engineering technician in the Electronics Technology Branch, has been rewarded "for excellence in support of the AFE Project."

Thomas E. Harris, apprentice engineering technician assigned to Technical Support Section C, has been recognized "for exceptional support to research activities conducted in the 1247 B Tunnel Complex and the 20-Inch Vertical Water Tunnel."

Roger D. Martin, engineering technician in the Metals Technology Section, has been cited "for outstanding support of the HALOE Gas Response Tests."

Stephanie J. Stockum, Resources and Contracts Branch secretary, has been recognized "for exceptional job performance and dedication to duty."

Golfers Make Tourney News

The NASA Golf Association announces individual winners in the Deer Run golf tournament held May 24. **J. Deaton** excelled with a low gross score of 82; **A. Grimes** and **C. W. Miller** tied with a low net score of 67.

The next NASA golf Association tournament is scheduled for Jordon Point on July 26. For more information, contact Tom Yager, ext. 41304.

Note of Thanks

Stu Flechner writes: "I appreciate everyone's well wishes and good thoughts. I'm feeling great and expect to be back at work soon. It's a good feeling to know you have so many friends."

Jim Penland writes: "My family and I wish to express our sincere appreciation for the many expressions of sympathy received in the form of letters, flowers and memorials following the recent death of my wife Byrd."

Addendum . . .

Peter J. Edgette, head of Occupational Health Services, writes: "**Billy Beasley** achieved the 12-gallon donation level for the Red Cross Blood Drive on May 22, 1991. Sorry, Billy, for the oversight. Congratulations."

Planetarium Show Opens

Is our solar system unique, or just one of many filling the vast universe?

Visitors to the Virginia Living Museum's Planetarium in Newport News may get some answers to this age-old question in the newest show, "To Worlds Beyond." The show runs daily through September 2.

Museum astronomy director Jon Bell says this is not just another planetarium show about the solar system. It is a far-reaching presentation of up-to-date science fact combined with some well-educated speculation.

As they ease back in the reclined seats of the theater, planetarium-goers will journey from the sunbaked surface of Mercury to the frozen wasteland of Pluto, to possible other worlds orbiting distant stars.

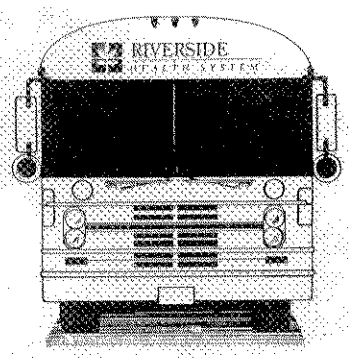
"To Worlds Beyond" is narrated by Patrick Stewart, Captain Jean-Luc Picard of television's "Star Trek: The Next Generation."

For information on cost and showing times, call 595-1900.

Health Corner

Mobile Cancer Unit Visits LaRC

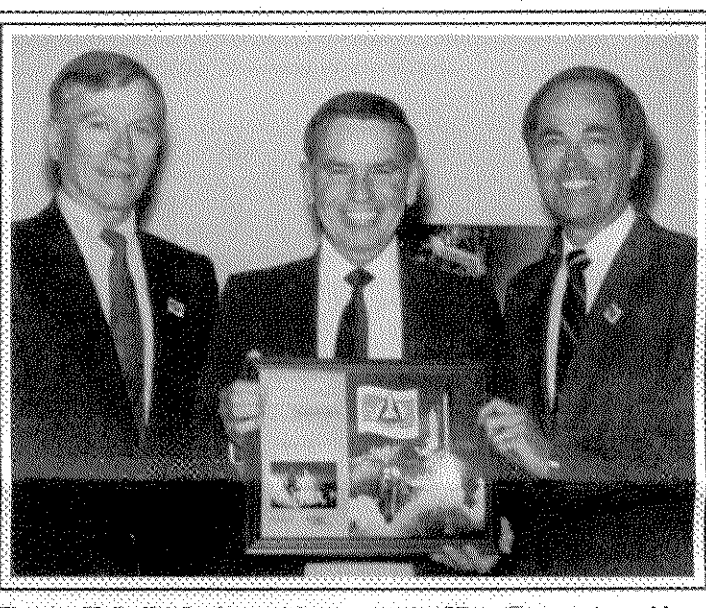
Riverside Health System's Cancer Awareness Risk Education Service (CARES) mobile unit will be on Center July 17-18 and August 7-8.



This 40-foot van houses computers that provide a personalized cancer risk questionnaire to help individuals identify their own cancer risk and learn ways to reduce these risks. A consultation with a registered nurse on board will further help participants recognize risk reduction and early detection actions.

This free service is available to all NASA employees, contractors, retirees and their family members. Please call 864-3191 for further information and an appointment.

The visit of the mobile unit is a cooperative endeavor of Riverside Health Systems and NASA Langley Occupational Health Services.



Thomas H. Leffel Jr. (center) is presented a Silver Snoopy Award by astronauts John Young and Robert Crippen. Leffel, Space Engineering Division, was cited "for exceptional service in the design, development, testing, flight preparations and post-flight system verification for the SILTS Space Shuttle experiment and for significant contributions as a member of the LDEF retrieval team. Leffel was on travel when eleven other Langley employees were honored.

Strides Made in NASA Challenge

Langley is making a good showing in NASA's Inter-Center Fitness Challenge. The challenge, based on the Presidential Sports Awards Program, has been issued to ensure that NASA employees are well represented in the increasing number of health-conscious individuals.

Intended to motivate adults to become more physically active throughout life and emphasize regular exercise rather than outstanding performance, the Langley Fitness Center challenge to you is to make a commitment to fitness through active and regular participation in sports and fitness activities.

The Fitness Center congratulates the following employees who have completed the requirements and earned an award in one or more categories:

Mac Jackson--Fitness Walking, Sports/Fitness, Jogging;
Steve Sudick--Running;
Patrick Minnis--Swimming;
Barton Bacon--Swimming;
Cathy Stafford--Sports/Fitness;
Edith Spritzer--Sports/Fitness;
Charles Dunton--Sports/Fitness;
Frances Meissner--Sports/Fitness, Fitness Walking;
Charles Bryant--Tennis;
Jag Singh--Fitness Walking;
Mark Motter--Bicycling;
Jim Thomas--Running.

Fitness Center personnel challenge all employees to meet or exceed the efforts of these employees. It's simple, it's fun and it's good for you and your body. Deadline for the competition is September 30.

For details about the NASA Inter-Center Challenge, contact Mary or Karen at the Fitness Center, ext. 46387.

People & Places

Everyone's a Winner

Bonds Awarded in Campaign

The 1991 U.S. Savings Bond campaign, the most successful in the past five years, came to a close with the drawing for the winners of two $100 savings bonds.

Winner in the new participant category was Tony L. Trexler of the Flight Applications Division. Trexler is among 66 new participants who signed up to purchase savings bonds through payroll deduction.

James Y. Taylor, Acquisition Division, won the bond for increasing his deduction. A total of 62 employees increased their payroll savings bond deduction amounts.

The bond giveaway was sponsored by the Langley Exchange Council.

50 YEARS OF U.S. SAVINGS BONDS

Holiday Warning

Fireworks Pose Serious Eye Hazards

Enough is enough, warns the National Society to Prevent Blindness. People who contact the Virginia Affiliate office about fireworks safety this Fourth of July are being advised not to use fireworks at all!

Rather than passing out advice on how to handle private or home use of fireworks, the society strongly recommends that the igniting, detonating and handling of these explosives be left to the professionals.

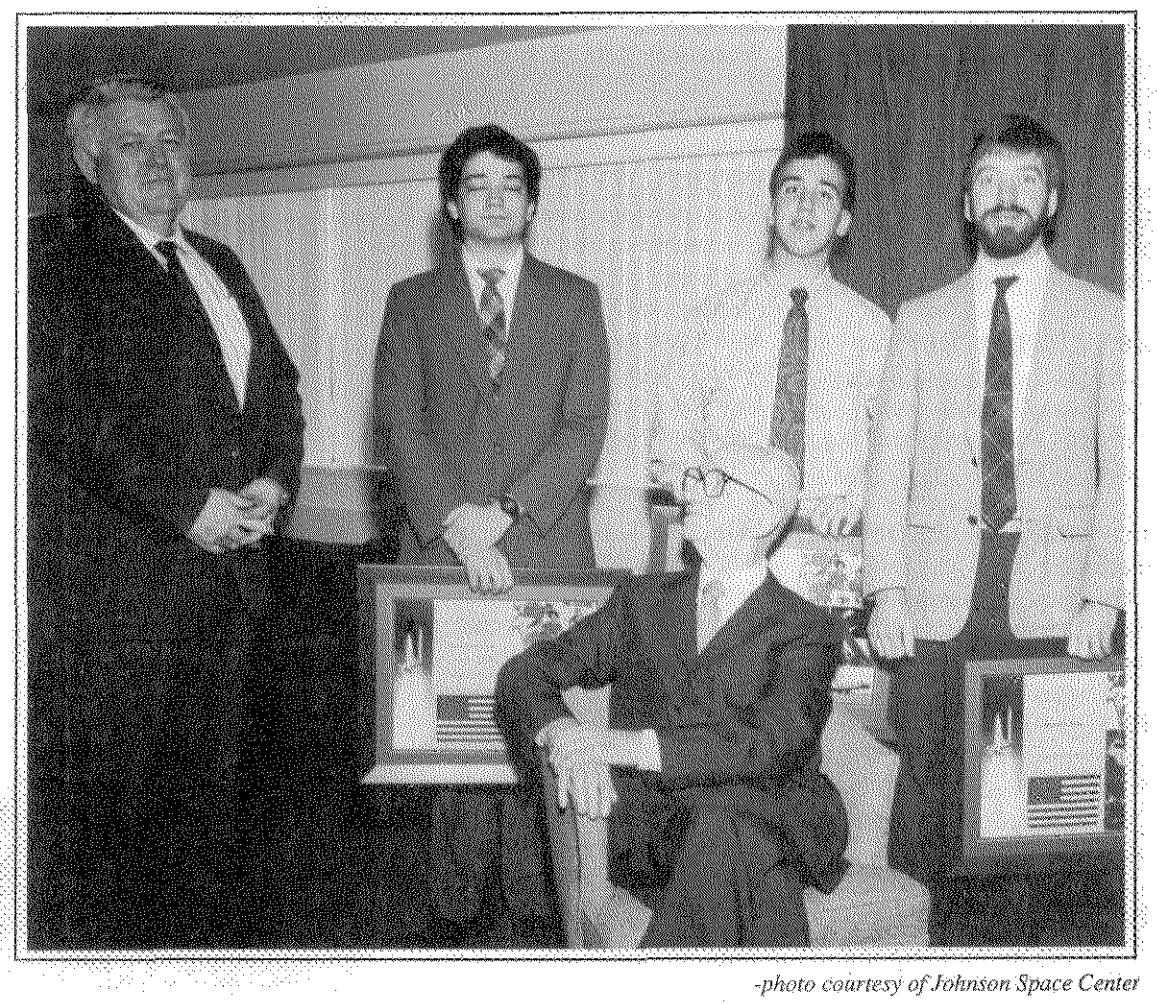
Statistics suggest that inexperience and mishandling of fireworks play a huge part in the nearly 10,000 injuries suffered by adults and children each year. The bulk of the incidents occur during Fourth of July festivities.

"We cannot in good conscience continue to advise people how to use fireworks safely," says Frank Carlomagno, society executive director. "The dangers of the private use of fireworks cannot be overstated. Adults and children are losing part or all of their sight; sometimes people are maimed or killed and thousands of fires are started due to the misuse of fireworks."

Studies have shown more than 40 percent of the eye injuries caused by fireworks have left permanent damage. Half of those injured were children. In another study, spectators were victims in 25 percent of the incidents.

Of particular concern are the Class C devices which are legal in Virginia. These are mistakenly thought to be of little danger and, thus, widely misused. These include firecrackers, smoke bombs, bottle rockets and sparklers. In fact, evidence cites sparklers as the cause of more than half of all reported injuries, and bottle rockets as responsible for a third of the eye injuries.

"We suggest that people mark Independence Day by enjoying fireworks at a public display," Carlomagno says. "The sight of someone you care about just might depend on it."



-photo courtesy of Johnson Space Center

Author James Michener (center) talks with NASA Langley Scholarship winners (starting second from left) James Pendergraft, Timothy Jarrett and Michael Fripp as Director for Space W. Ray Hook looks on.

Pulitzer Prize Winner Meets with NASA Scholars

Pulitzer Prize winning author James A. Michener met with many of the NASA College Scholarship Fund winners recently at Johnson Space Center. The Scholarship Fund was established in 1982 by a substantial gift from Michener for the purpose of awarding scholarships to the dependents of NASA employees.

Previous Langley winners James Pendergraft, Michael Fripp and Timothy Jarrett attended the celebration in honor of Michener and his wife Mari.

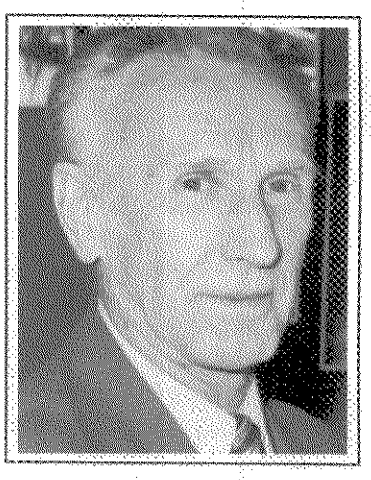
Financial assistance has been given to 18 students. Six of those have now graduated and are working in doctorate programs. Michener is so pleased with the quality of students receiving benefits he has recently donated another $25,000 to the fund.

"You have done a masterful job (of administering the program)," Michener said at the JSC Gilruth Center celebration in his honor. "We follow it closely. We are impressed by the character of the young people you have nominated. We are more than pleased with the wonderful results of their education in high school and college and advanced degrees . . . . That is what young people of above average ability ought to do."

Michener related that both he and his wife were children of the American education system. "I went to nine universities, always at somebody else's expense. I was early on tagged as a bright, young boy and could get As in almost anything I took," he continued. "That was in the period when you got an A for memorization. I was a dog for memorization. But, upon real analytical intelligence which is required now, I doubt that I would have stood so high.

"I often say, I think with great truth, had I been born in some country like Yugoslavia, I would have spent my life counting gasoline drums because there would have been no free education. There would have been none of that early identification of a bright boy. There would have been none of that, and, we are constantly aware of that vast difference.

"So, from a position of great satisfaction in what you have done, we are now going to increase the endowment," concluded Michener as he presented the check for $25,000 to JSC Director Aaron Cohen. "I hope you do as well with this as you have done in the past."



Long Service Honored

Robert J. Harbison (left), Technical Support Section C, Operations Support Division, was presented a 45-year service award May 28 by Center Director Richard H. Petersen.

Voluntary Leave Transfer Program

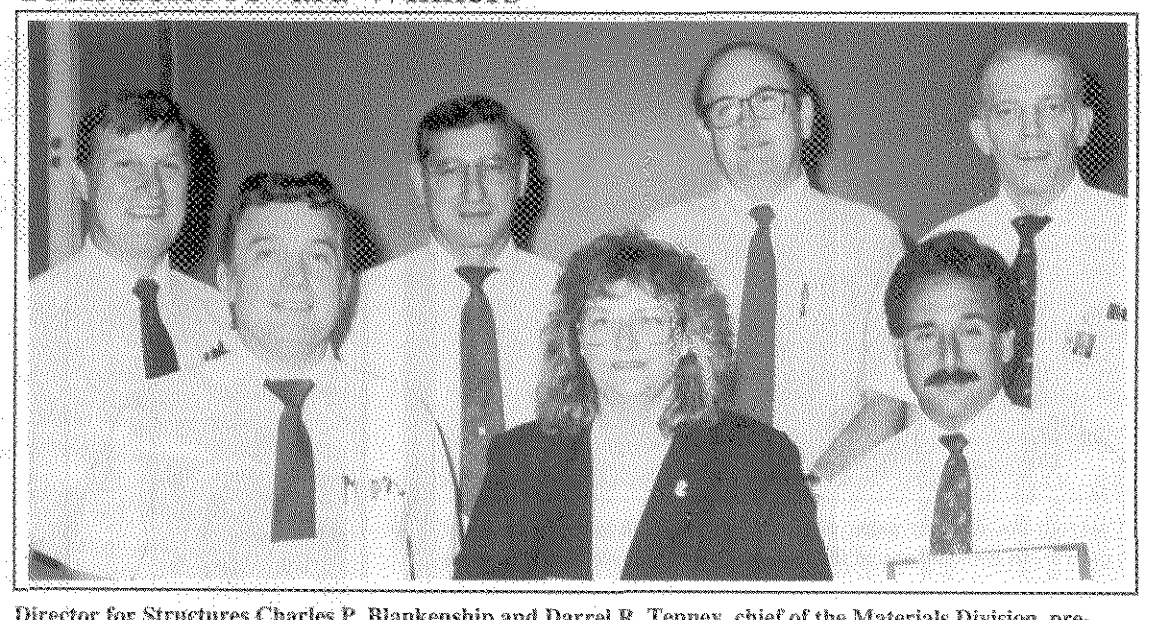
The Voluntary Leave Transfer Program is designed to permit Langley employees to donate annual leave to other employees who are experiencing a period of unpaid leave as a result of a medical emergency.

The following employees are approved leave recipients:

- Velma L. Clark
- Linda E. Edmundson
- Kdean Hargrove
- Gael M. Hawkins
- Cynthia L. Lach
- Noel A. Talcott Jr.
- Catherine B. Worth

If you wish to donate annual leave to these recipients, or wish more information concerning the Voluntary Leave Transfer Program, contact Linda Park of the Employee Relations Section, ext. 42610.

Tech Brief Award Winners



Director for Structures Charles P. Blankenship and Darrel R. Tenney, chief of the Materials Division, presented Tech Brief Awards to (front row, L to R) James C. Newman Jr., Anne K. St. Clair, Charles J. Camarda, (back row) Tenney, Donald J. Progar, Terry L. St. Clair, and Blankenship. Donald R. Rummler, not pictured, was also an award winner.

Happenings

NO LAA SOCIAL Friday, July 5 due to the Thursday holiday.

LAA OFFICE will be closed Friday, July 5. During the period July 8-19, the LAA Office will be open from 8:30 a.m. to 12 noon only. Please make a note of this time change.

DISCOUNT TICKETS are available for area attractions at the Visitor Center Souvenir Counter. For more information, call ext. 41585.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays from 5 to 6 p.m. in the LAA gym. Cost is $12 per month. First class is free.

BENCH STEP AEROBICS classes are held Saturdays from 9:30 to 10:30 a.m. in the LAA gym. Cost is $6 per month. Try aerobics with muscle!

FEDERAL WOMEN'S PROGRAM COMMITTEE will meet Wednesday, July 10, at 8:15 a.m. in the executive dining room of the NASA cafeteria.

NASA TOASTMASTERS will meet Wednesday, July 10, from 11:30 a.m. to 1 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road. Guests are always welcome.

BLOODMOBILE will be held Wednesday, July 17, from 9 a.m. to 3 p.m. in the Reid Conference Center. Give the gift of life.

INFERTILITY SUPPORT Group provides emotional and educational support for couples challenged with this condition. Meetings are held every second Monday of the month at the Jewish Community Center, Newport Avenue, Norfolk. For details, call 877-3094 or 220-1440.

FOR RENT: HOUSE in Denbigh. 3 BR, 2BA, LR with fireplace, DR, fenced yard. $625 per month, lease required. Call 898-5710 after 5 p.m.

FOR SALE: BOAT. 1988 Baretta, 18-1/2 ft. I/O Merc. 165 hp eng., low time, includes trailer, automatic bilge pump, Halon extinguisher system, covers, AM/FM cassette. $8,600. Call 723-1005 and leave message.

WANTED: ROOMMATE. Male to share two bedroom apartment with AC, W/D. Two miles from NASA. $170 per month plus half utilities, deposit and weekly chores. Non-smoker only. Available July 1. Contact Claudio, 766-2494. Leave message.

Ceremony Honors NASA Langley Inventors

-by Kristy Alligood

NASA Langley researchers and inventors will be recognized for their achievements at the 15th Annual Inventors and Technology Utilization Awards luncheon at 11:30 a.m. today, June 28, at the Sheraton Inn-Coliseum, Hampton. Forty-seven patents and 10 Technology Utilization awards will be presented.

U.S. Congressman Herbert Bateman will be the keynote speaker. He will discuss congressional views on encouraging the development of new technology as well as how technology utilization and patents help the government compete in the world market.

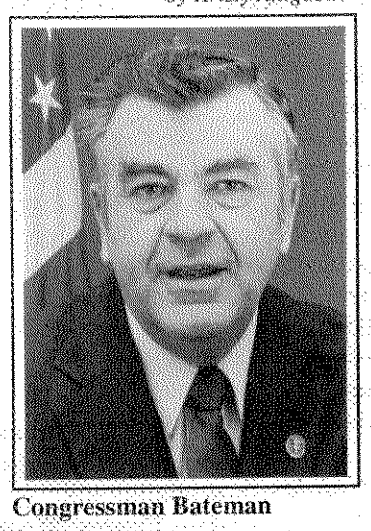
According to Technology Utilization Officer Joe Mathis, this connection between the patents and private industry is a main goal of his department.

"By getting the technology licensed, we're trying to help American companies become more competitve in the world market. Our mission is getting the technology transferred to and utilized by the public," said Mathis.

Dr. George Helfrich, patent counsel in the Office of the Chief Counsel, said that through the awarding of patents there is an ultimate technology transfer. This transfer means that the public is able to put the NASA technology to use.

Helfrich emphasized the importance that technology, once patented, be licensed so that industry continue the research. Consequently, there is reward for two groups. The inventor is able to share in royalty payments for researching and developing his idea, and the public benefits, as well, by the continued research that uncovers spinoffs that use the technology in varied applications

For example, one of this year's patented inventions is a catalyst for oxidizing carbon monoxide to create carbon dioxide. Helfrich said that, while the invention was developed for a laser, it can be transferred to benefit the public in numerous ways. One way this technology could be used is in air conditioning systems to change harmful carbon monoxide present in smoke-filled rooms to carbon dioxide, which is not harmful to humans.



Congressman Bateman

"NASA's Technology Utilization and Patent Offices work together to license the technology and initiate technology transfer to the public," said Mathis.

According to Helfrich, approximately one-third of NASA's patents for this year have come from Langley Research Center. Langley issues more patents than any other NASA facility.

National Aeronautics and Space Administration

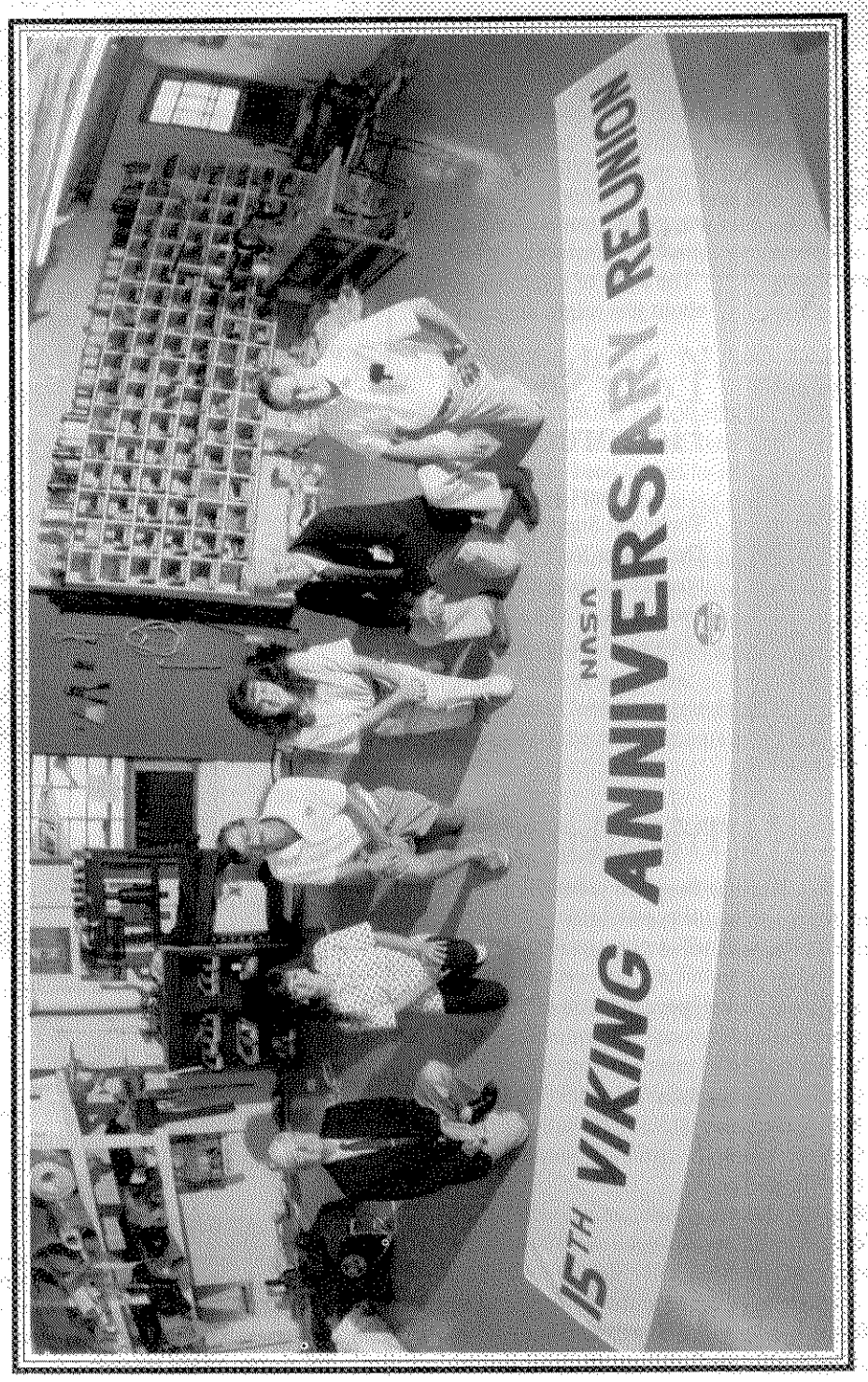
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

402 OA-SITE NON-LARC
SKORA, MARY M.
MAIL STOP 115

News Researcher



-photo by Fred Jones

READYING FOR A WARM WELCOME. Viking Reunion committee members present one of the banners which will welcome participants to a reunion commemorating the fifteenth anniversary of the Viking Project. The event, hosted by the Langley Alumni Association, will be held July 20 on the grounds of the H.J.E. Reid Conference Center. Banners were produced by committee members at North Sails in Hampton, which donated all materials. Shown (L to R) are Charlie King; Melody Sanford; Ken Saylor, manager of North Sails; Kathi Topping; Buddy DeRyder and reunion chairman Bill Boyer. Sanford, daughter of Jackie Kallick, and Topping, DeRyder's daughter, are members of the Viking Orphans, an ad hoc group composed of the children of the Viking Project team.

For Marny Skora, with warm regards and many thanks for your help
Robert Haynes
July 1991

NASA
National Aeronautics and Space Administration
Langley Research Center

Researcher News

Volume 5, Issue 14 July 12, 1991

Bi-weekly Employee and Contractor Publication

NASA Probes Philippine Volcano Effects on Global Atmosphere

-by Craig Murden

The massive outpouring of volcanic material from Mount Pinatubo, said by NASA to be double that from any eruption in the last century, has drawn a quick-response research team of NASA atmospheric scientists to the island of Barbados in the West Indies to gather information which should help predict the future effects of this catastrophic event.

Headed by Dr. M. Patrick McCormick, the special research team consists of other scientists from Langley, from the Ames Research Center, from the National Center for Atmospheric Research and from the Canadian Atmospheric Environment Service. The mission is being supplied near real-time data from satellites and computer predictions of the cloud locations.

Flying the NASA Lockheed Electra sampling platform, the combined group are taking advantage of the winds, which are pushing giant pillars of smoke and gas to the Caribbean. NASA scientists are staging their operations out of Grantley Adams Airport,where a number of flights will probe the clouds with remote sensors aboard the Electra.

As of press time, the team was scheduled to arrive July 8. Its primary focus is to capture enough data about the composition, density and distribution of the volcanic clouds to form the basis for detailed analysis of potential global effects. McCormick said, "volcanic aerosols are climate 'forcers,' so it is urgent we get an early characterization of the stratospheric plume. This effort will influence a number of future activities including measurement scenarios for ground- and satellite-based sensors and development of chemical models of ozone depletion." Instruments aboard the NASA Electra measure plume base, thickness, particle shape, spatial distribution, total-direct-diffuse radiation, optical depth and vertical columns of chemicals like sulfur dioxide (SO_2) and hydrogen chloride (HCl).

McCormick is internationally known for his work on the impact of major volcanic eruptions. He currently heads Langley's Aerosol Research Branch and is the project scientist for the Lidar In-Space Technology Experiment scheduled to fly on the Shuttle in 1993.

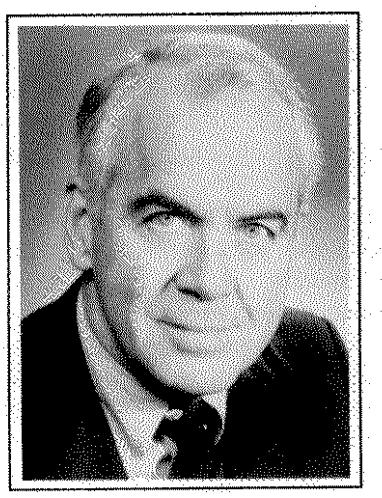
Langley Colloquium

Mars: Can it be Returned to Life?

-by Jean Drummond Clough

Mars is a cold, dry and inhospitable world. Measurements made by the Viking Orbiters and Landers 15 years ago this month, suggest that early Mars may have been very different--warmer, wetter and more hospitable for life than the Mars of today. Why and how Mars evolved the way it has is an intriguing scientific question. Can human activities return Mars to a more cordial state?

In a colloquium commemorating the 15th anniversary of the Viking Project, planned and managed at NASA Langley, Dr. Robert H. Haynes, a distinguished research professor at York University in Toronto, Ontario, will discuss "Mars: Bringing a Dead World to Life." Haynes will speak to employees, retirees and contractors in the H.J.E. Reid Conference Center, 14 Ames Road, Tuesday, July 16, at 2 p.m.



In his talk, Haynes will address the topic of terraforming Mars, that is, making Mars more Earth-like by engineering a thicker and warmer atmosphere and by generating an oxygen atmosphere. In addition, he will discuss the moral and ethical questions of terraforming. Research in this area is being conducted by Langley, NASA Ames in Mountain View, Calif., and York University. This subject was reported in a 12-page cover story in the May 1991 issue of *Life* magazine, which featured the research being conducted at NASA and York.

Haynes, who is in the biology department at York, has held academic positions at the University of London, the University of Chicago, the University of California at Berkeley, Yale University and Lawrence Radiation Laboratory before joining York University as chairman of the biology department in 1968. He has authored or co-authored more than 100 scientific papers. He co-edited the Scientific American reader on Molecular Biology.

Among many honors, Haynes is a member of the Royal Society of Canada and a recipient of the Gold Medal of the Biological Council of Canada.

NASA Focuses on Expanding the Frontiers of Flight at EAA Convention

NASA returns to Oshkosh, Wisconsin, July 26-Aug. 1, for the 39th Annual Experimental Aircraft Association (EAA) International Fly-In Convention and Sport Aviation Exhibition with a new exhibit entitled "NASA: Expanding the Frontiers of Flight."

The exhibit will showcase innovative NASA technologies that are paving the way for tomorrow's aerospace vehicles. It will also highlight the high-tech aircraft and spacecraft that are increasing our knowledge of Earth and the universe today.

Nearly 30 NASA speakers will participate in the convention's technical forums, with topics such as atmospheric lightning flight hazards and new propulsion systems for future supersonic transports.

Supporting the NASA exhibit in addition to Langley are the other Agency aeronautics field centers, Ames Research Center, Mountain View, Calif.; Ames-Dryden Flight Facility, Edwards, Calif.; and Lewis Research Center, Cleveland, Ohio. Marshall Space Flight Center, Huntsville, Ala., and Johnson Space Center, Houston, also are providing exhibit materials.

Goddard Space Flight Center, Greenbelt, Maryland, will provide the SARSAT van which tells the story of the Search and Rescue Satellite System. The always popular AEROVAN traveling exhibit will also be at Oshkosh. Both of these mobile van programs are managed by Langley.

In the NASA pavilion, visitors will discover how the Agency's aeronautics research helps maintain America's leadership in the fiercely competitive aerospace marketplace. The displays describe advances in aerodynamics, materials, propulsion and supercomputers that will make U.S. aircraft fly higher, faster, farther and more efficiently.

A highlight of the exhibit will be a 12-foot model of the latest design for the X-30 National Aero-Space Plane (NASP) highlighted by a new video presentation. This "ultimate X-plane" will take off horizontally like an airplane, accelerate to 17,000-plus miles per hour and reach low-Earth orbit, then return for a runway landing.

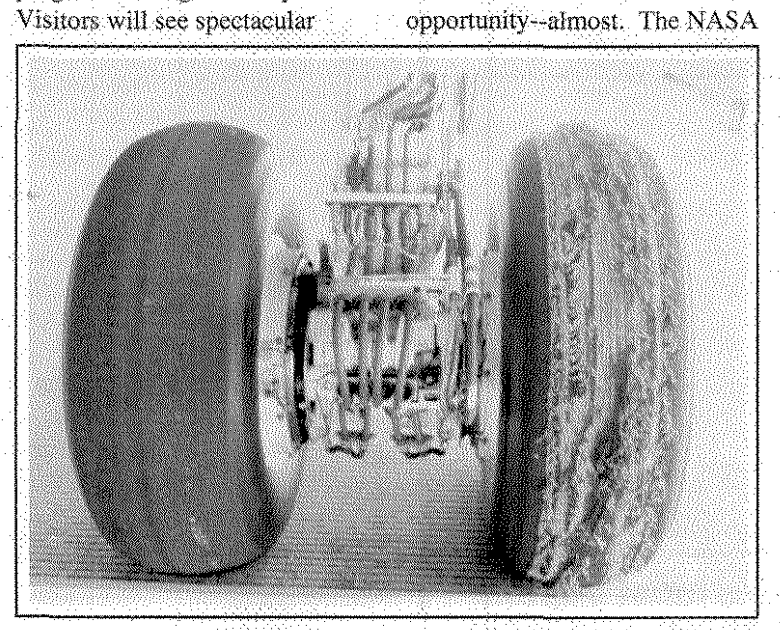
NASA's "air force" includes more than just flight research vehicles. Visitors will become familiar with the Agency's stable of flying science laboratories that roam the world to support atmospheric research and conduct Earth resources surveys and cosmic observations.

The exhibit will also emphasize the remarkable achievements of NASA's space programs during the last year. Visitors will see spectacular images returned by the Magellan and the Galileo planetary explorers and the Hubble Space Telescope. There will be displays on past and future missions of the Space Shuttle, including a model of the Spacelab science module.

And anyone who has always wanted to "kick the tires" of a Shuttle orbiter will have the opportunity--almost. The NASA exhibit will include a full-size tire typical of those used on the Shuttle landing gear.

NASA technology used in everyday life will also be exhibited. Among the artifacts on display will be artificial knee and hip joints that may give patients a more active lifestyle with no joint deterioration for 20 to 30 years.

In the craftsmanship exhibit area, technicians from various NASA centers will show how they fabricate test models and equipment, metal and composite structures and data-gathering devices.



KENNEDY SPACE CENTER, FLA. --- Several outer plies of the right outboard tire of the main landing gear on the orbiter Discovery were shredded during landing. Discovery and the seven-man crew of Mission STS-39 touched down on Kennedy's Shuttle Landing Facility, Runway 15, May 6. Discovery's return marked the seventh end-of-mission landing at KSC in 40 Shuttle launches.

Dual Landing Sites Approved

Shuttle Director Robert Crippen has indicated the Space Transportation System program is ready to place the Kennedy Space Center Landing Facility on equal status with the Dryden Flight Research Facility in terms of Shuttle landing sites.

The consideration of KSC and DRFR equally in terms of landing sites will begin with Shuttle Mission STS-43. See mission coverage, page 3.

News Briefs

JSC Space Act, Suggestion Award Winners in Spotlight --- Johnson Space Center contributions to world technology and its efforts to keep program costs down were spotlighted recently when 41 employees received $75,505 for Space Act and Suggestion awards. One of the awardees, in particular, is exceptionally noteworthy because of the amount and type of award. Dr. Frederic Dawn, JSC Crew and Thermal Systems Division, was awarded a $25,000 Space Act award for his development and application of the non-flammable, high-temperature Beta fiber. Originally developed for the Apollo space suits, the fiber is now used in any number of ways, including use as the roofing material for the Pontiac, Mich., Silverdome. The only other $25,000 Space Act award ever made was to Richard Whitcomb, the Langley aeronauticist who designed the super critical wing. The Space Act awards were established by the 1958 Space Act.

First Advanced X-Ray Astrophysics Facility Mirror Shipped --- The first mirror for NASA's Advanced X-ray Astrophysics Facility (AXAF) space observatory was successfully completed at Hughes Danbury Optical System, Danbury, Conn., and shipped June 12 to Eastman Kodak, Rochester, N.Y., for assembly. This mirror will be paired with another shipped June 30. The shipment of these two mirrors will mark the culmination of a challenging 2-1/2 year period for the AXAF program. The most sophisticated aspect of this activity is the highly complex measuring (metrology) stations, used to characterize the mirrors and guide the polishing stations.

NASA Tracks 4,800-Mile Volcanic Cloud from Mount Pinatubo --- Preliminary data estimates from a NASA satellite indicate a 4,800-mile-long cloud of sulfur dioxide has spread across the tropical Northern Hemisphere from the major eruption of the Mount Pinatubo volcano in the Philippines. The data was obtained from NASA's Total Ozone Mapping Spectrometer (TOMS), an instrument on the NIMBUS-7 satellite that measures ozone levels and monitors sulfur dioxide emissions. TOMS's mapping capability makes it possible to observe major volcanic eruptions, then track the plumes and measure the sulfur dioxide output during eruptions. Sulfur dioxide is a toxic gas known best as a major cause of air pollution.

IRAS Reveals Most Luminous Object Ever Seen in Space --- Astronomers studying very faint objects originally detected by the Infrared Astronomical Satellite (IRAS) has discovered a new, very distant object which they say is the most luminous object ever seen in the universe. The observations, published in the British science journal *Nature*, show that this luminous object is a massive dust cloud which radiates 99 percent of its light in the infrared part of the spectrum. The team of astronomers believes that this mysterious cloud may be a massive galaxy in the process of formation--or, alternately, a quasar embedded in the dust of a massive galaxy.

Senior Management Research Review

The Senior Management Research Review will be held Monday, July 15, from 9 to 11 a.m. at 17 West Taylor Road, Subsonic Tunnels Offices, Room 200. All employees are invited to attend. Program accomplishments will be given by the following Langley scientists.

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:00	Laser Velocimetry Measurements in Non-Isothermal CVD Systems	Ivan O. Clark (Flight Systems, ISD)
9:15	Measurement of Nonuniform Plasma Densities Developed During Space Vehicle Atmospheric Reentry Using a Millimeter Wave Radar System	Dr. Robert T. Neece (Flight Systems, GCD)
9:30	Extension-Twist Coupling Concept Demonstrated in TDT	Renee C. Lake (Structures, SDYD)
9:45	Scramjet Module-to-Module Interaction Study	Thomas N. Jentink (Aeronautics, HTO)
10:00	Stratospheric Chemistry Using SAGE II Data	Dr. Joseph M. Zawodny (Space, ASD)
10:15	Asynchronous, Macrotasked Relaxation Strategies for the Solution of Viscous, Hypersonic Flows	Dr. Peter A. Gnoffo (Space, SSD)
10:30	Director's Comments	

Following these presentations, the program directors will give status reports.

TQM Team to Visit Langley

In February 1990, NASA Administrator Richard H. Truly issued NASA Management Instruction (NMI) 1270 to formally launch NASA's Total Quality Management (TQM) Program with a view towards aggressive self-improvement.

To help assess how the Centers and Headquarters are progressing in implementing TQM, each Center and the various Headquarters program offices will be evaluated by an internal TQM assessment team who will conduct an on-site, two-day visit. The team will be made up of Center and Headquarters representatives and will be led by Joe McElwee, Code QB, NASA Headquarters. The reviews are designed to enhance and promote a quality culture and serve as a baseline to decide if the Agency will compete for the President's Quality and Productivity Improvement Award at some future date.

Langley will be visited July 22-23 by the Internal TQM Team. The team will consist of 10 members plus several staff personnel. While on site, interviews will be held with top management officials and selected managers and employees or team and project members. The review will focus on such areas as strategic planning, customer service, employee empowerment, and employee training and recognition. Once the interview schedule has been decided, proper notification will be given to all those involved.

The visits provide a vehicle for sharing information related to the implementation of TQM across the Agency. Your cooperation is requested during the on-site visit. The report findings and recommendations for further improvement will be shared once available.

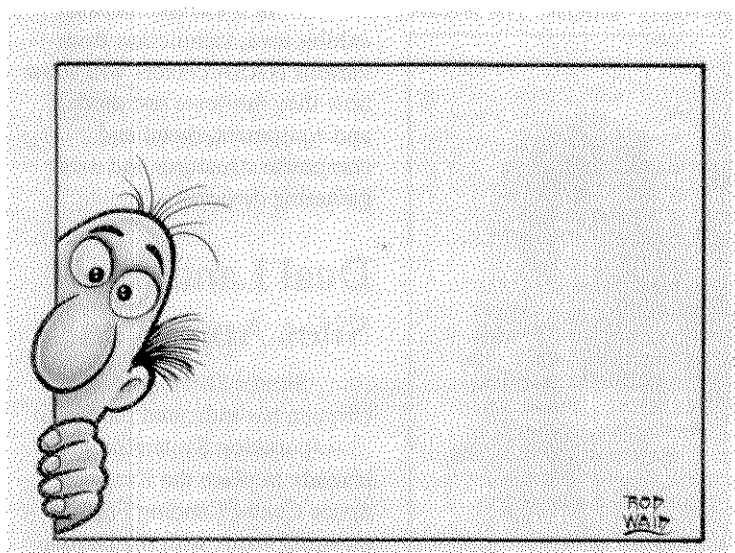
Retiree Service Center Opens

The National Association of Retired Federal Employees (NARFE), District II chapters of the State of Virginia, has established a center to provide guidance and assistance to federal retirees and their survivors in obtaining the benefits to which they are entitled. The center is located in Room 202 of the Norfolk Federal Building at 200 Granby Street. The hours of operation are 10 a.m. to 2 p.m. every Monday, except holidays.

The center will not eliminate the need for federal retirees and their survivors to interact with the Office of Personnel Management's (OPM's) Retirement Program Offices in Washington, D.C., and Boyers, Pennsylvania. However, the center can provide a valuable service by assisting individuals who need special help or who have unusual problems.

NARFE is a non-profit membership organization comprised of over 500,000 civilian employees, retirees, survivors and spouses. One of NARFE's specific objectives is to "work in partnership with the Office of Personnel Management to answer questions related to retirement benefits." It is this objective that has led the Norfolk area office of OPM to develop a working agreement with NARFE District II. Members from this district will be responsible for staffing the center. Center staff members will volunteer their time and effort to assist fellow retirees and survivors. There is no charge for this service and all visitors will be assisted, even if they are not members of NARFE.

Lankley



After years as NASA's most popular cartoon engineer, Lankley suddenly realizes he's being watched.

Competitive Placement Openings

The following vacancies are open to LaRC employees presently serving under permanent civil service appointments:

91-44: Resources Control Assistant (Typing), GS-503-5, Fabrication Division. Closes July 16.

91-45: AST, Facilities Systems Safety, GM-801-13 or 14, Systems Safety, Quality and Reliability Division. Successful candidate will service as head of the Facility Assurance Section. Closes July 17.

91-46: Secretary (Stenography), GS-318-7 or 8, Office of the Director for Management Operations. Successful candidate will serve as secretary to the Director and Deputy Director for MO. Closes July 19.

CELEBRATE AN AMERICAN TRADITION
50 YEARS OF
U.S. SAVINGS BONDS

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

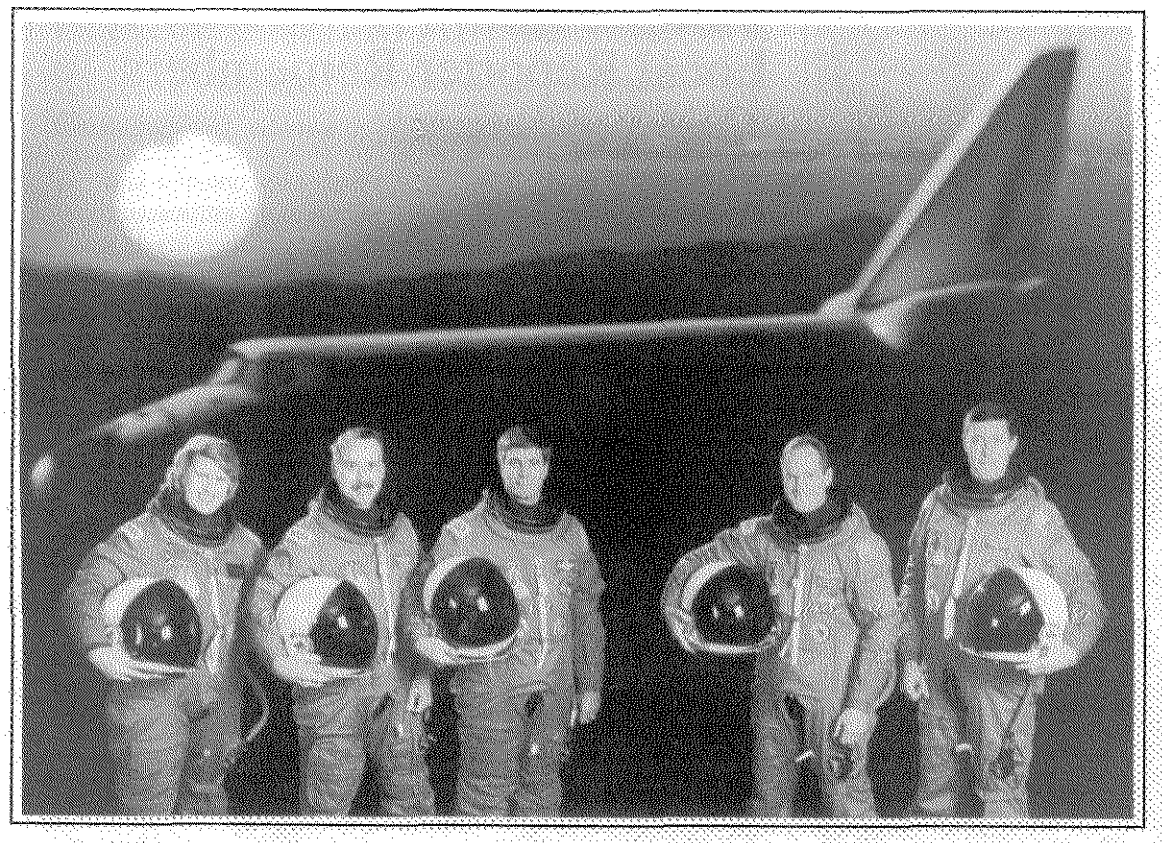
Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

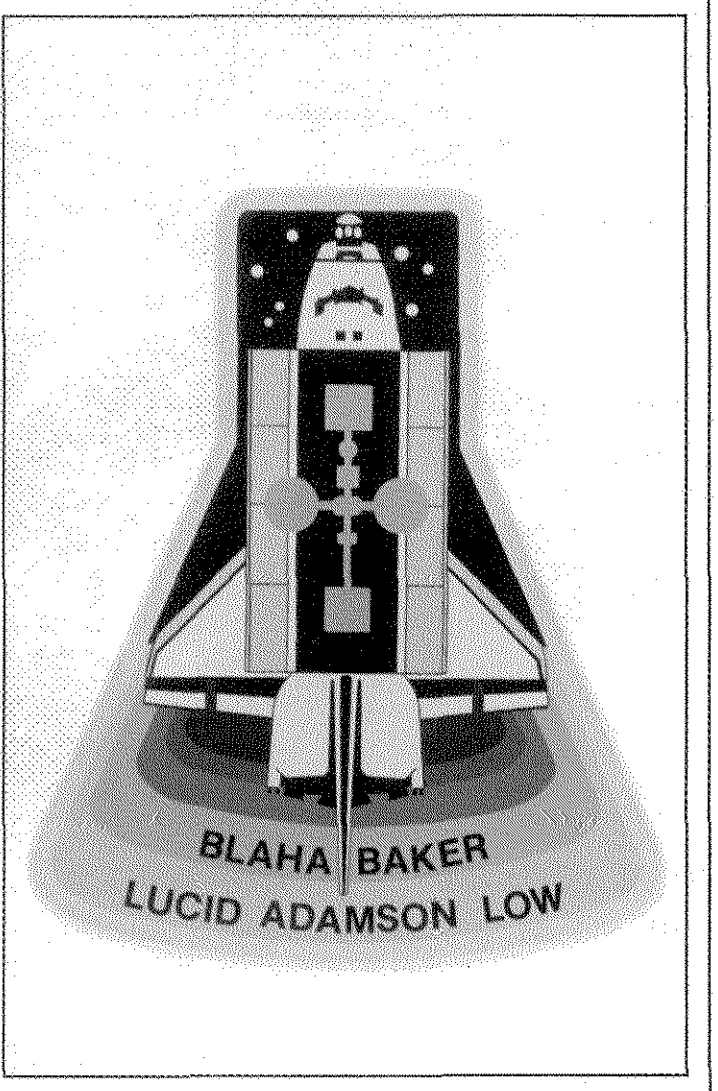
Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.



STS-43 CREW. Assigned to fly aboard the Space Shuttle Atlantis for STS-43 are (L to R) Astronauts Shannon W. Lucid and James C. Adamson, mission specialists; John F. Blaha, commander; G. David Low, mission specialist; and Michael A. Baker, pilot.



STS-43 INSIGNIA. Designed by the astronauts assigned to the mission, the STS-43 patch portrays the evolution and continuity of the U.S. space program by highlighting 30 years of American manned space flight experience--from Mercury to the Space Shuttle. The emergence of the Shuttle Atlantis from the outlined configuration of the Mercury space capsule commemorates this special relationship. Once in orbit Atlantis' cargo bay opens to reveal the Tracking and Data Relay Satellite (TDRS). A primary mission objective, the TDRS System will enable almost continuous communication from Earth to space for future Space Shuttle missions. The stars on the patch are arranged to suggest this mission's numerical designation, with four stars left of Atlantis and three to the right.

Atlantis to Boost Fourth NASA Tracking Satellite

Atlantis will put NASA's fourth Tracking and Data Relay Satellite (TDRS-E) into orbit on Shuttle mission STS-43 to update the satellite tracking network, resulting in two operating satellites plus a complement of two spares in the space network.

TDRS-E, to be deployed from Atlantis about six hours after launch, will be boosted to a geosynchronous orbit by an attached upper stage where it will be positioned to remain stationary 22,400 miles above the Pacific Ocean southwest of Hawaii.

The Tracking and Data Relay Satellite System, in operation since the eighth Shuttle flight, provides almost uninterrupted communications with orbiting shuttles and satellites and has replaced the intermittent coverage provided by globe-encircling ground tracking stations used during the early space program. A reduced string of ground stations remains in operations for radar tracking and backup communications.

Kennedy Launch and Landing . . .

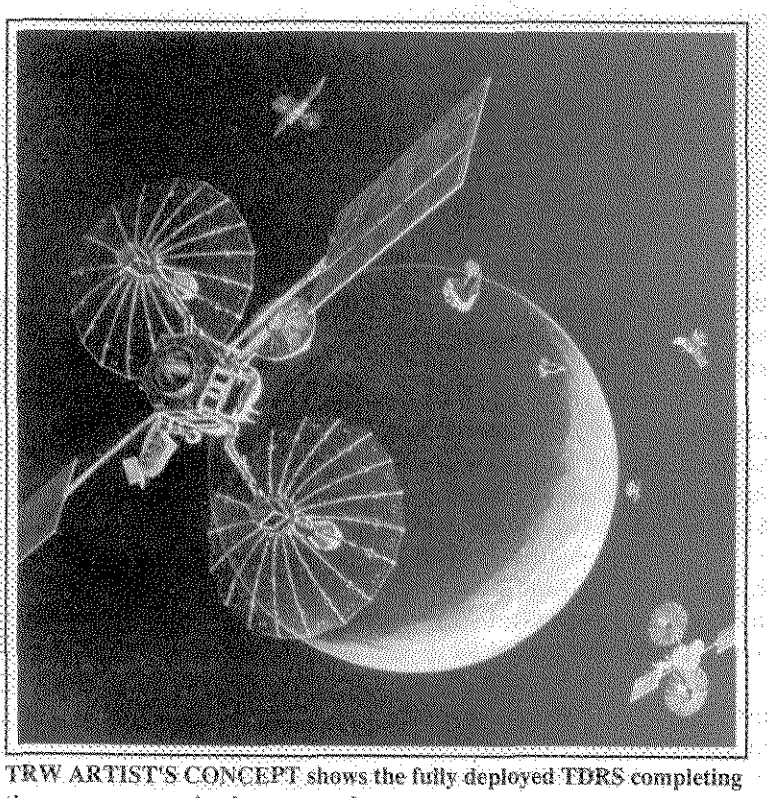
Atlantis, making its ninth flight and the 42nd Space Shuttle mission, is scheduled for a 10:53 a.m. EDT launch on July 23 from Kennedy Space Center's Launch Pad 39-A. On board Atlantis will be Commander John Blaha, Pilot Mike Baker and mission specialists Shannon Lucid, G. David Low and James C. Adamson. Landing is planned for 9:38 a.m. EDT at either Kennedy Space Center, Fla., or Dryden Flight Research Facility, Edwards, Calif.

Although two Shuttle missions have landed at the Kennedy Space Center's Shuttle Landing Facility since NASA's return to flight, both were diverted to Kennedy due to bad weather at Edwards. STS-43 is the first mission since the return to flight to have Kennedy as a planned landing site, dependent on weather.

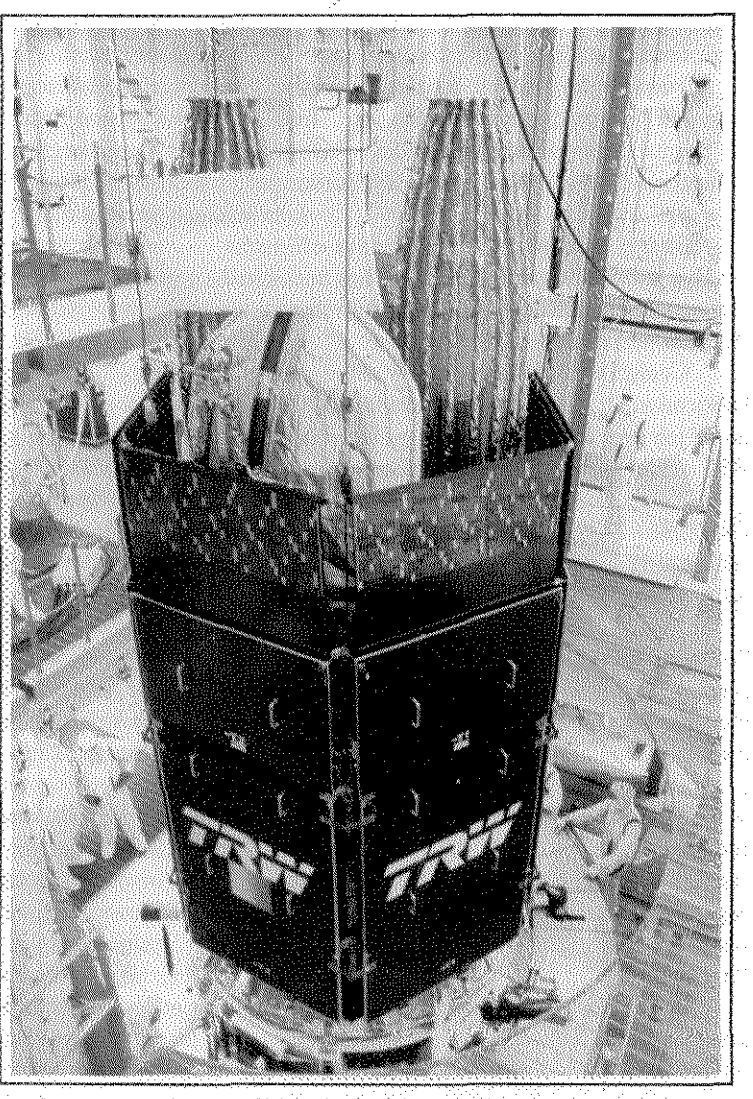
Secondary Experiments . . .

Along with the TDRS-E/IUS in Atlantis' cargo bay for STS-43 will be the Shuttle Solar Backscatter Ultraviolet (SSBUV) instrument, a device used to aid in calibrating ultraviolet satellites already in orbit that assist in measuring the Earth's ozone layer, among other functions; the Space Station Heat Pipe Advanced Radiator Element-II, a reflight of an earlier Shuttle experiment that tests a natural process incorporating no moving parts that may be used to cool Space Station Freedom; and the Optical Communications Through the Shuttle Window experiment, a test that uses fiber optics for communications onboard the Shuttle.

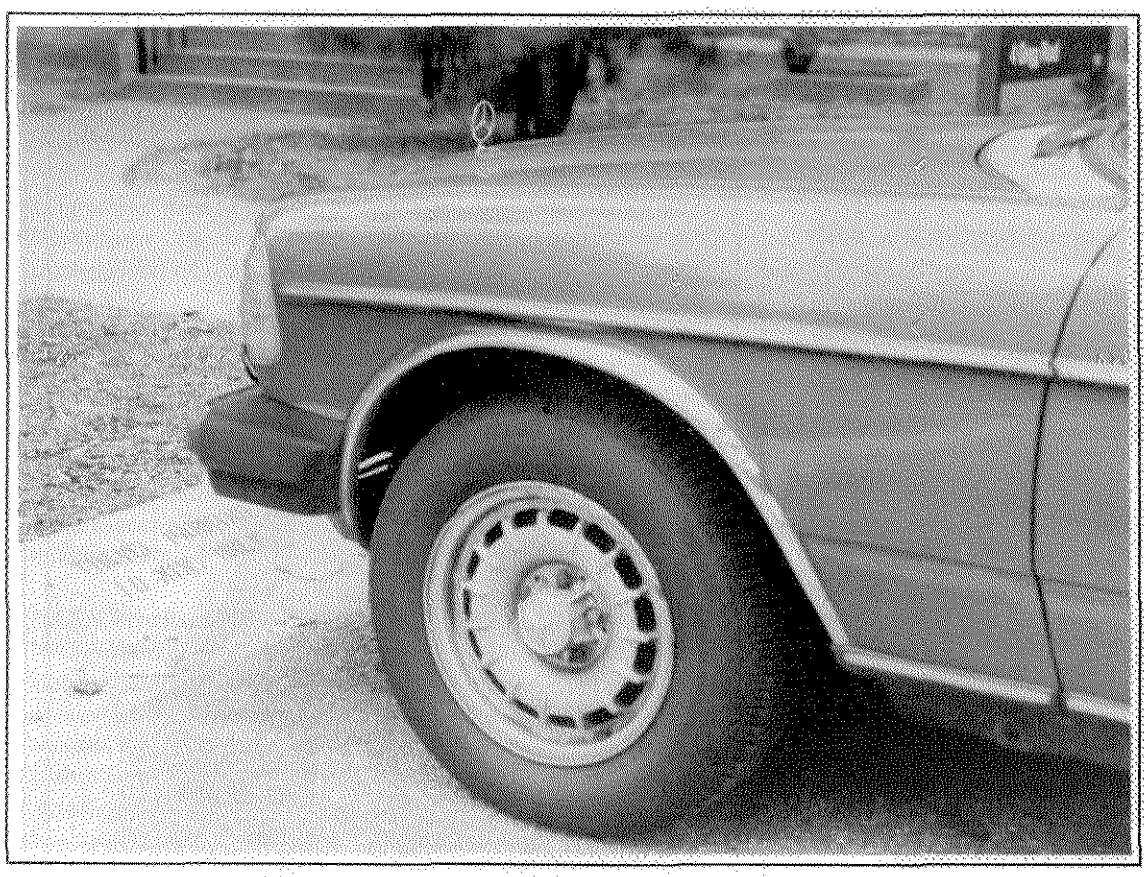
In Atlantis' middeck will be an experiment to study the Earth's auroras, more commonly known as the Northern and Southern Lights; an experiment in growing large protein crystals in weightlessness; a test of manufacturing polymers in orbit; a device used to grow crystals in zero-gravity; a device used to measure accelerations and disturbances to weightlessness during Atlantis' stay in orbit; a test of the way materials burn in weightlessness; and a check of innovative methods for controlling the amount of pressure inside high-pressure tanks.



TRW ARTIST'S CONCEPT shows the fully deployed TDRS completing the space communications network.



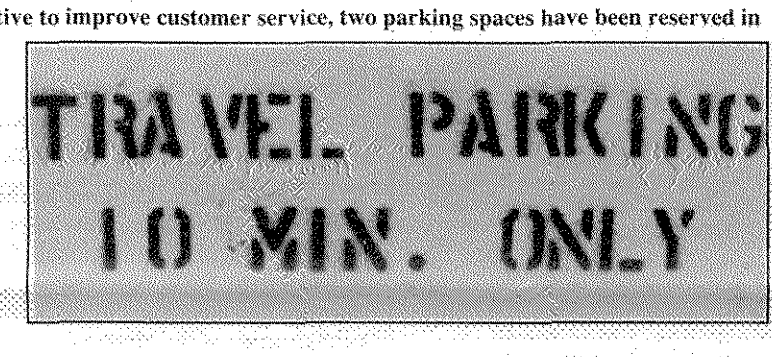
READYING THE STS-43 PRIMARY PAYLOAD. Mating of the Tracking and Data Relay Satellite-E (upper) with its Inertial Upper Stage booster (lower) is accomplished in the Vertical Processing Facility at the Kennedy Space Center.



What's RIGHT with this picture?

-photos by Mary Beth Payne

In a Management Operations initiative to improve customer service, two parking spaces have been reserved in front of the Financial Management Division, 4 West Gregg Road. Designated 10-minute parking, this service is designed to facilitate making travel arrangements. Employees who need to pick up travel reservations or drop off travel information are encouraged to take advantage of this convenient parking.



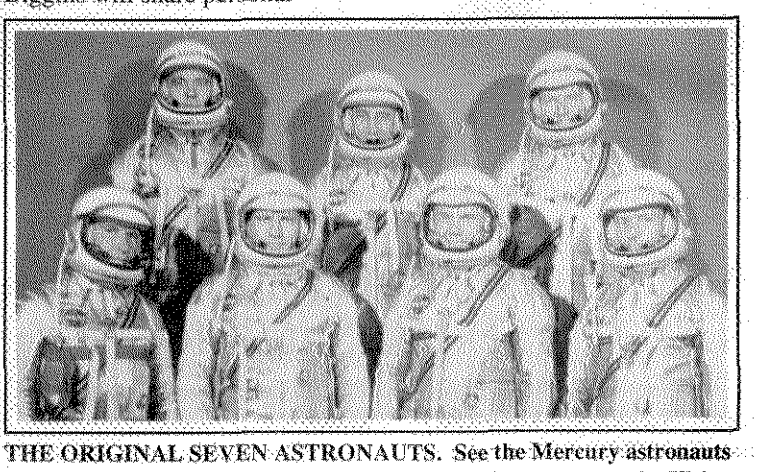
At the Visitor Center

Local Reporter Remembers 'Original Seven'

During the early 1960s, Virginia Biggins, a *Daily Press* reporter, covered the era of "the golden boys," Langley's Mercury astronauts. With the world's attention focused on Project Mercury, the first U. S. manned space program, it was an exciting time for Langley. In recognition of the 30th anniversary of Project Mercury, Biggins will present "A Personal Remembrance of Langley's Mercury Astronauts," Thursday, July 25, at noon in the Visitor Center theater.

In her presentation, Biggins will share personal insights and one-of-a-kind photos of the astronauts, their training and their life on the Peninsula. She will also describe the conditions at NASA Langley thirty years ago and discuss the impact the first astronauts had on the area.

Biggins began her career at the *Daily Press* in 1954 and extensively covered military, science and space events. She still writes for the paper and has won over seventy journalism awards and received numerous citations and honors during her career.



THE ORIGINAL SEVEN ASTRONAUTS. See the Mercury astronauts through the eyes of local reporter Virginia Biggins at noon at the Visitor Center Thursday, July 25.

Employees Recognized for Superior Accomplishment

E. Steelman Ketchum, head of Grants, Supply and Construction Contracts Branch, was granted a superior accomplishment award for leadership and significant personal contributions which have resulted in the timely and efficient award and administration of contracts in support of the Systems Engineering and Operations Directorate.

Vernelle V. Robinson, secretary in the Research Information and Applications Division, has been recognized "for outstanding performance in support of RIAD and the Langley Exchange Council."

Sherri L. Yokum, administrative officer in the Hypersonic Technology Office, has been cited "for outstanding administrative contributions to the Hypersonic Technology Office."

Craig D. Jones, an apprentice assigned to the Fabrication Division, has been rewarded "for exceptional job performance in the manufacturing of the NTF model support wall limit switch brackets."

Terry O. Clark, an apprentice assigned to the Fabrication Division, has been recognized "for outstanding support of the High Lift Transport Data Acquisition System."

Judy R. Neil, secretary in the Facilities Program Development Office has been cited "for dedicated professional clerical assistance in accomplishment of the mission and goals of the Facilities Program Development Office."

Patrick A. Troutman, aerospace technologist in the Systems Engineering and Analysis Office, has been recognized "for individual excellence, sustained high-level performance and multidisciplinary engineering analyses which supported the Agency-wide restructuring of the Space Station Freedom Program."

J. Wayne Oakley, engineering technican assigned to the Fabrication Division, has been rewarded for providing technical support during design, fabrication, assembly and testing of aerospace and aeronautical models.

Rebecca J. Lowe, engineering technican in the Fabrication Division, has been cited "for exceptional performance in support of the Large Gap Magnetic Suspension Optical Measurement System Project."

John L. Allen, aerospace technologist in the Space Station Utilization Office, has been recognized "for outstanding management of a team of civil servants and contractors in the performance of the Microgravity Science and Applications Division Spacelab to Space Station Freedom Transition Study."

George G. Ganoe, aerospace technologist in the Space Station Freedom Office, has been rewarded "for the design and development of an innovative operations analysis capability called the Space Operations Database and Analysis System."

Peter A. Padilla, electronics technician in the Information Systems Division, has been cited "for providing timely and significant effort and results in the verification of the Guidance and Control Software Simulator."

James C. Ellison, aerospace technologist in the Hypersonic Technology Office, has been recognized "for outstanding efforts in the Implementation of the NASP Government Work Package Process."

Hope R. Bane, stay-in-school student assigned to the Fabrication Division, has been rewarded "for exemplary performance as a stay-in-school student assigned to the Resources Control Section."

William R. Hutto, engineering technician in the Fabrication Division, has been cited "for innovative technical support of the 1/10 scale cast Personnel Launch System series wind tunnel models."

Diana Park, secretary in the Acquisition Division, has been recognized for excellent support as directorate secretary from March 24 to June 1, 1991.

Glenn Ormsby, engineering technician in the Fabrication Division, has been rewarded "for exceptional performance on the GIM Free Flight Models Program."

Sports News

Second Best and Getting Better

-by Bill Shinn

Members of the NASA tennis team placed second in the Peninsula Men's 50s Tennis League for the first half of 1991. This league is sponsored by the Wheat First Securities in conjunction with the Peninsula Tennis Patrons Association and is composed of five teams. Each team played the others twice in a three-team doubles match format.

After two rounds of play, the standings are:

1. Fort Monroe, 7-1
2. NASA, 6-2
3. Hilton, 5-3
4. Riverside Wellness, 1-7
5. Village Green, 1-7

The second place standing is an improvement from last year. The NASA team beat the number one team once, and almost forced a play-off for first place.

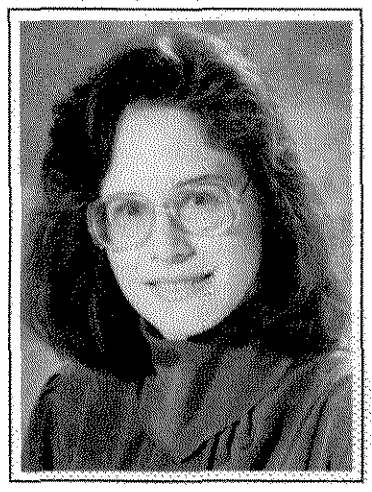
Plans are underway to begin the fall season September 3, followed by a picnic and round-robin social doubles matches. Teams from the Hampton Tennis Center, the Shipyard and Fort Eustis and others are expected to enter the fall season.

For information on joining the NASA tennis team or starting a team, call Charles Bryant, PTPA publicity officer, ext. 44674, or Bill Shinn, NASA team captain, ext. 47273.

NASA tennis team members are shown (front row, L to R) Bill Shinn, captain; Charles Pruitt, George Lawrence, David Carter, Maynard Sandford; (back row) Charles Bryant, Tom Yager, Woody Lovelace, and John Wilson. Members not pictured are Leonard Credeur and Herman Bohon.

Rinsland Chosen to Attend Smith College Program

-by Kristy Alligood, OPA intern



Pamela Rinsland, assistant head of Electronics Branch, Flight Electronics Division, has been selected for the Management Program for Women at Smith College, Northhampton, Massachusetts.

The program involves two three-week summer sessions that will include studies in managerial skills, finance and formal and informal organizational structure. The program also entails a project to be completed on the job during the year between the summer sessions.

"This will be an all-female program. It will be interesting to be in that type of environment because I will be able to learn about other women's management experiences. There will be women from all types of fields, from government to corporate. I am hoping to come back recharged," Rinsland said.

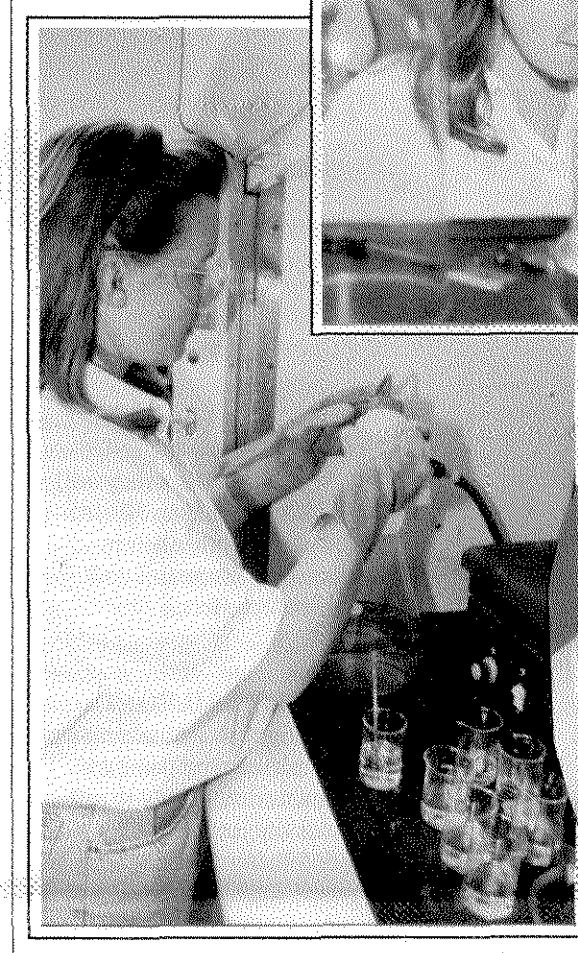
Rinsland was selected for her outstanding leadership and technical skills. She currently leads 81 personnel in all phases of in-house flight and ground software and hardware development. Her technical skills range from in-depth software expertise to an understanding of digital electronics.

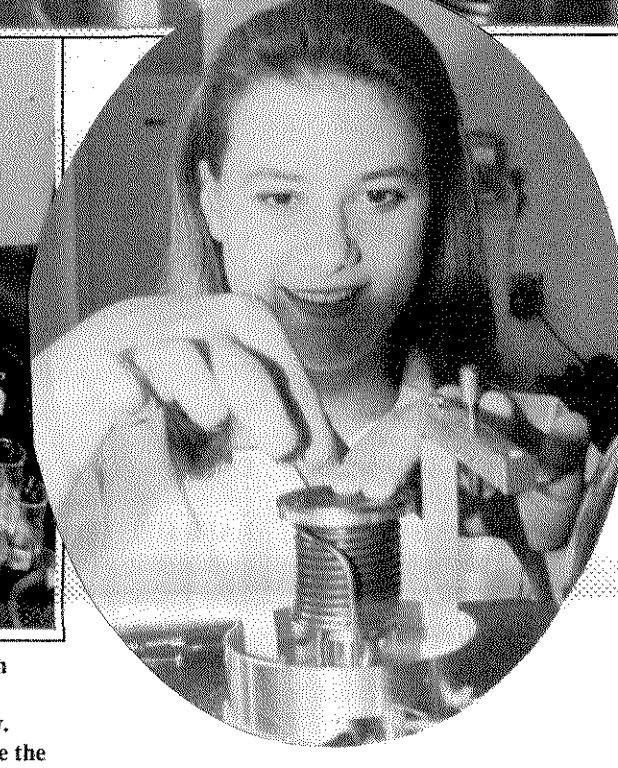
"I took the technical path throughout my education so I never had formal training in economics and business administration. This program will allow me that training," Rinsland said.

Technical and management accomplishments abound in Rinsland's 19 years service to NASA. She was one of the first at NASA-Langley to work with microprocessors. She designed the original PC-based data retrieval system for the Long Duration Exposure Facility. Rinsland also has numerous accomplishments involving ground-based software systems residing on the Center's mainframe computers.

Rinsland says that throughout the highly competitive application process she received a great deal of encouragement from NASA management to participate in the program. She says that this program will allow her to give something positive back to NASA.

Under the watchful eye of Dr. Richard Partos, summer volunteer Andrea Turk prepares a sample for dielectric analysis to determine the cure rate of a resin.





At 17 years old, Andrea Turk just "clicked" with chemistry. She is spending part of her summer volunteering in Langley's composites laboratory. Here she performs an acid digestion to determine the fiber volume of a composite.

-photos by Mary Beth Payne

Volunteer Analyzes Composites and Careers

When most high school students are researching the tanning index, Andrea Turk may be analyzing debris collected during shakedown of the 8-Foot High Temperature Wind Tunnel.

A certified lifeguard, she could be working at her local pool or at a fast-food restaurant like many of her friends. But this rising senior has traveled over a thousand miles from her Oklahoma residence to volunteer in a NASA Langley laboratory.

"Working here these past few weeks has been an overwhelming experience," said Turk. "My chemistry textbook has come alive as I work with the sophisticated equipment and interesting people here at Langley."

Her immediate goal is to find out more about what a chemist does. She is studying under the mentorship of Dr. Jeffrey Hinkley in the Polymeric Materials Branch and working closely with Dr. Richard Partos of Analytical Services and Materials, Inc. (AS&M).

"Andrea has been a big help to me," said Partos. "She has performed countless numbers of acid digestions, mastered dielectric analysis of high-performance resins and worked some on the scanning electron microscope." Partos, in turn, has taken extra time to explain the purpose of these activities as well as their consequences to give Turk a broader picture of the services a chemist might supply in a research environment.

Turk has found a home away from home with two other Langley employees, Jeff and Sally Viken. Jeff, an AS&M employee, is assigned to Laminar Flow Control Project Office; Sally, with Lockheed Engineering and Sciences, is assigned to the Cockpit Technology Branch. The Vikens and their two-year-old son Kevin have made Turk's first trip to the East Coast delightful and have shown her many of the local sites.

Travel isn't foreign to this 17-year-old and neither is science. For the past two summers, Turk has ventured to Washington state to work with her dad designing circuit boards for engine monitoring systems for experimental aircraft. When she finishes her internship here at Langley, she travels to Michigan to attend a ten-day leadership camp. Then she will return to Mustang High School, Mustang, Oklahoma, to complete her final year in high school, fulfill her elected position in the Student Council and begin filling out applications for college.

Turk has narrowed her college focus to three--MIT, Colorado School of Mines, or the University of Washington. Whichever she ultimately chooses, she will undoubtedly approach higher education with more career experience than most.

Volunteer Program Benefits All

The Volunteer Service Program is designed to provide volunteer service to federal departments and agencies as well as to provide educational experience to students. An individual interested in applying to the Volunteer Service Program must be at least 16 years of age and a full-time or part-time student enrolled in a high school, college, university, trade or technical school. For additional information on the Langley program, contact D. Elaine Gause, Placement and Position Management Branch, Mail Stop 174, or call (804) 864-2576.

Tidbits from Training

Nominations Sought for Seminars, Conferences, Fellowships

Langley is seeking nominees for Office of Personnel Management (OPM) executive seminars, Brookings management conferences and NASA fellowships. All directorate and division offices have received, or will soon receive, memoranda which list these programs, eligibility guidelines and recent Langley participants who can share personal experiences regarding a particular program.

Management education programs at the OPM executive seminar centers in Oak Ridge, Tenn.; King's Point, N.Y.; and Denver, Colo., are two-week seminars covering a variety of topics. These seminars are open to GS/GM-13s and above who have not attended an OPM seminar in the previous five years. Brookings Institution conferences are for senior-level managers, GM-15 and Senior Executive Service (SES). Many of these one-week conferences are offered in Williamsburg and cover broad policy issues. Competition for OPM and Brookings programs is limited to Langley civil servants.

NASA fellowhsips are available for both managers and non-managers from GS-12 to SES. The management fellowships offer an opportunity to study at Harvard, MIT, Stanford, Carnegie Mellon, Penn State, Syracuse, Smith or Simmons College for periods from one week to one year. NASA also offers, in conjunction with the National Space Club, three fellowships which are open to non-management employees. These three allow recipients to pursue research or coursework at any institution in the United States or abroad, where a faculty sponsor is found. Competition for NASA fellowships begins at the Center. Center nominees then enter the Agency-level competition, which ends in December.

Applications for all of these programs may be initiated by the individual and must be passed on to the directorate level. However, all nominations must have directorate endorsement. Directorate nomination deadlines are late July or early August. For additional information about seminars, conferences and fellowships, contact Louise C. Hamilton, ext. 42571.

Happenings

LAA SOCIAL will be held Friday, July 19, from 4 to 6:30 p.m. in the H.J.E. Reid Conference, 14 Ames Road.

BLOODMOBILE. The American Red Cross will hold a Bloodmobile Wednesday, July 17, from 9 a.m. to 3 p.m. in the H.J.E. Reid Conference Center.

NASA TOASTMASTERS meet the second and fourth Wednesdays of the month in the H.J.E. Reid Conference Center. The next meeting is July 24 from 11:30 a.m. to 1 p.m. Guests are always welcome.

FEDERALLY EMPLOYED WOMEN, Langley chapter, will meet Wednesday, July 31, at 11:30 a.m. in the executive dining room of the NASA cafeteria.

BODY DYNAMICS. Free high energy-low impact aerobics classes are held Mondays, Wednesdays and Fridays at 6:15 a.m. in the LAA gym, 14 A Ames Road. Classes are open to civil service employees.

NOON-TIME STRIDERS. Join the walking club Tuesdays and Thursdays at noon for a 30-minute walk and enjoy the outdoors with company.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m., in the LAA gym. Cost is $12 per month. First class is free.

BENCH STEP AEROBICS classes are held Saturdays from 9:30 to 10:30 a.m. in the LAA gym. Cost is $6 per month. Try aerobics with muscle!

NAT'L SPACE SOCIETY picnic and model rocket launch will be held Sunday, July 21, from 11 a.m. till dark on the grounds of the H.J.E. Reid Conference Center. This event is sponsored by the local NSS chapter and the Virginia Air and Space Center and is open to all interested families. Call Doug Stanley for details and reservations.

SAILING LESSONS are available from the Langley Yacht Club. Several classes in basic sailing and windsurfing for juniors (ages 10-17) and adults are open. The cost ranges from $75 to $160 depending on the class and membership status. For more information, contact Dave Arnold, 851-1709.

LAFB OFFICERS' CLUB is a membership club. Call 766-1361 for more information.

SHAKESPEARE. The Virginia Shakespeare Festival return to Williamsburg with *As You Like It* and *The Merchant of Venice*, July 5-28. Tickets are $10 and are available from the Shakespeare Festival, The College of William and Mary, Williamsburg, Va., 23185. For details and reservations, call 221-2674.

TIDEWATER DINNER THEATER features *No Time for Sergeants*--the Broadway comedy that made Andy Griffith a star! Now through August 25. For more information and reservations, call 461-2933 or 245-8304.

VA LIVING MUSEUM announces its new outdoor Wetlands Aviary, a precious haven to beautiful and endangered wildlife. The aviary will be home to more than 30 birds acquired from other nature centers, zoos, museums and waterfowl breeders.

FOR SALE: SAILBOAT. 14-Foot Sunfish with aluminum trailer. New Imron paint and aluminum trim. Ready to sail--includes life jackets. $625. Call 865-6659 after 5 p.m. weekdays, any time weekends.

PENINSULA PATHFINDERS will sponsor a seven-mile walk to benefit the local chapter of the Muscular Dystrophy Association Saturday and Sunday, July 13 and 14. Call Marilyn Richardson, 461-0177, or Jim Geith, 851-1829, for details.

Retirement Party

Jean D. Miller will be honored at a retirement dinner Tuesday, July 23, from 6 to 9 p.m. in the H.J.E. Reid Conference Center. Cost is $13 per person or $25 per couple which includes gift. Separate contribution for gift only are welcome. For reservations, contact Annie Young, Mail Stop 182, ext. 43426, by July 15.

Video Section Announced

The Visual and Printing Services Branch, Research Information and Applications Division, has opened a new services section in Building 1201T, 15 West Taylor Road.

The Video Section will provide a centralized facility for state-of-the-art broadcast quality video recording, production, post-production and duplication services.

To request services, call Tom Sweeney, ext. 46726, or Elizabeth Davis, ext. 46749, or complete a Video Section work order and forward to Mail Stop 283. Work orders may be requested by calling the Section.

Spaceweek '91 Links Education and Exploration

The Spaceweek '91 theme, "Look to the Heavens and Learn," is an Albert Einstein quote which reflects the fact that education and space exploration are closely bound, with one's success directly affecting the other's.

Spaceweek '91 targets and challenges the nation's youth and educators. The children in school today are likely to be the first settlers on another planet. The excitement of space encourages them to excel in school and prepare themselves for the exciting future which lies before them.

Spaceweek was created in 1980 by a group of space enthusiasts to encourage individuals, government and industry to join in an effort to carry a positive message about space to the public during the week of July 16-24 each year.

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

SPACEWEEK

Celebrate Spaceweek, July 16-24

Researcher News

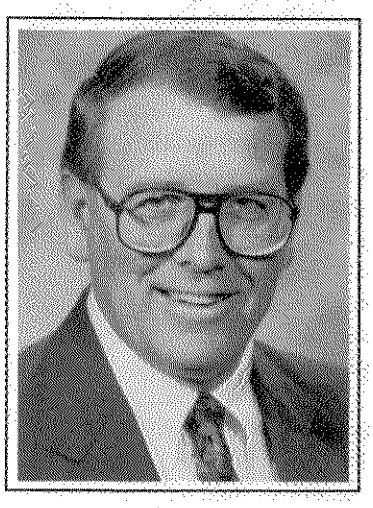
NASA
National Aeronautics and Space Administration
Langley Research Center

Researcher News

Volume 5, Issue 15 July 26, 1991

Bi-weekly Employee and Contractor Publication

Beach Heads NASP Program

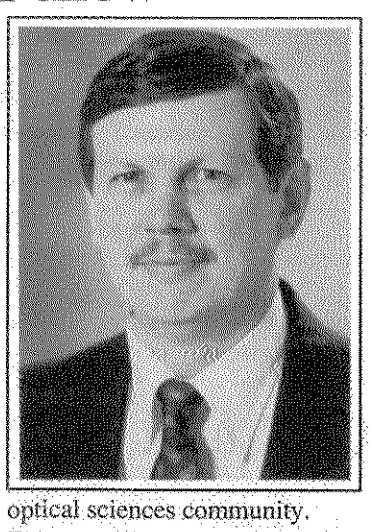


Dr. H. Lee Beach Jr. has been named director of the National Aero-Space Plane (NASP) program for the NASA Headquarters Office of Aeronautics, Exploration and Technology.

In this position, he will be responsible for the planning, direction and execution of NASA's participation in this joint NASA/Department of Defense program. In addition, he will be responsible for NASA's generic hypersonics research and technology program.

Beach is an internationally recognized authority in the field of high-speed, air-breathing propulsion. He began his NASA career at Langley in 1970 and has conducted and directed research related to propulsion, hypersonic aircraft and aeronautics. From 1981 to 1984, he headed Langley's Hypersonic Propulsion Branch; in 1984, he was named acting assistant chief of the High-Speed Aerodynamics Division. In October 1985, Beach went to NASA Headquarters in Washington, D.C., as acting deputy director for aeronautics where he remained until February 1986 when he was named Langley's deputy director for Aeronautics.

Browell Named American Optical Society Fellow



Dr. Edward V. Browell, head of Langley's Lidar Applications Group, Atmospheric Sciences Division, has been elected a fellow of the Optical Society of America.

Browell was recognized for his "distinguished service in the advancement of optics; particularly for important contributions to the development of differential absorption lidar techniques for measurements of trace gases in the atmosphere." Lidar, which stands for Light Detection and Ranging, is a laser remote sensing technique used in atmospheric investigations.

The Optical Society of America is the principal professional organization for the optical sciences community. The research conducted by members of this organization ranges very broadly over the optical sciences from basic research in optical processes and in optical properties of materials and the atmosphere to applied research in laser and lidar development and in active and passive remote sensing of the atmosphere.

Browell began his NASA career in July 1974 as a research scientist in the Atmospheric Sciences Division, and he has headed the Lidar Applications Group since 1978. He also serves as an experiment scientist for the Lidar Atmospheric Sensing Experiment (LASE). In his present position, he develops advanced laser systems for the remote measurement of atmospheric gases and aerosols and conducts investigations of fundamental atmospheric processes with these systems in global field experiments. His specialized fields of work are laser remote sensing and atmospheric sciences.

KSC Prime Landing Site

Shuttle Director Robert Crippen has announced that Kennedy Space Center will be the primary landing site for STS-43. "This decision has been briefed to, and concurred with, by management officials at all levels within NASA. The KSC landing is going to be approached in a conservative manner using very restrictive flight rules to ensure the safety of the vehicle and crew. However, there is a high probability that the landing could be at Edwards Air Force Base and the program is prepared to handle a landing at either site."

Langley Colloquium

Modern Jet Transports Topic of Langley Lecture

-by Jean Drummond Clough

The evolution of modern jet transports is the story of incremental advances in aeronautical knowledge and application. This story will be told during a NASA colloquium Monday, August 12, by Richard W. Taylor, retired vice president-government technical liaison, Boeing Commercial Airplane Group, Seattle, Washington.

Taylor will speak to employees, retirees and contractors in the H.J.E. Reid Conference Center, 14 Ames Road, at 2 p.m. In his presentation, he will trace the evolution of propulsion systems and aerodynamics from the earliest swept-wing jet bombers through the first commercial jet transports to today's efficient subsonic transports.

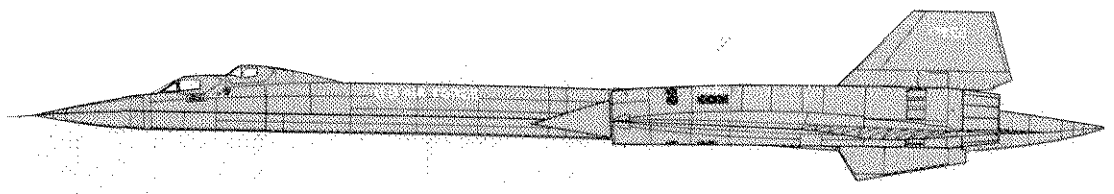
According to Taylor, these developments are directly responsible for the reliability and efficiency of modern twin-engine jet airplanes, especially those flying extended-range routes flown previously only by three-and four-engine jetliners.

Taylor worked for Boeing for 44 years, during which he held a wide variety of assignments. He joined Boeing as a design engineer and later was selected project pilot for the B-47 Stratojet bomber program. He was director of engineering on the Model 737 Program. After the 737 had operated in airline service for a year, he was named vice president-general manager of the Military Airplane Systems Division.

Taylor also served as Boeing vice president in charge of the Washington, D.C. office; vice president and special assistant to the president of Boeing Commercial Airplane Company; vice president-general manager for the 707/727/737 Division; and vice president-product development, Renton Division.

Taylor graduated from Purdue University. He is a fellow of the American Institute of Aeronautics and Astronautics and a member of the Society of Experimental Test Pilots. In 1967 he was presented the Society's James H. Doolittle award for excellence in technical management. In 1973, he was awarded an honorary doctor of engineering degree from Purdue University. Upon his retirement from Boeing, he was presented the Federal Aviation Administration's gold medal for extraordinary service, the highest honor for individuals outside the agency. The award cited Taylor's "outstanding leadership and untiring efforts to assure design safety of the air carrier fleet . . . throughout the world."

Taylor holds a commerical pilot's license and has flown B-47, B-52, KC-135, 707, 727, 737, 747, 757 and 767 model Boeing airplanes. He owns and flies a twin-engine Piper Aerostar with which he holds National Aeronautics Association speed records.



Unique Twin Cockpit SR-71B to Arrive at Dryden

The last of three SR-71 aircraft, loaned to NASA by the U.S. Air Force, is scheduled to arrive at NASA's Ames-Dryden Flight Research Facility, Edwards, Calif., in late July. The agency plans to use the Mach 3-plus "Blackbirds" as high-speed, high-altitude research testbeds.

The SR-71B is the only remaining twin-cockpit version of the famous reconnaissance models that are still the world's fastest and highest-flying production aircraft. The Air Force used the B-model as a pilot trainer.

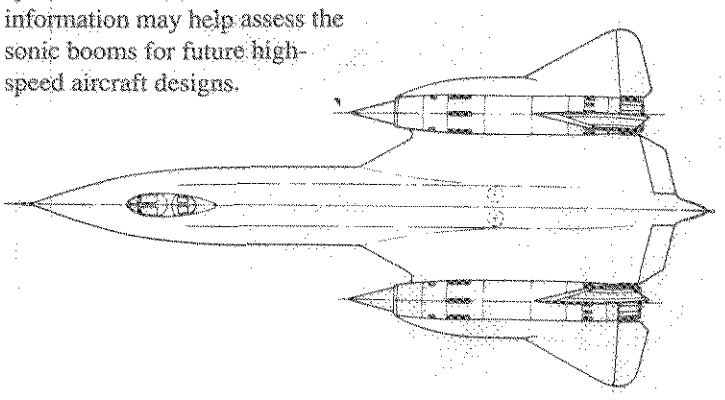
The Lockheed SR-71s can fly 2,200 miles per hour (more than three times the speed of sound) and at altitudes of more than 80,000 feet. NASA expects to use the aircraft in this flight environment for a variety of research areas including aerodynamics, propulsion, structures, thermal protection materials and high-speed, high-temperature instrumentation.

