NASA
National Aeronautics and Space Administration
Langley Research Center

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News Researcher

Bi-weekly Employee and Contractor Publication

Holloway Receives Presidential Rank Award

Paul F. Holloway, Deputy Director of the Langley Research Center, has received a Distinguished Presidential Rank Award.

The award was presented by The President of the United States during a special ceremony in Washington, D.C., January 5.

The President conferred on Holloway the rank of Distinguished Executive in the Senior Executive Service for "sustained extraordinary accomplishment in management of programs of the U.S. Government and for leadership exemplifying the highest standards of service to the public, reflecting credit on the career civil service."

Holloway is an internationally recognized authority in hypersonic aerodynamics, boundary-layer transition and flow separation, analysis of entry flight mechanics, and Earth orbital and planetary space missions. His foresight in maintaining a strong hypersonic research capability at Langley has been instrumental in readying NASA for development of the National Aero-Space Plane.

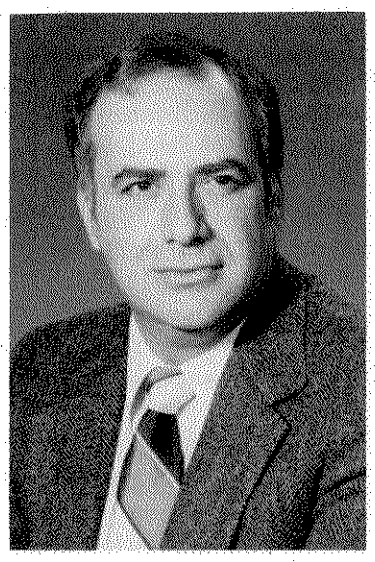
Throughout his career he has stressed interdisciplinary approaches to solving critical technical problems. This concept was vital in resolving the concern of Congress over excessive extra-vehicular hours for construction and maintenance of the Space Station. Under Holloway's direction, an interdisciplinary task team reconfigured in-space assembly sequences, successfully reducing extra-vehicular assembly and maintenance time.

In answer to a 1985 directive of the President, Holloway served as co-director of a joint Department of Defense-NASA Space Transportation Architecture study of next-generation systems, developing recommendations to ensure America's future access to space.

Each year only one percent of SES executives may receive the rank of Distinguished Executive. For 1987, the President granted 58 Distinguished Executive Awards, the largest number of awards in the history of the SES.

Holloway joined the Langley staff in 1960 and has served as an aerospace research engineer; Head, Systems Analysis Section; Head, Aerospace Operations Analysis Section; Chief, Space Systems Division; and Director for Space.

He is a Fellow of the American Institute of Aeronautics and Astronautics and in 1981 received the Presidential Rank of Meritorious Service for his sustained accomplishments in federal service. In addition, he has received



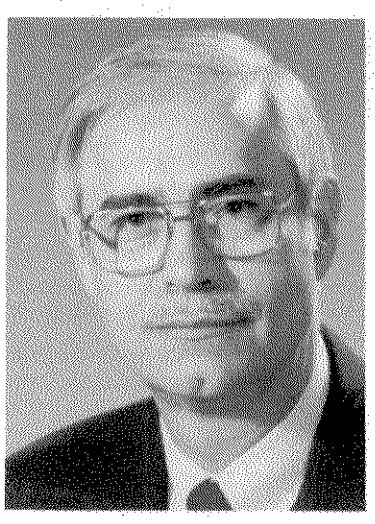
a NASA Outstanding Leadership Medal and a NASA Exceptional Service Medal.

Holloway and his wife, Barbara, live in Poquoson. They have one son.

Langley Managers Retire from Government Service

Five managers at the Langley Research Center retired from government service January 1.

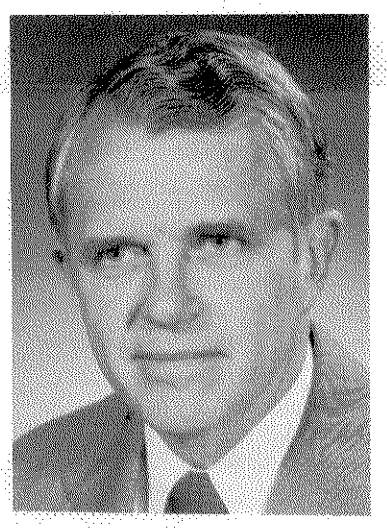
Retiring were Homer G. Morgan, Chief, Acoustics Division; Joseph Guarino, Assistant Chief, Instrument Research Division; Herman L. Bohon, Manager, Control of Flexible Structures Office; Lee R. Foster Jr., Manager, Scout Project Office; and Robert L. O'Neal, Manager, Long Duration Exposure Facility.



Homer G. Morgan

Morgan, who retired with over 33 years of service, joined the Langley staff in 1955. As a division chief, he was responsible for planning, developing and directing research aimed at understanding and reducing the sources of noise in jets and flows interacting with surfaces, rotors and propellers. The program includes research on the effects of noise on people and structures, and establishing noise and vibration acceptability levels for the community, crew and passengers.

Morgan and his wife, Norma, live in Newport News. They have two sons.



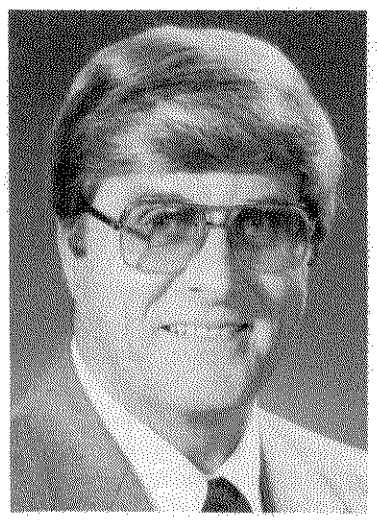
Lee R. Foster, Jr.

Foster, who retired after more than 37 years of service, was responsible for all activities associated with the Scout Project including planning, procurement of hardware, design of hardware, and launching Scout vehicles and assigned spacecraft into orbit.

Foster and his wife, Bea, live in Williamsburg. They have three children.

Bohon, who joined the Langley staff in 1959, was responsible for the definition and implementation of an integrated activity in structures and controls focused on the development of technology required to understand and accurately predict and control deformation of large flexible spacecraft in a microgravity environment. This activity evolved around a major ground test program and generic on-orbit testing using the space transportation system as the test bed.