Data from the SR-71 research program could aid designers of future supersonic/hypersonic aircraft and propulsion systems. Beneficiaries of this information would include a future high-speed civil transport and the National Aero-Space Plane program.

Later training flights could include the program's first research experiments. For example, NASA researchers could collect data on the propagation and intensity of sonic booms that the SR-71 generates at various speeds and altitudes. This information may help assess the sonic booms for future high-speed aircraft designs.

Two SR-71s already received by NASA are "A" models, which have a cockpit for the pilot and a station for the flight engineer. The planes came to Ames-Dryden in early 1990 and are in flyable storage.

NASA research pilots Stephen D. Ishmael and Rogers E. Smith will fly the SR-71s; Robert E. Meyer and Marta Bohn-Meyer are the flight engineers. The Meyers are the first husband-wife team of aeronautical engineers on flight status at Ames-Dryden.



News Briefs

Venus Lava Flow May be Similar to Current Earth Eruptions --- The Magellan spacecraft, mapping the surface of Venus with imaging radar, has discovered a lava flow that may represent a volcanic eruption similar to those that recently took place in Japan and the Philippines. A geologist on the Magellan science team said the spacecraft has been mapping a planet dominated by volcanism. Large volcanoes, long lava flows and rivers of lava have formed on the surface of Earth's nearest planetary neighbor and may be continuing to form today. Unusual volcanoes with petal-shaped flows have been imaged which are different from most other volcanoes on Venus. The lack of weathering or erosion due to lack of water on Venus allows scientists to view a whole preserved sequence of volcanism.

Astronaut O'Connor to Leave NASA --- Astronaut Bryan O'Connor, commander of the recently completed STS-40 Spacelab Life Sciences mission, will leave NASA July 29 to become commander of the Marine Air Detachment at the Naval Air Test Center, Patuxent River, Md. O'Connor is a colonel in the Marine Corps. Prior to the STS-40 flight, O'Connor was pilot on STS-61B in November 1985. During his 11-year stint with the Johnson Space Center, he also served as chairman of NASA's Space Flight Safety Panel from September 1986 through February 1989. He has been deputy director of flight crew operations since August 1989.

Galileo to Set Course for Encounter with Asteroid Gaspra --- NASA's Galileo spacecraft turned and fired its small on-board thrusters July 2 to set its course for an encounter with the asteroid Gaspra in October 1991. Acting on computer commands sent to it by engineers at the Jet Propulsion Laboratory, the 2-1/2-ton spacecraft began its maneuver about 11 a.m. EDT. The maneuver will alter Galileo's velocity in space by about eight miles per hour, slowing it slightly and adjusting the flyby distance at Gaspra on October 29 to 1,000 miles. The October event will be the first flyby of an asteriod.

Astronaut Coats to Leave NASA --- Astronaut Michael L. Coats will retire from the Navy and leave NASA August 1 to become director of Advanced Programs and Technical Planning at Loral in Houston. Coats is a captain in the Navy. He was pilot on STS-41D and commander of STS-29 and STS-39. In addition to these flight assignments, Coats served as acting chief of the Astronaut Office from May 1989 to March 1990.

Soviet Space Officials Visit NASA Facilities --- A 15-member delegation of Soviet space officials, headed by Oleg N. Shishkin, minister of general machine building, USSR, visited NASA Headquarters and space centers July 9-16. During his visit to the Soviet Union last October, NASA Administrator Richard H. Truly invited Shishkin and other Soviet space officials to visit NASA facilities. The Soviet delegation was briefed on the Agency's programs at Headquarters. They toured Space Shuttle and Space Station facilities at NASA's Goddard Space Flight Center, Greenbelt, Md.; Kennedy Space Center, Fla.; Marshall Space Flight Center, Huntsville, Ala.; Stennis Space Center, Miss.; and Johnson Space Center, Houston.

Ulysses Sets Course for Jupiter Flyby --- The Ulysses spacecraft fired two small thrusters July 8 to set the final course for its early February 1992 rendezvous with Jupiter. The trajectory correction maneuver, conducted by the mission operations team at the Jet Propulsion Laboratory, Pasadena, Calif., was the last change to the spacecraft's flight path before Ulysses completes its 484-million-mile journey to Jupiter. The eight and one-half-minute maneuver began at 9:24 a.m. EDT. NASA and European Space Agency officials said the maneuver was minor and was designed to alter the spacecraft's trajectory by less than one foot per second. The trajectory correction will trim approximately four minutes off Ulysses' arrival at Jupiter.

NASA's Goddard Space Flight Center Studies Solar Eclipse --- NASA participated in two experiments to study the July 11 solar eclipse from the ground and from space. A new cryogenic instrument attached to the three-meter NASA Infrared Telescope Facility on the summit of Mauna Kea, Hawaii, tested a theory about the sun's atomic processes, and an X-ray telescope carried by a sounding rocket launched from White Sands, N.M., studied the solar corona. An eclipse provides a unique opportunity to observe the chromosphere, which in not normally "seen" by instruments because of the brightness of the Sun's surface.

Editor's note: For copies of the NASA News Releases summarized above, contact Jolyn Rivenbark, Mail Stop 146, or call 864-3293. Please request copies by headline printed in bold.

NASA Announces Second Technology Transfer Conference

Technology 2001, the second national technology transfer conference and exposition, will be held December 3-5 in the San Jose, Calif., Convention Center.

The event, sponsored by NASA, *NASA Tech Briefs* magazine and the Technology Utilization Foundation, will showcase leading-edge technologies from the space agency, other government agencies and contractors which industry can use to develop new or improved products and processes.

The 1991 event will build on the overwhelming success of Technology 2000, a two-day conference held last November in Washington, D.C.

Expanded to three days, the Technology 2001 technical sessions will feature 120 papers covering critical technologies in five areas: advanced manufacturing, electronics, computer technology and software engineering, materials science and biotechnology and life sciences.

Additionally, Technology 2001 will have three times as many exhibits as last year, covering 50,000 square feet. Exhibitors will include all nine NASA field centers, the Departments of Energy, Defense, Commerce and other agencies, as well as universities, government research centers and a diverse array of high-tech companies.

Employees Recognized for Superior Accomplishment

Cathryn J. Stafford and **Robert D. Brown**, industrial hygenists in the Environmental Engineering Section, and **Gregory F. Sullivan**, environmental engineer in the Safety and Environmental Management Section, have been cited "in recognition of contributions to the LaRC Environmental Compliance Program."

Mary Lynn Jones, stay-in-school student in the Fabrication Division, has been recognized "for exemplary performance as a stay-in-school student assigned to the Resources and Contracts Branch."

Robin K. Rubrecht, head of the Laboratory Electrical Support Unit, has been rewarded "for exemplary technical and supervisory support to laboratory research."

Herbert R. Kowitz, aerospace technologist assigned to the Aeroassist Flight Experiment Project Office, has been cited "for outstanding leadership and technical support while serving as the Rarefied-Flow Aerodynamic Measurements Experiment (RAME) instrument manager and AFEPO electronics systems manager."

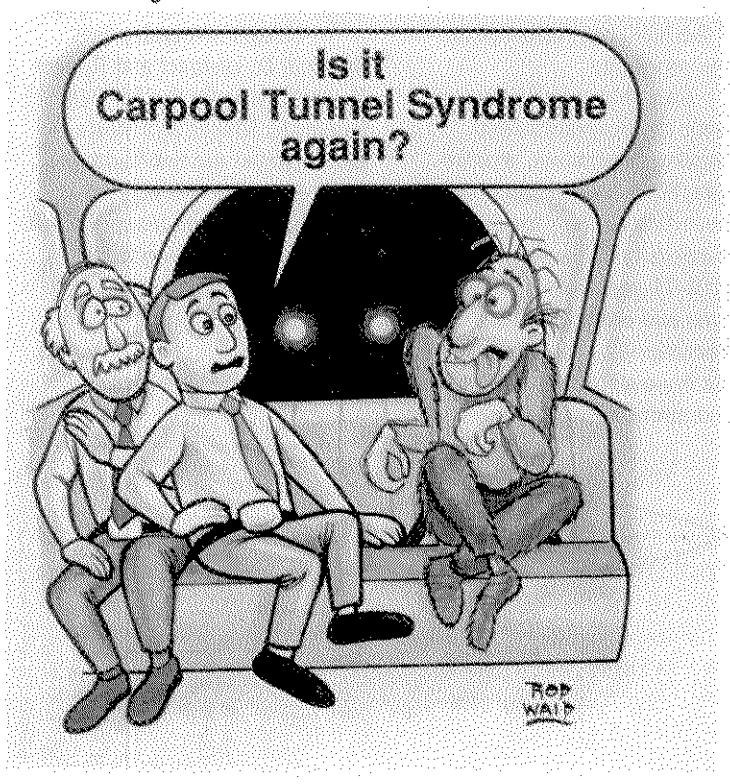
Call for Papers

The NASA Langley Measurement Technology Conference will be held April 22-23, 1992. Papers are solicited dealing with current research, development and aerospace applications of measurement and instrumentation technology in high-temperature environments in the areas of pressure, strain/force, temperature/heat flux and flowfield diagnostics. Deadline for submission of abstracts is September 16.

Abstracts should be a minimum of 500 words. Authors of accepted abstracts will be notified by November 1. Papers will be published in a NASA Conference Publication and distributed to all registered attendees.

Submit abstracts to William L. Sellers III, Mail Stop 170. For registration or general information, contact Dr. Richard R. Antcliff, Mail Stop 235A, or call (804) 864-4606.

Lankley



In Memoriam

Sympathy is extended to the family of **Joseph Briggs**, who died July 5 in Sentara Hampton General Hospital. Briggs retired from NASA Langley in 1983 after 42 years of service.

Help Pave the Way

See your name go down in history. For a $50 tax deductible contribution to the Virginia Air and Space Center and Hampton Roads History Center, your name or the name of you choice will be engraved on a paving stone that will be placed in the Center's main courtyard.

Be a part of the NASA/NACA section. Over 150 pavers have been reserved to date.

Call 727-0800 or 1-800-457-0402 for details.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

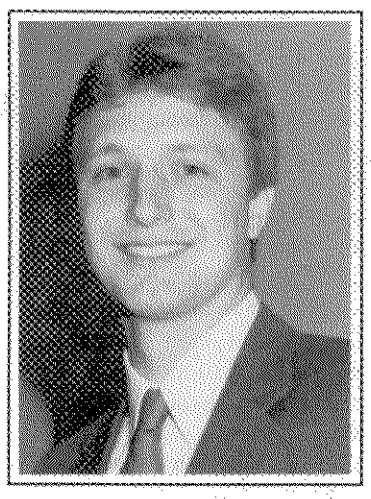
People & Places

Langley Newsmakers

Davis Honored for Best Paper

D. Dale Davis Jr., Army Aerostructures Directorate, was presented the Robert L. Lichten award at the American Helicopter Society's 47th Annual Forum and Technology Display in Phoenix, Arizona. Davis was honored for his paper, "Detailed Analysis and Test Correlation of a Stiffened Composite Wing Panel."

The Lichten Award is given to the author of the best technical paper presented at a regional meeting during the preceding calendar year. The award is based on the author's personal contribution, the originality of the work and the technical content.

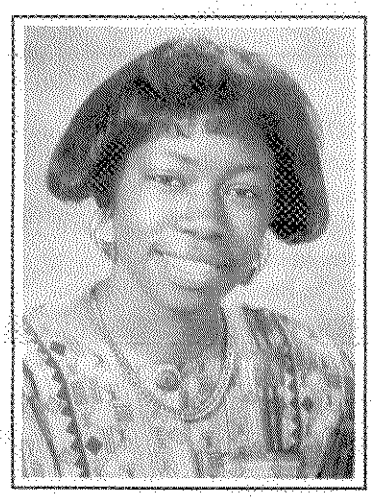


Davis, who is assigned to the Computational Mechanics Branch, will present his award-winning paper at the European Rotorcraft Forum, September 24-27, in Berlin.

Lynch is National Award Winner

Antoinette L. Lynch, secretary in the Technical Library Branch, has been named a National Collegiate Award winner in computer science by the United States Achievement Academy (USAA).

Lynch, who attends Thomas Nelson Community College, was nominated for this national award by Elsie Lewis, a student activities technician at TNCC.



USAA winners are selected on the recommendation of professors, coaches, counselors or other school sponsors and upon standards of selection set by the Academy. Criteria for selection are academic performance, interest and aptitude, leadership qualities, responsibility, enthusiasm, motivation to learn and improve, citizenship, attitude and cooperative spirit, and dependability.

Career Program Candidates Chosen

Eight employees have been selected for the Career Field Development Program (CFDP).

The CFDP is a competitive program designed to provide opportunities for selected employees to earn undergraduate degrees with financial assistance from the Center.

The program is structured in two tiers. Participants in Tier I may attend up to nine hours of classes each week during duty status. Selected recently are **C. Lynn Jenkins**, Visual and Printing Services Branch; **Gail S. McQuigg**, Technical Support Section B; **Linda S. Urquhart**, Acquisition Operations Branch; **Stephanie A. Vay**, Laser Technology and Applications Branch; and **William C. Wilson**, Electrical Systems Section.

Tier II particpants attend courses during off-duty hours. Selected employees are **Rebecca W. Bales**, Management Support Division; **Kendall W. Sherman**, Controls-Structures Interaction Office; and **Laura J. Smith**, Systems Validation Methods Branch.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program is designed to permit employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following employees are approved leave recipients:

- Velma L. Clark
- Linda E. Edmundson
- Kdean Hargrove
- Gael M. Hawkins
- Noel A. Talcott Jr.
- Catherine B. Worth

If you wish to donate annual leave to these recipients, or wish more information concerning the Voluntary Leave Transfer Program, contact Linda Park of the Employee Relations Section, ext. 42610.

Personnel Profiles

Langley . . . Her Field of Dreams

-by Allan Hanrahan

One of those time-honored rituals of summer--besides baseball--is graduation. Jeanette W. George, a 26-year Langley veteran, realized her late father's dream and her own ambition when she graduated from Saint Leo College in July.

Amid many honors, she received her bachelor of arts degree in human resources, with a minor in computer information systems. George credits her selection for the Center's Career Field Development Program for the attainment of a goal she had only viewed in the distant, misty future.

George had already earned associate degrees. The first was in business from Sanford Business College in Sanford, N.C., where she was born, reared and graduated from high school. Another was from Thomas Nelson Community College in computer information systems. A third was from Saint Leo College in human resources. In addition, there have been numerous classes taken over the years in support of her computer systems analyst position in the Business Data Systems Division's Administrative Software Applications Office. The office is headed by Iris "Jo" Russell, of whom George says, "She has been so very supportive and encouraging . . . . In fact, all of them (her supervisors) have been," she added.

"But working toward my four-year degree was the first time I ever got involved in the school itself. I really, thoroughly, enjoyed going to school," stated the summa cum laude graduate. In addition to coursework, she served on the yearbook staff for two years as well as the school newspaper, had works published in the school literary magazine, and took part in a half-dozen fund-raising events for charity.

Jeanette George proudly displays the Christa McAuliffe trophy awarded by St. Leo College for excellence in academic and service achievements.

In fact, an activity that began as a school project--volunteering at the Heritage Place Nursing Center in Poquoson--became a long-term effort.

"I got involved and attached to the people there," she confessed. "I do a little bit of everything--anything to help."

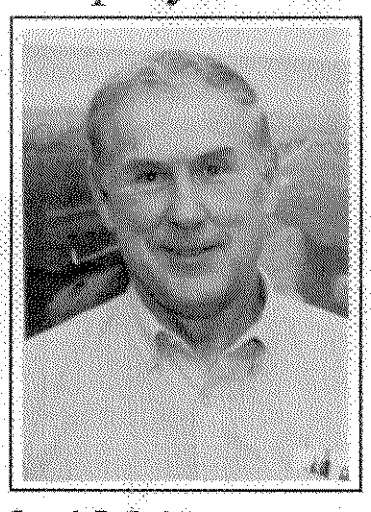
George still found time to help the Salvation Army soup kitchen and served the Meals-On-Wheels program for two weeks at Christmas so that the regular volunteers could have some time off. She continues to provide special favors for 27 of the people who are served by that program.

Judging from the foregoing, it is easy to see why George was inducted into the Kappa Gamma Pi National Catholic College Graduate Honor Society for outstanding academics and service to school and community. She was also awarded the Saint Leo Christa McAuliffe Award for overall excellence in academic and service achievements. She was elected to Who's Who Among Students in American Universities and Colleges, a recognition conferred annually on outstanding student leaders.

"I didn't know about the awards and wasn't going to take part in graduation. I was convinced by the Dean that I should because, as he pointed out, it was an important day in my life. So, we drove back from vacation early so that I could participate." She and her husband Sam, a Shipyard employee, have two daughters, Debbie and Kathi, and a son Scott.

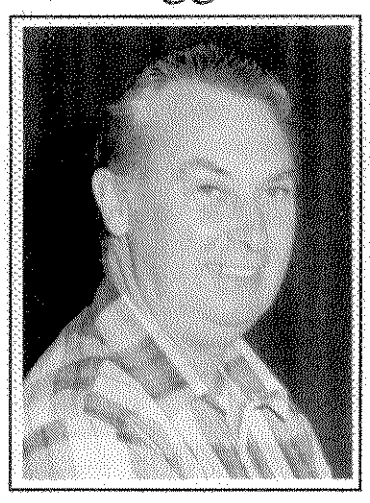
What's in the future for this award winner? Jeanette's next at bat . . . she's looking at graduate school.

Employees Receive Suggestion Awards



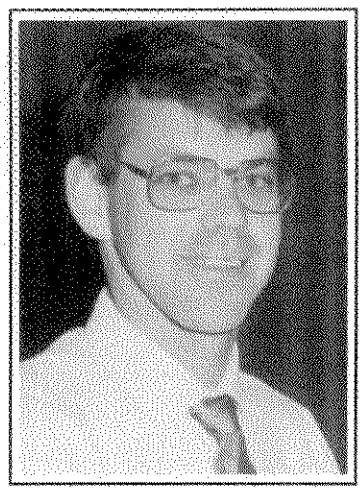
Joseph B. Jackson,

Analysis and Computation Division, was recognized for his suggestion titled "Removal of Old LaRC Telephone and Beckman Cables."



John D. Bresnahan,

Operations Support Division, was honored for his suggestion titled "Consolidated Hydraulic System."



Robert J. Wallis,

Facilities Engineering Division, was cited for his suggestion titled "Filling Underground Storage Vessels."

Happenings

LAA SOCIAL will be held Friday, August 2, from 4 to 6:30 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road.

FEDERAL WOMEN'S PROGRAM COMMITTEE will meet Wednesday, August 14, at 8:15 a.m. in the executive dining room of the NASA cafeteria.

NASA TOASTMASTERS will meet Wednesday, August 14, from 11:30 a.m. to 1 p.m. in the H.J.E. Reid Conference Center. Guests are always welcome.

LAFB OFFICERS' CLUB is a membership club. Call 766-1361 for more information.

TAC BAND will present free concerts Tuesday evenings at 7 p.m. at Hampton's Mill Point Park beginning July 23. Free tickets are available by sending a self-addressed stamped envelope to TAC Band Publicity, 564 TAC Band, Langley AFB, Va. 23665-5540.

MODEL RAILROADERS. Visit the Chesapeake Bay and Western HO Scale Railroad, 110-C Dare Rd., Grafton. Meetings on Thursdays at 7:30 p.m. For more information, call Joe at 864-3730 or 229-8633.

NASA FLAG FOOTBALL season begins September 14. Deadline for team entries is August 23. Contact Roger Lepsch at ext. 44520 for details.

NIGHT ON THE NILE. Fourth annual evening of Middle Eastern dance to benefit the Leukemia Society will be held at 7 p.m. Saturday, August 3, at Fields Dance Studio, 596 Hemlock Road, Newport News. Admission is $5 for adults; $2 for children under 12. For reservations, call 249-3839.

INFERTILITY SUPPORT group meets at the Jewish Community Center, Newport Avenue, Norfolk, the second Monday of the month. For more information, call 877-3094 or 220-1440.

WANTED ROOMMATE: Male to share two bedroom apartment with AC, W/D. Two miles from NASA. $170 per month plus half utilities, deposit and weekly chores. Non-smoker only. Contact Claudio, 766-2494. Leave message.

FOR SALE: AUTO. '86 Dodge Colt, 4-door sedan, A/C, 90,000 miles. Good condition. Asking $1,500. Call 766-3628 for more information.

Langley's Technical Library: Gateway to Information

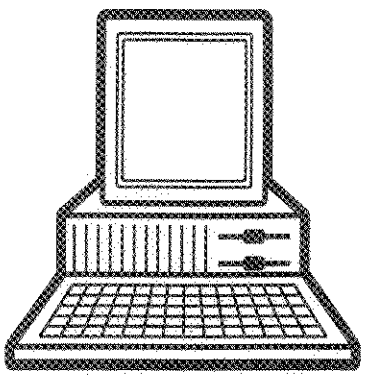
-by S. A. Motley

By early 1992, Langley researchers will find the Technical Library's on-line catalog is only as far away as their desktop computers. With a quick connection through LARCNET, scientists and engineers will have access to the entire book collection and portions of its journal and document holdings. This is only one of several expansions planned by the Library over the next year.

Researchers' access to the library's new Scientific and Technical Information Library Automated System (STILAS) will begin later this summer with the installation of on-line public access workstations in the reading room. Interface with LARCNET will follow. In addition to searching bibliographic information, the system will allow users to forward electronic messages and to place holds on specific titles.

Two CD-ROM workstations will be added to the Library's reading room. These 386-based machines with VGA color monitors and Pioneer CD-ROM jukebox drives will provide Langley with access to more than 15 databases ranging in coverage from aerospace to computers and management. The library is investigating copyright restrictions and networking systems for its CD-ROM collection and plans to make these available over LARCNET as well.

Finally, the staff is researching the value of optical disk technology as an archival and search medium by publishing its own CD-ROM. This prototype disc will contain the full test and images of a subset of classic NACA reports and will be available for testing by



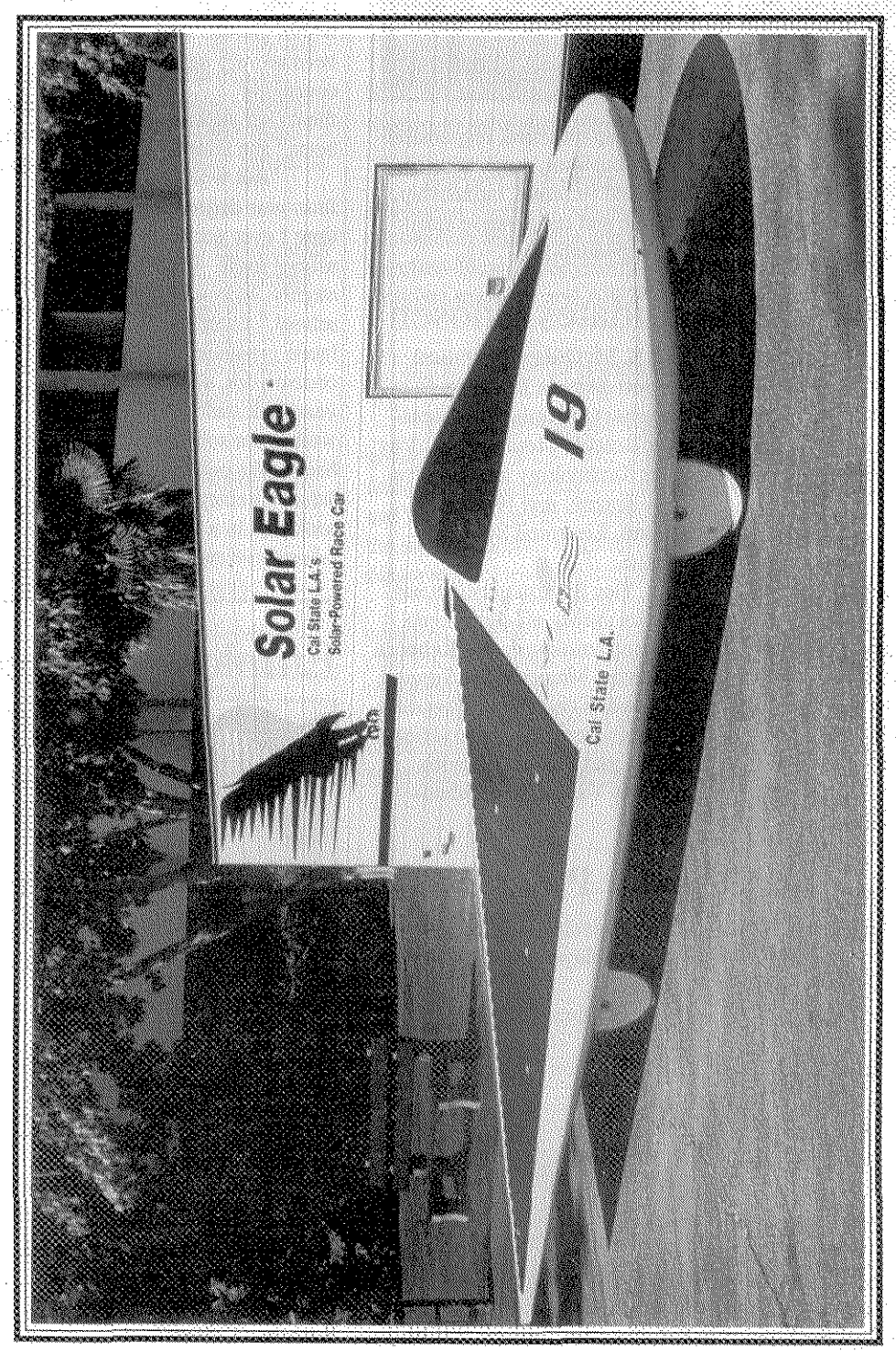
Langley researchers in 1992.

The Langley Technical Library is more than a storehouse of books, documents and journals. Capitalizing on advances in electronic information storage and retrieval, the library is extending its services beyond its own walls and enhancing its role as a gateway to scientific and technical information.

PENINSULA YOUNG SINGLE PARENTS organization is open to all single parents--divorced, widowed, separated or never married--who have children under 21. Call 827-8408 for more information.

BODY DYNAMICS. Free high energy-low impact aerobics classes are held Mondays, Wednesdays and Fridays at 6:15 a.m. in the LAA gym, 14A Ames Road. Classes are open to civil service employees.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m. in the LAA gym. Cost is $12 per month. Bench Step aerobics classes are held Saturdays from 9:30 to 10:30 a.m. in the gym. Cost is $6 per month.



Coming in August!

Solar Eagle **is a solar-powered car designed and built by the Cal State L.A. School of Engineering and Technology students, faculty and staff. NASA Langley served as one of the major sponsors of this endeavor. The *Solar Eagle*, which placed fourth in the 1,643-mile General Motors Sunrayce, will be on display at Langley August 5 in conjunction with a presentation by a Cal State spokesperson. The Cal State L.A. car came in first to win the Arizona Governor's cup at the regional competition for solar cars held in Phoenix in April.**

National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 RESEARCHER,NEWS
VANVALKENBURG, RANDAL L.,
MAIL STOP 125A BLDG 1268

Researcher News

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 16 August 9, 1991

Researcher News

Bi-weekly Employee and Contractor Publication

Discovery to Carry Langley Middeck Experiment in September

-by Jean Drummond Clough

When Discovery rockets into orbit in September on Space Shuttle mission STS-48, it will carry one of the most complex experiments to be conducted in the orbiter middeck. The experiment called MODE, for Middeck 0-gravity Dynamics Experiment, is designed to study critical aspects of mechanical and fluid behavior of components for future spacecraft, such as Space Station Freedom.

MODE, developed by the Massachusetts Institute of Technology (MIT) under contract to the NASA Langley Research Center, is part of NASA's In-Space Technology Experiment Program (IN-STEP), which allows universities, industry and NASA to develop technology flight experiments that could be flown in space.

The Langley experiment consists of special electronically instrumented hardware that Shuttle astronauts will test in the craft's pressurized middeck section. MODE will combine two tests of "nonlinear," gravity-dependent dynamic behavior: the sloshing behavior of fluids in partially filled containers and the vibration characteristics of jointed truss structures.

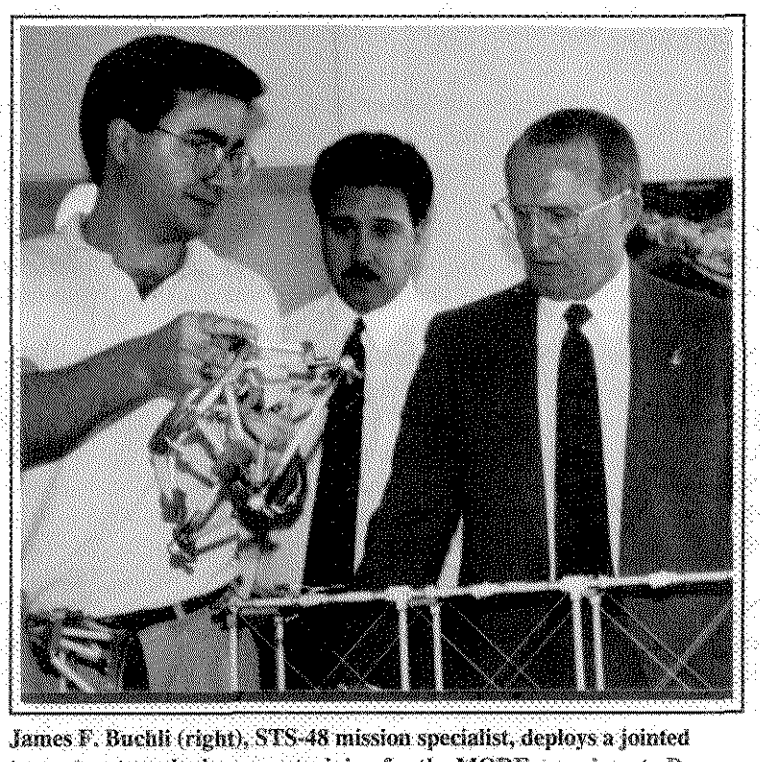
The power, signal conditioning and data storage facilities for the experiment will be combined in an experiment support module, which functions as a miniature dynamics laboratory. Astronauts will control and monitor the MODE experiment by using a special purpose computer, with voluminous data being stored in an optical disk drive.

In the fluid portion of the experiment, designed to simulate fluid behavior in large tanks, two small, partially filled transparent plastic cylinders containing fluids (one water and one silicon oil) will be mechanically excited to make the contents slosh. The dynamics of the sloshing fluids will be studied through use of a force-balance unit which will accurately measure the forces caused by the sloshing.

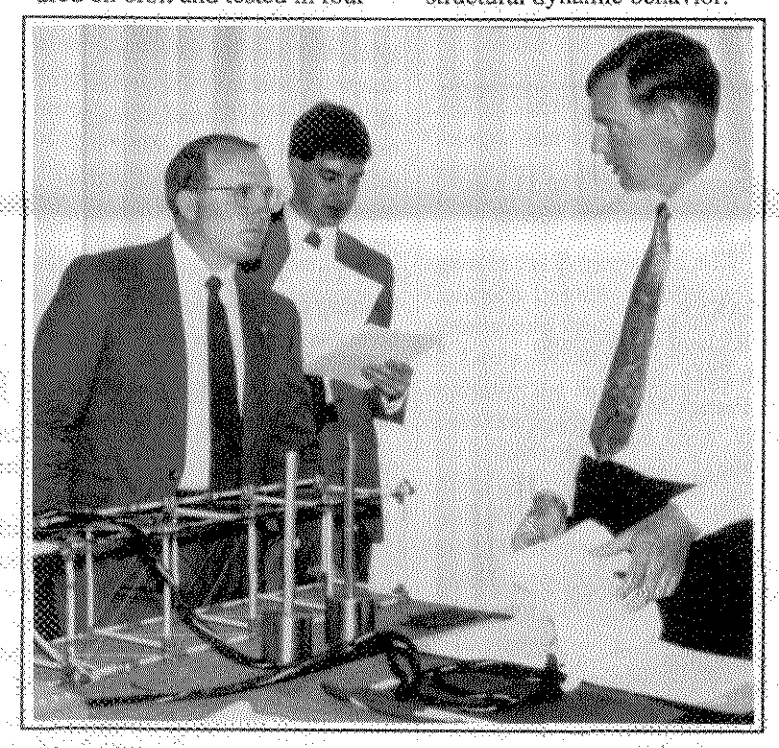
The structural test article, a highly sophisticated, highly instrumented, jointed truss structure, is modeled after the original transverse boom of the Space Station Freedom and resembles the truss structure of a construction crane boom. When deployed in the Shuttle middeck, it is about 72-inches long with an 8-inch square cross-section. The test structure, including a rotation joint similar to the "alpha joint" that will be used to control the orientation of the solar arrays on Freedom, will be reconfigured on orbit and tested in four different arrangements. All of the configurations are expected to behave differently in the weightless environment of orbital flight than on the ground.

Each test requires a computer controlled actuator to gently shake the structure. Eleven accelerometers and four strain gauges will be arranged along the structure and will measure how the structure responds to the "pulses" from the actuator. In the course of the two-day on-orbit testing, astronauts will monitor and videotape the experiments, modifying them when necessary as unexpected conditions arise.

NASA anticipates that the innovative design of this relatively low-cost experiment will lead to clearer understanding of nonlinear fluid and structural dynamic behavior.



James F. Buchli (right), STS-48 mission specialist, deploys a jointed truss structure during crew training for the MODE experiment. Dr. Javier de Luis (left), experiment support scientist from Payload Systems Inc. explains to Dr. Andrew S. Bicos, project scientist from McDonnell Douglas Space Systems Co., Huntington Beach, Calif., and Buchli, how a rotary joint similar to the Space Station Freedom alpha joints connects to the structure. The alpha joint planned for Freedom will allow the solar panels to track the sun.



STS-48 Mission Specialists James F. Buchli and Mark K. Brown and John Rogers (background), Shuttle Support Office, Johnson Space Center, review procedures for deploying the structural test article part of MODE. The crew training took place at the subcontractor's plant, Payload Systems Inc.

The behavior of the alpha joint, fluid slosh, and deployable and erectable structures are among the critical dynamics issues for future space missions. The knowledge gained from MODE should be applicable to a very wide range of future space activities.

The MODE experiment was awarded to MIT's Space Engineering Research Center in 1987, with the center's director professor Edward F. Crawley as the principal investigator. Payload Systems Inc., Cambridge, Mass., was selected by MIT to be the prime subcontractor responsible for hardware fabrication and certification, and mission support.

McDonnell Douglas Space Systems Company, Huntington Beach, Calif., joined the program in 1989. The company has used its own funds to support the design and construction of the MODE structural test article and will participate in the flight data analysis.

IN-STEP is funded by NASA's Office of Aeronautics, Exploration and Technology in Washington, D.C. MODE is managed by Langley's Space Station Freedom Office. Along with NASA Headquarters in Washington, D.C., Langley is providing technical and administrative assistance in integrating the experiment into the Space Shuttle.

Astronaut Class of 1990

The Astronaut Candidates of the class of 1990 recently became full-fledged astronauts.

The group consists of seven pilots and 16 mission specialists.

Peter J.K. Wisoff, Ph.D., 32, Norfolk, VA; David A. Wolf, M.D., 34, Indianapolis, IN; Air Force Capt. Carl E. Walz, 35, Cleveland, OH; Janice E. Voss, Ph.D., 34, Rockford, IL; Donald A. Thomas, Ph.D., 36, Cleveland, OH; Army Capt. Nancy J. Sherlock, 34, Troy, OH; Ronald M. Sega, Ph.D., 38, Northfield, OH; Ellen Ochoa, Ph.D., 33, LaMesa, CA; James H. Newman, Ph.D., 34, San Diego, CA; Army Maj. William S. McArthur Jr., 40, Wakulla, NC; Thomas D. Jones, Ph.D., 36, Baltimore, MD; Air Force Capt. Susan J. Helms, 33, Portland, OR; Bernard A. Harris Jr., M.D., 35, Temple, TX; Army Maj. Michael R.U. Clifford, 40, Ogden, UT; LeRoy Chiao, Ph.D., 30, Danville, CA; Navy Lt. Cmdr. Daniel W. Bursch, 34, Vestal, NY; Marine Maj. Terrence W. Wilcutt, 41, Russellville, KY; Air Force Capt. Richard A. Searfoss, 35, Portsmouth, NH; Air Force Maj. Charles J. Precourt, 36, Waltham, MA; Air Force Maj. James D. Halsell Jr., 34, Monroe, LA; Air Force Maj. William Gregory, 34, Lockport, NY; Air Force Maj. Eileen Collins, 34, Elmira, NY and Kenneth D. Cockrell, 41, Austin, TX.

IN-STEP Program Takes First Flight

NASA's In-Space Technology Experiments Program (IN-STEP) passed a major milestone when its first flight hardware, the Tank Pressure Control Experiment (TPCE), rode aboard Atlantis on STS-43. It's second flight hardware, Middeck 0-gravity Dynamics Experiment (MODE), will follow in September aboard Discovery on STS-48.

TPCE, developed by Boeing Aerospace Company, Seattle, Wash., under contract to NASA's Lewis Research Center, Cleveland, Ohio, demonstrated how cryogenic storage tank pressures can be controlled by actively mixing the fluids to eliminate temperature stratification. Transfer and control of very cold (cryogenic) fluids in microgravity is critical to plans for several future U.S. space efforts.

TPCE was contained in a Getaway Special canister mounted on the sidewall of Atlantis's payload bay. It included a Plexiglas tank 85 percent filled with liquid freon 113, a refrigerant. The remaining volume contained helium gas and freon vapor, so that the tank pressure was about two pounds per square inch above the liquid's vapor pressure.

During each test run, heaters were turned on to raise the pressure above equilibrium. Liquid jets then circulated the freon at a low velocity, a process that returned the pressure to equilibrium. The experiment measured pressure, temperatures and jet flow rates within the tank. Video cameras recorded the liquid flow patterns through the tank's transparent walls.

MODE will study the critical aspects of mechanical and fluid behavior of components for future space structures *(See related story above).*

One of the most attractive features of these experiments is the potentially large payoff for a relatively small financial outlay. Boeing developed the TPCE hardware for $1.7 million. MODE cost $1.9 million.

IN-STEP has brought NASA, the aerospace community and academia together to research potentially valuable space technologies using small, relatively inexpensive payloads.

News Briefs

Aviation Safety Reporting System Creates Safer Skies --- The Aviation Safety Reporting System (ASRS) -- the world's most comprehensive aviation human factors database -- has been preventing air accidents and saving lives for 15 years. More than 180,000 confidential reports of aviation incidents are contained in the ASRS database, which NASA manages for the Federal Aviation Administration (FAA). This vast amount of information makes ASRS invaluable to air safety researchers in the federal government, the aviation community, academia and the public. "The most important product of ASRS is the constructive attitude that the system has developed in pilots, controllers and many others involved with aviation," said William Reynard, director of ASRS at NASA's Ames Research Center, Mountain View, CA. "The people who file reports reveal and discuss all types of situations they consider threats to aviation safety."

NASA Global Change Study Raises New Questions --- A NASA study indicates that the Sahara Desert, the world's largest desert, has undergone a variety of fluctuations in size during the past 11 years. Since 1980, scientists at NASA's Goddard Space Flight Center, Greenbelt, MD., have been studying data from a variety of Earth observing satellites in an effort to provide insight on global climatic change. "The object of this study was to look at the size of the Sahara Desert to see if it is increasing in size," according to Dr. Compton J. Tucker, Goddard Earth scientist. Scientists believe that changes in global desert area would mean that the Earth is undergoing a climate change on a global scale.

NASA Rockets To Support International Cloud Study --- Seven NASA sounding rockets will be part of an international campaign to study polar Noctilucent Clouds (NLC), the highest and coldest clouds on Earth, from Kiruna, Sweden, July 25 through August 12. During this 20-day period, researchers from the United States and Europe will use aircraft, ground-based radars and rockets launched from the Swedish Space Corporation Facility in Kiruna, to study NLC. These clouds occur near an altitude of 52 miles only during summer periods at northern polar latitudes. The purpose is to gain an understanding of NLC and their relationship to Polar Mesospheric Summer Echoes (PMSE).

NASA Observatory Detects Strongest Gamma Ray Source --- The Goddard Space Flight Center's Energetic Gamma Ray Experiment Telescope (EGRET), one of four instruments aboard NASA's Gamma Ray Observatory (GRO), has detected "the most distant and by far, the most luminous gamma-ray source ever seen," according to EGRET principal investigator Dr. Carl Fichtel. The EGRET team reported that a source of intense localized gamma radiation was detected between June 15 and 28. The source of the radiation has been identified with the variable Quasar 3C279, located in the constellation Virgo, approximately 7 billion light years from Earth.

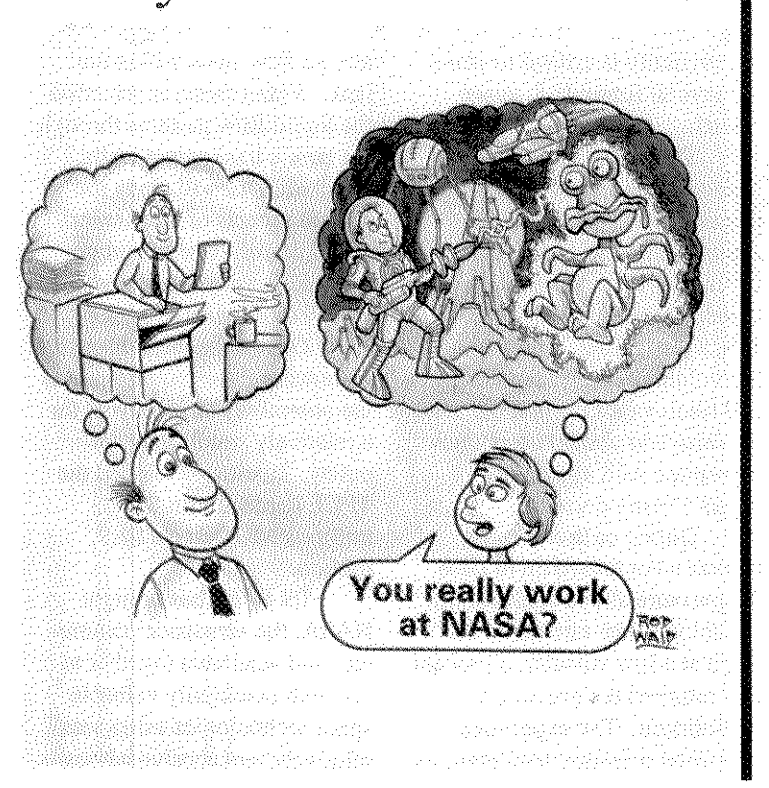
Senior Management Reveiw

The Senior Management Research Review will be held Monday, August 19, from 9 to 11 a.m. at 17 West Taylor Road, Subsonic Tunnels Offices, Room 200. All employees are invited to attend. Program accomplishments will be given by the following Langley researchers.

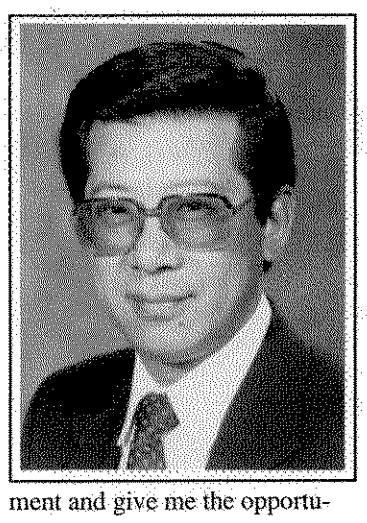
TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:00	Energetics of Gas-Surface Interactions in Transitional Flows at Entry Velocities	Dr. Richard G. Wilmoth (AB, SSD, Space)
9:15	Inference of Cirrus Cloud Properties from Visable and Infrared Radiances	Dr. Patrick Minnis (RSV, ASD, Space)
9:30	LaRC Tests Demonstrate Superior Wear Performance of Modified Space Shuttle Main Gear Tire	Robert H. Daugherty (LIDB, SDYD, Structures)
9:45	In Situ Windshear Detection Algorithm Developed for Transport Aircraft Equipped with Inertial Reference System	Rosa M. Oseguera (VORB, FLTMD, Flt Sys)
10:00	Subsonic Transport High-Lift Flight Research Phase I	Long P. Yip (FRB, FAD, Aero)
10:15	Performance of a Translating-Strut Inlet Concept Mach 2.5 to 5.5	Carl A. Trexler (HPB, FLDMD, Aero)
10:30	Director's Comments	

Following these presentations, the program directors will give status reports.

Lankley



Yu Named Sloan Fellow



Dr. James C. Yu, assistant chief of the Acoustics Division and manager of Langley's Rotorcraft Research and Technology Program, has been selected as a Sloan Fellow for 1991-92. Yu will follow a nine-month course of study leading to a master of science degree in management at Stanford University in California.

Out of numerous applications, Stanford has selected 42 mid-career executives from the United States and abroad as Sloan Fellows. The Stanford Sloan program was founded at the Stanford Graduate School of Business in 1957 under a grant from the Alfred P. Sloan Foundation. The program is designed especially for executives moving from narrow fields of specialization into general management. It gives the selected fellows an extraordinary opportunity to acquire an in-depth management education at one of the nation's leading graduate school of business.

"The Stanford Sloan Program will provide me with a unique opportunity for personal growth and the formal management training which would significantly enhance my effectiveness as a technology manager in present and future positions," said Yu. "It will broaden my training and perspective on business operations and management and give me the opportunity to exchange management experience with other participants from other sections of the business world."

Yu began his NASA career in 1977 as an aerospace technologist in the Acoustics Division, first serving as a group leader and then assistant head of the Aeroacoustics Branch.

In his present position, he is responsible for assisting and supporting the division chief in pursuing research goals of understanding, predicting and reducing noise sources and acoustic loads on aircraft and rotorcraft; predicting total system noise from transport, general aviation and rotary wing aircraft; quantifying subjective response to aircraft noise; and reducing and controlling the noise received by passengers and crew inside flight vehicles.

Employees Support Bloodmobile

Langley civil servants, contractors and retirees donated 329 pints of blood at the July 17 American Red Cross Bloodmobile.

Achieving status were:
12 gallons---Roger K. Amick;
8 gallons---Benjamin F. Guenther;
7 gallons---Virgil S. Laney, Weldon L. Staton;
6 gallons---Ronald D. Lewis, Raymond C. Scholz;
5 gallons---Ray L. Seals, Mark S. Wampler;
4 gallons---Christopher M. Cagle, Wayne D. Geouge;
2 gallons---William P. Chambers, James K. Geiger, James R. Mack, Thomas Toll;
1 gallon---Mark I. Hudgins, David G. Kessler, Kevin J. Laferriere, Karl I. Maddox, Brian T. Wonderly;
First Timers---Daniel Baize, Scott P. Belbin, Kelly Carroll, George D. Cowley, Ann Drummond, Selene D. Garcia, Sandra K. Keyes, Mary H. Lewis, George D. Lockett, Theresa A. Oden, Kurt Severance and Tobias L. Velasquez.

The NASA coordinator for the Langley Bloodmobile was Annette L. Forrest; Kitti Schatz was the Red Cross coordinator.

Have You Seen...

The following items have been reported missing. If you have seen any of them, please contact the Equipment Management Section, ext. 42056.

Counter, Frequency, ECN 0019938
Load Calibration Kit, ECN 0469995
Multimeter, Digital, ECN 0020582
Sensor, Temperature, ECN 0531862
Voltmeter, Digital, ECN 0284802
Temperature Measuring System, ECN 0466672
Printer, ADP, ECN 0353225
Camera, Television, ECN 0143779
Camera, Television, ECN 0221781
Tablet Graphics, ECN 0423046
Toshiba, Computer, Micro, ECN 0055014
Photographic Flash Unit, ECN 0530304
H-P 45 Calculator, ECN 0550854
Display (X-Y), Computer, ECN 0527798

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Career Field Development Program: Pilot Graduates Soar to Success

Phyllis Kay Millen's ambition, drive and commitment, coupled with a NASA continuing education program, have taken her career to the outer limits of space. After beginning as a secretary in the Structures Directorate, she now works as an aerospace technologist (AST) in the Space Station Freedom Office thanks to the Career Field Development Program.

A recent graduate of the program, Millen earned a baccalaureate degree by attending classes part-time with NASA providing financial support.

Millen is among four employees who participated in the program's pilot year in 1988. The program is structured in two tiers. Tier I participants attend up to nine hours of classes each week during duty hours; Tier II participants attend courses during off-duty hours.

"The Career Field Development Program allowed me to go to classes during the day, provided me with financial assistance and gave me the motivation and support to finish school and get my degree," said Millen. "What would have taken me numerous years on my own only took me three years in the program."

In May, she graduated with a bachelor's degree in computer science from Christopher Newport College.

Based on its initial success, the Career Field Development Program has increased the number of participants and scope of eligibility.

The first graduate of the program was Yvonne M. Armstrong, who graduated in December 1989 with a business administration degree in finance from Christopher Newport College. Since graduating, she has been selected as a program analyst for the Resources Analysis Office, Projects Division, through a competitive placement position announcement.

"I wanted the personal satisfaction and career enhancement the degree could offer me," said Armstrong. "It was very important to me that NASA benefit from my degree."

Before entering the program, Armstrong had been taking three classes a semester and working full-time at NASA in the Fabrication Division and part-time as a legal assistant to pay for school. Because the program provided financial support and permitted her to attend classes during duty hours, she was able to maintain her ambitious schedule while focusing her efforts on her studies knowing that NASA had a stake in her success.

Two other graduates of the pilot program were Tier II participants who attended St. Leo's College on off-duty hours.

Virginia B. Marks received her business administration degree in computer information systems in December 1990. Marks, an administrative officer in the Guidance and Control Division, enjoys the personal satisfaction and accomplishment of receiving her degree. Before the program, Marks took classes but was moving very slowly toward a degree. The program eased the financial burden and allowed her to fully concentrate on her studies.

"Receiving my degree was a personal goal that has enhanced my job potential," said Marks. "It hasn't really changed what I do, it has just helped me do it better."

Under Tier II, Marks attended classes during off-duty hours. With two children ages 9 and 6, she relied on a team effort involving her husband and mother to take care of her children while she attended evening courses. In the fall, Marks will start working on her master's degree under NASA's Graduate Study Program.

The program helped Judy W. Evans complete a journey that started 20 years ago. After going to school on and off, Evans, head of the Financial Services Branch, finally received her business management degree in accounting. Her career at NASA began 29 years ago as a secretary, and she has progressively worked her way up to her present position. The only thing missing was her baccalaureate degree.

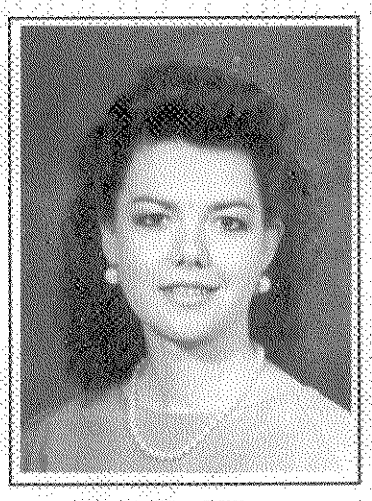
"Management has been very supportive of me throughout my career at NASA and I've been very loyal to NASA," said Evans. "My goal is to be successful and excel where I am."

Evans' outlook has helped her recognize the value and importance of her work and the opportunities that followed. Her loyalty to NASA was reciprocated when management in her division attended her graduation.

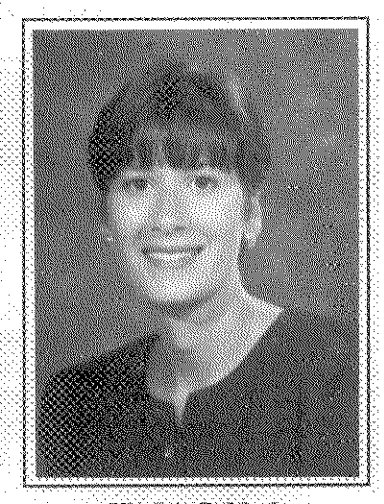
The Career Field Development Program has provided employees the opportunity to better themselves, their careers and their futures.

Other recent graduates, after the pilot program, were Lisa M. Harvey and Jeanette George. Harvey received her degree from Christopher Newport College and began a new position as a purchasing agent in the Projects and ADP Contracts Branch. George, a summa cum laude graduate of St. Leo's, works as a systems analyst in the Administrative Software Application Office.

"Since Millen, Armstrong, Marks and Evans comprised the 1988 pilot portion of the Career Field Development Program, 22 other Center employees have been selected to take advantage of this opportunity. The pilot program was limited to administrative professional employees, but now participants include technicians and clericals, said Robert Swain," director for Systems Engineering and Operations and chairman of the Undergraduate Training Committee. "Although there is no guarantee of a career change by attaining a degree, many of the participants are well on their way to positions of increased responsibility. Also, there is a tremendous feeling of inner satisfaction when personal goals are achieved. I feel the program is one of the best ever provided by the Center, since it is so beneficial to the employee in accelerating the fulfillment of long-held dreams."

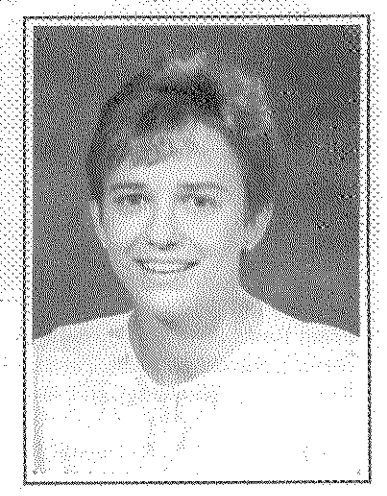


Phyllis Kay Millen



Virginia B. Marks

Judy W. Evans



Yvonne M. Armstrong

Administered under the auspices of the Undergraduate Training Committee, the program is offered to all permanent, civil service employees who have at least one year of current continuous service at Langley and who have completed approximately two years of undergraduate courses. This includes wage grade employees, technicians and clericals as well as administrative professionals. A rating panel, consisting of a representative from each directorate, screens the applications and recommends participants to the Undergraduate Training Committee for approval.

"The idea for the Career Field Development Program came from a Management Operations Directorate Retreat. We invited a group of young employees to make recommendations to management for improvements in the Directorate's work environment. Near the top of the list was a request to provide more assistance to employees seeking baccalaureate degrees. From this suggestion grew the two-tier program," said John Stokes, director for Management Operations. "I get a great deal of satisfaction when reading their success stories and receiving personal notes of thanks from participants after their graduation."

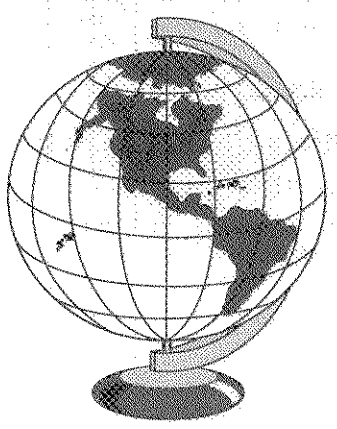
Dr. Mary H. Lewis, Employee Development and Services Branch, coordinates the Career Field Development Program.

Cofer Studies Kuwaiti Oil Fire Smoke

A research scientist from Langley's Atmospheric Sciences Division is part of the U.S./Saudi Arabian/Kuwaiti project team which is gathering and analyzing emissions from Kuwaiti oil field fires.

Wesley R. Cofer III is participating in the use of a helicopter-based sampling system, developed by Langley to study biomass burning emissions, which has been adapted to collect and characterize oil fire emissions. Under a United Nations plan, the group is seeking to determine emission strength for use in combustion/dispersion emissions and to assess potential global impact. The Royal Saudi Air Force is providing the helicopter sampling platform.

Cofer is a veteran NASA "smoke eater" who has flown into many fires collecting smoke samples for laboratory analysis. After Iraq fired the oil fields during Operation Desert Storm, he said computer-generated pictures showed smoke plumes 200 miles long. This pall was cast by reportedly over 500 flaming oil wells. At that time, conservative estimates placed the burning rate of the oil at 3 million barrels per day which meant that about 125 million gallons of Kuwaiti crude was going aloft daily. Other sources said the rate could have been as high as 250 million gallons each day. While some well fires have been squelched since then, the remaining activity still represents a major effusion of material into the atmosphere.



The missions began late in July when approximately 60 hours of flying time were to be spread over a 10-day span.

Training Tidbits

Engineering Courses Offered

Old Dominion University has provided an undergraduate engineering program at the Center since 1989. It was established in response to numerous requests received by the Employee Development Branch indicating a major need and interest in the program.

In spite of initial low enrollment, Old Dominion University has continued to offer the program at the Center. Its future is dependent upon the existence of a real need as demonstrated by increased enrollment.

The Mechanical Engineering and Electrical Engineering Departments will be offering the following courses at the Center beginning August 26:

ECE 312	Electronics
MEM 312	Thermodynamics II
MEM 315	Heat and Mass Transfer

If the program is needed, now is the time to demonstrate the need by enrolling! For more information on this program, contact George Allison, Employee Development Branch, ext. 42594.

Annual Inventors and Technology Utilization Luncheon Honors Inventors

Front Row: (L to R) Kimberly A. Chasteen, Dr. John H. Cantrell, Mrs. Pat Taylor (for Allen H. Taylor, deceased), Harold G. Bush, Patricia P. Davis, Daniel J. Murri, James R. Reeder, John H. Crews, Dr. Vernon T. Bell, Maggie Linehan, Cathi Maestrello (For Lucio Maestrello), Sharon S. Welch and Joy L. Bryant.

Middle Row: (L to R) Donald R. Bennington, Linda B. Blackburn, Daniel J. Crawford, Richard L. Puster, Robert L. Fox, Dr. Billy T. Upchurch, Dr. Jag J. Singh, Sidney G. Allison, Dr. Joseph J. Heyman, Dr. William T. Yost, Sang Q. Tran, Donald J. Progar, Dr. John W. Connell, George F. Helfrich and David C. Beals.

Back Row: (L to R) Philip O. Ransone, Robert Taylor (Allan Taylor's son), Robert C. Montgomery, David R. Schryer, Moses J. Farmer, Philip C. Kassel Jr., William T Davis, Stanley W. Ward, James C. Patterson, Norman P. Barnes, Marvin D. Rhodes, Dr. Terry L. St. Clair and Kevin B. Osborne.

(Missing From Photo: William H. Kinard, Robert L. Berry Jr., George E. Dickerson, Purnell Hopson Jr., Min Namkung, Anthony Jalink Jr., John P. Stack, Charles E. Byvik, David F. Johnston, Dr. Martin M. Mikulas, Donald H. Humes Jr., and Irwin M. Miller).

Technology Utilization Award Recipients: (L to R) Dr. John H. Cantrell Jr., Dr. Ernest S. Armstrong, Dr. Jag J. Singh, Dr. William Yost, John M. Franke, Dr. Ping Tcheng, Dr. Joseph S. Heyman, Dr. Terry L. St. Clair, Joseph J. Mathis Jr. (Missing: John D. Buckley, Paul M. Hergenrother).

Royalties Recipients: (L to R) Earnest W. Millen, Dr. Vernon T. Bell, Dr. John H. Cantrell Jr., Dr. William T. Yost, Robert L. Fox, Dr. Terry L. St. Clair, Joseph J. Mathis Jr. (Missing: James I. Clemmons, James F. Meyers, Anne K. St. Clair, Donald J. Progar, Dr. John D. Buckley and David F. Johnston).

Strides Made in NASA's Fitness Challenge

Participation in NASA's Inter-Center Fitness Challenge continues to increase. There have been 64 awards earned since the start of the competition. The challenge, based on the Presidential Sports Awards Program, has been issued to ensure that NASA employees are well represented in the increasing number of health conscious individuals.

The Fitness Center congratulates the following employees who have completed the requirements and earned an award in one or more categories:

Volleyball--Janice Bayer, Veloria Martinson, Frank Quinto. **Equitation**--Loretta Brown, Robert Brown. **Weight Training**--Ernest C. Burt III. **Sailing**--Dr. Richard D. Hansen. **Tennis**--Bandu Pamadi. **Softball**--Rodney D. Russell. **Running #2**--Jim Thomas. **Swimming #2**--Patrick Minnis. **Fitness Walking**--Wynee Johnson, Linda Rowell, Floyd Shipman, Charles N. Valade. **Aerobics**--Lee A. Lillard, Mary Mitchell **Bicycling**--Charles Dunton, Cliff Gentry, Walter (Doug) L. Heard, Frank Peri Jr., Washito Sasamoto, Terry Wallace. **Jogging**--Bruce Conway, Cliff Gentry, Dr. Richard Hansen, Dave Holmes, Joseph B. Jackson, Jim Leuci. **Sports/Fitness**--Sherman Clevenson, Paul Davidson, Ciff Gentry, Jerry Hefner, Catherine Herstrom, Michael Hudson, Charles Johnson, Scott Martinson, Mary Mitchell, George Olsen, Clemans A. Powell, Frank Quinto, Linda Rowell, Rodney D. Russell, Washito Sasamoto, Charles (Phil) Shore, Jag Singh, Clayton Turner, William C. Woods, W.R. "Bob" Young, James W. Youngblood.

Fitness Center Offers 12-Week "Health for Life" Weight Program

Summer is almost over and its time to really think about getting into shape. It's not too late to lose weight by Christmas and the New Year. Look and feel great while everyone else is making New Year resolutions to lose weight.

NASA's "Health for Life" is a program ready to help you lose weight the healthy way...for life!

It is a complete 12-week weight loss program which gives you the tools to practice a lifetime of proper nutrition and exercise with the aid of behavior modification and group support. The fall class begins Wednesday, September 11, with weekly brown bag seminars and twice-a-week exercise classes.

Forget the starvation diets and powdered meals; learn to eat real food and lose weight too. Others have tried it and found great results.

NASA employees may pick up applications at the Clinic or Fitness Center. Apply now and look great for winter. Applications will be taken on a first come, first served basis.

Colonial National Park Offers Battlefield Tours

The Colonial National Park is offering special tours of Yorktown Battlefield at 10:15 a.m. and 3:45 p.m on Saturdays and Sundays until September 3.

The one-hour guided tours will explore siege warfare tactics during the Revolutionary War.

Tours start at the National Park Service Center in Yorktown and will proceed to Redoubts 9 and 10. The guide will focus on the only major allied infantry action during the seige at Yorktown in 1781.

All programs are free to the public.

NASA to Honor Lunar Orbiter Office

Langley and the Alumni Association are co-sponsoring a reception honoring the former employees of the Lunar Orbiter Project Office (LOPO) at 5 p.m., on Friday, August 23, in the H.J.E. Reid Conference Center.

August will commemorate the 25th anniversary of the success in obtaining satellite pictures of the lunar surface vital to subsequent manned landings.

A committee is currently planning the activities for the reception. Look for registration and cost information in the mail. Mark your calender for this special occasion.

In Memoriam...

Royce K. McCormick, a senior electronics technician in the Instrument Support Section of the Instrument Research Division, died Saturday, July 20, 1991, at his residence. He was 53.

McCormick had been a NASA employee since October 1977. He was the Center's instrument consultant for magnetic tape recorders and instrument coordinator for several structures, acoustics and cryogenic flow research test facilities. During his career, he received four special service awards, the most notable being his system on the 720B transport used in the joint NASA/FAA controlled crash-test in the Mojave Desert in 1984.

"Royce was a key member of our instrument research team. We will miss his smile and 'can-do' attitude," said Bruce Conway, Chief, Instrument Research Division.

Competitive Placement Positions Open

91-51: Supervisory Aerospace Engineer, AST, Fluid and Flight Mechanics Program Management, GM-0861-14. Space Systems Division. Open to employees of all NASA installations with civil service status. Closes August 20.

91-52: Aerospace Engineer, AST, Air Breathing Propulsion Systems, GS-861-13. Fluid Mechanics Division. Open to NASA Langley employees with civil service status. Closes August 14.

People & Places

Technical Library to Test Online Catalog

by S. Motley & M. Ambur

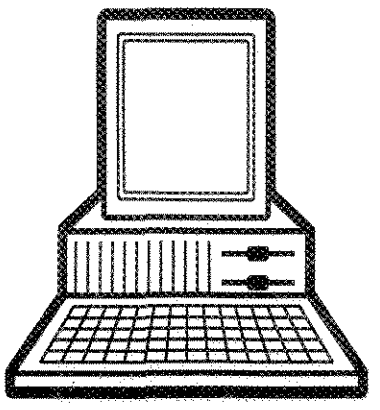
Langley researchers can begin testing the Technical Library's online catalog known as STILAS (Scientific and Technical Information Library Automated System). Using workstations located in the library's reading rooms in the first and third floor lobbies, researchers can query the database for materials of interest and find if they are currently available for loan.

STILAS contains bibliographic records for the library's entire book collection as well as a portion of its technical reports. The test will serve as a preliminary step in making the library's holdings accessible over LaRCNET by early 1992.

The STILAS system resides on a Unisys 5000/95 supermini computer system with two gigabytes of disk storage and uses the Unix operating system which provides the multi-user and multi-tasking environment essential for a library online catalog system. Written in C and developed by Sirsi Corporation, STILAS is designed for special libraries which handle technical reports as well as books and journals. STILAS is a fully integrated system, combining acquisitions, cataloging, serials, circulation and reference functions within a single database.

The heart of the STILAS system is its database which the library plans to build into a complete and accurate record of all its books, technical reports and journals. The database already contains bibliographic records for all 72,000 books currently listed in the card catalog located in the reading room. However, since the library's technical report collection numbers over half a million titles, the process of adding document records will be an ongoing project. During the next year, records for all journal titles and holdings will be added as will those for materials on order or in processing.

Scientists and engineers will find the STILAS online catalog easy to learn and a powerful tool for finding information quickly. Menus guide the user in performing searches by entering a single word or phrase or a combination of words which appear anywhere within a bibliographic record. The words entered may be an author's name, title, subject, key word, volume number, publisher, the city where a conference was held, or a publication date. The system also allows the search query to be refined using truncation, boolean and proximity operators, adjacency and hypertext.



STILAS's electronic bulletin board feature will allow users to view library announcements, conference dates and service bulletins as well as send suggestions and requests directly to the library.

The library staff is encouraging user participation in the test by offering special instruction of the STILAS online catalog. Field demonstrations and presentations on accessing the system over LaRCNET are planned for early next year. For more informaion, contact the reference staff at ext. 42356.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program is designed to permit employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following employees are approved leave recipients:

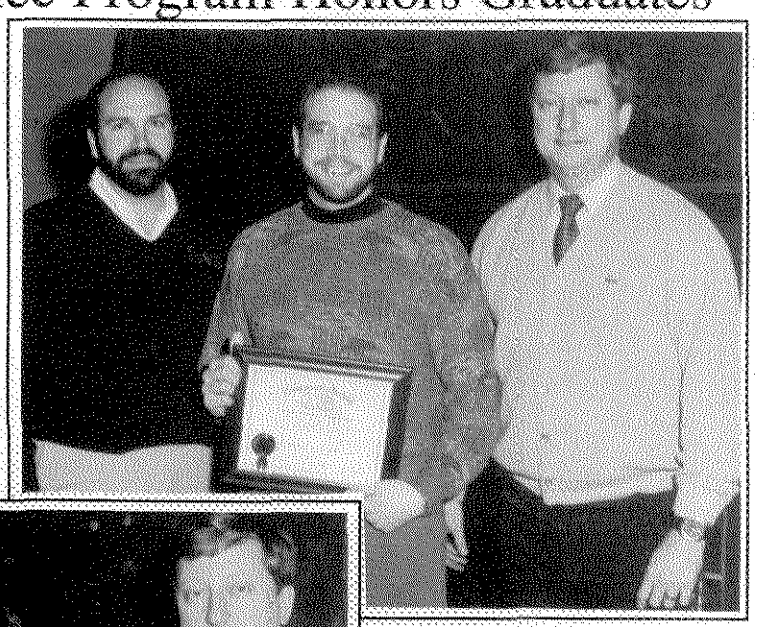
- o Velma L. Clark
- o Linda E. Edmundson
- o Kdean Hargrove
- o Gael M. Hawkins
- o Cassandra D. Stevens
- o Noel A. Talcott, Jr.
- o Catherine B. Worth

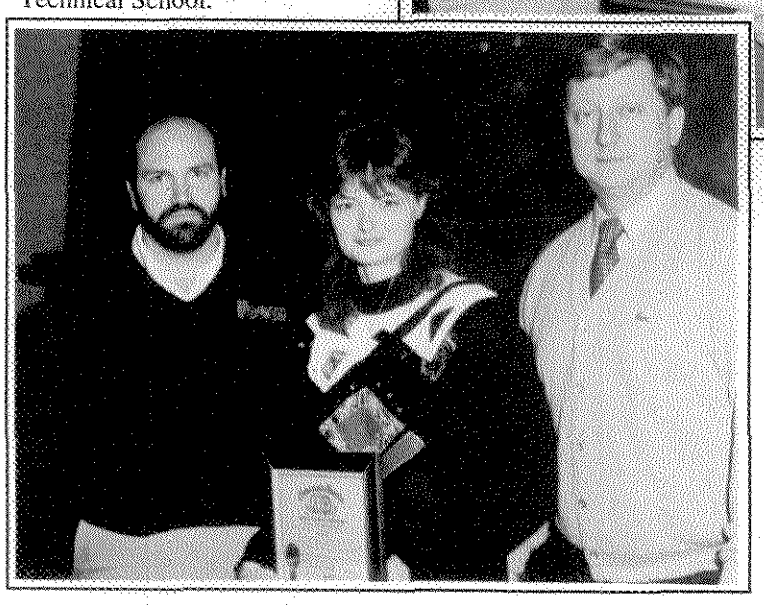
If you wish to donate annual leave to these recipients, or wish more information concerning the Voluntary Leave Transfer Program, contact Linda Park of the Employee Relations Section at ext. 42610.

EG&G Apprentice Program Honors Graduates

The Joint Apprentice Training Committee of EG&G, Langley Operations and IBEW Local 1340 recently awarded certificates of completion. Robin Freeman completed the carpentry program and Robert Roper completed the sheet metal program.

The EG&G apprentice program is certified by Virginia and consists of four years of on-the-job training and classroom intstruction at New Horizons Technical School.



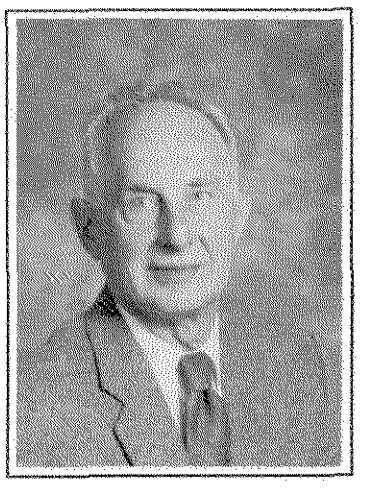


Above: Lester Jordan (left), business manager, IBEW Local 1340 and Jim Carbonneau (right), EG&G, Langley operations manager present Robert Roper with his certificate of completion in the sheet metal program.

Left: Lester Jordan (left) and Jim Carbonneau (right) present Robin Freeman (center) with her certificate of completion in the carpentry program.

Trimpi Receives AIAA Award

The American Institute of Aeronautics and Astronautics has awarded Robert L. Trimpi the 1991 AIAA Ground Testing Award. Trimpi was recognized for his outstanding research contributions during the AIAA/ASME/SAE Joint Propulsion Conference in Sacramento, California.



Trimpi was cited "for pioneering work in the conception, development and application of novel facilities, instrumentation and test techniques for experimental aerodynamic studies."

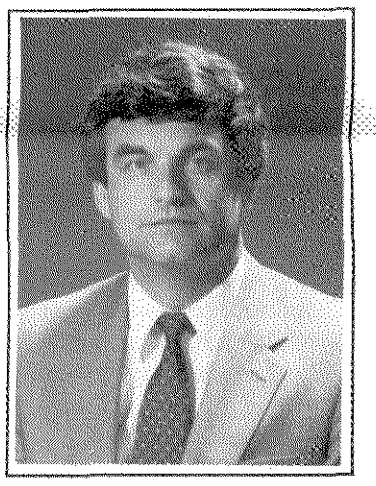
Trimpi retired from NASA in 1980 as associate chief of the High Speed Aerodynamics Division after a 30-year career with NACA/NASA.

For the past 10 years, he has been a senior research engineer at George Washington University. He has also served as a special consultant to NASA.

One of Trimpi's most important contributions was the conception and development of the Expansion Tube, a facility capable of generating gas test flows at speeds up to 25,000 miles per hour. This facility was originally used for planetary entry research and is currently a major contributor to the research of the propulsion system for the National AeroSpace Plane.

Pinelli Receives George Mandel Memorial Award

Tom Pinelli, assistant to the chief of the Research Information and Applications Division at Langley, received the first George Mandel Memorial Award at the annual conference of the Special Libraries Association (SLA) in San Antonio, Texas.



Pinelli presented a review of his research as a program speaker for the Aerospace Division of SLA at the conferenc

The award is named for the long-time chief of the Technical Information Center of NASA Lewis, killed in a traffic accident in 1989. George Mandel was an active participant in the library profession for over 30 years.

The purpose of the award is to perpetuate his enthusiasm for the Aerospace Division of SLA and his belief in the importance of participation in professional organizations.

The award of $500 is to provide financial support for SLA conference attendance.

Pinelli began his NASA career in 1974 as an administrative operations specialist. In his present position, he serves as the Center's resource person and principal advisor regarding scientific and technical information (STI) policy formulation. He also is the director of the NASA/DoD Aerospace Knowledge Diffusion Research Project.

NASA Scientific, Technical Facility Changes Name

For the first time since its doors opened in 1962, the NASA Scientific and Technical Information (STI) Facility, located near Baltimore, Maryland, has changed its name to the NASA Center for AeroSpace Information (CASI).

The name change was prompted by changes in the strategic goals and objectives of the NASA-wide STI program and is designed to better reflect the program's emphasis on aerospace-related information collection, processing and dissemination activities.

CASI is responsible for the collection, storage and dissemination of aerospace-related literature from an international arena, as well as the maintenance of a database consisting of more than three million bibliographic records.

The announcement was made on March 1, 1991, by Gladys A. Cotter, director of the Scientific and Technical Division for NASA.

CASI hopes to become more visible to the aerospace research and development commuity worldwide.

Happenings

LAA SOCIAL will be held Friday, August 16, from 4 to 6:30 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road.

NASA TOASTMASTERS meet the second and fourth Wednesdays of the month in the H.J.E. Reid Conference Center. The next meeting is August 14, 11:30 a.m. to 1 p.m.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m. in the LAA gym. Open to civil service, contractors and families. Cost is $12 per month.

BENCH STEP AEROBICS classes are held Saturdays from 9:30 to 10:30 a.m. in the LAA gym. Cost is $6 per month. Try aerobics with muscle!

TIDEWATER DINNER THEATER features *No Time for Sergeants*--the Broadway comedy that made Andy Griffith a star! Now through August 25. For more information and reservations, call 461-2933 or 245-8304.

FOUND: A WATCH was found at the Fitness Center on Thursday, July 11, around 9 p.m. Call ext. 43369 with watch description.

LAFB OFFICERS' CLUB is a membership club. Please call 766-1361 for details.

FEDERAL WOMEN'S PROGRAM COMMITTEE will meet Wednesday, August 14, at 8:15 a.m. in the executive dining room of the NASA cafeteria.

FOR SALE: BABY'S HIGH CHAIR. Graco high chair, including tray, with chrome padded back and seat. Excellent condition. $15. Call 596-3394.

NOON-TIME STRIDERS. Join the walking club Tuesdays and Thursdays at noon in front of the H.J.E. Reid Conference Center for a 30-minute walk.

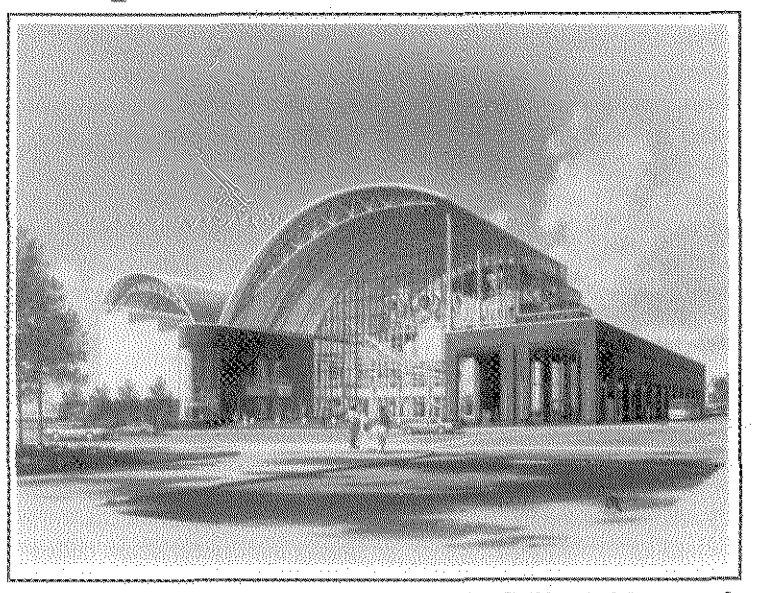
NASA BOWLING MEETING will be held Wednesday, August 14, at 1 p.m., in the Hampton Room of the H.J.E. Reid Conference Center. All team captains and new team candidates please be present. For more information, contact R. Russell ext. 41241.

INFERTILITY SUPPORT group meets at the Jewish Community Center, Newport Avenue, Norfolk, the second Monday of the month. For more information, call 877-3094 or 220-1440.

At the Visitor Center

Johnston to Give Update on New Center

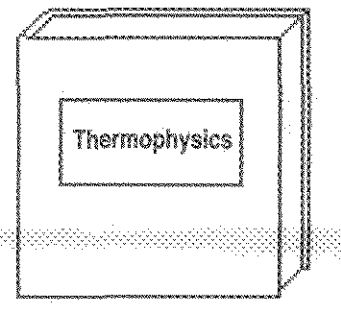
A new chapter for Langley will begin when the Visitor Center moves into its new home — The Virginia Air and Space Center/Hampton Roads History Center. This innovative move will integrate the region's abundant history with its rich aerospace heritage. With the construction ahead of schedule and the grand opening planned for April 5, 1992, an update on the new center is scheduled for Thursday, August 29, at noon in the Visitor Center theater.



Ralph Johnston, Virginia Air and Space Center/Hampton Roads History Center director, will discuss the current construction progress, exhibits, IMAX theater, staffing and volunteers, and public programs.

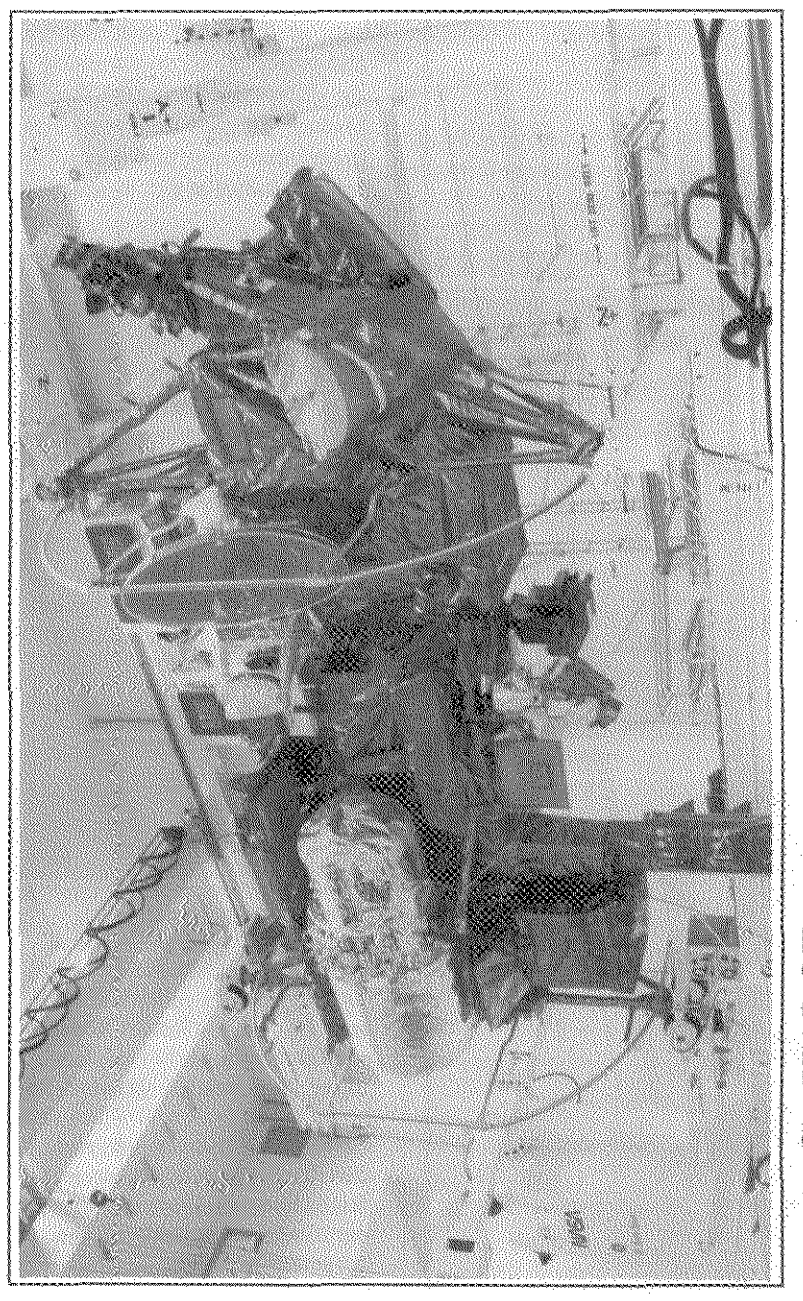
Johnston, the son of native Virginians, attended public schools in Maryland and Virginia and developed a lifelong interest in flight. His museum career began at the Smithsonian National Air and Space Museum where he was responsible for operations of the planetarium and the IMAX theater. He has been a consultant to the California Museum of Science and Industry and the Metropolitan Museum of Art. Before his current position, he served as the deputy director of the Museum of Flight in Seattle for three years.

Thermophysics Tech Committee Offers Latest Information



The Langley Thermophysics Technical Committee, organized through the Office of the Chief Scientist, is forming a mailing list of researchers interested in keeping abreast of technology in aerothermodynamics, heat transfer and thermal control.

The committee is also planning a workshop on "Current Technology for Thermal Insulation Systems." Anyone interested in being on the mailing list can send their name and mail stop to Obie Bradley, Mail Stop 434.



Home for HALOE

The Upper Atmosphere Research Satellite (UARS) is readied for shipment from the General Electric Corp., Astro Space Division, East Windsor, N.J., to the Kennedy Space Center for the STS-48 mission in September. One of ten experiments on UARS is Langley's Halogen Occultation Experiment (HALOE), shown suspended from the main structure, lower center to the right. HALOE will provide important data needed to study the effects of chlorine, nitrogen and hydrogen-related compounds on the ozone layer. The long-term near global observations provided by HALOE will allow assessments to be made of the importance of the man-made versus natural sources of chlorine in the upper atmosphere.

Researcher News

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

402 ON-SITE NON-LARC
SKORA, MARY M.
MAIL STOP 115

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 17 August 23, 1991

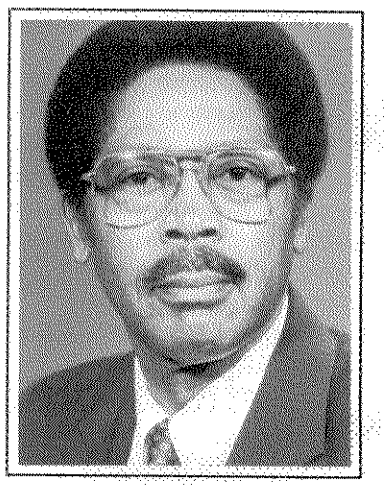
Researcher News

Bi-weekly Employee and Contractor Publication

University Affairs Officer Named to NASA Headquarters Position

-by Craig Murden

Dr. Samuel E. Massenberg, the Center's University Affairs Officer, has been selected for the newly created post of director of the Minority University Research and Education Programs Division at NASA Headquarters, Washington, D.C.



Responsible for coordinating all aerospace research projects conducted at the nation's minority institutions and for the application of the full range of NASA's undergraduate and post graduate academic programs to these schools, Massenberg assumed the position August 12.

He joined the Langley staff as an employee development specialist in 1980, after a distinguished career as a pilot and engineering officer in the U.S. Air Force and dean of men at Hampton University. In 1981, he became coordinator of the Career Development Center and, a year later, assumed the University Affairs Officer position where he handled research grants between Langley and more than 100 universities. He also managed all university-related programs involving professors as well as graduate and undergraduate researchers.

Massenberg has been a dynamic leader in developing national programs in minority education, according to the Center's Chief Scientist Michael F. Card. "Sam has a talent for creating outstanding aerospace education programs, at both graduate and undergraduate levels. His personal experiences and interest in aeronautics make him a wonderful role model for students interested in aerospace careers."

"My vision for the future is to provide the opportunity for every American student to become literate in science and mathematics," said Massenberg. "NASA is participating in the national enterprise of re-emphasizing the requirement for Americans to be technologically focused if the country is to remain competitive in the world economy. My new position will allow me to assist the NASA effort to capture, channel and enhance the students and teachers of the country."

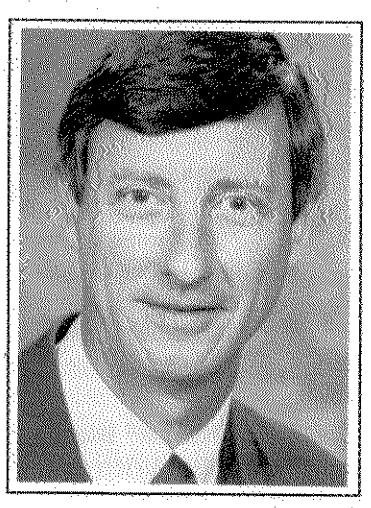
Edwin J. Prior has been named acting University Affairs Officer and Robert L. Yang, assistant University Affairs Officer.

Sawyer Named Chief, Advanced Vehicles Division

Wallace C. Sawyer has been named chief of the Advanced Vehicles Division, pending approval by the Office of Personnel Management.

In this position, Sawyer is responsible for directing multidisciplinary studies of advanced aeronautical vehicles both to assess the benefits of selected research advances and to identify new research thrusts. In addition, he coordinates focused research on subsonic and supersonic transports, advanced military aircraft and general aviation and commuter aircraft.

Sawyer began his NASA career at Langley in 1965 as an aerospace engineer. He has served as head of the Concepts Analysis Section; assistant head of the Supersonic Aerodynamics Branch; head of the Fundamental Aerodynamics Branch; head of the Supersonic/Hypersonic Aerodynamics Branch and, since April 1987, assistant chief of the Advanced Vehicles Division.



He earned a bachelor of arts degree in physics and mathematics from Elon College in North Carolina in 1964 and has done graduate work in physics at the College of William and Mary and in engineering management at George Washington University.

CFC COMMITTEE CHOSEN. The Combined Federal Campaign committee for 1991-92 has been named by Director Richard H. Petersen. Bruce A. Conway (center) is chairman. Assisting him are (seated) Lana M. Couch, vice chairman; Richard F. Mason, American Federation of Government Employees Union; (standing) Cassandra G. Favor, financial chairman; Jean W. Clough, publicity chairman; J. Campbell Martin, Langley representative to the Peninsula Federal Coordinating Committee; Thomas L. Vranas, Pattern Makers Union; and Miriam A. Hall, secretary. Not pictured are Roscoe C. Edge, NASA-Union liaison; and Ben J. Schlichenmayer, American Federation of Government Employees Union.

Voice of Hope, Campaign Theme

Langley Sets Challenging 1991 Campaign Goal

-by Jean Clough

It is time, once again, to think about the needs of others. The Combined Federal Campaign (CFC) provides the opportunity for us to reach out to the less fortunate and to be their *voice of hope*. In October, you will have a chance to help those in need when you make your campaign pledge.

Langley is looking forward to another successful year and is in the midst of planning this year's campaign. Director Richard H. Petersen has appointed a committee headed by Bruce A. Conway, chief of the Instrument Research Division, to help the center meet its most challenging goal of $285,000.

Langley will conduct a one-day centerwide solicitation Monday, October 7, preceded by a kickoff meeting for division chairpersons, key solicitors and new employees Friday, September 27, from 1:30 to 3 p.m., in the H.J.E. Reid Conference Center.

This is the one time during the year that government employees are asked to be the *voice of hope* for our families, our friends and our neighbors by contributing to the many worthy health, welfare and community service organizations. The CFC is not a charity drive. It is an opportunity for the Langley family to help improve the way of life on the Virginia Peninsula. Right here at home, we can make a difference. Most of the CFC gifts are used directly to make the Peninsula a better place to live.

Langley has always exceeded the goal set by the director and the campaign committee. Petersen has asked that Langley continue that tradition and support the campaign as the Center has in the past. When your key person contacts you on October 7, please remember to designate your pledge to your favorite agency and be their *voice of hope*. Keep in mind, the money you give this year may some day help a member of your own family. Statistics show that one out of every three contributors receives help from an agency participating in the campaign.

Be the *voice of hope;* give generously to the Combined Federal Campaign.

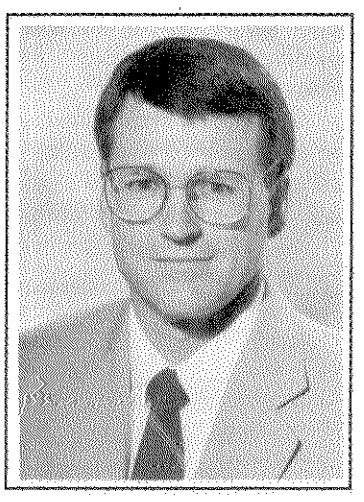
Rooker Chosen for Harvard Program

Dr. James R. Rooker, head of the Facility System Branch, has been selected to attend Harvard University's Program for Management Development in Boston, Massachusetts.

The intensive 12-week session at Harvard's Graduate School of Business Administration emphasizes fundamental management skills and techniques. In addition, the course helps participants understand the vital interrelationships of their current specialties to other business functions.

Rooker joined NASA Langley in 1967 as an aerospace technologist. In 1980, he was named head of the Structural Engineering Section, a post he held until 1989 when he was selected head of the Structural Design Branch. In May, 1991, he assumed his present position.

Experienced in analysis and engineering design, Rooker has led numerous complex projects vital to the Center's research objectives. Most notable, he directed the design, analysis, testing and checkout of the high-speed carriage for Langley's unique Aircraft Landing Dynamics Facility (ALDF), which tests both airplane and Space Shuttle tire performance. He also led an effort to resolve technical difficulties encountered during heavy rain simulation testing of airfoils, enabling an increased research capability for the ALDF facility. Among his contributions to Langley's wind tunnel work, Rooker directed structural analysis and testing of a novel repair to the blades of the 16-Foot Wind Tunnel, permitting continued tunnel operation during fabrication of new blades.



News Briefs

NASA F/A-18 Flies First Thrust Vectoring Flight --- NASA's F/A-18 High-Alpha Research (HARV) aircraft has maneuvered in flight for the first time using a specially designed thrust vectoring system. The successful test sets the stage for research flights over the next two years that could make future jet fighters safer and easier to fly at very high angles of attack. The F/A-18 HARV has three spoon-shaped paddles around the exhaust nozzle of each of its two engines. The nozzles deflect ("vector") engine thrust in different directions to maneuver and stabilize the aircraft. Thrust vectoring should give the plane better controllability at alphas up to 70 degrees.