Bohon conducted research in theoretical and experimental panel flutter, including the effects of aerodynamic heating on flutter and the influence of boundary support stiffness. More recently he was responsible for a comprehensive experimental and theoretical program for the evaluation of thermal-structural concepts for high-speed vehicles with an emphasis on space transportation systems. Prior to heading the COFS Office, he was Manager for Composites in the Aircraft Energy Efficiency Office. The ACEE program established the United States aerospace industry as world leaders in efficient use of lightweight composites in advanced military and civilian aircraft.



Herman L. Bohon

Bohon and his wife, Patricia, live in Suffolk.

Guarino retired after 32 years of federal service. As an assistant division chief since 1984, he was involved in planning, directing and coordinating the division's effort in research, development and instrument support activities for Langley's research facilities.

Joseph Guarino

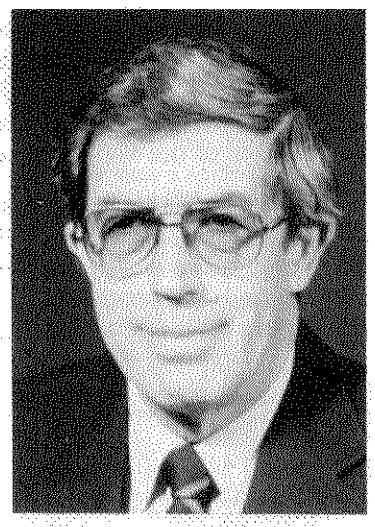
He came to Langley as an Air Force officer in 1955 on assignment to NASA's predecessor, the National Advisory Committee for Aeronautics. After his Air Force tour, he remained at Langley and served in various management positions during his career.

He and his wife, Genevieve, live in Yorktown.

O'Neal, as project manager, was responsible for LDEF project planning and evaluation; systems engineering, design, integration and safety; testing; reliability and quality assurance; scheduling; financial planning and control; technical monitoring of contracts; and determining project goals.

LDEF is a free-flying structure on which 57 international scientific applications and technology experiments are mounted. LDEF was placed in Earth orbit by the Space Shuttle in April 1984 for an exposure to the space environment. The retrieval of the LDEF, which was delayed by the Challenger accident, is currently planned as one of the early missions when the Space Shuttle flights resume.

O'Neal retired with more than 37 years of service, including a two-year tour in the U.S. Air Force. He worked in the Pilotless Aircraft Research Division at Langley. In 1962 transferred to the Space Task Group,



Robert L. O'Neal

which developed many of the early plans for the U.S. space program and for the transition of NACA to NASA. He moved with the Space Task Group to what is now the Johnson Space Flight Center in Houston. He returned to Langley in 1964 to work in the Applied Materials Division.

He managed the Explorer XXIII Project for Langley, which involved the development of an early spacecraft launched by a Scout Rocket, and the Meteoroid Detector Experiment.

News Briefs

HEADQUARTERS, Washington, D.C. — NASA has announced the selection of 59 research proposals for negotiation of Phase II contact awards in the Small Business Innovation Research (SBIR) program. SBIR seeks to stimulate technological innovation, icrease small business participation in federal research and development programs, and foster growth and economic strength of the private sector. SBIR Phase II continues the most promising Phase I projects which have indicated feasibility and potential value as research innovations.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — The second full-duration test firing of the redesigned Space Shuttle solid rocket motor, designated DM-9, was conducted at the Morton Thiokol Wasatch facility in Utah. While initial post-test inspection indicated the redesigned field joint performed properly, further examination of the motor revealed an anomaly in one nozzle component.

HEADQUARTERS, Washington, D.C. — Negotiators from NASA and the Canadian Ministry of State for Science and Technology have reached agreement on the text of a memorandum of understanding (MOU) for cooperation in the detailed design, development, operation, and utilization of the permanently manned, civil Space Station. Under terms of the MOU, Canada will provide a mobile servicing system to the international Space Station complex. In exchange, Canada will participate in the management and operation of the Station and Canadian users will be able to use the full range of capabilities provided on the Station.

NATIONAL SPACE AND TECHNOLOGY LABORATORIES, Miss. — Research being conducted at NSTL is helping a small Virginia community meet state and federal wastewater treatment standards. Microbial filter/higher plant technology developed for potential space applications is providing the only affordable solution to acquire the mandated secondary sewage treatment for Monterey, Va.

HEADQUARTERS, Washington, D.C. — Scientists have announced a major advance in the study of explosive nucleosynthesis – the creation of heavier elements out of lighter elements in the explosion of a supernova. The advance occurs with the first direct observational detection of gamma-ray emissions from radioactive cobalt produced in the supernova 1987A explosion. The evidence comes from three independent sources and confirms an astrophysics theory widely held since the 1950's.

HEADQUARTERS, Washington, D.C. — NASA has awarded letter contracts to the four companies selected on Dec. 1 to perform detailed design, development, test, evaluation, and delivery of the components and systems that will comprise the Space Station.

HEADQUARTERS, Washington, D.C. — Philip E. Culbertson, who has served the American space exploration program for 22 years in high level technical and policy positions, will retire from NASA in mid-January. Currently Associate Administrator for Policy and Planning, Culbertson will become president of the Lew Evans Foundation, a non-profit organization which supports and encourages the use of space to improve life on earth.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — MSFC has issued a two-part request for proposal to select a prime contractor for a long-duration, human-tended scientific satellite called the Advanced X-Ray Astrophysics Facility (AXAF). AXAF will be designed to observe some of the most violent processes in the Universe and reveal their hidden mysteries.

HEADQUARTERS, Washington, D.C. — NASA has announced that White Sands Space Harbor, N.M., has been designated as an alternate end-of- mission landing site for Space Shuttle missions STS-26 through STS-28. The alternate site would be used for a Shuttle landing if conditions were present that precluded a nominal end-of-mission recovery on lakebed Runway 17 at Edwards Air Force Base, Calif., the primary landing site.

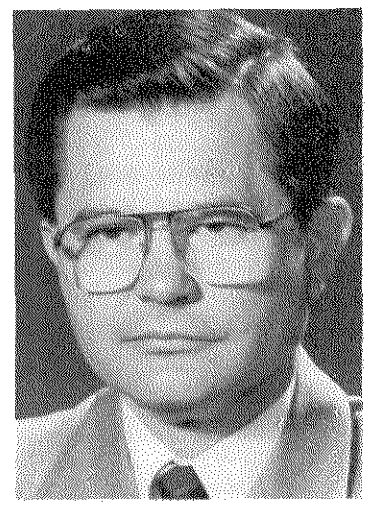
MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — NASA has completed acceptance tests on the three main engines which will power the Space Shuttle Discovery on the next Shuttle mission, STS-26. The final test, a full-mission-duration firing of main engine 2028, was performed at NASA's National Space Technology Laboratories in Mississippi. Detail examination of the engine and analysis of test data have been continuing since the firing.

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — Scientists from NASA, the Department of Energy (DOE), and two universities have discovered a way to further fortify high-level nuclear waste containers, virtually ensuring the safe storage of radioactive material for thousands of years. The key is magnesium. Magnesium provides better corrosion protection of the glass components of nuclear waste containers by a factor of 100 or more.

Editorials

Langley

Headquarters Forum



It is now and always has been universally accepted that the principal business of the Langley Research Center is research in the areas of technology associated with flight. Another universal belief is that the research we conduct must be reported clearly and concisely while it is still fresh. There were few relevant journals in the early days when the aeronautical sciences were young, so the NACA report was created and quickly became the dominant means of publication at the Center. NASA publications remain popular and useful in many areas of research conducted at Langley today.

As the arena of flight has been extended to higher speeds and the environment of space, the number of technologies practiced at the Center has increased dramatically. Many of these technologies already had well established publication forums consisting of one or more archive journals where relevant research results must be published if they are to reach the appropriate technical community. As a result, our avenues of publication have increased to include the archive journals in a number of fields of science and engineering.

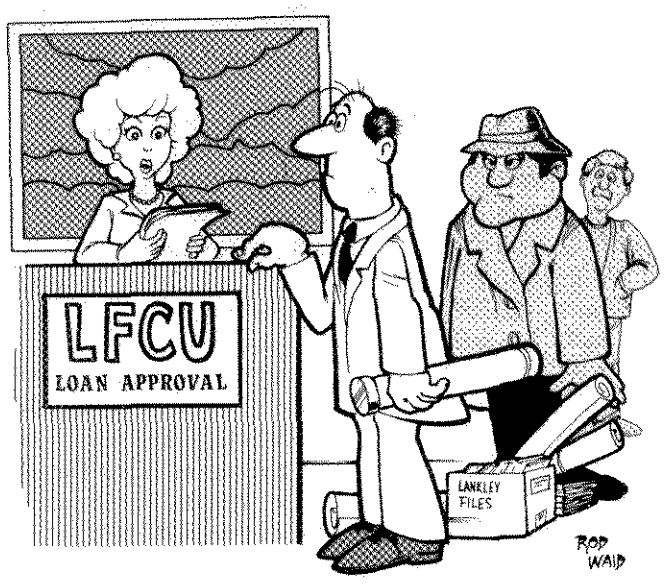
The principal characteristic which any reputable medium of publication must have is quality. The archive journals and our agency use the same method to insure quality: the peer technical review process. For NASA publications, the peer review process is implemented through the technical editorial committee; while the journals use a system of independent reviewers in which many of us participate. Both of these technical editing systems have a grass-roots orientation and derive their strength from the efforts of individual peers. Although we live in an era when the values of individual efforts often seem inconsequential, it is almost always possible to get a sense of real accomplishment from participating in a good, thorough technical review.

As in other endeavors, the maintenance of report quality requires constant vigilance. In view of some recent criticisms that technical report quality may have degraded nationally in recent years, it behooves all researchers to make an extra effort when it is their turn to review a peer's paper. A criticism which has been expressed by some researchers over the years is that the review process is a thankless one which provides little or no benefit for the extra effort. I believe that the maintenance of report quality benefits us all. Also, the present performance appraisal process provides supervisors with a means of recognizing our researchers' technical review efforts.

Our ability to keep the quality of our NASA papers and archive journal articles high is strictly dependent on the attention to detail paid by the individual reviewers. The potentially overwhelming problem of maintaining report quality can be solved simply by reviewing each individual paper properly.

Richard W. Barnwell
Chief Scientist

Lankley



"SORRY, WE CAN'T GIVE YOU A LOAN TO FUND YOUR NASA PROJECT."

NASA Selects Council to Conduct Orbiter Naming Competition

NASA has selected the Council of Chief State School Officers (CCSSO) to conduct a national competition among the nation's public and nonpublic school students to select a name for a Space Shuttle orbiter now under construction.

NASA will make the final choice, based on the top recommendations.

The competition requires students to undertake interdisciplinary projects and is open to all elementary, middle, and secondary schools in the 50 states, the District of Columbia, U.S. Territories, the Bureau of Indian Affairs schools, Department of Defense dependent overseas schools, and the Department of State overseas schools.

The project may involve teams which include teachers and community members working with schoold children. Each entry will include a suggested name for the new orbiter.

Under the arrangement with NASA, CCSSO will develop judging guidelines and a selection process to be adopted by each state. Contest rules will be distributed to school systems across the country beginning in March 1988.

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Thursday following the date of this issue.

Managing Editor . . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

Alumni News and Views

Langley Alumni Association to Elect Board of Directors

-by William J. Boyer

On January 20, 1988 at 8 p.m. the Langley Research Center Alumni Association will hold its first annual election meeting in the Activities Center. This formal organizational meeting follows a social and dinner which begins at 6 p.m.

From a Center-sponsored meeting to explore the possibility of establishing an alumni group that was held in February 1987 and attended by 16 people, the Langley Research Center Alumni Association has grown to a membership of over 200.

The past year was one spent in defining and documenting, with the help of many participants, the purpose and goals of the organization. The association's purpose is to develop, maintain, and enhance the relationship among former employees of the Langley Research Center and to provide a mechanism for the Center to maintain contact with its former employees. It will also provide an organized way for members to support special events at the Center and other activities of mutual interest.

With this charter, the initial group of attendees chose a temporary Board of Directors pending a formal election by the membership, defined the Alumni's role and objectives, and drafted a set of by-laws.

Not withstanding the "acting" nature of the current group, 1987 was a busy and productive year. The association's first formal activity was the staffing of an Alumni table at the Center's 70th Anniversary celebration in July where information and membership applications were distributed. This led to support and participation in the Center's Combined Federal Campaign drive.

The highlight of the year was the Alumni-sponsored banquet honoring the Center's 70th Anniversary attended by 191 people.

The year's activities concluded with a luncheon meeting on November 16 featuring Howard Wright, Langley's former Director for Projects, who gave a presentation on the National Aerospace Plane Project.

1988 promises to be a year of increasing opportunity to expand, improve, and enhance our alumni potential. It should be emphasized that this is the Langley Research Center Alumni Association. It is by and for former Langley employees and retirees. It is supportive of and in touch with other NACA/NASA alumni organizations, but it is uniquely a Langley organization.