Soviets to Launch NASA Instrument to Study Ozone Levels --- The first flight of a NASA ozone instrument on a Soviet spacecraft occurred in August when NASA's Total Ozone Mapping Spectrometer (TOMS) flew on a Meteor-3 meteorological satellite launched aboard a Cyclone rocket also provided by the Soviet Union. The Meteor-3/TOMS two-year mission, launched August 15, will make it possible to continue monitoring global ozone levels by measuring the total ozone content in the Earth's atmosphere. Since the first TOMS was launched aboard NASA's Nimbus-7 satellite in 1978, it has provided reliable, high-resolution daily mapping of global total ozone. The Meteor-3/TOMS instrument is identical to the Nimbus-7 in terms of optics and performance. By launching in August, Meteor-3/TOMS will be in place to observe the formation of the Antarctic ozone "hole" in September and October.

NASA Opens New Computer Research Center --- Can computers be designed to simulate human intelligence? Unique work now underway in the new Biocomputation Center at NASA's Ames Research Center, Mountain View, Calif., may one day provide the answer to this question. Directed by Dr. Muriel Ross, a team of physicists, neurophysiologists and mathematicians is studying the three-dimensional makeup of a biological neural network, a series of connections between nerves. The team hopes to uncover the basic principles of how nerves are organized and how they function. By using computers to construct 3-D models of biological neural networks, then reducing these detailed models to a mathematical level, it may be possible to design and build electronic circuits to mimic the biological circuits. Such circuits then could interact with artificial visual input and control the output for guidance systems in mobile robots.

NASA X-Ray Telescope to be Launched on Japanese Spacecraft --- NASA's Soft X-Ray Telescope, which will study solar flares, is scheduled to be launched aboard a Japanese spacecraft on August 26, under a cooperative agreement with the Japanese. The telescope is one of four instruments on the Solar-A spacecraft to be launched into Earth orbit by the Institute of Space and Astronautical Science aboard a Japanese M-3S2 three-stage, solid-fueled launch vehicle from the Kagoshima Space Center in Japan.

U.S. and Argentina Sign Space Cooperation Agreements --- In Buenos Aires, Argentina, Vice President Dan Quayle and Argentine President Carlos Menem signed an agreement for cooperation in the civil uses of space, with special emphasis on Earth and space sciences. This agreement establishes a framework for future cooperative space projects between NASA and the newly formed Argentine National Commission on Space Activities (CONAE). During the same ceremony, U.S. Ambassador to Argentina Terence A. Todman and Paul F. Matera, the Argentine Secretary of State for Science and Technology, signed an agreement to cooperate in a solar physics and astrophysics satellite mission, Satelite de Aplicaciones Cientificas-B (SAC-B). SAC-B will be the first joint spacecraft mission undertaken by NASA and a Latin American company.

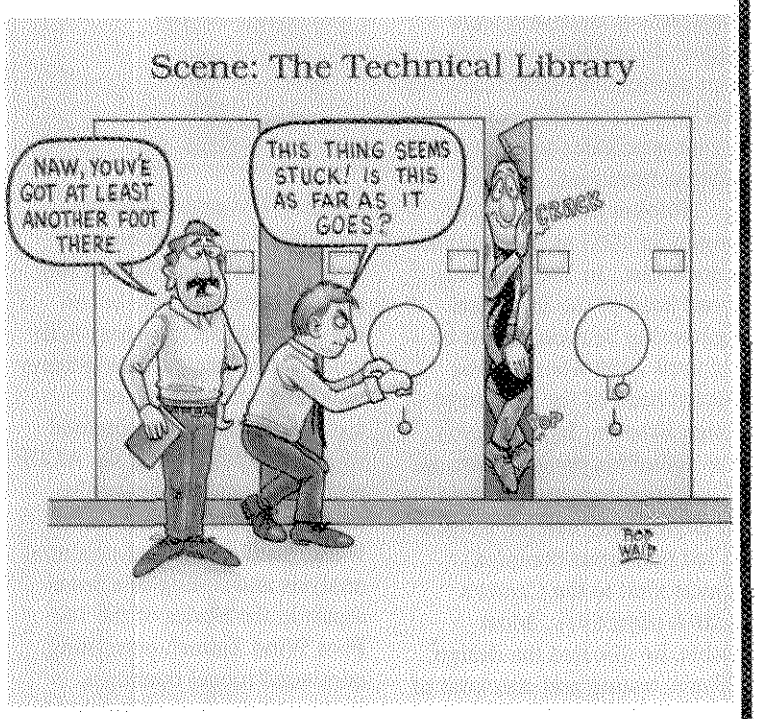
Report from beyond Earth . . .

Jet Propulsion Laboratory flight controllers report that both Magellan, in orbit about Venus, and Galileo, en route to its gravitational swing-by of Jupiter, are performing fine and providing good data to the various investigators.

As of press time, Magellan is in apoapsis solar occultation, residing in Venus' shadow on the outer reach of the satellite's orbit for more than 50 minutes, precluding the thermal management which previously hid the spacecraft behind its high gain antenna. This will continue through September, at which time the use of the high gain antenna as a solar shade will resume.

Galileo is about 156 million miles from Earth, making two-way communication time more than 26 minutes. Except for Galileo's still incompletely-deployed high gain antenna, spacecraft performance remains excellent. JPL engineers have scheduled a second experimental antenna cooling turn. Galileo will be maneuvered 165 degrees away from the Sun, placing the high gain antenna behind the solar shield. Also, antenna power loads will be reduced to further aid in the cooling process. The difference will permit the antenna to cool more, which JPL believes will cause the central antenna tower mast to shrink sufficiently to free the antenna ribs.

Lankley



James Irwin Dies

Retired astronaut James B. Irwin, the eighth human to walk on the Moon, died Thursday, August 8.

Irwin was the Lunar Module pilot for commander Dave Scott's crew and piloted the Falcon to a landing at Hadley Rille on July 30, 1971. Irwin and Scott explored the area using a Lunar Rover while Alfred Worden maintained an orbiting watch in the Command Module, Endeavor. The 295-hour lunar mission ended August 7, 1971, with the safe return of the crew.

NWS Director Speaks at Langley

Dr. Frances G. Holt, executive director of the Naval Weapons Station, Yorktown, will be the keynote speaker for Women's Equality Day. Holt's presentation is planned for 2 p.m., Wednesday, August 28, in the H.J.E. Reid Conference Center.

This program is sponsored by the NASA Langley Federal Women's Program Committee to commemorate the passage of the 19th Amendment to the Constitution which granted women the right to vote. Women's Equality Day was designated by President Carter as a reminder of the continuing efforts of women toward equality in all spheres of U. S. society.

Holt serves as the senior civilian manager of the Yorktown Station and is the only woman in the Naval Sea Systems Command to hold such a position. She also serves as a senior civilian leader in the Navy's ordnance community for which she serves as chairperson of the Quality and the Business Improvement Committees. She recently co-chaired a multi-systems Command Quality Management Board, studying maintenance of air-launched missiles.

Club Offers Thanks . . .

Tim Collins, president of the Langley Conservation Club, writes: "The Conservation Club would like to thank Langley management and all employees involved in the effort to make the LaRC telephone book 100 percent recyclable. There is a great deal of support for this decision, and we have received many favorable comments from employees who have noticed the 'recyclable' logo on the back of the new directory. We hope all NASA employees are now aware of this effort.

The recyclable books are attractive and are as functional as the previous editions. If most of the 24,000 books printed can be collected for recycling, nearly 20,000 pounds of paper will be saved each year. This represents a significant step towards environmental awareness at Langley and marks the kind of decision that can truly make an environmental difference."

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program is designed to permit employees to donate annual leave to other emplolyees who are experiencing personal or family medical emergencies.

The following employees are approved leave recipients:

- Linda E. Edmundson
- Kdean Hargrove
- Gael M. Hawkins
- Cassandra D. Stevens
- Noel A. Talcott Jr.
- Catherine B. Worth

If you wish to donate annual leave to these recipients, or wish more information concerning the Voluntary Leave Transfer Program, please contact Linda Park of the Employee Relations Office, ext. 42610.

In Memoriam

Sympathy is extended to the families of:

Beulah "Boots" Barger, who died August 3 in Riverside Regional Medical Center. Barger retired as a seamstress at NASA in 1972 after 28 years of service.

Patti S. Leatherman, who died August 6 in Lakeland, Florida. Leatherman retired from NASA Langley as a mathematics technician.

Leon W. Fitchett, who died August 10 in Norfolk. Fitchett retired from Langley as a procurement analyst.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

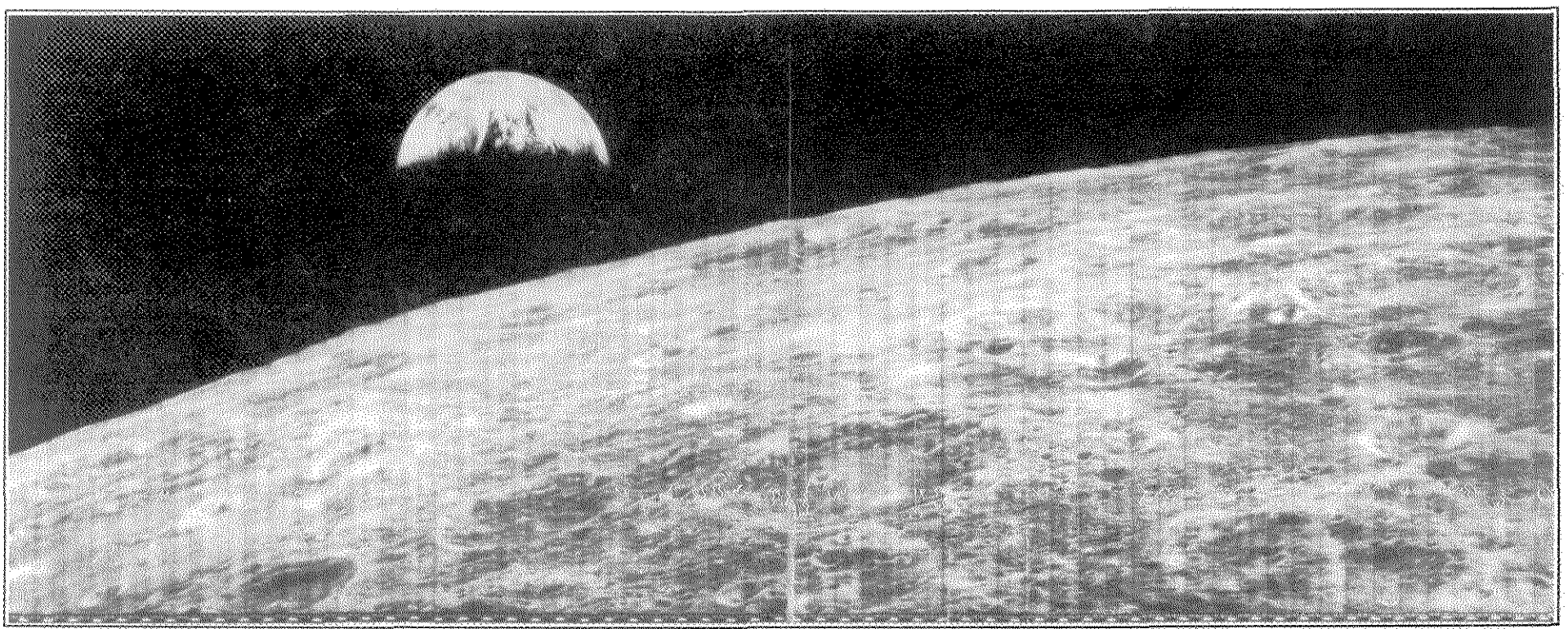
Editor ..... Marny S. Skora

Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Looking Back . . .

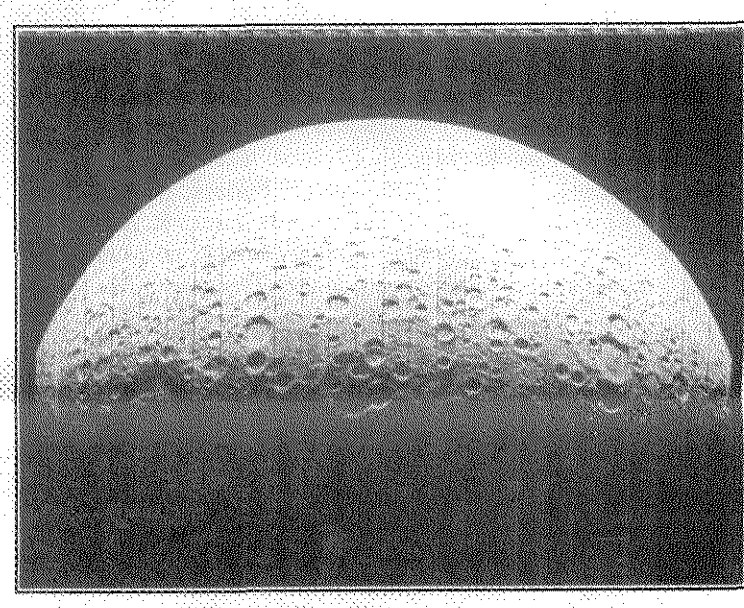


THE WORLD'S FIRST VIEW OF EARTH taken by a spacecraft from the vicinity of the Moon, this photograph was transmitted to Earth from Lunar Orbiter I and received at the NASA tracking station near Madrid, Spain. This crescent of the Earth was photographed August 23, 1966, when the spacecraft was on its 16th orbit and just about to pass behind the Moon.

Looking Back 25 Years

Lunar Orbiter Blazed a Trail for Man to Follow

- *Would a moon landing vehicle be damaged by jagged rocks or sink in deep layers of cosmic dust?*
- *Would the lunar surface be laced with cracks or covered with large, flat plains?*
- *How long could man survive when exposed to the radiation and micrometeoroid bombardment in the lunar environment?*



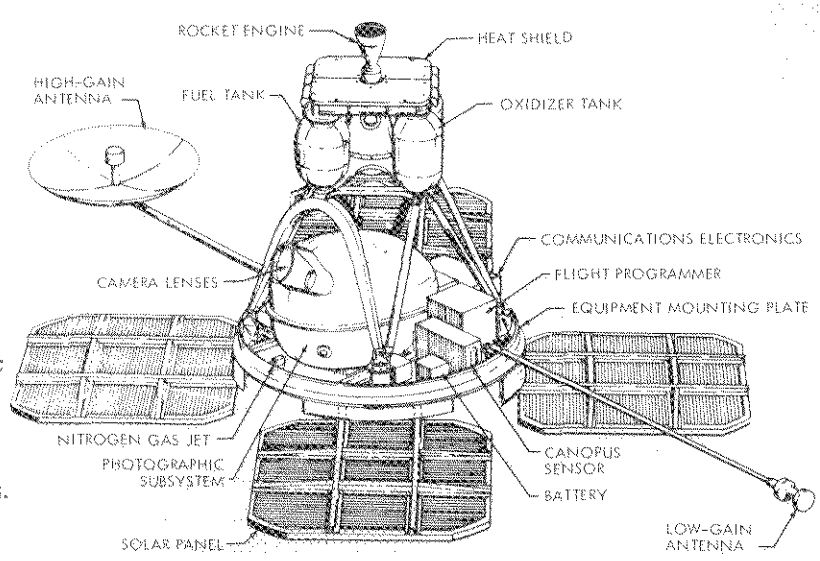
Pasadena, California---One of the first wide angle views of the Moon's hidden side photographed by Lunar Orbiter V is this picture made on August 6, 1967, and transmitted to NASA's Goldstone, California, tracking station.

Twenty-five years ago these were critical concerns which had to be resolved before man could safely set foot on Earth's satellite, the Moon. Lunar Orbiter was the third and final unmanned space program devised to provide this vital information.

The Lunar Orbiter project provided extensive photographic exploration of the lunar surface which aided in the selection of possible landing areas for the Project Apollo manned missions. But it was much more than that. Designed and managed by Langley for the NASA Headquarters Office of Space Sciences, the project proved to be a necessary and valuable contributor to man's knowledge of the Moon and its environment.

Initiated in early 1963, the Lunar Orbiter program consisted of the investigation of the Moon by five identical unmanned spacecraft. The spacecraft in orbit about the Moon were primarily platforms for a camera system designed to take high-resolution photographs of the lunar surface.

Five flights during the 12-month period from August 1966 to August 1967 returned over 1,654 high-quality photographs from lunar orbit. Each spacecraft was similarly equipped with two cameras which operated simultaneously and had the same line of sight but different fields of view and different resolutions.



Of the 1,654 Lunar Orbiter photographs, 840 were of areas photographed on the basis of Apollo program requirements and were obtained primarily during missions I, II and III. They were taken from low flight altitudes and provided detailed coverage of 22 areas located along the equatorial region of the near side of the Moon. Of the eight sites identified by Lunar Orbiter III as appropriate, one---in the Sea of Tranquility--was chosen for the Apollo 11 landing.

The remaining 814 photographs were taken primarily during missions IV and V and include 703 of the near side of the Moon, 105 of the far side of the Moon and six of Earth. Some of the lunarscapes of the far or "dark" side of the Moon had never before been seen by the human eye.

The Boeing Co. was prime contractor for the Lunar Orbiter program and built the spacecraft for Langley. In the final design the Orbiter weighed about 850 pounds, was five feet in diameter and five-and-a-half feet long. During launch, the solar panels were folded up under the spacecraft base, and the antennas were held against the side of the structure. In space, with its solar panels and radio antennas unfolded, the craft measured 12 feet two inches across the panels and 18-1/2 feet to the outer ends of its antennas. Structurally the spacecraft had three decks supported by trusses and an arch. On the largest deck, the main equipment was mounted, including the photographic system. Four solar panels and two antennas extended from the perimeter of this equipment. The middle deck supported the velocity control engine and fuel tanks. Above this, the third deck contained the heat shield which protected the spacecraft from the heat generated by the firing of the velocity control engine. This uppermost deck was part of the engine module.

The photographic system, designed and built by Eastman Kodak, was put together with the precision of a Swiss watch. The system was housed in a pressurized, thermally controlled container, and included the cameras, film, film handling apparatus, film processor, readout equipment and environmental controls. The system was designed to expose, develop and read out images for transmission to Earth by the communications system.

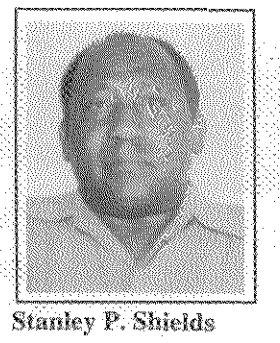
The photo subsystem operated like a threshing machine. The film, which had to go through three plane changes, was drawn from the supply spool, clamped in a movable platten, moved and exposed simultaneously, and advanced to make room for a new film--all in a matter of a few seconds. The film was actually developed on board the craft, which pressed the 70-mm aerial film into contact with a web that contained a single-solution processing chemical, before it was "read out" and transmitted to Earth-based receiving stations.

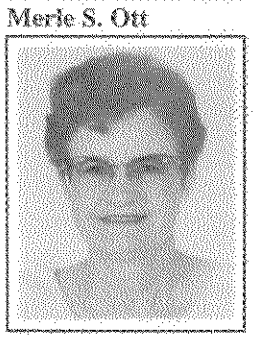
NASA launched five Lunar Orbiter spacecraft to the Moon and all five successfully performed their missions. This record set a precedent in the Office of Space Sciences for lunar exploration. In fact, from the time the Lunar Orbiter contract was signed on May 7, 1964, to the time the first spacecraft orbited the Moon was only 27 months.

The Lunar Orbiter missions demonstrated NASA's ability to develop the complex technology required to put an automated spacecraft into a precise orbit around another body of the solar system and then command it, through hundreds of exacting maneuvers, to do a prescribed series of tasks. The development and demonstration of such technology was vital to subsequent manned and automated space missions.

The magnificent photography returned from the Lunar Orbiter missions enabled the first and will aid future exploration of Earth's nearest neighbor.

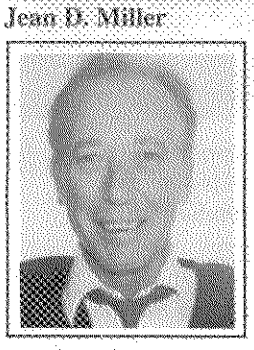
Merle S. Ott

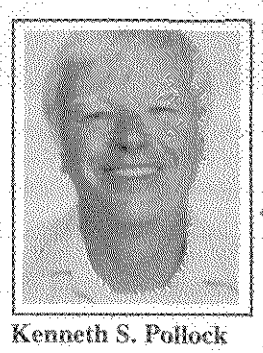

Stanley P. Shields

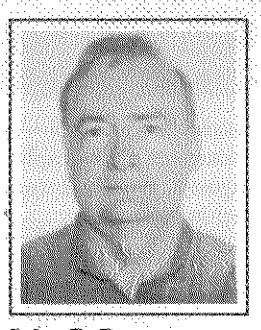

Lahoma L. Hart

Barrett L. Shrout

Jean D. Miller


Richard D. Hofler


Kenneth S. Pollock


John P. Raney

Recent Retirees

Merle S. Ott, Flight Applications Division; **Stanley P. Shields**, Management Support Division;**Lahoma L. Hart**, Personnel Division; and **Gaylen A. Thurston**, Structural Mechanics Division, retired May 31.

Barrett L. Shrout, Advanced Vehicles Division, retired June 3.

Jean D. Miller, Management Support Division, retired June 28.

Richard D. Hofler, Analysis and Computation Division, and **Roosevelt Borden**, Research Information and Applications Division, retired June 29.

Charles F. Bradshaw, Systems Engineering Division, retired July 3.

Kenneth S. Pollock, Analysis and Computation Division; **James R. Hall**, Flight Management Division; and **John P. Raney**, Space Station Freedom Office, retired July 31.

Richard D. Wagner, Flight Applications Division, retired August 2.

Daniel F. Slowikowski, Instrument Research Division, retired August 9.

Technical Library Keeps You Up-to-Date

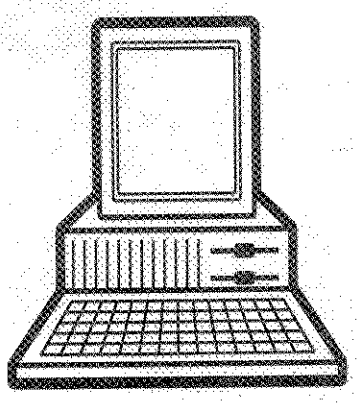
-by S. Motley and M. Ambur

Whether preparing for a project or already deeply immersed in research, you need up-to-date information. The library offers several current awareness services designed specifically to save you time and money as well as keep you informed in your field of interest.

Most Langley researchers are familiar with the bimonthly *International Aerospace Abstracts* (*IAA*) and the monthly *Scientific and Technical Aerospace Reports* (*STAR*). *IAA* and *STAR* limit their coverage to unclassified reports and articles covering the world's literature in the fields of aeronautics, space science and technology. These are arranged according to NASA's standard 99 subject categories and are drawn from the NASA online *RECON* database, a well-known resource provided by the Technical Library. Due to the high cost of *IAA* and *STAR*, only reference copies are available for use in the library.

Many managers as well as researchers bypass the full body of coverage provided by *IAA* and *STAR* and subscribe to a semi-monthly service known as *Selected Current Aerospace Notices*. More commonly known as *SCAN*, this provides printouts for specific portions of the database which fit individual subject needs. For example, if interested only in composite materials, *SCAN* can provide listings of titles covering reinforced materials and fibers as well as types, properties and uses of composite materials.

For current awareness at a more specialized level, *UPDATE Service* is available. *UPDATE* is a personally tailored search using multiple subject terms to automatically produce a customized bibliography once a month. For example, through UPDATE the technical information specialist can narrow a search on



composite materials to concentrate solely on the thermal properties of materials used in spacecraft. Similar information services are also available from other government and commercial databases provided by the library.

Researchers may subscribe to these current awareness services and automatically receive customized bibliographies on a regular basis. For more information, contact the Reference Section, ext. 42356.

Tech Committee Shares Information

The Langley Thermophysics Technical Committee, organized through the Office of the Chief Scientist, is planning a workshop on **Current Technology for Thermal Insulation Systems**. The committee is also forming a mailing list of researchers interested in keeping abreast of technology in aerothermodynamics, heat transfer and thermal control.

Those interested in the workshop or who would like to be on the mailing list should send their name and mail stop number to Obie Bradley, Mail Stop 434.

Sports News

Sporting Spirit Marks LaRC Softball

-by Gordy Degear

Back in my twenties, I played for a team
Where errors were frowned on and outs brought on screams.
We once were the champions of A-League softball,
But I came to conclude it was no fun at all.

So I hung up my spikes, gave my glove to the dog,
And on warm summer evenings, I'd go for a jog.
But old jocks are restless, and I missed the strike 3s
And the line drives and grounders that bounced off my knees.

Then, as fortune would have it, one day I was called
To reclaim my old glove and, once again, play softball.
For Coach Rinehart was forming a team of Bahrphlyes
To play in the B-League and aim for the skies.

We ended that season with twelve or so losses
Lots of pulled muscles, bad hops, and many wild tosses.
But we launched a tradition we're now famous for:
Celebrating each game, irrespective of score.

-Lamont Poole

The Bahrphlyes, now in their tenth year of existence, have come to personify the tradition of softball at LaRC, where pure competition has become balanced by social interaction.

Comprised of players from five LaRC directorates, including NASA, contractor, university and NASA Exchange employees, the Bahrphlyes have combined solid play with a sense of sheer relaxation and a spirit of togetherness. With the Bahrphlyes' traditional game day keg of beer and legion of team supporters, the opposing team quickly knows who its opponent is.

"We like to win," said current coach Bobby Huffman, "but our emphasis has always been on just getting together to have some fun."

The team was first organized in 1982. "A bunch of us used to get together after work at the Activities Center," said Huffman. "Someone suggested that we start a team. Since we originated in a bar, the name Bahrphyles seem appropriate."

Eight of the original players are still with the team, including Huffman, Bob Rhinehart, George Lawrence, Gretchen Lingenfelser, Mike Pitts, Lamont Poole, Drew Wallio, Bill Woods and Dave Young. The team has captured two league titles and four playoff championships, including consecutive tournament titles from 1985 to 1987. "We always have our best turnouts at tournament time and we've ended up doing pretty well," said Huffman.

Team activities have expanded beyond just playing softball. Players and "Bahrphyles Emeritus" team alumni get together regularly for social gatherings and the annual end-of-season awards banquet. As Huffman says, "The social chairman has always been the most important team position."

Tidbits from Training

Video Seminars Offered

The Training Office is once again making available the Empowerment Series of Video seminars offered by Executive Communications, Inc. These are brought in via satellite once a month for Langley managers and others on a first come, first served basis.

The seminar for September is **Customer Satisfaction: The Other Half of Your Job**. It will be presented Thursday, September 25 at 2 p.m.

This course offers skills and techniques to enhance relationships with both internal and external customers. The presenter, Dr. Dru Scott of Dru Scott Associates, identifies remedies for the five major causes of poor customer service. She shares proven and practical steps that managers and front-line people can use to build customer satisfaction, and discusses methods for getting more cooperation and satisfying internal customers.

To enroll, submit an Application for On-Site Training (NASA Langley Form 24) to Marie Metcalf, Mail Stop 309. These forms are available from the Employee Development Branch, ext. 42585, or from your Training Coordinator.

Note of Thanks

Jean Miller writes: "I want to thank all my friends who attended my retirement party, and especially those who participated in the program. I wish to thank all of you for the lovely gifts and remembrances. I shall always cherish my years at NASA and the opportunity to work with so many nice people."

Tired of Toxic Vegetables?

Certified Organic produce buying club is now forming in the Hampton Roads area. Only commitment would be a trip to Virginia Beach every few months. Open to 12 people. Contact Steve Dahmen, ext. 44519, for more information.

Engineers Club Kicks Off Year

The Engineers Club of the Virginia Peninsula has scheduled its annual kickoff meeting Wednesday, October 2.

The topic for the evening will be "Ship Designs for the 21st Century." For additional information, contact Jim Branstetter at ext. 46396 or Ron Harvey at ext. 43682

LAFB Aero Club Open House, August 31, 10 a.m. to 5 p.m.

Fifty Years of Computer Innovation Gives Preston Unique Window on History

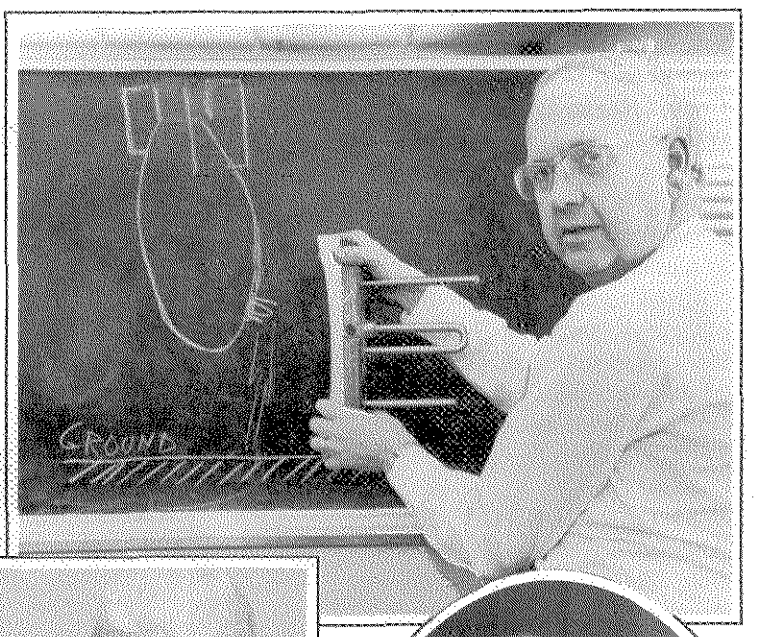
-by Craig Murden

From the project which harnessed atomic energy and shortened World War II to the technology which optimized supercomputer performance for aerospace research--Langley's Frank S. Preston was there. For over fifty years, this versatile devotee of computer engineering has applied his creativity in laboratories and classrooms across the country as an engineer, an inventor, a teacher and an executive.

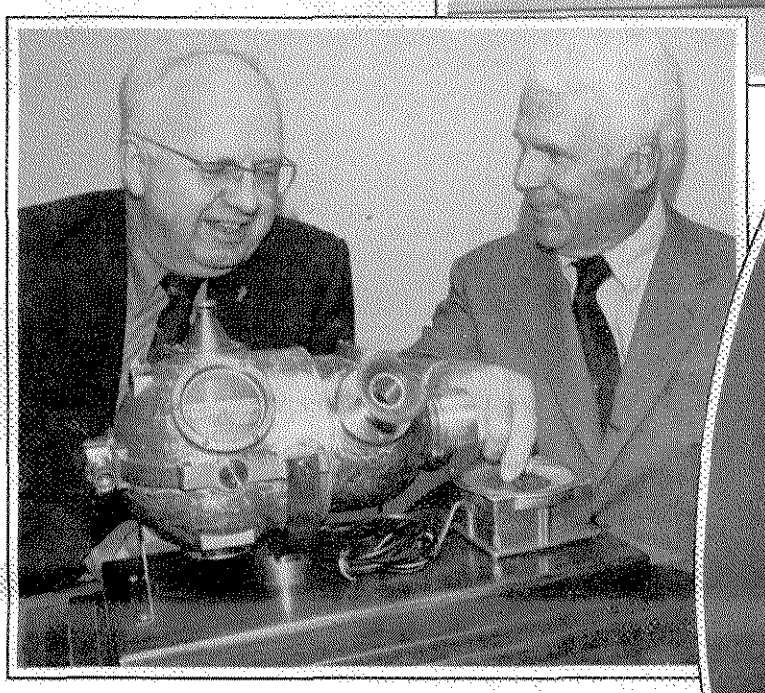
Preston began this scientific odyssey in 1940 when he took his newly earned degree in electrical engineering from the University of Washington--to MIT--where he entered a masters program in the same discipline. As a research associate there, he worked to develop high-voltage insulation to be used by the Navy in an X-ray project to examine captured enemy weapons like mines and torpedoes and to then develop countermeasures. In the course of that pursuit, Preston was the first to develop sulfur hexafloride--as a high-pressure gas for insulation. That process involved finding a way to make free florine which was not then available. With success in florine production came secret inquiries from the now famous but then carefully disguised Manhattan Project whose scientists needed the designs to enable them to combine free florine with uranium to make the major ingredient for the world's first atomic bombs. Historians have chronicled how those weapons influenced the conclusion of World War II.

In 1945, Preston moved on to what would be a major element in his diverse career when he joined Norden Laboratories. At that time Norden was best publicly known for the bombsight which aimed the payloads of U.S. B-17 and B-24 bombers in the European and Pacific theaters. He advanced bombsight technology into the use of television and infrared imaging and was involved in the first manned airborne digital computer which was pioneered for a Navy bombsight. He also advanced the concept of terrain avoidance radar which Grumman Aircraft purchased for the A-6 bombing system used in Viet Nam and most recently in the Gulf crisis.

Frank Preston displays the antenna used on "Fat Man" and "Little Boy" atomic bombs dropped on Japan to end World War II. This device, on which he worked, triggered detonation of the bombs at pre-established altitudes.



Below, Preston and Norden President Paul W. Adams view the prototype model of the famous Norden Mark XV bombsight used by allied bombers in World War II. This famous artifact was presented to the Smithsonian Institution by Adams in 1977.



Preston, shown at right with Langley's Cray Y-MP, was instrumental in fostering supercomputer applications to NASA research objectives.

-Langley photo by Mary Beth Payne

At Norden, he was given increasingly varied technical and management assignments culminating in his selection as the company's chief engineer with supervision of over 2,000 employees, 500 of them engineers. His responsibilities included development of radar, video, stabilization and microcircuit systems including display technology used by NASA for the Apollo Lunar Lander and the Shuttle. Overall, his efforts were heavily flavored with computer system operation and software development.

In 1977, he embarked on a new career path when he served as Distinguished Lecturer in Engineering Analysis and Design at the University of North Carolina, Charlotte. Preston taught undergraduate and masters students such subjects as basic engineering, numerical methods, electronics, circuit analysis and computer programming. During the same period, he also did engineering consultant work in the private sector.

He left academia in 1982 to join NASA's Numerical Aerodynamics Simulation Program at the Ames Research Center where he prepared the program master plan and system specifications. His involvement then focused on simulation of system and subsystem loading, security, operational environment, workload definition, and workstation and graphics subsystem requirements.

His next enterprise at Ames was to have important implications for supercomputer application throughout NASA's aerospace research organizations. Preston defined the requirement and concept for 800 megabit-per-second local area net and worked with the vendor to get it developed. He also worked with Cray Research, Inc., builders of the world's most powerful computers, to get a matching channel (HSX) on the Cray-2 machine. These initiatives provided the momentum which today is represented by the almost unbelievably powerful supercomputing capability which NASA can now apply to problems ranging from Shuttle design correction, to National Aero-Space Plane engineering, to the multiple unknown technologies required for the Martian adventure.

Preston retired from Ames in 1989 and moved to Williamsburg but let it be known that he wanted to remain technically active. On the basis of recommendations from NASA Ames, he was brought into the Langley fold, under contract, as a senior systems requirements analyst. According to Mickey Rowe, assistant chief of Langley's Analysis and Computation Division, Preston provides an enormously broad perspective from which the division can draw as it charts the future course of computing for the Center. Most notably, he is investigating the shift to massively parallel computing hardware configurations for supercomputers and how industry trends in mass storage can best support that direction. "He brings an unbiased, objective viewpoint to the task of planning where we need to be in the future to best serve Langley's downstream research objectives," Rowe adds.

Throughout his varied career Preston has also been a prolific technical innovator and now holds the patents on 14 inventions whose variety testifies to his virtuosity as a computer engineer. The trail begins in 1956 with his electrical elevation angle computer, includes the multiphase analog-to-digital converter in 1961, the automatic terrain avoidance system in 1967, the gun platform stabilization system in 1968, wide-angle interferometer radar in 1969 and ends with his TV animation interactively controlled invention in 1987.

He has a number of observations about the events of World War II. For instance, in a letter to history professor Stephen McFarland of Auburn University, Preston adds to the discourse about the role of strategic bombing in defeating Nazi Germany. "Radar, in my view, was more important to the winning of the war than bombing. That does not mean that I don't think the bombing was important. Experts have stated that, had Hitler allowed research and development in radar, they could well have won before the allies could have rallied. In my view, the allies would not have survived to launch invasions of France had England not had radar to assist in their defenses on land and at sea."

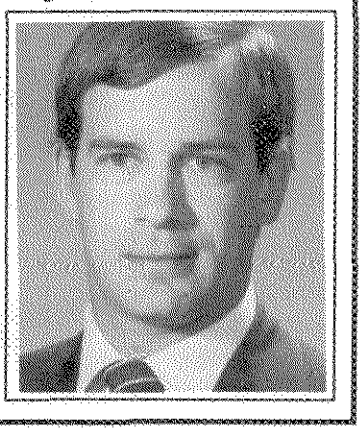
It is not surprising Preston has strong views about the events of history. He, more than many other people, has helped provide the insightful technology of today's research tools which will shape tomorrow's events in aerospace history.

Sliwa Selected President of Embry-Riddle

Dr. Steven M. Sliwa has been named the third president of Embry-Riddle Aeronautical University. Sliwa was deputy chief of Langley's Guidance and Control Division from 1985 to 1989.

"Dr. Sliwa's reputation as an educator, researcher, and aviator, combined with his unique vision, makes him eminently qualified to shape the future of Embry-Riddle, the world's leading aviation/aerospace center for higher education," said John C. Adams, chairman of the presidential search committee.

Sliwa joined the Langley staff in 1978 as an aerospace technologist in the Active Controls Project Office. In 1989 he became vice president in charge of product development at Integrated Systems, Inc., in Santa Clara, Calif.



Happenings

NO LAA SOCIAL Friday, August 30, due to the Labor Day holiday weekend.

BODY DYNAMICS. High energy-low impact aerobics classes are held Mondays, Wednesdays and Fridays at 6:15 a.m. in the LAA gym, 14A Ames Road. Classes are open to civil service employees.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m., in the LAA gym. Cost is $12 per month. First class is free. In addition, bench step classes are offered Saturdays, 9:30-10:30 a.m. Cost is $6 per month.

NOON-TIME STRIDERS. Join the walking club Tuesdays and Thursdays at noon in front of the H.J.E. Reid Conference Center, 14 Ames Road, for a 30-minute walk.

FEDERALLY EMPLOYED WOMEN, Langley chapter, will meet Wednesday, August 28, at 11:30 a.m. in the executive dining room of the NASA cafeteria.

FOUND: HANDKERCHIEF, cross-stitched, found near Building 1229, 3 Ames Road. Call Natalie Scrader, ext. 44649.

NASA TOASTMASTERS will meet for an anniversary celebration potluck luncheon Wednesday, August 28, at 11:30 a.m. in the H.J.E. Reid Conference Center, 14 Ames Road. Contact Regina Byrne at 865-0000, ext. 391, for more details.

NACA REUNION MEETING. A meeting will be held at 4 p.m. Wednesday, September 4, at the Visitor Center for all persons planning to attend the NACA Reunion #5 to be held October 18 in Galveston, Texas. For further information, call Abe Leiss, 877-2939.

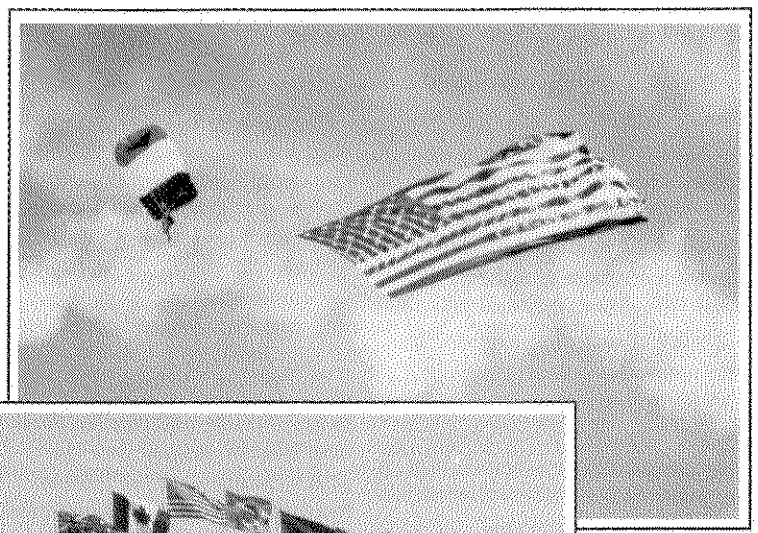
WANTED: RIDE TO WORK. Alternate driver or ride is needed from Gloucester Point to West Area on 8 a.m to 4:30 p.m. shift. Call Hudgins, ext. 47251.

FOR SALE: ITEMS. Three-piece living room suite--couch, grand chair, swivel rocker. Also, 16-ft. Feathercraft aluminum boat, trailer, motor. All in great condition. Prices negotiable. Call 827-6759 and leave message.

FOR SALE: FURNITURE. Four-piece maple bedroom set, excellent condition. $400. Call 722-0036.

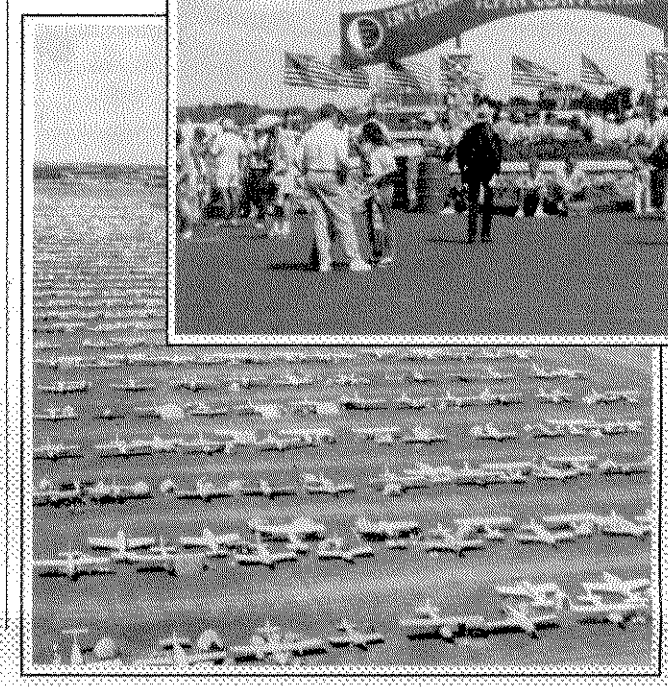
Oshkosh '91

. . .where
People and Planes
converge . . .

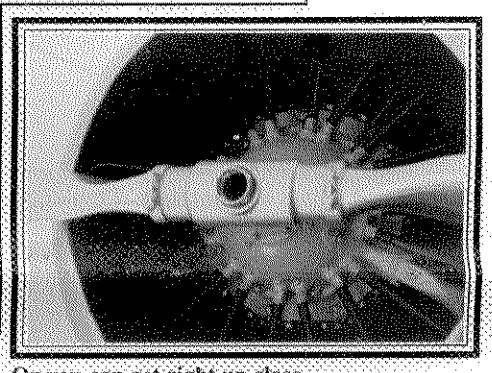


Spectacular air shows give you something to watch in every direction.

Opening day brings on the crowds.

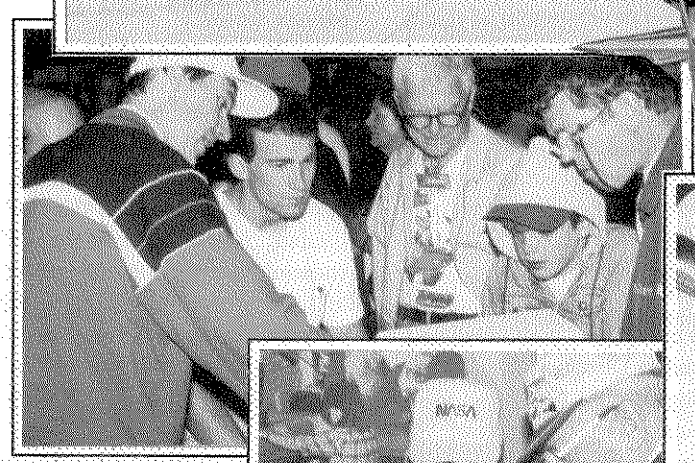


Planes lined up as far as the eye can see . . .

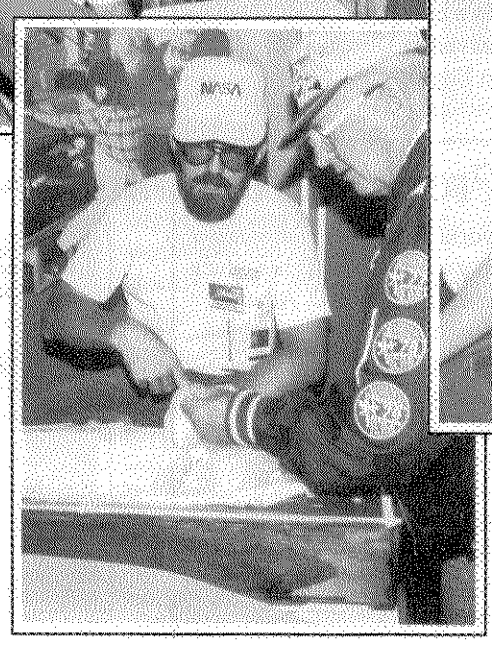


Or you can get right up close . . .

See new technology . . . and old standards.



Above, Dr. Ray Comstock (left) interests a group in Langley's human factors studies, including Oshkosh regular Doug Garner (center).



Craftsmen Joseph Moore (above) and Robert Myers (left) demonstrate various techniques to the delight of endless crowds.

-photographs by John A. "Drew" Martin

Researcher News

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

402 ON-SITE NON-LARC
SKORA, MARY M.
MAIL STOP 115

NASA
National Aeronautics and Space Administration
Langley Research Center

News Researcher

Volume 5, Issue 18 September 6, 1991

Bi-weekly Employee and Contractor Publication

Langley experiment aboard UARS

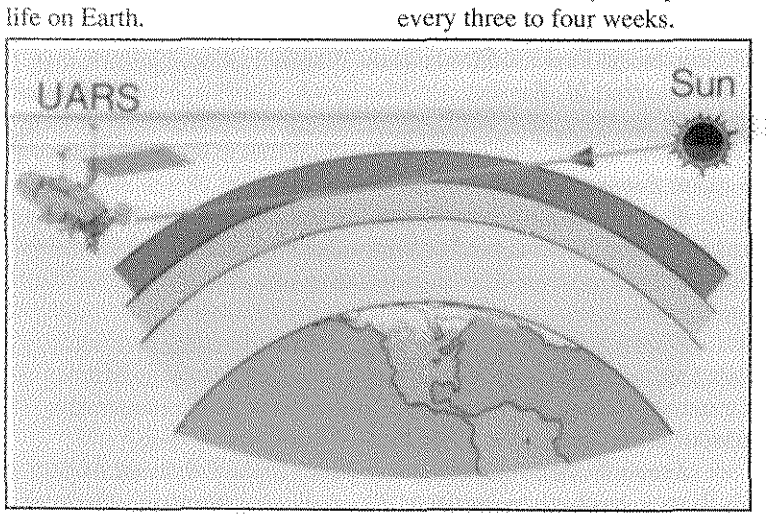
HALOE to Observe Sun from Space Vantage

After more than 15 years in development, Langley's Halogen Occultation Experiment (HALOE) is scheduled to be deployed September 12 when Discovery launches Space Shuttle mission STS-48. One of 10 experiments on NASA's Upper Atmosphere Research Satellite (UARS), HALOE will provide important data needed to study the effects of chlorine, nitrogen and hydrogen-related compounds on the now famous ozone layer.

Scientific studies have shown that natural events and human-related activities cause changes in the chemistry and physics of the upper atmosphere. These studies have led to concern that mankind's activities may be altering weather, climate and the shield of ozone that is important to the protection of life on Earth.

The Sensor Assembly makes the science measurements and consists of eight science detectors and radiometers, a Cassegrain telescope, a two-axis gimbal assembly, a sun sensor, the spacecraft adapter and supporting electronics.

The HALOE instrument operates autonomously once powered and initialized. During a typical event, measurements will begin at a height of 93 miles where there is no atmospheric interference, down to the Earth's surface or until the sun is obscured by clouds. HALOE will view approximately 15 sunrises and sunsets each 24-hour day collecting data on vertical trace gas concentrations. Each event will occur at a different latitude and longitude, and global coverage is repeated every three to four weeks.



HALOE is a solar tracking instrument designed to monitor the vertical distributions of a number of key upper atmosphere trace gases. Measurements will be made during the sunrise and sunset time of each orbit throughout the UARS mission, providing semi-continuous observations and nearly global coverage for the experiment.

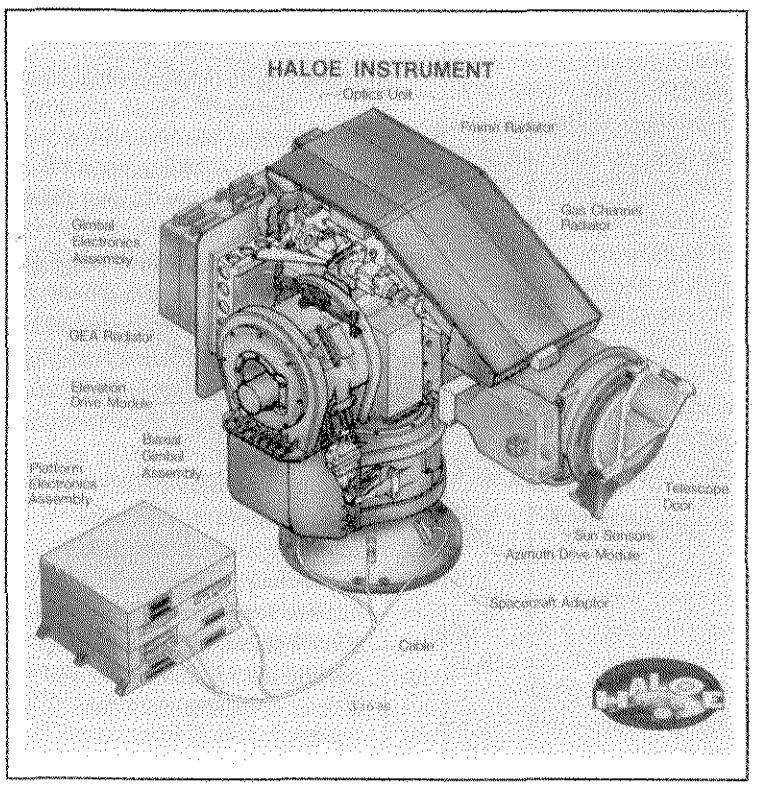
HALOE's mission is to improve our understanding of ozone depletion in the stratosphere by collecting and analyzing a vertical profile of ozone and gases important in its destruction--hydrogen chloride, methane, water vapor, nitric oxide and nitrogen oxide. HALOE will also study the chlorofluoromethane impact on ozone by measuring hydrogen chloride and hydrogen fluoride in addition to the other key chemical species, and using data on Freon 11, Freon 12 and chlorine nitrate obtained from other UARS experiments.

The HALOE instrument hardware (shown at right) is contained in two separate packages, the Platform Electronics Assembly (PEA) and the Sensor Assembly. The PEA links the instrument with the spacecraft.

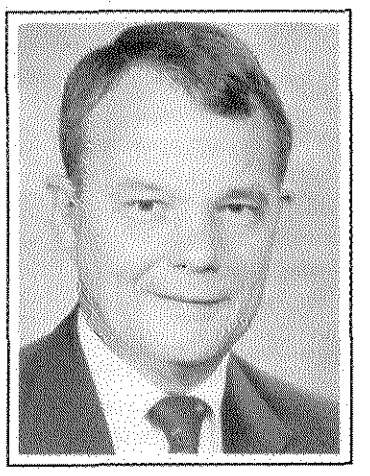
Data from HALOE will be stored in one of two tape recorders aboard the UARS observatory. The data will be transmitted to the White Sands receiving system through the Tracking Data Relay Satellite System (TDRSS). Routine processing of the data will occur at the Central Data Handling Facility (CDHF) at the Goddard Space Flight Center with software provided by the Langley science team. Interaction with the CDHF will be through a direct data link between the HALOE Remote Analysis Computer at Langley and the CDHF.

Langley has responsibility for the management of HALOE including fabrication, assembly and testing of the HALOE instrument, reduction of flight data, retrieval of geophysical data and supervision of scientific investigations. Dewey M. Smith is project manager, Thomas C. Jones is deputy manager and Dr. James M. Russell III is HALOE principal investigator. The Goddard Space Flight Center has overall responsibility for the UARS mission.

UARS is the spearhead of a long-term, national program of space research into global atmospheric change and a leading element of NASA's Mission to Planet Earth. It is the first comprehensive space experiment ever mounted to study the coupled chemistry, dynamics and energetics of the Earth's upper atmosphere. UARS is expected to provide valuable scientific input to critical policy decisions in the 1990s aimed at protecting the thin, fragile ozone layer--our shield against harmful solar ultraviolet radiation and a major atmospheric driver of the Earth's climate system.



Your Gift Can Make A Difference



One of the pleasant duties I have as chairman of this year's Combined Federal Campaign is sharing my thoughts on the challenge ahead of us.

Our Center campaign committee deliberated long to set a goal for the CFC. We assessed such things as the economy, the return of our Desert Storm troops, the past generosity of the Langley staff, and the needs of our community, our nation and the world. We also took into account the desires of General Mike Loh of TAC, this year's Peninsula CFC honorary chairman, to promote increases in total giving, average gift per contributor, and percent participation by the employees of each federal organization on the Peninsula. After comparing our situation with that facing us last year (including the invasion of Kuwait and potential government furloughs), we all felt that Langley can again demonstrate its leadership in supporting the civic and social endeavors of the many CFC member agencies. With Pete Petersen's concurrence, we established a 1991 campaign goal of $285,000.

This goal represents an increase of almost 12 percent over last year's Langley goal ($255,000), but only 3.8 percent over last year's pledges ($274,259). The 1991 goal can be reached if each of the 2,455 contributors in 1990 gives just $4.38 more--17 cents more per pay day. Or, we can reach our goal if just 97 additional Langley staff members contribute at last year's average gift rate of $111.71. On the other hand, a combination of increased participation and increased giving should make the task the easiest to achieve. Since the current payroll at Langley is almost six percent higher than at this time last year (resulting from both salary increases and more staff members), we should theoretically have little difficulty in conducting a successful campaign.

Let's consider the impact of our goal, particularly as it affects the quality of life for all those who stand to benefit from its accomplishment. The Combined Federal Campaign supports 790 agencies or organizations. Many of these are affiliated with the local United Ways, the International Service Agencies--such as C.A.R.E. and Project Hope--and the National Voluntary Health Agencies--including the American Cancer Society and the Muscular Dystrophy Association.

Our campaign kickoff will be held Friday, September 27, at 1:30 p.m., in the Reid Conference Center. Our traditional one-day solicitation will take place Monday, October 7. To be sure your contributions go where you want them, please remember to designate specific organizations on your CFC pledge card.

I close by expressing my thanks to all who are working to make this the most successful Langley Combined Federal Campaign ever. Our giving does have an impact; our caring does make a difference.

Bruce A. Conway
CFC Campaign Chairman

Langley Colloquium

Automobiles: What's in the Future?

An often taken-for-granted part of our everyday life, automobiles share the same basic gasoline burning powerplant and four-wheel configuration as their ancestors of 100 years ago, but they have changed tremendously.

During a colloquium Monday, September 9, Robert C. Austin, Volvo Cars of North America, Rockleigh, N.J., will discuss "The Automobile Today and Tomorrow, A Swedish Perspective." Austin will give his lecture to Langley employees, retirees and contractors at 2 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road.

According to Austin, automotive progress has not been punctuated with landmark events like lunar landings, but today's automobiles are among the most technologically advanced products available for public consumption. They are far more complex than the typical single- engine airplane.

What roles will aerodynamics, electronics, composites and alternate fuels play in shaping the cars of our future? Austin will cover these topics and review Volvo's LCP 2000 engineering concept car and Volvo's present flexible fuel test vehicle.

News Briefs

NASA Project to Measure Changes in Greenland's Polar Glaciers --- Researchers from the NASA Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Va., will use satellite and airborne instruments to measure the surface elevation of polar glaciers, aiding scientists in determining ice buildup or melting due to global climate changes. The campaign, which will take place in Greenland between August 23 and September 16, will use the Global Positioning System (GPS) and a laser-ranging instrument aboard a P-3 Orion aircraft to accurately measure the elevations of the glacier surface. The laser will scan an area 656 feet wide immediately below the aircraft, measuring the elevations of the glacial surface to a target accuracy of four inches. Other instruments on the aircraft will include two radar altimeters, a profiling laser and an inertial navigation system to measure the aircraft's pitch and roll. Knowledge of the ice budget in polar glaciers will provide an indirect measure of sea-level changes and may indicate trends in world climate.

NASP Program Sponsors Mockup Competition --- The nation's undergraduate engineering schools will compete this fall for the opportunity to design and build a mockup of the X-30 National Aero-Space Plane (NASP). The NASP Joint Program Office, composed of NASA and Department of Defense officials, is sponsoring the competition to stimulate student interest in aerospace science and to provide an engineering education project tied to a "cutting-edge" technology program. NASP is a particularly exciting undertaking because of the technology challenges involved in developing a hypersonic space plane with airbreathing propulsion. U.S. colleges with four-year accredited engineering programs may compete for the $125,000 award. The competition will be coordinated by the Virginia Space Grant Consortium, Hampton, Va.

NASA Plans Another Attempt to Resolve Galileo Antenna Problem --- The cooling turn performed in mid-August by the Galileo spacecraft did not result in low enough temperatures to release the few antenna ribs apparently bound by friction to the antenna's central tower. Another cooling turn is being planned for December 1991 when Galileo is farther from the sun. Additional actions will be taken at that time to cool the antenna tower further. These cooling turns are part of a series of steps project officials believe will be required ultimately to deploy the antenna. For the next two months, the Galileo flight team will concentrate on the final preparations for Galileo's October 29 encounter with the asteroid Gaspra. This will be the first spacecraft-asteroid encounter. Galileo's high-gain antenna is not essential for mission operations until the spacecraft is in orbit around Jupiter in December 1995.

NASA Releases Mixed Fleet Manifest -- NASA has issued its semi-annual Payload Flight Assignments --Mixed Fleet Manifest, providing the latest schedules for payloads to fly on the Space Shuttle and on expendable launch vehicles (EVLs). The last manifest was published in February and modified in March. The sequence for near-term Shuttle flights is identical to the March update, with some minor adjustments to the schedule. In 1992, eight Shuttle missions are planned, including the first flight of the Shuttle Endeavour on STS-49 and the return of orbiter Columbia to flight status on STS-50. Two ELV launches remain in 1991 and five ELV launches are planned in 1992, including the joint U.S.-Japan Geotail mission in July and the Mars Observer in September.

New Supply Management System Implemented

The NASA Supply Management System (NSMS) was implemented at Langley in June. This new system has enhanced the operating efficiency of the supply process, as evidenced by the 14,000 orders processed during July.

A few problems with the new system have been identified, as *Lankley* notes below; but these are expected to be short-term. Your continued cooperation and patience during this transition period is greatly appreciated.

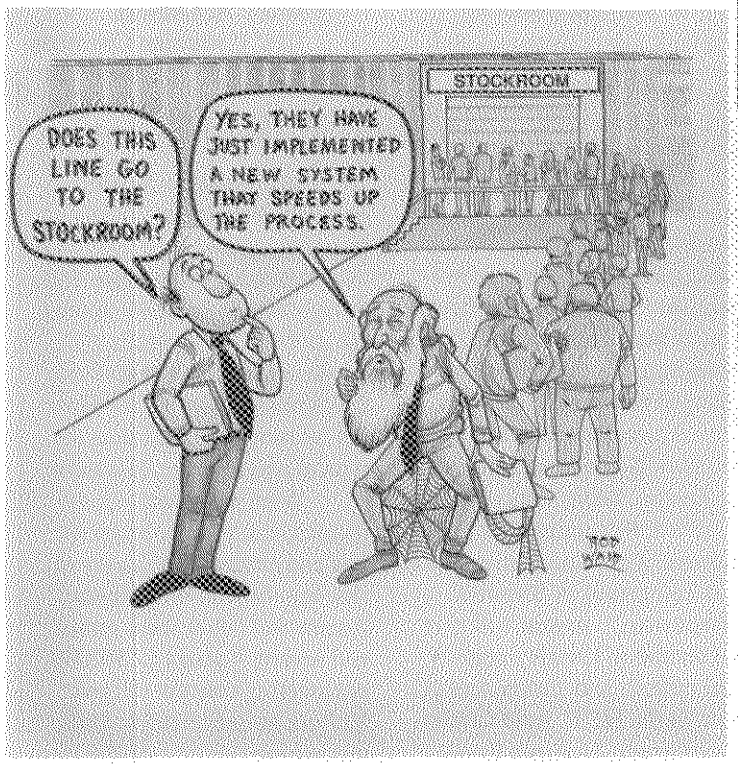
The Agency-wide system was developed to facilitate uniform supply management throughout NASA, thereby reducing the cost of development and maintenance of unique systems at each Center. Objectives of the new system are to increase productivity of supply management personnel; improve accountability, control and disbursement of stock supplies; facilitate electronic interface capabilities with other Agency-wide systems; and to support the Agency reporting and audit requirements in an accurate and timely manner. However, the **most** important objective is to provide better service to you--our customers.

The supply system data base provides control of the stock withdrawal process and expedites the issue and delivery of stock items to the user under a priority system which accommodates regular, urgent or work stoppage requests. Regular requests will be filled within 24 hours; urgent requests will be filled within 8 hours. Only work stoppage requests need to be "walked through" to the Stockroom and this method should only be used in an emergency. Additionally, the use of Langley Form 55F, LaRC Stock Issue (via datafax), is encouraged for stock items needed sooner than the normal fill time of 24 hours.

Other advantages of the new supply system include the provision to substitute items when requested stock items are unavailable; catalog change bulletins by page rather than pen-and-ink changes; and monthly reports to users to reflect current status on back-order items.

Future plans are to make on-line access available to customers with the capability to access the Stores Stock Catalog and to order stock through an on-line terminal process. Funding for this capability has been requested for F.Y. 1992.

Lankley



Langley Employees Rewarded for Special Achievement

The following employees have been honored with cash awards for superior achievement:

Eric S. Price, engineering technician in Technical Support Section B, has been recognized "for exceptional performance in the design and fabrication of an iodine laser oscillator needed for the Master Oscillator Power Amplifier (MOPA) Research Program, High Energy Science Branch, SSD."

Lloyd W. Binger, electronics technician assigned to the Electronics Packaging Development Group, has been rewarded "for excellence in support of the HALOE project."

Sang Tran, electronics technician in the Microelectronics and Technical Support Section, has been cited "for excellence in microelectronic fabrication support of direct-deposited thin-film sensors for three-dimensional models."

Patricia A. West, administrative officer of the Flight Applications Division, has been rewarded "for superior accomplishment in the planning and administration of the NASA High-Angle-of-Attack Technology Conference."

John A. Greco, product assurance engineer in the Systems Assurance Branch, has been cited "in recognition of excellent support to the Aeroassist Flight Experiment Project Office."

Richard E. Cooper, quality assurance specialist in the Systems Assurance Branch, has been rewarded for "designing and implementing a computer-based data system for nonconformance and failure reports."

J. Milam Walters, product assurance engineer in the Systems Assurance Branch, has been recognized for "designing and implementing a local area network to enhance the division's computing stations capabilities."

Stephen E. Devan, personnel specialist in the Placement and Position Management Branch, has been cited for "exceptional performance of duties in support of NASA Headquarters and the Placement and Position Management Branch."

Harriett M. Berkley and Marilyn C. Outlaw, personnel clerks in the Placement and Position Management Branch, have been recognized "for exceptional support to activities in the Technical Support Section."

E. Thomas Hall Jr., engineering technician in the Training and Education Section, has been rewarded "for outstanding contributions to the Center's technical cooperative education and apprentice programs."

Karen E. Ridlon, personnel clerk in the Training and Education Section, has been cited "for outstanding contributions to the Center's technical, engineering and secretarial science cooperative education and apprentice programs."

James F. Dezern, chemical engineer in the Polymeric Materials Branch, has been recognized "for developing the use of chemical graphics computer technology in the Polymeric Materials Branch and the Advanced Aircraft Project Office."

James E. Spencer, electrical engineering technician assigned to the Systems Controls Unit of the Electrical Drives and Systems Operations Section, has been rewarded "for excellence in providing high-level support to work control and reporting for the 8-Foot High-Temperature Tunnel Rehab Project."

Dr. Ivan O. Clark, electronics engineer in the Information Processing Technology Branch, has been cited "for contributions to the current state of knowledge in chemical vapor deposition processes."

Angela E. Claud, secretary for the Flight Applications Division, has been recognized "for superior secretarial contributions to the Flight Applications Division."

James W. West, electronics technician in the Instrument Support Section, has been rewarded "for significant contributions in meeting the instrumentation and measurement needs of the 8-Foot High-Temperature Tunnel modification project."

Gail R. D. Blow, program analyst in the Manpower Analysis Office, has been cited "for exemplary effort in carrying out the duties of several different positions during a time of major transition in the Program and Resources Division."

Pamela J. Williams, secretary in the Information Processing Technology Branch, has been rewarded "for cheerful contributions significantly supporting the administrative and technical objectives of the branch."

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

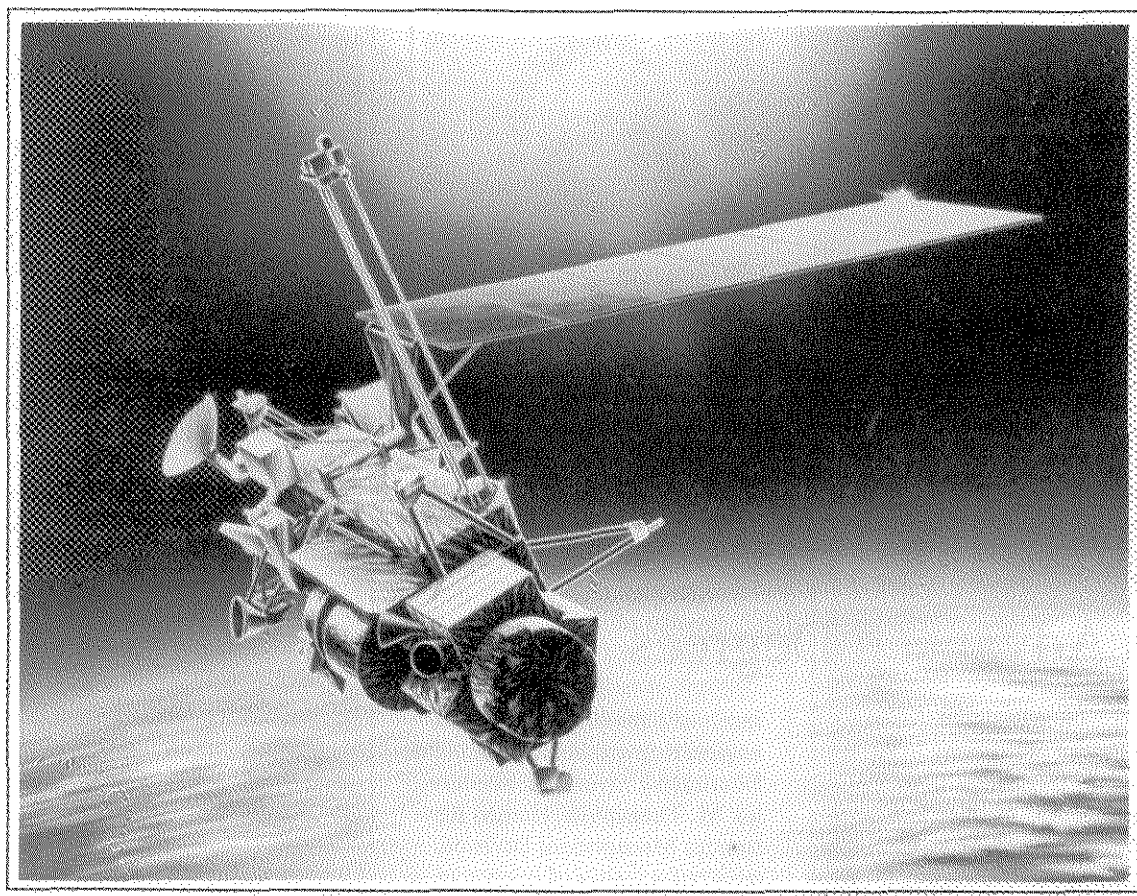
Managing Editor ..... Jean Drummond Clough

Editor ..... Marny S. Skora

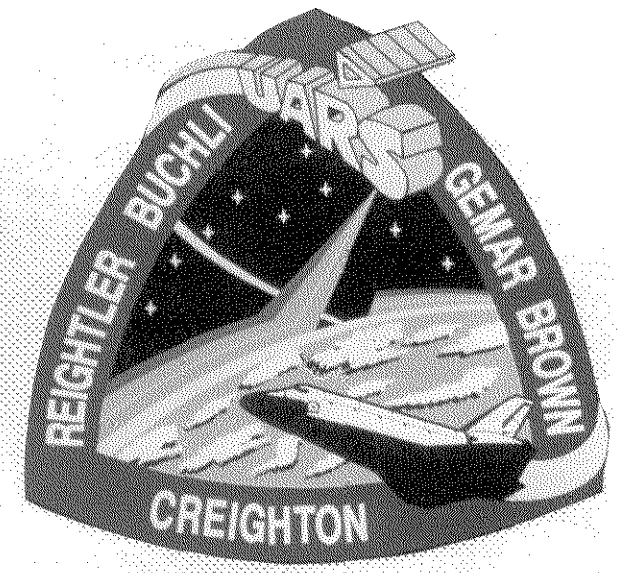
Photojournalist ..... Carol Petrachenko

Photographic Support ..... Photo Lab

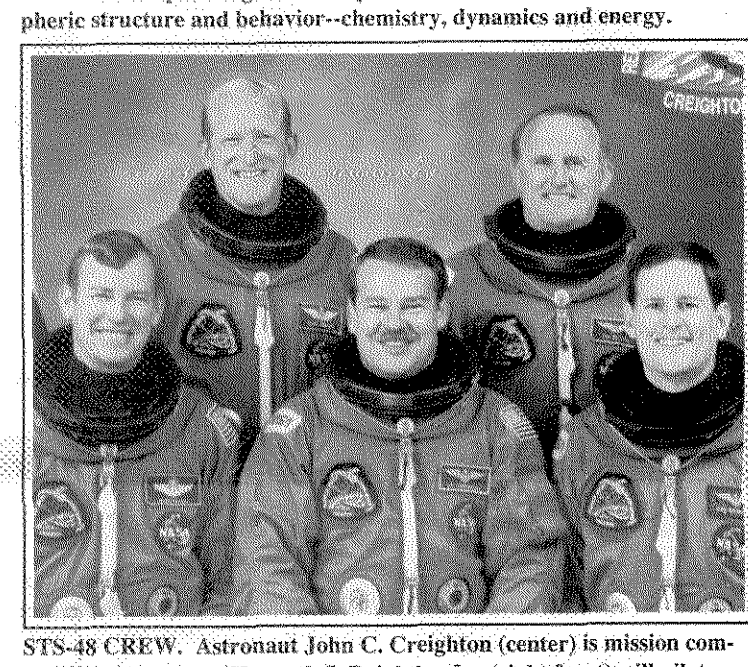
The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.



UPPER ATMOSPHERE RESEARCH SATELLITE. UARS is the spearhead of a long-term, national program of space research into global atmospheric change. A leading element of NASA's Mission to Planet Earth, UARS will provide the comprehensive data base needed for an understanding of changes in the upper atmosphere and for informed policy decisions to address the human role in such changes.



STS-48 CREW INSIGNIA. Designed by the crewmembers, the STS-48 patch represents Discovery in orbit about the Earth after deploying UARS, depicted in block letter style. The stars are those in the Northern Hemisphere as seen in the fall and winter. The bands on Earth's horizon depict the study of Earth's atmosphere. The triangular shape represents the relationship among the three processes that determine upper atmospheric structure and behavior--chemistry, dynamics and energy.



STS-48 CREW. Astronaut John C. Creighton (center) is mission commander. Astronaut Kenneth S. Reightler Jr., (right front) will pilot Discovery. Mission specialists are Mark N. Brown (left, front) and (L to R, back row) Charles D. "Sam" Gemar and James F. Buchli.

Discovery to Launch UARS Satellite

Discovery will deploy the Upper Atmosphere Research Satellite (UARS) 350 statute miles above Earth to study mankind's effect on the planet's atmosphere and its shielding ozone layer. Once deployed, UARS will have two opportunities to study winters in the northern hemisphere and one opportunity to study the Antarctic ozone hole during the satellite's planned 20-month life.

The Upper Atmosphere Research Satellite (UARS) is the first major flight element of NASA's Mission to Planet Earth, a multi-year global research program that will use ground-based, air-borne and space-based instruments to study the Earth as a complete environmental system. Mission to Planet Earth is NASA's contribution to the U.S. Global Change Research Program, a multi-agency effort to better understand, analyze and predict the effect of human activity on our environment.

UARS is designed to help scientists learn more about the fragile mixture of gases protecting Earth from the harsh environment of space. UARS will provide scientists with their first complete data set on the upper atmosphere's chemistry, winds and energy inputs.

One of UARS' focuses will be an area in which humanity's technological advancement is changing the Earth on a global scale--depletion of ozone in the stratosphere, or upper atmosphere. Ozone, a molecule made up of three oxygen atoms, blocks ultraviolet light that can cause skin cancer and damage food crops.

Although there are some natural causes of stratospheric ozone depletion, the "ozone hole" that forms over Antarctica in the Southern Hemisphere's spring season and the five percent depletion observed over northern mid-latitudes in the last decade are widely believed to be a direct consequence of human activity. These long-term ozone trends are caused by chlorine compounds released into the atmosphere as byproducts of industry, including refrigeration and the making of plastic foam.

To study ozone depletion more completely and to better understand other aspects of Earth's fragile atmosphere, scientists need the global perspective available from an orbiting satellite, one that makes simultaneous measurements of all the factors of ozone depletion with state-of-the-art instruments. To that end, the UARS science program has been designated as a single experiment with nine component instruments--Langley's HALOE among them--that will study the upper atmosphere's chemical, dynamic and energy systems.

Discovery is planned to launch at 6:57 p.m. EDT, September 12, from Kennedy Space Center's Launch Pad 39A. STS-48 is Discovery's 13th flight and the 43rd Space Shuttle mission.

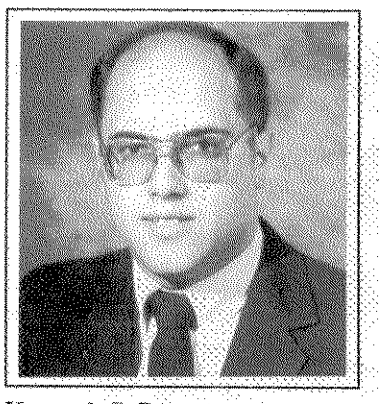
Commanding Discovery will be Navy Capt. John Creighton. Navy Cmdr. Ken Reightler, making his first space flight, will serve as pilot. Mission Specialists will be Marine Corps Col. Jim Buchli, Army Lt. Col. Sam Gemar and Air Force Col. Mark Brown. The five-day mission is scheduled to land at Kennedy's Shuttle Landing Facility at about 1:55 a.m. EDT September 18, the first night landing at Kennedy Space Center.

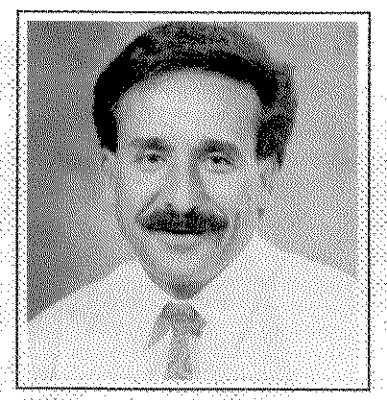
Secondary Payloads . . .

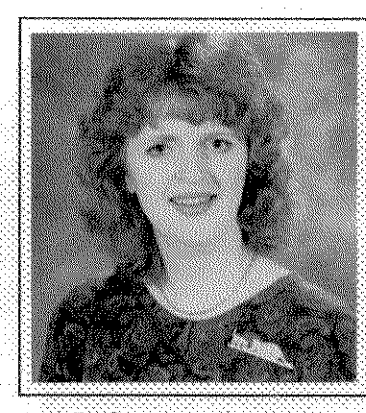
Discovery will carry one of the most complex experiments ever conducted in the orbiter middeck. Langley's MODE, Middeck 0-gravity Dynamics Experiment, will study how fluids and structures react in weightlessness.

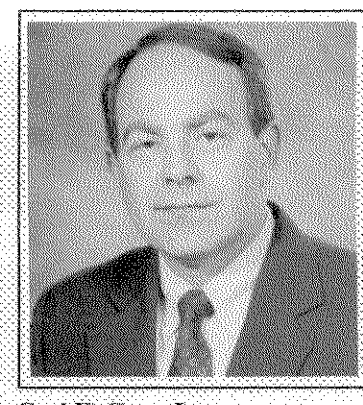
Additional secondary objectives on the flight include Protein Crystal Growth-7, the seventh flight of an experiment in growing protein crystals in weightlessness; Investigations into Polymer Membrane Processing-4, research into creating polymer membranes in space for use as filters in many industrial refining processes; Physiological and Anatomical Rodent Experiment, a study of the effects of weightlessness on rodents; Shuttle Activation Monitor, a device that will measure the amounts of gamma rays in the Shuttle's crew cabin; Cosmic Radiation Effects and Activation Monitor, a study of cosmic radiation in the orbiter environment; Radiation Monitoring Experiment, an often-flown device that monitors the amounts of radiation inside the Shuttle; and the Air Force Maui Optical System, a use of the Shuttle's visibility in orbit to calibrate Air Force optical instruments in Hawaii. Also, in the payload bay with UARS, the Ascent Particle Monitor will measure any contaminants that enter the cargo bay during launch.

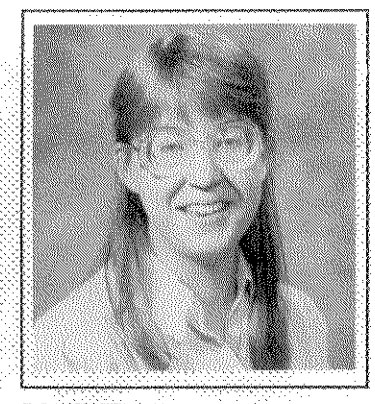
UP CLOSE. STS-48 Mission Specialist Charles "Sam" Gemar (center) takes a close look at the Upper Atmosphere Research Satellite, undergoing preflight preparation at Kennedy Space Center. Gemar and his fellow crew members were at KSC for the Crew Equipment Interface Test. Commonly referred to as the sharp edge inspection, this activity gives the flight crew a chance to become more familiar with the orbiter they will fly and the mission's primary payload.

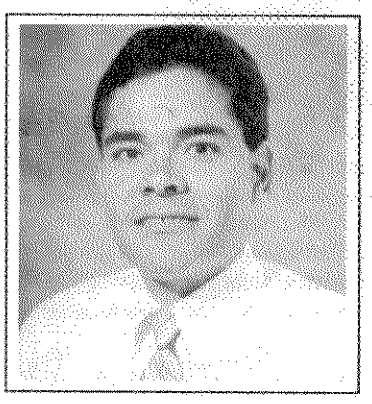

Kenneth S. Brentner

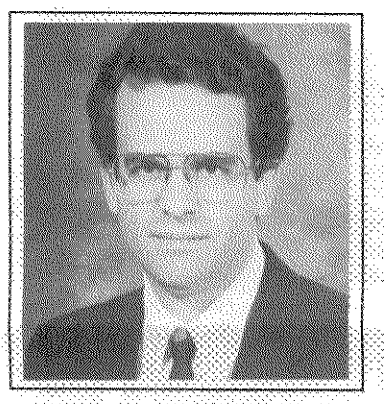

Charles J. Camarda

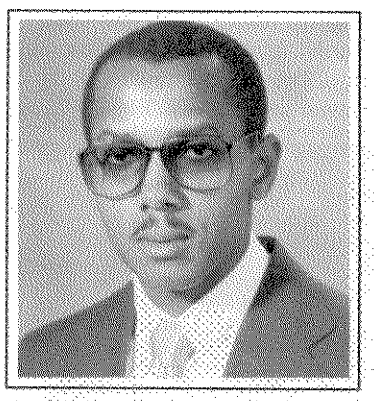

Ann B. Carlson


Carl E. Gray Jr.


Lin C. Hartung


Lucas G. Horta


Christopher L. Rumsey


Rodney T. Harris

Jocelyn I. Pritchard

Graduate Study Benefits NASA/Employee

Employees Earn Advanced Degrees

Twenty Langley Research Center staff members have received advanced degrees through the Center's Graduate Study Program.

The program, established in the 1940s, provides Langley engineers, scientists and administrators an opportunity to improve their proficiency in aeronautical and space research and earn advanced degrees while working at Langley. Approximately 1,420 employees have been awarded master's or doctoral degrees under this program.

Doctoral degrees have been awarded to 10 employees. **Kenneth S. Brentner**, Acoustics Division, received a doctor of philosophy in acoustics from the University of Cambridge, Cambridge, England. **Charles J. Camarda**, Structural Mechanics Division, received a doctor of philosophy in aerospace engineering from Virginia Polytechnic Institute and State University. **Ann B. Carlson**, Systems Engineering Division, received a doctor of philosophy in aerospace engineering from North Carolina State University. **Carl E. Gray Jr.**, Facilities Engineering Division, received a doctor of philosophy in engineering mechanics from Old Dominion University. **Lin C. Hartung**, Space Systems Division, received a doctor of philosophy in aerospace engineering from North Carolina State University.

Lucas G. Horta, Structural Dynamics Division, received a doctor of engineering science from Columbia University. **Gregory S. Jones**, Fluid Mechanics Division, received a doctor of philosophy in engineering mechanics from Virginia Polytechnic Institute and State University. **Thomas E. Pinelli**, Research Information and Applications Division, received a doctor of philosophy in library and information sciences from Indiana University. **Christopher L. Rumsey**, Fluid Mechanics Division, received a doctor of philosophy in aerospace engineering from the University of Michigan. **Willie R. Watson**, Acoustics Division, received a doctor of science in fluid mechanics and thermal sciences from George Washington University.

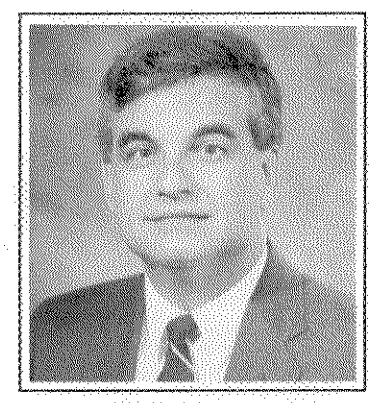
Master's degrees were awarded to 10 employees. **John A. Costulis**, Systems Engineering Division, received a master of science in engineering management from Old Dominion University. **George C. Firth**, Facilities Engineering Division, received a master of science in engineering management from Old Dominion University. **Rodney T. Harris**, Facilities Engineering Division, received a master of architecture from Virginia Polytechnic Institute and State University. **Gregory L. Humphreys**, Facilities Engineering Division, received a master of science in computer science from Old Dominion University. **David S. McDougal**, Atmospheric Sciences Division, received a master of science in engineering management from George Washington University.

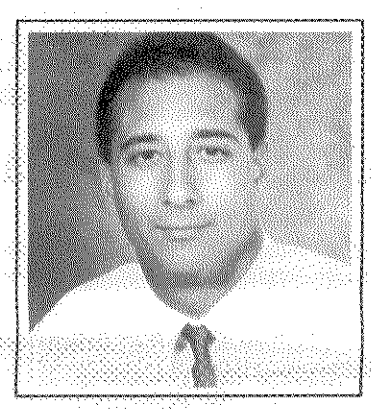
Jocelyn I. Pritchard, Structural Dynamics Division, received a master of science in engineering mechanics from Old Dominion University. **Frederick M. Thompson**, Human Resources Management Division, received a master of science in human resources personnel management from Golden Gate University; **Christopher W. Tremper**, Business Data Systems Division, received a master of business administration in information systems from Golden Gate University. **Sixto L. Vazquez**, Information Systems Division, received a master of engineering in electrical engineering from Old Dominion University. **Terryl A. Wallace**, Materials Division, received a master of science in materials science from the University of Virginia.

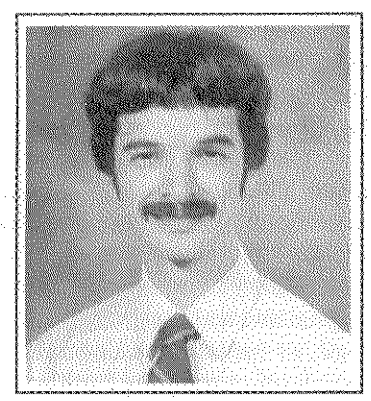
Two employees received advanced degrees shortly after being hired by the Center. **Jerry L. Garcia**, Flight Electronics Division, received a master of science in electrical engineering from the University of Virginia; and **Jill M. Marlowe**, Systems Engineering Division, received a master of science in mechanical engineering from Rensselaer Polytechnic Institute.

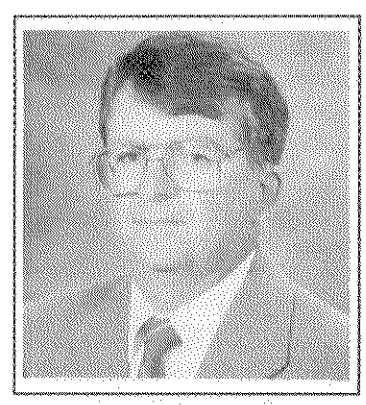
The Employee Development Branch congratulates these individuals for the long hours and hard work necessary for this accomplishment. Such work not only brings additional expertise to Langley, but also enhances the individual's professional growth and career development.

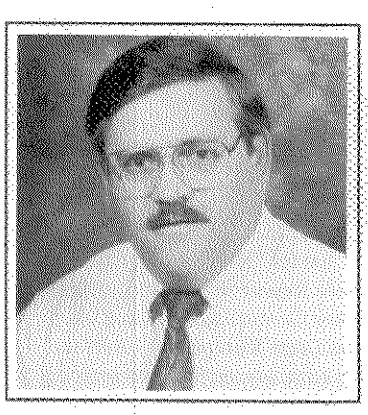
For information on the Center's Graduate Study Program, please call George D. Allison, ext. 42594.

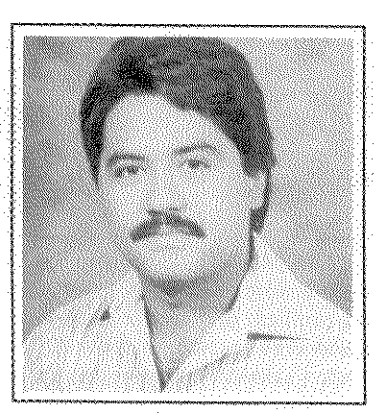

Thomas E. Pinelli

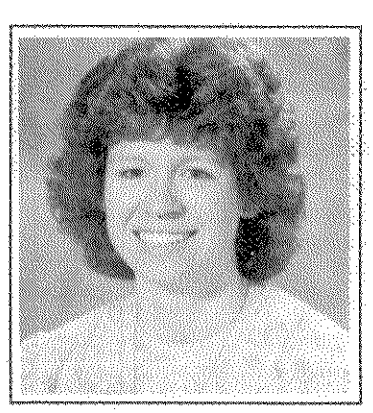

John A. Costulis

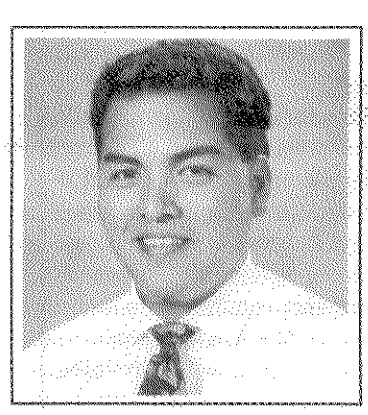

Gregory L. Humphreys

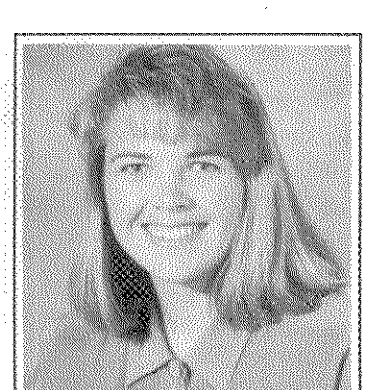

Frederick M. Thompson


Christopher W. Tremper


Sixto L. Vazquez


Terryl A. Wallace

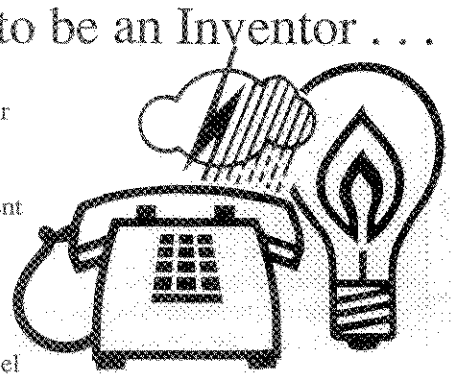

Jerry L. Garcia


Jill M. Marlowe

People & Places

At the VC in September

So You'd Like to be an Inventor . . .



Benjamin Franklin, Thomas Edison and Alexander Graham Bell are all famous inventors of the past. Today, Langley's research environment has produced more inventions and patents than any other NASA facility. To spark the curiosity of young minds, Dr. George Helfrich, patent counsel for the Office of Chief Counsel, will present "The Process for Inventors," a children's program, at the Visitor Center.

The one-hour program will teach youngsters about patents, copyrights and trademarks through games and activities. Helfrich, assisted by Dr. Kevin Osborne and Dr. Kimberly Chasteen, will encourage the children to come up with an invention, build it, then create a trademark and a slogan. At the end of the program, children will be offered an activity booklet to take home.

Children ages 9 to 12 are invited to attend the Saturday program which will be offered from 10 a.m. to 11 a.m., September 21 and 28. Due to limited seating, reservations are required. For reservations or more information, call the Visitor Center at 864-6000.

TQM Review Team Presents Findings

NASA Administrator Richard H. Truly issued NASA Management Instruction 1270 in February 1990 to give impetus to NASA's Total Quality Managment (TQM) efforts, with specific focus on implementing aggressive continuous self-improvement processes.

To help assess how the Agency is progressing in implementing TQM, each Center and Headquarters program office was scheduled for on-site visits by an internal review team. The reviews, designed to promote a quality culture, also serve as a baseline for competing for the President's Quality and Productivity Improvement Awards.

The team, composed of Center and Headquarters representatives led by Joe McElwee of Code QB, conducted its first on-site visit at Langley July 22-23. The Langley Director and Associate Director presented overviews of the Center's mission and TQM-related activities. The team then met individually with management officials and employees to focus on the following eight criteria: top management leadership and support, strategic planning, focus on the customer, employee training and recognition, employee empowerment and teamwork, measurement and analysis, quality assurance, and quality and productivity improvement results.