For retirees, a membership application is included with this issue and may be used to join the Association. Dues are only $5 per year and are payable with the submitted application. Members and persepective members who have not made arrangements to attend the dinner are invited to attend the annual meeting's business session and election which will begin at 8 p.m. on Wednesday, January 20.

In conclusion, 1987 was an organizational year; 1988 should be a year of growth and consolidation. Join us and be a part of the on-going activities to help determine the direction the association should take in the future.

MEMBERSHIP APPLICATION

LANGLEY RESEARCH CENTER ALUMNI ASSOCIATION, INC.
NASA LANGLEY RESEARCH CENTER
MAIL STOP 154
HAMPTON, VIRGINIA 23665

DATE: _____

FULL NAME: _____ NICKNAME: _____

ADDRESS: _____

_____

TELEPHONE: _____

SECOND ADDRESS: _____

_____

SPOUSE'S NAME: _____ NICKNAME: _____

FIRST DATE OF EMPLOYMENT: NASA: _____

COMPANY: _____

DATE OF RETIREMENT/SEPARATION: _____

NOT RETIRED: _____ PRESENT EMPLOYER: _____

LAST POSITION/ASSIGNMENT AT LANGLEY: _____

FAVORITE POSITION: _____

RETIREMENT INTERESTS:

ART	BRIDGE	GOLF	READING	TRAVEL
BASEBALL	CRAFTS	HUNTING	SWIMMING	WOODWORKING
BOWLING	DANCING	JOGGING	TENNIS	

WILLING TO SERVE ON BOARD? YES_____ NO_____

COMMENTS: _____

_____

****
*****Please include yearly dues of $5.00 with this application.*****
****

Notes of Thanks

Lloyd E. Yeatts writes: "I would like to thank all of my NASA and contractor friends and co-workers for the retirement luncheon and my Seiko watch. I thank everyone at the Center for helping to make my 31 years at NASA productive and happy years."

Grace P. Gardner wishes to thank her many friends and co-workers for the lovely luncheon and gifts. "NASA is very special to me and I sincerely hope 1988 will bring all the good things hoped for to all of you."

Herb Cunningham writes: "Thanks to all those who attended my retirement party. It was wonderful to see so many friends and co-workers, including those old timers who were here when I came in 1947. Special thanks to John Edwards and Eleanor Wynne for their preparations for this once-in-a- lifetime occasion."

Special Thanks

Langley Director Richard H. Petersen would like to share the following letter from the Governor of the Commonwealth of Virginia following his recent tour of Langley Research Center:

Dear Dr. Petersen:

Thank you for a terrific tour of this nation's premier aeronautics and aerospace research center.

I've had several astronauts and pilots tell me that their accomplishments were directly related to the good work done at Langley. After watching a 50-ton vehicle travel 240 mph and stop right in front of me, I was converted on the spot.

Please extend my thanks to the entire staff for planning an interesting and productive tour. The aerospace plane is an important addition to my office. I have given the specs to Senator Andrews to assist in his search for a new state aircraft.

With kindest regards, I am

Sincerely,

Gerald L. Baliles

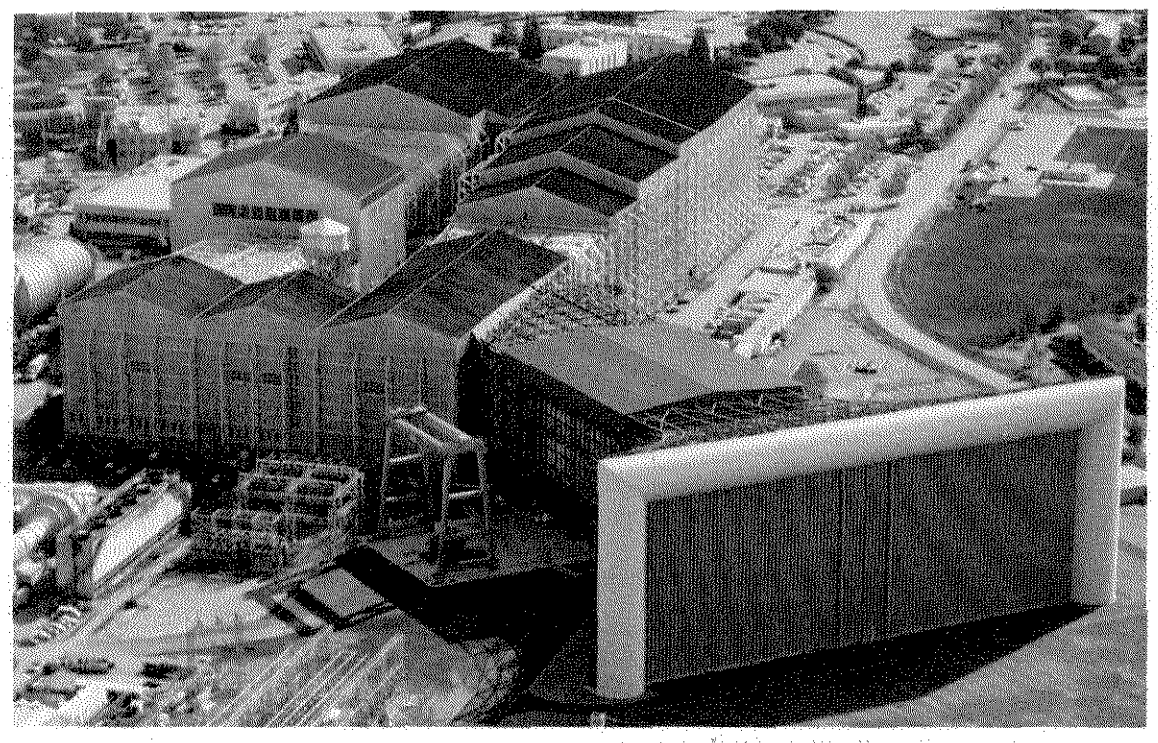
Senior Management Research Review

The Senior Management Research Review will be held Tuesday, January 19, at 9 a.m. in Building 1219, Room 225. Following the Director's comments and program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENTS	SPEAKER
9:30	Full-Color Thin-Film Electroluminescent (TFEL) Flat-Panel Display Achieved	James Robertson (Flight Systems/FLMD)
9:45	Investigation of the Influence of Wind Shear on the Aerodynamic Characteristicsof Aircraft Using a Vortex-Lattice Method	Dan Vicroy (Flight Systems/FLMD)
10:00	Theoretical Evaluation of Optimized Waverider Configurations	Steven Bauer (Aeronautics/HSAD)
10:15	Demonstration of Phosphor Thermography System in 31-Inch Mach 10 Tunnel	Gregory Buck (Space/SSD)
10:30	Kirchhoff Formula for Radiation from Moving Surfaces	Fereidoun Farrassat (Structures/ACOD)
10:45	Free-Flight Drop Model Instrumentation/ Electronics Development	Preston Carraway (Electronics/FED)

Swain Lauds NFAC Rebuild Project

World's Largest Wind Tunnels Operational



The National Full-Scale Aerodynamic Complex (NFAC) was dedicated December 11 at Ames Research Center. The $122.5 million facility covers 12 acres. The air circuit is over a half-mile long and, at maximum speed, the airflow is some 63 tons per second.

The world's two largest wind tunnels became fully operational at Ames Research Center, Mountain View, California, in mid-December. The tunnels are housed in the National Full-Scale Aerodynamics Complex (NFAC), a major resource for aeronautical research and development for the United States.

Increased pressure for higher full-scale wind tunnel speeds and a larger test section led to a decision in 1977 to upgrade the Ames 40- by 80-Foot Wind Tunnel, long known as the world's largest closed circuit wind tunnel. In addition to an upgraded 40-by-80, the NFAC adds an all new, open circuit, 80- by 120-Foot Wind Tunnel, again the largest in the world.

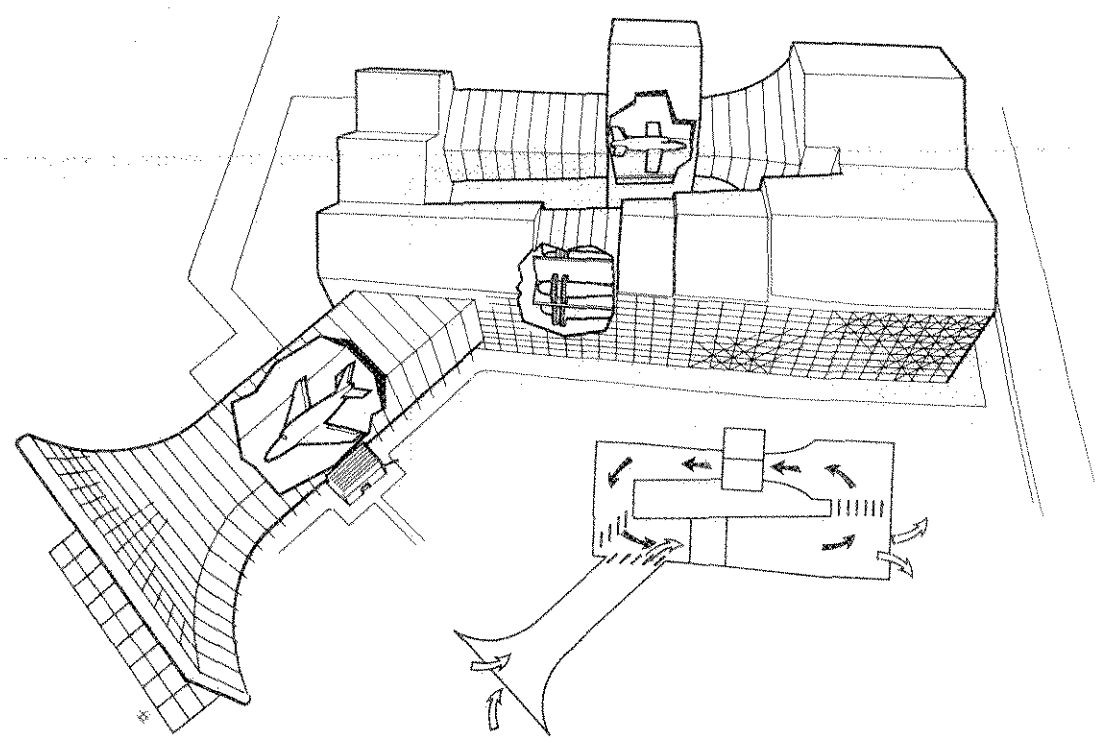
The two tunnels provide unique facilities for full-scale and large-scale testing of advanced aircraft, closely simulating actual flight conditions. The facility provides a valuable new capability for full-scale testing of rotorcraft and vertical and short-takeoff and landing (V/STOL) aircraft through a wide speed range.

Modifying an existing structure is often more challenging than building a new one. In the case of the NFAC, it was necessary to replace the original six 6,000-horsepower drive motors with a 135,000-horsepower system . . . utilizing the same space. By using modern synchronous motors with controllable pitch- fans and solid-state variable-frequency speed controls, the new drive system was squeezed into the existing motor support structure.

The new drive system was carefully designed to take maximum advantage of the latest acoustic technology and reduce drive-system-generated noise to extremely low levels. The test sections of both tunnels have also been acoustically treated, reducing community noise and allowing efficient noise measurements to be made on model hardware during aerodynamic testing.

The old 40- by 80-Foot Wind Tunnel single-return circuit remains essentially intact, but a large system of turning vanes and louvers deflect flow to utilize the newly grafted-on 80- by 120-Foot Wind Tunnel leg when it is used for testing. Though the two tunnels cannot be operated simultaneously because they share a common set of motors and drive fans, full access to the tunnel not in use allows for model preparation and checkout prior to tunnel testing.

Robert L. Swain, Langley Director for Systems Engineering and Operations, is Chairman of the Office of Aeronautics and Space Technology (OAST) Oversight Review Panel (ORP) for the NFAC Rebuild Project. Swain says, "The ORP gives Ames high marks for the excellent and highly professional manner in which the Project has been accomplished. We were impressed with both the detail and technical quality of the many design analyses, aerodynamic studies, outstanding planning for shakedown testing and, across the board, the overall management of the Project including engineering, construction, safety, R&QA, etc." The ORP, an inter-center committee established in early 1983 by Jack Kerrebrock, former Associate Administrator for OAST, has worked closely over the past five years with Ames personnel on all levels and in all areas of the rebuild project. Swain concludes, "This NFAC project has now set the drum beat for other major Construction of Facility Projects across the Agency."



As shown in the small diagram, the NFAC facility is two tunnels, powered by one set of motors and drive fans. When the 40- by 80-foot test section is used, tunnel air goes round and round in a continuous loop. When the larger 80- by 120-foot test section is operating, air is pulled in through the big horn-shaped inlet, flows down one side of the loop and back to the outside.