The review team presented their findings and recommendations to the Director and the TQM Steering Committee July 23 and forwarded a final report August 2 for the Director's consideration. The team was impressed with recent progress and the "professionalism and openness to the continuous improvement process."

The full report is available from Irwin Schauer by calling ext. 42552. Highlights of the report are summarized below:

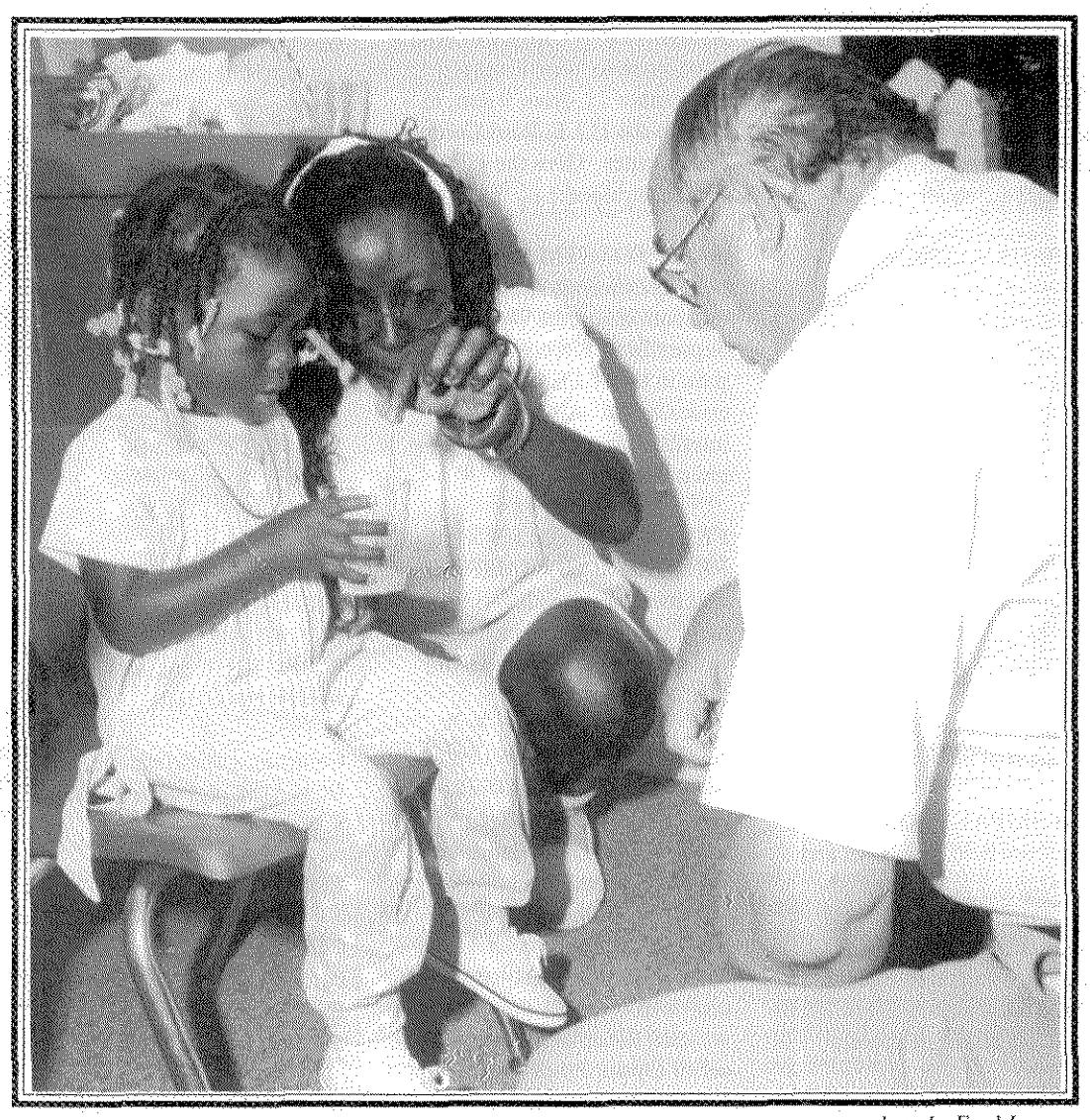
TQM Internal Review Team Findings

Strengths:

- Established LaRC Contractor Steering Council, TQM Steering Committee, Division Chief and Employee Forums to improve program coordination and communication.
- Established SCAN Teams for cultural assessment and process improvement.
- Committed six years of regularly-scheduled Strategic Planning and developed mission, goals and objectives.
- Demonstrated continuous efforts to "make Langley an even better place to work."

Opportunities for Improvement:

- Increase emphasis on measuring both internal and external customer satisfaction on a regular basis.
- Follow-up in one to two years with another SCAN-type survey to measure and evaluate improvements.
- Improve communications below the Senior Staff/ Division Chief levels concerning deployment of the Strategic Plan.
- Provide increased TQM training, particularly for employee awareness and team development.



-photo by Fred Jones

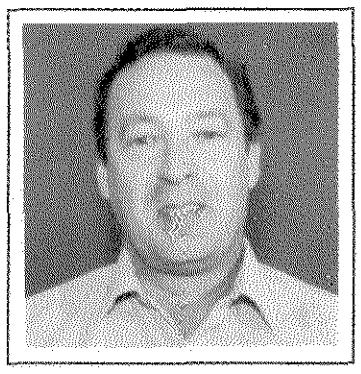
THE SANDS OF TIME. Young women ages four to 18 are encouraged to participate in the myriad of programs offered each day at Girls, Inc., one of the many nonprofit human care agencies that receives support from the annual Peninsula Combined Federal Campaign. Bill Wiley, Operations Support Division, is ready to assist as a creation of multicolor sand takes shape, destined to be an afternoon's work of art.

Donna L. Myers, executive director, said the agency's goal is to help youths become more confident and responsible adults. "We help them look ahead, set goals and work on developing their talents for achieving economic independence and personal fulfillment." The clubs also work with children who are mentally retarded or physically handicapped.

Serving over 600 girls on the Peninsula, Girls, Inc., operates two facilities, one in Hampton and one in Newport News. Each $334 contributed supports one girl in a broad range of wholesome recreational activities in the summer and afternoons throughout the year. Your one contribution can help them--and countless other organizations locally, nationally and internationally--all year long.

CFC
Virginia Peninsula

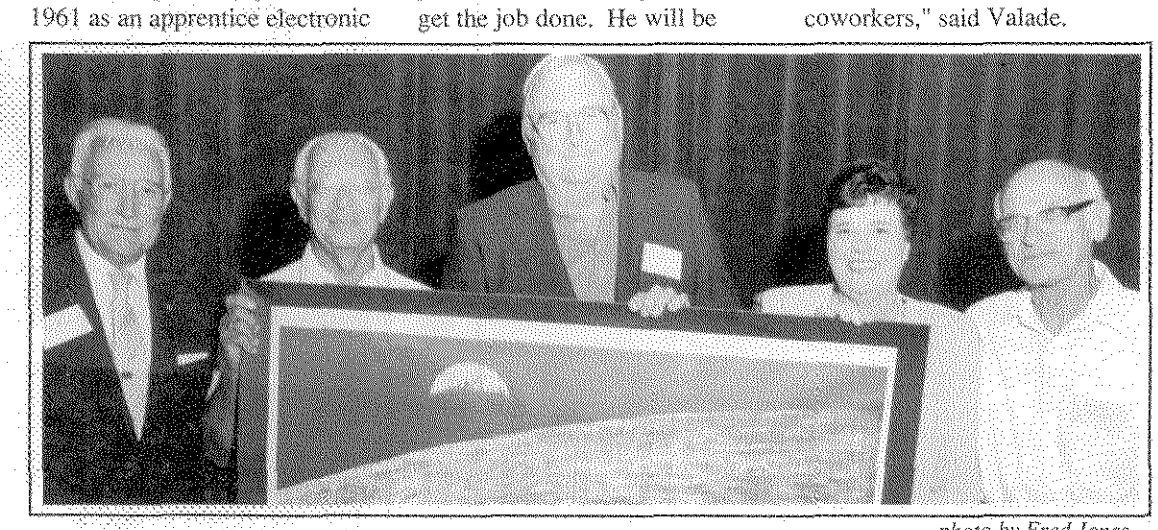
In Memoriam . . .



Sympathy is extended to the family of John R. Gambill, who died August 20 in Athens, Tennessee. An electronics technician in the Analysis and Computation Division, he had amassed nearly 30 years of civil service.

Following four years in the U.S. Air Force, Gambill joined NASA Langley in September 1961 as an apprentice electronic instrument maker in the Electrical Division.

Charles Valade, head of the Analysis and Simulation Branch remembers Gambill as a creative electronics technician who made valuable contributions to Langley's computational, data processing and flight simulation capabilities. "John was a problem solver, always able to get the job done. He will be sadly missed by his friends and coworkers," said Valade.



-photo by Fred Jones

RELIVING A MOMENT IN HISTORY. Holding the "photo of the century," taken by Lunar Orbiter 25 years ago are original Orbiter team members (L to R) Bob Girouard, space vehicle manager; Ed Brummer, communications and tracking systems manager; Will Watson, assembly and integration manager; Anna Plott, secretary; and Israel Taback, science manager. This historic photo was the first view of Earth from space.

Happenings

SPECIAL LAA SOCIAL will be held Friday, September 13, from 4 to 8 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road. "Autumn Antics" will feature music by D. J. Mark Bradley. $1 cover charge.

BODY DYNAMICS. High energy-low impact aerobics classes will be held Mondays, Wednesdays and Fridays at 6:15 a.m. in the LAA gym, 14A Ames Road. Classes are open to civil service employees.

LaRC ALUMNI ASSOC. resumes monthly luncheons Tuesday, September 10, at 11:30 a.m. in the private dining room of the NASA cafeteria, 16 West Taylor Road. The program will feature helpful tips and information for travelers. Future activities will also be discussed.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m. in the LAA gym. Cost is $12 per month. First class is free. In addition, bench step classes are offered Saturdays, 9:30 to 10:30 a.m. Cost is $6 per month.

NOON-TIME STRIDERS. Join the walking club Tuesdays and Thursdays at noon in front of the H.J.E. Reid Conference Center for a 30-minute walk.

BLOODMOBILE. The American Red Cross will hold a Bloodmobile Wednesday, September 11, from 9 a.m. to 3 p.m. in the H.J.E. Reid Conference Center. Give the gift of life--give blood.

NASA TOASTMASTERS will hold a humorous speech and evaluation contest Wednesday, September 11, from 11 a.m. to 1 p.m. in the H.J.E. Reid Conference Center. All who are interested in this learning session are invited to attend.

FEDERAL WOMEN'S PROGRAM COMMITTEE will meet Wednesday, September 11, at 8:15 a.m. in the executive dining room of the NASA cafeteria.

AFGE LOCAL 2755 Union Meeting will be held Wednesday, September 18, at 4:15 p.m. in the Union Office Building, 8B Ames Road.

SQUARE DANCE CLUB. The *Square Edges* square dance club will offer classes in modern western dance at Palmer School, off of Oyster Point Rd., Newport News. The first class will be Thursday, September 12, 7:30 to 9:30 p.m. For more information, contact Sam Holben at 229-9817 or Gil Firth at 595-5302.

PEARL HARBOR. Participants and volunteers are needed for the 50th anniversary commemoration of Pearl Harbor. Meet at 4 p.m. September 19 at the War Memorial, Newport News. Call Abe Leiss, 877-2939, for additional information.

BACKYARD ASTRONOMY course offered at the Virginia Living Museum, October 10-31, 7:30 to 9:30 p.m. Cost is $65.

MISSING: ITEMS.
35mm Nikon , ECN 847903, contact Bob Bryant, ext. 45501.

TV cameras, ECN 062338, 282764, 550150; pressure gauge, ECN 427881; and HP-9845, ECN 410169; contact George Beeler, ext 45762.

Centronics audio tape recorder, ECN 428274, contact Tom Prothro, ext. 41592.

Electric welder, ECN 0424678; TV monitors, ECN 0144100 and 0417679; video cassette recorder, ECN 0531226; contact Equipment Management Section, ext. 42049.

ROOMMATE NEEDED. Male to share two-BR apartment near Casey Chevrolet. Pay 1/2 rent + 1/2 utilities. Call 599-5746 after 5 p.m.

Langley Salutes Hispanic Heritage

President George Bush has proclaimed the week of September 15-21, 1991, National Hispanic Heritage Week.

In honor of this decree, the Office of Equal Opportunity Programs is sponsoring a "Meet Langley's Hispanic Employees" coffee at 2 p.m. Friday, September 20, in the H.J.E. Reid Conference Center, 14 Ames Road. All employees are invited to share in this informal exchange. Attendees should charge their time to JO-A1980.

During this week-long observance, the cafeteria will serve special dishes. Informational handouts will be available by calling ext. 43290.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program is designed to permit employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

- Linda E. Edmundson
- Gael M. Hawkins
- Cassandra D. Stevens
- Noel A. Talcott Jr.
- Catherine B. Worth

If you wish to donate annual leave to these recipients, or wish more information concerning the program, please contact Linda Park of the Employee Relations Office at ext. 42610.

Job Openings . . .

91-61: Program Analyst, GS-345-13, Human Resources Management Division, Management Operations Directorate, NASA-wide consideration. Closes September 12.

91-62: AST, Technical Management, GS-801-14 or 15, or **Engineering Technician,** GS-802-14. CERES Project Office, Projects Division, Electronics Directorate. Open to Langley Research Center civil servants. Duty station: TRW, Redondo Beach, California. Closes September 11.

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

402 ON-SITE NON-LARC
COPPEDGE, AUDREY S.
MAIL STOP 146

News Researcher

-photo by Fred Jones

AT HOME IN THE COCKPIT. NASA Administrator Richard H. Truly and Associate Administrator for the Office of Aeronautics, Exploration and Technology Arnold Aldrich visited Langley August 23. They were briefed on Langley's HL-20 research program. Truly (above) "flew" numerous landings of the lifting body concept in the visual motion simulator.

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 19 September 20, 1991

Langley Researcher News

Bi-weekly Employee and Contractor Publication

Langley Inventions Among Most Significant Technical Advances of Year

Two Langley inventions are among the 100 most significant technological advancements of the year, having won R&D 100 awards presented annually by Research and Development *magazine.*

The awards recognize 100 outstanding products developed during the year to advance science and technology. Selection is by a panel of scientists, engineers and magazine editors after studying new technology around the world.

Langley Research Center has earned 21 awards in its 24 years of competition and ranks second on the list of recipients.

Flight Aid Helps Prevent Accidents

-by Kristina Murden

R&D 100 Winner

NASA Langley researchers have developed a flight deck decision aid called Faultfinder that will help pilots handle malfunctions and emergencies.

The fault management system gives pilots information for the monitoring, diagnosis and recovery from engine and hydraulic system component problems -- capabilities not provided by present aircraft systems.

Its implementation will help flight crews prevent or reduce the severity of accidents.

Faultfinder's principal developer, Kathy Abbott, head of the Human/Automation Integration Branch, Flight Systems Directorate, began development of the decision aid seven years ago with researchers Paul Schutte, co-principal investigator, Mike Palmer, Wendell Ricks, and Lockheed research programmer Steve Smith.

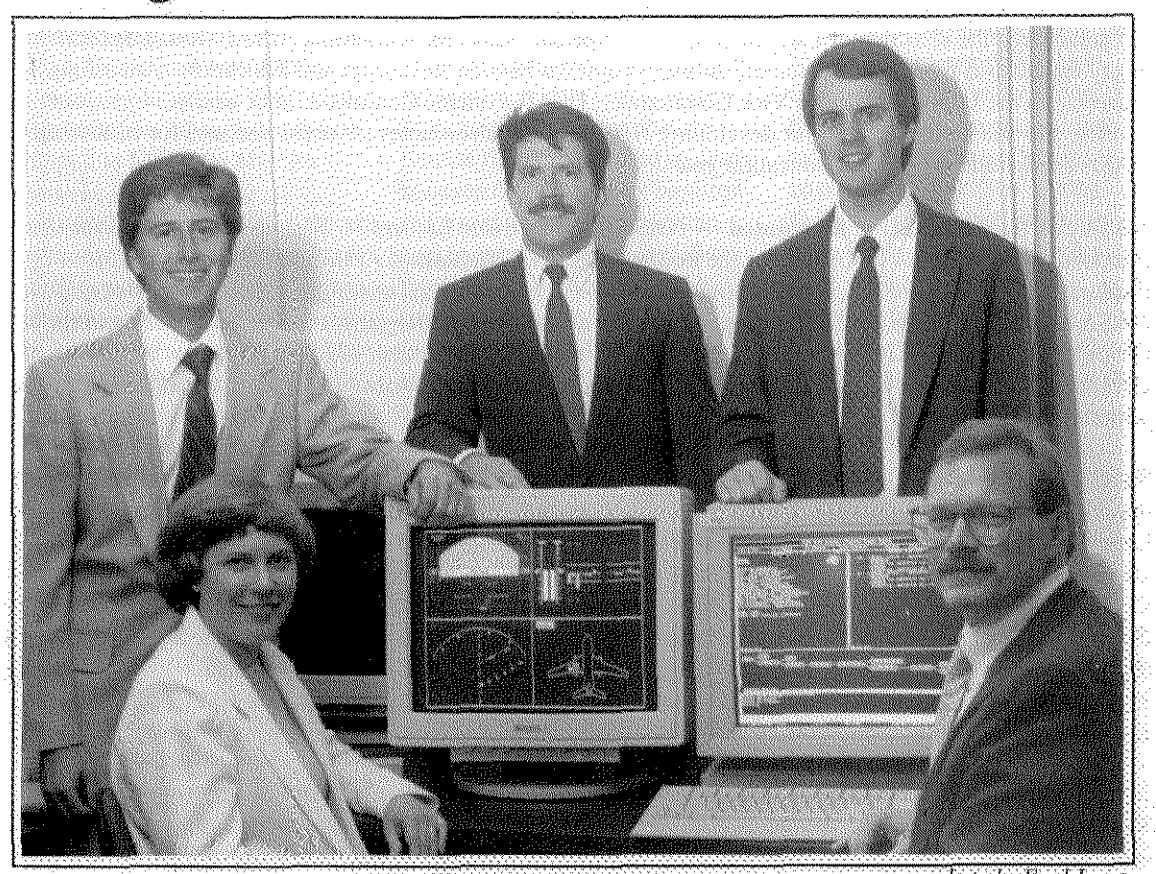
Faultfinder is designed to simplify pilot management of engine and hydraulic failures by providing comprehensible and integrated information to the pilot regarding fault situations.

This capability is particularly useful for the diagnosis of novel or complex faults involving physical damage -- such as occurs in uncontained engine failures. This is significant because these faults are difficult for pilots to diagnose and have caused major aircraft accidents.

The problem with the majority of current engine system instruments is that they require the pilot to mentally process raw sensor data in failure situations that are time-critical and often involve high workload and associated error.

Faultfinder processes raw sensor data into monitoring, diagnosis and recovery information that is more meaningful to the pilot in understanding current fault situations and their consequences.

Faultfinder's monitoring function provides early detection and displays abnormal sensor readings using the NASA Langley E-MACS (Engine Monitoring and Control System) format, a display concept for presenting monitoring information to the flight crew.



-photo by Fred Jones

The Faultfinder development team: Back row from left, Steve Smith, Wendell Ricks and Mike Palmer. Front row from left, Kathy Abbott and Paul Shutte. The computer screen on the left shows what the pilot will see.

The detection process begins when sensor readings become abnormal, not just when they exceed the normal operating range.

The diagnosis function identifies the cause and effects of known and unanticipated faults, then provides information about the faults and the resulting system status.

Its identification of the effects of the fault on the status of the physical system is equally as important as identifying the cause of the fault.

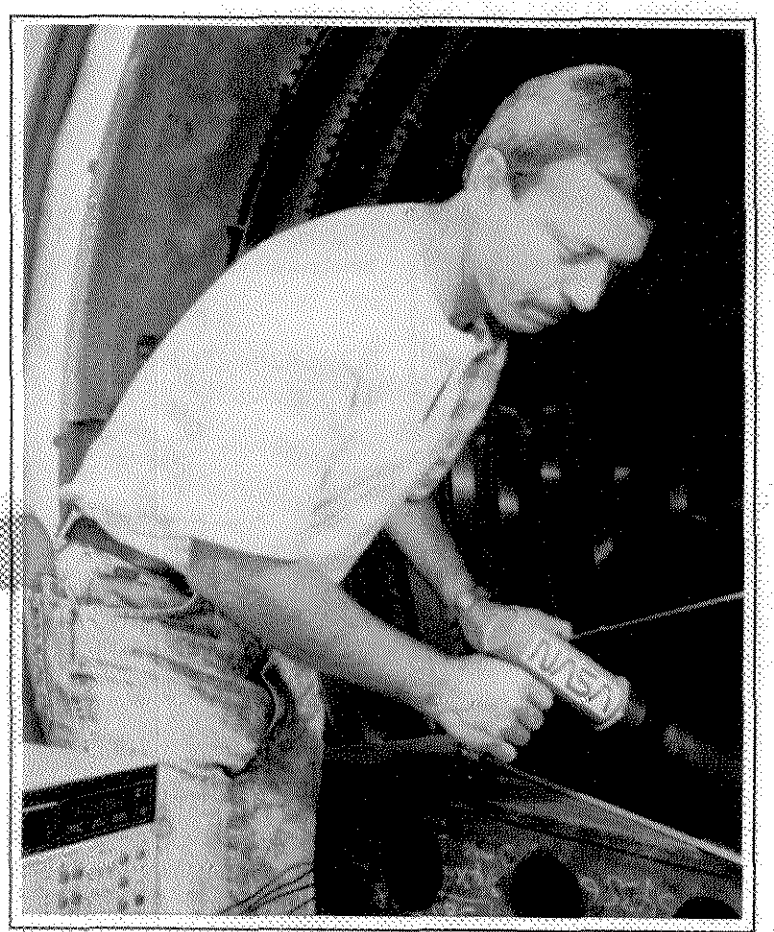
The purpose of this operative diagnosis is to facilitate continued safe operation, rather than identifying the part to repair.

The recovery recommendation function assists flight crews by providing checklists that contain the corrective actions for the diagnosed faults.

The capability to notify a flight crew immediately of an abnormality and to specifically define the symptoms is unprecedented. This early definition will increase the crew's situational awareness and give them more time to develop a response before the situation becomes critical.

Applications for the future include modification of Faultfinder for use in any jet or turbine powered craft.

It is designed for NASA Langley's Boeing 737 aircraft, and will be tested in simulated critical situations.



-photo by Carol Petrachenko

Electronics technician Robert L. Fox helped develop the Thermoset Impedence Monitoring and Control System to gauge composite curing.

System Monitors Composite Curing Non-invasively

-by Kristy Alligood

R&D 100 Winner

Two electronics technicians have developed a system capable of monitoring the important final curing process of composites without inducing structural change.

It is the only one of its kind that is non-intrusive.

The Thermoset Impedance Monitoring and Control System was developed by Robert L. Fox and David Johnston.

"This is an extremely prestigious award," said Langley Technology Utilization Officer Joe Mathis. "R&D reviews approximately 2,000 applicants each year. The impedance monitoring system is one of only 100 that has been recognized and that means a great deal for NASA Langley."

The new technology non-invasively monitors the chemical changes that take place in composites during the curing process.

Composites are materials, such as plastic, that are bound by resins to form a solid.

A gun-like device is held outside the composite and it uses an electromagnetic field to sense changes in resistance during the finishing process or curing.

Measurements are made of changes in the induced electric current, indicating the composite's chemistry during curing.

The system allows for more reliable and efficient measurement of the changes because no foreign material is introduced into the composite.

"Previously, we had to actually place a capacitative gauge in the composite to monitor the change," Fox said.

"That induced a permanent structural flaw in the composite because the gauge could not be removed. The key to this new technology is that it is non-intrusive and this is the only one of its kind that is non-intrusive."

Fox, and Johnston began developing the system in 1985. Johnston is now a self-employed electronics technician.

Composites are used instead of metals in applications as diverse as aircraft, artificial joints and helicopter drive shafts because they are lighter, stronger and more resistant to environmental conditions.

"This system could reduce the cost of processing and the time involved in determining the cure rate," said Fox.

"It also can be used in other methods such as a thickness monitor or to non-intrusively test stress and strain. It can be utilized for many purposes and will be helpful to many industries," said Fox.

In his 20-year career with NASA Langley, Fox has received one other R&D award.

He also holds five patents, with nine additional patents pending, and has been awarded several exceptional service medals.

News Briefs

Magellan Discovers Longest Channel in Solar System --- The Magellan spacecraft, mapping the surface of Venus with imaging radar, has discovered the longest channel known in the solar system. The channel crosses the plains of Venus for 4,200 miles, longer than the Nile River, the longest river on Earth. "The very existence of such a long channel is a great puzzle," said Project Scientist Dr. Steve Saunders. "If the long channel were carved by something flowing on the surface, the liquid must have had unusual properties -- some material near its freezing or melting point at the average surface conditions of Venus."

NASA AA for Human Resources and Education Appointed --- NASA Administrator Richard H. Truly has announced the selection of Lieutenant General Spence "Sam" M. Armstrong, USAF (Ret.,), for the newly established position of Associate Administrator for Human Resources and Education. Armstrong retired from the U.S. Air Force as Vice Commander, USAF Systems Command, after nearly 34 years of service. He will be responsible for developing NASA's human resources strategic plan and for furthering NASA's emphasis on national education goals.

NASA AA for Exploration Appointed --- NASA Administrator Richard H. Truly has announced the selection of Dr. Michael D. Griffin for the newly established position of Associate Administrator for Exploration. In this position, he will provide direction, integration and oversight of activities involving NASA exploration goals, including program, technical and fiscal management for matters relating to the Office of Exploration. Griffin comes to NASA from the U.S. Department of Defense, where he was Deputy for Technology, Strategic Defense Initiative Organization, responsible for all technical research within the program.

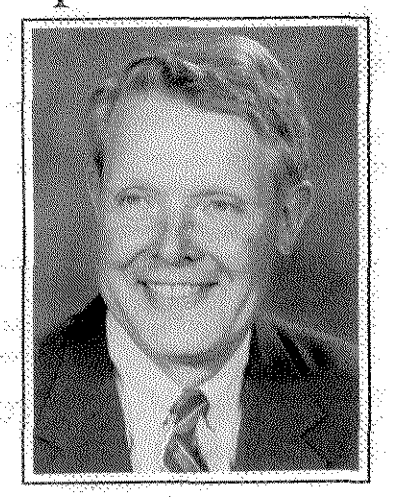
Spacelab Payload Specialist Named --- Dr. Dirk D. Frimout has been appointed payload specialist for the ATLAS-1 Spacelab mission scheduled for flight in early 1992. The appointment was made by Dr. Lennard A. Fisk, NASA's associate administrator for space science and applications. Frimout was an alternate payload specialist for ATLAS-1 and is the Spacelab utilization manager in the Microgravity and Columbus Utilization Department of the Space Station and Microgravity Directorate of the European Space Agency. He has a Ph.D. in applied physics from the University of Ghent in his native Belgium. He also is a co-investigator for the Grille Spectrometer, part of the ATLAS-1 payload. He replaces Michael K. Lampton, who became disqualified for medical reasons. Lampton will continue to serve on the Spacelab Mission Operations Control Team as an alternate payload specialist.

Editor's note: To obtain a copy of any of these NASA Headquarters News Releases contact Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request information summarized above by headline printed in bold.

Editorials

CFC Message from the Director

Langley Employees Offer the 'Voice of Hope'

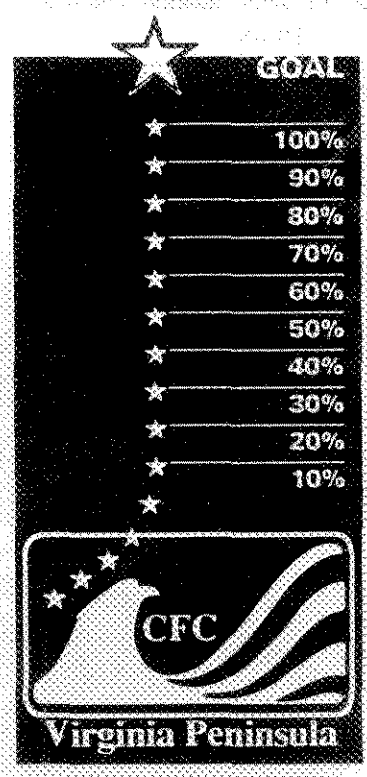


I want to talk with you today, one federal employee to another.

As government employees, our mission is to serve others and, I'm proud to say, we at Langley take that mission seriously. Langley Research Center is known worldwide as a technological leader. The research that goes on here everyday makes the world a better place—advancing aviation, space, medical, environmental and countless other sciences.

But the commitment of Langley employees does not stop at the gate. As residents of the Peninsula, we are committed to community concerns, to the needs of our neighbors and friends, to making things better for our families. And, in this imperfect world, we'd often like to ease the problems we see around us—locally, nationally and internationally—and to help those we don't even know, those who cannot help themselves.

That's a tall order for any federal employee, but we have a vehicle in place that can help us make a difference. That vehicle is the Combined Federal Campaign—an organization founded by federal employees to help those in need.



The CFC, through its member agencies, is committed to better educational and employment opportunities; helps fund critical local, national and international relief efforts; protects our environment; and provides support to those who need a helping hand.

Langley employees have always been leaders in community concerns in addition to aerospace research. Public- spirited men and women from this research center serve on planning commissions and recycling committees, fire departments and school boards. It's no surprise, then, that Langley employees also lead Peninsula citizens in contributions to the Combined Federal Campaign.

This year's CFC theme invites us to be the "voice of hope" to those in our community as well as those we may never meet who need hope and help desperately. Langley CFC chairman Bruce Conway and his committee have set a challenging goal of $285,000 for this year's campaign. I ask you to keep the Langley tradition alive—support Bruce in his efforts to make this campaign the most successful ever.

Do what you can when your key worker contacts you on October 7. Your one gift will help the hopeless and the helpless all year long.

Richard H. Petersen
Director

Computer Select: A Database for Hardware, Software

-by S.A. Matley

What do you do when you find $6,000 left in your ADP equipment budget and have only a few days to spend it? What you need is a ready source of comprehensive information on computer hardware and software.

What you really need is Computer Select, a compact disk available at the Technical Library that can provide the information for evaluating and selecting the hardware or software you might purchase.

Computer Select is no ordinary database. In addition to the abstracts for articles from more than 110 computer journals, it contains the full text of papers from another 40 published in the last three years.

From *AI Expert* and *Communications of the ACM* to *MacWorld* and *Byte*, Computer Select provides information on hardware, software, electronics, engineering, communications, and the application of technology.

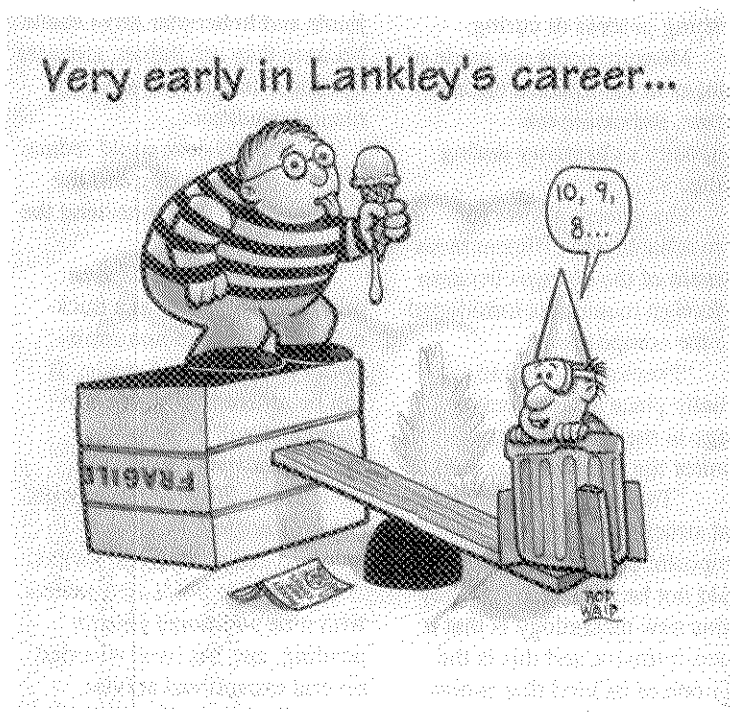
This single compact disk also includes specifications for both software and hardware as well as company profiles.

Begin your search by querying Computer Select for articles on all personal computers selling for less than $6,000. Narrow it by limiting the search solely to product reviews of battery-powered 386-SX portable computers. This search yields the full text of several survey articles that critique the features of comparable machines on the market.

You can zero in on portables manufactured by companies with fewer than 500 employees and in business only since 1990. Profiles for more than 11,000 companies include addresses and phone numbers, names of key executives, gross annual sales, and so on.

Updated monthly by Ziff Communications Co. of New York, Computer Select is a trove of information. Most importantly its query language is intuitive and easy to learn. Finally, its compact disk format eliminates communications costs incurred with other online databases.

Lankley



In Memoriam . . .

Sympathy is extended to the family of Earlie F. Smith, who died August 17. Smith retired as supervisor of the Transportation Department in 1974 after 32 years of service.

Video conferences for teachers to start

NASA's Educational Affairs Division will broadcast, via satellite, the first of four live educational video conferences on October 16.

The first conference will discuss the Space Exploration Initiative in which the United States will establish a permanent human presence on the moon and send human and robotic missions to Mars.

Participating schools can receive the program, which is free, from 2:30 to 4 p.m. Eastern time. The 1991-92 video conference schedule is:

- October 16: Space Exploration Initiative.
- December 11: Life Sciences Research.
- Feb. 19: Aeronautics.
- April 15: Space Flight/ Space Station.

Schools should register by writing NASA Aerospace Education Services Program, Videoconference Series, 300 North Cordell, Oklahoma State University, Stillwater, Okla., 74078-0422 or call (405) 744-7015.

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough
Editor ..... Michael Finneran
Photojournalist ..... Carol Petrachenko
Photographer ..... Fred Jones

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Instrument to Open New Window on the Atmosphere

-by Craig Murden

Laser, Telescope Measure Atmosphere from Unrestricted View of Space

A Shuttle-borne Langley experiment which packages existing technology in a cutting-edge space instrument is beginning to take shape in the clean rooms and labs of the Center's Flight Electronics and Systems Engineering Divisions. The focus of this increasing attention is a pioneering NASA effort to conduct atmospheric research from long-duration, untended, free-flying platforms in space. This technology will be used in future applications, such as the Earth Observing System (EOS) whose objective is to measure the interactions of forces which govern how the Earth works as a system.

The Lidar In-Space Technology Experiment (LITE), scheduled to fly on the Shuttle in late-1993, is designed to validate the deployment of laser-based hardware used to measure stratospheric and tropospheric gases, the planetary boundary layer, cloud top heights, and atmospheric temperature and density. The mission is part of a series of Space Shuttle flights to demonstrate changing technological development. Langley is responsible for developing the flight hardware, conducting the flight experiment and handling the flight data.

Lidar technology is not new. The combination of a laser, a telescope, optical detectors and supporting electronics has been developed by Langley design engineers and atmospheric scientists and used extensively to measure the atmosphere from both the ground and airplanes. But this hardware has never been used to examine the atmosphere with the clarity expected of the unrestricted view from space.

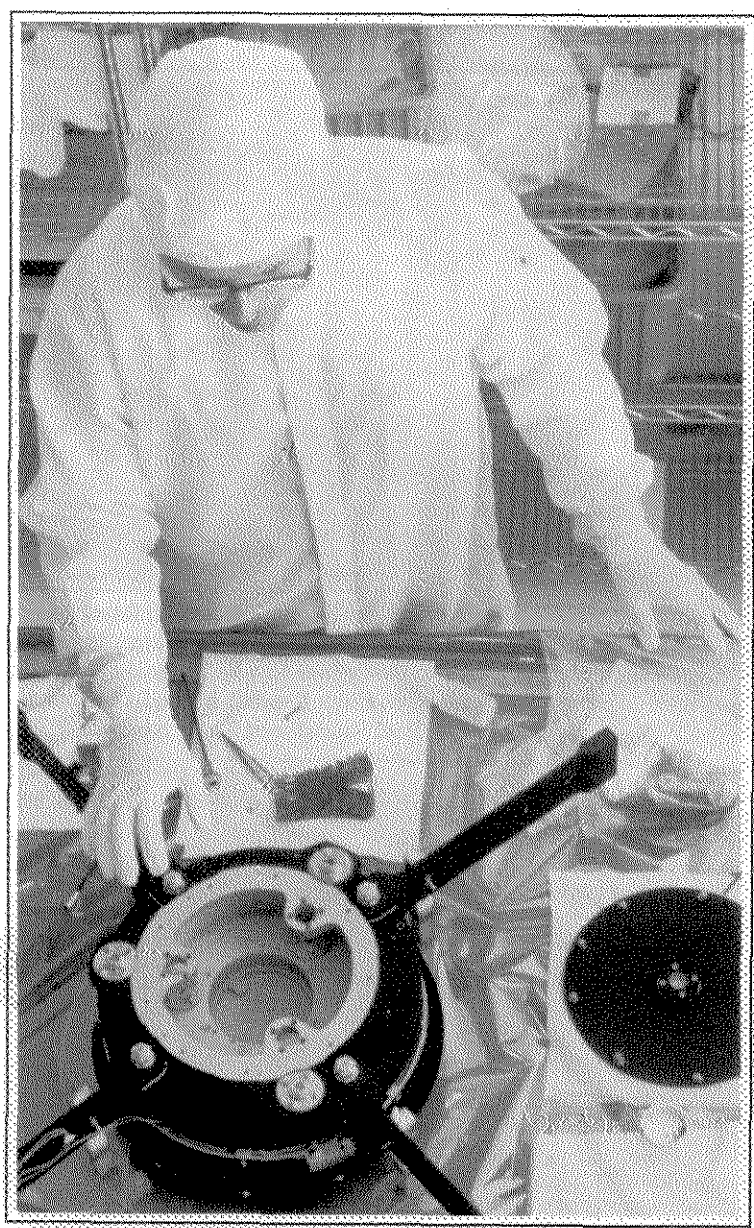
The Langley instrument will operate like this: The laser transmits energy at three harmonically-generated wavelengths into the atmosphere. The telescope-receiver collects the energy backscattered from the atmosphere and brings it to focus on three detectors. Electronics in the receiver process the detector output signals and send them to a high-speed digitizer for further processing and recording. Alignment between the laser and the telescope is handled by a two-axis, gimballed boresight unit.

The LITE instrument is being integrated into a Marshall Space Flight Center (MSFC) spacelab pallet. The main support structure for the instrument was fabricated, assembled and load tested at Langley early this year. It was then disassembled, shipped to the Kennedy Space Center and reassembled onto the flight pallet. The pallet, with structure now attached, was shipped to MSFC in May for dynamic model testing using mass models of the LITE subsystems. The pallet next came to Langley where the actual flight subsystems will be installed and the complete instrument will get extensive testing.

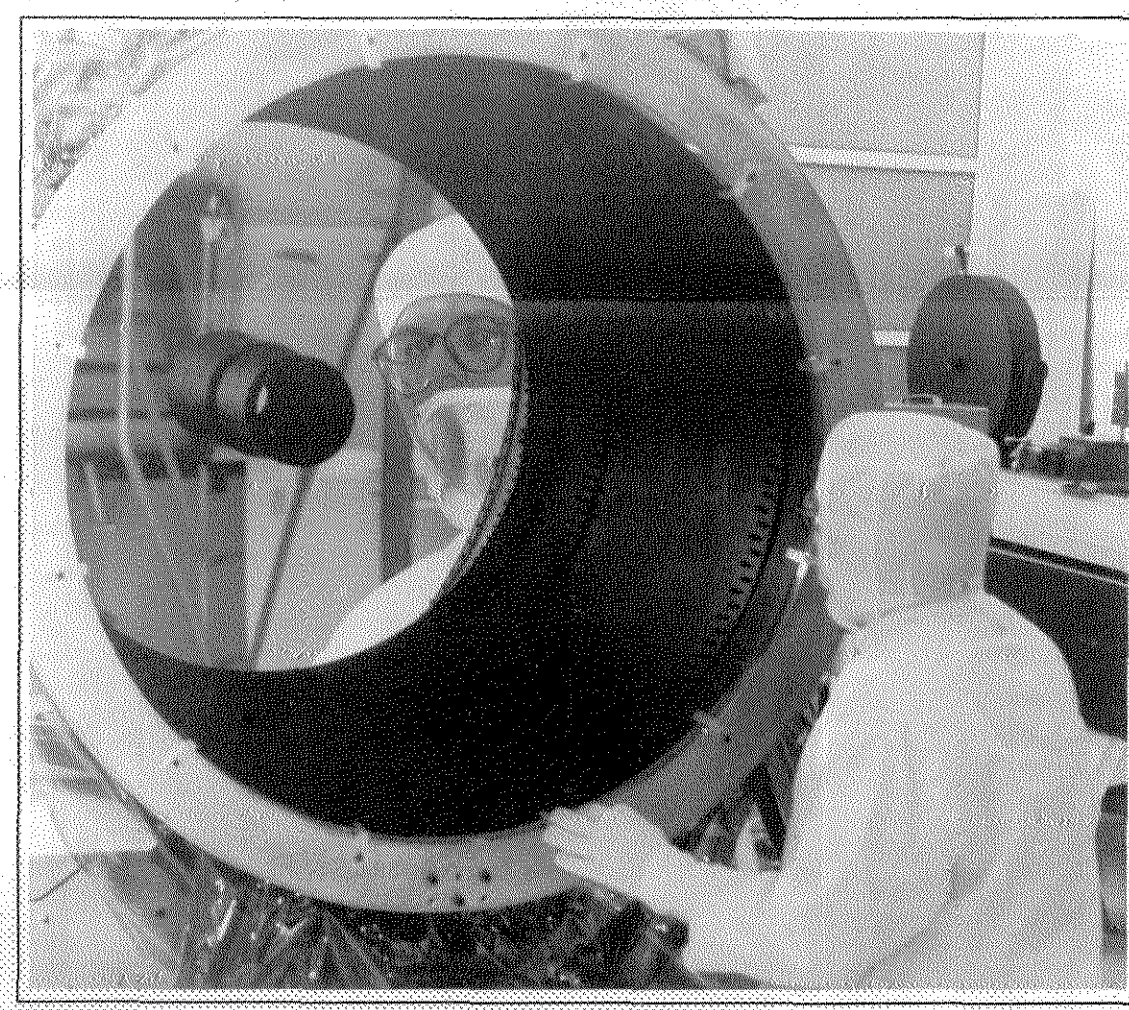
Langley is also building the boresight unit, the camera, the optics and detectors, the system electronics, and the telescope support structure. The telescope is the engineering model of the Orbiting Astronomical Observatory (OAO) telescope built in 1967. It has been completely disassembled, refurbished and reassembled for flight. It is currently being aligned and having its optics and detectors installed.

The project's lead engineer for mechanical systems, Joseph F. DeLorme, explains that the Shuttle flight is intended to demonstrate the technology required for a space-based lidar system and to provide "space qualification" for the instrument which means how well the LITE survives the rigors of launch, operation in space and landing. DeLorme says the vibrations of a Shuttle launch and the on-orbit thermal environment can be particularly harsh on the performance of optical systems that are highly sensitive to misalignment. Sound mechanical and thermal design are required to minimize these effects and that is why this instrument, which capitalizes on proven component design and performance, has a very good chance to excell, he adds.

DeLorme also spoke of the NASA-wide teamwork which characterizes the undertaking. "I think one of the most challenging aspects of this project is the coordination of efforts among the six NASA organizations involved. Assembly and testing have already been done at Kennedy Space Center and Marshall. Instrument environmental testing will be done at the Goddard Space Flight Center. Johnson Space Center is providing integration hardware and mission management while NASA Headquarters provides program management. And, of course, KSC is also providing payload integration and launch services."



Joe DeLorme, lead engineer for mechanical systems, reassembles the secondary mirror of the LITE telescope in Langley's new clean room. Langley is the focal point for developing and conducting the Lidar In-Space Technology Experiment which is scheduled for a Shuttle mission in late 1993. The *Researcher News* will provide increasing coverage of LITE's progress as assembly and checkout proceed.



-photos by Mary Beth Payne

The large mirror of the LITE telescope reflects DeLorme's curiosity as he peers into the primary tube. LITE capitalizes on proven technology, such as the telescope designed in 1967 for NASA's Orbiting Astronomical Observatory.

The Mission . . .

LITE is manifested to fly on a seven-day mission when the Shuttle will orbit at 160 nautical miles. Each 90-minute orbit will allow both day and night coverage over Central America, most of South America, most of Africa, and parts of India, China, and Australia. The instrument will be activated as soon as orbit is achieved and the cargo bay doors are opened. When power is first applied, a two to three hour stabilization period will allow components and subsystems to reach operating temperatures and to be configured for the command to begin taking data. Data takes will be conducted for approximately 4.5 hours, twice each day.

In addition to technology demonstration, the mission's secondary purpose will be to measure weather systems including large-scale cloud systems in the western Pacific, marine stratus decks off the west coasts of South America and Africa, the movement of Saharan dust by westerly Atlantic tradewinds and the tropospheric gases over the Amazon rain forest. Another objective will be to study transfer of thermal and mechanical energy between the ocean and the atmosphere by looking at the height and structure of clouds and the planetary boundary-layer height and gas loading.

LITE's two-pronged mission of hardware performance coupled with scientific study is mirrored by the ongoing cooperative Langley effort which involves engineers who are designing and building the instrument and their constant interaction with the atmospheric scientists who will study and interpret the data provided by this innovative application of proven technology to a bold new window on the planet's health.

Council Named to Implement Improvement Program

Training of Employees Starts in Fiscal 1992

Center Director Richard H. Peterson began a long-term commitment to continuous improvement -- and a new chapter in Langley's history -- by initiating an Executive Steering Council on Total Quality Management (TQM).

The council, established on August 19, will provide impetus and guidance for implementing the Center's continuous improvement program.

"Langley is a good place to work and we produce good products. However, we want to be better," Peterson said.

The Center has contracted with 3M Quality Management Services to assist in the implementation process.

Senior staff and facilitator training will begin soon, and all employees will receive 2-1/2 days of quality awareness in fiscal 1992.

Sid Pauls, associate director, said he believes the program is a logical follow-on to the Strategic Culture Assessment for the 90s (SCAN) teams' recommendations.

"Our goal is to institutionalize processes to continually improve the quality of our environment and products," he said.

The title of the program will probably be changed in the near future, but implementation of continuous improvement concepts will enhance Langley's reputation as a world-class research center.

Council members are the director, deputy director, associate director, and all seven program directors.

Irwin Schauer is executive secretary.

Aerospace Technology Vans on Display

Transcontinental Marketing Exhibits, Inc., will exhibit two 50-foot vans Friday, October 4, from 2:30 to 4:30 at the corner of West Taylor Road and Stratton Road, across from the NASA cafeteria.

This mobile tour show, previously exhibited at Marshall Space Flight Center and Ames Research Center, will feature 24 aerospace manufacturers.

The display vans will feature hands-on inspection of capabilities in machine tools, cutting tools, machinery, machining, milling, castings, fluid control, metrology, testing, test inspection, software, plating, hardware, and video.

Also featured will be an exhibit illustrating NASA's Project LASER, a nationwide mobile program that addresses one of the industry's biggest challenges -- developing engineers, scientists, and researchers to fill the expanding needs of the industry.

1991 Softball Season a Success

-by Lou Glabb

Thirty-five teams participated in the four-month-long 1991 NASA softball season. Teams were grouped into three divisions for the first round of play. Then, based on their win/loss record, the teams were further separated into six leagues for the second part of the season. All teams participated in the double elimination tournament, which concluded the season in early August.

The BALLER dynasty continues in A-League. After losing only one game during regular season play, the BALLERS went undefeated in the tournament to become A-League champions.

B-League was not as clear cut. After finishing in the middle of the pack during regular season play, BBI (8-10) went on to sweep the championship tournament and become B-League champs.

The new team on the block, ADVEX (18-1), proved to be the unstoppable force in C-League and compiled a formidable record in becoming C-League champions.

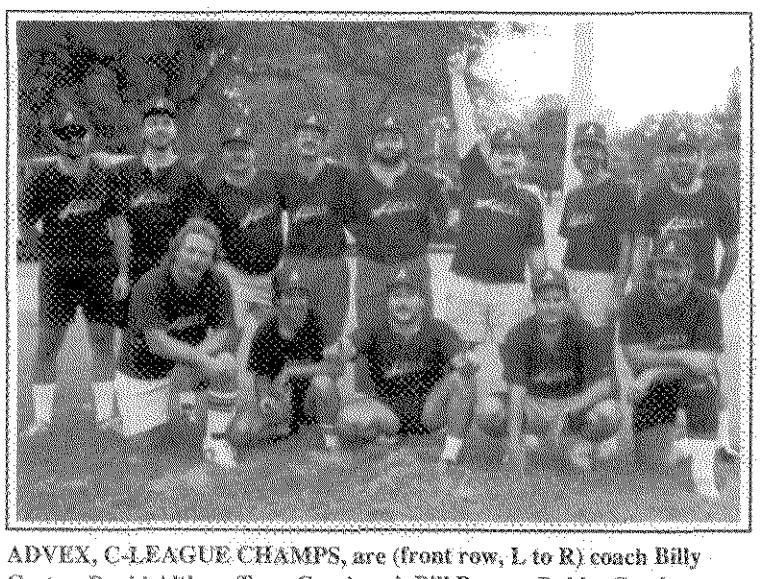
The wild and crazy MAC-hinist (10-12) won D-League after fininshing fourth in regular season play. Taking the long road through the losers bracket during the tournament, MAC-hinists played the most games this season of any championship team.

In E-League, the never-say-die SIM-ulation (17-2-1) team won the tournament in grand style with a come-from-behind victory that generated six runs in the bottom of the seventh inning to steal victory from a hungry and thirsty BARphlies team.

The DECIBELS (11-5-3) were the team to beat in F-League as they placed first during regular season play and then went on to sweep the championship tournament.

BALLERS, A-LEAGUE CHAMPS, are (front row, L to R) Archie Dimery, Bob Booth, Chip Quinn, Bobby Borchardt, Allen Frizzell, Jimmy Adams; (back row) Steve Geissinger, Kevin Laferriere, Ed Covington, Mark Frye, Rodney Russel, and John Costulas. Not shown are Wayne Merson, Jeff Conover and George Hilton.

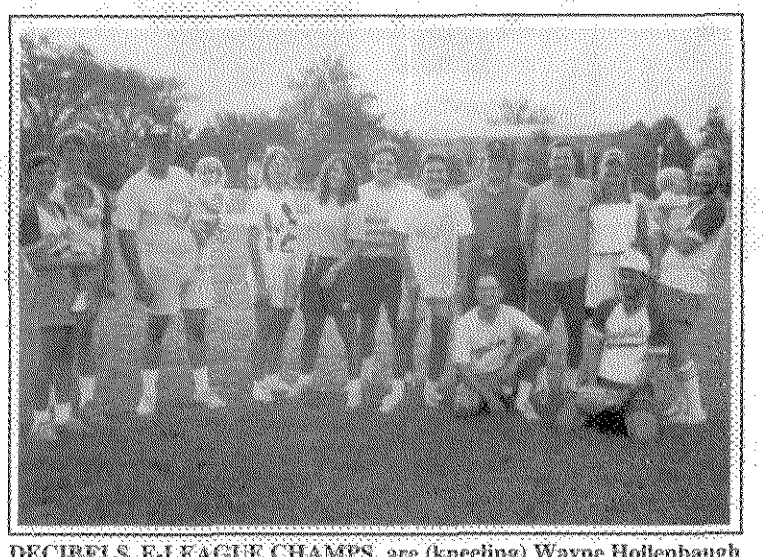
BBI, B-LEAGUE CHAMPS, are (front row, L to R) Bob Patterson, John Swartzbaugh, Craig Neal, Dave Kessler; (back row) Steve Lee, Joe Woolsey, Jeff Pierro, Chris Wright, Robert Hayhurst and Brian Cheshire. Not shown are Rich White, Joe Vega, Ty Moen and Mike Harrell.



ADVEX, C-LEAGUE CHAMPS, are (front row, L to R) coach Billy Carter, David Althen, Tony Gambucci, Bill Brown, Bubba Condon; (back row) Kirk Mayer, Mike Slemp, Tim Whitt, Bob Dermady, Allen Barbrey, Scott Bloxom, George Naill, and Steve Thorne.

MAC-hinist, D-LEAGUE CHAMPS, are (front row, L to R) coach Jeff Brady, Mark Simonton, Kevin Bonilla, Sam Pollard, Brad Crawford; (back row) Don Carey, Joe Havens, Phil Milburn, Mike Smock, Sal Buccellato, Dave Murray and Tom Skalski.

SIM-ulation, E-LEAGUE CHAMPS, are (front row, L to R) Dale Aschom, Rylan Cambell, David Kopacz, coach Warren Atkins, Jim Prince, Dave Geyer, Joe Cambell; (back row) Lon Kelly, David Cooke, Terrence Lawrence, Gene Mountjoy, Louis Randall, Miguel Alverez and Steven Williams. Not shown are Paul Sandall and Kathy Sandall.

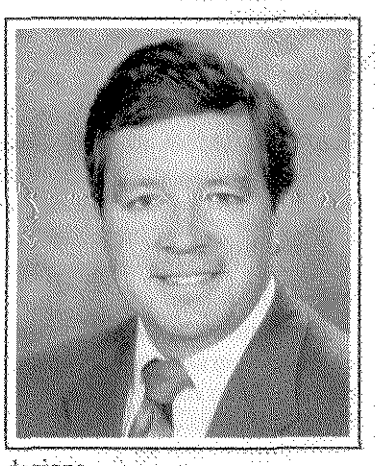


DECIBELS, F-LEAGUE CHAMPS, are (kneeling) Wayne Hollenbaugh and Ken Elliott; (standing) Rita and Autry Smith, Charlie Smith, Ken and Abigail Brentner, Judi Hannon, Janice Bayer, Ray Istenes, Carol Pates, Dave McCurdy, Travis Turner, Andrea Turner and Brian and Mike Marcolini. Not shown are Todd Beyer, Sheri Brown, James Brown, Jay Hardin, Doug Nark, Steve Rizzi and Chuck Gray.

People & Places

Langley Newsmakers

Holmes Wins Piper Award for Work Advancing General Aviation Aircraft



Dr. Bruce Holmes, acting deputy director for Aeronautics, will receive the Piper General Aviation Award in a special ceremony Monday, September 23, in Baltimore, Md.

The award is being given by the American Institute of Aeronautics and Astronautics (AIAA) for "outstanding contributions in aerodynamic design technology for general aviation aircraft. Many current general aviation airplane designs are beneficiaries of his exceptional accomplishments."

The award honors William T. Piper Sr., who made the name Piper synonymous with general aviation.

Holmes, who began his NASA career at Langley in 1977, has worked on several general aviation research efforts.

He made major contributions to the development of advanced high lift and flight control systems and drag reduction technologies. These technologies now appear on numerous modern business and commuter aircraft.

He also conducted early NASA studies that advanced the design of high-performance single-engine turbo-prop aircraft. In recent years, several manufacturers have produced such airplanes, which are capable of higher flight speeds and payloads, with lower fuel consumption, than alternative designs.

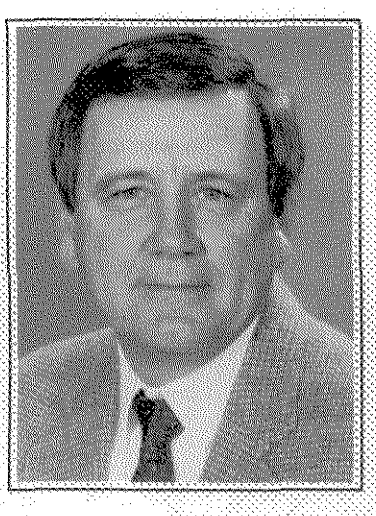
Holmes' work in another area -- agricultural aviation -- improved the environmental impact and economics of chemical spraying from planes. This 1970s research program resulted in computer programs used by industry to design and operate aerial applications systems that more precisely target chemical sprays.

Holmes' research on natural laminar flow (NLF) led to a new understanding in industry of the practicality of the technology on production aircraft.

"We did a lot of inventing of testing technologies to show to industry the wide ranges of operating conditions in which laminar flow worked," Holmes said.

Holmes said the award "is a nice thank-you" from the industry and urged others to do what he did in the work that led to the recognition -- "take risks."

Talbot Named Harvard Fellow



Joseph B. Talbot, manager of the Space Station Freedom Office, has been chosen to attend the Harvard University Senior Executive Fellows Program. Talbot will enter a nine-week study session at Harvard's John F. Kennedy School of Government, Boston, Massachusetts.

The JFK Program is an intensive executive education program offered to help meet the federal government's need for a corps of senior executives with broad experience in the implementation of government policies and programs. The Harvard program is designed to broaden the perspectives of participants toward their roles and opportunities as public managers, as well as to strengthen their conceptual and analytical skills in policy and program design.

Talbot began his NASA career at Lewis Research Center, Cleveland, Ohio, as a research engineer assigned to the Flight Projects Division.

Since joining the Langley staff in 1964, he has been involved in the research, development and operation of flight projects, including the Scout Launch Vehicle, numerous NASA international spacecraft involving the European Space Agency, as well as programs sponsored by foreign countries.

His assignments include a tenure at NASA Headquarters as program manager for Shuttle payloads in the Environmental Observation Division, Office of Space Science and Applications; three years as a special assistant to the Langley Director for Space; and a one-year assignment at the NASA Johnson Space Center as the Langley lead representative to the Space Station Freedom definition design activity.

In his present position, he defines and executes Langley's efforts in the NASA Space Station Freedom Program.

CFC is Langley's Collective Effort to Help Others

Many of us at Langley invest personal time throughout the year participating in local social and civic endeavors. These voluntary efforts greatly contribute to bettering our lives and those of our neighbors, and significantly enhance the effectiveness of the many local Combined Federal Campaign member organizations. The annual CFC campaign provides the opportunity for us, collectively, to support those organizations that provide the day-to-day services and aid for our communities.

The theme of this year's campaign, "Voice of Hope," expresses the goal of CFC member organizations. These organizations offer assistance in many different ways, including supplying day care services, helping youngsters develop through organized sports activities, providing health care services as well as food and shelter to those in need. Although everyone hopes for good health and reasonable prosperity throughout life, unexpected misfortunes can occur that are beyond the control of the individual--accidents, serious illnesses or loss of employment--misfortunes that can overcome even the best financial planning. Assistance, available from CFC member organizations, can lessen the impact of such misfortunes so that families can remain together, illnesses may be treated properly and the quality of life be maintained. They provide hope to those in need.

This year's campaign kickoff will be held at 1:30 p.m. Friday, September 27, in the H.J.E. Reid Conference Center, and the traditional one-day solicitation will occur Monday, October 7. In order to ensure that our contributions reach the organizations that we wish to support, it is important to designate those organizations on our CFC pledge cards. The CFC goal this year is a very challenging one, $285,000, and continues a Langley tradition of strong and caring support for people in our own communities and beyond.

Lana M. Couch
Campaign Vice Chairman

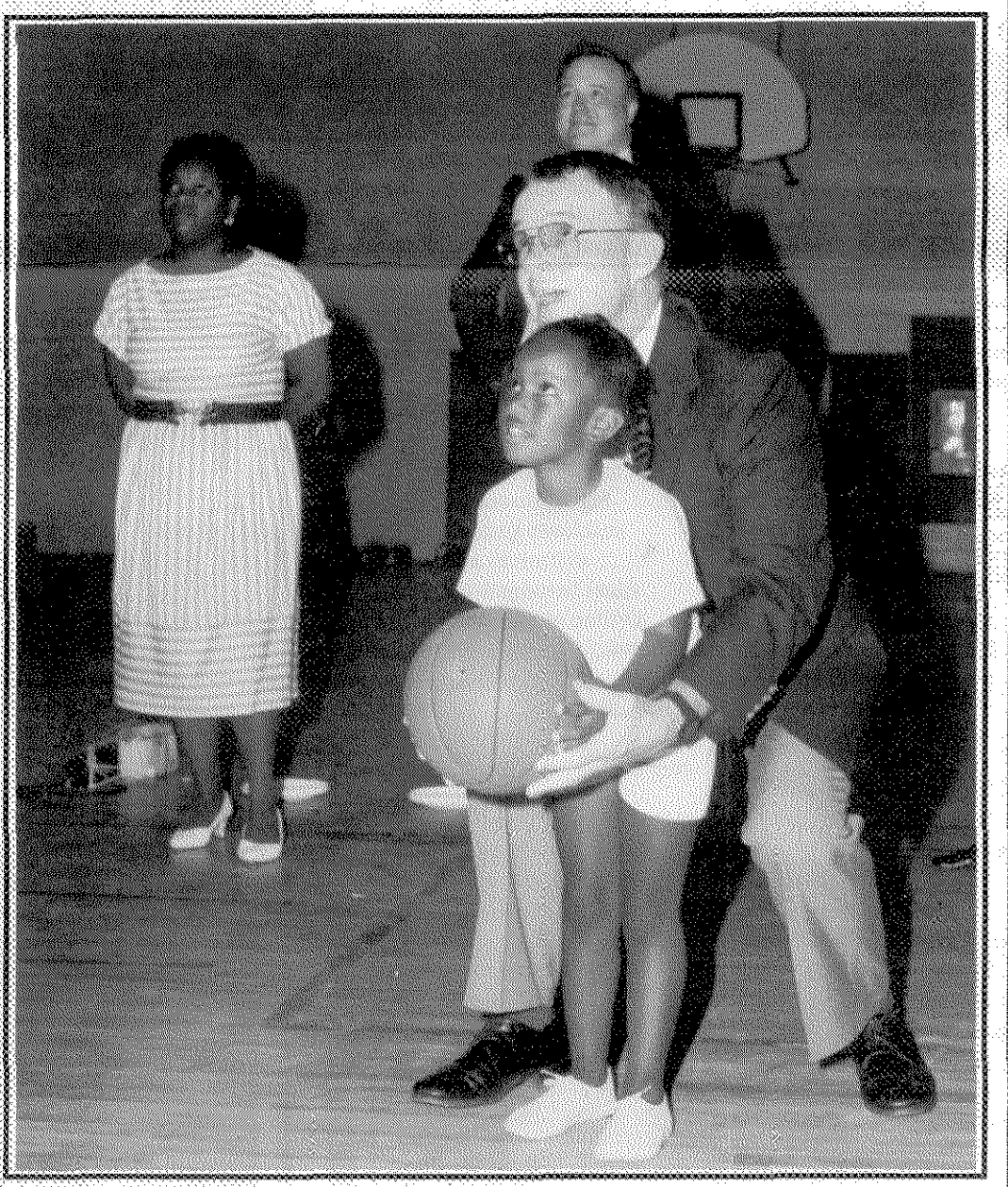


Photo by Fred Jones

A HELPING HAND GOES A LONG WAY TOWARD MAKING THE GOAL. CFC chairman Bruce Conway gives a much-needed helping hand to a young basketball hopeful at the Peninsula YMCA as Cassandra Favor, Financial Management Division, and Ed Prior, acting University Affairs Officer, observe. Sports activities are just a portion of the varied opportunities available to these six and seven year olds at summer day camp where area children make friends, become a part of a group, meet physical challenges and know that they are liked, respected and appreciated.

The YMCA has a way of changing people's lives. The physical fitness programs offer weight training and muscle toning, cardiovascular conditioning, sports leagues and tournaments, cheerleading and even dance classes. Youth programs offer fitness, sports and recreation activities for pee-wees to teens. Child care programs offer summer activities, before and after school programs, even preschool opportunities. "There's one thing that doesn't seem to change," says executive director Danny Carroll. "With all the programs and activities offered by the Peninsula YMCAs at both the Hampton and Newport News sites, there is definitely something for everyone."

Your one gift to the CFC helps the YMCA--and other local, national and international agencies--offer hope to the hopeless and help to those who desperately need a helping hand. Be their *voice of hope*.

Happenings

LAA SOCIAL will be held Friday, September 27, from 4 to 6:30 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road.

BODY DYNAMICS. High-energy low-impact aerobics classes will be held Mondays, Wednesdays and Fridays at 6:15 p.m. in the LAA gym, 14A Ames Road. Classes are open to civil service employees.

FEDERALLY EMPLOYED WOMEN, Langley Chapter, will meet Wednesday, September 25, at 11:30 a.m., executive dining room of the cafeteria.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays from 5 to 6 p.m. in the LAA gym. Cost is $12 per month. First class is free. In addition, bench step classes are offered Saturdays from 9:30 to 10:30 p.m.; cost is $6 per month.

PIEZOELECTRIC MATERIALS AND THEIR APPLICATIONS will be the subject of a presentation by Dr. Ping Tcheng on Monday, September 23, from 2 to 3 p.m. at 3 Ames Road, Room 124. The presentation will be given to the Active Structures Technical Committee. Interested researchers are invited.

ENGINEERS CLUB of the Virginia Peninsula will hold its annual kickoff meeting Wednesday, October 2. Topic is ship designs for the next century; contact Jim Brandstetter at ext. 46396 or Ron Harvey at ext. 43682.

WOMEN IN AEROSPACE, NASA Langley Chapter, will hold a brown-bag lunch seminar at 11:30 a.m. Tuesday, October 1, at 3 Ames Road, Room 124. The subject will be the status of permanent part-time professionals at Langley. For more information call Veloria Martinson at ext. 47688 or Diana Freeman at 868-0802.

NUTRITION SEMINAR will be held Tuesday, September 24, at the H.J.E. Reid Conference Center from 2 to 3 p.m. "Trimming Fat" is the subject. For more information call Mary Mitchell, ext. 46387.

NASA INTERCENTER RACES will be held September 30; October 10, 15, and 24; two-mile races October 3, 17, and 21. All start at 5 p.m. on Doolittle Road. Also, a two-mile race will be held at noon October 8 at the Bethel High School track. Walkers welcome at all races. Call Richard Shearer at ext. 47036 for more information.

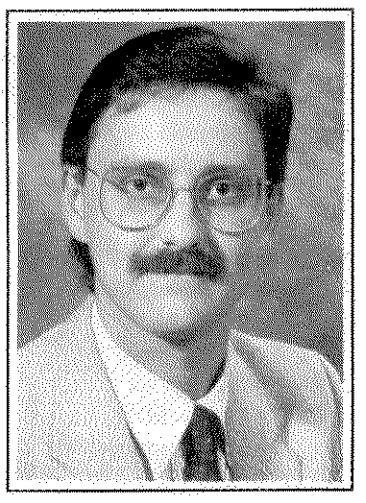
LAA ELECTIONS, executive board. Positions are open for terms starting January 1. October 7 is nominations deadline. Call 46369 for more information.

A MATERIALS WORKSHOP will be sponsored by the Long Duration Exposure Facility Materials Special Investigation Group from November 19 to 22 at the H.J.E. Reid Conference Center. For technical information call Bland Stein, Dr. Phillip Young or Louis Teichman at extensions 43492, 44265, or 43510. For administrative information call Dr. Arlene Levine, ext. 43318.

FOR SALE: SAILBOAT. A 14-foot Sunfish look-alike with aluminum trailer. New Imron paint and aluminum trim. Ready to sail with life jackets. Excellent condition, $550 OBRO. Call 865-6659 after p.m.

FOR SALE: A motorcycle and a car. 1986 Honda Rebel, 450cc, silver and black, very clean. Less than 1,500 miles. Runs great. Asking $2,300 including two helmets. Also, a 1986 Plymouth Horizon with four-speaker AM/FM stereo cassette deck, air conditioning and new tires. Looks good and runs well. Call 838-0912 for motorcycle or car.

Former *Virginian-Pilot* Editor Takes Over **Researcher News**



The **Researcher News** has a new editor.

Michael Finneran, a former newspaper reporter and editor, has replaced Marny Skora, who is moving to the Office of Public Services as an education and information specialist. She had been editor of the **Researcher News** since May 1987.

Finneran has 15 years of experience in newspapers, most recently as an editor with *The Miami Herald*.

Prior to that he was an editor at *The Virginian-Pilot/The Ledger-Star*.

He also worked at *The* (Bergen) *Record*, in Hackensack, N.J., where he was an award-winning medical writer for five years before moving into editing.

He started his journalism career in 1976 as a reporter for *The Fitchburg-Leominster Sentinel & Enterprise* in Massachusetts.

Finneran has a bachelor of arts degree in English from Southeastern Massachusetts University.

He enjoys camping, hiking, backpacking and traveling.

He comes to NASA's Langley Research Center after four months touring the country in a motor home with his wife, Lynn, and their golden retriever Toby.

Finneran said that during the trip he decided to try leaving newspapers to start a second career.

"I needed a new challenge," he said. "I think Langley Research Center is a fascinating place to work and I know it will provide that challenge.

"I also wanted to move back to Hampton Roads because we liked it here when I was with the *Pilot*, and I have family here."

Finneran and his wife live in the Ghent section of Norfolk.

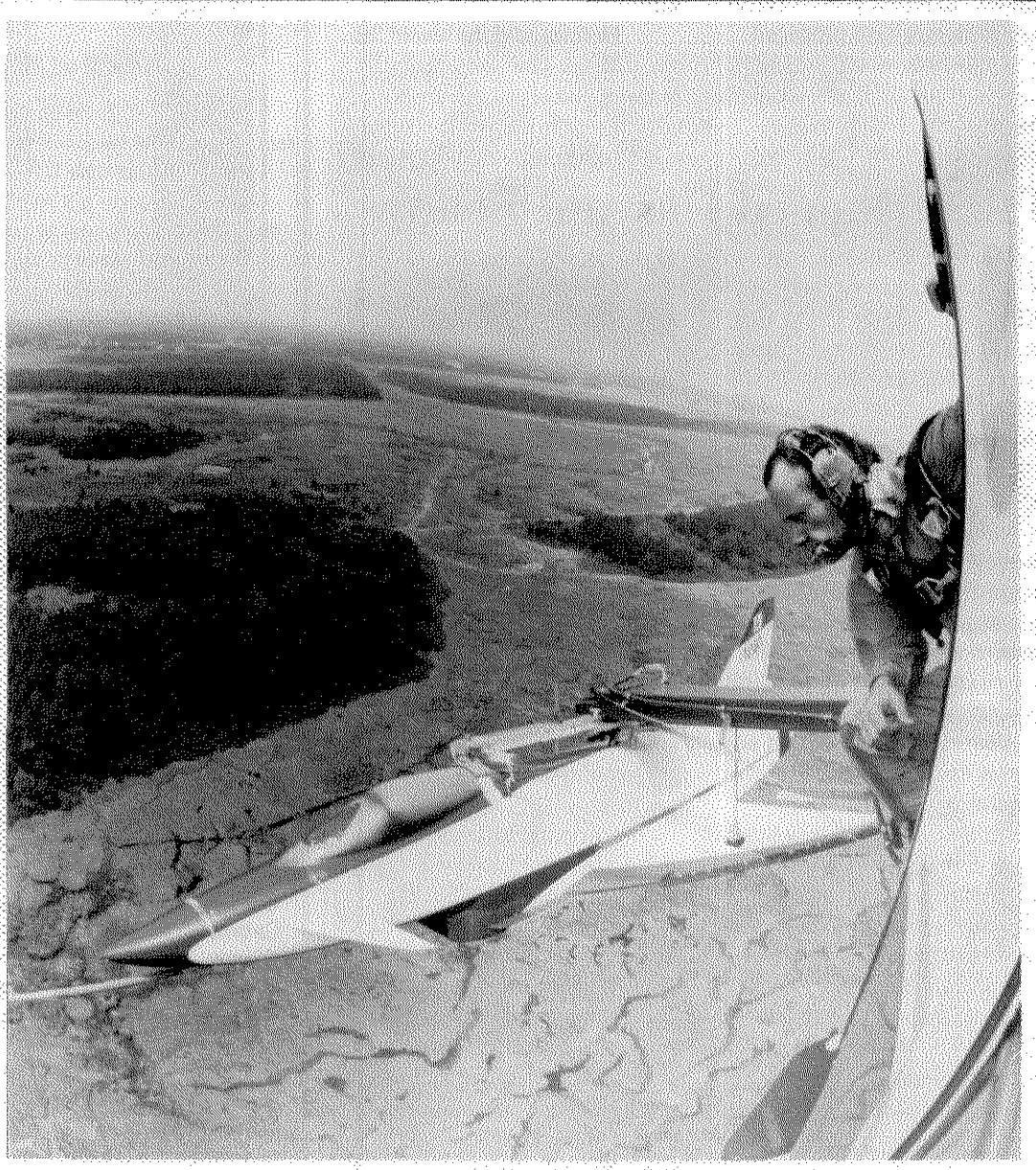
Researcher News

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

402 ON-SITE NON-LARC
GIESY, DANIEL P. DR.
MAIL STOP 230



-photo by Fred Jones

THE X-31 REMOTE -CONTROL DROP -TEST MODEL is about to be released from a helicopter by NASA engineering technician Robert F. Bryant Jr. over Langley's Plum Tree Test Site. The X-31 is an experimental craft designed to examine high-angle-of-attack flying tactics. The model's length is 12 feet with a six-foot wing span and it weighs 510 pounds. Thus, the model's behavior at high-angle-of-attack flight closely replicates that of the full-size configuration.

NASA
National Aeronautics and Space Administration
Langley Research Center

News Researcher

Volume 5, Issue 20 October 4, 1991
Bi-weekly Employee and Contractor Publication

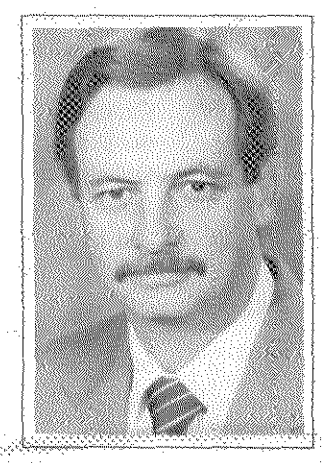
Langley Playing Prominent Role in U.S.-Japan Pacific Exploratory Mission

By Craig Murden

Man's impact on the chemical processes in the atmosphere of the western Pacific ocean is the focus of studies by scientists from Pacific Rim countries and the United States.

NASA, in cooperation with the Japanese National Institute of Environmental Sciences (NIES), is spearheading the effort as part of the space agency's continuing role in the assessment of global atmospheric chemistry.

NASA leadership is provided by the Program Manager, Dr. Robert J. McNeal from NASA Headquarters, and by Project Manager James M. Hoell, Jr. of Langley.


James M. Hoell Jr.

The expedition combines measurements from airborne and ground-based sampling platforms in the quest to understand the natural chemical processes that take place in the troposphere, the lower portions of the atmosphere where man lives, and the susceptibility of this vital region to chemical changes from man's activities.

The multi-year studies, which began September 16, are known as the Pacific Exploratory Mission (PEM).

The Pacific Ocean is a particularly attractive measurement arena because it is the only region in the Northern Hemisphere which is relatively free of atmospheric pollution. It is thus possible to study the chemistry of carbon, nitrogen, ozone, sulfur and aerosols in an almost unperturbed environment.

Mission atmospheric scientists, however, say there is little doubt that the long-range transport of man-made air pollutants from Asia and North America is now starting to have a major impact on the atmosphere over the Pacific. The current studies will provide an excellent baseline of measurements to gauge how man's activities might affect the atmospheric cycles of those elements.

This international venture in the vast reaches of the western Pacific illustrates the growing realization that the Earth's atmosphere is shared by all nations. Coordination of the overall effort is through the East Asia/North Pacific Regional Study, which is part of the International Geosphere-Biosphere Program, an international oversight committee for environmental studies.

This NASA DC-8, equipped with a suite of highly sophisticated instrumentation, is being used as the primary measurement platform in the Pacific Exploratory Mission. It is based at the Ames Research Center.

Testing Gases, Aerosols

The initial PEM study will consist of a series of field missions conducted over the next two to three years to evaluate the concentration levels of some 50 different atmospheric gas and aerosols species.

The primary measurement platform involved will be a DC-8 aircraft based at the Ames Research Center. This aircraft, carrying a suite of highly sophisticated instrumentation developed by scientists from U.S. and Japanese universities and from NASA Centers, will conduct at least 16 flights from Yokota Air Force Base, Japan; Hong Kong and Guam.

An instrumented aircraft from NIES will also conduct measurements coordinated with those of the NASA DC-8.

Ground stations, which will provide a set of intensive measurements during the same time the aircraft are active, are situated on several remote Pacific islands, on the eastern coast of China, and in Japan, Korea, Taiwan and Hawaii. These stations will remain in place after the airborne missions to provide a longer term study of selected chemical species.

Essential to the project's success is weather data that will be provided by a team of meteorologists stationed at the Royal Observatory in Hong Kong. This will be the central point for satellite reception of a wide array of meteorological data and retransmission of up-to-the-minute weather forecasts to the DC-8 before each flight. Meteorologists at the Royal Observatory will also assist in analysis and interpretation of real-time, high-resolution imagery, which will be stored for more detailed post-mission scrutiny.

Diverse Representation

Acting as co-mission scientists and showing the diverse representation of U.S. scientists in the project are Dr. Douglas D. Davis, Georgia Institute of Technology, and Dr. Shaw C. Liu, National Oceanographic and Atmospheric Administration.

The NASA mission meteorologist is Dr. Reginald Newell from the Massachusetts Institute of Technology. Japanese research activities are led by Dr. Hajime Akimoto of the NIES, who is also chairman of the East Asia/North Pacific Regional Study steering committee.

A data protocol has been developed that will foster timely analysis, interpretation and publication of the results. It is designed to enhance collaboration among this international team of investigators and to produce an integrated archive to serve as a central repository of data products for release to the public domain.

Photo by Fred Jones

Members of the Apprentice Program Class of 1991 pose next to the HL-20 model. Some class members worked on the HL-20 project. Graduates are featured on pages 8 - 12.

A Message from the Director:

The NASA Langley Apprentice Program is graduating 34 engineering technicians today, and I would like to take the time to congratulate these men and women on their achievements.

Members of the Class of 1991 have distinguished themselves. Twenty-three are graduating with honors. The class has achieved a 3.39 grade-point average overall. Four graduates earned a 4.0 grade-point average and deserve special recognition: Steven Bene, Thomas Bryant, Mark Jones, and George Rowe.

The entire class carries on a tradition of excellence that began when the apprentice program was established in 1941 as a vehicle to further aeronautical applications and research.

Since then, the six-year program has worked to identify talented individuals in cooperation with Thomas Nelson Community College, Tidewater Community College, and Elizabeth City State University.

To date, the apprentice program has provided 1,301 journeyman technicians to NASA. Nearly 50 years later, nearly half of them are still working at the Center.

I give you my best wishes for your continued success at NASA.

Pete Petersen
Richard H. Petersen
Director

News Briefs

Office of Space Flight Development Created --- NASA Administrator Richard H. Truly has announced plans to create a new Office of Space Flight Development, with responsibilities for Space Station Freedom development, large propulsion systems development -- including the National Launch System, and other large space flight project development. Truly, on September 13, said that this new office will enable the Office of Space Flight to focus on the safe and efficient use of the space shuttle, expandable launchers and the Spacelab system. Detailed definition of the new office's organization and appointment of an Associate Administrator will be completed in the near future.

AXAF Mirrors Successfully Tested --- The two largest mirrors for NASA's Advanced X-ray Astrophysics Facility (AXAF) have been successfully tested in the new X-ray Calibration Facility at Marshall Space Flight Center. "We're excited about the results," said Dr. Lennard Fisk, associate administrator for the Office of Space Science and Applications, NASA Headquarters. The mirrors, at nearly 48 inches in diameter, are the largest ever made to collect X-rays in space. AXAF will be the third of NASA's four proposed orbiting "Great Observatories" and is scheduled to be launched in 1998. It will be used to study stellar structure and evolution, large scale galactic phenomenon, active galaxies, clusters of galaxies, quasars and cosmology.

Maps of Venus Available --- The Magellan program office has released five new CD-ROMS, covering the first 21 days of Venusian surface radar mapping. The program office will release another two dozen disks next month to complete the first four months of the mapping sequence. By March, 1992, the radar results of Magellan's first mapping cycle should be available on CD-ROM. Those disks, expected to number 50, will cover 84 percent of Venus' surface. The disks are available at no charge to researchers, and at a nominal fee to others, including teachers, from NASA's National Space Science Data Center, Greenbelt, Md.

Editor's note: To obtain a copy of any of these NASA Headquarters News Releases contact Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request information summarized above by headline printed in bold.

VDT Landmark to be Dedicated; Park Official will Speak

The Variable Density Tunnel National Historic Landmark Exhibit will be dedicated at the Center on Thursday, October 10.

Dr. Harry Butowsky, a research historian, National Park Service National Historic Landmarks Survey, will speak at 1:30 p.m. to employees, retirees and contractors at a special colloquium in the H.J.E. Reid Conference Center.

In his talk, "The Variable-Density Wind Tunnel: NASA's Most Consequential National Historic Landmark," Butowsky will discuss the significance of the landmark in the development of American aeronautical and space sciences.

The dedication ceremony will take place at 2:30 p.m. beside the tunnel chamber, which is adjacent to the conference center.

Proposed by Max M. Munk, Langley's German aerodynamicist in 1921, this unique and revolutionary piece of experimental equipment permitted small-scale models to be tested at full-scale flight values in the low-speed range.

The results yielded by the VDT were so superior that they made Langley a world leader in aerodynamic research, and the idea was taken up by others.

The VDT, manufactured by Newport News Shipbuilding and delivered by railway to Langley in February 1922, was designated a National Historic Landmark by the Secretary of the Interior in December 1985.

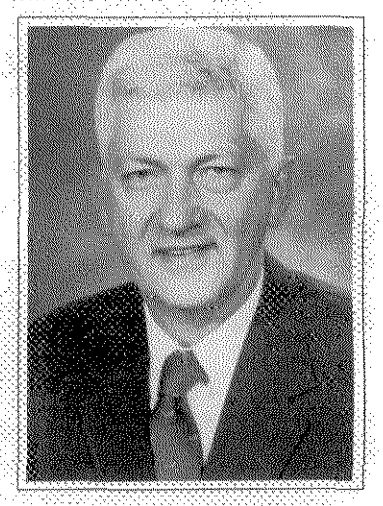
Thompson Resigns as Deputy Director, Praises NASA

NASA Deputy Administrator J. R. Thompson, Jr. has submitted a letter of resignation to President Bush and will leave the agency on November 8. Thompson said his resignation is entirely due to personal circumstances and had high praise for NASA's men and women, saying they "lead the world in aeronautics and the exploration of space." He also said he considers his last several years as NASA's deputy to be the highlight of his 25-year space agency career.

Thompson is an internationally recognized propulsion expert who has managed major space programs and directed major research and development efforts. As deputy administrator, he spearheaded efforts to improve program management, upgrade institutional capabilities and aggressively fought for a balanced civil aeronautics and space program.

NASA Administrator Richard H. Truly said: "Our nation owes a profound measure of gratitude to J.R. Thompson. His brilliance, dedication and untiring efforts have been instrumental to the success of America's space program for a generation. His wise counsel and unflagging spirit will be sorely missed."

In Memoriam: Dewey M. Smith, was HALOE Project Manager



Dewey M. Smith, 50, project manager for the Halogen Occultation Experiment (HALOE), died Sunday, September 22.

HALOE, an orbital flight instrument, was launched on the Space Shuttle Discovery September 12 as part of the Upper Atmosphere Research Satellite. The instrument was designed to measure the Earth's protective ozone layer as part of NASA's effort to monitor environmental change.

Smith, who worked at Langley for 29 years, had held a number of positions on the HALOE project before becoming manager in March 1990.

"Dewey was an outstanding project manager. He combined the single mindedness required by the job with an awareness and concern for all of the people associated with the project," said Dr. Ralph J. Muraca, chief, Systems Engineering Division. "He was totally dedicated to HALOE; in fact, he did not attend the launch because he felt his place was at the Payload Communications Center at Goddard where decisions regarding the instrument might have to be made. His untimely death is especially tragic since the HALOE instrument, to which he devoted so much of his career, will begin providing scientific data in a few weeks. I will miss him as a friend, and the Center will suffer from his absence."

Smith received a NASA Exceptional Service Medal in 1990 for his work on the HALOE project. He also was the recipient of a NASA Special Service Award, seven NASA Group Achievement Awards and the Systems Engineering and Operations Directorate Outstanding Paper Awards for 1984 and 1990. He was a member of the American Institute of Aeronautics and Astronautics.

He received his bachelor of science degree in mechanical engineering at the University of South Carolina and his master's degree at North Carolina State University, where he completed course work for his doctorate.

He is survived by his wife, Dr. Mary H. Lewis, a Langley employee development specialist in the Human Resources Development Division; his parents, Copeland D. and Marjorie H. Smith of West Columbia, S.C.; a brother, Edwin O. Smith of West Columbia; and two nieces.

Training Office Offering Video Seminar

The Training Office is again making available the Empowerment Series of video seminars offered by Executive Communications Inc.

The seminar for October is "Developing Career Partnerships" and will run Wednesday, October 16 from 2 to 3:30 p.m. on a first-come first-served basis. To enroll, submit application for on-site training form (No. 24) to N. Marie Metcalf, Mail Stop 309. Forms are available by calling ext. 42585 or your training coordinator.

September Bloodmobile Report

The September 11 Bloodmobile drive drew 297 donors, including six first-time contributors.

Donor totals so far are:

Fourteen gallons: Neale H. Kelly.

Twelve gallons: Nelson L. Seabolt.

Eleven gallons: Pendleton M. Jackson.

Ten gallons: Earl S. Knight.

Eight gallons: Charles A. Sweet, Carl S. Larsen, Joseph M. Price, Paul W. Kidder, Richard G. Booth Jr.

Seven gallons: Robert L. Spruill, Jerry W. Wright.

Six gallons: Ben Wilson Jr., Mark W. Frye.

Five gallons: James L. Thomas.

Four gallons: Thomas J. Skalski, Felecia C. Berry.

Three gallons: Vincent B. Cruz, Kurt N. Detweiler.

Two gallons: Mark L. McMillin, Richard D. White, Gene S. Monroe Jr., Michael S. Wusk.

One gallon: Mark A. Simonton, David W. Alderfer, Stacie R. Kissinger.

First-time donors: Julie Hedrick, Shannon Inge, Robin Morris, Mattie Firth, Karen Sage, Eric Vinson.

Coordinators are Peter J. Edgette and Octavia Judge at NASA, Joanne Owens at the Red Cross.

Everyone's Invited: Langley to Host Helicopter Display

More than a dozen military and civilian helicopters will take part in a static display at the Flight Research Hanger on Wednesday, October 9.

The display is a result of a joint meeting of the American Helicopter Society, the Army Aviation Association of America, and the Naval Helicopter Association. It is being hosted by the Army's Aerostructures Directorate and NASA Langley.

All Langley employees and contractors are invited to view the helicopters at the north end of the hangar from 10:30 a.m. to 3 p.m.

Some of the aircraft expected to be on display are:

- Navy HH-60H Special Operations Black Hawk (search and rescue missions).
- Navy CH-53 Sea Stallion.
- Army UH-47 Chinook.
- Army AH-64 Apache (attack helicopter).
- Army UH-60 Black Hawk.
- Navy H-46 Sea Knight.
- Army AH-1G Cobra.
- Air Force UH-1N Huey.
- Bell 206, Virginia Beach Police.
- Bell 222, Virginia State Police.
- Robinson R-22.
- B-105 Nightingale.
- WAVY TV Chopper-10.
- Army OH-58 Delta.
- Navy SH-60 Seahawk.
- Army OH-6A Cayuse.
- Navy SH-2 Sea Sprite.

Because of limited parking, those who attend the display are asked to car-pool or walk to the hangar. Charge time to A-1980.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Michael Finneran

Photojournalist ..... Carol Petrachenko

Photographer ..... Fred Jones

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Electrical Load Shedding: It's No Mystery When the Power Goes Off

Hey, Lankley, do you remember when we mysteriously lost our air conditioning last May 31, that scorching hot afternoon? You remember -- the day we both called for emergency repair service and got little satisfaction -- they said something about a Condition 3 load shed. Well, it's not a mystery any more. I now understand; let me explain.

For over eight years, Langley has had a contractual agreement with Virginia Power to help reduce electrical power loads during critical production or supply periods. This cooperative agreement provides the Center electrical power at attractive rates (averaging about 4.5 cents per kilowatt-hour).

Budgeting Baseloads

In return, the contract ensures the local power company that Langley will quickly respond to their emergency power reduction needs by shedding electrical loads when necessary. This power package allows Langley to budget its base loads—lighting, air conditioning, labs, computers, utilities, small facilities, data processing, shops—and accommodate the high power needs of major and minor wind tunnels at a pre-determined charge.

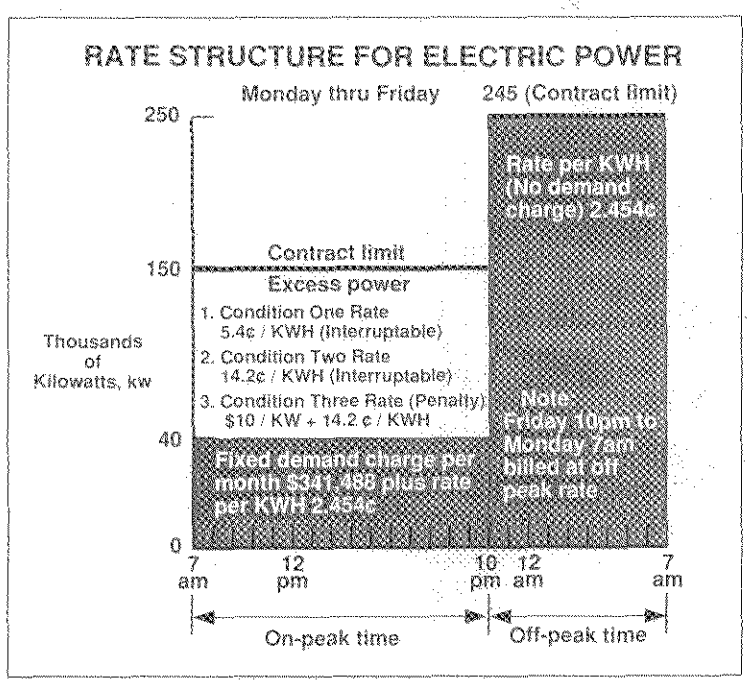
The contract divides power into two categories, demand power and excess power. Demand power is that amount of power—currently 40 megawatts—that the Center is guaranteed at all times; excess power is any power used above the demand value. Our air conditioning problem is created when Virginia Power tells Langley it can only use up to the demand level agreed to in the contract.

Specifically, the contract calls for Langley to shed electrical loads and bring power consumption down to 40 megawatts within 10 minutes after notification of a Condition 3 situation. Virginia Power's Condition 3 denotes that the utility cannot produce or purchase enough power to meet its immediate demand.

The Center has a comprehensive electrical load shedding plan that permits a rapid but orderly reaction to the request. The plan addresses the temporary shutdown of all significant power users ranging from high-power wind tunnel facilities to building heating, ventilation and air conditioning (HVAC) systems.

Employee comfort is given high priority and HVAC interruption is executed only when all other reductions have not lowered the power usage below the 40-megawatt ceiling.

When notified of a Condition 3 situation, the Langley power dispatcher executes the load shedding plan following its sequential steps until the actual power load is below 40 megawatts. First, all on-line major tunnels are notified to immediately terminate operation and shut down all primary and support equipment. If that does not satisfy the limit, the high-pressure air compressor station at 7 East Moffett Road is shut down. Next, all minor tunnels and facilities are directed to shut down research activities and shed all unnecessary loads.



Shutting Down

Fourth, the Air Force, which draws power from the NASA substation, is notified to commence load-shed procedures. Finally, if the Center's power load still exceeds the 40-megawatt limit, the heating/air conditioning systems in non-critical facilities are remotely shut down by the Utility Control System (UCS).

On that hot May 31 afternoon, Virginia Power lost a generator and declared a Condition 3. Langley was only able to reduce power below the 40-megawatt limit by executing all five of the load shedding steps which, unfortunately, required our air conditioning system to be temporarily turned off. In the past six years, HVAC shutdown has only had to be exercised twice, although we have been in Condition 3 nine times.

The penalty for failing to comply with the cooperative agreement is substantial. The Center is assessed $10 per kilowatt -- or $10,000 per megawatt -- for any electrical power demand over the 40-megawatt limit. Langley has never been penalized for a Condition 3 violation and maintains good rapport with Virginia Power.

Langley's compliance plan is reviewed periodically. In fact, a recent review resulted in the removal of the Child Development Center from the HVAC shutdown list and the removal of Headquarters from the restart priority list. HVAC restart is initiated as quickly as possible and shutdown has never exceeded two hours in any facility.

With the inevitably increasing power loads for the Center as well as increasing demands on Virginia Power resources, the likelihood of more frequent Condition 3 situations, particularly on extremely hot days, is forecasted.

Current efforts are underway to identify methods for faster response to an emergency, as well as to identify other facility equipment that can be shut down to prevent HVAC interruption or permit quicker HVAC restart.

Also, the feasibility of time sharing power in the event of an extended HVAC shutdown period is being studied. This would minimize and equalize any discomfort to employees. The ultimate goal is to develop a plan that does not require HVAC interruption.

In summary, when any air conditioning problem is suspected, it is best to notify the facility coordinator and let him interface with the proper organizations. The energy management team is addressing the issue of how to quickly notify all affected facilities to prevent confusion.

Presidential Orders

More energy news: Langley is preparing to respond aggressively to a recent Presidential order that mandates a 10 percent reduction per square foot of electrical energy consumption for federal facilities by the year 1995 and a 20 percent reduction by the year 2000. Energy consumption levels for 1985 will be used as a baseline for this mandated reduction. More information about the executive order and Langley's plan to improve energy efficiency will appear in a future **Researcher News** article.

Superior Achievement Awards

The following employees have been honored with cash awards for superior achievement:

William J. Debnam, engineering technician in the Information Processing Technology Branch, has been recognized "for contributions to the Advanced Automated Directional Solidification Furnace in discovering the source of the calibration thermocouple anomalous behavior and its impact on the flight and for recognizing that the thermal and crystallographic interfaces in a growing crystal are not the same."

E. Vincent Zoby, aerospace engineer in the Aerothermodynamics Branch, has been cited "for outstanding contributions as a member of the NASA Non-Advocate Review Panel for the Assured Crew Return Vehicle and the Langley National Aero-Space Plane Government Work Package Review Team."

Nancy H. White, computer engineer in the Space Systems Division, has been recognized "for outstanding contributions in the Space Systems Division Office during the absence of a technical assistant."

Bernard Spencer Jr., aerospace research engineer assigned to the Experimental Hypersonics Branch, has been rewarded "for an outstanding contribution in enhancing the aerolines and aerodynamic performance of a candidate Personnel Launch System (PLS) lifting body configuration."

Althea O. Brown, secretary in the Experimental Hypersonics Branch, has been cited "for outstanding contributions to the efficient and effective management and operation of the Experimental Hypersonics Branch Office."

Christopher J. Riley, aerospace engineer in the Aerothermodynamics Branch, has been cited "for outstanding achievement in the development of an approximate method for analysis of the inviscid flowfield about three-dimensional configurations in hypersonic flight."

Jeffrey S. Hodge, aerospace engineer in the Experimental Hypersonics Branch, has been recognized "for exceptional contributions to the development of the 15-Inch Mach 6 High-Temperature Tunnel to the level of a major hypersonic wind tunnel at Langley and a contributing member of the Hypersonic Facilities Complex."

Francis A. Greene, aerospace engineer in the Aerothermodynamics Branch, has been rewarded "for outstanding achievement in the implementation of a viscous, equilibrium air capability for the analysis of flowfields about hypersonic flight vehicles."

Carol M. Forrest, administrative officer for the Space Systems Division, has been recognized "for outstanding contributions to the effective coordination and execution of the relocation of office personnel in the Space Systems Division."

William M. Berrios, supervisory aerospace engineer in the Space Systems Engineering Branch, has been rewarded "for sustained high level performance in support of LDEF post-flight data reduction and analyses activities."

Harriett A. Coombs, administrative officer for the Systems Engineering Division, has been cited "for exceptional administrative support to the Systems Engineering Division in carrying out many and varied responsibilities."

John E. Teter Jr., aerospace engineer in the Space Systems Engineering Branch, has been recognized "for sustained high level performance in support of the LITE orthogrid load path and verification test."

David H. Butler, senior aerospace engineering technician in the Space Systems Engineering Branch, has been rewarded "for sustained high level performance in support of multiple task assignments for the CETA, SEI, Hoop Column Antenna, LASE and MAPS II projects."

Robert D. Averill, aerospace engineer in the Mechanical Systems Section, has been cited "for outstanding innovation, dedication and technical leadership in support of the Spectroscopy of the Atmosphere using Far Infra-Red Emission (SAFIRE) Experiment."

Carissa T. Smith, secretary (stenography) in the Polymeric Materials Branch, has been recognized "for sustaining a high level of improvement in clerical skills while learning a new technical language in the Polymeric Materials Branch."

Ralph D. Buehrle, aerospace engineer assigned to the mechanical Systems Section, has been rewarded "for outstanding technical leadership, coordination and dedication in support of the vibration testing of numerous ground and flight experiments and instruments."

Howard C. Jones, engineering technician in the Systems Development Support Section, has been cited for "significant exceptional performance in the operation of the vibration facilities and in conducting vibration tests on aerospace hardware."

Space Shuttle Manifest

'91

Mission:	48	44
Date:	September	December
Orbiter:	*Discovery*	*Atlantis*
Payload:	UARS APM-03	DSP, IOCM
Inclination:	57°	28.5°
Altitude:	292	195
Duration:	5	10
Crew CDR:	John O. Creighton	Frederick D. Gregory
PLT:	Kenneth S. Reightler Jr.	Terence T. Henricks
MS:	Mark N. Brown James F. Buchli Charles D. "Sam" Gemar	F. Story Musgrave Mario Runco Jr. James S. Voss
PS:		Thomas J. Hennen

Fiscal Year '95	1st QTR	2nd QTR	3rd QTR	4th QTR
	SFU-RETR TPITS CAPL-02 SRL-02	SPACEHAB-04 WSF-02 ISEM-01 CMSE-02 PL OPPTY	USMP-03. EP, PL OPPTY SPACEHAB-05, EURECA-2L, SPTN-201-03, FLOATZONE-01, IEH-02 USML-02	SL-D3 LITE II-01, SSBUV-A-04 ISEM-02, CMSE-03 SPACEHAB-06, WSF-03 EURECA-2R, CXM-04

Fiscal Year '96	1st QTR	2nd QTR	3rd QTR	4th QTR
	ATLAS-04, WISP SSBUV-A-05	SSF/MB-01 (FEL) SLS-03 SSF/MB-02	XTE, EUVE RETR FROZEPIPE, MICROWAVE-01 SSF/MB-03 SPACEHAB-07, WSF-04 CXM-03, IEH-03	SRL-03 SSF/MB-04 USMP-04, OAET-02 PL OPPTY

'92

Mission:	42	45	49	50	46	47	52	53
Date:	February	May	May	June	September	September	November	December
Orbiter:	*Discovery*	*Atlantis*	*Endeavour*	*Columbia*	*Atlantis*	*Endeavour*	*Columbia*	*Discovery*
Payload:	IML-01 IMAX-05 GAS BRIDGE	ATLAS-01 SSBUV-A-01	INTELSAT-VI-R ASEM	USML-01	TSS-01, EURECA-1L IMAX-06 EOIM-III/TEMP2A-03 CONCAP2-01 CONCAP3-01 LDCE-01	SL-J GAS BRIDGE	LAGEOS II USMP-01, CANEX-02 ASP	DOD
Inclination:	57°	57°	28.5°	28.5°	28.5°	57°	28.5°	57°
Altitude:	163	160	183	160	230	160	160	200
Duration:	7	8	7	13*	7	7	9	4
Crew CDR:	Ronald J. Grabe	Charles F. Bolden	Daniel C. Brandenstein	Richard N. Richards	Loren J. Shriver	Robert L. Gibson	James D. Wetherbee	David M. Walker
PLT:	Stephen S. Oswald	Brian Duffy	Kevin P. Chilton	Kenneth D. Bowersox	Andrew M. Allen	Curtis L. Brown Jr.	Michael A. Baker	Robert D. Cabana
MS:	PLC Norman E. Thagard David C. Hilmers William F. Readdy	PLC Kathryn D. Sullivan C. Michael Foale David C. Leestma	Thomas D. Akers Richard J. Hieb Bruce E. Melnick Kathryn C. Thornton	PLC Bonnie J. Dunbar Carl J. Meade Ellen S. Baker	PLC Jeffrey A. Hoffman Franklin R. Chang-Diaz Claude Nicollier Marsha S. Ivins	PLC Mark C. Lee N. Jan Davis Jerome Apt Mae C. Jemison	William M. Shepherd Tamara E. Jernigan Charles Lacy Veach	Guion S. Bluford James S. Voss Michael R.U. Clifford
PS:	Roberta L. Bondar Ulf D. Merbold	Dirk D. Frimout Byron K. Lichtenburg	Pierre J. Thuot	Lawrence J. Delucas Eugene H. Trinh	TBD (Italy)	Mamoru Mohri		

'93

Mission:	54	55	51	56	57	58	59	60	61
Date:	January	March	April	May	July	July	August	October	December
Orbiter:	*Endeavour*	*Columbia*	*Discovery*	*Endeavour*	*Atlantis*	*Columbia*	*Discovery*	*Endeavour*	*Atlantis*
Payload:	TDRS-06 DXS	SL-D2	ACTS ORFEUS-SPAS	ATLAS-02 SPTN-201-01 SSBUV-A-02	EURECA-1R SPACEHAB-01 GAS BRIDGE SHOOT	SLS-02	FLT OPPTY	SRL-01	WSF-01 SPACEHAB-02 GAS BRIDGE CAPL-01, OAET-01
Inclination:	28.5°	28.5°	28.5°	57°	28.5°	28.5°	TBD	57°	28.5°
Altitude:	160	160	160	160	160	160	TBD	130	160
Duration:	6	9	8	9	8	13*	TBD	9	7
Crew CDR:	John H. Casper	TBD	5	5	6	7	TBD	6	6
PLT:	Donald R. McMonagle	TBD						TBD	
MS:	Gregory J. Harbaugh Mario Runco Jr. Susan J. Helms	PLC Jerry L. Ross Bernard A. Harris Jr. TBD						TBD PLC Linda M. Godwin TBD	
PS:		TBD TBD						TBD TBD	

'94

Mission:	62	63	64	65	66	67	68	69
Date:	January	February	April	May	May	June	August	September
Orbiter:	*Columbia*	*Discovery*	*Endeavour*	*Atlantis*	*Columbia*	*Discovery*	*Atlantis*	*Columbia*
Payload:	USMP-02, SPTN-204 FTS-DTF-01 CMSE-01	HST REV-01	CRISTA-SPAS ATLAS-03 SSBUV-A-03	LITE I SPAS-III DEE	IML-02	SPACEHAB-03 SPTN-201-02 DSCT, IEH-01 ROMPS-01	FLT OPPTY	ASTRO-02 OAET-FLYER
Inclination:	28.5°	28.5°	57°	28.5°	28.5°	28.5°	TBD	28.5°
Altitude:	160	330	160	160	160	160	TBD	190
Duration:	9	8	9	7	13*	7	TBD	9
Crew:	5	7	7	5	7	6	TBD	7

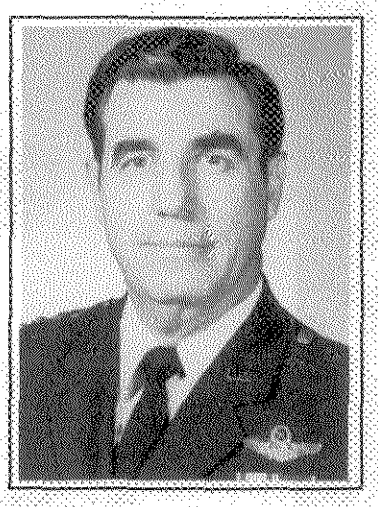
Glossary

AAFE	Aeroassist Flight Experiment
ACTS	Advanced Communications Technology Satellite
APM	Ascent Particle Monitor
ASEM	Assembly of Station by EVA Methods
ASP	Attitude Sensor Package
ATLAS	Atmospheric Laboratory for Applications and Science
CANEX	Canadian Experiment
CAPL	Capillari Pump Loop Experiment
CMSE	Candidate Materials Space Exposure
CONCAP	Consortium for Materials Development in Space
CONE	Cryogenic Orbital Nitrogen Experiment
CRISTA	Cryogenic Infrared Spectrometer Telescope for Atmosphere
CXM	Commercial Cross-Bay for Materials Science Laboratory
DCWS	Debris Collision Warning System
DEE	Dexterous End Effector
DOD	Department of Defense
DSCT	Directional Solidification of Cadmium Telluride
DSP	Defense Support Program
DXS	Diffuse X-Ray Spectrometer
EOIM	Evaluation of Oxygen Interaction with Materials
EP	Electric Propulsion
EURECA	European Retrievable Carrier
EUVE	Extreme Ultraviolet Explorer
FLOATZONE	Office of Commercial Programs Experiment
FROZEPIPE	Office of Commercial Programs Experiment
FTS-DT	Flight Telerobotic Servicer Demonstration Test Flight
GAS	Getaway Special
HST	Hubble Space Telescope
IEH	International Extreme-UV Far-UV Hitchhiker
IMAX	Large format motion picture camera
IML	International Microgravity Laboratory
INTELSTAT	International Telecommunications Satellite Organization
IOCM	Interim Operational Contamination Monitor
ISEM	ITA Standardized Experiment
LAGEOS	Laser Geodynamics Satellite
LDCE	Limited Duration Candidate Exposure
LITE	Lidar In-Space Technology Experiment
MICROWAVE	Office of Commercial Programs Experiment
OAET	Office of Aeronautics, Exploration and Technology
ORFEUS	Orbiting and Retrievable Far and Extreme Ultraviolet Spectrometer
ROMPS	Robotic Materials Processing System
SFU	Space Flyer Unit
SL	Spacelab
SHOOT	Super Fluid Helium On Orbit
SLS	Spacelab Life Sciences
SPACEHAB	Commercial middeck augmentation module
SPTN	Shuttle Pointed Autonomous Research Tool for Astronomy
SRL	Space Radar Laboratory
SSBUV	Shuttle Solar Backscatter Ultraviolet Instrument
SSF/MB	Space Station *Freedom* Manned Base
TDRS	Tracking Data Relay Satellite
TPITS	Two Phase Integrated Thermal System
TSS	Tethered Satellite System
UARS	Upper Atmosphere Research Satellite
USML	U.S. Microgravity Laboratory
USMP	United States Microgravity Payload
WISP	Waves in Space Plasma
WSF	Wake Shield Facility
XTE	X-Ray Timing Explorer

*Dependent on prior long duration flight experience.

AF General Leads CFC

Honorary Chairman Sets the Tone for 1991 Campaign



For 30 years, federal workers have supported their communities by donating generously to the Combined Federal Campaign.

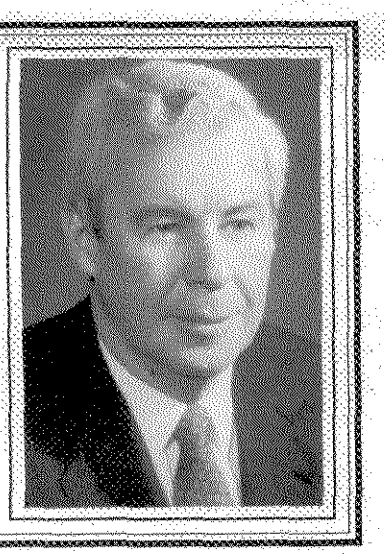
As this year's honorary chairman for the Peninsula, I call upon the area's nearly 40,000 federal employees to continue the spirit of giving that has made the Peninsula's campaign one of the finest in the nation.

Although CFC is a national campaign, it allows us to put our donations to work right here on the Peninsula. Key workers will provide every federal employee with a list of organizations eligible to receive contributions, so you can earmark your donation for the charitable cause that has the most personal meaning for you.

Last year, despite the deployment of thousands of eligible donors to the Middle East, the Peninsula's federal workers contributed more than $1.4 million to the CFC. This year, I am confident we can surpass that amount in supporting the agencies that do so much for our friends, neighbors and, in many cases, our own families.

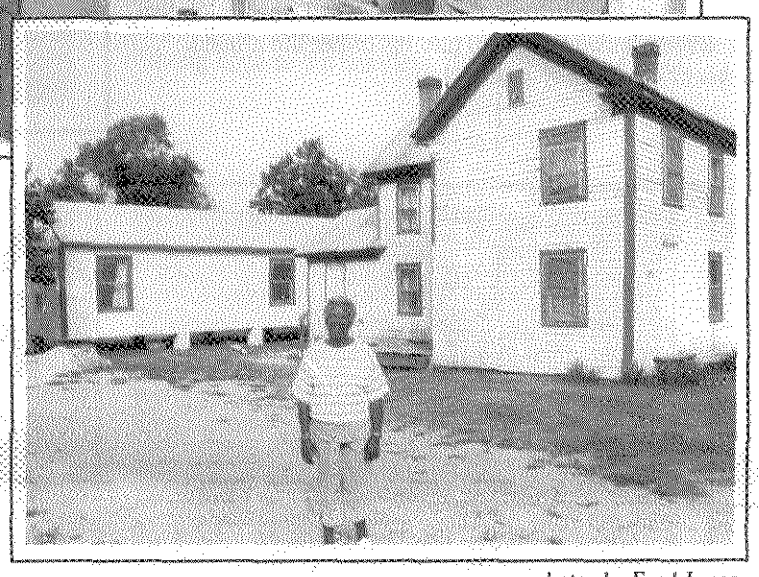
Thanks to your generosity in the past, the Peninsula is a great place to work and live. Your continued support of the Combined Federal Campaign can help keep it that way.

General John Michael Loh
Commander
Tactical Air Command



Edward J. Campbell, president and chief executive officer of Newport News Shipbuilding, was the guest speaker at the September 27 kickoff of the Center's 1991-92 Combined Federal Campaign at the H.J.E Reid Conference Center.

Langley's Bruce Conway (from left), Gary Beasley and Doug Whipple get instructions on finishing touches for Mrs. Thornton's new home, built by New Horizons Technical Center under the direction of CFC-funded Housing Partnerships.



Mrs. Thornton is shown at right in front of her 100-year-old home in York County which will be razed when her Housing Partnerships home, behind, is completed.

-photos by Fred Jones

Who benefits from CFC funds?

Volunteers Raise the Roof on Substandard Housing

A man's home is his castle . . . or is it?

How comfortable can a century-old structure with no indoor plumbing be for its proud, elderly occupants?

How warm can an infant's room be when snow blows in through absent window panes?

How mobile can a disabled individual be when he or she is fenced in by missing boards in a rotting porch?

Area volunteers are raising the roof about substandard housing--but the noise they are making is not verbal. Instead, it's the buzz of an electric saw, the regular cadence of hammer on nail and the swish of a paintbrush.

Organized under the direction of Housing Partnerships, a nonprofit agency formed in 1985, these volunteers do everything from repairing roofs and installing windows to new home construction or outhouse repair.

Calling on the after-hours talents of doctors and professors, ministers and housewives, college students, church groups and countless others, Housing Partnerships has orchestrated the repair of over 241 homes in Williamsburg, James City County and upper York County.

According to Nayda Pophal, administrator of Housing Partnerships, over 2,400 amateur craftsmen have donated well over 21,000 hours to transform substandard dwellings and near hovels to real homes for local residents whose self-esteem has been raised in the process. A great majority of the volunteers have been William and Mary students from fraternities, sororities, clubs and other campus organizations.

"Our original goal was to repair or rebuild the houses of those unable to help themselves," said Pophal. "Eventually we found some structures in such bad repair, it just made good sense to investigate a way to replace rather than repair."

Housing Partnerships joined with New Horizons Technical Center, Hampton and Newport News campuses, who have provided two of the five new homes completed thus far. Two others were built by area church groups.

Qualifying residents may borrow $15,000 at three percent interest to help pay for replacement home construction materials. Donations from businesses, financial institutions and individuals, government grants and community contributions, plus in-kind gifts of materials and specialty services round out the Housing Partnerships' budget. Then, all that remains to do is the work.

In addition to individuals and groups, more than 50 local businesses have made donations or organized volunteers within their own companies to do vital housing projects. "And they are so reliable," remarks Pophal. "If it's the third Saturday of the month, for instance, we better have something for the Sovran Bank crew to do."

Housing Partnerships completes about 60 repairs a year and jobs range from patching a roof to building an entire house.

Pophal credits Jack Marahrens, retired BASF vice president now Housing Partnerships project coordinator, with the smooth running of the volunteer effort. "Marahrens estimates the cost of the job, orders materials, matches volunteers with the tasks to be accomplished and, in general, makes the work fun."

In addition to the 60 small- and large-scale repairs annually, Housing Partnerships hopes to erect two new homes in 1992 providing safe, warm shelter for countless needy neighbors.

Housing Partnerships, a Combined Federal Campaign-funded agency, underscores an important CFC tenet--people helping people. Join these amateur craftsmen, no experience necessary. Barring that, your one donation helps them and other agencies all year long.

AFGE: Your Gift Makes a Difference

It's that time of year when employees here at NASA Langley will make up their minds about the amount they will give to the Combined Federal Campaign.

I could talk about some of the organizations that help those in need in this less-than-perfect world -- and there are many -- but we are highly educated and highly motivated employees.

We know the needs of others and understand that people need help from time to time. We have a "can-do" attitude; we get the job done. We will walk the extra mile to complete the project because we know we "can do."

The CFC is a very important project that is successful every year because of that "can-do" attitude. This is exceptional when looking at the number of employees who make the sacrifice. There are fewer employees participating, and donating more to insure this project will be a success.

Remember, without the employee, this project would never get started. With this in mind, I know you will do the right thing. You have the "can-do" attitude and you can make this year's CFC drive the biggest success it has ever been.

Employees can give as little as $2 per payday. Some employees will give as much as a $500 yearly gift, while others will give even more.

Donations are very personal and will vary depending on the amount the employee believes is correct. Yes, it is still our choice; employees can make this project a big success.

Please remember, when you donate, designate where you want your gift to go. It really does help.

B.J. "Ben" Schlichenmayer
President, AFGE
Local 2755

CFC . . .

N|USA

National|United Service Agencies

PROVIDING FOR A BETTER WAY.
The National/United Service Agencies is a federation of 78 national charitable and advocacy organizations that provide specialized help to assist citizens in achieving their basic human rights and human welfare needs.

These agencies help the disabled, the sick, the educationally impaired, the dying, minority groups, the young and the old, those who have been discriminated against, those who seek to protect the environment, the consumer and the needy. Individually and together they meet just about every category of assistance or advocacy need of importance to government workers and all Americans.

For the cost of a daily newspaper for a year, you can provide the food, clothing, shelter, medical care and counseling that one desperate child needs to turn his or her life around. Be his or her *voice of hope*.

NVHA

MAKE A GOOD HEALTH CONNECTION.
The 65 member organizations of the National Voluntary Health Agencies of Virginia benefit from designated funds raised during the Combined Federal Campaign. Member organizations provide a wide range of health needs, including patient and family services, public and professional education and medical services.

NVHA is working to ensure that everyone enjoys the highest quality of life--from the time they are our precious little ones through the golden years when they are our treasured ones.

During the past twelve months, nearly one out of four people in the Peninsula CFC area received direct assistance from NVHA member organizations. Your contributions to the NVHA keep that hope alive.

You can be their

NASA Langley employees are invite
hope to the hopeless through the 199
ized by federal workers, the CFC un
can help! The funds collected in this
for countless agencies to relieve suffe
aged, the homeless and the hungry. T
families, friends, neighbors, even tho

Langley Research Center will hold a
During the day, each employee will h
***of hope* through a contribution or pie**
agency or cause of your choice. Your
federations listed on this page. Each
directly to their subsidiary agencies.
gifts and describing their programs,
the brochure . . . each agency needs y

ICA Independent Charities of America

Share The American Way

WITHOUT YOUR HELP, SOME PEOPLE WILL BE ALL ALONE.
Independent Charities of America represents 40 charitable agencies working to feed the hungry, shelter the homeless, provide for the disabled. ICA works to protect the human rights and safety of those who do not have the resources to fight for themselves.

ICA is founded by federal employees and is partially funded by Combined Federal Campaign funds. Your one contribution to the CFC can help the ICA and other organizations who reach out to help those in need. You can be that vital *voice of hope*.

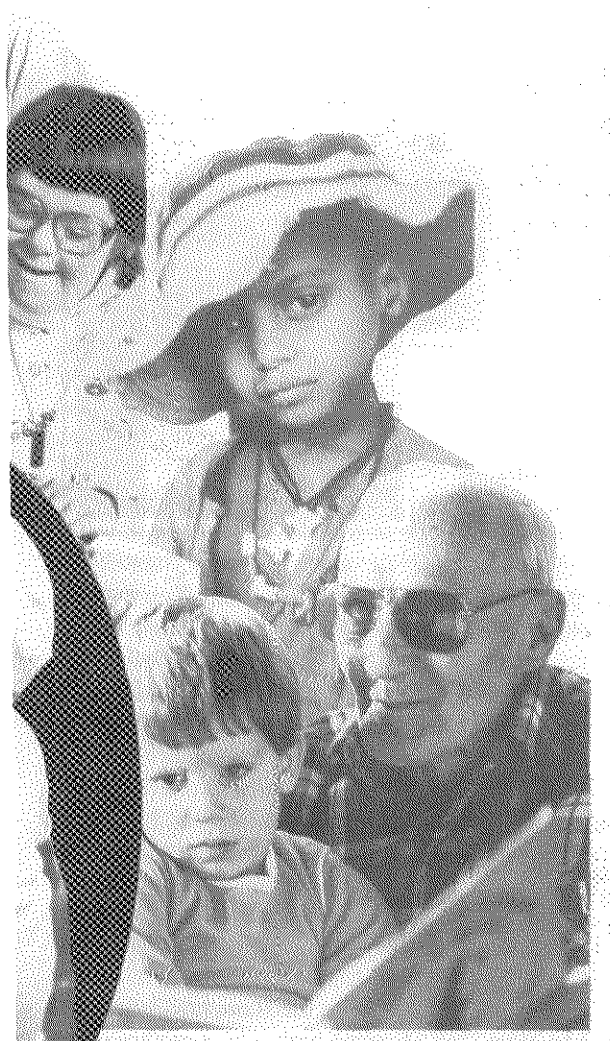
United Way of Greater Williamsburg

TOGETHER WE CAN MAKE IT HAPPEN.
Big Brothers/Big Sisters, providing one-to-one friendships to children of single-parent households, is just one of the 24 social service agencies in the greater Williamsburg area supported by the United Way.

The United Way of Greater Williamsburg has a long histor of efficiently dispensing your contributions to human service agencies in the community who help feed the hungry; shelter the homeless; counsel, protect and comfort those in need.

The United Way of Williamsburg relies on Combined Federal Campaign funds to supplement their operating budget. You can be their *voice of hope*.

the gift of self



voice of hope!

United Way

IF YOU CAN READ THIS, YOU'RE FORTUNATE.
Fifteen percent of all teenagers, 20 percent of adults, 33 percent of mothers on welfare and 60 percent of the unemployed cannot read.

The United Way of the Virginia Peninsula is a community volunteer effort to help all sorts of people in need right here where we live and work. From literacy to livelihood, the need is great. Without your help, Peninsula people could go hungry, be left in the cold, feel alone.

Forty-one human care agencies rely on the United Way of the Virginia Peninsula. And the United Way relies on you. By giving to the Combined Federal Campaign, you are offering hope to the hopeless. Be their *voice of hope.*

ı their federal neighbors in offering
ɔined Federal Campaign. Organ-
se who need help with those who
-year solicitation make it possible
ıd provide care for the young, the
e campaign helps people--your
may never meet--all year long.

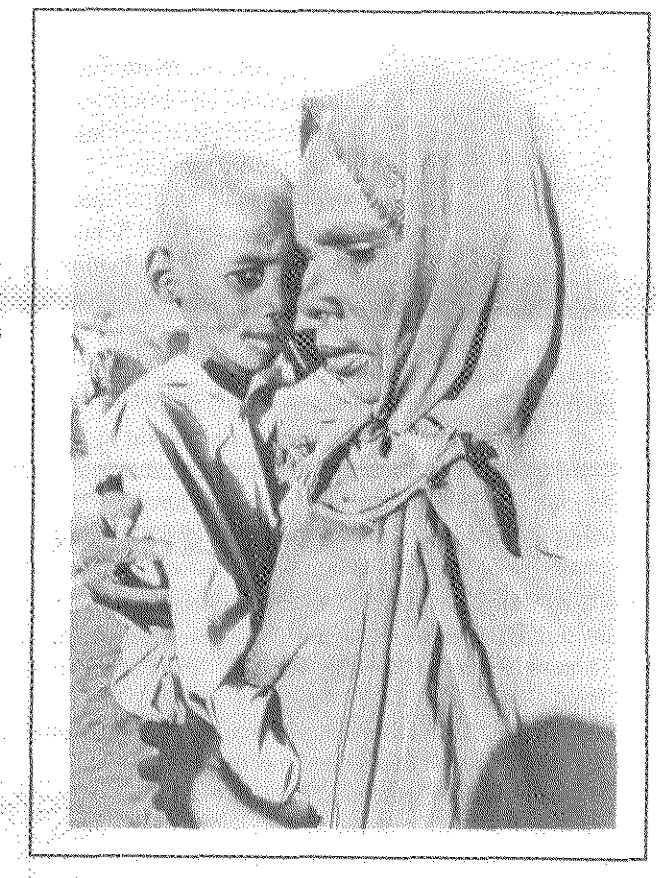
y solicitation Monday, October 7.
opportunity to be someone's *voice*
ırough payroll deduction--to an
butions are distributed among the
e organizations distributed funds
hure, listing the recipients of your
available. Take a moment to study
ısideration and your support.

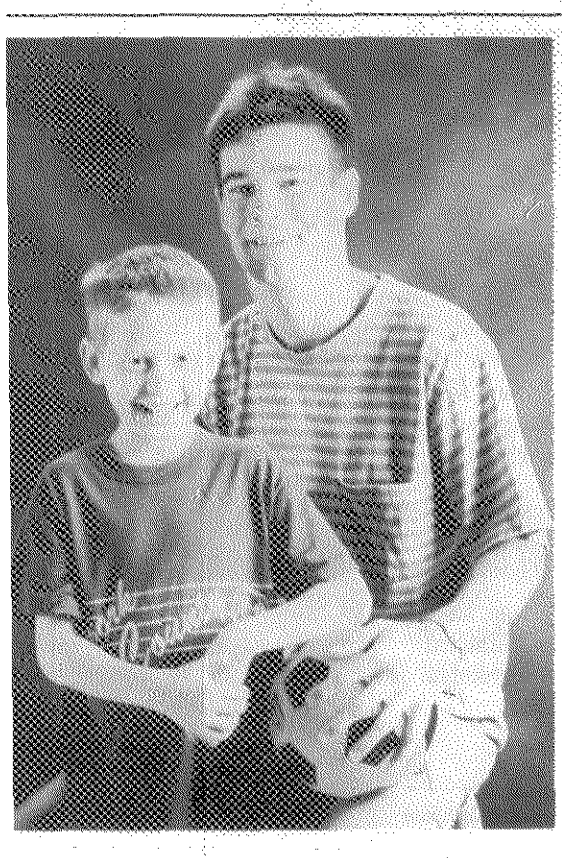
ISA

IF THEY JUST HAD A CHANCE.
Chronic poverty quietly and relentlessly claims the lives of 40,000 children every day. The real tragedy is that these deaths are preventable. International Service Agencies foster self-help programs that bring hope to the poor through farming assistance, education, clean water, medical care and training, refugee assistance, job training and more.

ISA is a nonprofit federation of 40 American charitable agencies which, last year, assisted nearly 150 million needy people in 100 countries throughout Latin America, Africa, Asia and the Far East.

ISA agencies depend on the support of the Combined Federal Campaign to help them help those in need. Your one contribution helps them--and many others--all year long.





THE EARTH IS OUR FOREMOST ENDANGERED SPECIES.
America's cities as a whole have no more than 25 years of available landfill capacity. EARTH SHARE agencies work with neighborhoods and municipal governments to organize effective recycling programs to ease the strain on landfills and reduce the consumption of our natural resources.

EARTH SHARE

As a coalition of 18 national environmental charities, EARTH SHARE offers us the chance to help save America for ourselves and the children who follow us. Do your part to make our world a better place. Yours may be the crucial *voice of hope.*

Apprentice Graduation

Class of '91 to Graduate 34 Technicians

The Langley Research Center will graduate 34 engineering technicians, 23 of them with honors, at ceremonies today.

The Forty-Seventh Annual Completion Exercises for Engineering Technicians will be held in the H.J.E. Reid Conference Center, Building 1222.

Langley Director Richard H. Petersen will preside, and Frederick M. Thompson, apprentice program coordinator, will present the certificates.

Music will be provided by the Continental Army Band.

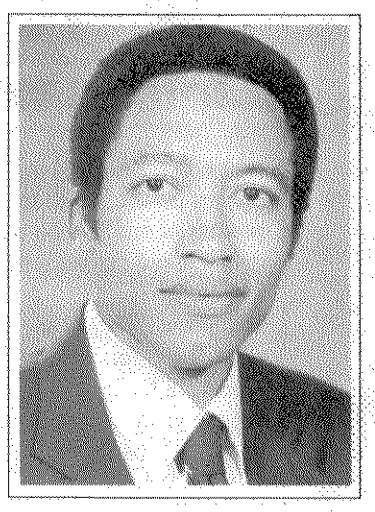
The class of 27 men and seven women maintained an overall grade-point average of 3.39, with four students earning a 4.0 GPA.

Thirteen came to the apprentice program with two-year degrees from Thomas Nelson Community College; seven are from Tidewater Community College.

One graduate is from the Growth Opportunity program, and 13 were direct hires by the Office of Personnel Management. Five already have four-year degrees.

Among them they have earned 16 superior accomplishment awards; four special achievement awards; 18 group awards; and 21 letters of commendation.

Dudley Picked to Address Students



Kenneth L. Dudley has been elected by his classmates as speaker for the apprentice program Class of 1991 and will address the commencement assembly at today's ceremony.

He is an electronics engineering technician in the Antenna and Microwave Research Branch, Guidance and Control Division.

Dudley graduated from Gloucester High School in 1982. Upon graduation he attended the Air Force Academy in Colorado Springs from 1982 to 1984.

He earned an associate's in applied science degree in electronics technology at Thomas Nelson Community College, graduating cum laude.

He entered the NASA technical co-op program and was accepted into the apprentice program.

Dudley received a letter of appreciation from the Controls-Structures Interaction Office for his wiring of the Appletalk system, and a superior accomplishment award for his contributions to the development of a microwave laboratory for performance simulation of the Aft Flow Ionization Experiment (AIFE).

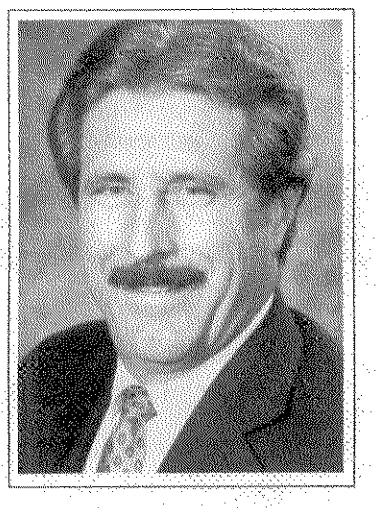
He also received a group achievement award for the advancement of Compact Range Technology through the development of an Experimental Test Range (ETR).

Dudley is pursuing a bachelor of science degree in electrical engineering from Old Dominion University. He expects to graduate in 1993.

Dudley lives in Hampton and enjoys snow skiing and hiking.

He also has been a pilot of sailplanes and gliders for two years. Dudley is a cum laude graduate of the 1991 apprentice class.

Keynote Speaker is Director of Virginia Apprentice Bureau



A man who entered an apprentice program "quite by accident" and is now the director of the state Bureau of Apprenticeship and Training will be the guest speaker for the 1991 apprentice graduation ceremony today.

James F. "Jim" Walker said he hadn't planned to enter the Hampton Roads Joint Apprenticeship and Training Committee's four-year electrical apprenticeship program after he was discharged at Langley Air Force Base in 1963.

"I had a wife and a son to support and I took a job as a laborer on a construction site just to get by, and I ran across the apprentice program," said Walker. "I saw it was what I really liked to do.

He used the G.I. Bill to finance his education, and has been a licensed journeyman electrician ever since. Walker also was the training director for the Hampton Roads Joint Apprenticeship and Training Committee of the Electrical Industry from 1971 to 1985.

In 1985 he was the apprenticeship and training representative with the U.S. Department of Labor's Bureau of Apprenticeship and Training in the Norfolk area office.

He has been director of the federal Virginia Bureau of Apprenticeship and Training in Richmond since 1989. Walker also has been a member of vocational education advisory committees in Newport News, Hampton, Norfolk, and Virginia Beach.

He also was on the advisory council that created the Peninsula Job Convention, held yearly at the Hampton Coliseum for area high school graduates.

A Peninsula resident for 30 years, he lives in Hampton. His keynote theme will be "Quality Craftsmanship Through Apprenticeship."

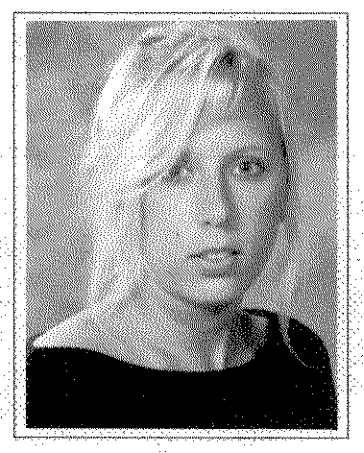
Langley Apprentice Class of 1991

Holly A. Baughan is a mechanical engineering technician in the Technical Support Section D, Operations Support Division. Baughan entered NASA as a co-op through Thomas Nelson Community College. She was accepted into the apprentice program upon completion of her co-op term.

During her apprenticeship she received a superior accomplishment award for demonstrating exceptional insight and mechanical skills for the Multi-Role Fighter and the Test Technique Demonstration RCS models.

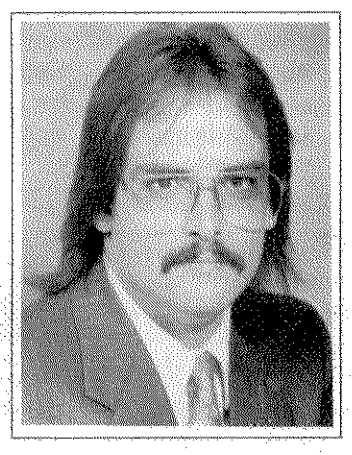
She earned an associate in applied science degree in mechanical technology from TNCC, graduating cum laude.

She is a graduate of Bethel High School and is pursuing a bachelor of science degree in mechanical technology through TNCC and Old Dominion University. She expects to graduate in 1993. She lives in Newport News.



Steven Keri Bene is a mechanical engineering technician, aerospace model development, in the Composite and Models Development Section, Fabrication Division. He entered NASA through the co-op program while attending Tidewater Community College. Upon completion of his co-op program he was accepted into the apprentice program. He has received a special achievement award for his outstanding efforts on the HL-20 project. He has been involved with the 16-Foot Blade Rehab and NTF Fan Blade Rehab projects.

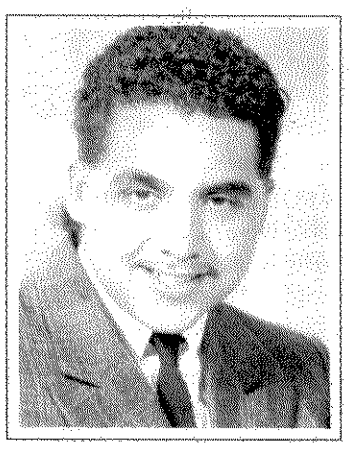
Bene has an associate in applied science degree in drafting and design from TCC, graduating magna cum laude. He is considering pursuing a bachelor of science degree in mechanical engineering. Bene, born deaf, earned a 4.0 GPA and is a magna cum laude graduate of the apprentice program. Bene lives in Newport News with his wife, Annette Alie, who was his interpreter in the program before they were married.



Kevin M. Bonilla is a mechanical engineering technician in the Advanced Machining Section, Fabrication Division. Bonilla joined NASA through the co-op program at Thomas Nelson Community College. Upon completion of his co-op program he was accepted into the apprentice program. He has been involved in a variety of projects, such as the HALOE project, and received a superior accomplishment award for his expertise on the Crew Equipment Translation Aid (CETA) project.

He has an associate in applied science degree in mechanical technology from TNCC. He also has an associate in applied science degree in drafting and design from TNCC.

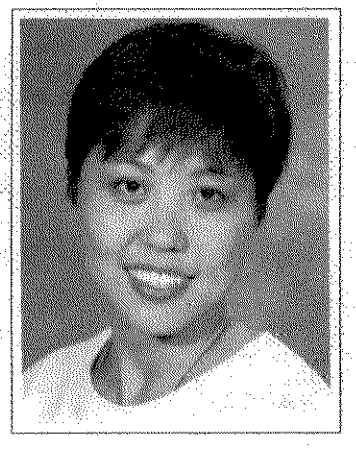
He is pursuing a bachelor of science degree in mechanical engineering at Old Dominion University. He is a cum laude graduate of the 1991 apprentice class. Bonilla lives in Seaford.



Shaio-Shan Hsu Branham is an electrical engineering technician in the Electrical Drives and Systems Operation Section, Operations Support Division. Branham entered NASA through the co-op program with Thomas Nelson Community College. She has received the group achievement award for her outstanding contributions to the rehab of the National Transonic Facility. She has been involved with the Oven Control Systems project.

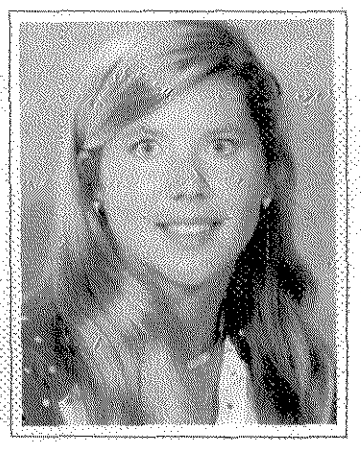
She has an associate in applied science degree in electrical engineering technology from TNCC, graduating cum laude.

Branham, a native of Taipei, Taiwan, has been married for 12 years and became a naturalized citizen in 1984. She is a magna cum laude graduate of the 1991 apprentice class.



Biographies were compiled by Patricia Christian, Kathleen S. Long, and Donald W. Grigsby.

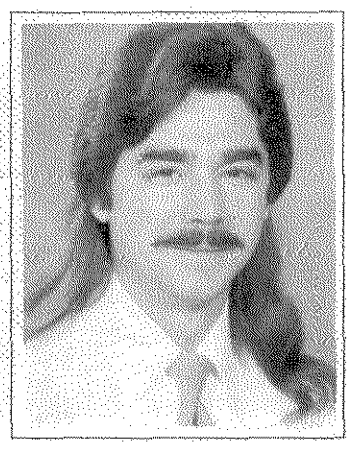
Class of 1991



Ellen M. Brantly is an electrical engineering technician in the Laboratory and Plant Electrical Section, Operations Support Division. Brantly received a superior accomplishment award while working in the Plant and Power Distribution Unit. She also received a letter of appreciation for her efforts in the initial testing of the 7 x 10 High Speed Tunnel Main Drive startup. She was a panel representative for NASA at the Virginia Association of Cooperative Education Conference in Virginia Beach in 1988.

She has an associate in applied science degree in electronic technology and a certificate in electrical/electronics technology from Tidewater Community College. She also has a certificate in electrical/electronics technology from TCC.

Brantly, a native of Chattanooga, Tenn., lives in Yorktown.



Thomas S. Bryant III is an electrical engineering technician in the Electrical Drives and Systems Operation Section, Operations Support Division.

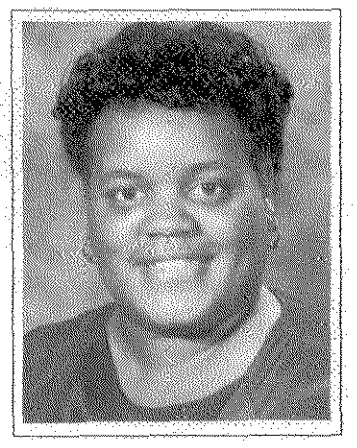
Bryant entered NASA through the co-op program while attending Tidewater Community College. Upon completion of the co-op program he was accepted into the apprentice program.

He has received a group achievement award for the NTF Fan Blade Rehab project and outstanding ratings on his performance appraisals.

He earned a 4.0 GPA in the apprentice program.

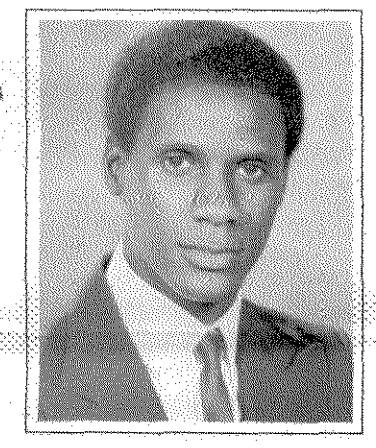
He has an associate in applied science degree in electronics technology from TCC, graduating magna cum laude.

Bryant and his wife life in Hampton.

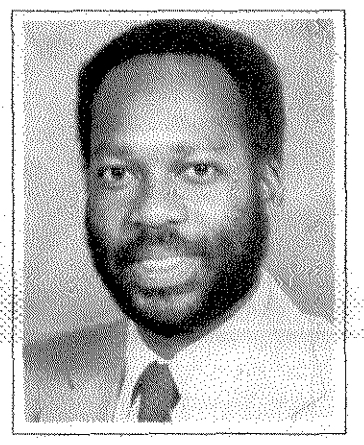


Patricia Christian is a mechanical engineering technician in the Technical Support Section D, Operations Support Division. Christian entered NASA as a co-op through Thomas Nelson Community College's secretarial science program. She received many special achievement awards for secretarial support to the Facilities Engineering Division. After the co-op program she was accepted into the Growth Opportunity (GO) Program as an engineering technician apprentice.

She received a superior accomplishment award for fabrication of a dye penetrate stand at the Water Tunnel and four letters of commendation for work at the 7 x 10 High Speed Tunnel. She has an associate in applied science degree in secretarial science from TNCC, graduating cum laude. She is pursuing state certification in supervision/management through the NASA Management/Supervisory Training Program. She and her children, Don Jr. and Latrice, live in Newport News.



Terry O. Clark is an engineering technician in the Metals Technology Development Section, Fabrication Division. Clark, a direct NASA hire, has received a superior accomplishment award for outstanding support of the High Lift Transport Data Acquisition System; a certificate of appreciation for dedicated/cooperative spirit on the Crew and Equipment Translation Aid (CETA) Flight Experiment Team; a group achievement award for his contributions in the design of the Mobile Transporter for assembling the Space Station truss; a group achievement award for the NTF Mishap Recovery; and a letter of commendation for support of the ATOP Program. He has a bachelor of science degree in mechanical design technology from Norfolk State University, graduating in 1986. He is pursuing a bachelor of science degree in mechanical engineering from Old Dominion University. Clark lives in Portsmouth with his wife, Cynthia, and child Terry II. He is a cum laude graduate of the apprentice class.



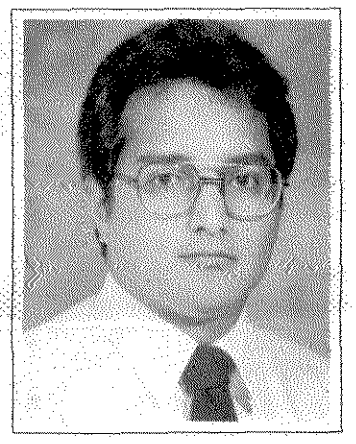
Larry Cowen is an electrical engineering technician in the Laboratory and Plant Electrical Section, Operations Support Division.

Cowen graduated from Piedmont Aerospace Institute with a diploma in aircraft technology. Upon graduation he enlisted in the Navy and attended the Navy Aviation Electronics "A" School. After serving his four-year enlistment as an avionics technician aboard the USS John F. Kennedy he joined Hughes Aircraft Co. as a field engineer.

He joined NASA as a direct OPM hire and entered the electrical engineering apprentice program.

He is responsible for supporting tunnel and laboratory facilities by performing trouble-shooting, repairing, and calibrating electrical/electronic equipment.

He has a diploma in aerospace technology from Piedmont Aerospace. Upon graduating from the electrical engineering apprentice program he plans to continue taking courses toward an engineering degree.



Vincent B. Cruz is an electronics technician in the Microelectronics and Technical Support Section, Fabrication Division.

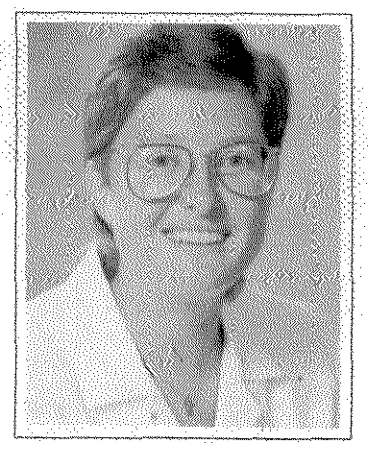
Cruz entered NASA through the co-op program at Tidewater Community College.

Upon completion of his co-op program he was accepted into the apprentice program. He has received a superior accomplishment award for excellence in microelectronic fabrication support of the Model Deformation and Position Measurement System.

He also has been the recipient of a quality increase in recognition of the outstanding manner in which he performed his duties in the division.

He has an associate degree in applied science in electronics technology from Tidewater Community College.

Cruz and his wife, Karen, and son Michael live in Gloucester.

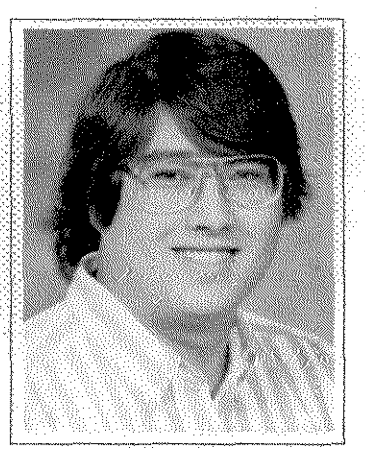


S. Janet Dail is a mechanical engineering technician in the Advanced Machining Section, Fabrication Division.

Dail joined NASA as an OPM hire. She has been involved in projects such as the HALOE, where she received a letter of appreciation for her excellent technical performance and expert workmanship and the NTF Fan Blade Rehab, where she received a group achievement award.

She has a bachelor of arts degree in Christian education from Roanoke Bible College. She has an associate in applied science degree in drafting and design technology from the College of Albermarle.

Dail is pursuing a degree at Thomas Nelson Community College and graduates magna cum laude from the apprentice class.



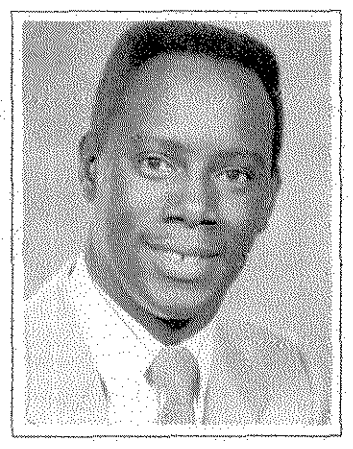
Wayne A. Davis is an electronics technician in the Microelectronics and Technical Support Section, Fabrication Division.

He entered NASA through the co-op program at Tidewater Community College.

He has an associate in applied science degree in electrical/electronics technology from Tidewater Community College, graduating cum laude.

He was the second co-op through TCC in 1985. He is a graduate of Lake Taylor High School.

Davis has lived in Norfolk since leaving the Navy in 1972.



Clinton Duncan is a mechanical engineering technician in the Technical Support Section C, Operations Support Division.

Duncan entered NASA as a direct OPM hire after taking classes at Norfolk State University.

He received a superior accomplishment award for exceptional support to research conducted in 1247B.

He also has received a group achievement award for exceptional accomplishments in the reconfiguration of the 8-Foot Transonic Pressure Tunnel.

He is assigned to the Plum Tree Facility to provide mechanical support for the X-31 Drop Program.

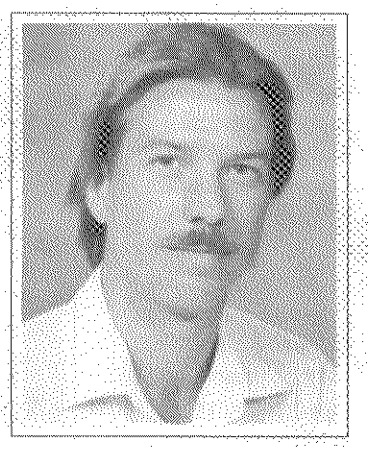
Duncan is pursuing a degree in mechanical engineering technology at Tidewater Community College and Norfolk State University.

Duncan lives in Portsmouth.

He is a magna cum laude graduate of the 1991 apprentice class.

More on next page

Class of 1991



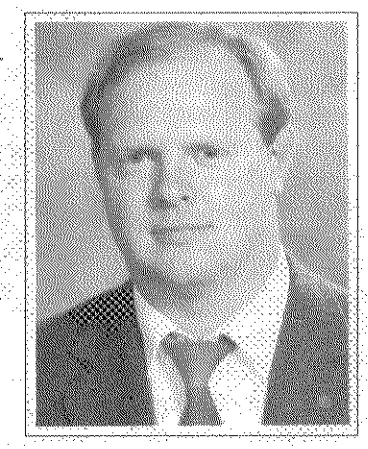
Glenn R. Farnsworth is a glass/electronics technician in the Electronics Fabrication Development Section, Fabrication Division.

Farnsworth entered NASA through the co-op program while attending Thomas Nelson Community College. He was later accepted into the apprentice program.

He has received a superior accomplishment award for excellence in glass blowing and a group achievement award for outstanding dedication to the HALOE and Space Systems project.

He earned an associate in applied science degree in electronics technology from TNCC, graduating summa cum laude.

He studied history at Old Dominion University and Virginia Polytechnic Institute and State University, and glass blowing at VPI. He graduated from Lafayette High School. He is a native of Williamsburg.



Donald W. Grigsby is an engineering technician, mechanical development, in the Mechanical Equipment Support Section, Operations Support Division.

Grigsby entered NASA through the co-op program at Tidewater Community College.

He has a special achievement award for the NTF Mishap Recovery. He also received a certificate of appreciation for outstanding accomplishments for serving as a member of the assessment, design, installation and checkout team, and serving as a member of the Space Structures Research Laboratory Development Team. He has an associate in applied science degree in mechanical engineering from TCC. He is pursuing a bachelor of science degree in mechanical engineering at Old Dominion University. He is a native of Kalamazoo, Mich., and lives in Chesapeake with his wife, Tonya, who is starting her fourth year in the apprentice program. He is a magna cum laude graduate of the apprentice class.

Jerome Harris is a mechanical engineering technician in the Technical Support Section C, Operations Support Division.

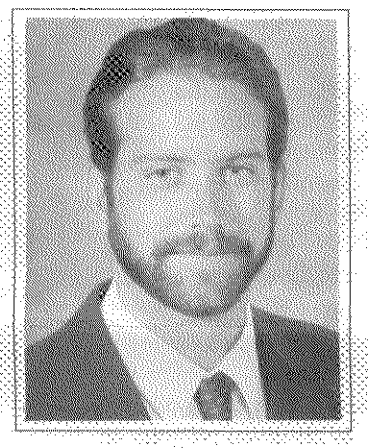
Harris entered the NASA apprentice program as a direct OPM hire to develop advanced mechanical skills and to broaden his educational background.

He has received a group achievement award for the 8-Foot Transonic Pressure Tunnel Reconfiguration Team and a letter of commendation for his technical expertise with the PCB Sampling Team.

He has been involved in a variety of projects, such as the creation of the 60 swept wing airfoil.

He is a former student at the Newport News Shipbuilding and Drydock Co. apprentice program.

He also was a student at Hampton University.

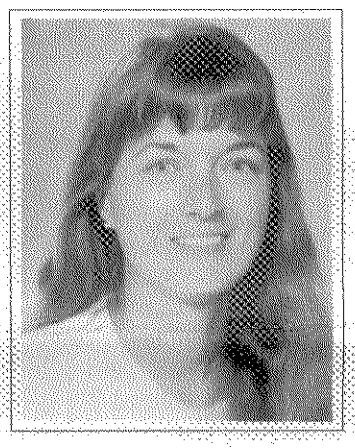


John W. Hopkins is a glass/electronics engineering technician in the Electronics Fabrication Development Section, Fabrication Division.

Hopkins entered NASA through the co-op program, where he earned an associate in applied science degree in electronics technology. He entered the apprentice program upon completion of the co-op program.

He became proficient in the fabrication of glass and ceramics and has received two letters of commendation for outstanding support from the Automation Technology Branch for fabrication, repair, and installation of electronic and mechanical components with the Intelligent Systems Research Lab.

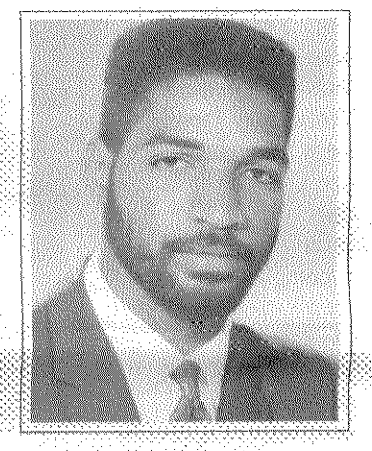
He also received a letter of commendation from the Department of Physics at the College of William and Mary for supporting the coolable glass absorption cell in obtaining infrared spectra of cooled methane gases. Hopkins is a native of Newport News.



Tammy K. Hopkins is a mechanical engineering technician in the Technical Support Section B, Operations Support Division.

Hopkins entered NASA as a direct OPM hire. She has received a letter of recognition from the Aircraft Structures Branch for her professional approach in the 1.2-Million Pound Test Machine Repair Team. She also received a letter of commendation from the Mechanics of Materials Branch for her performance in conducting the Proof Test Evaluation for the Aircraft Structural Integrity Program.

She has an associate in applied science degree in math from Tidewater Community College, where she was a summa cum laude graduate. She graduated from Kellam High School in Virginia Beach. Hopkins and her husband, Kevin, live in Seaford. Hopkins is a magna cum laude graduate of the 1991 apprentice class.

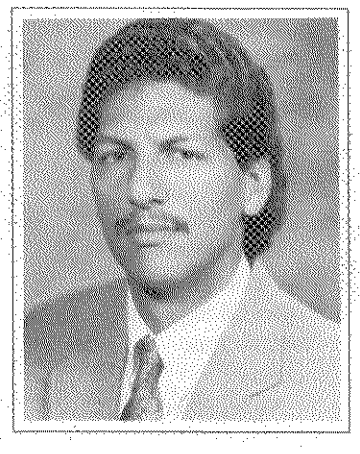


Samuel James is a mechanical engineering technician assigned to the Composite and Models Development Section, Fabrication Division.

James entered NASA as a direct OPM hire. He has been involved in several projects, such as the NTF Fan Blade Rehab, where he received a group achievement award, and the F-18 strakes, an Ames/Langley project.

He represented NASA Langley at the Science Teacher's Convention in Houston, Texas, and in an Old Dominion University Publications video called "New Frontiers."

James, a native of Elizabeth City, N.C., is a member of the NASA ATOMS Program, in which participants talk with middle school students on the Peninsula.

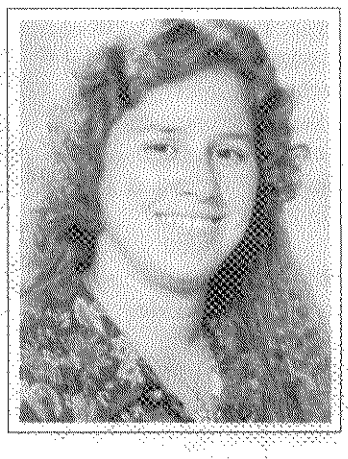


Mark L.M. Jones is an electrical engineering technician in the Laboratory and Plant Operations Section, Operations Support Division.

Jones entered NASA through the co-op program at Tidewater Community College. He is a member of the Airborne Differential Absorption Lidar Group, which is a principal part of the Global Tropospheric Experiment (GTE) research managed by Langley's Atmospheric Science Division. The group uses laser systems to detect trace gases, such as ozone, from a DC-8 aircraft.

He has an associate in applied science degree in electronics technology from TCC, where he graduated cum laude. After completing the co-op program he entered the apprentice program, where he earned a 4.0 GPA.

Jones and his wife, Lera, live in Virginia Beach.



Kathleen S. Long is a mechanical engineering technician in the Technical Support Section A, Operations Support Division. She supports the Aircraft Landing Dynamics Facility.

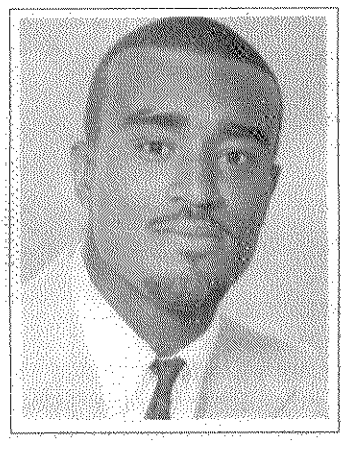
Long entered NASA as a co-op while attending Thomas Nelson Community College. After completing the co-op program she was accepted into the apprentice program.

She received a letter of commendation for her exemplary performance of duties to the National Space Transportation System (NST) Program and for her contributions to the Shuttle program.

She earned an associate in applied science degree in mechanical technology from TNCC.

She is pursuing a degree in wildlife and forestry conservation from the International Correspondence School, and expects to graduate in 1993.

Long is a native of Georgia and lives in Hampton.



Clyde G. Medley is an electrical engineering technician assigned to the Electrical Drives and Systems Operation Section, Operations Support Division.

Medley joined NASA as a direct OPM hire. He has received a group achievement award at the National Transonic Facility for outstanding electrical repairs and modifications. Prior to his apprenticeship, he was lead electrical supervisor at the Air-A-Plane Corp. for nine years. He has an associate in applied science degree in electrical technology from Thomas Nelson Community College. He also has an associate in applied science degree in industrial technology and a bachelor of science degree in electrical science technology from Norfolk State University.

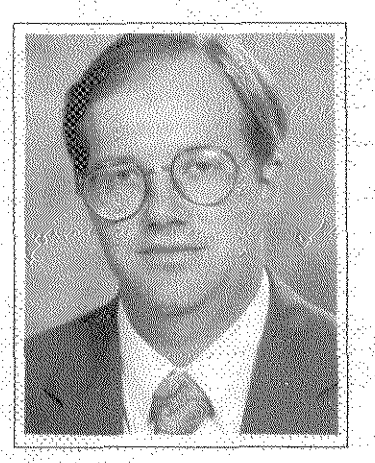
Medley, his wife, Marilyn, and children Courtney Nicole and Clyde Lee live in Chesapeake. He is pursuing a bachelor of science degree in electrical engineering at Old Dominion University. He also has applied for the Career Field Program.

Class of 1991

Tammi S. Moat is a mechanical engineering technician assigned to the Composites and Models Development Section, Fabrication Division.

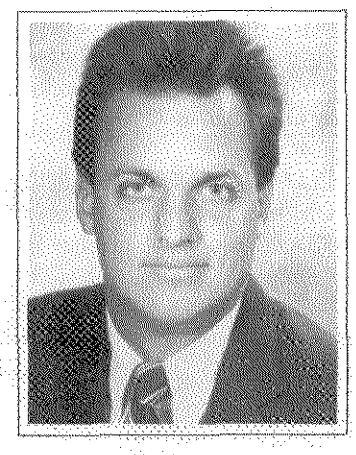
Moat entered NASA through the co-op program while at Thomas Nelson Community College. Upon completion of the co-op program she was accepted into the apprentice program. She received a group achievement award for her work in the rehab of the NTF Fan Blades.

She has a superior accomplishment award for her work in the modification of the X-31 Free Flight Model. She was a speaker at the Engineer's Week Special Speaking Program. She also has contributed to the HL-20 Full Scale Model and HL-20 6-Inch Model. She has an associate in applied science degree in mechanical technology from Thomas Nelson Community College, graduating cum laude. The Corning, N.Y., native and Army veteran is a cum laude graduate of the apprentice class.



James V. Plant is an engineering technician in the Technical Support Section A, Operations Support Division.

Plant entered NASA as a direct OPM hire. He has a superior accomplishment award for exceptional performance in technical/mechanical support to the Differential Absorption Lidar (DIAL) structural fabrication; a superior accomplishment award for his technical contributions to the fabrication and testing of the Real-Time Gas Chromatograph; and a certificate of appreciation for outstanding accomplishments in his contributions as a member for the CSI Evolutionary Model Development Team. He supports Global Tropospheric Experiment (GTE) research managed by the Atmospheric Science Division. He has an associate in applied science degree in drafting and design from Tidewater Community College, graduating summa cum laude. He is a resident of Norfolk.



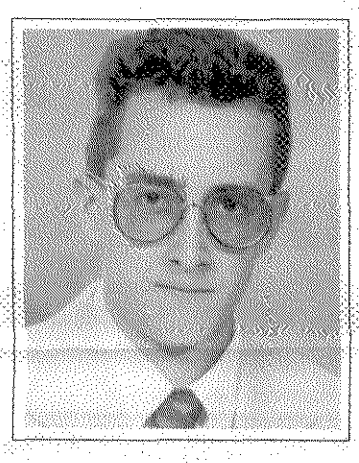
Michael E. Ramsey is a mechanical engineering technician in the Technical Support Section D, Operations Support Division.

Ramsey joined NASA as an OPM hire and entered the apprentice program. He has been relied on for technological expertise in support of the NASP Model.

Ramsey has received numerous letters of commendation for outstanding work in mechanical engineering while working at the 14 x 22 Wind Tunnel. He is a former Klate Holt employee.

Ramsey has a bachelor of arts degree in business administration and technology management from St. Leo College, graduating magna cum laude.

Ramsey, a native of Hopewell, and his wife, Belinda, live in Hampton.



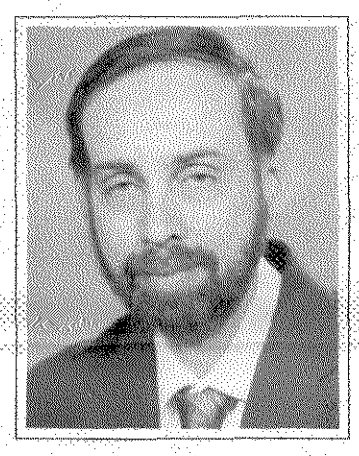
Anthony W. Robbins is a mechanical engineering technician in Technical Support Section C, Operations Support Division.

Robbins entered NASA through the co-op program while attending Thomas Nelson Community College.

He has received a superior achievement award for his outstanding contributions to the Douglas Test performed at the Low Turbulence Pressure Tunnel.

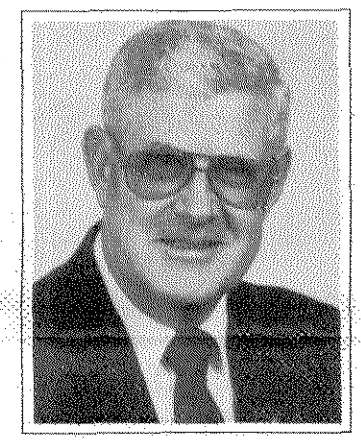
He has an associate in applied science degree in mechanical engineering from TNCC. He is a graduate of Kecoughtan High School.

Robbins lives in Hampton with his wife, Yancy and son Kelsey.



George M. Rowe is an electronics technician in the Electronics Branch, Flight Electronics Division. He entered NASA through the co-op program while attending Thomas Nelson Community College and was accepted into the apprentice program, where he earned a 4.0 GPA. He has a superior accomplishment award for contributions to the design and development of the Lidar In-Space Technology Experiment (LITE) Electronics Subsystem in 1990. He received a superior accomplishment award for his significant contributions to LITE and to the Electronics Branch in 1989. He is the LITE bond stores manager and property branch custodian.

He has an associate in applied science degree in electronics technology and a diploma in electronics servicing from TNCC, graduating summa cum laude. He lives in Newport News.

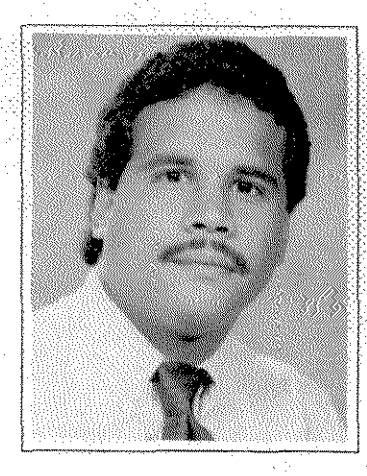


Basil B. "Ben" Shrader is an engineering technician, mechanical development, in the Mechanical Equipment Support Section, Operations Support Division.

Shrader entered NASA as a direct OPM hire. His work involves the technical responsibility for NASA's equipment and machinery. He completed an apprenticeship with the Newport News Shipbuilding and Drydock Co. as a boilermaker from 1953 to 1957. He started an apprenticeship with the Norfolk Naval Shipyard but dropped out because of an injury.

Entering NASA, Shrader began his third apprenticeship and, at age 57, is the oldest graduating apprentice to date.

He is pursuing a degree in business management through Thomas Nelson Community College. He and his wife, Patricia, live in Denbigh. He is a native of Duhring, W. Va.



Donald D. Smith is an engineering technician in the Advanced Machining Development Section, Fabrication Division.

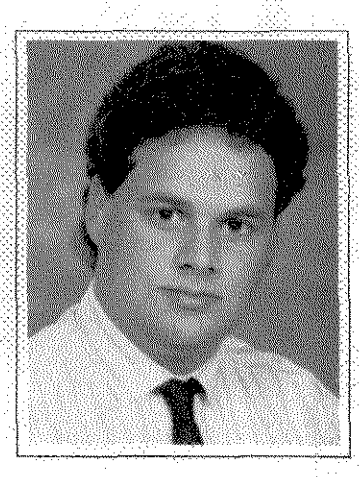
Smith joined NASA as a direct OPM hire.

He has been involved in a variety of programs, such as the Magnetic Suspension and Balance System and the LASE projects.

He has received a group achievement award for his technical expertise in support of the NTF Fan Blade Rehab project.

He is a magna cum laude graduate of the 1991 apprentice class.

Smith lives in Hampton.



James S. Smith Jr. is an electronics technician in the Electronic Packaging Development Section, Fabrication Division.

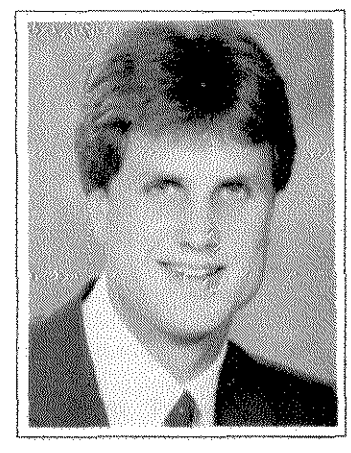
Smith entered NASA through the co-op program while attending Thomas Nelson Community College.

After completing his co-op term he was accepted into the apprentice program.

He has received a superior accomplishment award for exceptional support of the Jet Noise Laboratory, and letters of commendation for the design of PC boards for the SUNLITE project, the electronic support/design of the Wind Shear Radar, and the Jet Noise Laboratory.

He has an associate in applied science degree in electronics technology from TNCC, graduating summa cum laude.

Smith and his wife, Tamara, live in Gloucester.



Pete H. Veneris is a mechanical engineering technician assigned to the Composites and Models Development Section, Fabrication Division.

Veneris entered NASA through the co-op program and was accepted into the apprentice program. He has received a group achievement award for the NTF Fan Blade Rehab project. He also received a certificate of recognition for the creative development of a technical innovation, which as been proposed for publication as a NASA technical brief entitled "Casting Using a Polystyrene Pattern," February 1990.

He has an associate in applied science degree in mechanical technology from Thomas Nelson Community College, graduating summa cum laude. He graduated from Phoebus High School in 1985.

He graduates magna cum laude from the apprentice program. Veneris and his wife, Amy, live in Hampton.

More on next page

Happenings

SLIDE RULES that have been used at the Center are being sought for display in the Virginia Air and Space Center. Call Ray Goodman at 727-0800.

DISABLED PERSONS SATELLITE COMMITTEE will meet from 8:15 to 9:30 a.m. Thursday, October 10 in the cafeteria.

AFGE LOCAL 2755 will meet, 4:15 p.m. October 16, union office building.

LANGLEY RESEARCH ALUMNI ASSOCIATION will meet at 12:30 p.m. Tuesday, October 8. Brian Pritchard will discuss NASA space initiatives.

PENINSULA FEDERAL WOMEN'S PROGRAM MANAGERS NETWORK will host the 1st Annual Fall Training Program at the H.J.E. Reid Conference Center from 7:30 a.m. to 5 p.m. Wednesday, October 16. The theme is "Step Up, To Step Ahead." For more information call Patsy Campbell, ext. 43291.

LAA SOCIAL will be held Friday, October 11 from 4 to 6:30 p.m. at the H.J.E. Reid Conference Center.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m., in the LAA gym. First class free. Bench step classes will be offered Saturdays, 9:30 to 10:30 a.m. Cost is $6 per month.

FOR SALE: 1988 Subaru Justy, 4-speed, AM/FM cass., new tires, 55,000 miles. Call 868-7785.

A PLANET AT RISK is the subject of a talk to be given Dr. Joel Levine, of the Atmospheric Sciences Division, at 7 p.m. October 17 in the Visitors Center theater. The talk is co-sponsored by the Visitors Center and the Langley chapter of the National Space Society. The talk will concern the effects of the Kuwait oil well fires and recent volcanic eruptions on the global weather patterns. Anyone can attend. For more information call Doug Stanley, ext. 44518.

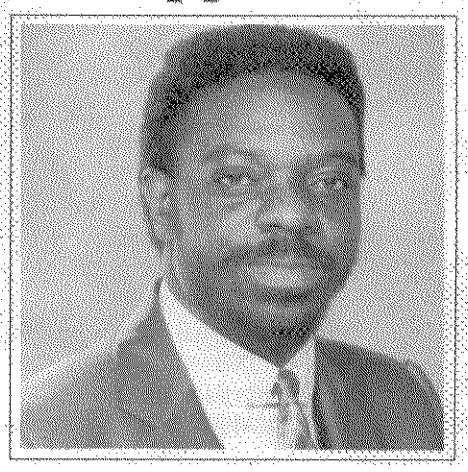
NOON-TIME STRIDERS take a 30-minute walk Tuesdays and Thursdays starting in front of the H.J.E. Reid Conference Center.

NASA TOASTMASTERS will hold its next meeting Wednesday, October 9, from 11:30 a.m. to 1 p.m. in the H.J.E. Reid Conference Center.

RENT: Poquoson townhouse, 3 br, 2-1/2 baths, lr w/fpl, sep. dr, e/i kit, storage bldg, lots of closets, excellent schools nearby. Avail Nov. $575 month. Lease, dep. rqd. 838-6000 after 6 p.m.

FOR SALE: 1976 Suburban, 3/4-ton, 305 V8, auto, ps, pb, a/c, cruise, AM/FM cass., step-and-tow bumper, 3 seats, 8 pass, $2,000. Also: Hobie Cat 16 and trailer, $1,500, McKibbon sails. Also: 1973 Volvo 1800ES coupe, $4,000, 4-speed, overdrive, a/c, stereo, good body, needs engine work. Consider part trade for 350-550cc motorcycle or 1 to 3 hp outboard motor. 596-6949 after 5 p.m.

Apprentice Class of 1991



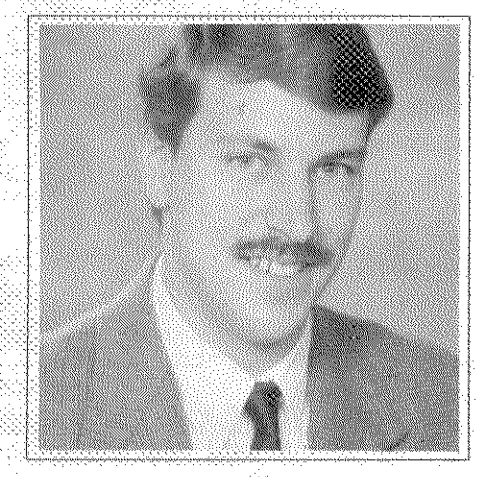
Frederick D. Wilson is an electronics technician in the Microelectronics and Technical Support Section, Fabrication Division.

Wilson entered NASA as a co-op while attending Thomas Nelson Community College. Upon completion of the co-op program he was accepted into the apprentice program.

He has received a certificate of commendation from Gov. Douglas Wilder and a certificate of appreciation from Richard H. Petersen, director of Langley Research Center, for his role as a mentor for the Virginia 1990 Presidential Governor's School.

He has an associate in applied science degree in electrical/electronics technology from TNCC.

Wilson is a native of Newport News and a cum laude graduate of the apprentice program.



William "Cy" Wilson is an engineering technician designer (electrical) in the Electrical Support Section, Systems Engineering Division.

He entered NASA as a direct OPM hire. He received a superior accomplishment award for his work on the Lidar Atmospheric Sensing Experiment (LASE) Temperature and Timing Emulation Unit (TTEU); a superior accomplishment award for support of division and section projects; and a group achievement award for work on the National Transonic Facility.

He has associate in applied science degrees in electronics technology and instrument technology from New River Community College, graduating summa cum laude. He has entered the Career Field Development Program to work toward an applied physics microelectronics degree. He and his wife, Susan, live in Hampton.

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 RESEARCHER,NEWS
VANVALKENBURG, RANDAL L.,
MAIL STOP 125A BLDG 1268

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

Researcher News

$285,000
GOAL
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
CFC
Virginia Peninsula

Photo by Carol Petrachenko

GOING VERTICAL: Billie Waters, an EG & G rigger, peers into the cabin ingress-egress hatch atop the HL-20 full-scall model, which was lifted to launch attitude September 17. The metal ring in the cabin simulates the size of the actual hatch through which test participants will enter and exit in Human Factors Studies that are about to be conducted at Langley.

NASA
National Aeronautics and Space Administration
Langley Research Center

Researcher News

Volume 5, Issue 21 October 18, 1991

Bi-weekly Employee and Contractor Publication

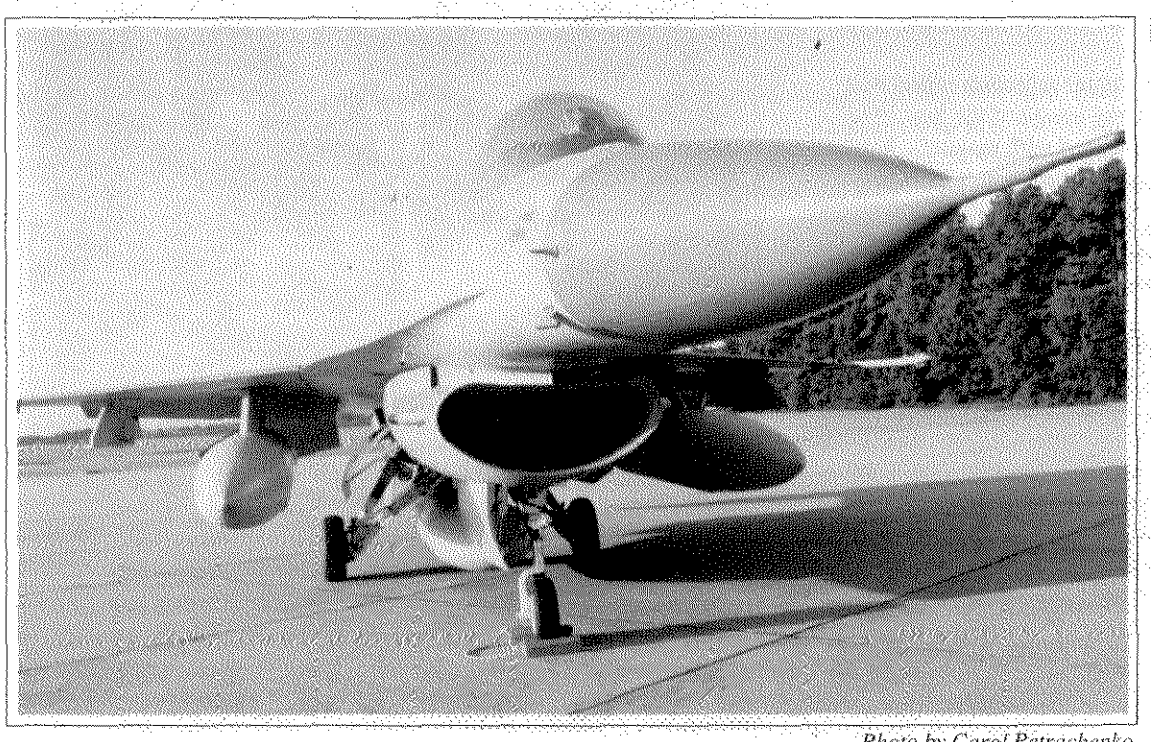


Photo by Carol Petrachenko

The state-of-the-art "Fighting Falcon" is the newest addition to the Center's support fleet.

Langley Readies F-16A for Support Role

By Craig Murden

A new plateau of pilot proficiency to complement Langley's role in providing design innovations for fighter aircraft will soon exist as the Flight Applications Division prepares to place its newly acquired F-16A in service.

This state-of-the-art vehicle has a special connection to Langley because the General Dynamics airplane incorporates three major elements developed by the Center's aeronautical engineers -- the vortex lift strake, the basic wing airfoil, and the flight control logic for high-angle-of-attack conditions.

The F-16 "Fighting Falcon" evolved from the YF-16 Lightweight Fighter Prototype in 1974 and joined U.S. Air Force operational combat squadrons in 1980.

Originally designed for an air superiority role, the F-16 has shown its versatility by also handling air-to-surface combat missions, and was one of the stars of Desert Storm with its surgically precise placement of bombs and missiles. Fifteen other countries fly the F-16, making it the most popular U.S. fighter in the Western world.

ON THE INSIDE

See page 4:
- **Details, photos of F-16A**
- **Project pilot profile**

Joseph R. Chambers, chief of the division, emphasizes the important support role the new Langley F-16A will play. He points out that Langley pilots are constantly involved in research programs that focus on the design of the next generation of U.S. fighters.

"We rely heavily on the Differential Maneuvering Simulator in our work to assess the effectiveness of Langley-developed concepts on advanced fighter designs," he said. "But to continue to expand the cutting-edge technology required for success in such projects, it is critical that our pilots be proficient in modern fighter aircraft and the relevant technology."

Chambers named several areas where pilot currency in the latest fighters is crucial, including: head-up displays, flight controls, contemporary radars and life-support systems.

Chambers points to another aspect of the need for Langley pilots to fly the latest airplanes. He says that many of the fighter innovations under study in NASA originated at Langley in terms of concept exploration and detailed assessment.

Then, as they mature, the innovations are implemented in high performance research aircraft at the NASA Dryden Flight Research Facility at Edwards Air Force Base in California for testing and implementation.

The current NASA thrust vectoring work, using the Dryden F-18 High Angle of Attack Research Vehicle, is a case in point. In the transition period between Langley and Dryden, there is a critical need for constant dialog and actual flying exchanges for pilots and engineers of both centers.

But, says Chambers, unless both groups have very similar experience in state-of-the-art aircraft, common perspectives on the value of innovative concepts are difficult.

Petersen Named to Head Agency's Aeronautics and Space Technology Programs

Center Director Richard H. "Pete" Petersen has been appointed associate administrator for the Office of Aeronautics and Space Technology (OAST) at NASA Headquarters.

OAST was formerly the Office of Aeronautics, Exploration and Technology.

"NASA is extremely fortunate to have such an outstanding senior executive ready to take on a challenging new responsibility," NASA Administrator Richard H. Truly said in announcing the appointment October 3.

"This management change will ensure a strong future in NASA's aeronautics research and space technology."

ON THE INSIDE

- **Daily Press interview with the director, page 3**
- **Top-level changes, page 2**

Director Since 1985

Petersen has been Center director since January 1985. As the senior management official at Langley, Petersen has been responsible for the Center's aeronautical and space research programs, as well as facilities, personnel and administration.

He also served as an advisor to the NASA administrator on NASA programs. The Center employs about 3,000 civil servant personnel and another 2,200 support service contract personnel.

Petersen was deputy director at Langley from 1980 before becoming Center director.

Prior to coming to Langley, he was chief of the Aerodynamics Division at NASA's Ames Research Center in California.

He joined the National Advisory Committee for Aeronautics, NASA's predecessor agency, at Ames in 1957.

His initial work was in theoretical and experimental aerodynamics, particularly in the supersonic and hypersonic speed ranges.

Subsequently he directed computer studies of advanced aircraft including hypersonic transports, airbreathing launch vehicles, short takeoff and landing transports and general aviation aircraft.

A native of Quincy, Ill., Petersen graduated with highest distinction from Purdue University in 1956 with a bachelor of science degree in aeronautical engineering.

He earned a master of science degree in aeronautics from the California Institute of Technology in 1957.

He was a Sloan Executive Fellow at the Stanford Graduate School of Business from 1972 to 1973.

Among Petersen's many honors are the Reed Aeronautics Award from the American Institute of Aeronautics and Astronautics (AIAA), a Distinguished Presidential Rank Award, a NASA Outstanding Leadership Medal, and honorary doctorates from Purdue University and George Washington University.

HALOE Team 'Elated' as Telescope Door is Successfully Opened

The telescope door on Langley's Halogen Occultation Experiment (HALOE) opened successfully October 2.

"We have fired the pyro that kept the door closed to the telescope," said Thomas C. Jones, deputy project manager, shortly after the 1 p.m. event.

"We're certainly in high cotton. We're very, very happy and elated," Jones said.

"If the doors didn't open, we're out of business and we have to come back to Langley hat in hand."

The door opening took place 20 days after the launch of the Space Shuttle Discovery on September 12.

Jones said that before data-gathering began, the solar tracking instrument would undergo out-gassing in the stow position to eliminate contaminants that would cloud the optics.

Data Gathering to Start

"We will gradually get into a science-taking mode in about 10 days," he said.

HALOE is one of 10 experiments deployed September 15 on NASA's Upper Atmosphere Research Satellite (UARS), whose main focuses are the processes involved in ozone depletion.

HALOE is expected to provide important data for studying the effects of chlorine, nitrogen, chlorofluoromethane, and hydrogen-related compounds on the ozone layer.

The experiment will monitor the vertical distributions of temperature, and of the key upper atmosphere trace gases such as ozone, hydrogen chloride, hydrogen fluoride, nitric oxide, methane, water vapor and nitrogen dioxide.

Measurements will be made at sunrise and sunset of each orbit, providing semi-continuous observations and nearly global coverage.

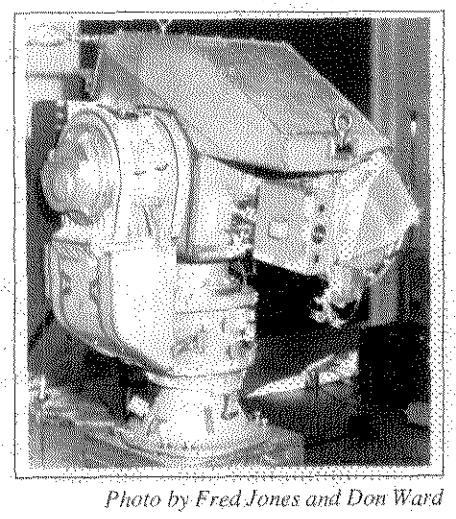


Photo by Fred Jones and Don Ward

HALOE was launched September 12.

News Briefs

Payload Specialists Named --- Dr. Franco Malerba has been named prime payload specialist and Dr. Umbert Guidoni has been named backup payload specialist for the Tethered Satellite System (TSS-1) mission scheduled for flight aboard the Space Shuttle Atlantis next summer. The TSS-1 is a cooperative mission between NASA and Italy's space agency, Agenzia Spaziale Italiana (ASI). Malerba will be the first Italian to fly in space. He is from Genoa and received his doctorate in physics at the University of Genoa. Guidoni is from Rome and received his doctorate in physics from the University of Rome.

Soft X-ray Telescope Gets First Image of Sun--- Marshall Space Flight Center scientists report that their joint U.S.-Japanese Soft X-ray Telescope has acquired its first soft X-ray image of the Sun. The image shows intricate detail of the solar X-ray corona, including loops associated with magnetic bottles within the corona. The telescope is one of four instruments aboard the Japanese spacecraft Yohkoh.

Editor's note: To obtain a copy of any of these NASA Headquarters News Releases contact Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request information summarized above by headline printed in bold.

Senior Management Research and Review Agenda

The Senior Management Research Review will be held Monday, October 21, from 9 to 11 a.m. at 17 West Taylor Road, Subsonic Tunnels Offices, Room 200. All employees are invited to attend. Program accomplishments will be given by the following Langley scientists:

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:00	Cooperative AFW Program Successfully Completed	Boyd Perry III (AB, SDyD, Structures)
9:15	Wing Loads Actively Controlled During Rolling Maneuvers	Jessica A. Woods-Vedeler (AB, SDyD, Structures)
9:30	Active Flutter Suppression: Control System Design and Experimental Validation	Martin R. Waszak (AGCB, GCD, Flt Sys)
9:45	Self-Correcting Techniques for Large Antennas	Dr. Marion C. Bailey (AMRB, GCD, Flt Sys)
10:00	Aerodynamic Design Using Advanced Computational Fluid Dynamics (CFD) Methods	Richard L. Campbell (TAB, AAD, Aero)
10:15	A Practical Solar-Pumped t-C_4F_9I Laser	Gilda A. Miner (HESB, SSD, Space)
10:30	Director's Comments	

Following these presentations, the program directors will give status reports.

Headquarters Makes Top-Level Personnel Changes

In addition to the appointment of Center Director Richard H. Petersen as associate administrator for the Office of Aeronautics and Space Technology, NASA Administrator Richard H. Truly has announced the following changes:

• William B. Lenoir, currently associate administrator for the Office of Space Flight, will continue to head that office, with its new focus on space flight operations.

• Charles T. Force will remain in his current assignment as the associate administrator for the Office of Space Communications, formerly the Office of Space Operations.