In the larger drawing, the three cutaways show the 40- by 80-foot test section (top), the 135,000 horsepower tunnel drive fans (center) and the 80- by 120 test section in the big horn. These tunnels are large enough to test full- scale aircraft with their engines running.

Jacobs Attends Maxwell Program at Syracuse University

Kenneth L. Jacobs, Head, Electronic Systems Branch, Facilities Engineering Division, has been selected to attend the Maxwell Mid-Career Development Program at Syracuse University for 15 weeks.

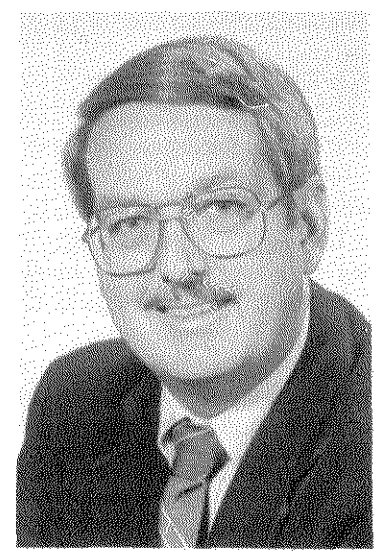
Jacobs began his Langley career in 1967. As a branch head, he is responsible for planning, managing and directing activities of two engineering sections engaged in the design, development and construction of Langley's communications systems and the automation and controls of research facilities.

Jacobs said he is interested in improving his management skills and thinks that a concentrated formal program is the most efficient method. "The Syracuse University Maxwell Mid- Career Development Program will allow me the opportunity to assess my managerial skills, identify areas for improvement and develop better specific skills in analysis, communication and leadership," Jacobs explained. "I will gain a better understanding of human behavior as it impacts organizational productivity and hope to increase my knowledge of managerial techniques for securing maximum productivity from limited resources. Learning from the experience of other managers will broaden my perspective and enhance my managerial skills."

Following the program at Syracuse, Jacobs will return to his position as branch head. Special emphasis will be placed on increased productivity of the organization to compensate for technological advances, increased workload and limited resources. "The skills learned in the area of communication, leadership and decision making will enhance my ability to assume greater responsibilities at Langley," Jacobs said.

Jacobs received bachelor and master of science degrees in electrical engineering from Old Dominion University in 1967 and 1973, respectively.

Jacobs and his wife, Connie, live in Seaford.

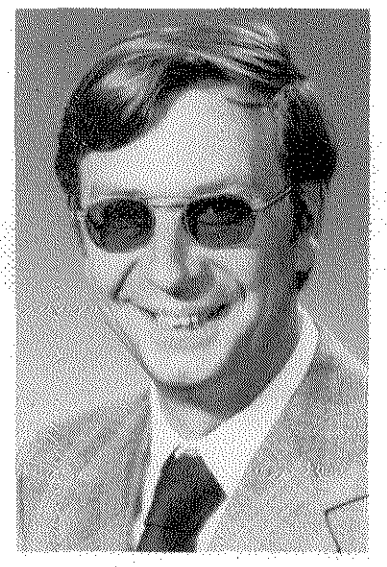


Visitor Center Announces January Programs

NASA now has computers which speak in gigaflops. A gigaflop is about a billion calculations per second. Because of computers, flight research data can be compiled with more accuracy, less expense, and greater speed.

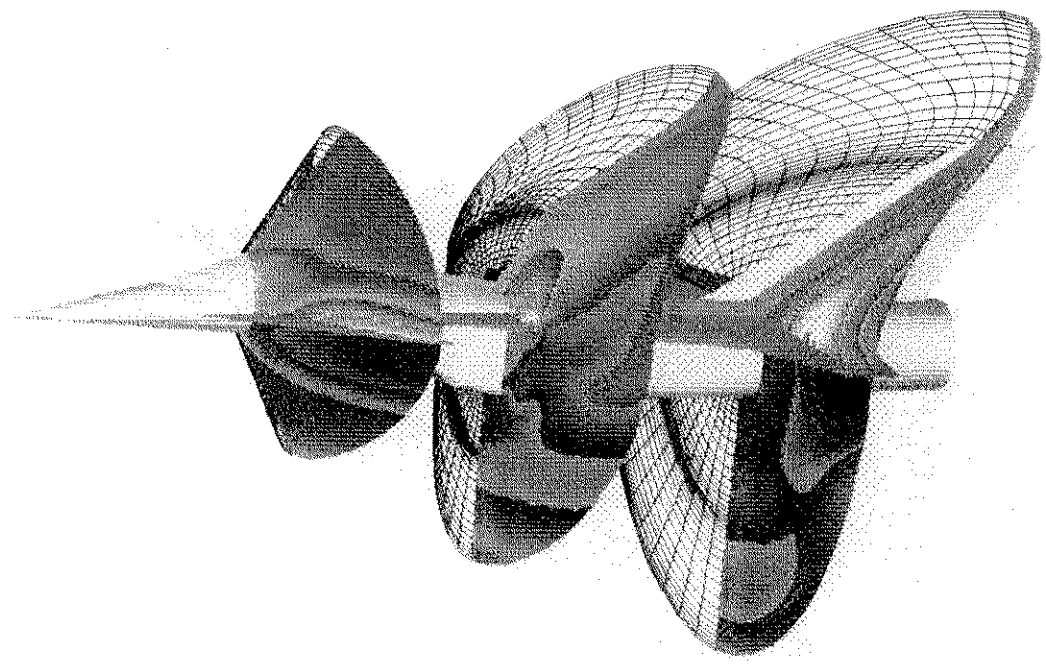
A special display of full color computer graphic designs, generated by supercomputers, will be on display at the Visitor Center throughout the month of January. Three-dimensional slides will give visitors a close-up view of computer graphics and how they work. In addition, films will be shown daily in the Visitor Center which highlight the use of computers for flight research.

Dwoyer Discusses Supercomputers: Simulating Future Flight



In the 1960's, it would take Doug Dwoyer several days to carefully plot hundreds of sheets of computer-generated data by hand. With today's supercomputers, Dwoyer can watch that same information appear in full color on a television monitor in a matter of seconds. These supercomputers supplement, and will one day replace, some of the wind tunnel testing in the development of aircraft designs.

Dwoyer, a senior research engineer in the Hypersonic Technology Office, will speak on the fascinating new generation of supercomputers on Thursday, January 21, at 7:30 p.m. in the Visitor Center. He will illustrate his lecture with film clips revealing the scientific wizardry behind computer-generated images.



From Behind the Scenes

Advanced Visualization Techniques Add Dimension to Aerospace Research Analysis

Could it be an aircraft penetrating and stimulating the imagination?