NASA field center reporting assignments will remain unchanged and transition plans will be arranged as soon as possible.

Truly, in announcing the appointments, said: "NASA is extremely fortunate to have such outstanding senior executives ready to take on these challenging new responsibilities. With the creation of the Office of Space Systems Development and these key appointments, NASA will be better aligned to execute the development and operation of Space Station Freedom as well as other new capability development projects, and to focus more directly on efficient space operations.

"These management changes will also ensure a strong future in NASA's aeronautics research and space technology efforts."

New Office Announced

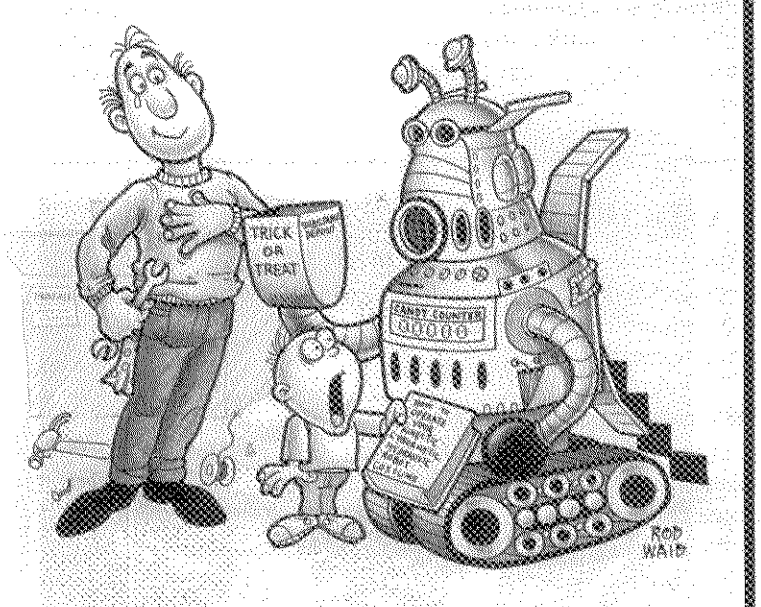
Truly also announced the intended creation of the Office of Management Systems and Facilities, which will consolidate the offices of Management and Headquarters operations. Benita A. Cooper has been named associate administrator of the new office. She currently is assistant administrator for the Office of Headquarters Operations.

Dr. C. Howard Robins Jr., current associate administrator for the Office of Management, will be on special assignment to help the deputy administrator ensure smooth organizational transition activities at NASA Headquarters. He will return to a senior technical position.

The new Office of Management Systems and Facilities will provide synergy between operational responsibilities and policy development in information systems, facilities and maintenance, logistics, aircraft management, and security.

The office also will be responsible for industrial relations, the Board of Contract Appeals, and the Inventions and Contributions Board. The NASA Headquarters Equal Opportunity function will be consolidated within the existing Office of Equal Opportunity Programs.

Lankley



Each Halloween Junior's costume looks less and less like the other kids'

Editorials

Photo by Fred Jones

CFC KICKOFF. Langley began its 1991-92 Combined Federal Campaign with a kickoff September 27. Participating in the program and the cake-cutting ceremony were Edward J. Campbell, keynote speaker for the occasion and president and CEO, Newport News Shipbuilding; Bruce A. Conway, CFC chairman; and Richard H. Petersen, Langley director.

CFC: Common Thread to Giving is Desire to Help Less Fortunate

As Langley's annual Combined Federal Campaign (CFC) starts, we again have the opportunity to reach out to those in our communities who really need our help.

Last year's campaign showed the true character of Langley employees when you gave more than ever before, even at a time when you were being told that we could be furloughed because of the lack of a federal budget. Your giving demonstrated that you cared for others and were willing to meet the needs even in uncertain times.

We need to remember that for some people, every day brings uncertainty related to basic necessities of life -- food, clothing, shelter -- let alone other issues such as health care, education, and training.

The many health, welfare, and service organizations which your contributions support through the CFC can help to reduce the uncertainties in the lives of our less fortunate friends and neighbors during the year. We all need hope and your giving can be a *voice of hope* for someone at just the right time.

The goal for this year's campaign ($285,000) is a significant increase over what we gave last year ($274,259), but I believe that Langley's employees are more than equal to this challenge.

We have a very proud heritage of always meeting our goal, not because meeting the goal is the object, but rather because helping others is our way.

During my association with the CFC campaign, particularly during the past two years, I have been very impressed with the excellent support given the CFC, not only at Langley but at all the other federal installations on the Peninsula.

The common thread has always been the earnest desire to help others. Let us again join together to reach out to our community, our nation, and our world to be a *voice of hope* to someone in need.

-- Darrel R. Tenney
1990 CFC Chairman

Thank you:

To all of you a word of thanks, with a word of appreciation for donating your annual leave hours to me during the illness of my daughter Tiffany. Knowing you care means so much. May God bless each of you in his own way.

-- Velma L. Clark

On behalf of my family and myself I want to express my appreciation to all those who participated in my very meaningful and enjoyable retirement luncheon on September 10, 1991. It was a wonder experience, one I will always remember.

-- Fred M. Smith

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Michael Finneran

Photojournalist ..... Carol Petrachenko

Photographer ..... Fred Jones

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Q&A: Petersen Bids Langley Farewell, Sets Goals for Headquarters Job

Daily Press reporter Kirk Saville interviewed Center Director Richard H. Petersen about his appointment as associate administrator of the Office of Aeronautics and Space Technology (OAST). The following is a condensed transcript of that interview, which took place October 3 in Petersen's office.

Are you looking forward to it?

Yes, it's a real challenge.

As you look back, do you see something that sticks out, or something that you're the most proud of in your time here?

Well, there are a lot of things. It's been a great time. I think, on the aero side, I'm excited about what we've done on the aero-space plane and the work we are continuing there. I am excited about the laminar flow work we've done in the subsonic area and the laminar flow control experiment that we're flying in the 757; and I am excited about getting started toward the High Speed Civil Transport, which we need to do a lot more work on. On the space side, again there are diverse things: getting HALOE up on UARS several weeks ago was very exciting. That's a good start on the EOS program. Our "space taxi" (the HL-20) is something that I think has a lot of potential, and I hope to see that progress further.

That just scratches the surface, but those are some of the most important things that we've done, and I've been lucky enough to be here while these people did it.

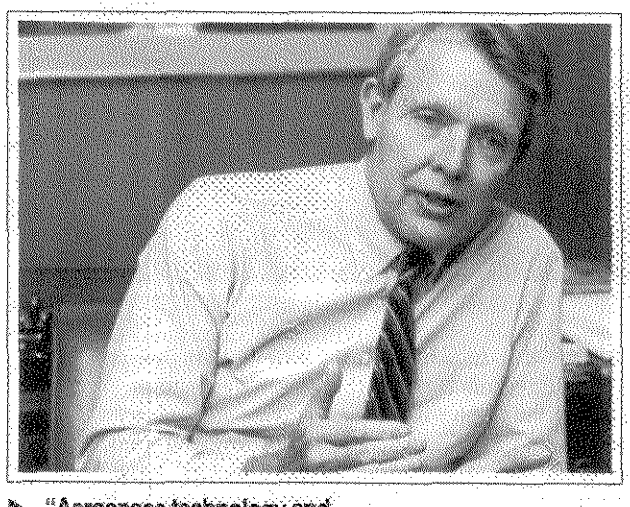
Some say this is not a real glamorous time to be associated with NASA and Washington.

I think you are right. There has been a fair amount of criticism running around, and that hurts because I've spent my career in NASA, and I think NASA is still a great organization. I think there are some problems. I hope I can help some of those problems, and I think it is a challenge to have the opportunity to try to make NASA better. There are a number of challenges, certainly, in Washington. I am very pleased to have the opportunity to bring some of the Center background and my lifetime experience at two of the research centers into Washington to try to help.

Do you have any goals or anything in mind that you would like to do specifically?

Yes. I have set myself three goals, basically. One is to take the management job there and see if I can make the Office of Aeronautics and Space Technology a more effective and efficient organization. NASA is moving to implement Total Quality Management and I think there are some things I can do to make the Office of Aeronautics and Space Technology a more effective and smooth-running operation which can help the centers get the job done.

Goal two, I would like after two or three years to look back and say that we got the second phase of the high-speed research program, which is the technology for High Speed Civil Transport. We are working on advocating that now. It is a tough budget environment, but the country needs to do it.



▶ "Aerospace technology and aeronautics, I think, has always led our industrial competitiveness."

The third goal is similar. We have over and over again had recommendations that NASA needs to increase space technology. The latest was from the Augustine Commission, and they recommended tripling the space technology budget. As a goal, in a couple of years I would like to see twice as much as we have now in space technology, and moving toward a tripling eventually.

How are you going to get the space technology budget doubled in the next couple of years?

First we build a solid program plan, and that is already in place. We have a very good definition of the program that should be done that was put together by a group of advisors from industry and universities. They have laid out a really excellent plan for what we should do, and the funding requirements. We need to work that through NASA management, through the Office of Management and Budget, and through Congress. It is a matter of sitting down with a lot of people and telling them how important it is, and selling them on the fact that it's what the country needs to be doing.

It is a difficult time in the budget situation, but I think it's very important. We ought to be doing a stronger space technology program. I have been saying that for 10 years, and I will probably be saying that 10 years from now. I believe in the importance of technology to the country -- just as the technology work on the High Speed Civil Transport is important to the U.S. competitiveness in the aircraft industry.

▶ "Langley has always been an environment where people speak up and disagree with the boss . . . I think that gets us a lot of good information."

Is that related to the aero-space plane program?

Only very loosely. They are in different flight regimes. The aero-space plane technology works toward a single-stage vehicle that can take off from a runway and go to orbit, and deals with very high speeds -- six times the speed of sound, 12 times the speed of sound, 20 times the speed of sound -- and very high temperatures. The High Speed Civil Transport is down around two or three times the speed of sound and much lower temperatures, but the challenge is to get the technology good enough to build airplanes cheaply -- cheap enough to make money for the airlines. We are convinced that we can do that if we do our homework for the next five years. We need to do the technology demonstration in the next five years. If we do that we can have an airplane that begins flying around 2005.

Why is this important, outside NASA, that we develop this and our space technology?

Because aerospace technology and aeronautics, I think, have always led our industrial competitiveness. One of the biggest elements of the balance of payment is U.S. aircraft, but it is much more than that. Advanced technology spins off to other industries. It projects the image of U.S. technology as being very, very high in the world. If we successfully pursue the High Speed Civil Transport, we will continue that leadership, continue to sell the premier aircraft, and continue to spin off those technologies in other parts of our industry. The same with space technology -- the work that's involved there involves robotics and artificial intelligence and many, many high-tech areas that spin off into normal industrial competitiveness. That is very important to this country -- we're not falling behind yet, but we're not keeping ahead of some of our competitors.

▶ "It will be a new challenge, but I am going to miss a lot of good friends and just a wonderful place to work."

Do you feel the primary problem is NASA being under-funded in these areas?

In the areas of technology, yes. I think it is important that we find the funding, but we are working in a budget environment where the competition is very stiff as NASA is being under-funded.

Tell me about your management style. People out here tell me you are sort of relaxed and informal.

I guess that's fair enough. I believe in a very people-oriented style of management. I think that particularly fits in a research environment where you have very fine people, and they are really your most important resource. I think you have to be very aware of that. I like to work in an environment with a lot of participation and communication. Langley has always been an environment where people speak up and disagree with the boss, technically and other ways, and I think that gets us a lot of good information. We try to encourage a lot of discussion, a lot of decisions reached together. So that is the kind of management style I am used to.

I believe in strategic planning. Where do we want to be in five years? That tells us what we want to do this year and why we want to do it. We have a pretty good idea where we plan to go. The new Total Quality Management emphasis on looking at who each person's customer is, is worthwhile. We're going to be working more on that and also looking at the value added of what we do each day. I think that is important at Headquarters -- to ask, "How is this helping the center get the job done?" Because the real work happens out at the centers.

Are you going to miss Langley?

Very much. This is the best job in the world for my background. Now and then I wonder why I am doing this, but I am doing it because I think that I can really help out. I have had seven good years here, and I think I can do some things at Headquarters that are good for the agency and good for the centers. So it will be a new challenge, but I am going to miss a lot of good friends and just a wonderful place to work.

All photos by Carol Petrachenko

F-16A Incorporates Three Significant Langley Design Contributions

By Craig Murden

The General Dynamics F-16, which reached its one-millionth operating hour in 1986, is a mid-wing configuration utilizing a blended wing/body design and a cropped delta platform.

The blended wing/body design concept, using a flared wing/body intersection to get lift from the body at high angles of attack, offers less wetted surface and allows more internal fuel volume.

Refining this feature was one of Langley's direct contributions to the design. During the plane's development, General Dynamics engineers brought a stability and performance problem, resulting from the lifting fuselage, to the attention of Langley researchers under the leadership of Edward C. Polhamus, a flight test engineer now retired.

The vortex lift strake was proposed and accepted as the solution. It increased vortex lift and stabilized the high angle of attack flow field over the aircraft.

Another contribution was the wing itself, a derivative of the Langley NACA 64A-204 section with a 40 percent sweepback on the leading edges. Leading edge maneuvering flaps are programmed to automatically react to speed and angle of attack. The increased wing camber maintains effective lift at high angles of attack.

The third Langley contribution to the F-16, was the design of the flight control system for high angle of attack conditions. A team of Flight Applications Division researchers, under the direction of Joseph R. Chambers, chief of Langley's Flight Applications Division, identified key logic parameters which were incorporated in all production F-16 vehicles to significantly improve the control and safety of the airplane during strenuous maneuvers.

The F-16 has been called the 'Electric Jet' because of its unique flight control system, a departure from anything flown on a fighter at the time of its introduction.

The F-16 has been called the "Electric Jet" because of its unique flight control system that represented a departure from anything ever flown on an operational fighter at the time of its introduction.

Photo by Sandie Horsey

Joseph R. Chambers, chief of Langley's Flight Applications Division, thanks Air Force delivery pilot Lt. Col. Terry Tomeny for bringing NASA 516 home when the F-16A arrived August 1.

Major Differences

In fact, General Dynamics experimental test pilot Joe Bill Dryden says that there was more difference between the F-16 and its immediate predecessors such as the F-15 and F-14 than between the propeller-driven fighters of World War II (P-51, P-47, etc.) and the first jet fighters such as the F-80 and F-84. In previous aircraft, control stick movement deflected the flight controls to a degree proportional to stick displacement. In the F-16, with minor exceptions, the pilot never has direct control of the surfaces. Redundant computers, equipped with the right parameters for a given flight regime, move the surfaces based on pilot pressure on the stick. The computers determine magnitude and direction of surface movement. "You only think it's you moving the surfaces," Dryden said.

Project Pilot Phillips has Impressive Credentials

Langley's F-16A Project Pilot is Air Force Lt. Col. Michael R. Phillips, who lists the attributes the airplane provides in its support mission: Fly-by-wire flight control system, state-of-the-art radar and inertial navigation avionics, head-up display, relaxed longitudinal static stability for increased maneuverability and the advanced Pratt & Whitney turbofan propulsion system.

He points out that the F-16A will replace the Northrop F-5F support airplane in current use at Langley when the F-16A becomes operational in January, 1992. At that time, the F-5F will be retired.

Phillips played an important part in bringing the airplane to Langley, said Harry A. Verstynen, head of the Aircraft Operations Branch.

"Through DOD channels, Mike learned that an F-16A might be available because it had been used strictly as a test bed by the Air Force and could not be economically demodified to an operational combat configuration. We inspected the airplane at Eglin AFB and found that it was in superb condition with only 1,000 hours on it.

"And, most importantly, the test configuration would be transparent to the pilot, making it a perfect choice for us as a support vehicle."

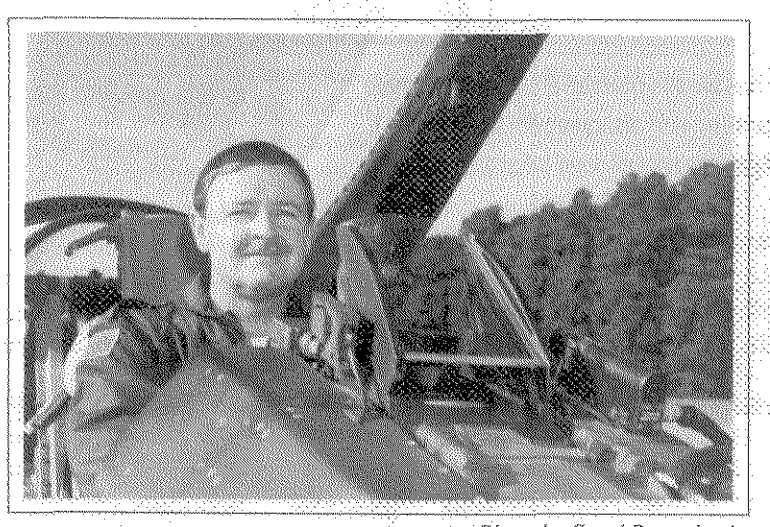


Photo by Carol Petrachenko

Pilot Michael R. Phillips gets comfortable in the cockpit of the F-16A.

The airplane was transferred to NASA, delivered to Langley on August 1, and assigned tail number NASA 516.

Phillips has a host of responsibilities. He will establish initial qualification training for Langley's pilots and maintain a continuing proficiency program which includes periodic testing.

He will also monitor and approve changes and modifications to NASA 516, help establish the logistics network and serve as the instructor and functional check pilot.

"The addition of the F-16A to our fleet has caused more enthusiasm in our branch than any other event since I have been assigned here (July 1988)," he said. "I'm confident that it will help brighten the future of aeronautics at NASA Langley for the next decade and that, in the process, will enhance our ability to support the goals of NASA in pursuit of aeronautical innovation."

Phillips, in 20 years in the Air Force, has amassed 5,000 flying hours in 50 different types of aircraft. A graduate of the Navy Test Pilot School, he has 11 years of experience as an experimental test pilot and research pilot.

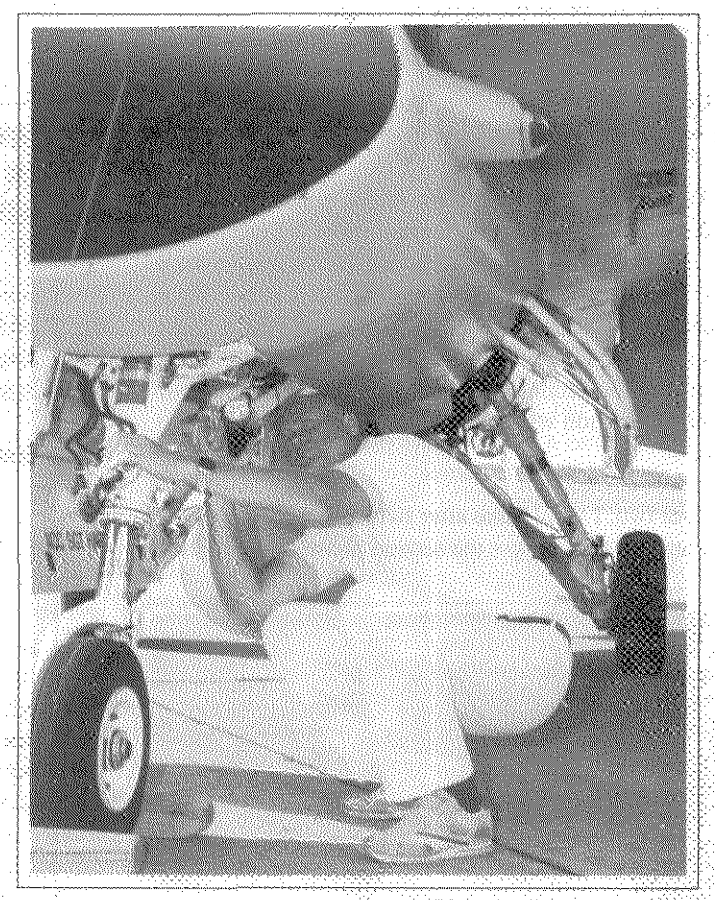


Photo by Carol Petrachenko

Arnold C. "Buddy" Burcham inspects the nose landing gear on Langley's F-16A. Burcham is one of the Center's aerospace engineering technicians who will perform routine and unit level maintenance on NASA 516 under the overall direction of Tony L. Trexler, head of the Research Aircraft Support Section. Other maintenance support may be available through agreements with several Air Guard units that fly the F-16. The Air Force will provide intermediate/depot level component repair and maintenance.

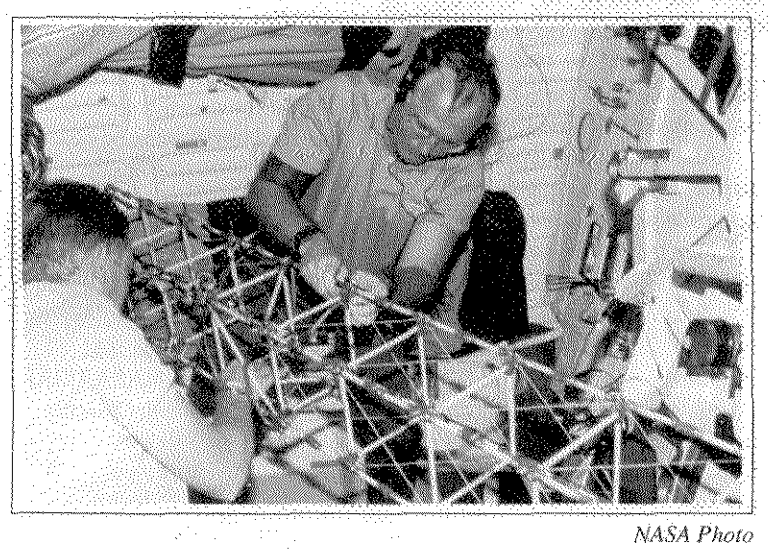
MODE Provides Engineers Tips for Building Spacecraft

By Jean Drummond Clough

Friday the 13th of September was not an unlucky day for the members of the Middeck O-gravity Dynamics Experiment (MODE) team. Quite the contrary!

It was approximately 7:15 p.m. Tension mounted among the MODE investigators gathered in Mission Control at the Johnson Space Center as they anxiously awaited word from Commander John "J.O." Creighton -- word that mission specialists Jim Buchli and Mark Brown, who were given the name of MODEsters, had successfully activated the MODE's experiment support module. The module controlled the motion of the test articles during the flight experiment.

Confirmation came at approximately 11 p.m., and cheers and applause were heard throughout the customer support room.



NASA Photo

Astronauts Mark Brown, left, and Jim Buchli work with the structural test article (STA), a model of the space station truss structure.

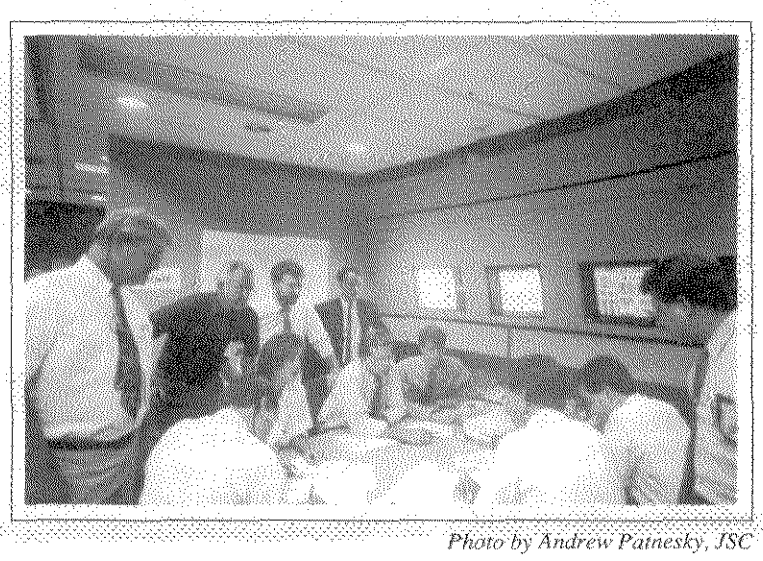


Photo by Andrew Painesky, JSC

Members of the MODE team huddle around TVs to watch Jim Buchli and Mark Brown conduct the MODE experiment. Standing, from left, are Robert W. Buchan and Sherwin Beck, Langley; Dr. Lee D. Peterson, former MIT student; Dr. David W. Miller, MIT; and Dr. Andrew Bicos, McDonnell Douglas. Seated from left are Dr. Martinus van Schoor, Julianne Zimmerman, Roman Hatchkowski, Mark Barlow, Dr. Javier de Luis, Payload Systems Inc., and Professor Edward F. Crawley, MIT.

Fluid Studies

MODE, one of the more complex experiments ever performed in the orbiter's middeck cabin area, studied the sloshing of fluids in partially filled containers and the dynamics of jointed truss structures. The data obtained from this experiment will be of great significance in the design and building of future spacecraft.

On flight days two and four of the Discovery STS-48 mission, the fluid test articles were successfully operated by the MODEsters. During the first two-hour test period, the MODEsters set up the flat bottom Lexan fluid tank containing silicon oil attached to a shaker device mounted in Discovery's middeck. A computer sent precisely controlled forces to the shaker device, then measured the fluid's movement.

Several interesting features were observed. First, the silicon oil remained aligned at one end of the tank; there had been concern that it might not.

Second, the surface shape of the silicon oil was very different from the shape observed on the ground. The surface shape extended far up the sides of the tank. This feature is prevented by gravity on the ground.

Third, the resonant frequency of the silicon oil (the excitation frequency at which the fluid exhibits the largest motion) was higher than predicted. This led to an alteration of the flight plan for the operations on flight day four. This ability to adapt the test plan demonstrates the versatility of the MODE hardware and the Space Shuttle as a 0-g laboratory environment.

The MODEsters later tested three fluid tanks: a hemispherical bottom tank containing silicon oil, a flat bottom tank containing water and a hemispherical bottom tank containing water.

Several interesting features were observed in the fluid slosh testing. While predictions of the behavior of the tanks containing water seem to almost exactly match the observed behavior, the behavior of the silicon oil has been more elusive. Two nonlinear effects were seen in the motion of the fluid. A swirling motion of the water was observed at the predicted frequency of excitation. In addition, a nonlinear jump phenomena was observed where the amplitude of the slosh motion drastically decreased with a slight change in excitation frequency.

From MODE, experiment investigators hope to learn more about the impact of moving liquids, such as fuel, in future spacecraft.

The MODEsters spent the remainder of flight day four and part of flight day five testing different configurations of a truss structure originally proposed for Space Station Freedom. The baseline structural configuration is a nine bay, straight truss consisting of two four-bay deployable segments joined by one bay of erectable truss hardware. Six tests in four different frequency ranges were performed by the MODEsters.

The baseline or straight configuration was tested with a rotary joint similar in concept to the Space Station Freedom alpha joint inserted in place of the erectable truss bay. The alpha joint will allow the solar panels to track the Sun.

The MODEsters then reconfigured the structural test articles into an "L"-shaped structure with the alpha joint still attached. Finally, a very flexible appendage was attached. This appendage, which mimicked a solar panel, was so flexible that gravity prevented ground testing of this configuration. Engineers expect to gather additional knowledge to help develop more sophisticated computer models for accurately predicting the performance of future large space structures.

All information available to the MODE team indicates that the hardware performed well and that the experiment was performed as planned but ahead of schedule, thereby allowing for the performance of additional tests. Therefore, the MODE dynamic test facility obtained 120 percent of planned scientific data on two radically different types of dynamic systems: fluids and structures. About 300 million measurements were obtained in the 20 hours of on-orbit testing.

Team Members

The MODE team consists of the Massachusetts Institute of Technology, Cambridge, Mass.; Payload Systems Inc., Cambridge; McDonnell Douglas Space Systems Co., Huntington Beach, Calif.; and NASA. MODE was the first university experiment to fly in NASA's Office of Aeronautics and Space Technology outreach program, called In-Space Technology Experiment Program. Langley managed the MODE contract with Sherwin M. Beck as project manager and Robert W. Buchan as experiment manager.

Visitor Center Closing After Two Decades

By Christine Heitoff

After more than 20 years of service, the NASA Langley Visitor Center will permanently close on Thursday, October 31. With support from NASA Langley, the city of Hampton, the state of Virginia and the citizens of Hampton Roads, the Visitor Center will become part of the new Virginia Air and Space Center and Hampton Roads History Center.

The NASA Langley Visitor Center opened in 1971, inviting visitors to view exhibits and take part in programs reflecting the research at NASA and Langley Research Center. About three million people from around the world have visited the center in the last 20 years. As public interest grew, the center expanded several times and has outgrown its present facility.

In a cooperative effort, the Virginia Air and Space Center and Hampton Roads History Center will showcase NASA artifacts and exhibits, provide a 300-seat IMAX theater, house a new NASA Teacher Resource Center and create an expanded aerospace education program for students and adults. The new center is planned to open April 5.

A transition center in the Hampton Visitor Center, 710 Settlers Landing Road, Hampton, will open Friday, November 1.

Open Sunday through Saturday, 9 a.m. to 5 p.m., the transition center will display NASA exhibits, sell aerospace gifts and include information on NASA and the new Virginia Air and Space Center and Hampton Roads History Center.

To mark its closing, the Visitor Center will hold a "Blast-Off Saturday" celebration from 8:30 a.m. to 4:30 p.m. October 26.

A highlight will be NASA researchers stationed in the Visitor Center to talk with visitors about Langley's latest projects.

Other organizations taking part will be the local chapter of the National Space Society; American Institute of Aeronautics and Astronautics, Hampton Roads Section; Langley Conservation Club; and Virginia Air and Space Center and Hampton Roads History Center.

16-Foot Tunnel will Celebrate 50th Anniversary with November 14 Reception, Tours

Langley's 16-Foot Tunnel will celebrate its 50th continuous year of operation with a reception at the H.J.E. Reid Conference Center on Thursday, November 14, from 2 to 3 p.m.

Tours of the tunnel will be conducted starting at 3 p.m. and can be arranged by calling 864-3001 or writing to Mail Stop 280. November 13 is the deadline for scheduling a tour.

The anniversary celebration will be a gathering of those who worked at the tunnel. Langley employees, contractors, and alumni are invited to attend.

The 16-Foot High-Speed Tunnel became operational November 13, 1941. The tunnel permitted a maximum Mach number of 0.71 and was powered by two 8,000-horsepower electric motors.

It was used primarily for aircraft engine cooling and cowling tests, and to investigate aerodynamic characteristics of full-scale propellers.

The tunnel went transonic on December 6, 1950. The 16-Foot Transonic Tunnel has a maximum Mach number of 1.1 and a 60,000-horsepower drive system. Work pertained to the extension of propeller aerodynamic data to supersonic speeds and to extensive study of jet effects on aircraft performance.

The tunnel's air-removal system became operational March 9, 1961, allowing an increase in the Mach number to 1.3, with the addition of a 36,000-horsepower compressor capable of removing about 4.5 percent of the tunnel mass flow through the test section wall slots.

"Almost every military aircraft that's flying has been through here," said Bob Berrier, head of the Propulsion Aerodynamics Branch. Models tested at the tunnel include the Bell X-1; F-15; F-14; F-111; F-18; A-6; B-1; C-5, and Boeing 737.

"The Apollo was tested here, the Shuttle," he added. "The Saturn booster was tested here."

Happenings

LAA HALLOWEEN SOCIAL will be held Friday, October 18, from 4 to 8 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road. Music is by "Foxfire" and cover charge is $1.

MAMMOGRAMS will be offered on-site October 22, 23, 29 and 30, 7:30 a.m. to 5 p.m., by Riverside Mammography Services. The van will be next to the Health Clinic, Building 1149. Cost is $45. NASA employees, retirees, contractors and family members are eligible. Call 864-3191 for an appointment.

NASA BASKETBALL ASSOCIATION will hold an organizational meeting for the 1992 season Tuesday, October 22, at 4:30 p.m. in the H.J.E. Reid Conference Center. Team managers and players should attend. Call Tom Brinkley at ext. 42507 for more information.

NOON-TIME STRIDERS. Join the walking club Tuesdays and Thursdays at noon in front of the H.J.E. Reid Conference Center for a 30-minute walk.

NASA TOASTMASTERS meet the second and fourth Wednesdays of the month in the H.J.E. Reid Conference Center. The next meeting is Wednesday, October 23, 11:30 a.m. to 1 p.m.

LOW-IMPACT AEROBICS are offered Tuesdays and Thursdays, 5 to 6 p.m., in the LAA gym. First class free. Bench step classes are Saturdays, 9:30 to 10:30 a.m. Cost is $6 per month. For more information call ext. 42295.

DISABLED PERSONS SATELLITE COMMITTEE meets the second Thursday of the month, 8:15 to 9:30 a.m., in the cafeteria, 16 West Taylor Road. The next meeting is November 14. The public is invited.

FOR SALE: 1978 Ford Fairmont wagon, 6-cylinder, AC, power steering, automatic, good condition, $900. Call 826-5971.

FREE FIREWOOD. Call 826-5971 after 5 p.m.

FOR SALE: Mid-sized Buck stove fireplace insert with thermostatically controlled fan. Cost $700 new. Asking $350 or best offer. Call 898-3768.

FOR SALE: 1988 Mazda RX7, 5-speed, power sunroof, alarm, smoke/burgundy color, $9,500. Call Tim at 898-5808.

LOST: Video camera, RCA model CKC021, from Building 1298. Call Susan Quisumbing at ext. 44004.

Intercenter Races

Final races of the Fall NASA Intercenter are the two-mile race October 21 and the 10-kilometer race October 24. Both races start at 5 p.m. on Doolittle Road.

All NASA employees, retirees, on-site contractors, and co-ops at work earn points for Langley by participating.

Langley finished fifth in both Spring Intercenter Races and needs more participation to improve.

For more information about the races or the Langley Runners Club, call Richard Shearer at ext. 47036.

In Appreciation:

The family of Bryan Bullock has expressed deep appreciation for the support and compassion shown by Langley personnel.

Bryan Matthew Bullock, 15, son of R.L. and Kathy Bullock of Chesapeake, died September 18. Bryan collapsed September 17 in the locker room at Great Bridge High School. An undiagnosed congenital heart condition is thought to be the cause.

Bryan, a sophomore, was a lettered athlete, honor roll student, and member of the First Baptist Church of Norfolk. Survivors include three brothers, Brad, Brady and Brent.

Langley Praised on Desert Storm

Langley and 16 employees have received a letter of commendation for support of Operation Desert Storm with the development of a thermal infrared beacon for identification of friendly ground vehicles.

The commendation is from Richard M. Childress, director of the Advanced Systems Concepts Office, U.S. Army Laboratory Command, Fort Meade, Md.

Members of the NASA/USAF team that developed the beacon are:

Antony Jalink, project management, team leader for concepts and design; Samuel Sokol, assistant project management, team leader for electrical design; Capt. James A. Hubert, systems requirements and design, military coordinator; Maj. John S. Jensen, AF tactical operations and requirements; Dave E. Williams, team leader for mechanical concepts and design; Robert L. Fox, electronic engineering and fabrication; Walter L. Wade, mechanical engineering and fabrication; Norman Barnes, radiometric concepts and design; Vincent B. Cruz, electronic fabrication of power supply; Jeffrey S. Brady, mechanical fabrication of rotation drive assembly; David T. Fahringer, optical/mechanical fabrication; Leonard S. Mayo, electro-optical assembly; Don M. Robinson, optical design of reflector; Charles T. Solomon, optical fabrication of reflector and window; and Tommy C. Steele and Michael D. Vanek, spectrographic testing of filter materials.

Job Openings:

91-67: Supervisory Aerospace Engineer, AST, Structural Dynamics, GM-0861-14 or 15, Unsteady Aerodynamics Branch, Structural Dynamics Division, Structures Directorate. NASA-wide, status and non-status consideration. Closes October 21.

91-70: Supervisory Aerospace Engineer, AST, Fluid & Flight Mechanics Program Management, GM-861-14 or 15, Laminar Flow Control Project Office, Flight Applications Division, Aeronautics Directorate. Open to Langley Research Center permanent civil servants. Closes October 21.

91-71: Supervisory Aerospace Engineer, AST, Aerospace Flight Systems, GM-861-14, Aircraft Operations Branch, Flight Applications Division, Aeronautics Directorate. Open to Langley Research Center permanent civil servants.

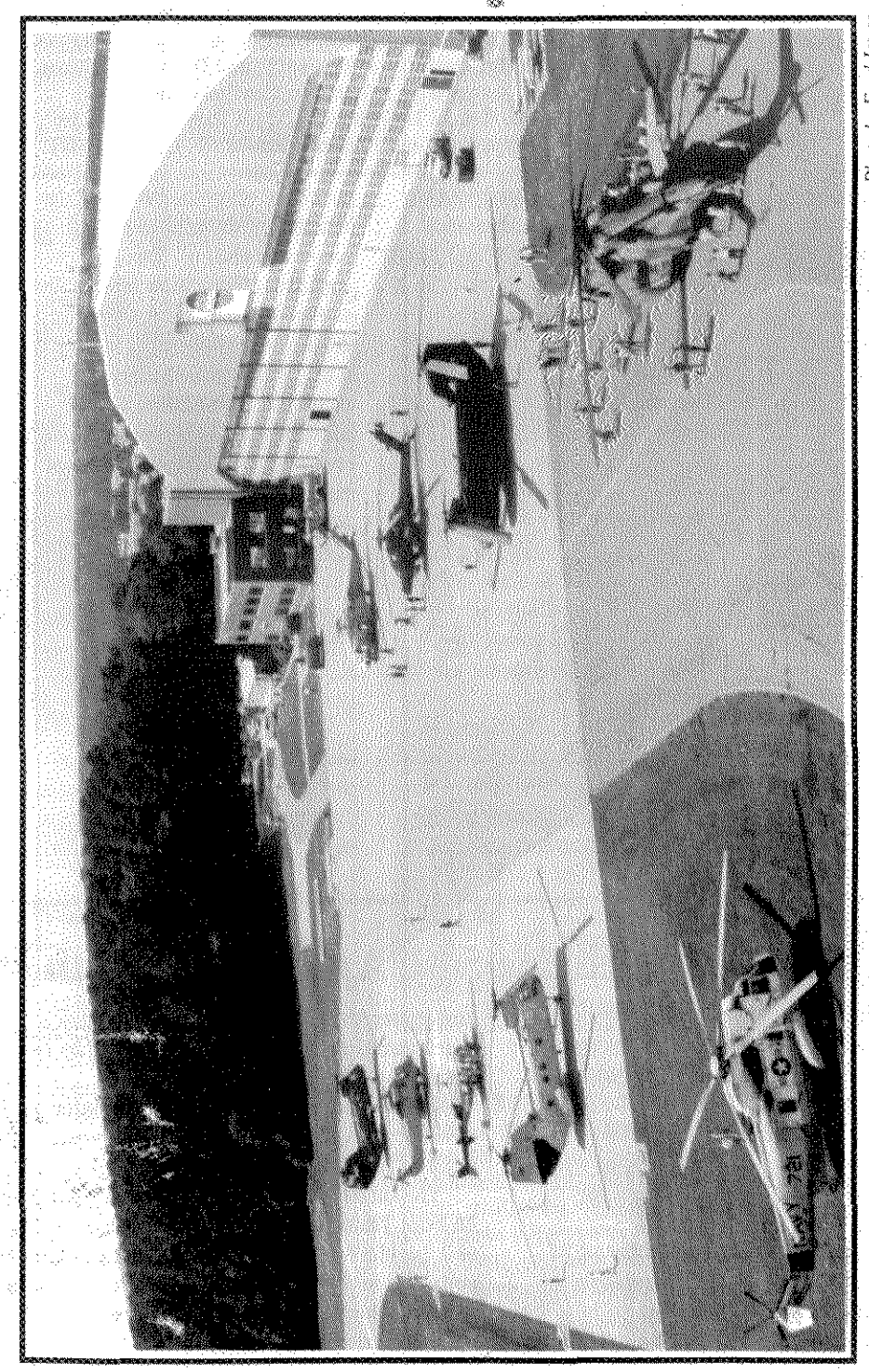


Photo by Fred Jones

HELICOPTERS from all over were on display October 9 at the Center. About 20 helicopters took part in a static display at the Flight Research Hangar as a result of a joint meeting of the American Helicopter Society, the Army Aviation Association of America, and the Naval Helicopters Association. It was hosted by the Army's Aerostructures Directorate and Langley, and featured tours, a deli lunch, and a presentation by Robert J. Huston, special assistant in the Structures Directorate. The biggest helicopter was a three-rotor Navy MH-53E minesweeper. The smallest was a two-seater from Phillips Aviation, a Robinson R-22. "It went super," John Cline, Army's technology transfer officer at Langley, said of the display.

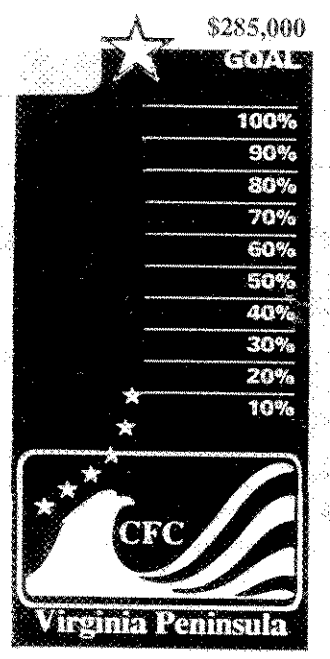
National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

402 ON-SITE NON-LARC
COPPEDGE, AUDREY S.
MAIL STOP 146

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

News Researcher



NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 22 November 1, 1991

News Researcher

Bi-weekly Employee and Contractor Publication

Holloway Taking the Reins as Sixth Director of Langley Research Center

Paul F. Holloway has been named director of Langley Research Center in Hampton, Va., by NASA Administrator Richard H. Truly.

Holloway, deputy director since 1985, will replace Richard H. Petersen, who was appointed associate administrator for the Office of Aeronautics and Space Technology at NASA Headquarters in Washington, D.C., on October 3.

In making the announcement October 15, Truly said, "We in NASA are very fortunate to have leaders with the professional reputation and experience of Paul Holloway to fill our most senior positions. The Langley Research Center, as NASA's longest-standing field organization, vividly represents the research and exploration heritage of the entire agency, and Paul Holloway is the ideal person to be at its helm."

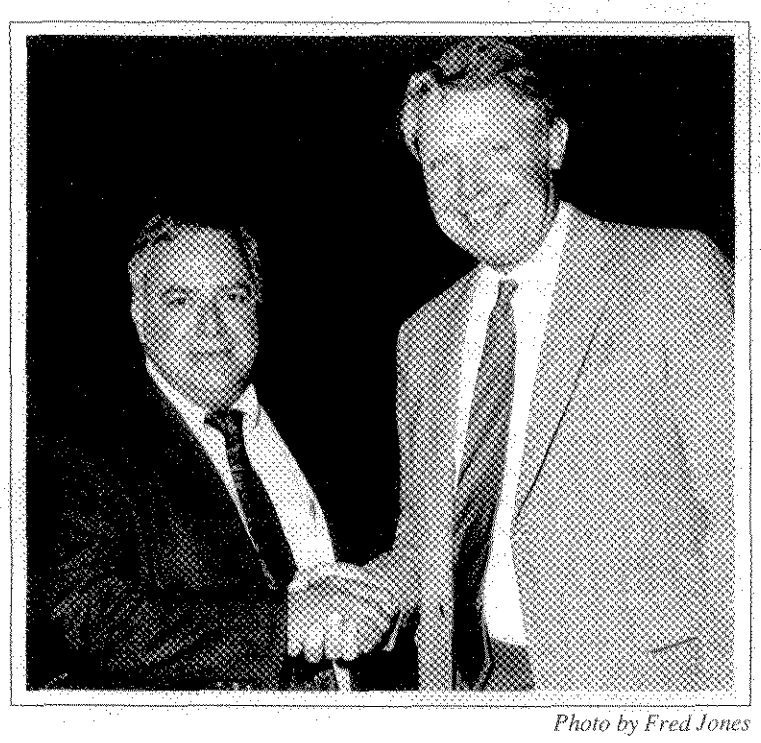


Photo by Fred Jones

Richard H. Petersen congratulates his successor, Paul F. Holloway.

The following is a transcript of the remarks of Paul F. Holloway following his introduction as Center director by Richard H. Petersen. Holloway addressed an all-hands meeting at the H.J.E. Reid Conference Center on October 15.

I'll be brief because right now Pete is still director, and he wants to get back to work, and we have a staff meeting at eleven.

I agree with everything he said. I certainly think this is the best job within NASA. I can tell you, it's frightening to have responsibility for an organization such as this, which I think is the most important aerospace research center in the world.

It's also, though, very comforting, because I can't think of anything that we could be asked to do that **you** can't do. The people that make up Langley -- the engineers, the technicians, the administrative and clerical staff, the contractors -- can pull together to do almost anything, and we sure have proven that in the past. I think we will again in the future.

I'll say one thing Pete said about his new job: If he accomplishes just a fraction of what he wants to accomplish, Langley Research Center is going to be a whole lot nicer place to work in the future -- less Headquarters interference with what we want to do. Thank you for coming, and I appreciate it.

Praises employees

Holloway, in remarks to Langley employees, called his new assignment "the best job within NASA" and praised Center personnel, saying "I can't think of anything that we could be asked to do that you can't do."

Holloway joined the Langley staff in June 1960 as an aerospace research engineer. He was appointed head of the Systems Analysis Section, Aero-Physics Division, in 1969. He was named head of the Aerospace Operations Analysis Branch, Space Systems Division, in 1971.

He was chief, Space Systems Division, from 1972 until he became director for Space in May, 1975. He was on special assignment as acting deputy associate administrator, Office of Aeronautics and Space Technology at Headquarters, for five months in 1977.

He was appointed deputy director at Langley in February, 1985. As Center deputy director he was responsible for directing research and technology programs and for institutional management of all facilities and equipment.

Holloway's research work has been in hypersonic aerodynamics, boundary layer transition and flow separation, analysis of entry flight mechanics, and Earth orbital and planetary space missions.

He has written 40 technical publications in his fields of expertise. His early work in hypersonic aerothermodynamics, flight mechanics and mission analysis led to his 1969 appointment to the Space Shuttle Task Group.

He was later a consultant to the Shuttle Launch Site Review Board and a member of the STS Technology Steering Committee, STS Payload Activities Committee and the R&T Advisory Panel for Space Vehicles. He chaired the Shuttle Environmental Impact Panel on Sonic Boom and was administratively responsible for the Launch Vehicle Effluents Panel.

Holloway is a fellow of the American Institute of Aeronautics and Astronautics and the American Astronautical Society. He is also a member of the International Academy of Astronautics. He was selected for the Senior Executive Service Distinguished Presidential Rank Award in 1987 and received the Presidential Rank of Meritorious Service in 1981 for his sustained accomplishments in federal service.

He received a NASA Outstanding Leadership Medal in 1980 and a NASA Exceptional Service Medal in 1981. The Poquoson native earned a bachelor of science degree in aeronautical engineering from Virginia Polytechnic Institute in 1960 and did graduate study in physics at The College of William and Mary. He attended the Advanced Management Program at Harvard Business School in 1988.

Expanded Gift Store to Open in Cafeteria

Flowers, Film Drop-off, Tickets to be Offered

An expanded gift shop offering everything from discounted movie tickets to fresh flowers and film drop-off will open in the cafeteria early next year, replacing the Souvenir Counter at the now-closed Visitor Center.

Construction of the glass-walled, 400-square-foot NASA Langley Exchange Shop is expected to begin soon and should be finished by February 1, said General Manager Lisa Ryan.

With the closing of the Visitor Center, Ryan said, the emphasis at the new shop will shift away from tourist souvenirs and focus more on goods and services for Center employees.

"Basically, we're trying to get away from souvenirs in general and into what you need as an employee," she said. "My goal is to get that person who has been here for 25 years and has never bought anything from the Souvenir Counter."

The Exchange Shop will offer fresh flowers, FTD service, 24-hour film drop-off and possibly express package service. Discounted tickets will be sold to AMC Theatres, Tidewater Dinner Theatre, Colonial Williamsburg, Kings Dominion and Busch Gardens.

Other items expected to be available include clothing, coffee mugs, stationery, cards, stamps and tickets. The shop also will offer a higher-quality line of small gifts, Ryan said, and possibly snack items and pharmaceuticals such as aspirin.

A separate outside entrance will allow Center personnel to visit the Exchange Shop even after the cafeteria has closed for the day. The shop will be open from 7:30 a.m. to 5 p.m.

Gifts have been sold at a table in the cafeteria in addition to at the Visitor Center. With the Visitor Center closing, however, that area will be expanded starting November 1 and will continue selling gifts until the Exchange Shop is opened.

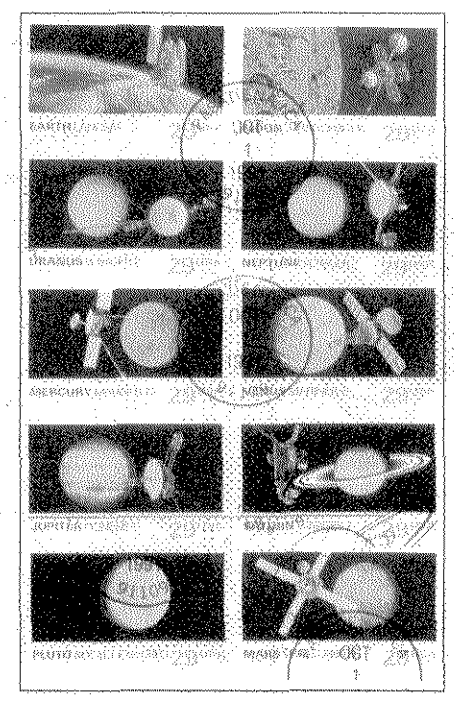
Gifts may also be bought through mail-order brochures available at the cafeteria or by calling ext. 41585.

The NASA Langley Exchange Shop will be run by the NASA Langley Exchange Council, which also operates the Center's vending machines, day-care program, cafeteria and Langley Activities Association. Profits are used to subsidize employee morale and welfare.

Space Stamps: Nov. 22 Ceremony will be Held for Second Day of Issue

A Second Day of Issue ceremony for the Space Exploration Commemorative Stamps issued October 1 will be held Friday, November 22.

The ceremony, sponsored by the Langley Alumni Association, will be held at 2:30 p.m. at the H. J. E. Reid Conference Center, 11 Ames Road. All employees, contractors and retirees are invited. Two Langley projects -- Lunar Orbiter and Viking -- are featured on two of the 10 Space Stamps dedicated at the First Day of Issue ceremony at the Jet Propulsion Laboratory in October. Israel Taback represented Langley at that event. Taback, chief engineer for The Bionetics Corp., was chief engineer on the Viking and Lunar Orbiter projects.



The Lunar Orbiter and Viking are featured on two of the 10 Space Stamps.

The 29-cent stamps depict unmanned spacecraft traveling to the Earth's moon and the nine planets that orbit the Sun, except for Pluto, which has not been explored. Mariner, Landsat, Pioneer and Voyager are depicted on the other stamps. The stamps were designed by Ron Miller of Fredericksburg.

At the Langley ceremony, a representative of the U.S. Postal Service will present a replica of the 10 stamps to the Center. A cachet (souvenir envelope) and stamps will be sold in Reid Center lobby. The post office will hand-cancel the cachet with a special second-day cancellation. Time should be charged to A-1980.

News Briefs

Search for Extraterrestrial Life --- Five hundred years after Columbus' discovery of America, NASA will begin the most comprehensive search ever conducted for evidence of intelligent life elsewhere in the universe. The NASA Search for Extraterrestrial Intelligence (SETI) microwave observing project is a ground-based, decade-long effort to detect microwave radio transmissions broadcast toward Earth. The project will use a targeted search and a sky survey. The targeted search will use the largest available radio telescopes around the world and search a frequency range of 1,000 to 3,000 megahertz for patterns indicating an artificially generated signal. The sky survey will use the 34-meter antennas at NASA's Deep Space Network sites to scan the sky in the 1,000 to 12,000 megahertz range. The search will start October 12, 1992.

Antarctic Ozone Depletion Reported --- Data from NASA's Total Ozone Mapping Spectrometer (TOMS) suggest that 1991 will be the third consecutive year that severe ozone depletion has developed over the Antarctic. Goddard Space Flight Center scientists report that ozone amounts declined steadily from August, when minimum polar values were near 200 Dobson units through October 1, when values of 127 were reached. This is the 13th year the ozone hole has been monitored by TOMS on the Nimbus-7 spacecraft.

Feeble Star Found --- One of the most feeble stars known to date has been identified in a collaboration between U.S. and United Kingdom astronomers, according to the Royal Astronomical Society. The star, BRI0021-0214, is 10,000 times dimmer than the Sun, has a surface temperature of only 2,250 degrees Kelvin and is 30 light years away in the Constellation Pisces. The discovery was made by Dr. Mike Irwin, Royal Greenwich Observatory; Dr. Richard McMahon, Institute of Astronomy at the University of Cambridge; and Dr. Neill Reid, California Institute of Technology.

Headquarters Personnel Changes --- Air Force Brigadier Gen. Elmer T. Brooks has been named deputy associate administrator (agency programs), Office of Management Systems and Facilities. He had been deputy associate administrator for the Office of Management. Michael D. Christensen has been named deputy associate administrator (operations), Office of Management Systems and Facilities. He had been deputy assistant administrator, Headquarters Operations. Jay H. Green has been named deputy associate administrator, Office of Exploration. He currently is deputy manager, Space Shuttle Program.

Editor's note: To obtain a copy of any of these NASA Headquarters News Releases contact Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request information summarized above by headline printed in bold.

Langley Researchers Win Awards for Technical Papers

Two Langley researchers -- Dr. Charles E. Knox and Robert B. Lee III -- have received awards for technical papers.

Knox, of the Vehicle Operations Research Branch, Flight Management Division, won an Arch T. Colwell Merit Award for his technical paper titled "Flight Tests Using Data Link for Air Traffic Control and Weather Information Exchange". The award, from SAE International, was presented at a banquet in September.

Lee, of the Radiation Sciences Branch, Atmospheric Sciences Division, received the first Best Technical Paper Award at the 63rd Annual Conference of the National Technical Association, in Dallas in August.

His paper, based on Earth Radiation Budget Experiment satellite data, was titled "Implications of Solar Irradiance Variability Upon Long-Term Changes in the Earth's Atmospheric Temperatures".

Instrument Loan Pool Catalog Revamped

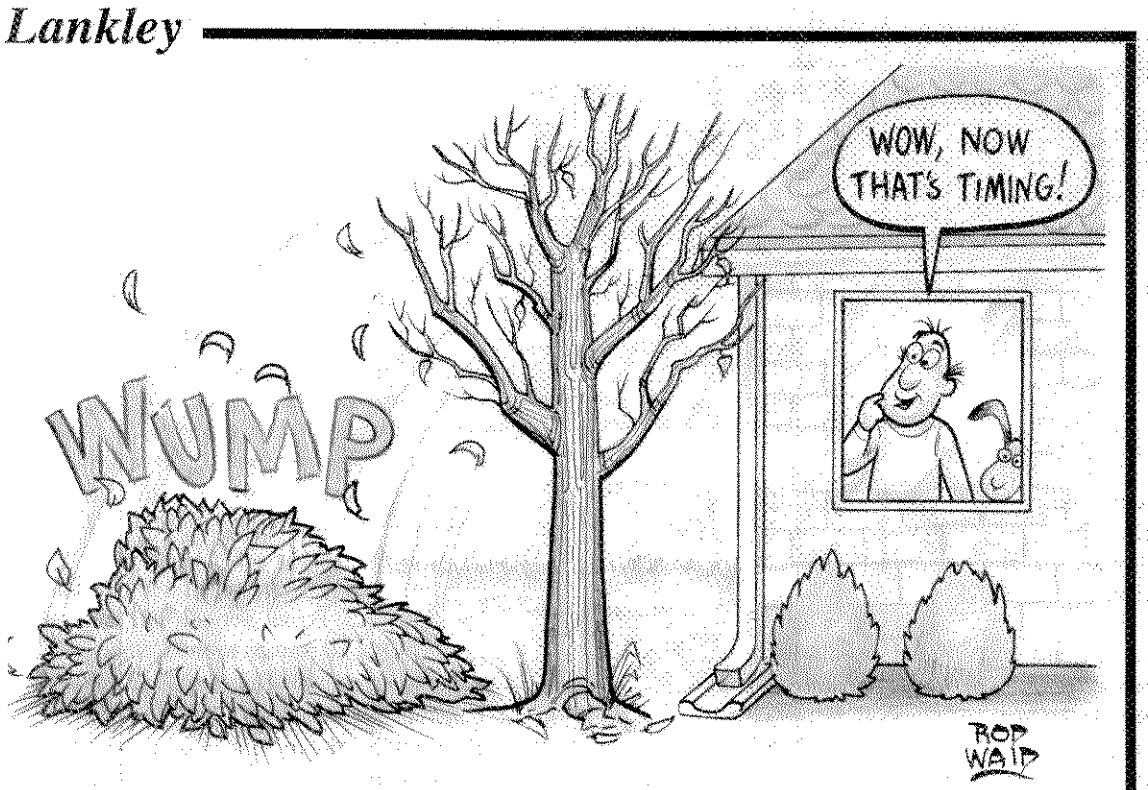
The 1991 edition of the Instrument Loan Pool Catalog has been revamped to include pictures and specifications of instruments and transducers available for loan. Distribution is in loose-leaf form and should be installed in the original binders as an entire replacement for all previous editions.

Langley Key Personnel Changes

The following personnel changes have been made:

Michael Glenn, head, Employee Development Branch, GM-235-14; **Janice Johnson,** secretary (steno), GS-318-6; **Karen Scholes,** employee relations specialist, GS-230-11; **Alan Phillips,** head, Facility Assurance Section, GM-801-13; **Mary Skora,** education and information specialist, GS-1701-11; **Carl Gray,** head, Structural Design Branch, GM-801-14; **Brenda Graham,** secretary (steno), GS-318-7; **Kenneth Young,** lead engineering technician, GS-802-10; **Troy Middleton,** aerospace engineer, GS-861-13; **John W. Paulson Jr.,** assistant head, Experimental Hypersonics Branch, GM-861-14; **Robert J. Pegg,** assistant manager, Conceptual Studies Office, GM-861-14; **Michael J. Walsh,** assistant head, Experimental Flow Physics Branch, GM-861-14.

Lankley



Editorials

In Memoriam:

Barden: Sympathy is extended to the family of William I. "Bill" Barden Jr., who died September 12. A Lockheed employee, he was the aircraft instrumentation engineer on the F-106 flight research aircraft.

Barden began support NASA Langley programs in 1967 as a LTV employee.

He made major contributions to many aircraft research programs, including B-57 Atmospheric Turbulence, F-106 Severe Storms and F-106 Vortex Flap.

Dan Hawley, his Lockheed supervisor, and Vernie Knight, head of the Flight Instrumentation Branch, said Barden was an outstanding and highly creative engineer.

"Bill Will be sadly missed by his friends, management and co-workers," Knight said.

Revere: Sympathy is extended to the family of Robert M. Revere, who died October 1.

Revere was a mechanical engineer, retiring in 1978 after 35 years of service. He served in the Merchant Marines and the Navy during World War II.

Selby: Sympathy is extended to the family of James H. Selby Jr., who died August 22. Selby worked in transportation at NACA before entering the Air Force during World War II. He retired from NASA in July, 1976, after 35 years of service.

Thank you:

John D. Buckley writes: I want to thank the Apprentice Class of 1991 for presenting me with the first Apprentices' Choice Award. It is a great honor. I'm really proud of the class. Your GPR's suggest that you took to heart some of the thoughts shared in class in addition to academics. Remember: "A brain is a terrible thing to waste" and "Be all you can be". These bits of wisdom are not original but are still worth repeating again and again.

Charles N. Valdade writes: To all my friends and colleagues at NASA Langley, thank you for making my retirement day very special and my career very rewarding. Thanks to Center management for encouragement and support in providing NASA Langley with a nationally recognized flight simulation laboratory.

Calendars are Available from Stockroom

Requests for the 1992 calendars can now be submitted to the Stockroom, Mail Stop 382, on NASA Langley Form 55. Stock numbers for the calendars are as follows:

- Calendar pad, flipover, 3 x 3-5/8: 7510-01-226-2952
- Calendar pad, executive flipover, 3-/58 x 5-7/8: 7510-01-225-9217
- Wall calendar, displays three months at a time, 11-5/8 x 8-7/8: 7510-01-241-0545
- Loose-leaf appointment book refill, daily and monthly calendar sheets, 6-1/2 x 5-1/2: 7530-01-229-1112
- Weekly appointment book, features two pages per week, columns for appointments and reminders are marked off in 15-minute intervals, 8-1/2 x 11: 7530-01-233-2435
- Desk blotter, monthly sheets ruled and squared for each day, 17 x 22: 7510-01-241-0550

Voluntary Leave Program Approvals

The following individuals have been approved for the Voluntary Leave Transfer Program:

Manjula Y. Ambur, Linda E. Edmundson, Gael M. Hawkins, Cassandra D. Stevens, Noel A. Talcott Jr., Catherine B. Worth.

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who have personal or family medical emergencies.

If you wish to donate annual leave to these recipients or want more information about the program, call Linda Park, Employee Relations Office, ext 42610.

Joshi reelected to IEEE board

Dr. Suresh M. Joshi, a senior research scientist in the Spacecraft Controls Branch, Guidance and Controls Division, was reelected to the board of governors of the Institute of Electrical and Electronics Engineers (IEEE) Control Systems Society.

His second three-year term starts January 1.

The board of governors provides technical leadership and makes major policy decisions. It is also responsible for appointments.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

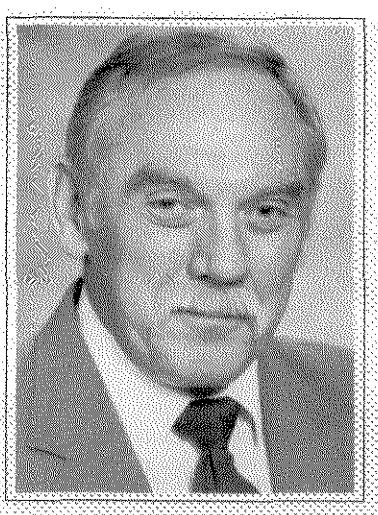
Editor ..... Michael Finneran

Photojournalist ..... Carol Petrachenko

Photographer ..... Fred Jones

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Edwards Named NASP Interagency Director



Clyde L.W. Edwards, manager of National Aero-Space Plane aerodynamics, has been named to a senior executive service position as director for interagency programs for the NASP Joint Program Office.

Administratively he will remain assigned to the Aeronautics Directorate at Langley, but will be located at Wright-Patterson Air Force Base

In his new position, Edwards will formulate and establish mission requirements and objectives to meet the national goals proposed for the NASP, including specific technology in structural concepts, aerodynamics, flight systems, subsystems, materials, and propulsion for the X-30 Aero-Space Plane.

Edwards began his NASA career at Langley in 1955 as an engineering aide. He became a research engineer in the High Temperature Fluid Mechanics Section in 1963.

From 1980 to 1983, he was chief engineer of the Transonic Aerodynamics Division, where he was responsible for the concept and development of new facilities, apparatus, instrumentation and methods, as well as the modernization and improvement of equipment and methods to keep the division in the forefront of transonic research.

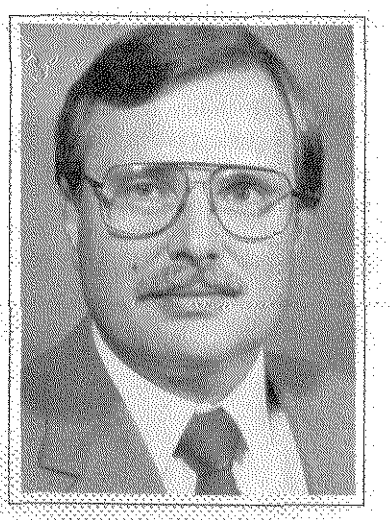
He was the technical assistant to the director for aeronautics from 1983 to 1984; head of the Experimental Branch of the Space Systems Division from 1985 to 1987; assistant chief of the High Speed Aerodynamics Division from 1987 to 1989; and assistant chief of the Applied Aerodynamics Division from 1987 to 1989.

Edwards has been manager of NASP Aerodynamics at Langley since 1986, a position he held in addition to his regular duties as a branch head and assistant division chief until November, 1989, when it became a full-time position. In addition to Langley's aerodynamics technology support for NASP, his responsibilities also included leadership of the NASP Aerodynamics Technology Maturation Program and the Aerodynamics Technical Evaluation Team for the NASP Joint Program Office, and vertical cut manager for Langley's Generic Hypersonics Program.

He has authored or co-authored 25 technical papers and received six certificates of outstanding performance; five group achievement awards; two National Aero-Space Plane (NASP) awards; a special achievement award; a Langley special service award; and the 1984 H.J.E. Reid award for co-author of the best directorate paper.

He is an associate fellow of the American Institute for Aeronautics and Astronautics. He received a bachelor of science degree in mathematics from Old Dominion University.

Lewis' Groeneweg Acts as Assistant Chief, Acoustics



Dr. John F. Groeneweg has been named to temporarily replace Dr. James C. Yu as assistant chief of the Acoustics Division and manager of the Rotocraft Program.

Groeneweg comes to the Structures Directorate from Lewis Research Center, where he manages the Propeller and Acoustics Technology Branch.

His assignment at Langley runs from September 1 to May 31. Meanwhile, Yu is participating in the Stanford Sloan Program from September 3 to June 14.

The purpose of the assignment is to provide Groeneweg with experience and expertise in division-level management and Langley coordination; inter-center coordination experience in acoustics and noise reduction; and inter-center and inter-agency coordination experience in rotorcraft research and technology. "It's a chance to strengthen the already good cooperation we have between the acoustics groups at Lewis and here at Langley," Groeneweg said.

Groeneweg, in his 26 years at Lewis, has conducted research on rocket combustion instability, and on aircraft propulsion noise reduction, including acoustic treatment, turbomachinery noise, and advanced propeller aeroacoustics.

He has contributed to the aeroacoustics content of the Quiet Engine; JT8D Refan; Quiet, Clean; Short-Haul Experimental Engine; Energy Efficient Engine; and the Advanced Turboprop Project.

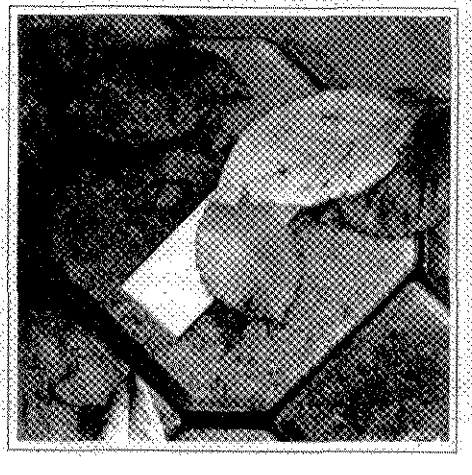
At Lewis he was responsible for ducted and unducted rotor aerodynamics and acoustics, and propulsion noise reduction for high-speed civil transports.

Groeneweg has his doctorate in mechanical engineering from the University of Wisconsin.

Pavers Make Good Gifts for Friends, Relatives, Employees

For that hard-to-buy-for person at Christmas, here's an idea: a brick with his name on it.

A $50 tax-deductible contribution will buy an engraved paving stone that will be placed in the main courtyard of the new Virginia Air and Space Center and Hampton Roads History Center.

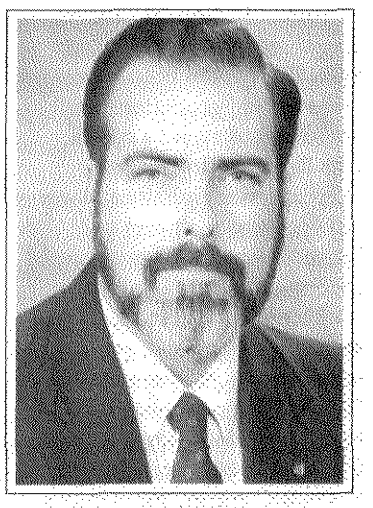


The center is pitching the pavers as great gifts for birthdays, retirements, weddings, anniversaries and as memorials. Local businesses are buying pavers for sales awards, retirements and other forms of employee recognition. The pavers can be personalized with a single name or several. Individuals buying more than one paver can group them together or request placement in one of the following groups: NACA/NASA, Association of the U.S. Army, Air Force Association, American Institute of Aeronautics and Astronautics, Hampton Lions Club, Exchange Club, Hampton Yacht Club.

About 2,500 pavers have been sold. Orders must be placed in time to have the pavers in the courtyard when the center opens April 5.

The deadline for ordering is December 31. Orders are being taken at the center and at the gazebo at the carousel in old downtown Hampton. Individuals outside Hampton Roads may call 1-800 457-0402. Locally, call 727-0800.

Malone is Appointed Chief of Structural Mechanics



Dr. John B. Malone, former head of the Unsteady Aerodynamics Branch, has been named chief of the Structural Mechanics Division pending Office of Personnel Management approval.

His appointment fills a position that had been vacant since January.

"I look upon this as an opportunity to work with expert researchers in a number of vital research technologies which are important to the U.S. aerospace industry," Malone said of his new position.

In the position, Malone is responsible for directing the development and validation of innovative metallic and composite structural concepts, advanced computational mechanics and fluid dynamics, thermal and failure analysis methodologies, and new structural design procedures that will increase the performance, efficiency and durability of modern aerospace vehicles.

He coordinates activities that range from basic theoretical and experimental research through specific projects leading to aircraft and spacecraft flight experiments, and which include focused programs for subsonic, supersonic, and hypersonic aircraft and large space structures.

Malone has 17 years of industrial and government experience, including six years of management and supervisory responsibilities. His academic and industrial experience includes theoretical, computational and experimental research.

His began his career at NASA Langley in 1989 as head of the Unsteady Aerodynamics Branch, coming from Bell Helicopter, where from 1988 to 1989 he was chief, computational methods and staff engineer to the director of research and technology.

From 1988 to 1987 he was acting manager, Advanced Flight Sciences Department, at Lockheed-Georgia. From 1985 to 1987 he was group leader, experimental aerodynamics, for Lockheed-Georgia. From 1979 to 1985 he was a scientist in the Computational Fluid Dynamics Group at Lockheed-Georgia.

Malone was an aeroelasticity methods senior engineer, Structural Mechanics Section, for Grumman Aerospace from 1974 to 1979. From 1962 to 1966, he was a ground radio repairman in the Marine Corps.

Malone has three degrees from the Georgia Institute of Technology: a bachelor of aerospace engineering, a master of science in aerospace engineering, and a doctorate in aerospace engineering. He has been an associate editor of the AIAA Journal since 1989.

Virginia Space Grant Consortium Announces Fellowship Competition

Students pursuing studies in fields related to aerospace may qualify for scholarships and fellowships offered by the Virginia Space Grant Consortium.

Scholarship and fellowship applications must be received by December 6, 1991. An application packet may be obtained from the consortium at 2713-D Magruder Blvd., Hampton, Va. 23666. The phone number is 865-0726.

A minimum of $100,000 is awarded annually to students in aerospace-related disciplines at Virginia's Space Grant colleges, which are The College of William and Mary, Hampton University, Old Dominion University, University of Virginia and Virginia Polytechnic Institute and State University. Funding has been provided by NASA and Virginia's Center for Innovative Technology.

Undergraduates may receive up to $8,500 to support research during the academic year or the summer. Any undergraduate major that includes course work related to aerospace is eligible. Students must have completed their second year of undergraduate study.

Graduate fellowships are $5,000 add-on awards to basic graduate research support.

Graduate students must be pursuing a degree in a aerospace-related field such as science or engineering. Fellowship awards are made annual and are renewable up to a total of three years.

Achievement Awards

The following employees have been honored with cash awards for superior achievement:

Staten R. Spruill, contract specialist in the Services Contracts Branch, has been recognized for "diligent efforts to negotiate and award a contract with Rockwell International Corporation for missions, systems and operations analyses of NASA Space Station Freedom advanced concepts."

Monica G. Schrum, contract specialist in the Services Contracts Branch, has been rewarded "in recognition of diligent efforts to negotiate and award a contract with McDonnell Douglas Space Systems Company for missions, systems and operations analyses of NASA Space Station Freedom advanced concepts."

Sharon A. Harper, contract specialist in the Services Contracts Branch, has been cited "in recognition of diligent efforts to negotiate and award contracts with Boeing Aerospace Operations, Inc., and TRW, Inc., for missions, systems and operations analyses of NASA Space Station Freedom advanced concepts."

Linda Tenney, contract specialist in the Services Contracts Branch, has been recognized "for diligent efforts to negotiate and award a contract with General Dynamics Corporation for missions, systems and operations analyses of NASA Space Station Freedom advanced concepts."

Earl Arrowood, contract specialist in the Services Contracts Branch, has been rewarded for "diligent efforts in the preselection activities and award of a contract to Lockheed for the missions, systems and operations analyses of NASA Space Station Freedom advanced concepts procurement."

Holly A. Baughan and **Janice E. Mongesku,** engineering technician apprentice assigned to Technical Support Section D, have been cited "for exceptional technical and dedicated support to research conducted in the Unitary Wind Tunnel."

James F. Allen, electrical engineering technician assigned to the Tunnel Drives Unit, has been recognized "for high quality performance and contributions in the design, testing and installation of new electronic circuits in two power recorders."

John W. Meador, engineering technician apprentice assigned to Technical Support Section D, has been rewarded "for exceptional technical support to the NTF research programs."

Shirley B. Crockett, secretary for the Materials Division, has been cited "for dedicated, high-quality service in support of the NASA Langley Combined Federal Campaign."

Helen M. Bruce, computer assistant, Office of the Director for Electronics, has been recognized "for outstanding performance in support of the Center ADP Officer and computer security manager functions."

Nominations Sought for the 1991 Value Engineering Award

Ramsey Wins First Award Ever Given

Earlier this year, Dr. James W. Ramsey Jr., of the Facilities Engineering Division, won Langley's first Value Engineering Award for recommending changes that led to $1.5 million in savings to the Heavy Gas Reclamation System in the Transonic Dynamics Tunnel.

The changes were adopted without sacrificing quality or capability and permitted the construction-of-facilities project to proceed on schedule and within the allotted funding.

The value engineering certificate and $1,000 stipend awarded to Ramsey was a small but appreciated recognition for a job well done. Now it's time to choose the winner of the 1991 award. Nomination letters should be submitted through line management to the Employee Relations Section, Employee Development and Services Branch, Mail Stop 129.

Nominations for the 1991 award will be considered through December 31, and the winner will be announced in February. Individuals and groups are eligible.

The award is open to all Langley civil service employees who have taken a value engineering action this calendar year on a program, project, or acquisition that will result in significant savings or added value.

The Value Engineering Award will be included in the next edition of the Langley Incentive Awards Handbook scheduled for publication later this year.

Photo by Fred Jones / Hubert Lloyd

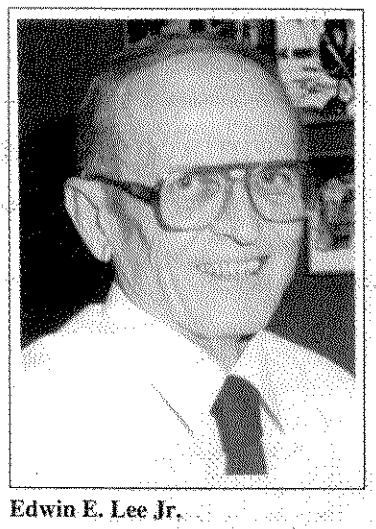
Dr. James W. Ramsey Jr. won the first Value Engineering Award.

Value engineering originated during World War II as an outgrowth of severe material shortages. Industry turned to alternative materials, designs and manufacturing processes, many of which worked as well or better than the original -- and often at lower cost. The General Electric Co. recognized the value of a continuing search for quality improvement and cost reduction and is credited with institutionalizing the value engineering concept.

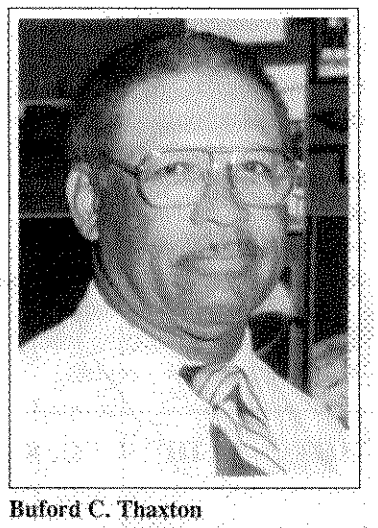
NASA's Value Engineering Program was formally adopted in November, 1990, and is described in NASA Management Instruction 5184.1A. It is defined as an organized effort to analyze the functions of hardware, software, services and facilities to achieve the lowest life-cycle cost consistent with required performance, reliability, maintainability, human factors, logistics, quality and safety. The program addresses contracted and in-house activities. Since 1990, Langley's procurement contracts in excess of $100,000 have included value engineering clauses that instruct contractors on how to share value engineering cost savings.

"On the in-house side, the centers have considerable latitude for implementing a program," said Chief Engineer Joseph W. Stickle. "At Langley, we feel that the principles of value engineering are good and that they are a normal part of each employee's job. We have elected, therefore, to encourage these principles by establishing an annual Value Engineering Award."

Forty Year Service Awards

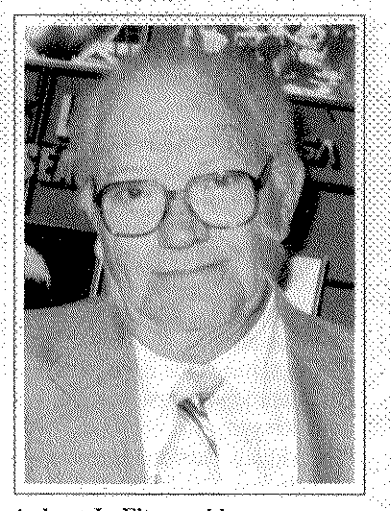


Edwin E. Lee Jr.

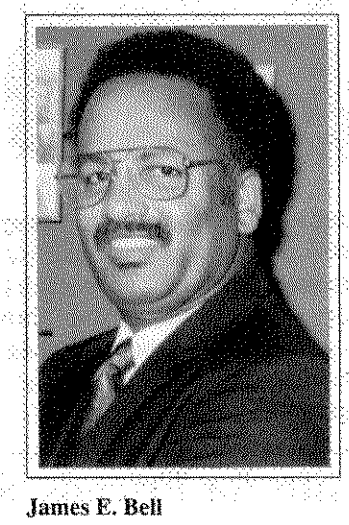


Buford C. Thaxton

Edna C. Cox



Aubrey L. Fitzgerald



James E. Bell

David G. Stephens

Two Langley Employees Receive Equal Opportunity Program Awards

Two Langley employees have been presented with awards in Langley's Equal Opportunity Program.

• **James E. Bell** was recognized for personal commitment and leadership in advocating the ideal of equal opportunity at Langley in general and in particular within the Systems Engineering and Operations Directorate. He is supervisor, Fabrication Division.

• **David G. Stephens** was recognized for outstanding leadership and significant personal contribution in advancing equal opportunity at Langley. He is chief of the Acoustics Division, Structures Directorate.

CFC: Peninsula Foodbank is an Example of Your Contributions at Work

By Anne D. Harmon

Hunger is stalking thousands of residents on the Virginia Peninsula, and most of its victims are powerless to help themselves. One organization that is making a big difference in the lives of thousands of our area's hungry is the Foodbank of the Virginia Peninsula.

Current times have created a "new poor" -- families whose breadwinners have lost their jobs or been laid off; some have even lost their homes. These new poor often are hungry -- more than half of them are children; some are single parents with children; many are ill, handicapped or elderly. The Peninsula's Foodbank, one of the organizations funded by the Combined Federal Campaign, is bridging the gap for many of these needy citizens. In 1990, the Foodbank distributed 800,000 pounds of food, with 50 percent of that feeding local children.

June was a record-breaking month for the Foodbank. The agency distributed 91,000 pounds of food to their 175 member agencies which, in turn, distribute 22,000 meals a month.

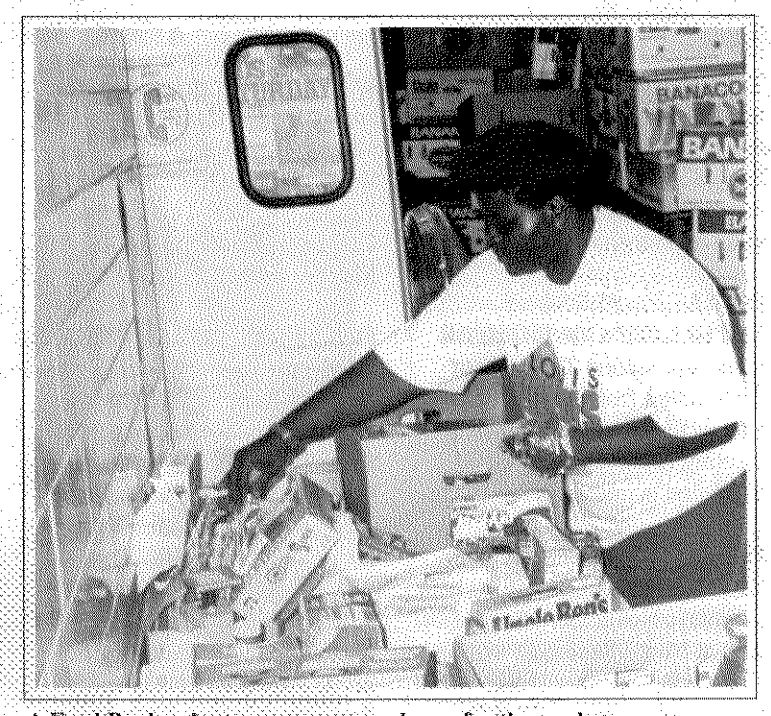
Agencies of the Foodbank are its hands reaching into the community. Agencies such as area churches and nonprofit organizations operate food pantries and on-site feeding programs, such as soup kitchens. In addition, several Foodbank agencies distribute bread weekly through bread basket programs. Some distribute as much as 1,000 pounds a week.

Seeing first-hand the tremendous need on the Peninsula, and to work with those who are filling that need, is not easy to forget.

I worked at the Foodbank when a man in his late twenties came for help. A cabinetmaker whose fingers had been severed in an accident, he had been terminated without benefits. A proud individual, it was not easy for him to walk up the stairs to the Foodbank's main office and admit his family needed food. When he left that afternoon with large boxes of food, he carried renewed hope in his heart.

CAMPAIGN UPDATE

As of October 24, donations totalled $258,567.44, or 91 percent of the goal.



A Food Bank volunteer prepares packages for the needy.

Member agencies

Just as the Foodbank helped this newcomer, it also helps many others through member agencies. Executive Director John N. "Jack" Marston said the Foodbank no longer has an emergency pantry operating at its main office, but works directly through member agencies throughout the area, reaching Newport News, Hampton, Williamsburg and the counties of Mathews, James City and Gloucester and part of Isle of Wight. In addition to food assistance, these agencies provide information about other services, such as clothing, shelter, furniture and other necessities.

Alice Munday, Foodbank's agency coordinator, said the goal is to help as many as possible. "A real measure of our success is when we can help people help themselves. Our emergency pantry programs are a prime example."

Emergency pantries are an arm of the Foodbank in which low-income families help each other by forming clubs to buy food from the Foodbank at greatly reduced rates.

Members raise money by donations, contributions from outsiders and fundraising, such as car washes and flea markets. Each week, 300 pounds of free bread is distributed from the pantry's clubhouse. In addition, each month a member of the club drives a truck to the Foodbank to stock up on whatever food is available, for no more than 14 cents a pound in shared maintenance costs.

Marlene McKoy, her husband and six children are members of the Rainbow Emergency Food Pantry in Merry Oaks Mobile Home Park in Newport News. In 1990, three surgeries and a new baby stretched the family's income to the limit. The Rainbow Pantry helped out.

Helping each other

"Even if someone has no money for a donation that month, no one is turned away," said McKoy.

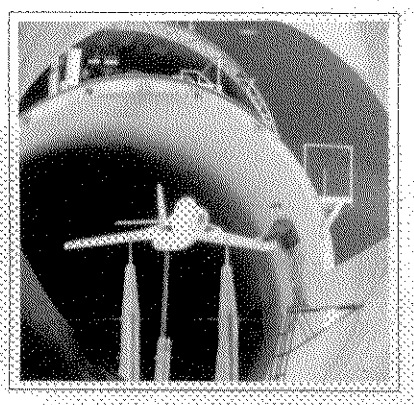
"In fact, Rainbow members often put a little extra in the 'pot' when overtime or an unexpected check in the mail boosts their income. This is our way of helping others."

And that's what the Foodbank is all about -- people helping people.

We can all do our part to ensure that Peninsula people do not go to bed hungry. Contribute generously to the Foodbank or other agencies supported by the Combined Federal Campaign.

16-Foot Tunnel's 50th Anniversary to be Recognized by Reception, Tours

Langley's 16-Foot Tunnel will celebrate its 50th continuous year of operation with a reception at the H.J.E. Reid Conference Center on Thursday, November 14, from 2 to 3 p.m. Tours of the tunnel will start at 3 p.m. and can be arranged by calling 864-3001 or writing to Mail Stop 280. November 13 is the deadline for scheduling a tour.



The anniversary celebration will be a gathering of those who worked at the tunnel. Langley employees, contractors, and alumni are invited to attend.

The 16-Foot High-Speed Tunnel became operational November 13, 1941. It was converted to transonic speed and renamed the 16-Foot Transonic Tunnel on December 6, 1950.

Photo by Fred Jones

THE VARIABLE DENSITY TUNNEL was dedicated as a National Historic Landmark Exhibit in a ceremony October 10 at the H.J.E. Reid Conference Center. Unveiling a plaque commemorating the exhibit are, from left, Dr. Harry A. Butowsky, a National Park Service research historian; Center Director Paul F. Holloway; and W.R. Phillips, executive vice president of Newport News Shipbuilding. Butkowsky called the tunnel "NASA's most consequential National Historic Landmark." Said Butowsky: "The Variable Density Tunnel was the first facility to establish the NACA as a technologically competent organization and led to the construction of superior aircraft that dominated the airways." The VDT was built by Newport News Shipbuilding and delivered to Langley in February, 1922. Proposed by Max M. Munk, Langley's German aerodynamicist, the tunnel allowed the testing of small-scale models at full-scale values in the low-speed range.

Health Corner: Time to Get Your Flu Shot

The annual flu season is here again. Countless work hours and off-duty leisure time will be lost to high fever, aching bones, sore throat and the general misery of the flu. These losses can be largely prevented by simply taking the flu shot.

Remember, the protection you receive from the flu shot prevents you from carrying the virus home to family members, who usually are at higher risk.

The new flu vaccine is now available at the Occupational Health Clinic for all Langley employees and on-site contractors at no cost. Women who are pregnant will not be offered the flu shot and should check with their obstetricians.

The Occupational Health Clinic will offer the flu shot Monday through Friday from 7:30 a.m. to 3:30 p.m.

To save you time, clinic staff will also come to your building by invitation to give the shots to groups of 15 or more. For this "house call" service, have your building coordinator call the clinic at ext. 43196.

Happenings

SKYWATCHERS ASTRONOMY CLUB will host a public telescopic viewing Friday, November 8, from 7:30 p.m. to midnight at the club observatory, 10 Lindbergh. Telescopes will be set up for use. The event will be held the next night if skies are cloudy. For more information, call Marilyn Ogburn, ext. 41175.

LAA SOCIAL will be held Friday, November 8, 4 to 6:30 p.m. in the H.J.E. Reid Conference Center.

BODY DYNAMICS high-energy, low-impact aerobics classes are held Mondays, Wednesdays and Fridays at 6:15 p.m. in the LAA gym. Classes are open to civil service employees and are free.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m., LAA gym. Cost is $12 per month. Bench step aerobics are held Saturdays from 9:30 to 10:30 a.m. in the gym. Cost is $6 per month.

NASA TOASTMASTERS meet the second and fourth Wednesday of each month in the H.J.E. Reid Conference Center. The next meeting is November 13 from 11:30 a.m. to 1 p.m.

LANGLEY COLLOQUIUM SERIES will sponsor a lecture and discussion of the Interstate 664 James River Crossing on Tuesday, November 12, from 2 to 3:30 p.m. at the H.J.E. Reid Auditorium. The speaker will be Jerry K. Morrison, assistant resident engineer, state Department of Transportation.

DISABLED PERSONS SATELLITE COMMITTEE meets the second Thursday of each month from 8:15 to 9:30 a.m. in the cafeteria. The next meeting is November 14 . Everyone is invited.

PENINSULA AREA WRITERS' LUNCHEON will be held Saturday, November 16, at 11:30 a.m. at Nick's Seafood Pavilion, Yorktown. Speaker is Jim Kincaid of 13 News WVEC. Cost is $15. To register call Carole Barrett, 898-3556.

FEDERAL WOMEN'S PROGRAM COMMITTEE will meet Wednesday, November 13, at 8:15 a.m. in the cafeteria executive dining room.

LANGLEY ALUMNI ASSOCIATION'S monthly get-together will be held Tuesday, November 12, in the cafeteria. Dr. Roland Bowles will talk on air transport operating problems.

LOST: Light brown soft briefcase lost October 9 or 10. Reward. Call Carol, ext. 42824.

LOST: Steel-rim bifocals with spring-loaded frames lost between Building 1232, 6 Ames Road, and back door of Building 1268A, 24 West Taylor Road. Call Doug Price, ext. 46605, Mail Stop 161.

IT'S TURKEY TROT TIME. Signup is underway for the annual "predict your time" Turkey Trot Race. The two-mile run starts at 5 p.m. November 14 on Doolittle Road. A $2 entry fee will be charged. Call the fitness center, ext. 46387, for details.

A SCIENCE FICTION convention will be held November 8-10 at the Holiday Inn Executive Center, Newtown Road, Virginia Beach. More than 30 guest writers, artists and editors will attend, including Lois McMaster Bujold, Vincent DiFate and Gordon Dixon. Membership is $25 for the weekend. For more information, call John Kaiser at ext. 47380.

HAMPTON ROADS INFERTILITY SUPPORT GROUP will meet November 11 at the Jewish Community Center, Newport Avenue, Norfolk, to discuss coping with the holidays.

LDEF Materials Workshop Scheduled

How have initial Long Duration Exposure Facility (LDEF) results affected the potential space applications of materials or the understanding of the space environment? How have LDEF results affected materials development, ground simulation testing and the materials needs for future flight experiments?

These questions will be addressed during the LDEF Materials Workshop '91 November 19-21, 1991 at the NASA Langley Research Center. The conference, to be held in the H.J.E. Reid Conference Center, is sponsored by the LDEF Materials Special Investigation Group. The purpose of the workshop is to update the information exchanged between LDEF materials investigators at the First LDEF Post-Retrieval Symposium held last June in Orlando and to transfer this information to potential users in the general aerospace materials community.

The general workshop agenda includes technical sessions and panel meetings. Papers will be presented on LDEF materials, environmental parameters and data bases; LDEF contamination; thermal control and protective coatings and surface treatments; polymer/films; metals, ceramics and optical materials; polymer-matrix composites; and lubricants, adhesives, fasteners, solar cells, batteries and seals.

Attendance is unrestricted but reservations are required. For more information or to register for the workshop, please call the LDEF Project Office, ext. 43782 or 43318.

LAA Turkey Shoot

The Langley Activities Association will sponsor a Turkey Shoot on Saturday, November 16, from 9 a.m. to dusk on the Activities Center grounds.

The cost is $1 per shot (targets are used, not real turkeys). Food and beverages will be available for purchase. For more details call ext. 46369.

Polymer Award

Langley's Paul Hergenrother, of the Polymer Materials Branch, has been selected to receive the Distinguished Service Award for 1992 given by the Division of Polymer Chemistry Inc. of the American Chemical Society. The award will be presented at the society's Meetings Awards Banquet in 1992.

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

402 ON-SITE NON-LANG
COPPEDGE, AUDREY S.
MAIL STOP 146

Researcher News

National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

$285,000 GOAL
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
CFC
Virginia Peninsula

Photo by Fred Jones

CAPITOL VIEW. Richard H. Petersen enjoys the scenery from his new office at Headquarters, where he will serve as associate administrator of the Office of Aeronautics and Space Technology (OAST). Petersen said he expects to soon complete the transition from his position as Langley director to his job directing OAST. For a story on the new Center director, Paul F. Holloway, see page 1.

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 23 November 15, 1991

News Researcher

Bi-weekly Employee and Contractor Publication

Headquarters Team will Examine Cultural Climate, Practices at Langley

The status of minorities at Langley will be the focus of a review team that plans to visit the Center and interview employees this month.

The Headquarters team will visit from November 20 to 22 to evaluate Langley's "cultural climate and practices."

All other NASA installations have been, or will be, visited by the review team.

Said NASA Administrator Richard H. Truly, who appointed the team in February: "My interest is in assuring a healthy, stimulating work environment and equitable treatment conducive to maximum productivity among all of NASA's diverse work force.

"Thus, I would like to identify any internal policy or practice which has, or is perceived to have, an adverse effect on minority employees."

Langley Associate Director Sidney F. Pauls encouraged employees to be candid with the review team.

"This is an opportunity for us to lay out a model for the future at Langley," Pauls said at a meeting to prepare for the review team visit. "This is not an attempt to tell a story that does not exist. I want us to fairly and equitably represent what the Center is all about multi-culturally."

> **"I want us to fairly and equitably represent what the Center is all about multi-culturally."**
> - Sidney F. Pauls

The review team is headed by Brigadier Gen. Elmer T. Brooks, deputy associate administrator for management.

"If one reviews the statistical data for NASA centers," Brooks said, "it is apparent that we still have a long way to go in achieving a balanced, representative work force -- especially in key and senior level positions."

Cultural diversity, however, is on the rise in the U.S. work force, according to a study commissioned by the Department of Labor. The study indicates that by the year 2000, women and minorities will account for 85 percent of net new employees.

Minority representation in Langley's work force has increased, although nonminority men continue to make up the bulk of NASA civil servants (see table).

That trend is reversing, however. Since 1985, the percentage of nonminority men working at Langley has dropped from 72.1 percent to 67.4 percent as of August, 1991, according to Langley's Office of Equal Opportunity Programs (EOP).

The number of women and minorities in high grade civil service positions at Langley also is rising, EOP figures indicate.

MINORITY REPRESENTATION AT LANGLEY

Overall (NASA only)	**1985**	**Percent**	**1991**	**Percent**
Nonminority men	2,079	72.1	1,981	67.4
Nonminority women	589	20.4	704	24
Black	165	5.7	192	6.5
Hispanic	30	1	41	1.4
Asian	36	1.2	73	2.5
American Indian	10	0.3	11	0.4

High grade (GS/GM 14+)	**1985**	**1991**
Nonminority women	9	28
Black	6	11
Asian	13	22
Hispanic	1	2
American Indian	0	1

Review team meetings

Brooks will meet with key representatives of the Office of Public Affairs, the Office of Equal Opportunity Programs, the Office of Inspector General, the Human Resources Management Division, union officials and advocacy groups.

Brooks said the team also will hold discussion meetings with selected work units that have recently achieved successes or experienced problems with multi-cultural relations. Those meetings will include first- and second-line supervisors and as many other employees as possible.

Brooks stressed that "we are not authorized, nor do we intend to intercede, in cases that have entered into a formal review or legal process."

In addition, team members will interview individual employees who want to meet with them. The team will develop a report of its observations, findings and recommendations and present it to Truly.

Employees wishing to speak with the review team should call Barbara Fryer at ext. 46113.

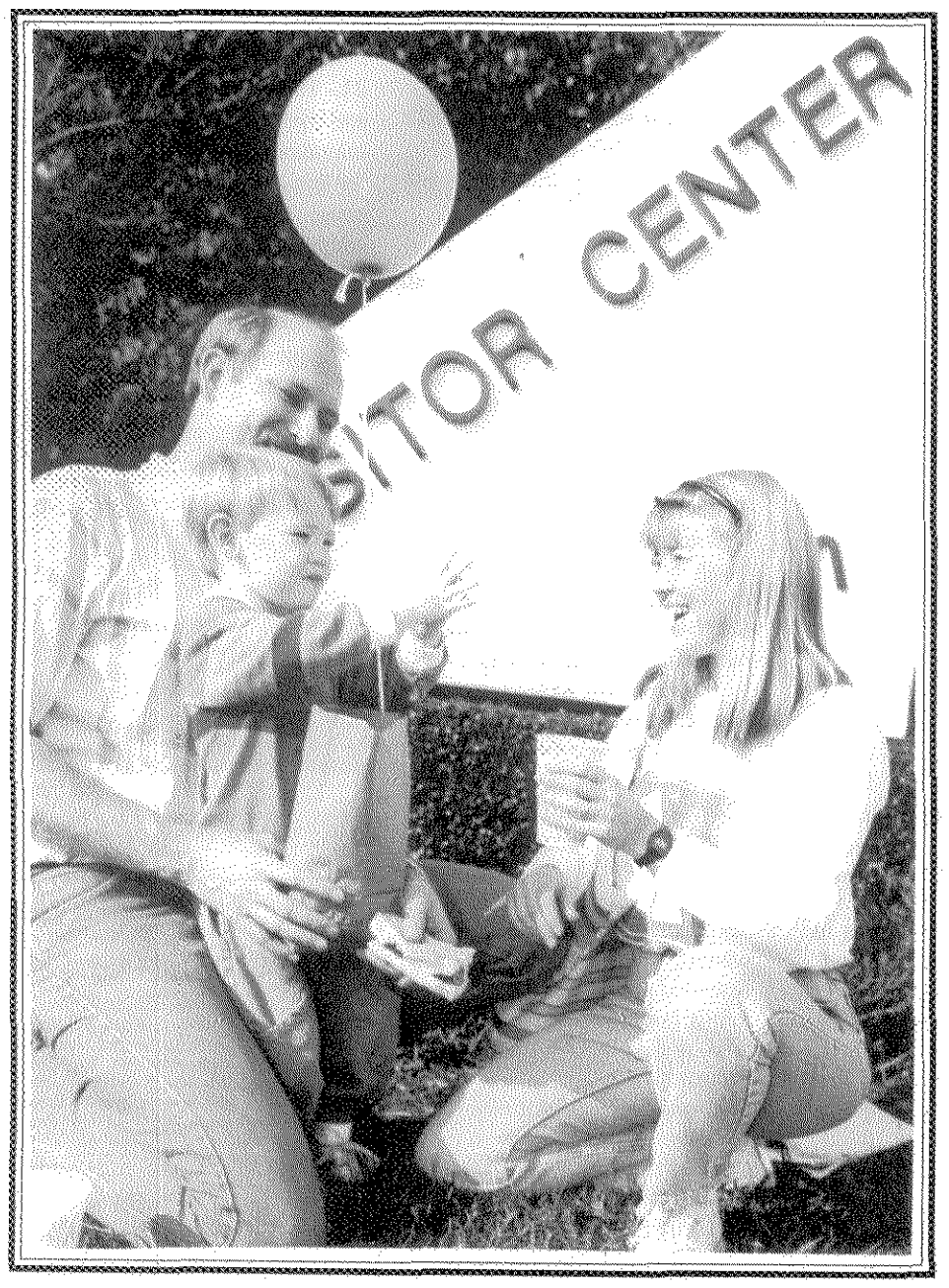


Photo by Carol Petrachenko

Nancy and Ron Sisemore and son Nathan, 2-1/2, enjoy a snack in front of the Visitor Center during the October 26 "Blastoff Saturday" celebration to commemorate the center's closing October 31. See story and photos, pages 4 and 5. Ron Sisemore works for Lockheed at Langley Air Force Base.

CLAWS: Laser-Based System Improves Collection of Wind Data at Launch Sites

Langley researchers have developed a laser-based system for measuring winds above launch sites that may eventually replace weather balloons as a means of gathering data aloft.

The system is called CLAWS -- Coherent LAunch Site Wind Sounder -- and was created by the Spacecraft Controls Branch, Flight Systems Directorate; and Lockheed.

CLAWS underwent its first full-system test at the September 12 launch of the Space Shuttle Discovery.

Earlier this month, researchers were wrapping up final testing in which detailed comparisons were made of CLAWS, weather balloons and another type of wind-measuring system called weather radar.

Dr. Daniel D. Moerder, of the Spacecraft Controls Branch, said CLAWS has several advantages over using weather balloons prior to launches.

"That process takes about an hour as several of these balloons are released as the time of launch approaches," he said. "The balloons have a number of disadvantages, one of which is that when they encounter strong winds, they get blown away from the launch site.

"This is really a huge step forward. It will provide us with a level of detail that will permit more reliable availability for launches, more safety in launches, and will make it possible to design more efficient trajectories that will enable us to launch more payload into orbit per vehicle."

With CLAWS, Moerder said, "we are able to get a wind profile in about a minute instead of in about an hour. Also, because light propagates in a straight line, we are actually measuring along the line of sight. We're actually looking up through a cone of atmosphere.

"And finally -- and this is extremely important -- CLAWS is capable of a 75-meter range resolution, which lets us seen fine-grained phenomena that balloons miss, such as sharp wind shears."

The system uses high energy, short wavelength solid-state laser radar to measure, over a series of altitudes, the Doppler shift of very fine aerosol particles as they pass overhead.

The pencil-thin laser beam can cover an area ranging from 0.7 to 10 kilometers in diameter based on a 20-kilometer height. Measurements are taken from a series of laser pulses.

"In recent testing," Moerder said, "the system has been able to measure winds with a 0.1 meter-per-second accuracy up to an altitude in excess of 25 kilometers."

Development of CLAWS "is part of a several year effort that will culminate in fully demonstrating the technological maturity that would justify procurement of an operational system for launch support," Moerder said.

The current system does have several drawbacks, he said. It cannot penetrate solid cloud cover. In addition, the laser is not eye-safe, and requires that air space be cleared before it can be used.

Plans are to upgrade from a laser using a 1.06-micron wavelength at 1.1 joule pulse energy to a 2-micron laser, which would be eye-safe.

Moerder said the cloud-cover problem may be skirted by using CLAWS system in conjunction with wind radar, another method being developed for measuring winds aloft.

News Briefs

Venus Images Show Earth Similarities --- Magellan scientists have confirmed that Venus has features similar to those on Earth, such as rifts the size of the Grand Canyon and suspected volcanoes the size of Mauna Kea. Radar investigator John Wood, of the Smithsonian Astrophysical Laboratory, said that one of Venus' largest volcanoes, Maat Mons, could be active. Project Scientist Steve Saunders noted that Venus has now been mapped more thoroughly than Earth. The global radar coverage of Venus is of such high resolution that features the size of city blocks are visible anywhere on the planet.

Crippen to Head Kennedy --- Robert Crippen has been named director of Kennedy Space Center effective January 1, replacing Air Force Lt. Gen. Forrest McCartney. NASA Administrator Richard H. Truly said McCartney's tenure as the Center's director was a period in which a remarkable safety record was achieved. He said Crippen is a key leader who brings to the job experience from four Shuttle missions and a proven management leadership record. "He will take the helm at Kennedy during the exciting years leading to Space Station Freedom launch operations," Truly said.

Headquarters Makes Personnel Changes --- James T. Rose, assistant administrator for the Office of Commercial Programs, will leave NASA effective December 6. He has held the position since October, 1987. Rose will be replaced by John G. Mannix, currently director of Space Commercial Opportunities in the Office of the Administrator. "Jack not only has solid NASA experience in the technical fields involved, but also has the management experience to evolve an already successful program into a far more stimulating opportunity for American industry," said NASA Administrator Richard H. Truly.

Payload Specialist Named --- Dr. M. Rhea Seddon has been named payload commander for Spacelab Life Sciences-2 (SLS-2), Space Shuttle Mission STS-58, scheduled for launch in July 1993. The mission is dedicated to continued life sciences research on adaptation to microgravity in preparation for Space Station Freedom and future planetary exploration. Seddon has conducted medical research on two Shuttle missions, STS-51D in April 1985, and STS-40 in June 1991.

Satellite Lease Delayed --- NASA and Columbia Communications Corp. have agreed to delay for up to six months the start of operations under Columbia's lease of NASA's Tracking and Data Relay Satellite System (TDRSS) C-Band capacity. To compensate, Columbia will pay up to $10 million in increased payments later in the lease, depending on when operations begin. Columbia leases transponders on two TDRSS satellites to serve international telecommunications customers in the Atlantic and Pacific regions.

Editor's note: To obtain a copy of any of these NASA Headquarters News Releases contact Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request information summarized above by headline printed in bold.

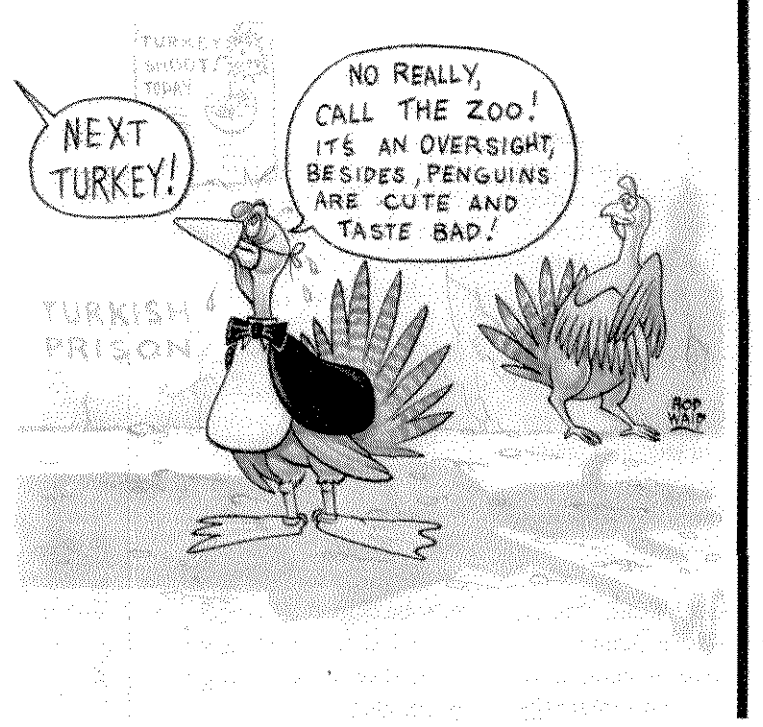
Senior Management Research and Review Agenda

The Senior Management Research Review will be held Monday, November 18, from 9 to 11 a.m. at 17 West Taylor Road, Subsonic Tunnels Offices, Room 200. All employees are invited to attend. Program accomplishments will be given by the following Langley scientists:

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:00	Cooperative AFW Program Successfully Completed	Boyd Perry III (AB, SDyD, Structures)
9:15	Wing Loads Actively Controlled During Rolling Maneuvers	Jessica A. Woods-Vedeler (AB, SDyD, Structures)
9:30	Active Flutter Suppression: Control System Design and Experimental Validation	Martin R. Waszak (AGCB, GCD, Flt Sys)
9:45	Self-Correcting Techniques for Large Antennas	Dr. Marion C. Bailey (AMRB, GCD, Flt Sys)
10:00	Aerodynamic Design Using Advanced Computational Fluid Dynamics (CFD) Methods	Richard L. Campbell (TAB, AAD, Aero)
10:15	A Practical Solar-Pumped t-C_4F_9I Laser	Gilda A. Miner (HESB, SSD, Space)
10:30	Director's Comments	

Following these presentations, the program directors will give status reports.

Lankley



Video Seminar Focuses on Commitment

The Empowerment Series of video seminars offered by Executive Communications Inc. will feature "Building High Commitment in the Workplace" from 2 to 3:30 p.m. December 11.

The seminars, brought in by satellite, are offered monthly for Langley managers and others on a first-come, first-served basis.

To enroll, submit an application for on-site training form (form 24) to Kim D. Dobbs, Mail Stop 309.

The forms are available from the Employee Development Branch, ext. 42597, or from your training coordinator.

Employees Invited to Visit GEOLAB

GEOLAB, a laboratory for creating and manipulating computational geometry, has been established in the Analysis and Computation Division. Langley personnel are invited to visit the lab and see demonstrations of the software from noon to 4 p.m. Friday, November 22.

The laboratory consists of hardware and software housed in an attractive work environment. The hardware includes high-performance work stations and peripheral equipment. The software consists of computer-aided design/engineering systems, grid-generation systems and visualization systems.

GEOLAB has a permanent staff of highly skilled scientists and engineers who will work on projects in conjunction with Langley researchers and serve as a training resource. In addition, guest researchers will be invited to co-locate in GEOLAB for a few weeks to several months for intensive laboratory use.

The lab is in Room 2119, 24 West Taylor Road. Questions about the lab should be directed to Bob Smith, ext. 45774, or Eric Everton, ext. 45778.

Perspectives is new assistance provider

Effective November 1, the new employee assistance provider for Langley is Perspectives Employment Assistant Program (EAP). The multidisciplinary staff includes licensed and certified social workers, addictionologists, psychologists, psychiatrists, professional counselors and intervention specialists.

Services include professional and confidential assessments, short-term counseling, interventions, referral and follow-up for personal and job stress, marital and family problems, legal, financial, or emotional difficulties and substance abuse. NASA employees and their families may be seen at these locations:

- 2206 Executive Drive, Suit A, Hampton.
- Walter Reed Professional Park, Suite 201, Route 17, Gloucester.
- 5660 East Virginia Beach Blvd., Suite 101, Norfolk.

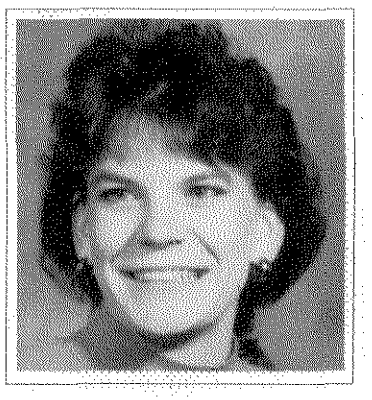
Services are available 24 hours daily, seven days a week. The telephone number is 1 (800) 950-3434 or 826-8565. For more information call the Office of Occupational Health Services at ext. 43191 or 43194.

Great American Smokeout is Nov. 21

The American Cancer Society's Great American Smokeout will be held Thursday, November 21, when tobacco users are encouraged to give up smoking, chewing or dipping for 24 hours.

Free "Quit Kits" from the society will be available in the cafeteria November 19, 20 and 21. The kits include brochures and tips for overcoming cigarette cravings and stickers and buttons for smokeout participants to wear. Nonsmokers can help by adopting smokers or smokeless tobacco users and lending support.

In Memoriam: LeAnn R. Ashcom



LeAnn R. Ashcom, a cooperative student-secretary in the Low-Turbulence Pressure Tunnel Section, Fluid Mechanics Division, died Monday, November 4. She was 21. She was a 1988 graduate of Hampton High School and a student at Thomas Nelson Community College.

"As a co-op, LeAnn worked hard to learn everything about her job, and she always completed her tasks successfully," said Robert McGhee, section head. "She was a bright, enthusiastic member of the NASA family, and her contributions went beyond her secretarial duties. Her warmth and her friendliness were extended not only to the NASA family but to contractors visiting through the NASA Industry Cooperative Program. She performed secretarial duties for them and often helped them find a place to stay while in town. LeAnn will be sorely missed by her many friends and family."

Ashcom's father, Claude R. Watts Jr., is head of the Transportation and Warehousing Section, Management Support Division. Her husband, Dale, is a Unisys Corp. employee in the Analysis and Computation Division.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Michael Finneran

Photojournalist ..... Carol Petrachenko

Photographer .....Fred Jones

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Shuttle Mission: STS-44

Atlantis will Deploy DOD Satellite to Detect Nuclear Detonations, Launches

QUICK LOOK

Launch Date/Site:
November 19,
Kennedy Space Center,
Pad 39A.

Launch Window:
6:51 - 9:30 p.m. EST.

Orbiter:
Atlantis (OV-104).

Orbit & Inclination:
195 x 195 nautical miles,
28.5 degrees.

Landing Date/Time:
2:27 p.m. EST, Nov. 29.

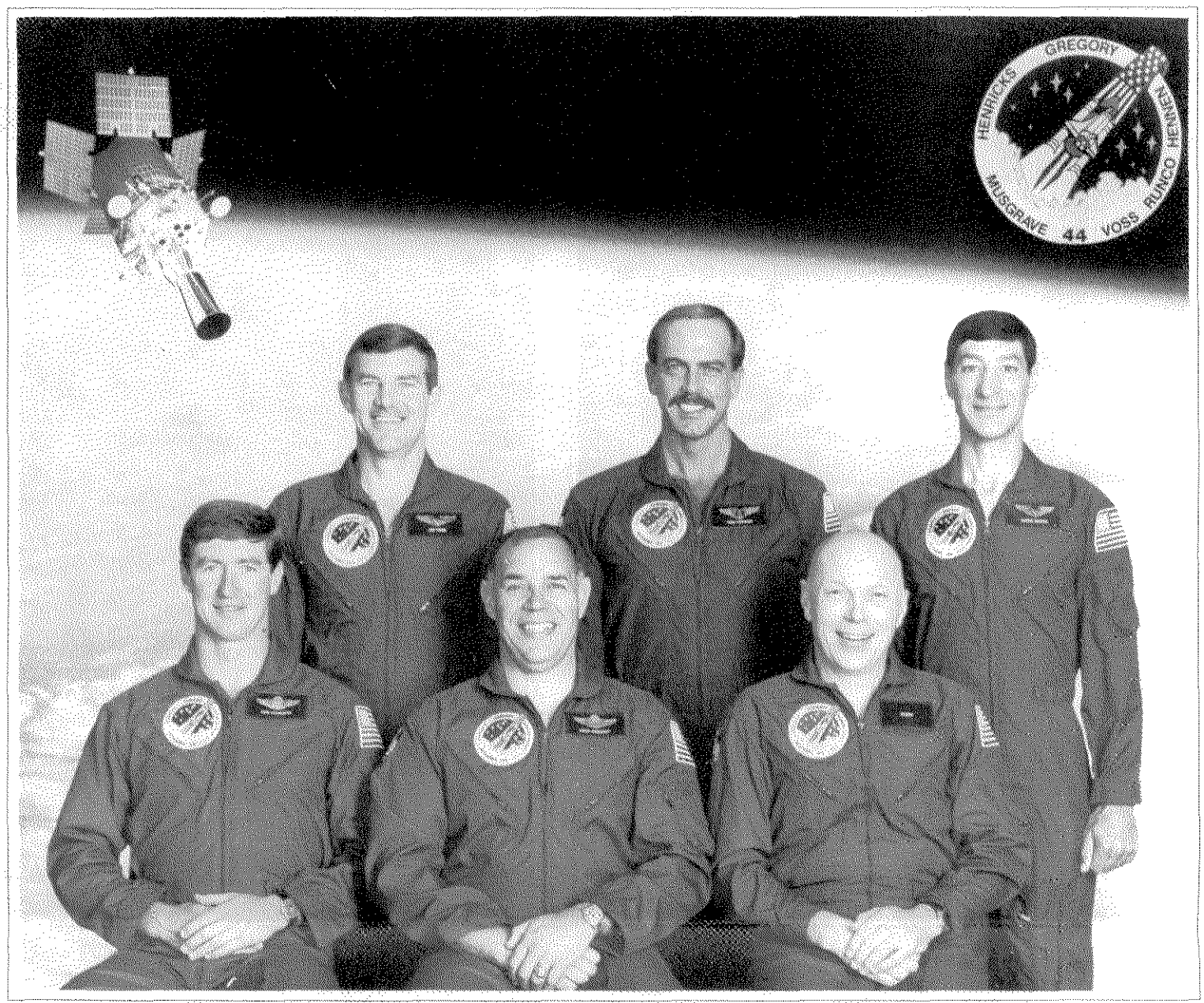
Primary Landing Site:
Kennedy Space Center.

Abort Landing Sites:
Return to Launch Site - Kennedy Space Center.
Transoceanic Abort Landing - Banjul, Gambia.
Alternates - Moron, Spain; Ben Guerir, Morocco.
Abort Once Around - White Sands Space Harbor, N.M.

Crew:
Frederick D. Gregory, commander.
Terence T. Henricks, pilot.
James S. Voss, mission specialist 1.
F. Story Musgrave, mission specialist 2.
Mario Runco Jr., mission specialist 3.
Tom Hennen, payload specialist.

Cargo Bay Payloads:
DSP/IUS (Defense Support Program).
IOCM (Interim Operational Contamination Monitor).

Middeck Payloads:
Terra Scout.
M88-1 (Military Man in Space).
AMOS (Air Force Maui Optical System).
CREAM (Cosmic Radiation Effects and Activation Monitor).
SAM (Shuttle Activation Monitor).
RME-III (Radiation Monitoring Experiment-III).
VFT-1 (Visual Function Tester-1).
UVPI (Ultraviolet Plume Instrument).



Johnson Space Center Photo

STS-44 crew, back row from left: Jim Voss, Tom Hennen, Mario Runco Jr. Front row from left: Tom Henricks, Fred Gregory, Story Musgrave.

Other Instruments will Examine Medical Effects, Onboard Radiation

Space Shuttle mission STS-44, the ninth Department of Defense-dedicated Shuttle flight, will deploy the Defense Support Program (DSP) satellite designed to detect nuclear detonations, missile launches and space launches from a geosynchronous orbit.

Atlantis is scheduled to launch at 6:51 p.m. EST on November 19 for the 10-day flight, Atlantis' tenth flight and the 44th Shuttle mission. With an on-time launch, landing would be at 2:27 p.m. EST on November 29 at Kennedy Space Center, the primary landing site.

Commanding Atlantis will be Fred Gregory. Tom Henricks will serve as pilot. Mission specialists will be Jim Voss, Story Musgrave and Mario Runco Jr. Tom Hennen will serve as payload specialist.

After deploying DSP on the first day of the flight, the crew will work with a variety of secondary payloads aboard Atlantis. The Terra Scout experiment will include onboard analysis and an evaluation of using the Shuttle to observe various sites on Earth by Hennen, a trained analyst who has intensively studied the sites to be observed. The Military Man in Space experiment will evaluate the ability of a spaceborne observer to gather information about ground troops, equipment and facilities.

Other experiments include the Shuttle Activation Monitor, which will measure the radiation environment onboard and its effect on gamma ray detectors; the Cosmic Radiation Effects and Activation Monitor, which will gather information on cosmic rays and radioactivity onboard; and the Radiation Monitoring Equipment, a third-generation instrument used to measure the ionizing radiation aboard and the crew's exposure to it.

Although no onboard equipment is carried for them, two experiments will use remote sensors to study the Shuttle in orbit.

The Air Force Maui Optical System experiment uses an Air Force electrical-optical system on the Hawaiian island of Maui to look at Shuttle jet firings, water dumps and encounters with atomic oxygen. The Ultraviolet Plume Instrument, a sensor on a Department of Defense satellite in geosynchronous orbit, also will attempt to observe Atlantis as a method of fine-tuning the sensor.

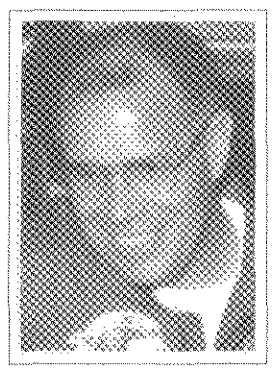
Also aboard will be the Visual Function Tester, an experiment to study changes in vision that may be experienced in weightlessness. The Interim Operational Contamination Monitor, located in the cargo bay, will measure contamination in the bay during launch.

In addition, the crew will take part in continuing medical investigations of the effect of weightlessness on the human body and methods of counteracting those effects.

Among the medical studies will be use of the Lower Body Negative Pressure unit, an often-flown device that uses low pressure to pull body fluids back to the lower extremities, counteracting the tendency for such fluids to rise to the upper body in weightlessness.

Other investigations and the 10-day length of the flight are in preparation for a gradual increase in the duration of Shuttle missions, including the first 13-day flight, which is planned for1992.

Gregory was Langley Test Pilot



Atlantis Commander Fred Gregory has a special connection to Langley Research Center -- he was a test pilot here from June 1974 until his selection to the Astronaut Program in January 1978.

Gregory, 50, has logged more than 6,500 hours of flying time in more than 50 types of aircraft, including 550 combat missions in Vietnam.

He has flown nearly 300 hours in space, having served on two missions prior to STS-44. His first Shuttle flight was as pilot on STS-51B in April 1985. His last Shuttle flight was as commander of STS-33, another Department of Defense-dedicated mission, in November 1989.

For car passes to the launch, call Ann Suit at ext. 43305

Photo by Carol Petrachenko

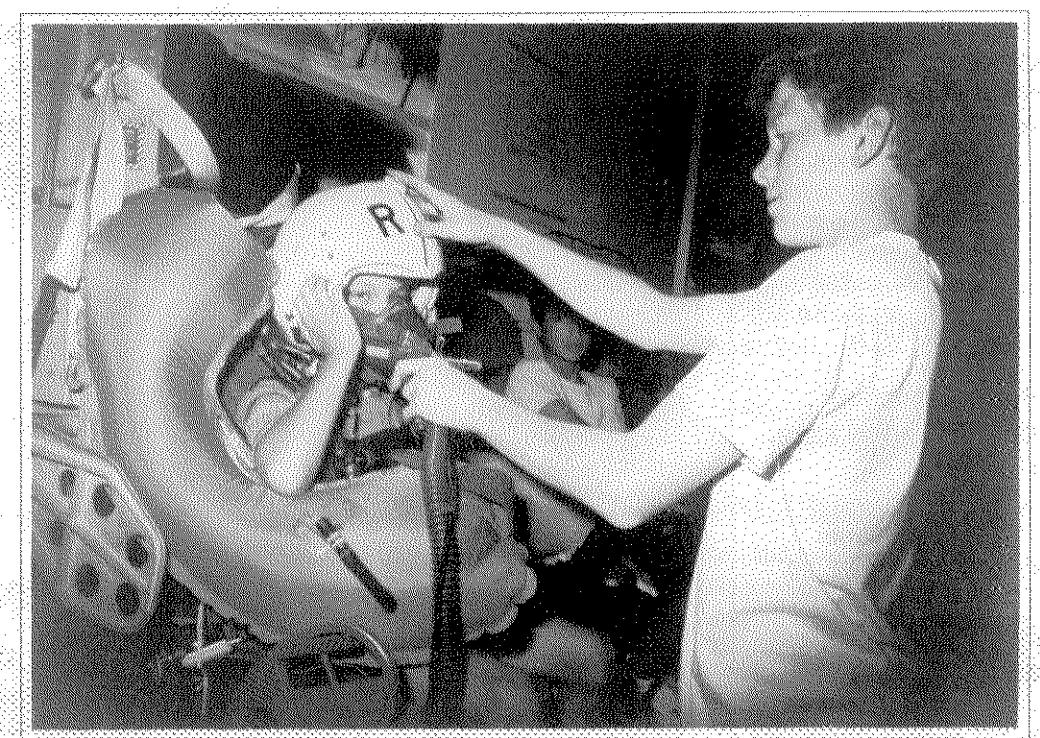
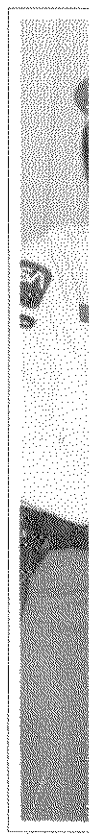


Photo by Carol Petrachenko

Above: Bryce Bell gets a taste of fighter flying while Adam Winston waits his turn during the "Blastoff Saturday" celebration at the Visitor Center on October 26. Left: Hilary Rinsland, 5, pokes her head through the space suit mockup at the Visitor Center. Her father, Curtis, works for NASA in Langley's Atmospheric Sciences Division.



Langley Hollow board c

Langley Bids F

New Air and Space

Photo by Carol Petrachenko

Katie Woronowicz looks up to Sei Kawabe, who played astronaut during the October 26 party at the Visitor Center. Katie's father, Michael, is an engineer for Vigyan in Langley's Aerothermodynamics Branch, Space Systems Division. Kawabe, a docent at the Visitor Center, is a doctoral student at George Washington University at Langley.

The NASA Langley Visitor Center permanently closed on Thursday, October 31, but not without a proper goodbye to mark its 20 years of service.

Four events commemorated the center's closing. On November 1, NASA marked the occasion with an official ceremony and comments from Paul F. Holloway, Langley's director.

"This facility has just completed 20 years of operation, having served millions of people," Holloway said. "Tourists, employees and their families, distinguished visitors to Langley -- all have used this facility. It is sad to see it disappear."

Holloway said that despite several expansions, the center needed more room and was outgrowing Langley's resources. The Virginia Air and Space Center was created, in part, to absorb Visitor Center exhibits.

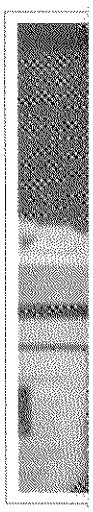
"Built with no federal money, but instead with private donations, state and municipal funding, the Virginia Air and Space Center honors the rich aerospace heritage of this region," he said. "It encompasses the contributions of the U.S. Air Force, of NASA, of the entire region. We are extremely pleased that the community has chosen to honor our collective accomplishments."

Volunteers thanked

Holloway thanked the volunteers and contractors who ran the Visitor Center.

"Your success here in this modest facility," he said, "has laid the foundation for the magnificent enterprise that will open next April in downtown Hampton."

Dr. Mark Nataupsky, Visitor Center director, thanked those who worked for or supported the



"Ladies Center Nataup visitors

center, who is tude wh no way dedicat

Als tion we employ center.

In a Moon I chairma board o

"We that I h

Photo by Peggy Pancoast

rity officer Linda Barry retrieves the Apollo 17 Moon Rock, which Center Director Paul F. iddle) had symbolically turned over to Thomas P. Chisman, president and chairman of the Virginia Air and Space Center, at the November 1 closing ceremony for the Visitor Center.

ırewell to an Old Friend

enter to Fill Void left by Closing

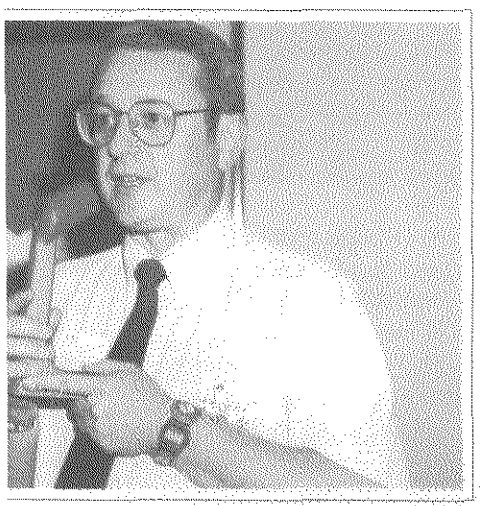


Photo by Carol Petrachenko

ɜentlemen, it's 4:30 p.m. and the Visitor ing -- forever," says Dr. Mark announcing the shutdown to center ɔer 31.

ularly volunteers. "There is nobody aware than I am of the debt of grati- ve owe each of you," he said. "There is ould have functioned without your d talented support."

e ceremony, certificates of apprecia- sented to Visitor Center volunteers and f The Bionetics Corp., which ran the

n, Holloway presented the Apollo 17 o Thomas P. Chisman, president and the Virginia Air and Space Center's ctors.

ing to build an Air and Space Center ou will all be proud of," Chisman said.

Other commemorations included an all-day "Blast-Off Saturday" on October 26, which drew more than 2,000 visitors, including the public and Langley employees, retirees and contractors. Researchers stationed throughout the center talked with visitors about Langley's latest projects, displayed exhibits, offered hands-on activities and distributed information.

The celebration also featured children's activities, aeronautics and space videos, games, balloons, space trivia and more.

Organizations that took part in the celebration included the local chapter of the National Space Society, the American Institute of Aeronautics and Astronautics Hampton Roads Section, the Langley Conservation Club and the Virginia Air and Space Center and Hampton Roads History Center.

An October 24 party recognized Visitor Center employees and volunteers. And an October 20 event gathered local Bionetics employees.

New center

The Virginia Air and Space Center will be supported by NASA Langley, the city of Hampton, the state and admission fees.

The center will showcase NASA artifacts and exhibits, offer a 300-seat IMAX theater, house a new NASA Teacher Resource Center and create an expanded aerospace education program for students and adults.

The new center is scheduled to open Sunday, April 5. Meanwhile, a transition center in the Hampton Visitor Center, 710 Settlers Landing Road, opened November 1. Hours are Sunday through Saturday, 9 a.m. to 5 p.m.

VISITOR CENTER FACT SHEET

History Highlights

1971: Visitor Center opens June 3.
1973: Apollo 12 capsule displayed in trailer next to center.
1974: Apollo Room built to hold Apollo 12, Lunar Orbiter.
1975: "Big Joe" Mercury boilerplate capsule displayed; Scott Apollo 15 suit replaces Shepard practice suit.
1976: "Tech House" built and tours offered. Family of four lives in the house for a year,1977-78.
1977: Apollo 17 lunar sample, "Good Will Rock," replaces Apollo 12 sample.
1978: Construction of Space Gallery doubles size of center.
1980: Apollo Room becomes new front entrance.
1981: Space Gallery officially opens; renovation of Aeronautics Gallery begins.
1982: First of three mobile exhibit vans, Aerovan 1, begins operation.
1984: Display of five Collier Trophies highlights new Aeronautics Gallery exhibits.
1988: Visitor Center sets peak one-year attendance, as nearly 230,000 visit.
1991: Center closes October 31 after hosting more than three million visitors.

Key exhibits/artifacts moving to Virginia Air and Space Center

- Moon Rock.
- Space suit.
- Apollo 12 spacecraft.
- Evolution of Aircraft display.
- Mercury capsule.
- Satellite models including:
  - ITOS (Improved TIROS Operational Satellite).
  - Landsat formerly ERTS (Earth Resource Technology Satellite).
  - INTELSAT IV (INternational TELecommunications SATellite group).
  - SMS/GOES (Synchronous Meteorological Satellite/Geostationary Operational Environmental Satellite).
  - OGO (Orbiting Geophysical Observatory).
  - Solar Max (Solar Maximum Mission).
  - HEAO (High Energy Astronomy Observatory).
- Lunar Orbiter.
- Viking lander model.
- Wright Brothers wind tunnel.
- C-5A model.
- Forward-swept wing model.

Operators

1971-74: Oklahoma State University.
1974-79: Calif. State University, Chico.
1979-84: The Bionetics Corp.
1984-89: J.L. Associates.
1989-present: The Bionetics Corp.

Employee Awards

The following employees have been honored with cash awards for special service:

Betty J. Maddrea, procurement clerk, Research and Services Contracts Branch, in recognition of outstanding support to the branch during the time the branch's procurement clerk position has been vacant.

John V. Foster, aerospace engineer, Flight Applications Division, for outstanding performance in group leadership and significant contributions in flight dynamics research.

The following employees have been honored with cash awards for a special act:

Bakori A. Davis, stay-in-school clerk/typist, Business Data Systems Division (BDSD), for demonstrated initiative and secretarial support to the Division.

Paul C. Davidson, computer systems analyst, BDSD, for exceptional performance and significant contributions in the selection, evaluation, and integration of new technologies into the BDSD computing environment.

Lisa Y. Yu, computer systems programmer, BDSD, for exceptional performance and significant contributions in the development and testing of the Business Resumption Plan for the BDSD computing systems.

The following employees have been honored with cash awards for superior accomplishment:

R. Bradley Gardner, Acquisition Division contract specialist, for assuming and professionally implementing additional workload assignments and responsibilities over and above those normally assigned.

Sallie Harvey, Acquisition Division contract specialist, in recognition of outstanding service and leadership in the award of supply, construction and AE procurements.

Panice H. Clark, Acquisition Division contract specialist, in recognition of outstanding leadership and contributions to the Projects Group during a critical period.

Timothy W. Towell, Materials Division materials research engineer, for outstanding performance and technical achievement in identifying, evaluating, and fabricating materials components and reflector panels in support of the Precision Segmented Reflector (PSR) program.

Joan G. Funk, Materials Division materials research engineer, for outstanding performance and technical achievement in identifying, evaluating, and fabricating materials components and reflector panels in support of the Precision Segmented Reflector (PSR) program.

Dr. John W. Connell, Materials Division materials research engineer, for outstanding performance and technical achievement in identifying, evaluating, and fabricating materials components and reflector panels in support of the Precision Segmented Reflector (PSR) program.

Dr. David E. Bowles, Materials Division materials research engineer, for outstanding performance and technical achievement in identifying, evaluating, and fabricating materials components and reflector panels in support of the Precision Segmented Reflector (PSR) program.

Dr. Stephen S. Tompkins, Materials Division materials research engineer, for outstanding performance and technical achievement in identifying, evaluating, and fabricating materials components and reflector panels in support of the Precision Segmented Reflector (PSR) program.

Charles R. Hyde, Flight Electronics Division (FED) electronics engineer, in recognition of excellent performance and flight instrumentation contributions to the Free-Flight Drop Model Research Program.

Carroll D. Lytle, FED electronics engineer, in recognition of excellent performance and flight instrumentation contributions to the Free-Flight Drop Model Research Program.

Leonard P. Kopia, FED aerospace technologist, technical management, in recognition of his contributions to the accommodation of major changes in scope of the CERES instrument development.

Otis S. Childress, Acoustics Division assistant manager, for his outstanding management skills and dedicated personal efforts in advancing Langley's Rotorcraft Program in the areas of Advanced Tiltrotor Transport Technology and Rotorcraft Noise Reduction.

Dr. David M. Winker, Atmospheric Sciences Division (ASD), for outstanding efforts in the development of lidar systems and scientific leadership for the Experimental Cloud Lidar Pilot Study.

Noah Scott Higdon, ASD electronics engineer, for outstanding achievement in developing and testing the airborne water vapor DIAL system.

Dr. Joel S. Levine, ASD senior research scientist, for outstanding contributions in organizing and carrying out an innovative research program in biomass burning.

Anne E. Overbay, ASD Aerosol Research Branch secretary, for exemplary secretarial support of the branch satellite and lidar programs.

Lee M. Avis, ASD, climate and radiation, for development of the spectral characterizations and instrument conversion algorithms which were vital to the archival of the ERBE climate data sets.

G. Louis Smith, ASD, climate and radiation, for major contributions to climate research through the development and analysis of a 10-year data set of albedo and absorbed solar radiation.

Bill R. Rouse, ASD physical science technician, for significant contributions to the Aerosol Research Branch's atmospheric lidar programs, instrumentation, and facilities.

John G. Wells Jr., ASD HALOE flight operations manager and HALOE science manager, for outstanding contributions and dedicated service in developing and carrying out HALOE flight operations plans.

Linda S. Warren, ASD computer engineer, for outstanding leadership of the SOLCON team in the development of on-board data acquisition and control software and ground data analysis procedures.

William L. Weaver, ASD deputy mission manager for operations, for outstanding dedication to the continuous on-orbit operations of the ERBE instruments.

H. Andrew Wallio, ASD research scientist, for superior achievement in the demonstration of the TRACER experiment as a scientifically significant methane measurement system.

Vickie S. Connors, ASD researcher, for superior achievement in the development of the TRACER definition phase activities of the Atmospheric Motions Working Group.

James L. Leuci, Instrument Research Division (IRD) electronics technician, for exceptional performance in the assumption of duties as technical monitor of the Langley ADPE maintenance support services contract effort.

Jon C. Currey, IRD electronics engineer, for superior effort in investigating and designing new open architecture data systems.

Michael C. Lightfoot, IRD, data systems project engineer, for exceptional effort in the conceptual design of an intelligent display controller system.

Dolores M. Kochman, Flight Management Division (FMD) certifying officer, in recognition of exceptional service and dedication within the Commercial Accounting Section.

Patricia J. Murray, FMD, voucher examiner, in recognition of exceptional service and dedication within the Commercial Accounting Section.

Marie W. Hall, FMD certifying officer, in recognition of exceptional service and dedication within the Commercial Accounting Section.

Harry D. Stough III, Flight Applications Division (FAD) supervisory aerospace engineer, for efforts leading to the publication of an outstanding retirement ceremony souvenir booklet.

Linda H. Park, Human Resources Management Division (HRMD), personnel assistant, for outstanding contributions to the Center's Awards and Suggestion Program.

Richard T. Bright, II, FAD resources management specialist, for coordinating activities which led to the successful development of an LaRC/DFRF Flight Research Monitoring Room.

Robert A. Rivers, FAD aerospace engineer and pilot, for outstanding contributions to the development and refinement of the HL-20 flight control system.

Robert T. Fults Jr., FAD primary avionics technician, for exceptional performance on the F-106B.

Frederick H. Austin, FAD quality assurance specialist, for exceptional performance as quality assurance representative for the B-737 Windshear Program.

Nathan R. Johnson, FAD quality assurance specialist, for exceptional performance as quality assurance representative for the Lear 28.

Gautam H. Shah, FAD research engineer, for exceptional contributions to aircraft tail buffet research including development of test techniques, identification of dominant causative flow phenomena, and development of alleviation concepts.

Martin R. Waszak, Guidance and Control Division (GCD) aerospace engineer, for superior performance in the design, analysis, and wind tunnel testing of an active flutter control law design for the Advanced Flexible Wing wind tunnel model.

Barton J. Bacon, GCD aerospace engineer, for contributions to mathematical model order reduction techniques for use in Control System Design procedures.

John D. Shaughnessy, GCD aerospace engineer, for outstanding technical contributions to Control System Design issues relating to flight of hypersonic vehicles.

David B. Middleton, GCD aerospace engineer, for superior performance in providing and documenting significant technical contributions in developing and evaluating the Take-off Performance Monitoring System Display.

William M. Adams, GCD aerospace engineer, for superior performance in the design, analysis, and wind tunnel testing of an active flutter control law design for the Advanced Flexible Wing wind tunnel model.

Carey S. Buttrill, GCD aerospace engineer, for superior performance in the development of analytically tractable mathematical models of the Advanced Flexible Wing used to demonstrate active flutter control.

Joyce E. Fly, FMD payroll supervisor, for recognition of outstanding service in the performance of assigned duties and extra responsibilities and workload.

Hatsue Mori, FMD clerk, for recognition of a high degree of dedication and support within the travel section.

Vasiliki (Vicki) N. O'Neill, FMD voucher examiner, for recognition of a high degree of dedication and support, which has contributed greatly to the accomplishment of the mission of the travel section.

Lisa M. Oliver, FMD accountant, for recognition of excellent service in the performance of assigned duties and the outstanding manner in which they were performed.

Patricia M. Borman, HRMD personnel management secretary, in recognition of willingness to assume work over and above the normal assignment.

Patricia R. Whitehead, secretary to the Director for Aeronautics, for superior performance of duties and contributions to the preparation of the Langley Research Center Aeronautics Strategic Plan.

Rosa M. Oseguera, Flight Management Division research engineer, for developing an analytical windshear model, encounter scenarios, and analysis results to be included in the FAA Technical Standard Order, TSO-C117, "Airborne Windshear Warning and Escape Guidance Systems for Transport Airplanes."

Sean M. Britton, Operations Support Division (OSD) engineering technician, for diligence and technical competence in support of operations at the 8-Foot Transonic Pressure Tunnel.

Mark L.M. Jones, OSD electrical engineering technician, for exceptional skill and dedication in supporting atmospheric sciences research.

Ellen M. Brantly, OSD electrical engineering technician, for exceptional skill and dedication in support of Acoustics Division sesearch.

Dr. John W. Wilson, Space Systems Division physicist, for significant contributions in radiation physics enabling practical shield designs for manned space missions, and for authorship of the Space Systems Division Best Paper for 1990-1991.

Eight More Langley Employees Earn Advanced Degrees, Bringing '91 Total to 28

Eight more Langley staff members have received advanced degrees in fiscal 1991, bringing the total to 28 for the year.

Twelve doctorates and 16 master's degrees have been earned.

Doctorates

Recently receiving doctorates were:

Neal T. Frink, Applied Aerodynamics Division, who received a doctor of philosophy in aerospace engineering from Virginia Polytechnic Institute and State University.

Patrick Minnis, Atmospheric Science Division, who received a doctor of philosophy in meteorology from the University of Utah.

Master's degrees

Master's degrees were awarded to six employees:

Linda S. Bangert, Applied Aerodynamics Division, received a master of science in aeronautics from The George Washington University.

Judith A. Hannon, Applied Aerodynamics Division, received a master of science in aerospace engineering from the University of Michigan.

Paul E. McGowan, Structural Dynamics Division, received a master of science in mechanical engineering from Old Dominion University.

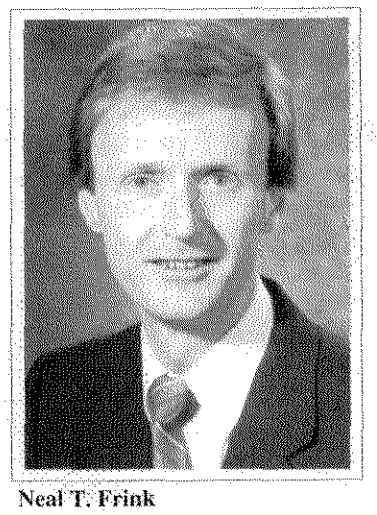
Scott A. Striepe, Space Systems Division, received a master of science in engineering from the University of Texas at Austin.

Alan H. Phillips, Systems Safety, Quality and Reliability Division, received a master of science in engineering management from The George Washington University.

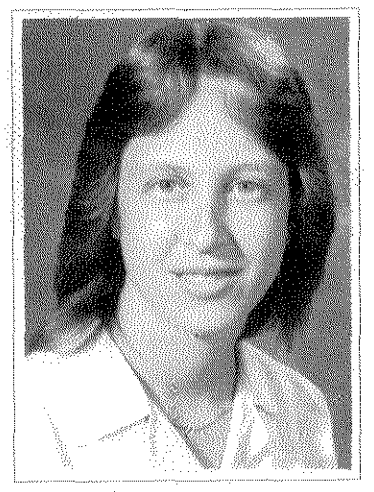
Travis L. Turner, Acoustics Division, received a master of science in engineering mechanics from Old Dominion University.

For information about the Center's Graduate Study Program, call George D. Allison, ext. 42594.

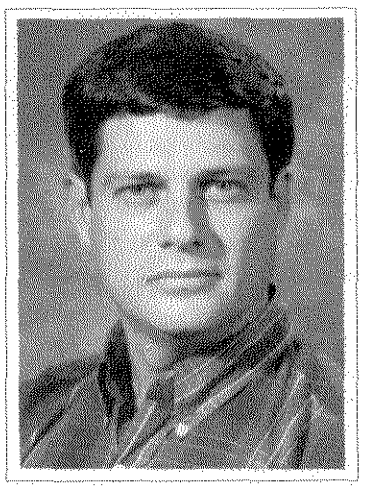
Linda S. Bangert



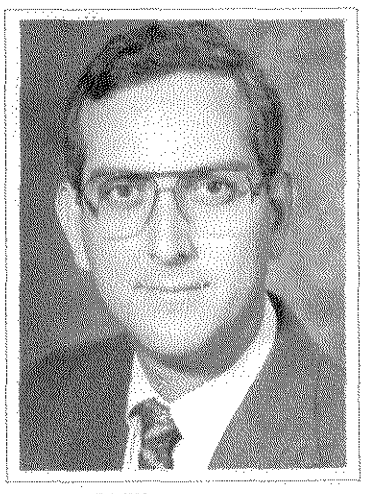
Neal T. Frink



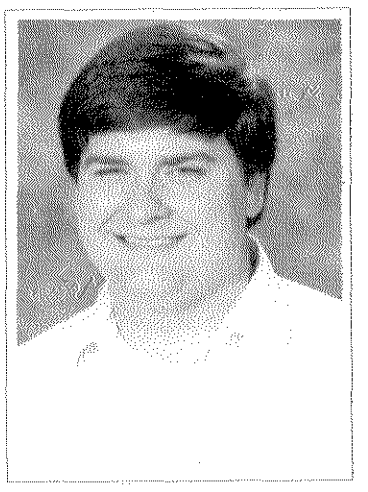
Judy A. Hannon



Patrick Minnis



Alan H. Phillips



Scott A. Striepe

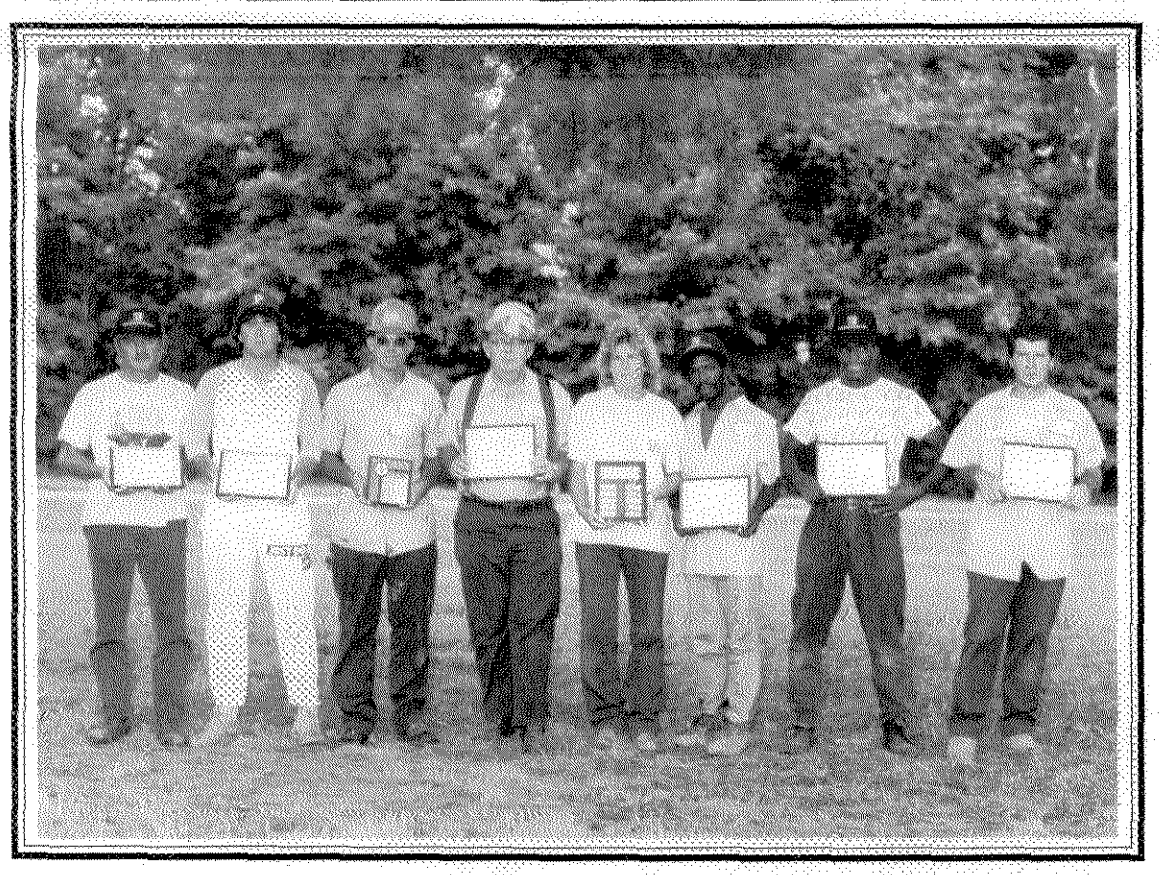


Photo by Clements C. Mayes

MLB Enterprises Inc. held an Employee Appreciation Day to honor its groundskeeping and pest control personnel at Langley. Recognized for outstanding contributions to the company's mission were, from left: Gerald Smith, job performance awardee; Robert Snyder, job performance awardee; Wally Moore, safety award winner; Jackie Trent, job performance awardee; Bonnie F. Hampton, employee of the year; Ernest Todd, job performance awardee; Joseph Mavin, job performance awardee; and Robert Pauley Jr., job performance awardee. Awards were presented by Michael L. Brittin, contract manager.

Supervisors Recognized at 16-Foot Anniversary Ceremony

Past and current supervisors were recognized during ceremonies marking the 50th Anniversary of Langley's 16-Foot Tunnel on November 14 at the H.J.E. Reid Conference Center.

Recognized were:

David J. Bierman, section head.

John V. Becker, section head.

L. Irving Turner, assistant section head.

Blake W. Corson Jr., branch head.

Jack F. Runcke, assistant branch head.

Charlie M. Jackson Jr., branch head.

William P. Henderson, branch head.

Laurence E. Putnam, assistant branch head.

Bobby L. Berrier, branch head (current).

Laurence D. Leavitt, assistant branch head (current).

Robert H. Turner, unit head.

James W. Burden, unit head.

Charles W. Miller, unit head.

O. Earl Shortt, unit head.

Ronald J. Logioco, unit head.

R. Michael Taylor, unit head (current).

News Notes

A SCHOLARSHIP has been established at Virginia Polytechnic Institute and State University in the name of Dr. Manuel Stein, a longtime Langley researcher who died in January. It will be presented annually to a graduate student who demonstrates the characteristics exemplified by Stein, whose doctorate was in applied mechanics. Scholarship gifts should be payable to Virginia Tech Foundation Inc. and sent to The Dr. Manuel Stein Fund, Office of University Development, 201 Pack Building, Blacksburg, Va., 24061-0336.

THE NEXT EDITION of the LaRC Telephone Directory is scheduled for publication in January. Submit changes to Management Support Division, Mail Stop 123, by November 22 to insure incorporation into this issuance.

A REMINDER THAT CALENDAR ORDERS cannot be requested on the same form as other stock supplies. Also, each branch secretary should submit branch and section requirements to reduce the number of requests for calendars.

Pinelli Receives Dissertation Award

Dr. Thomas E. Pinelli has been named a co-winner of the 1991 American Society for Information Science (ASIS) Doctoral Forum Award for outstanding doctoral research work in the information field.

Pinelli, assistant to the chief, Research Information and Applications Division, wrote his dissertation on "The Relationship Between the Use of U.S. Government Technical Reports by U.S. Aerospace Engineers and Scientists and Selected Institutional and Sociometric Variables."

Pinelli developed the dissertation while at Indiana University. When nominated, the dissertation was called "the best I have encountered" by Herbert S. White, distinguished professor at Indiana University.

Personnel Changes

The following key personnel appointments have been made at Langley:

David C. Beals, head, Structural Engineering Section.

Calvin C. Chandler, supervisory aerospace engineering technician.

Billy R. Ashworth, head, Analysis and Simulation Branch, reassignment.

Edward G. Carden, supervisory engineering technician, reassignment.

Richard W. Tyson, manager, National Aero-Space Plane Work Package Office, reassignment.

Happenings

LAA "GOBBLERS" SOCIAL will be held Friday, November 22, from 4 to 8 p.m. in the H.J.E. Reid Conference Center, 14 Ames Road. Music will be provided by Gator Allmond & Spice of Life. Admission is $1.

BODY DYNAMICS high-energy, low-impact aerobics classes are held Mondays, Wednesdays and Fridays at 6:15 a.m. in the LAA gym. Classes are open to civil service employees and are free.

LOW-IMPACT AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m., LAA gym. Cost is $12 per month. Bench step aerobics are held Saturdays from 9:30 to 10:30 a.m. in the gym. Cost is $6 per month.

NASA TOASTMASTERS meet the second and fourth Wednesday of each month in the H.J.E. Reid Conference Center. The next meeting is November 27 from 11:30 a.m. to 1 p.m.

FEDERALLY EMPLOYED WOMEN, Langley chapter, meets the last Wednesday of each month. The next meeting is at 11:30 a.m. November 28 in the cafeteria's executive dining room.

LANGLEY ALUMNI ASSOCIATION'S monthly get-together will be held Tuesday, December 10, in the cafeteria. Bill Kinard will discuss what has been learned from LDEF.

LAA NEW YEAR'S EVE DANCE tickets are on sale from 9 a.m. to 4 p.m., Monday through Friday, at the Activities Office, 14 Ames Road. Music will be provided by Foxfire. For more information, call Andrea Lewis, ext. 46369.

LAA TURKEY SHOOT will be held from 9 a.m. until dusk Saturday, November 16, at the Activities Center. Cost is $1 per shot. For information call Andrea, ext. 46369.

SKI TRIP to Lake Placid includes three days in upstate New York. Bus leaves 6 p.m. February 14, returns, 6 a.m. February 18. Cost is $265, including transportation, lift tickets, two nights lodging, two dinners and three breakfasts. Call Dave Hahne at 874-7414.

CHESAPEAKE BAY RAILROADERS will hold an HO scale-model open house, 10 a.m. to 5 p.m., Saturday and Sunday, November 23 and 24, at 110-C Dare Road, Grafton. No charge.

RENT: Denbigh townhouse at Victoria Station, 3 bedrooms, 2-1/2 baths, fireplace, storage, deck, alarm system, community pool, 1,650 square feet, $645 a month. Call 877-7088.

FOR SALE: 1975 Monte Carlo, excellent condition. Price negotiable. Call Julie Hedrick at 249-5686.

FOR SALE: 1976 Suburban, $2,000. Three-quarter ton, 305 V8, automatic, power steering and brakes, air conditioning, cruise control, AM/FM casette stereo, step-and-tow bumper, three seats, eight passenger. Also: Very fast Hobie Cat 16 and trailer, $1,500. McKibbon sails. Also: 1973 Volvo 1800ES coupe, $4,000. Four-speed, overdrive, air conditioning, stereo, good body, needs engine work. Parts-trade considered: 1-3 horsepower outboard motor. Call 596-6949 after 5 p.m.

AFGE MEETING, Local 2755, will be held at 4:15 p.m. Wednesday, November 20, in the Union Office Building, 8B Ames Road.

THE OFFICERS' CLUB is a membership club. Call 766-1361 for more information.

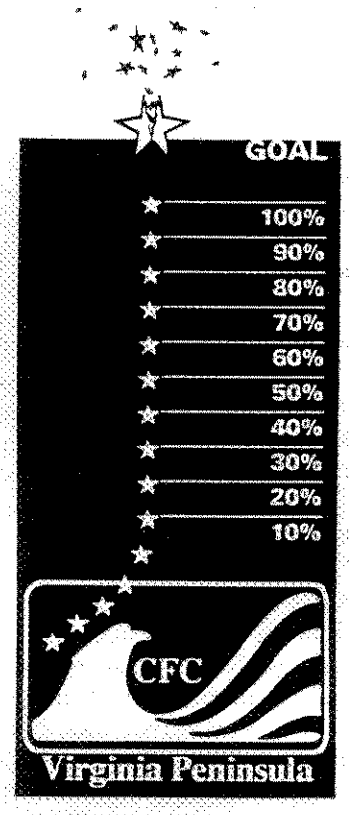
CFC's 1991 *Voice of Hope* Donations Set Center Record

Over the top!

These are words that any campaign chairperson loves to hear, because they signify that the teamwork and giving spirit of the participants have once again triumphed over apathy and lack of dedication.

Langley had a most challenging CFC goal this year -- $285,000.

Once again the people of Langley Research Center, including the Army Aerostructures Directorate and the Office of Inspector General, have shown that no challenge is too great when it comes to caring for the needs of our community and the world around us.



Highest total in history

I express my sincere appreciation to all who have contributed so generously to making this the highest Combined Federal Campaign total in Langley history, over $289,000 (and still rising!).

Through your efforts, we have truly become a "Voice of Hope" to our fellow citizens. I am proud to be associated with each and every one of you.

Thanks, Langley!

-- Bruce A. Conway
1991-92 CFC Chairman

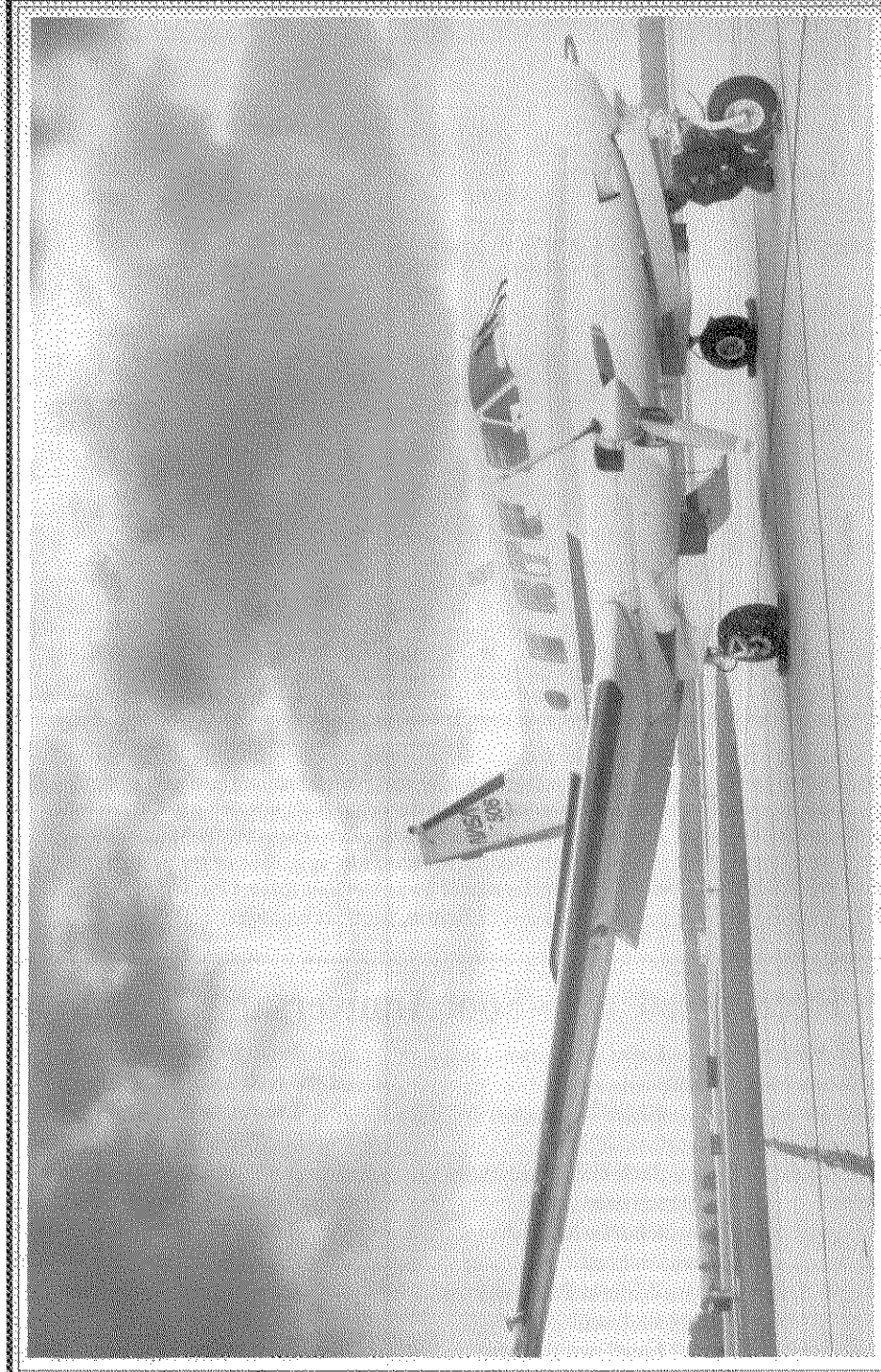


Photo by Fred Jones

Crew chief Bob Rule inspects the nose gear on a B-80 at the Newport News-Williamsburg International Airport. Four NASA aircraft have been deployed to the airport due to repairs being made on the runway at Langley Air Force Base. The other planes are a T-38, T-34 and U-3A. Rule and three other Lockheed employees at NASA Langley -- Bruce Foster, Leo McHenry and Lou Brown -- are assigned to the aircraft.

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 RESEARCHER,NEWS
VANVALKENBURG, RANDAL L.?
MAIL STOP 12SA BLDG 1268

News Researcher

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 24, November 29, 1991

News Researcher

Bi-weekly Employee and Contractor Publication

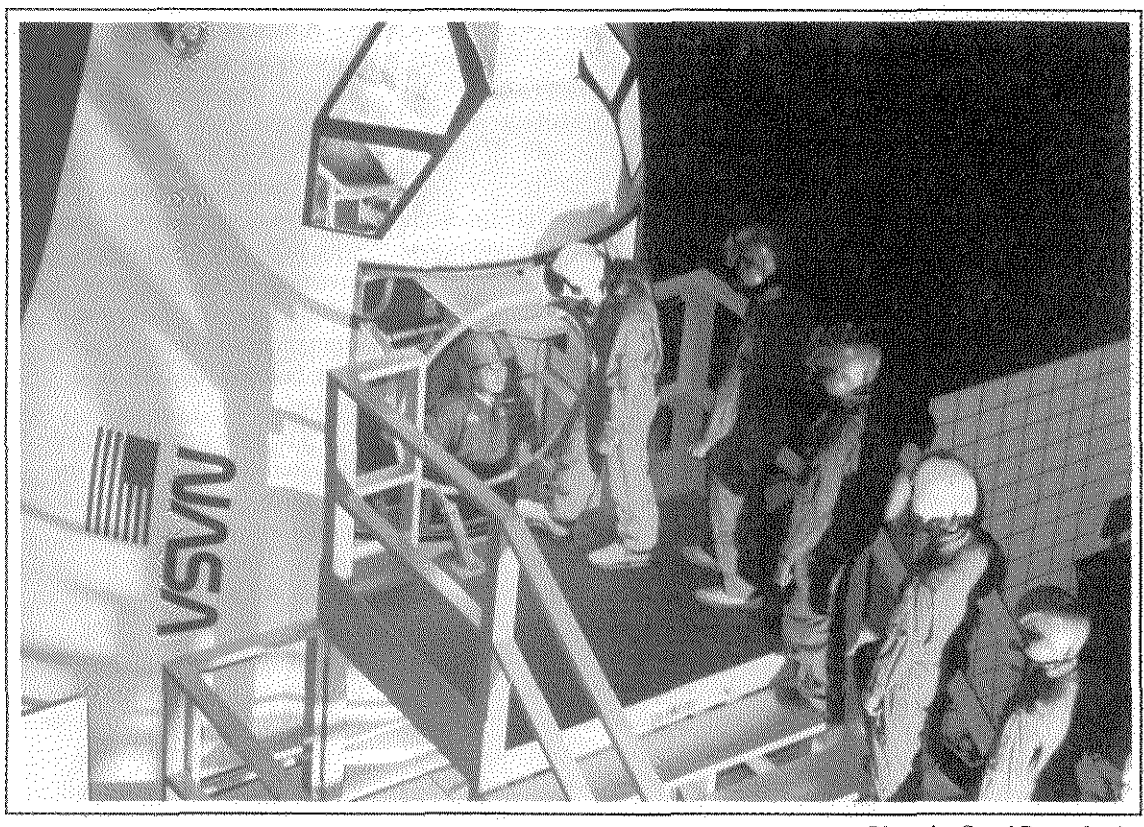


Photo by Carol Petrachenko

Study participants board the HL-20 model for human factors studies in the vertical mode.

HL-20 proving a good fit for astronauts

Horizontal study concluded and vertical tests underway

Human factors studies have been completed on the HL-20 model in the horizontal mode, and investigators say the spacecraft would provide a good fit for astronauts – with minor modifications.

"From those results, it was reasonably acceptable," said Dr. Kelli F. Willshire, one of two principal investigators studying the full-size research model for the Vehicle Analysis Branch, Space Systems Division. Lisa Simonsen is the other principal investigator.

The HL-20 is being developed as a candidate Personnel Launch System for ferrying eight crew members or cargo and two pilots on an approximately 12-hour voyage to and from Space Station Freedom. Crew members would be dropped off at the station. Pilots would stay about 36 hours at the station and then return to the launch site.

The human factors studies are examining how the pilots and crew would interact with the HL-20.

"It's a question of how small can you make it and still have enough room," said Willshire. "We want to make sure, for habitation, that people can accept it for 12 hours."

The horizontal study, which ran from March to May, used Langley volunteers as subjects. The participants, who ranged in height from 4-feet 10-inches to 6-feet 3-inches, were put through a series of tests investigating the spacecraft's design.

How quickly could crew members get in and out of the model? In what order should they enter and exit? Could an injured crew member be removed with standard equipment and methods? How did the seats fit people of different sizes? How adequate was the view from the spacecraft's forward windows? How well would the pilots fit in the cabin area?

The testing showed that:

- More side-head room is needed for the last row of seats to accommodate someone taller than 5-feet 7 inches.
- A 10-member crew has adequate volume to get in and out quickly and orderly.
- The absence or presence of 6- or 12-inch keels protruding into the aisle makes little difference in ingress or egress.
- The available volume and proximity to others is more than reasonably acceptable for a 10-member crew.
- For emergency personnel, volume is marginally adequate for standard equipment, especially with keels.
- A wider aisle, removable seats and more training may improve emergency personnel capabilities and performance.
- More downward viewing capability is needed for the pilot. A minimum of 17 degrees is required, but the nose of the spacecraft blocks viewing by about three degrees in the current design. Structural supports in the windows also reduce viewing.
- The cockpit display and seat design must be integrated with window placement.

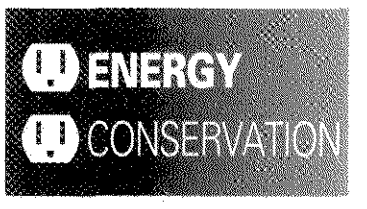
Photo by Carol Petrachenko

Fabrication Division engineering technicians work on the HL-20 in the vertical mode. From top to bottom are Steve Nevins, Gary Wainwright, Michael McGuire and Paul Daspit.

The HL-20 model now is being examined in the vertical mode, which would be its launch attitude. Willshire said she plans to conclude the study in December.

Willshire and Howard Stone, project manager, said they also hope to run through the study using partial-pressure suits from Johnson Space Center. Study participants have been using non-pressurized Langley flight suits and helmets.

Center Launches Campaign to Comply with President's Energy Reduction Order



In response to an order from President Bush, the Center has formed an Energy Conservation Tiger Team to reduce power use at Langley, and employees and contractors are being asked to help.

Bush signed an executive order in April mandating energy conservation in all federal facilities. The order directs specific energy reduction levels by fiscal 1995 and additional reductions by 2000.

"This is an order from the President, and we are very serious about its implementation," said Center Director Paul F. Holloway. "Energy conservation is one way we can all help reduce costs, conserve our country's natural resources and protect our environment from pollution."

The team is chaired by Ronald L. Baker, who has been named the Center's energy manager. The team reports directly to Robert L. Swain, director for the Systems Engineering and Operations Directorate.

The Tiger Team's charter is to formulate the Center's strategy for energy management and to develop implementation plans for energy conservation mandates. The team will define short-range and long-term energy reduction measures for existing facilities and guidelines for making new construction and facility modifications more energy efficient.

Targeted energies are those derived from fossil fuels and direct electricity.

Three goals

The President's order specifies three energy reduction mandates, with the first requiring compliance with a 1988 law setting a 10 percent reduction in energy use per gross foot of floor space by fiscal 1995 in non-mission variable facilities. A non-mission variable facility is one that does not directly perform or support research operations. Examples include office buildings, the library, the dispensary, and the cafeteria.

The order also mandates a 20 percent reduction in energy use per gross square foot of floor space by 2000 in non-mission variable facilities.

Finally, the order requires a 20 percent efficiency increase by 2000 for mission variable facilities. A mission variable facility is one that performs or supports direct research operations and has an energy consumption significantly influenced by research tests. Examples include wind tunnels, laboratories, compressor stations, the data reduction center and the aircraft hangar.

Energy consumption levels for fiscal 1985 will be the baseline for all reductions.

"This is a significant challenge. I hope everyone on Center will help us work toward these goals," said Swain. "We plan to aggressively pursue compliance with the President's order, and voluntary participation is, in my mind, an essential element for success. We probably will have to implement some involuntary controls at some point, but their extent will depend directly on reductions gained by employee participation in energy reduction."

Power use up

Langley's energy consumption has increased in the last several years. In fiscal 1991, the Center consumed 964 billion BTUs of total energy. Electrical power is by far the largest energy source, providing nearly 73 percent of the Center's total demand. In non-mission variable facilities, about 50 million kilowatt hours, or 55 kilowatt hours per gross square foot, were used in fiscal 1991. That number must be cut to 32 kilowatt hours per gross square foot, according to the President's order.

"Trimming more than 20 kilowatt hours per gross square foot is not going to be easy but I am convinced the team is capable of tackling this challenge," said Tiger Team Chairman Baker.

Biggest energy users

The proliferation of personal computers, and the installation of a Center-owned telephone system, are being studied to determine their impact on the growth in energy use. Since 1985, an additional 3,500 personal computers have been added on Center. The number of computer printers has risen by

See ENERGY, page 4

News Briefs

Low Trophy Winners --- Grumman Technical Services Division, Titusville, Fla., and Thiokol Corp., Space Operations, Brigham City, Utah, are the recipients of the 1991 George M. Low Trophy, NASA's Quality and Excellence Award. Grumman provides hardware and support services to the integrated launch team at Kennedy Space Center; Thiokol provides the redesigned solid rocket motor propulsion system that produces 80 percent of the thrust necessary for Space Shuttle liftoff.

NASP Competition --- Undergraduate engineering students at Mississippi State University in Starkville have won a competition coordinated by the Virginia Space Grant Consortium to build a 50-foot mockup of the X-30 National Aero-Space Plane (NASP). The NASP Joint Program Office, composed of NASA and Department of Defense officials, sponsored the competition to stimulate student interest in aerospace science and to provide an engineering education project tied to a cutting edge technology program. The one-third scale mockup will be displayed at major aerospace shows and exhibitions throughout the United States.

Core Research Center Grants --- Seven historically black colleges, including Hampton University, have been chosen by NASA to receive Core Research Center grants to further develop their research capability and infrastructure. Each of the colleges will receive about $500,000 for the first year and may be funded for up to five years. Colleges include Clark Atlanta University, Atlanta; Fish University, Nashville; Florida A&M University, Tallahassee; Howard University, Washington, D.C.; North Carolina A&T State University, Greensboro; and Tuskegee University in Alabama.

Essay Competition --- The National Space Club has announced the opening of the Robert H. Goddard Historical Essay Award Competition for 1991. Essays should be forwarded to the club by December 13 to the Goddard Historical Essay Contest, National Space Club, 655 15th St. N.W., Suite 300, Washington, D.C. 20005. All U.S. citizens are eligible. Winners receive $1,000 and a plaque. For more information call Linda Plato on FTS (88) 453-2622.

Editor's note: To obtain a copy of any of these NASA Headquarters News Releases contact Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request information summarized above by headline printed in bold.

Senior Management Research and Review Agenda

The Senior Management Research Review will be held Monday, December 16, from 9 to 11 a.m. at 17 West Taylor Road, Subsonic Tunnels Offices, Room 200. All employees are invited to attend. Program accomplishments will be given by the following Langley scientists:

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:00	The Effects of the Pinatubo Volcanic Eruption	Dr. M. Patrick McCormick (ARB, ASD, Space)
9:15	Proof-of-Concept Test of the Doppler Global Velocimeter	James F. Meyers (LVS, IRD, Electronics)
9:30	Rotor Flow Field Investigation	Susan L. Althoff (SAB, AAD, Aeronautics)
9:45	Toughening of PMR Composites by Gradient Semi Interpenetrating Networks	Dr. Norman J. Johnston (PMB, MD, Structures)
10:00	Coherent Launch Site Atmospheric Wind Sounder (CLAWS)	Dr. Daniel D. Moerder (SCB, GCD, Flt. Sys.)
10:15	Wide Field-of-View Binocular Helmet-Mounted Display (HMD) Developed for Pilot/Vehicle Interface Studies	James R. Burley II (CTB, FLTMD, Flt.Sys.)
10:30	Director's Comments	

Following these presentations, the program directors will give status reports.

Center Sets Safety Record

The Center has experienced its best year ever for safety, according to the Risk Management Branch, Systems Safety, Quality and Reliability Division.

Support service contractors had a lost time rate of 0.67 accidents per 200,000 hours worked, well below their fiscal 1991 goal of 0.82. It is the first time the contractor rate has been below 1.0, with the previous low of 1.08 in 1989.

A total of 15 contractor lost time accidents occurred in 1991 – 10 fewer than in 1990 – and none of them were significant mishaps.

"Certainly, this has been their most successful year regarding safety," said Bill Wessel, safety manger and head of the Risk Management Branch.

The civil servant staff had eight lost time accidents for a rate of 0.29, also below the 1991 goal set by Headquarters. An electrical shock/burn accident at the Unitary Tunnel Substation was the only major personal injury.

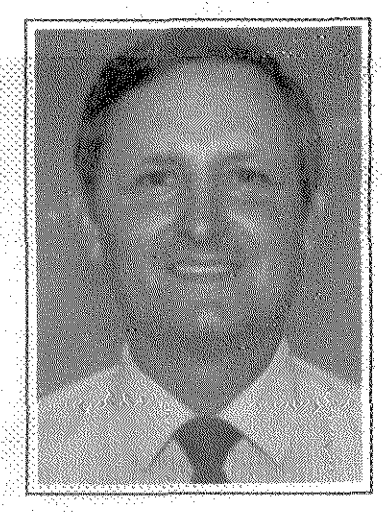
"The injured party is expected to have full recovery, and that speaks well for the efficiency of our accident/incident response team," Wessel said.

A total of $96,000 was lost in equipment and property damage in 1991. The most significant loss – $56,500 – was a model and a survey rake at the Eight-Foot Transonic Pressure Tunnel.

"In a research environment, with facility and equipment inventory in the billions of dollars, it is significant that equipment and property losses were below $100,000" said Wessel.

"The case can be established that, statistically, this was the best safety year ever experienced at the Center," he said. "The success is attributed to the safety culture at Langley. Without all Center employees working together for a safe and productive research environment, successes like this could never be possible. All employees can take pride in this accomplishment. We are challenged to improve this record. A zero lost time and mishap occurrence year remains our ultimate goal."

In Memoriam: James C. Ward



James Clark Ward Jr., 50, an aerospace engineer in the SAFIRE Project Office, died November 13.

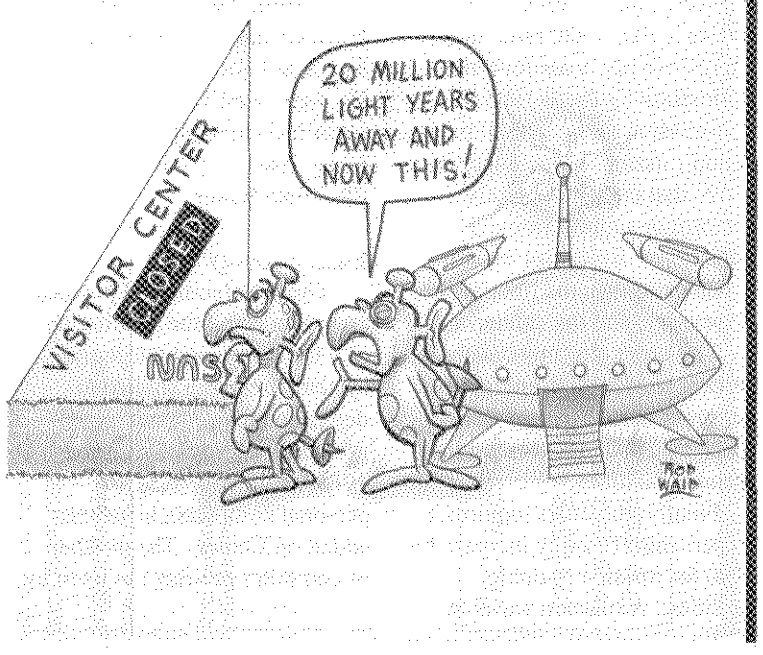
"Jim was a hard worker who was very thorough and professional in his job," said Jon L. Van Cleave, assistant chief, Systems Safety, Quality and Reliability Division. "He started work in the Rocket Test Area, moved to the Viking Project and was assigned to the Scout Project for the last 11 years. Jim made many major contributions to the Scout Project and received numerous awards.

"Jim was a friendly, warm person, had a variety of interests and made friends easily. He was a devoted family man, active in his church and community affairs. He will certainly be missed by his co-workers and friends."

Ward was a native of Sparta, Tenn., and had been a Peninsula resident for 28 years. He was a past president of the Tabb High School Athletic Boosters and coached in the Grafton Youth Football League and the York County Youth Basketball League.

Memorials donations may be made to Mary Immaculate Hospital, Hospice Unit, 800 Denbigh Blvd., Newport News, Va. 23603; or the American Cancer Society, 618-C J. Clyde Morris Blvd., Newport News, Va. 23601.

Lankley



Christmas Shop to Open Dec. 9

The NASA Langley Exchange Shop will open its Christmas Shop in the cafeteria on Monday, December 9.

It will be open through Friday, December 20.

The shop's hours will be from 10:30 a.m. to 2 p.m.

Register to win a four-foot Paddington Bear, which will be given away December 20.

Tickets for the bear are available through December 20 and are 50 cents each or three for $1.

For more information call Cheryl at ext. 41585.

Thank you:

The family of **LeAnn Ashcom** wishes to express their appreciation for the support and the many expressions of sympathy in the form of cards, letters, flowers and visits following her recent death.

From **Barbara Murphy:** A word of thanks to all those who so kindly donated annual leave to me so that I could be with my daughter during her final hours. May God bless you.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Michael Finneran

Photojournalist ..... Carol Petrachenko

Photographer .....Fred Jones

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Langley's New Director May be New to the Job, but He's No Stranger

In October, Paul F. Holloway was named director of Langley Research Center, succeeding Richard H. Petersen, now associate director for the Office of Aeronautics and Space Technology. Holloway was interviewed about his new job by Daily Press reporter Kirk Saville. This is a condensed transcript of their conversation.

Q&A

Photo by Carol Petrachenko

Paul F. Holloway: "I won't fall into the trap of 'This is the Langley way and you must do it this way.' There are many of us here constantly seeking new ideas. I think it is important."

Tell me a little about what you want to do now that you're in charge.

I don't anticipate any major changes at all, which is good because I still work for Pete. Langley, on balance, is in great shape. We don't have any major problems in any programs and we have a lot of opportunities in the future. Just today, for example, the Aerospace Engineering Board is visiting Langley. They are reviewing the high speed research program, which is aimed at laying all the technology for the next generation SST to make it a profitable and environmentally acceptable supersonic transport. It is very clear that this program at Langley is needed.

We just put up the HALOE instrument on the Upper Atmosphere Research Satellite. It's working great. We're beginning to get measurements for scientific interpretation.

We're off and running on building the next generation radiation budget and prime instruments for the Earth Observing Program. We're directed to restructure that program, and as everything is restructured, to do some of the things Langley is responsible for faster, because the overall program is slipping and they want to get some instruments in orbit. We've just been asked by the National Aero-Space Plane program to provide some people to assist them.

As things get tight in the agency, the research centers usually rise to the top and get more attention, and the work we're doing is even more important as budgets become tight and because we can provide options for the future.

How are you going to go about running Langley? Some people tell me that you are technically demanding.

I tend to try to be very selective in people and in making assignments to people whom I have very high confidence in, and then my style is to get out of their way and let them do it. I think that has paid off very well for me over the years. We have a fantastically talented staff. I said when the announcement was made (about his appointment as Center director) that it was both frightening and very soothing to think about what Langley represents. I think it's clearly the best aerospace research operation in the world, and it's an awesome responsibility. We have really unique people at the Center. It's soothing because I can't think of a single thing that they've asked us to do that the Center can't do. We have a very strong in-house technician work force. For example, Bob Swain likes to say that if you can conceive of it and draw it, we can build it, and he's done that. We've built a number of space experiments in-house that have flown, including the HALOE instrument. LITE is being put together. LASE is actually even more complex that LITE because it has to be totally automated, and for a really complicated laser system to be totally automated will be a first. We built the ACCESS experiment that was flown on the Shuttle in '85, and the astronauts were able to build a 50-foot Tri-stand of 131 pieces in 29 minutes, and that's quite an accomplishment.

Are you kind of informal with your people?

I think so, but then you tell me that I'm technically demanding. I wouldn't say that either, but I probably am. I don't deny it. I feel very comfortable with all of our employees. We're talking with new employees about having mentors assigned to help them develop. When I first came here, I worked in an experimental program and these people had so much experience. The mentors were primarily the technicians. The technicians took the young engineers under hand and taught them how everything worked and how to get things started. So I feel very comfortable with all of our work force, particularly so this year.

My wife told me that when it was announced that I was going to be director, she was inconspicuously sitting in the back of the auditorium with Sid Pauls. As they were leaving, a group in front of her said "This is really going to be great . . . we don't have to wear ties anymore and maybe we can arrange for jeans."

You're been around here for a long time, haven't you?

Thirty-one years plus.

Does that give you an advantage?

I think it could be both an advantage and a major disadvantage. I'm fortunate in that since '67 I've been working on major intercenter assignments. So I have worked at all the NASA centers. I've been detailed to Washington twice, once for four months. I spent a month on the West Coast in the Air Force Space Division — that was in '69. Then in '77, I spent five months in Washington. I've done congressional testimony. I've had cooperative programs with all the other centers. From that standpoint, I don't think there is a problem. I think periodically it's good to have someone come in who is a familiar employee from the Center.

Is there any concern that in Washington you will be thought of as "That Langley guy?" Is that a disadvantage?

I think that is a disadvantage that is frequently talked about. I don't think that is a problem here. Certainly there has been no indication from anybody that I talked to, and I don't think anybody has ever felt that way that I've worked with. The concern, though, is that you get into a set way of doing things and that you don't want to consider new approaches or new options. I've never worked like that. In fact, in one of these personality assessments that Don Hearth liked to use, one of the bottom lines on me was that I would change things just for the sake of change rather than continue to be familiar. I don't think that's a problem. I think Langley is well respected in the agency because we know and accept our role. There are programs that we need not only for NASA but for the country, like leading the Global Tropospheric Environment (GTE) program. We need that for the agency and it is an international program, and so we're program managers.

Is that SAFARI?

No, you're thinking of SAFIRE. That's an instrument that has three other countries involved in it. We first started by going into the Brazilian rain forest a few years ago. Just recently we completed the PEM mission, which is the Pacific Exploratory Mission. We're conducting these things all over the world. So we frequently have major leadership roles and are very comfortable doing that. By the same token, we provide detailed support to other centers and frequently to the DOD (Department of Defense), and it is very clear that we're in the supporting role. It's accepted and everybody works just as hard as if they were running the program. We had a visit recently from a senior NASA official who said that he had a program that involved four centers and needed an evaluation across the program. No one of the centers would accept any of the other three in playing that role. But they were all very comfortable with Langley doing it, and asked us to play that overall evaluation role. We did it and are still doing it today. So I think the agency in general, the people, are very comfortable working with Langley and I don't think that will be a problem at all.

How did you get involved in aeronautics and what was it that interested you in college or before then?