Actually this mathematically-generated computer graphic shows calculated pressure gradients around a conceptual fighter aircraft. The techniques include shaded solid modeling of 3-D geometries, hidden-line wireframe representations, and color contoured surfaces generated on high performance graphic workstations and a digital film recorder.

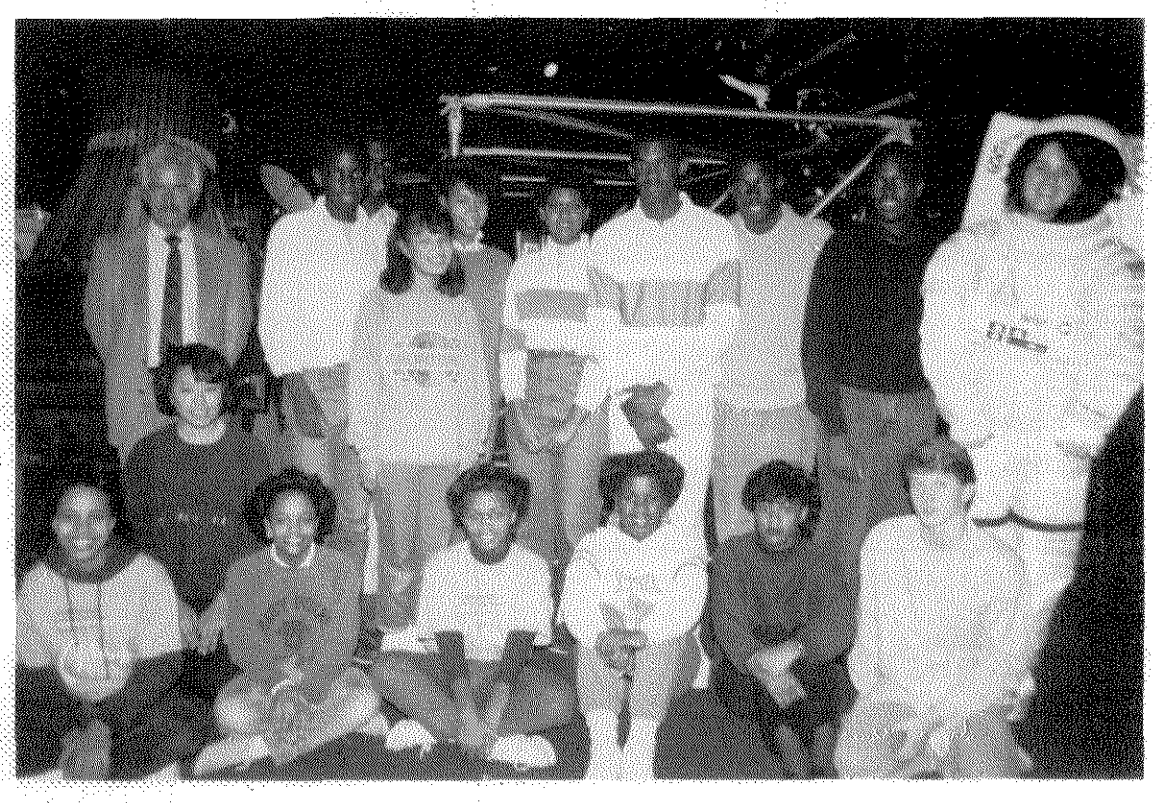
Computer graphics allows a multitude of mathematical calculations to be visualized. New computer graphics techniques which significantly aid in the analysis of computational and experimental data are being developed by the Flight Software and Graphics Branch/ACD.

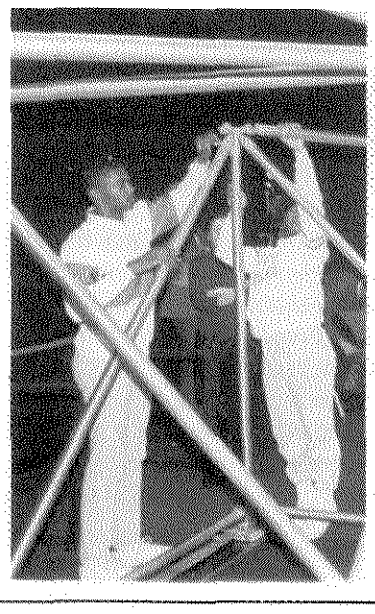
CHROME Students Attend Aerospace Workshop at Visitor Center

The spirit of pioneers and explorers lives on in the students of Hampton Roads. Sixteen students from the Cooperating Hampton Roads Organization for Minorities in Engineering (CHROME) tackled the challenge of space recently at the NASA Visitor Center.

These high school students from area schools were selected by essay competition. "Programs such as this workshop give students the opportunity to learn firsthand the variety of professions available in high technology," explains Dr. Lillian Meyers, Director of CHROME.

The two-day aerospace workshop focused on the Space Shuttle and the Space Station. Students toured NASA facilities. In the Structures Laboratory, they viewed a demonstration of new structures for the Space Station and participated in assembling Space Station hardware. The students experimented with computer programs highlighting the Space Station and Space Shuttle. A highlight of the workshop was their visit to Langley Air Force Base where students tried their skills in the F-15 simulator.

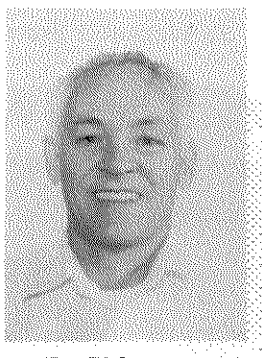


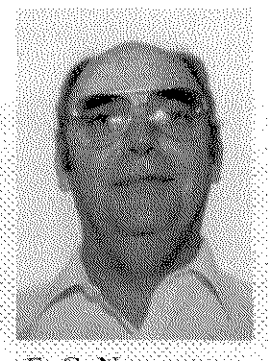


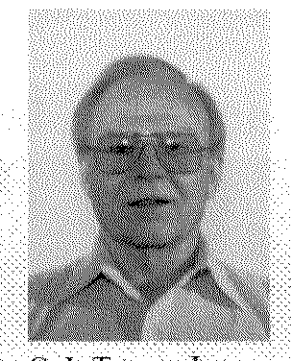
Above: Participating in CHROME aerospace workshop are (front row, seated, L to R) Stephanie Garland, Louise Chang, Toni Walker, Veronica James, Janet Darden, Courtenay Sturdivant, Chris Taylor, (second row, standing) Langley mentor Richard E. Wallsom, PRC Kentron; Maurice Murphy, Shawn McLeod, Elsa Chang, Jacquelyn Nickens, Vinesha Pegram, Christopher Wynder, Addison Parker, Glenn Newsome, and Janice Moseley.