My degree is in aeronautical engineering. They changed the program to aerospace the year after I graduated, though I've worked in the space program ever since I've been here. I guess you can say that it's all my wife's responsibility. I got married when I was 18 and she worked and put me through college. I did not build model airplanes when I was young or anything like that. I actually had no thought of going to college, but she thought I definitely should go to college, so I applied to U.Va. and to Virginia Tech, and aeronautical engineering at that time was alphabetically at the top of the list, and I was interested in engineering because math was one of my better subjects. It's really just as simple as that. Not inspiring at all.

I talked to some people who

See Q&A, next page

Q&A

Continued from previous page

said that Sputnik sort of motivated you.

I had just started my sophomore year at Virginia Tech when that was launched, and that's one of those events that you will always remember where you were. I was in economics class, which I hated, when they announced it. But that really generated a tremendous amount of interest and determination on the part of the aero students in particular. One, that we had chosen an exciting area to work in, and two, that we would stay with it.

When you went away to college did you want to come back and work at Langley?

Not originally, no. I am very glad I did. I said years ago when the Shuttle was launched, the first Shuttle, that the really unique thing about this work is that this is one of the few fields where you can identify people who are unquestionably rated as the top in the world at what they do. There is no such thing as the best lawyer in the world or the best doctor or the best anything else. But in the aerospace world there *are* the best in the world. I have really felt honored to have had the opportunity to work with people like that.

You did a lot of work on the Shuttle. Is there anything about the Shuttle that disappoints you?

It's not so much what the Shuttle is, it's what we made it. The Shuttle, technically, is almost a miracle. The whole premise required that it be operated like an airline. The whole premise was that many flights would drive the cost down. And yet the operation has to be sized for whatever the peak workload is. It's a very inefficient way to have to operate. I think the one thing we've learned an awful lot about is how we can drive costs down, but you don't do it by maximizing performance, you do it by making it robust and easily maintainable and easily accessed.

To a lot of critics, this Shuttle is sort of the focus of all NASA's sins or evils. Tell me a little bit more about what you've learned and what the Shuttle shows you.

The fact is, you can realize it's never been done before and it still hasn't been done. The Russians have announced that it (shuttle Buran) was damaged during return and will not fly again. This design is a Langley designed double-delta platform. The fact that, from the point it enters the atmosphere, it flies 5,000 miles and lands on a little tiny runway with no propulsion - that's a fantastic accomplishment. Then it turns around and flies again. The problem has been that we could not set up a system to get the number of flights that was required to make it more cost effective.

The word I often hear was that the Shuttle was compromised because of budget cuts.

Budgets do drive technical decisions. I don't know if we'll ever get out of this box, but we accept compromises during the development phase of the program and pay for it with increased operational costs. We're doing that right now on the Space Station. We take out things that would reduce the operational cost because they cost money up front. It's a Fram oil filter thing – you pay me now or you pay me later. The political system in this country, for any government investment, wants you to pay later. The congress is elected for two-year horizons and the Space Program requires a long horizon. You can't do anything quickly.

Does that drive you crazy? Because you're the people who have to live with it. The congressman who said "Let's cut the Shuttle budget for 1972" doesn't have to answer questions about the Shuttle today.

A lot of them were in the Senate and they're gone. Yes, it gives you problems, but we still think that, overall, what we're doing is really in the best interest of the country. I mentioned earlier the HALOE instrument on the Upper Atmosphere Research Satellite. We will measure hydrogen fluoride molecules and hydrogen chloride molecules. One of them occurs naturally; the other is manmade. By looking at the relative amount of each of those over a period of time, we'll know whether man's impact on the ozone is greater that what naturally occurs. It took us a long time. The budget was tight in that program too. It's launching a lot later than what we hoped. But still it's a goal well worth pursuing.

Is there a program that you look back on in your career that you're most proud of your contribution to?

The Shuttle certainly, because where we impacted the program, the decisions that were made were good decisions — the shape of the vehicle, the land-landing capabilities, the way it's used.

Secondly, the atmospheric sciences program at Langley. Those are the two things I've been most closely coupled with personally. The atmospheric sciences program was built from scratch in the early '70s into a program that was recently described to the NASA Advisory Council as being of a quality that would be the envy of any university in the world. There is generally an opinion that all the best science is done in universities and that the NASA scientists are kind of second rate. This outside review group said that wasn't true in general. They used language about the atmospheric sciences program as an example of "world class." We've got a lot more coming. We will play a major role in this aero-space plane if that goes ahead, and that is going to really set the stage for what happens at the turn of the century in new transportation systems.

One of the criticisms of NASA has been that there's a shortage of people between the age of 35 and 45.

What happened is that we had a great deal of hiring in the early '60s when we built up for Apollo. In '66, '67, the peak of the manpower requirements for Apollo were over even though we hadn't landed on the moon yet. So we weren't able to hire; that's why we don't have people in that group. Langley cut an average of about 120 to 130 people a year in staff for an extended period of at least 10 years. If we had a stable work force we would have hired 1,200 people who would be in that 35 to 45 age group right now. But we did that without ever having to fire anyone. There was really never a reduction in force here. At the Marshall Space Flight Center they had a reduction in the force of several thousand people in one year. From that standpoint I think we were lucky. We do have a shortage in that age group as a result, but it's not because people were leaving disenchanted with NASA; we just didn't hire at that time.

Did you ever consider leaving NASA?

Not really seriously.

Do you miss being a researcher?

From a supervisory standpoint, the job I enjoyed the most was being a section head, because that is where I had the most direct contact with the researchers. I think I'm pretty much of a realist. I think I quickly realized my limitations as a researcher.

You must like it here – you said you like change for the sake of change.

The way I do things personally, I don't do them the same way very many times. My point is that I won't fall into the trap of "This is the Langley way and you must do it this way." That's generally what people worry about when someone works at the same place for their whole career. There are many of us here constantly seeking new ideas. I think it is important.

***ENERGY**, continued from page 1*

about 2,600, and work stations by 235. Initial findings indicate that these devices are not the "tallest poles," but they are definite contributors with a double penalty because the heat they generate must be removed by air conditioning.

Lighting and air conditioning are the largest consumers of electricity in office buildings. More efficient methods for controlling lighting and air conditioning will be examined, including direct digital control for heating, ventilation and air conditioning systems, and occupancy sensors for lighting control.

The Tiger Team's current focus is on gathering data for developing action plans to address the 1995 mandate. A survey of non-mission variable facilities is underway, as are laboratory tests of high-efficiency lighting systems and control methods.

A second study is underway to identify additional power measurements needed to monitor and understand the electrical energy flow at the Center, particularly in non-mission variable facilities.

"The 1995 date puts urgency in the Center's actions for compliance," said Baker, the Tiger Team chairman. "Center personnel cooperation is paramount in achieving these goals. No one knows their facilities' operations and office practices like the employees who work there, making them the best source for identifying energy reduction opportunities. We're encouraging each employee to submit conservation suggestions to me, and actively support this effort by turning off all electrical devices when not needed – particularly before leaving in the evening."

Baker added: "The Tiger Team is seeking solutions that do not unduly compromise productivity or personal comfort. The use of new technology and automated controls will improve efficiency, but most likely won't be enough to achieve the reduction goals. That's why daily conservation measures taken by each employee will be a strong factor in the final reduction actions that must be imposed."

Team members

Tiger Team members are: Albert H. Bell, Robert L. Charles Jr., Alan B. Clark, George E. Geiger, Robert F. Graham, Joseph Getsug, Carl E. Horne, Marshall D. Johnson, Jerry M. Nichols, Alan H. Phillips, Robin K. Rubrecht, Donald B. Shortt and Charles M. Southall III.

The progress of the Energy Conservation Tiger Team will be reported periodically in the **Researcher News**.

Video Seminar to Focus on Job Commitment

"Building High Commitment in the Workplace" is the subject of the December video seminar offered in the Empowerment Series by Executive Communications Inc.

The video will be shown live December 11 from 2 to 3:30 p.m. via satellite on a first-come, first-served basis.

This month's video illustrates the major structural changes that will drive successful organizations in the future. It provides maps for focusing organizational strategy, building trusting relationships and renewing individual competencies.

The presenters are Dr. Dennis Jaffee and Dr. Cynthia Scott, both authors and leaders in the field of organizational change.

To enroll, submit an Application for On-Site Training Form (NASA Langley Form 24) to Kim M. Dobbs, Mail Stop 309.

The forms are available from the Employee Development Branch, ext. 42597, or from your training coordinator.

PTA to Hold Annual Book Fair on Dec. 4 and 13

The NASA Langley Child Development Center PTA will hold its annual book fair from Wednesday, December 4, through Friday, December 13.

Children's books, cassettes and video tapes will be available for purchase at the LCDC Building, 8 Lindbergh Road (next to the credit union and the hangar) from 11 a.m. to 1 p.m. and 3:30 to 5 p.m.

A sales table will also be set up in the cafeteria Tuesday through Thursday, December 10, 11 and 12, from 11 a.m. to 1 p.m. MasterCard, VISA, American Express and Discover credit cards will be accepted. For more information, call Michelle Ferebee at ext. 45617 or Linda Hunt at ext. 45856.

People & Places

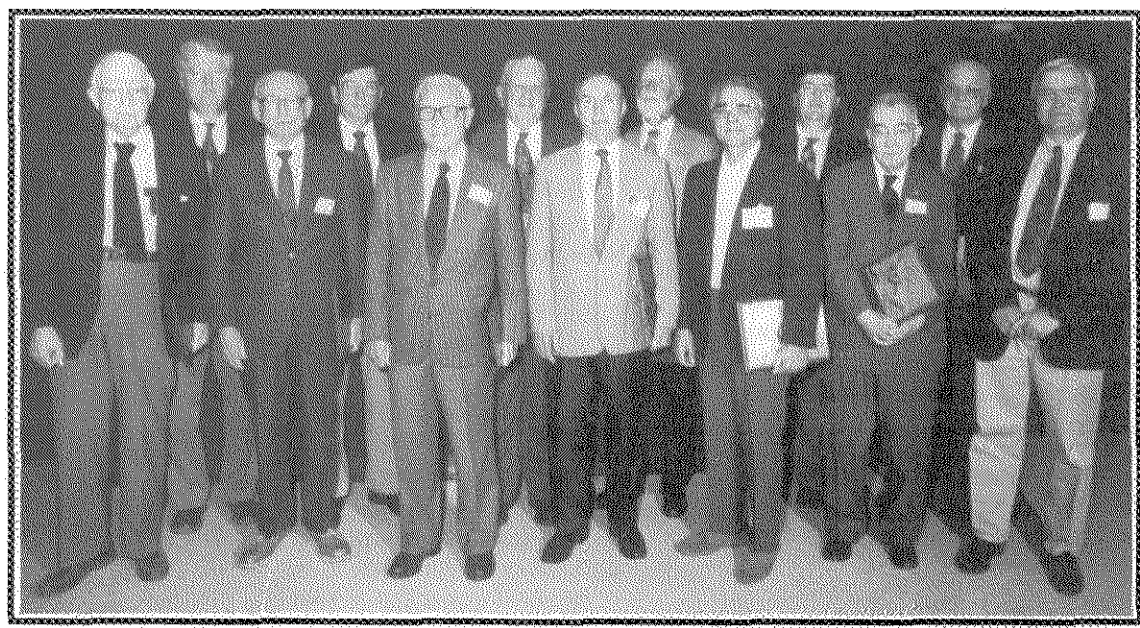
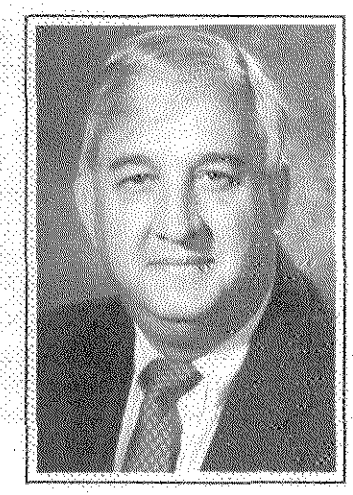


Photo by Alphonso Perabeles

PAST AND PRESENT supervisors at the 16-Foot Tunnel were recognized at the facility's 50th Anniversary Celebration on November 14. And a spruce gavel made from an old fan blade was presented to the Virginia Air and Space Center. RIGHT: Supervisors included, from left, L. Irving Turner, William P. Henderson, Robert H. Turner, Lawrence E. Putnam, John V. Becker, James W. Burden, O. Earl Shortt, Charles W. Miller, Ronald J. Logioco, R. Michael Taylor, Blake W. Corson Jr., David J. Bierman and Bobby L. Berrier. ABOVE: Berrier (right) and Pete H. Veneris, Fabrication Division, present a gavel crafted by Veneris to Thomas P. Chisman, president and chairman of the board of the Air and Space Center.

Photo by Fred Jones

Thames is Assistant Chief, Analysis and Computation



Frank C. Thames has been named assistant chief, Analysis and Computation Division.

In this position he is responsible for assisting in planning, directing and coordinating the research, development and operational activities that provide Center-wide support and applied research programs in scientific and engineering computing, experimental data reduction, real-time flight simulation, graphics software, data communications and network systems.

Thames previously was chief engineer, Fluid Mechanics Division, a position he held from 1989 to 1991. He began his NASA career at Langley in 1980 as a senior research scientist in the Theoretical Aerodynamics Branch and continued in that position until 1989.

Prior to joining NASA, Thames worked for the Vought Corp., in Dallas, where he conducted military aircraft/weapon compatibility studies using analytical and experimental techniques.

Thames has won three group achievement awards, three special achievement awards and one superior accomplishment award. He has authored more than 20 technical publications.

Thames received his doctorate in aerospace engineering in 1975 from Mississippi State University. He also received a master's of science degree in aerospace engineering in 1967 and a bachelor of science degree in aerospace engineering in 1966, both from Mississippi State.

Hook Named to International Academy of Astronautics

Director for Space W. Ray Hook has been elected to the International Academy of Astronautics. The Paris-based academy, which has 1,100 members in 58 countries, named Hook a corresponding member of Section 2 (Engineering Sciences).

Hook has overseen space research at Langley since October, 1988. He is responsible for advanced space transportation, planetary entry, Space Station Freedom, large space antenna research and Langley's atmospheric sciences program.

Hook began his federal career at Langley in 1955 as an aeronautical research intern. After serving in the Air Force, he returned to Langley as an aerospace engineer and was project co-engineer on the Trailblazer II Program.

As study manager for the Manned Orbiting Research Laboratory Office, Hook helped develop space station concepts, flight experiments and operational procedures that were adapted for the Skylab Program. In 1966, he was named assistant head of the Advanced Aerospace Studies Branch and, later, head of the Systems Analysis Branch. Hook received a bachelor of science degree in mechanical engineering from North Carolina State University in 1955.

He is the author or co-author of many technical publications and has served on several NASA committees. He has received numerous NASA awards, including the Presidential Rank of Meritorious Executive in the Senior Executive Service in 1989 for his outstanding contributions to the management of NASA programs.

Approved Leave Transfer Recipients

The following employees are approved recipients for the Voluntary Leave Transfer Program:

Manjula Y. Ambur
Linda E. Edmundson
Gael M. Hawkins
Barbara F. Murphy
Cassandra D. Stevens
Noel A. Talcott Jr.
Catherine B. Worth.

Aeroassist Project Victim of Budget Cuts

Congressional cuts in NASA's 1992 budget have forced the termination of contracts for work on the Aeroassist Flight Experiment project at Langley and other centers.

At Langley, about 25 civil servants and contractors were involved in the project, accounting for roughly $3.5 million annually in the $200 million project, said W. Ray Hook, director for space.

"For the most part, all of the civil servants have reassignments," Hook said.

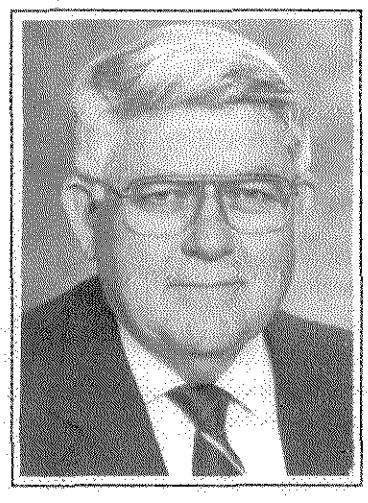
Hook called the termination "the result of a continuing congressional assault on the space exploration initiative. Because of this, we're going to miss having some flight data that you can't get any other way."

The project began in 1987 and was designed to acquire data to expand the technology base for use of aerobraking by spacecraft returning to Earth from lunar or other high-energy orbits.

Hook said certificates of appreciation were awarded to project employees at a November 18 luncheon.

Prior to that, certificates of appreciation were given to project employees who worked in the Space Directorate.

"We needed to say 'Thanks



for the good work even though you didn't get to the culmination of the goals you set for yourself'," Hook said.

Langley was working on four experiments:

◆ FACE, or Forebody Aerothermal Characterization Experiment, consisting of an array of temperature sensors – thermocouples – located below the tile coating of the aerobrake thermal protection system. Temperature histories obtained during the aeropass were to have been used to determine total forebody heating and the convective heating component.

◆ PD/ADS, or Pressure Distribution/Air Data System Experiment, consisting of an array of pressure orifices in the aerobrake and associated transducers for pressure data acquisition during the aeropass. The pressure data information was to have been used for computational fluid dynamics code validation and for the air data determination for post-flight performance evaluation.

◆ MRIS, or Microwave Reflectometer Ionization Sensor Experiment, consisting of a four-frequency microwave range-measuring system at the stagnation region on the AFE aerobrake. The system was to have measured wave reflectance and phase during the aeropass to determine both critical electron density and distance from the aerobrake for computational fluid dynamics flowfield characterization.

◆ RAME, or Rarefied-Flow Aerodynamic Measurement Experiment, consisting of high resolution triaxial and angular accelerometers and rate gyros aligned to the AFE axes that would supplement the baseline accelerometer and gyros to provide data in the transition and free-molecule flow regimes. These data were to have been used to accurately determine vehicle aerodynamic coefficients in these low-density viscous flight regimes.

Hook said that two of the experiments – PD/ADS and FACE – "for all practical purposes were completed."

Employee Awards

The following employees have received cash awards for job performance:

Patricia M. Borman, personnel staff and class specialist, Human Resources Management Division, in recognition of her willingness to assume work over and above her normal assignment.

Dr. Lawrence W. Townsend, Space Systems Division (SSD) physicist, for significant contributions in radiation physics enabling practical shield designs for manned space missions, and for authorship of the Space Systems Division Best Paper for 1990-1991.

Lee T. McIntosh, Instrument Research Division (IRD) data systems project engineer, for superior accomplishment in managing software configuration control for the Center's wind tunnel data acquisition systems and developing new data systems for the 16-foot Transonic Tunnel and .3M TCT.

John E. Nealy, SSD electrical engineering technician, for significant contributions in radiation physics enabling practical shield designs for manned space missions, and for authorship of the Space Systems Division Best Paper for 1990-1991.

Dr. Francis A. Cucinotta, SSD physicist, for significant contributions in radiation physics enabling practical shield designs for manned space missions, and for authorship of the Space Systems Division Best Paper for 1990-1991.

Patsy L. Campbell, equal employment specialist, Office of the Director (OD), in recognition of superior leadership to the Affirmative Employment Program and the Federal Women's Program.

Barbara Fryer, OD secretary, for exemplary performance of her duties, both assigned and assumed, in support of the office.

Myra Green, OD secretary, for superior accomplishment in revising the filing system for the University Affairs Office and coordinating the Agency's Industry Research and Development (IR&D) Program for Langley.

Margaret Hunt, information specialist in the Office of External Affairs, for diligence and interest as Langley's Freedom of Information officer.

Michael K. Ponton, aerospace engineer in Analysis and Computation Division (ACD), for significant accomplishment in identifying the existence of nonlinear interactions in supersonic free jets.

Harold G. Brush, supervisory aerospace engineer, Structural Mechanics Division (SMD), for a research paper in space structures technology selected as the best paper published by the division in 1990.

Catherine L. Herstrom, SMD mathematician for a research paper in space structures technology selected as the best paper published by the division in 1990.

Walter W.L. Heard Jr., SMD aerospace engineer, for a research paper in space structures technology selected as the best paper published by the division in 1990.

Timothy J. Collins, SMD aerospace engineer, for a research paper in space structures technology selected as the best paper published by the division in 1990.

Wilbur B. Fichter, SMD aerospace engineer, for a research paper in space structures technology selected as the best paper published by the division in 1990.

Robert W. Mitchell, supervisory engineering technician, Operations Support Division (OSD), for exceptional technical support during loss of high-pressure air to the 16-Foot Transonic Tunnel and the National Transonic Facility.

Suggestion Awards Guidelines

To be considered for an award, a suggestion must be made in writing and directly contribute to productivity, economy or efficiency, or directly increase the effectiveness of government operations. Use Optional Form 303, available from training coordinators. Forms also are available from Stock or by calling Employee Relations, ext. 48238.

James V. Plant, OSD engineering technician apprentice, for superior technical contributions to the fabrication and testing of the Real-Time Gas Chromatograph.

Rhonda L. James, OSD engineering technician apprentice, for exceptional technical and operational support to the High Speed Civil Transport Project.

Jerry W. Wright, OSD electrical engineering technician, for outstanding efforts and contributions to ensure compliance with Environmental Protection Agency PCB regulations.

John J. Treier, OSD lead engineering technician, for exceptional technical leadership in support of the joint NASA/Army/Boeing Rotor Test in the 14-By 16-Foot Subsonic Tunnel.

Anh T. Trinh, OSD engineering technician, for exceptional technical support in machining of pressure bleeds in Building 1265, High-Pressure Air System.

Robert J. Nowak, SMD aerospace engineer, for outstanding contributions in the initial planning, coordinating, advocating, and direction of Government Work Packages 12 and 77.

Laura H. O'Connor, aerospace technologist, for outstanding and timely contributions to shakedown of the 8-Foot High Temperature Tunnel, June 1990 to May 1991.

Marshall Rousek, SMD research engineer, for fundamental contributions to understanding the buckling and postbuckling behavior of composite shear webs.

Stephen J. Scotti, SMD research engineer, for important contributions to the development of high-speed transport structural analysis and design technology.

Virginia M. Seider, secretary for the Spacecraft Structures Branch, SMD, for outstanding administrative support of the Branch in 1990-1991.

Jonathan B. Ransom, SMD structures research analyst, for development of advanced global/local modeling methods for aerospace structures.

Olaf O. Storaasli, researcher, Computational Mechanics Branch, SMD, for development and leadership in advanced computational methods of structural mechanics on high-performance computers.

Linda W. Sutherland, secretary, Acoustics Division, for outstanding secretarial and administrative support to the division and associated professional organizations.

Floyd J. Wilcox Jr., senior research engineer, Applied Aerodynamics Division (AAD), for outstanding performance in summarizing NASA's contributions to Store Carriage and Separation Research in a survey paper of international significance.

Richmond P. Boyden, senior research engineer, AAD, for superior accomplishment in obtaining Dynamic Stability Data in support of the National Aero-Space Plane Program.

Adolphus B. Blair Jr., AAD senior research engineer, for superior accomplishment in support of the Sidewinder Improvement Program.

Steven X.S. Bauer, AAD research engineer, for superior accomplishment in developing and validating waverider optimization methodology.

Daniel W. Banks, AAD aerospace engineer, for proposing an innovative concept to control the flow of air through a porous surface as applied to a forebody or wing surface for improving the aircraft control characteristics.

Susan Naomi McMillin, AAD aerospace engineer, for publication of the Best NASA Formal Publication prepared by personnel of the division.

Paula W. Chambers, AAD administrative assistant, for outstanding support to the division in accomplishing its goals and objectives.

Donna L. Forbes, AAD secretary, for providing outstanding support to the mission of the division.

Michael Cavelli, as Accounting Division (AD) procurement analyst, for extraordinary effort in accomplishing the revision to the Center's procurement Systems Certification Report.

Betty Crowley, AD procurement analyst, for extraordinary effort in accomplishing the revision to the Center's procurement Systems Certification Report.

Karen Sych, AD secretary, in recognition of extraordinary effort in accomplishing the revision to the Center's procurement Systems Certification Report.

Ann Timberlake, AD procurement analyst, in recognition of extraordinary effort in accomplishing the revision to the Center's procurement Systems Certification Report.

Daniel G. Murri, aerospace engineer, Flight Applications Division (FAD), for outstanding performance in group leadership and significant contributions in flight dynamics research.

Krista D. Bullock, FAD secretary (stenographer), for exceptional accomplishment of secretarial and stenographic duties and implementation of data systems that have enhanced the operations of the Flight Dynamics Branch.

Robert V. Kerns Jr., aerospace technologist, Gas and Fluid Systems, Facilities Engineering Division (FENGD) for exceptional work supporting the Checkout and Shakedown of the 8-Foot High Temperature Tunnel.

Michael D. Mastaler, aerospace technologist, Gas and Fluid Systems, (FENGD) for exceptional work on the 8-Foot High Temperature Tunnel's Test Pod Hydrogen System and exceptional work on other engineering assignments.

Kenneth M. Proctor, engineering technician, Operations Support Division (OSD) for exceptional technical contribution in synthesizing polymeric materials for applications on thin film reflectors.

Theresa F. Elliott, Management Support Division (MSD) supply systems analyst, for exemplary supply support to the NASA Supply Management System.

Judy W. Lowe, supply technician, MSD, for exemplary supply support to the NASA Supply Management System.

Suzanne S. Melson, supply technician, MSD, for exemplary supply support to the NASA Supply Management System.

Lucy B. Watkins, supply technician, MSD, for exemplary supply support to the NASA Supply Management System.

Kimberly D. Duncan, supply technician, MSD, for exemplary supply support to the NASA Supply Management System.

Susan C. Tillman, supply clerk, MSD, for exemplary supply support to the NASA Supply Management System.

Vacant Langley Positions have a Closing Date of December 2

The following vacancies have been announced by the Human Resources Management Division:

◆ Supervisory electronics engineer, AST, Electronic Instrumentation Systems, Electro-Optics Branch, Flight Electronics Division, Electronics Directorate. GM-855-14 or 15 (head, Electro-Optics Branch). Langley employees currently serving under permanent civil service appointments will be considered. Closing date is December 2, 1991.

◆ Supervisory electronics engineer, AST, Electronic Instrumentation Systems, Sensor Systems Branch, Flight Electronics Division, Electronics Directorate. GM-855-14 or 15 (head, Sensor Systems Branch). Langley employees with currently serving under permanent civil service appointments will be considered. Closing date is December 2, 1991.

◆ Contract price/cost specialist, Pricing Office, Acquisition Division, Management Operations Directorate. GS-1102-11 or 12. Langley employees currently serving under permanent civil service appointments will be considered. Closing date is December 2, 1991.

◆ Lead accounting technician, Fund Accounting and Control Section, Accounting Branch, Financial Management Division, Management Operations Directorate. GS-525-6, 7 or 8. Langley employees currently serving under permanent civil service appointments will be considered.

Closing date is December 2, 1991.

People & Places

Weinstein Wins Langley's Largest Award for Cost-Saving Suggestion

Dr. Leonard M. Weinstein, Experimental Methods Branch, Fluid Mechanics Division, has won the largest cash award for a cost-saving employee suggestion at Langley.

Weinstein won the $4,300 award for developing an improved large-field focusing schlieren system that is now in use or planned for use in many wind tunnels at Langley and other NASA centers.

The system features a smaller depth of field using an extended light source and no mirrors. The smaller depth of field does not require expensive optics and allows a more localized view of flow.

Weinstein said the system he developed is "incredibly cheaper" than conventional schlieren. A conventional system would cost about $250,000, he said, while his would cost $25,000.

The system was studied in the '40s but had never been fully developed. "Basically I rediscovered a principle that had not been developed very far," Weinstein said.

"I don't claim the credit for the basic concept, but I followed through. I think that's the biggest thing that I did – I followed through."

Microspace Revolution is Subject of Dec. 9 Langley Colloquium Series

"The Microspace Revolution" will be the topic of a Langley Colloquium Series presentation Monday, December 9, at 2 p.m. in the H.J.E. Reid Conference Center.

David W. Thompson, president of Orbital Sciences Corp., will speak. Orbital is a commercial space technology company formed to develop, make and market space transportation systems and pursue commercial satellite applications and other space-related businesses. New applications and enabling technologies for microspace systems – small spacecraft, launch vehicles and related ground equipment – are transforming space missions. Characterized by early use of advanced technology, fast development cycles, low acquisition cost and small project teams, microspace systems are being developed or proposed for a wide range of scientific, commercial and defense applications.

Thompson will discuss the use of such systems in distributed satellite networks and single-purpose orbital platforms for global mobile communications, Earth observation, space science, military support and planetary exploration. Thompson also will talk about key technologies that underpin the systems. He will repeat his talk at 7 p.m. at the Holiday Inn Hampton Coliseum Hotel and Conference Center.

Angels Come in All Shapes and Sizes

Division Challenges Langley Employees to Help Kids

For the fourth consecutive year, Langley's Acquisition Division is gearing up for a holiday tradition of giving.

There will be the customary tree in the conference room, the holiday door-decorating contest and the annual Christmas party. But the tradition that really puts the spirit in the season is "adopting" their Angel Tree kids.

A Salvation Army program, Angel Trees are set up in department stores, malls and churches. The trees are decorated with tags in the shape of angels. The tags carry age and size information about needy children whose Christmas wish may not otherwise be granted.

Preparing bundles for last year's "adopted" kids are, from left, the Acquisition Division's Mary Deuell, Linda Urquhart and Stan Ward.

Family affair

This year, the division plans to cast an even wider net – it also will adopt a family, said Stan Ward, Acquisitions Division project coordinator.

In 1990, the division collected enough money to outfit 27 children. Each child was given jeans, a warm shirt or sweatshirt, underwear, socks, gloves, a knit hat, a special need such as a coat, and a toy.

"This project has really drawn our division together," Ward said.

"It's hard to determine who is happier Christmas morning – the givers or the receivers. But we feel the glow from the time the first Angel Tree kid is selected through the whole season."

Acquisition Division employees shop for their kids after work.

The Salvation Army requests that gifts not be wrapped but placed in plastic bags with the Angel Tree label attached to them. Last year, Ward delivered the bundles to Salvation Army headquarters on Big Bethel Road.

"It looked like Santa's workshop," he said.

Remaining Angel Tree tags are collected by the Salvation Army and all kids are "adopted."

For those who want more information about how to participate in the Angel Tree project, call the Salvation Army at 838-1443.

FAD's Lee Receives SAE Oral Presentation Award

Cynthia C. Lee, senior research engineer, Flight Research Branch, Flight Applications Division, has been selected as a recipient of a 1991 Oral Presentation Award from the Society of Automotive Engineers (SAE).

The award was presented for Lee's outstanding presentation during the 1991 SAE General, Corporation and Regional Aviation Meeting.

"The basis for the award was the evaluation of your presentation by your peers that were in attendance at the session," said a letter to Lee from K. Clark White, 1991 chairman, SAE Aerospace Vehicle Activity.

Lee's presentation was titled "In-Flight Measurement of Boundary-Layer Disturbance Growth Patterns."

The SAE's Excellence in Oral Presentation Award Program is intended to maintain the high quality of standards associated with SAE technical meetings, according to the SAE.

Speakers Bureau Report

The following Langley representatives have participated in the Speakers Bureau:

October

Brian Pritchard – Poquoson Elementary School– Exploration of the Solar System.
Jim Meyers – Women in Aerospace – Permanent/Part-time Employment at NASA Langley.
David Throckmorton – Petersburg Kiwanis – Advanced Space Transportation Systems.
Dick Snyder – National Contract Management Association, Norfolk Chapter – Center Overview.
Naomi McMillin – Magruder Elementary School, Newport News – Baroncopter Spins Again - An Aeronautical Experiment.
Melvin and Michelle Ferebee – Norfolk Middle School – Stay in School - Don't Do Drugs.
Dr. M. Patrick McCormick – Menchville High School, Newport News – Volcanic Effects and Other Environmental Effects.
George Helfrich – National Contract Management Association, Hampton Roads Chapter – Protecting Data and Inventions.
Dr. Frank Farmer – Devonshire Retirement Community, Hampton – Biomedical Spinoffs from Aerospace Research.
Bill Hood – Tucker Capps Fundemental School – Lasers and Optics.
Bill Hood – Boy Scout Show, Newport News City Park – Lasers and Optics.
Robert Miserentino – Peninsula Shrine Club – Large Space Structures.
Bill Hood – Cub Scout Banquet, Virginia Beach – Nasa Laser Program.
Nola Graves – Page Middle School, Gloucester – Using Computers on the Job.

September

Joe Watts – Blackwater Falls Astronomy Weekend, State Park, W. Va. – National Aero-Space Plane.
Dr. M. Patrick McCormick – NASA Headquarters Code SE Briefing – Volcanic Eruption of Pinatubo and its Effects.
Dennis Pelty – Hampton Roads Chapter, Society of Manufacturing Engineers – CO-OP Program.
Dr. M. Patrick McCormick – Warwick Rotary Club – Volcanic Eruption of Pinatubo and its Effects.
Billy Gilbert – Peninsula Chapter, Society of American Engineers – NASA High Angle of Attack Technology.
Dwight Smith – International Test and Evaluation Association – Dynamic Drop Test of Aircraft.
Kimberly Chasteen, Kevin Osborne and George Helfrich – Visitor Center Childrens Program – The Incredible World of Inventions.
Dr. Frank Farmer – Doric Convention, Williamsburg – Biomedical Applications of NASA Technology.

August

Dr. Joel Levine – American Lung Association of Virginia – Global Burning: Forests, Grasslands and Oil Wells.
Dr. Joel Levine – ASEE/LARSS Program – A Global Warning.
Dr. Joel Levine – The College of William and Mary – A Planet at Risk.
Greg Riebe – Hampton Kiwanis Club – National Aero-Space Plane.

July

Sharon Tanner – NEWEST Teachers – Overview of CSI and MIE Experiment.
Sharon Tanner – Governor's School, West Point Elementary – Large Space Structures.
Sharon Tanner – Wakefield High School – Careers in Engineering.
Doug Stanley – West Point Kiwanis Club – Next Generation of Space Shuttle.
Veloria Martinson – Lower and Upper Elementary, Wakefield Library – Fun with Science.

Happenings

LAA SOCIAL will be held Friday, December 6, 4 to 6:30 p.m. at the H.J.E. Reid Conference Center.

BODY DYNAMICS high-energy, low-impact aerobics classes are held Mondays, Wednesdays and Fridays at 6:15 p.m. in the LAA gym. Classes are open to civil service employees and are free.

LOW-IMPACT AND BENCH AEROBICS classes are held Tuesdays and Thursdays, 5 to 6 p.m., LAA gym. Cost is $12 per month. First class is free. Classes are open to civil servants and contractors and their families.

NASA TOASTMASTERS meet December 11, 11:30 a.m. to 1 p.m. in the H.J.E. Reid Conference Center.

DISABLED PERSONS SATELLITE COMMITTEE meets the second Thursday of each month from 8:15 to 9:30 a.m. in the cafeteria. The next meeting is December 12. Everyone is invited.

FEDERAL WOMEN'S PROGRAM COMMITTEE will meet Wednesday, December 11, at 8:15 a.m. in the cafeteria executive dining room.

LANGLEY ALUMNI ASSOCIATION'S monthly get-together will be held Tuesday, December 10, at 11:30 a.m. in the cafeteria. Bill Kinard will discuss what LDEF has taught us and the effect of space environments on materials and structures.

A WORKSHOP on automation and robotics for space-based systems will be held December 10 from 8:30 a.m. to 4 p.m. at the Structural Mechanics and Dynamics Lab, 3 Ames Road, Room 120. The workshop will assess state-of-the-art automation and robotics for space operations from a Langley perspective and identify areas of opportunity for supporting research. All interested employees are invited. For more information call Bob Williams at ext. 47690 or Ray Montgomery at ext. 46615. The workshop is sponsored by the Guidance, Navigation and Control Technical Committee.

A WINTER COMPUTER EXPO will be held Thursday, December 12, from 10 a.m. to 2 p.m. at the H.J.E. Reid Conference Center. More than 35 exhibitors will display the latest in engineering capabilities, office automation, lab automation, graphics, CAD/CAM, work stations, OCR, scientific computing and other hardware and software. All civil servants and contractors are invited. Admission is free and refreshments will be served. The event is sponsored by the National Small Business Council and the Evaluation and Information Center.

NEW YEAR'S EVE DANCE tickets are on sale at the Activities Office, 14 Ames Road. The December 31 LAA event will feature music by Foxfire and go from 9 p.m. to 1 a.m. Tickets will be sold from 9 a.m. to 4 p.m. Monday through Friday. For more information, call Andrea Lewis, ext. 46369.

AN OLD-TIMERS' Christmas Coffee will be held at 9 a.m. December 14 in Room 121, Flight Research, 6 East Taylor Road.

AFGE LOCAL 2755 will hold a union meeting at 4:14 p.m. December 18 in the Union Office Building, 8B Ames Road.

LANGLEY RUNNERS CLUB will hold the Interdirectorate Team 5 KM Race on Thursday, December 5, starting at 4:45 p.m. on Doolittle Road. Teams will consist of four or more runners from a NASA directorate or contractor. The team score will be the sum of the finish positions of the top four team members, with low score winning. There also will be a women's division with teams consisting of two women. Small contractors may run with the directorate to which they are assigned. For more information, call Richard Shearer at ext. 47036.

TUTOR WANTED to help with English composition. Learn Japanese in return. Call Hatsue at ext. 42081.

FOUND: Black and gold bead necklace. Found by the cemetery walk path. Call Tom Abbott, ext. 45480.

LOST: A book titled "Optical Integrated Circuits" by Hiroshi Nishihara, Masamitsu Haruna and Toshiaki Suhara. Call Kimchi Ngo at ext. 44672.

FOR RENT: Nag's Head house, Milepost 7 between the highways. Three bedrooms, two baths, sleeps eight, has cable TV, $300 a week. Call 220-1129 after 6 p.m.

FEMALE ROOMMATE WANTED: Share quiet three-bedroom home in Fox Hill area. Rent is $275 a month including utilities. Call 851-2255.

FOR RENT: One-bedroom basement apartment in townhouse for NASA employees coming to Washington. Apartment is in safe, secure neighborhood near Crystal City. Close to Headquarters. Call Larry Herbolsheimer, (703) 998-0055.

MISSING: Plug-In, Time Base, O'Scope, ECN 0778279; Oscillograph, ECN 0411138; Power Supply, Lo Volt/Hi Current, ECN 0284818; Power Supply, Lo Volt/Hi Current, ECN 0532502; Buffer, Printer, ECN 0059159; Printer, ADP, ECN 0257485; Plotter, Graphics, ECN 1086487. Please contact the Equipment Management Section, ext. 42049.

NBA BASKETBALL TRIP, Washington Bullets vs. Chicago Bulls, December 14. Bullets vs. the Los Angeles Lakers, March 14. Each game $55 or two games for $100. Covers transportation, game ticket and dinner allowance. Call 890-0959.

SKI TRIP to Lake Placid in upstate New York includes two days at Whiteface Mountain and one at Gore Mountain. Bus departs at 6 p.m. February 14 and returns at 6 a.m. February 18. Cost is $265 and includes transportation, lift tickets, two nights of lodging, two dinners and three breakfasts. Call Dave Hahne at 874-7414.

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

402 ON-SITE NON-LARC
COPPEDGE, AUDREY S.
MAIL STOP 146

CFC Update:

$294,372.46 had been received as of November 21. The goal was $285,000.

Researcher News

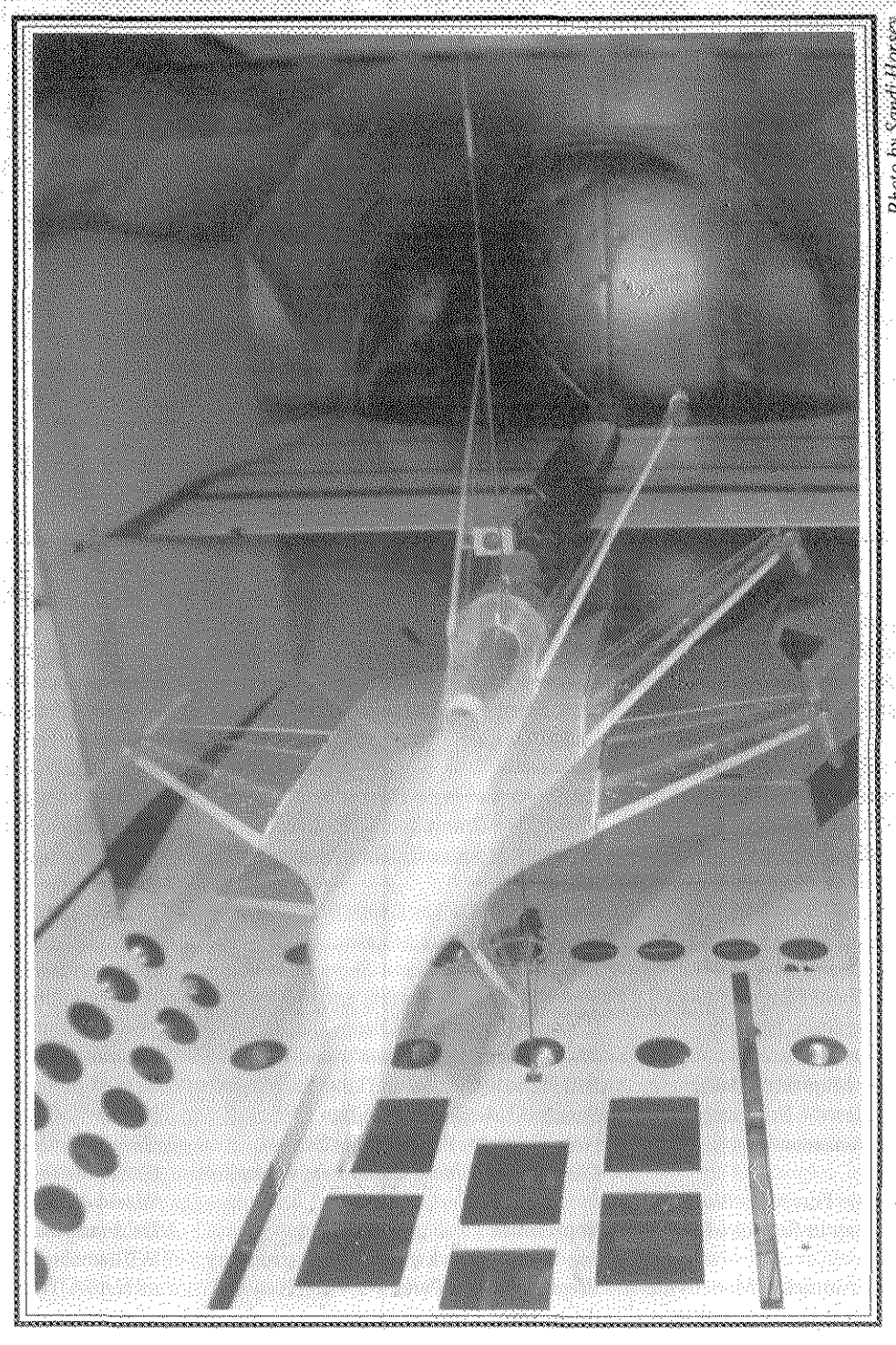


Photo by Sandi Horsey

The Active Flexible Wing (AFW) in this multi-exposure photo is performing a roll maneuver in Langley's Transonic Dynamics Tunnel. The 8-1/2-foot span advanced tactical fighter model was designed by Rockwell International Corp. and tested in the tunnel this year through a cooperative program between Rockwell and Langley. The purpose of the AFW testing was to demonstrate advanced aeroservoelastic technology such as flutter suppression and rolling maneuver load alleviation using active controls.

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 5, Issue 25, December 13, 1991

Bi-weekly Employee and Contractor Publication

Researcher News

Beach Named Deputy Director of Langley

Dr. H. Lee Beach Jr. is returning to Langley as the Center's new deputy director. He will fill the position vacated by Paul F. Holloway, whose appointment as Center director was announced in October.

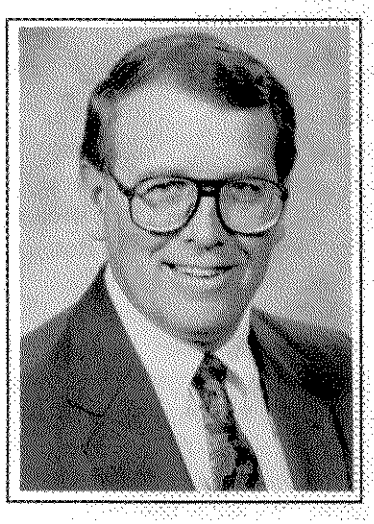
The effective date of Beach's appointment was not announced.

Beach currently is director for the National Aero-Space Plane Directorate in the Office of Aeronautics and Space Technology at Headquarters.

In making the announcement December 4, NASA Administrator Richard H. Truly said: "Dr. Beach has exemplified outstanding leadership in managing the Aero-Space Plane Program for NASA. He and Center Director Paul Holloway will make an outstanding team to assure Langley's continued leadership in aeronautics and space research."

Beach was deputy director for aeronautics at Langley from 1986 to 1989.

From 1985 to 1986, he was acting deputy director for aeronautics in the Office of



Aeronautics and Space Technology.

Beach began his NASA career in October 1970 as a research engineer in hypersonic propulsion at Langley. In 1975 he was named head, Combustion Section; in 1977, leader, Performance Analysis Group; in 1980, assistant head, Hypersonic Propulsion Branch; in 1981, head, Hypersonic Propulsion Branch; and in 1984, acting assistant chief, High-Speed Aerodynamics Division.

He received bachelor and master's degrees and a doctorate in mechanical engineering (thermal sciences) from North Carolina State University in 1966, 1968 and 1970.

Beach is the author or co-author of 18 technical publications and a fellow of the American Institute of Aeronautics and Astronautics. He is a past chairman of the JANNAF Ramjet Committee.

He received a NASA Exceptional Service Medal in 1989 for "significant contributions and outstanding leadership in the field of high-speed propulsion technology."

He also has received outstanding performance and group achievement awards and is co-inventor of an advanced flow laser concept.

Suceeding Beach as director of the NASP Directorate is Vincent L. Rausch, assistant director for aeronautics (high performance aircraft) in the Office of Aeronautics and Space Technology. Rausch's appointment is effective January 12.

A New Year's Message from the Director

During the upcoming holiday season, on behalf of the entire senior staff, I would like to wish you and your family the very best.

As 1991 draws to a close, it's a good time to reflect on our accomplishments and look forward to a busy and productive 1992, our 75th Anniversary. The past year saw excellent progress in both aeronautics and space. We have seen tremendous progress in the High-Speed Research Program and on the National Aero-Space Plane Program. Our wind shear technology work may soon measurably increase the safety of flight. Hybrid Laminar Flow Control and the Advanced Composites Technology Program could very well revolutionize the industry.

Our space research continues to be recognized worldwide. We are flying HALOE, a remarkable instrument built inhouse and monitoring the Earth's atmosphere from the Upper Atmosphere Research Satellite. The MODE and CETA experiments were outstanding successes. Excellent progress continues on the HL-20 lifting body "space taxi," increasing the probability that it will be the next generation manned space transportation vehicle.

The coming year is certainly cause for celebration at Langley, for it marks 75 years of accomplishments that have had incalculable impact on all humanity. We could not have reached this milestone without the dedication and vision of the Center's past and present employees. Their work and yours will be recognized and heralded in the coming year with many special events and activities marking our more than seven decades of operation.

On a personal note, I would like to say that I am very honored to have been selected to serve as Langley's sixth director. We have a truly premier laboratory and I can assure you that we will continue to be in the forefront of aerospace research.

Best wishes for a happy holiday and new year.

Paul F. Holloway, Director

Langley Gears Up to Commemorate 75th Anniversary with a Year of Events

In just a few weeks, Langley will begin celebrating its 75th Anniversary with the theme "Expanding the Frontiers of Flight." The year-long commemoration will serve to increase the Center's visibility and offer a variety of activities, including three major employee events:

- An employee picnic in May, sponsored by the NASA Langley Exchange Council.
- Parties and receptions in honor of Langley's 75th birthday on the weekend of July 17, the date the Center was established.
- An open house in October for employees and the public.

Many other activities will take place throughout the year involving community leaders, schools and universities, the public and Langley organizations.

Here's a sample of what's to come:

Anniversary logo

A 75th Anniversary logo will be used extensively in the next 12 months. In January, anniversary logo decals will be affixed to Langley's NASA aircraft. The logo will be represented on Langley's letterheads and envelopes.

The new Langley phone book will be distributed and feature the 75th Anniversary logo as the cover design.

Flags bearing the anniversary logo will be flown on the Center. An anniversary flag will be hung inside the H.J.E. Reid Conference Center.

Signs bearing the anniversary logo will be erected at the Main and Wythe Creek gates to the Center.

A logo decal will be distributed to all employees, contractors and retirees in the January 17 issue of the **Researcher News.**

Book, video, publicity

Langley will publish a 75th Anniversary photo book and issue an anniversary video. The Center will sponsor TV and radio interviews and spots and publicize the anniversary on billboards.

The Newport News and York County public schools radio and TV channels will publicize anniversary events.

The 1992 C&P Williamsburg and Peninsula telephone books, which will be distributed in January, will feature Langley on the cover.

Many other activities are planned. The **Researcher News** will publish a calendar of these events in January and update them in each issue.

Committee members

Members of the anniversary committee, which began planning the anniversary early this year, are Michael Card, Edwin Prior, John Molloy, Sullivan Donadio, Willard Weaver, James Gardner, Gary Beasley, Reginald Holloway, Andrew Hansbrough, Gary Price, Karen Credeur, Cam Martin and Catharine Schauer, chairman. The committee is responsible for the overall planning of the anniversary, but other individuals and groups will organize specific events.

Ordering new supplies

Supply is stocking the following items with the anniversary logo: letterhead stationery, white envelopes and large brown envelopes. Employees are asked to use these items through the year, beginning January 1.

The stock numbers are as follows:

- Letterhead stationery: 7530-00-LPO-1112.
- 3-7/8 x 8-7/8 white franked envelopes: 7530-00-LPO-1038.
- 9-1/2 x 12-1/2 brown franked envelopes: 7530-00-LPO-1109.

Employees who need large supplies should alert Suzanne Melson, Mail Stop 380, ext. 43568, 30 days in advance.

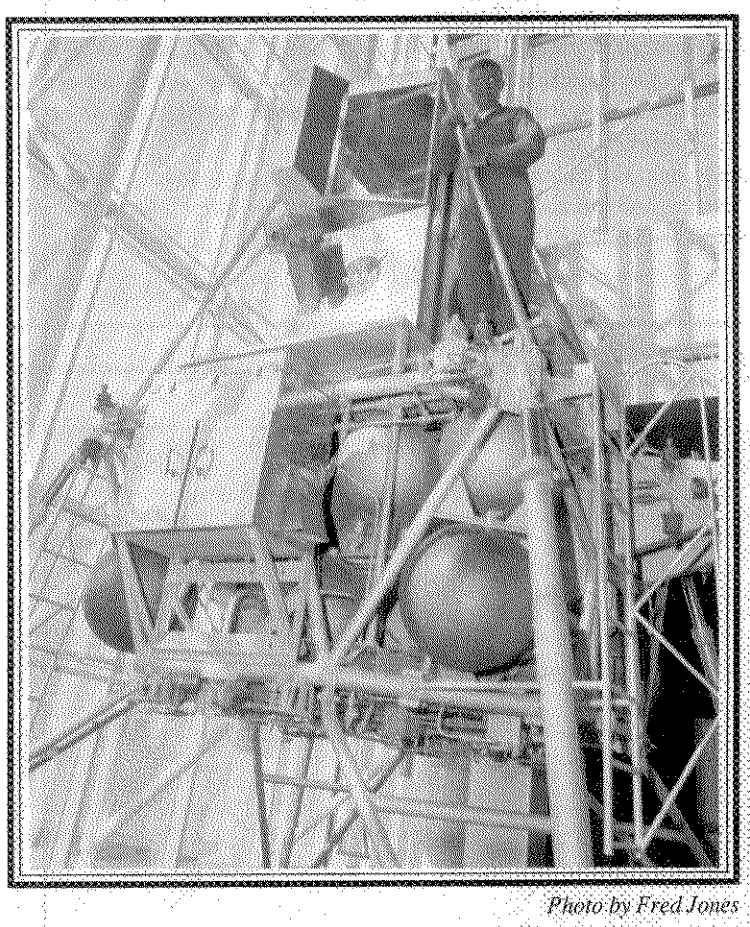


Photo by Fred Jones

Langley's Lunar Excursion Module Simulator (LEMS) sits in its new location at the Virginia Air and Space Center after being moved from the Visitor Center. The simulator was used to train every astronaut who landed on the moon. Lee H. Person Jr., a Langley research pilot, is standing on the LEMS. Person was the first to accurately use the simulator. The simulator was designed and built at Langley and restored with the help of students at the New Horizons Technical Center.

News Briefs

UARS functioning well --- The on-orbit operation of the Upper Atmosphere Research Satellite (UARS) continues to go well, according to project officials. Goddard officials report the spacecraft systems are meeting or exceeding specifications. The satellite includes a Langley experiment, HALOE. HALOE is one of 10 UARS experiments whose main focus is the processes involved in ozone depletion. HALOE is expected to provide important data needed to study the effects of chlorine, nitrogen, chlorofluoromethane, and hydrogen-related compounds on the ozone layer. The experiment is monitoring the vertical distributions of temperature and the key upper atmosphere trace gases.

Carbon propellant proposed --- A carbon molecule – Carbon 60 – may be be the perfect propellant for a spacecraft engine that produces thrust by expelling charged atoms or molecules, say researchers at the Jet Propulsion Laboratory (JPL) and the California Institute of Technology (Caltech). They propose to use Carbon 60 as a fuel in ion engines, saying the large molecule would reduce the energy required to ionize the propellant. JPL and Caltech will evaluate Carbon 60 in a small ion engine testbed.

Editor's note: To obtain a copy of any of these NASA Headquarters News Releases contact Jolyn Rivenbark, Mail Stop 146, ext. 43293. Please request information summarized above by headline printed in bold.

November Bloodmobile Donations Report

The following persons have donated to the Bloodmobile:

17 gallons: Richard Holt.

15 gallons: Robert P. Davis.

11 gallons: Charlie Marple.

10 gallons: Robert Davis.

9 gallons: Wayne E. Silver.

7 gallons: James M. Shipp, James F. Pike, Charles J. Wittkopp, James Brown, John J. Treiter, Randy Fly, Robert Daugherty.

6 gallons: Ernest Burt, Laurence D. Heubner, Jerry M. Allen.

5 gallons: James Williams.

4 gallons: Luckey L. Thomas, Michael L. Walker, Paul D. Aronsohn.

3 gallons: Robert V. Gifford, Vernet Boone, John S. Crisp, James A. Phillip.

2 gallons: Artistine Lethcoe-Reid, James L. Leuci, Charles D. Mercer, Henry H. Chambers, Brian C. Cheshire, Cathy McGowan, James T. Berry.

1 gallon: Sheri E. Koczka, Bruce W. South, David P. Boerschlein.

In Memoriam: George A. Greer

George Arthur Greer, 52, died November 24. He was an electronics engineer with the Lockheed Engineering and Sciences Co.

He worked at Langley in the Flight Instrumentation Branch, Flight Electronics Division. Greer came to Langley in 1974 and worked for Planning Research Corp. for 15 years before joining Lockheed in October 1989.

Said Dan Hawley, Greer's Lockheed supervisor: "George was known and liked throughout Langley Research Center, having worked on numerous projects, including the Boeing 720 Controlled Impact Demonstration, the FAA Boeing 727 Runway Friction Program, the PA-28 Wake Vortex Experiment, the OV-1 Laminar Flow Nacelle, and most recently, the Small Expendable Deployment System (SEDS) End Mass Payload.

"His quiet, unassuming attitude and dedication to his work will be missed by all of us who have worked with him at Langley and elsewhere."

Greer, a graduate of the Detroit Institute of Technology, is survived by his wife, Deby.

In Memoriam: Fred N. Rector

Fred N. Rector, 71, who retired from Langley after 35 years of service, died November 28. Rector had been assistant chief of technical information at the Center.

The Norfolk native had been a Peninsula resident most of his life.

Annual Leave Transfer Recipients

The following employees are approved recipients of the Voluntary Leave Transfer Program:

- Manjula Y. Ambur
- Linda E. Edmundson
- Cassandra D. Stevens
- Noel A. Talcott Jr.
- Catherine B. Worth
- Patricia E.J. Williams.

The Voluntary Leave Transfer Program is designed to permit employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

Lankley

Clip and use as actual greeting card!

TQM Corner: Use Tiger Team Skills to Prevent Problems in the First Place

By Richard H. Truly
NASA Administrator

All of us on the NASA team take justifiable pride in our problem-solving abilities. The term "tiger team" was invented at NASA and we have perfected the approach as we have solved problems over the years. But, our history has been that something has had to be demonstrably broken before we formed a team to fix it.

Our continuous improvement efforts are intended to be the next progressive step after tiger teams. We know how to fix problems; now let's use those same skills, techniques and teamwork to do a better job of preventing problems in the first place.

Our tiger teams are great firefighters. Many of our leaders occupy their current positions because, when finding a point out of control, they've been good at finding the special cause and removing that cause to put the process back to where it was in the first place.

Continuous improvement

Suppose we devoted the same time, level of talent and staff to process improvement teams as the effort we devote to attacking known problems? I don't know what the answer is, but I do know the people of NASA and my bet is that we'd see a lot of improvement. That's what I mean when I say continuous improvement is the next advancement of a skill we already know and practice. All we need is the will to put time and effort into improving things that aren't broken, yet.

In the survey done by the Cumberland Group prior to the Headquarters leadership retreat last summer, many of you identified firefighting skills as one of NASA's strengths. But, you also said that we were not good enough at delegating decision-making. That's a generalization that doesn't give us much guidance for improvement. The continuous improvement process is a way to get at that problem in a very specific way. As we form teams to look at how we carry out our current administrative and technical processes, one of the things each team should do is identify current decision, approval and signature points in that process. This gives us a chance to look at each of those points and ask whether any value is being added by that step and whether the decision or approval is being made at the lowest practicable level.

Keep goal clear

One caution. Many of our administrative processes have become so cumbersome that you could be tempted to call them broken. Be careful that you don't confuse a process improvement team whose goal is to make things better with a tiger team whose goal is to put a process back to where it was in the first place.

Things that are broken identify themselves. Continuous improvement is harder because a conscious choice has to be made regarding what to work on. Processes to be improved need to be prioritized based on such factors as impact, scope, ability to change and ownership, so that resources are directed at those processes in which improvement can provide the greatest payoff for the organization.

The country expects, and we expect of ourselves, that we will be the inspiration and leader of the country for the accomplishment of great things. But, great things are an aggregate of many smaller things – the details. I'm calling on you to sweat the details.

When we get the details right, the big things follow.

Saying Thank You . . .

From John V. Quarstein, board member, Vietnam War Monument Foundation Inc.: On behalf of all Vietnam veterans, I would like to thank you (Langley Research Center employees) for your generous contribution in honor of Evelyn Goodrich to the Vietnam War Monument. Your support has helped to make this monument a reality, finally welcoming home those men and women who served our nation during the Vietnam war.

From Andrea Lewis, Langley Activities Association: The LAA wishes to thank all those who helped to make this year's Turkey Shoot a success. A special thank-you is extended to Jim Carbonneau, contract manager of EG&G, for all his efforts in the distribution and sale of raffle tickets.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Submit contributions to the Editor, Mail Stop 115, telephone 864-6126. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor ..... Jean Drummond Clough

Editor ..... Michael Finneran

Photojournalist ..... Carol Petrachenko

Photographer ..... Fred Jones

The privilege of advertising in this publication is restricted to the employees and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Langley Scientists Probe Cirrus Clouds to Forecast Climate Patterns

Global Warming a Target of FIRE

By Craig Murden

The feathery wisps of cirrus clouds are NASA's latest target in an accelerating focus on predicting the planet's climate patterns

Atmospheric scientists from Langley led researchers to Kansas in mid-November, where ground, airborne and satellite measurement platforms collaborated for 25 days of intensive cirrus cloud investigation. Heading the effort as project manager was David S. McDougal, Atmospheric Sciences Division, who had overall responsibility for directing the multi-agency international research program. Langley's Dr. Patrick Minnis was the project scientist.

Photo courtesy Ames Research Center

This ER-2 is one of several aircraft used to probe cirrus clouds. It gathered data while flying above the clouds. A Saberliner and a King Air flew into the clouds.

The Role of Clouds

The role of cirrus clouds, which form at the top of the troposphere eight miles up, is of major importance in predicting climate. In addition to controlling the amount of heat escaping from the Earth's atmosphere, they have the potential to be a vital feedback mechanism in assessing global warming from increases in carbon dioxide. This is because an increase in global cirrus cloud cover of only four percent causes the same rise in global temperature that a 100 percent increase in carbon dioxide would cause. Thus, if scientists can translate these affects to predictive computer models, the cirrus/carbon dioxide relationship can be applied as a barometer of the planet's climate changes.

To serve that objective, scientists from NASA and five other government agencies were joined at a Coffeyville, Kan., base of operations by a cadre of skilled computer modelers. Although cirrus measurements were made in 1986, this is the first occasion when real-time measurement data flowed into a field analysis center where both atmospheric researchers and modelers ran experiments. Modelers had direct input into how the data was compiled and ultimately used. The importance of this NASA cloud study is underscored by the fact that the role of clouds has the highest priority within the U.S. Global Change Research Program, which embraces several projects in seven distinct fields of pursuit.

The Kansas effort is known as FIRE (First ISCCP Regional Experiment; ISCCP is the International Cloud Climatology Project). End data products will cover a wide range of spatial scales, from the large-scale imagery of satellites to the microscale measurements of cloud droplets. Broad temporal scales, from the monthly averages of cloud properties to the millisecond measurements of atmospheric turbulence, also characterized the scope of the venture.

Coffeyville, 120 miles southeast of Wichita, was chosen because it is the locus of state-of-the-art sensors installed by the National Weather Service to measure horizontal and vertical winds throughout the atmosphere in the central United States.

McDougal's project management responsibilities were wide-ranging. He coordinated across agency lines between NASA's lead position and the other agencies, recommending plans, levels of participation and funding support. He also designed, organized and implemented large field experiments involving multiple satellite, aircraft and surface-based measurement platforms and communicated FIRE's plans and progress to the agencies, the scientific community and various national and international technical committees.

A perspective on the intensity of the project comes from a report he gave the **Researcher News** about events between November 13 and 27. At this point, the experiment was in full stride, with all instruments and platforms operational. In one 55-hour period, 13 separate aircraft missions were flown while numerous satellite overpasses, weather balloon launches and extensive ground-based remote sensing activity were conducted. McDougal says this level of activity represented the most comprehensive set of measurements ever performed on a cirrus cloud system.

McDougal came to Langley in 1963 as an aerospace technologist after earning a bachelor of science degree in physics from The College of William and Mary. His master's of science in physics was also from that school and he holds a professional degree as an applied scientist in engineering management from George Washington University.

McDougal spent one year at NASA Headquarters, where he served as an advanced development program manager in the Office of Space Station Freedom. He has authored 20 formal publications and been involved in 31 other presentations or publications.

Fort Eustis Offers Holiday "Visits"

The Fort Eustis Video Teleconference Center will offer free holiday visits for soldiers, their families and Department of Defense employees who are unable to be home for the holidays.

The event will be offered from December 16 through January 3. Visits will be limited to 30 minutes. Anyone who schedules a visit may bring a half-inch VHS video tape and the staff will record the visit.

Teleconference sites are located throughout the country.

Holiday visits to Germany, however, are limited and reservations must be made by December 15. For more information, call 878-2030/3861 or AV 927-2030/3861. Ask for Sandy Panuska or Luis Blanco.

SCOUT Video to Air

WHRO TV Channel 15 will feature a half-hour program titled "SCOUT – The Unsung Hero of Space" at 10:30 p.m. December 20.

Cellular Phones are Available

The Logistics Management Branch, Management Support Division, recently purchased two cellular telephones to serve as a backup communications link between the Headquarters Shuttle Bus and the Motor Vehicle Operations Office.

These phones are available to other organizations for official functions or emergencies.

For more information, call Charlie Harris at ext. 43440.

Win Stuffed Toy at Christmas Shop

The NASA Langley Exchange Shop's Christmas Shop will be open in the cafeteria from 10:30 a.m. to 2 p.m. through December 20.

Register to win a four-foot Paddington Bear, which will be given away December 20. Tickets are 50 cents each or three for $1.

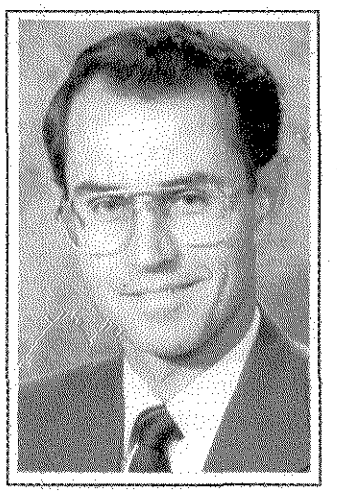
For more information call Cheryl at ext. 41585.

Gilbert is Appointed Assistant Chief of FAD

William P. Gilbert has been named assistant chief, Flight Applications Division. He previously was the division's assistant chief for special programs.

Gilbert began his career at Langley as a cooperative education student while attending North Carolina State University.

He began working fulltime at the Center in 1969 in what is now the Flight Dynamics Branch, Flight Applications Division, at the Full Scale Tunnel.



Spent time in OAST

Gilbert has been a section head, assistant branch head and branch head at Langley.

He served two temporary duty tours at NASA Headquarters for a total of about 1-1/2 years in the Office of Aeronautics and Space Technology (OAST).

He has been active in the development of research and technology programs within NASA involving Langley and other OAST Centers and in joint efforts with industry and the Department of Defense.

Gilbert was a principal architect in the development of the NASA High-Alpha Technology Program and has been directly involved in guiding its execution.

More recently, he has been heavily involved in the planning for the High-Speed Research Program in OAST.

Education

Gilbert, a native of Washington, N.C., grew up in Ahoskie, N.C., and graduated from high school there in 1964.

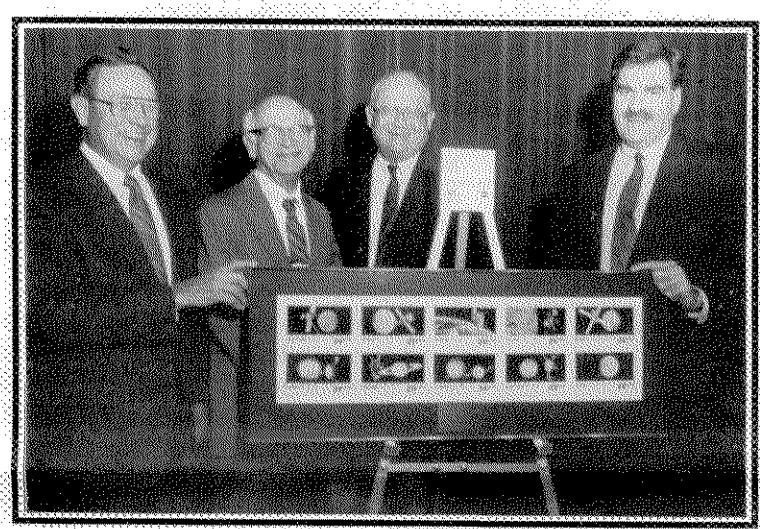
Gilbert graduated from North Carolina State University in 1969 with a bachelor of science degree in aerospace engineering. He also has a master's degree in aeronautical engineering from George Washington University.

His expertise and experience has been in aerodynamics, flight dynamics and stability and control of airplanes.

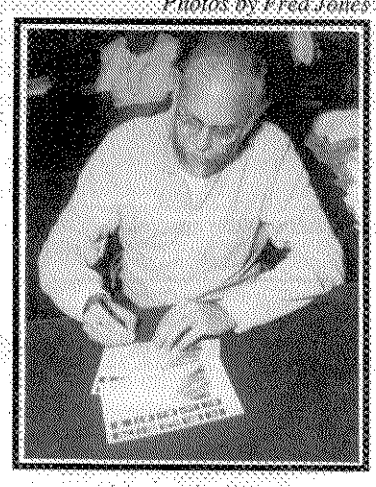
Gilbert has extensive experience in wind tunnel work, piloted simulations and flight research. He has worked extensively with military and civil airplane technology development.

Photo courtesy Langley AFB Office of Public Affairs

Langley was praised at a Combined Federal Campaign ceremony for its outstanding contributions this year. Honorary Chairman Gen. John Michael Loh of Langley Air Force Base, right, presents an outstanding achievement award to Center Director Paul F. Holloway, left, and the Center's CFC chairman, Bruce A. Conway. Langley personnel were among 40,000 Peninsula federal employees who raised $1,671,280 through the CFC – an 18.3 percent increase over last year.



Photos by Fred Jones



A Second Day of Issue stamp ceremony was held at Langley on November 22 to honor two stamps commemorating Langley's Lunar Orbiter and Viking projects. Above, from left: Bill Boyer, who was operations manager, Lunar Orbiter; Israel Taback, who was deputy project manager/technical; Sidney F. Pauls, Center associate director; and Joe Raia, U.S. Postal Service representative. Right: Ron Miller of Fredericksburg, who designed the 10-stamp series, autographs stamp cachets at the ceremony.

PDP Nominations are Sought

Nominations are being sought for the NASA Professional Development Program (PDP). The program gives individuals a 12-month work assignment at NASA Headquarters or other NASA installations.

The work assignment provides experience in new tasks and functions from an Agency-wide perspective and is supplemented with briefings and formal training. Those selected will take part in a one-year assignment beginning in August 1992.

The PDP has two levels within the Headquarters-sponsored program. Level I is for employees at GS/GM-15 and Senior Executive Service (SES) levels. Level II is for those at GS/GM-13 and 14, and GS-12 in special circumstances. Individuals may nominate themselves to their directorate offices if they are in the specified grades and believe that they have demonstrated the potential to take on broader responsibilities in future positions. The Langley Executive Resources Panel will select Langley's nominees in early February.

This year, in response to a SCAN recommendation, a PDP Level III is being designed to provide on-Center developmental opportunities. Information will be published separately for implementation of this program in fiscal 1992-93.

If you are interested in PDP Level I or II, call Louise C. Hamilton, Employee Development Branch, ext. 42571, for a nomination form.

Inform your directorate office as soon as you decide to complete the form. The nomination deadline for directorate offices is mid-January.

Employee Awards

The following employees have received cash awards for job performance:

Arthur S. Johnson, supervisory inventory management specialist, Management Support Division (MSD), for exemplary support to the Supply Management System.

Jeannette W. George, computer systems analyst, MSD, for exemplary supply support to the NASA Supply Management System.

Ruperto Razon, engineering technician, OSD, for exceptional contributions in molding neat resins in support of the Polymeric Research Program, Building 1293.

Ronald W. Rader, engineering technician, OSD, for exceptional technical and innovative improvements to the Unitary Wind Tunnel Facility.

Rudeen Smith-Taylor, aerospace engineer, Guidance and Control Division (GCD), in recognition of the successful completion of the Phase I Guest Investigator CSI Program and dissemination of the research results to the scientific community.

Phillip T. Trussell, computer engineer, FENGD, for exceptional support in construction of facility automation software for fiscal 1989 Hypersonic Facilities Upgrade Project.

James O. Bryant, engineering technician, Fabrication Division, for exceptional performance in support of the high-temperature microphones for the NASP Research Project.

Mark A. Motter, electrical engineer, FENGD, for authoring TM-102647 "Simulation of Pressure and Temperature Responses for the 20-Inch Supersonic Wind Tunnel."

Michael J. Logan, aerospace engineer, Advanced Vehicles Division (AVD), for outstanding performance in planning and implementing studies to establish the design impact of emerging technologies on fighter-attack aircraft.

William B. Igoe, aerospace technologist, AAD, for outstanding contributions to the National Transonic Facility by conducting flow quality assessment studies and guiding experimental assessment of turning vane fairing loads.

Jean M. Foster, computer engineer, AAD, for providing timely data reduction support for the National Transonic Facility (NTF) Boeing 767 and McDonnell Douglas C-17 tests.

Darlene A. Walker, procurement clerk, OSD, for superior administrative support to the Engineering Task Area Manager FESS Contract.

Kenneth Test, engineering technician, OSD, for superior technical support in the design and installation of the Radio Frequency Induction Heater, Building 1148.

Burt R. Emerson Jr., engineering technician, OSD, for exceptional technical contributions in the characterization of low coefficient of thermal expansion polyamides.

Lisa J. Massie, engineering technician apprentice, OSD, for demonstrating innovative technical skills in resolving anomalies at the Atmospheric Controlled Combustion Apparatus.

Tony L. Parrott, aerospace engineer, AD, for quantifying unsteady pressure loads in scramjet engines under unprecedented conditions of high temperature and hypersonic grazing flow.

James C. Manning, aerospace engineer, for superior contributions to the development of advanced jet research nozzles and the safe, efficient operation of the Jet Noise Laboratory.

Myra L. Walton, engineering technician, Fabrication Division (FD), for exceptional support and dedication to cleaning of systems and equipment for oxygen service.

Edward C. Taylor, nondestructive testing technician, FD, for exceptional support and dedication to ultrasonic c-scan inspection of composite panels.

Janice K. Via, secretary/stenographer in the High-Speed Research Program Office, Analysis and Computation Division (ACD), for outstanding performance as secretary of the Office and for exceptional contributions to the First Annual High-Speed Research Workshop.

Paula R. Rawles, secretary, AVD, for outstanding performance in support of the High-Speed Airframe Integration Research and High-Speed Research Programs.

Velma R. Martin, secretary, AVD for superior performance as secretary of the Mission Analysis Branch in a manner that significantly contributed to the overall programs of the branch.

Doris B. Williams, secretary, AVD, for outstanding performance, including important contributions to the classified research programs in the Branch.

Spencer D. Boullianne, engineering technician, OSD, for superior technical contributions to the acoustical wedge modifications in the Jet Noise Facility.

Conard L. Chapman, engineering technician, OSD, for leading and coordinating efforts to enhance run time in the Hypersonic CF4 Tunnel.

The following are corrections to statistics on minority representation at Langley published in the November 15, 1991 issue of the Researcher News:

Overall	1985	%	1991	%
Nonminority men	2,079	72.1	1,994	67.2
Nonminority women	462	16	557	18.8
Black	265	9.2	291	9.8
Hispanic	30	1	43	1.4
Asian	36	1.2	73	2.5
American Indian	10	.3	11	.4

High Grade (GS/GM 14+)	1985	1991
Nonminority men	530	552
Nonminority women	9	27
Black	6	12
Hispanic	1	2
Asian	13	22
American Indian	0	1

SES/ST	1985	1991
Nonminority men	29	39
Nonminority women	0	1

Intercenter Race Results

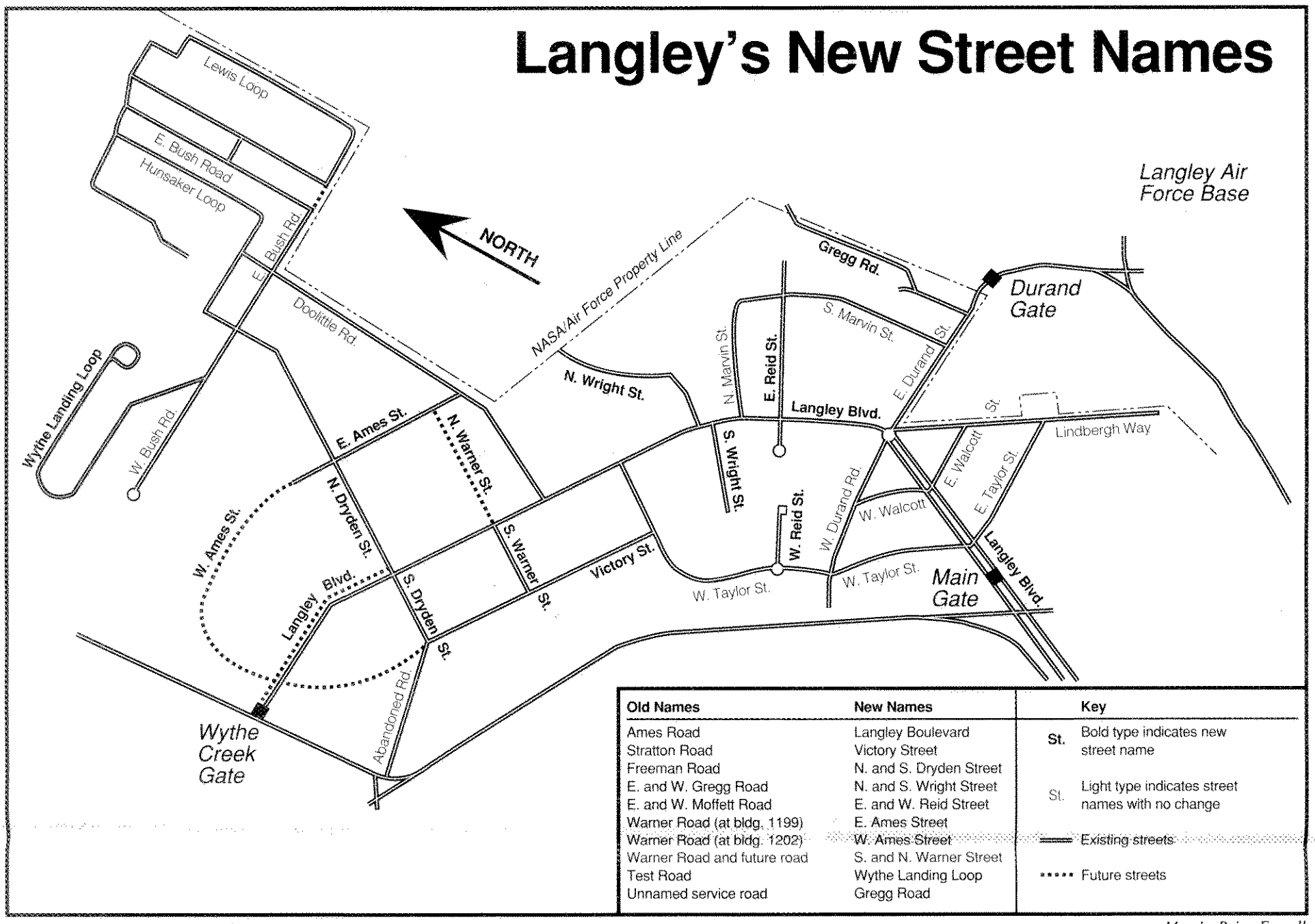
The top Langley runners in the NASA Intercenter Races were:

◆ 10 KM Race. Men: Steve Sudik, 38:17; John Hoppe, 40:42; and Bob Ferguson, 41:52. Women: Kathy Powell, 42:06; Alene Heuser, 51:48; and Karen Sage, 52:11.

◆ Two-mile race. Men: Erik Kielin, 10:53; Steve Robbins, 10:54; and David Sobota, 11:35. Women: Valerie Plyler, 11:58; Kathy Powell, 13:24; and Michelle Kattan, 14:37

Retirement Luncheon

A retirement luncheon will be held for Anne S. Reed, Acquisitions Division, at 11:30 a.m. January 14 at the H.J.E. Reid Conference Center. She is retiring after 31 years of service. For more information, call Richard Siebels, ext. 42418, or Beverly Thomas-Burse, ext. 42420.



Map by Brian Farrell

Langley Streets being Renamed to Coincide with 75th Anniversary

Langley streets will be renamed early in 1992 to coincide with the Center's 75th Anniversary. The biggest change will be the renaming of Ames Road, the Center's main thoroughfare. Ames will become Langley Boulevard.

"Many of the roads here were named early in the Center's history," said Center Director Paul F. Holloway in explaining the changes.

"The people after whom they were named had played significant roles at that time. But history has given us a broader perspective and we would like our street names to reflect that. The occasion of our 75th Anniversary is the perfect opportunity."

For example, said Holloway, "Ames Road was named before there was an Ames Research Center. So it makes sense now to change it to reflect that this is the main road for Langley. The name Ames, however, will not be lost – we'll continue to use it as the new name for another street."

Holloway, who helped former Center Director Richard H. Petersen select the names, noted that the changes will require employees to use the new addresses on stationery, envelopes and business cards. New telephone books also will incorporate the changes.

"I know this will cause inconvenience – my office will have to start using a new street address too, and I will have to buy new business cards," Holloway said. "I ask everyone to bear with these changes because they are meaningful."

The changes are as follows:

♦ **Ames Road becomes Langley Boulevard** in honor of Samuel P. Langley, the aviation pioneer and Smithsonian Institution secretary after whom the Center is named.

♦ **East Warner Road becomes East Ames Street.** Dr. Joseph S. Ames was a charter member of the NACA.

♦ **South Warner Road becomes South Warner Street.** Edward P. Warner was a NACA member from 1929 to 1945 and was Langley's original chief physicist.

♦ **Stratton Road becomes Victory Street** in honor of John F. Victory, the NACA's first employee and its only executive secretary. Samuel W. Stratton was a NACA member from 1915 to 1931.

♦ **Freeman Road becomes North and South Dryden Street** in honor of Hugh L. Dryden, NACA director at the time NASA was created, and then NASA's first deputy administrator. The Hugh L. Dryden Flight Research Facility was named after him. Freeman Road was named after John R. Freeman, a NACA member from 1918 to 1919.

♦ **Gregg Road becomes North and South Wright Street** in honor of Orville Wright, a longtime NACA member.

♦ **An unnamed service road becomes Gregg Road.** Willis R. Gregg was a NACA member from 1922 to 1923 and 1938 to 1958.

♦ **Moffett Road becomes East and West Reid Street** in honor of Henry J.E. Reid, Langley's engineer in charge and director from 1926 to 1960. Moffett Road had been named after William A. Moffett, a NACA member from 1921 to 1933.

♦ **Test Road becomes Wythe Landing Loop** in honor of the historic George Wythe home site and the sailing vessel landing that operated on Brick Kiln Creek in colonial days.

In addition, most of the Center's "roads" have be re-titled as "streets" because of the high density of facility development that has taken place over the years. The definition of "street" better suits these areas of urban or campus character.

Also, the West Area electrical substations, which had been named for their locations, will drop the designation "road" and remain Ames, Moffett, Stratton, Taylor, Warner and Yorktown substations.

Researcher News Deadline Dates

For your convenience, **Researcher News** deadline and distribution dates for the first half of 1992 are listed below. Please clip and save.

Deadline	Distribution
January 3*	January 17
January 21	January 31
February 4	February 14
February 17	February 28
March 3	March 13
March 17	March 27
March 31	April 10
April 14	April 24
April 28	May 8
May 12	May 22
May 26	June 5
June 9	June 19

* Early deadline, falls on a Friday.

Almanac Orders are Being Taken

Orders for the 1992 Federal Employees Almanac are being taken at the Langley Activities Association office. Stop by or send payment by check for $7.50 to Mail Stop 496. Make your check payable to the Langley Activities Association. January 10 is the deadline for ordering.

Mars Mission Workshop is Planned

A workshop titled "Spacecraft Controls for the Mars Mission" will be held January 13 from 8:30 a.m. to 4 p.m. at ICASE, Room 124, 18 West Taylor Road.

The workshop will begin with an overview on the Mars Mission by Dr. Gerald Walberg and continue with a series of technical presentations. It will conclude with a panel discussion of the directions in Spacecraft Controls for the Mars Mission.

For more information, contact Dr. Dave Ghosh at ext. 46616.

The workshop is sponsored by the NASA Langley Guidance, Navigation and Control Technical Committee.

Happenings

NEW YEAR'S EVE DANCE tickets are on sale at the Langley Activities Association (LAA) office, 14 Ames Road, from 9 a.m. to 4 p.m. Monday through Friday. The LAA-sponsored dance will be held from 9 p.m. to 1 a.m. December 31 at the H.J.E. Reid Conference Center. For more information, call Andrea Lewis, ext. 46369.

FEDERAL WOMEN'S PROGRAM COMMITTEE will meet January 8 at 8:15 a.m. in the cafeteria executive dining room.

ANNUAL MEETING and election of officers for the Alumni Association will be held January 14, 11:30 a.m., cafeteria.

BODY DYNAMICS high energy, low impact aerobics classes are held Mondays, Wednesdays and Fridays at 6:15 a.m. in the LAA gym. Classes are free and open to civil servants.

LOW-IMPACT and bench aerobics classes are held Tuesdays and Thursdays from 5 to 6 p.m. in the LAA gym. The cost is $12 per month. The first class is free. The classes are open to civil servants, contractors and their families.

CAT FOUND: A female cat was found between the headquarters building and 1 Gregg Road on November 15. Cat is tiger (orange) color. Call ext. 46671 from 8 a.m. to 4:30 p.m. or 1-725-3421 after 7 p.m.

LET MUSIC make your special day memorable. Pianist/vocalist will provide the right sound to suit your individual taste. Let us add the personal touch to your wedding or set the mood with background music for other special occasions. Call Shannon at 838-1829.

FOR SALE: Brick-front rancher, Northhampton area, 3 bedrooms, 2 baths, living room, dining room, eat-in kitchen with new floor, new wall-to-wall carpet, central air/heat, sunken den with bay window, utility room, detached garage, storage shed/playhouse, large fenced backyard, deck. Excellent location, convenient to schools and shopping. Priced to sell at $79,900. Call 827-6447 after 5 p.m. or leave a message on the machine.

EARRING FOUND: Outside cafeteria December 5. Pearlized, quarter-size earring features embossed woman's head. Call **Researcher News**, ext. 46126.

Aviation Week's Craig Covault to Discuss International Space Year at Colloquium

The International Space Year (ISY) was established as a 1992 focal point for international space cooperation to celebrate the 500th anniversary of Columbus' role in the discovery of America.

Dozens of multinational space projects will be carried out in 1992 under the ISY. Through the ISY, multiple countries have developed entirely new mechanisms for space cooperation. These new concepts will broaden the number and depth of cooperative space ventures into the 21st Century.

During two lectures on the Peninsula on Monday, January 13, Craig Covault, senior space technology editor, Aviation Week & Space Technology, will address "Toward a New World Order in Space Cooperation – The International Space Year."

At 2, p.m., Covault will speak to Langley employees, retirees and contractors during a colloquium in the H.J.E. Reid Conference Center, 14 Ames Road.

At 7:30 that evening, Covault will give the same presentation at the Radisson Hotel Hampton as part of The Sigma Series.

The Sigma Series is a series of free public lectures sponsored by the Virginia Air and Space Center, the Daily Press and NASA.

As senior space editor of Aviation Week for nearly 20 years, Covault has written more than 1,000 news stories on the United States, Soviet and other space programs.

His coverage of White House national space policy decisions over the last 15 years helped bring this issue to the national forefront.

Covault routinely participates in space simulations with U.S. astronauts, including underwater simulations in pressurized space suits to demonstrate extravehicular tasks.

He began his space writing career in 1969 at the Kennedy and Johnson Space Centers working under grants from *Readers Digest Magazine*.

Covault is also a pilot and has flown numerous missions in U.S. military aircraft such as the F-100, the F-106, the F-4, the F-15, the F-111, the Harrier, AWACS, the B-52 and the KC-135.

He has also flown on the Shuttle training aircraft during steep shuttle approaches.

National Aeronautics and Space Administration

Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 RESEARCHER,NEWS
VANVALKENBURG, RANDAL L.,
MAIL STOP 125A BLDG 1268

News Researcher

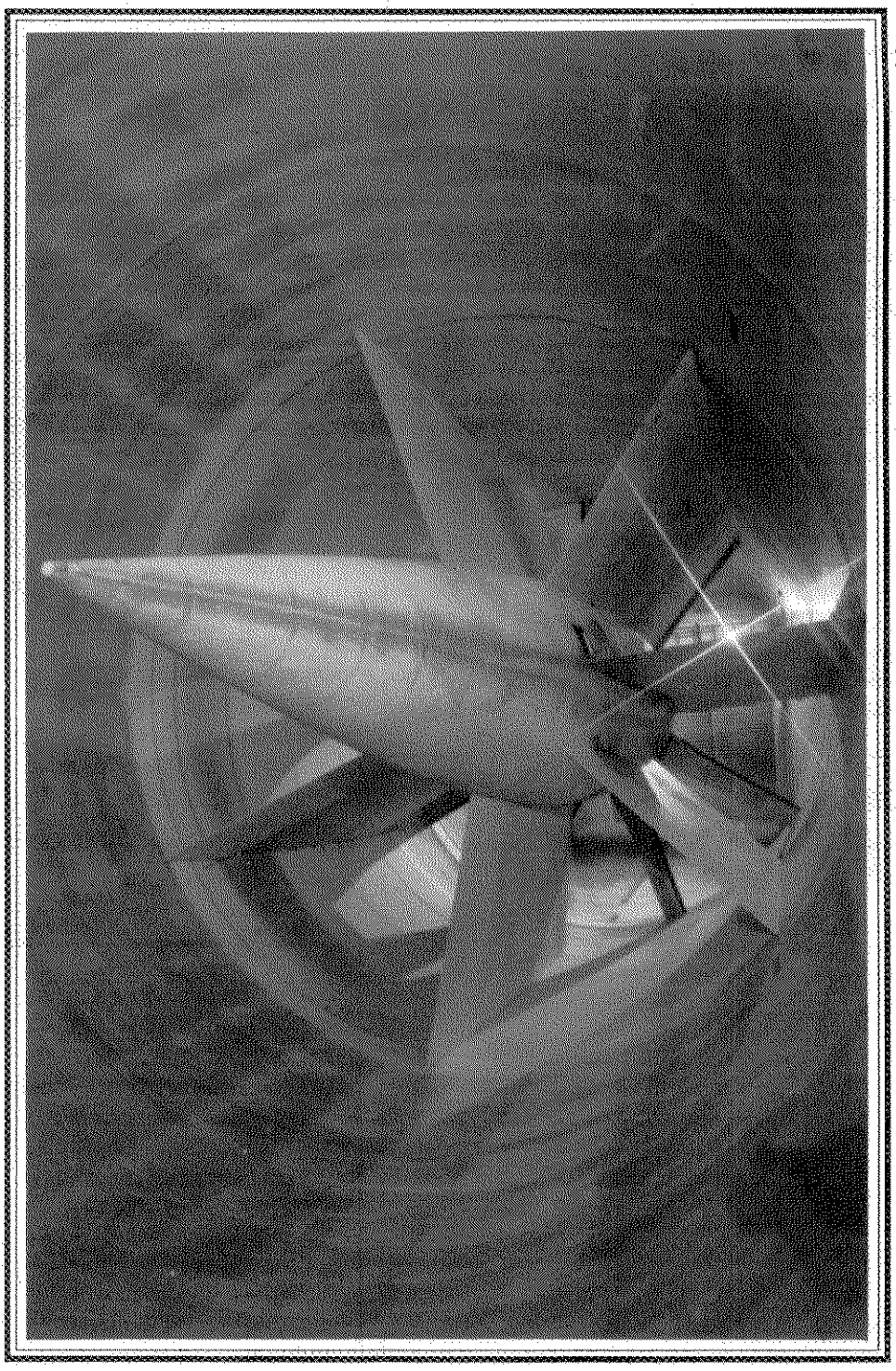


Photo by Fred Jones

A VIEW of the 14 x 22-Foot Subsonic Tunnel shows the 40-foot fan section. Each blade is nearly 16 feet long. The fan is powered by a 12,000-horsepower motor and produces wind speeds of up to 230 miles an hour.