Far left: Students visited the Structures Lab where they participated in Space Station construction exercises. Jacquelyn Nickens tries her hand at assembly techniques while hoisted on an elevated platform to simulate conditions in space.

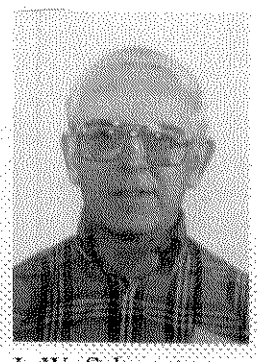
Left: Students then divided into teams to compete in assembly drills–this time on ground level in the Visitor Center Space Gallery.

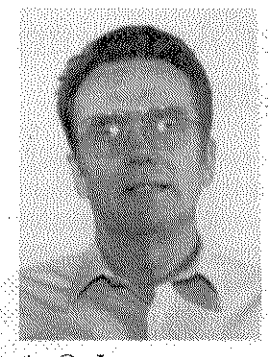

B. D. Sidney


E. C. Naumann

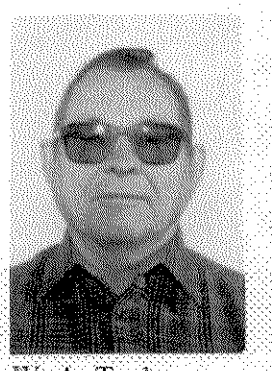

C. I. Tynan, Jr.

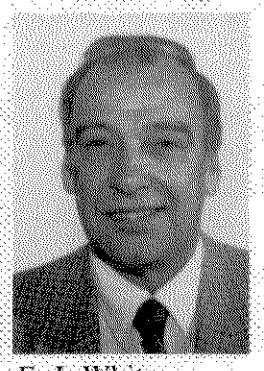
C. J. May


J. W. Schwartz


A. O. Lupton

J. A. Dorst


W. A. Tuck


E. J. White

Recent Retirees

Barry D. Sidney, Flight Electronics Division, retired November 30.

Eugene C. Naumann, Loads and Aeroelasticity Division, retired December 21.

Gerard E. Migneault and **Amy O. Lupton**, Information Systems Division, retired December 31.

The following employees retired January 1: **James Arthur Dorst** and **William A. Tuck**, Acquisition Division; **Ellis J. White**, Analysis and Computation Division;

Wendell G. Ayers and **Daniel I. Sebacher**, Atmospheric Sciences Division; **Franklin Walker Poole**, Control of Flexible Structures Project Office;

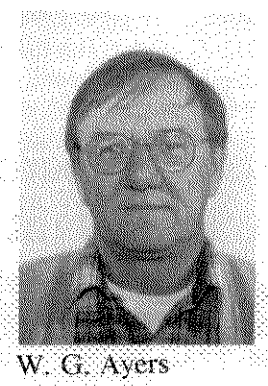
James W. Geouge, **John William Simpson**, and **Billy Grey Teagle**, Fabrication Division; **Mildred Frances Hartman**, Financial Management Division;

Opal H. Merryfield, Financial Management Division; **Paul L. Yeager**, Flight Electronics Division; **Marion A. Wise**, Information Systems Division;

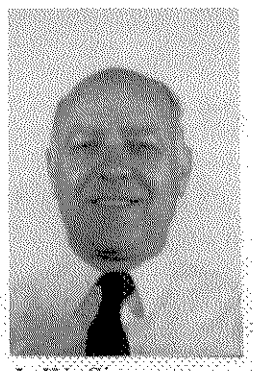
Colossie N. Batts, **Beverley W. Lewis** and **Irvin M. Miller**, Instrument Research Division; **Herbert J. Cunningham** and **Robert W. Hess**, Loads and Aeroelasticity Division;

Clifton L. Blizzard, **Fred Dolan Clontz**, **Dean M. Ferris**, **Robert M. Gleason**, **Herbert Lee Whitaker** and **Lloyd E. Yeatts**, Operations Support Division;

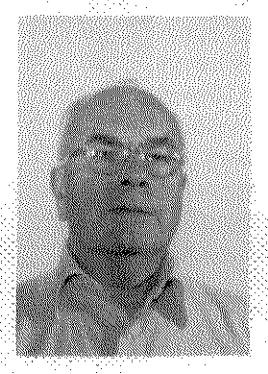
Charles I. Tynan, Jr., Projects Division; and **Clyde J. May** and **John W. Schwartz**, Systems Engineering Division.

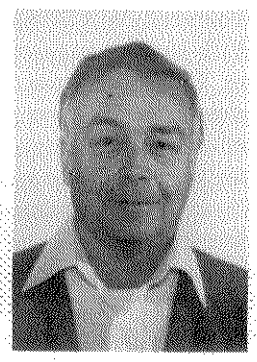

W. G. Ayers

J. W. Geouge

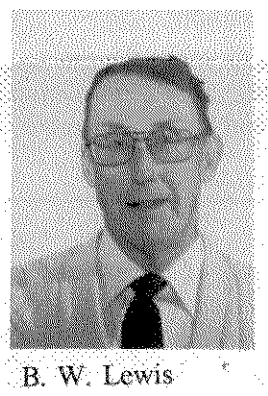

J. W. Simpson

B. G. Teagle

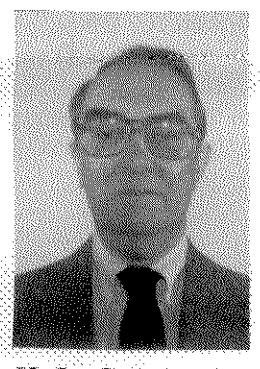

P. L. Yeager

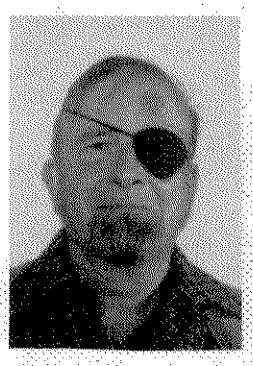

M. A. Wise

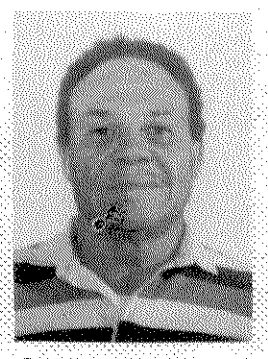
C.N. Batts

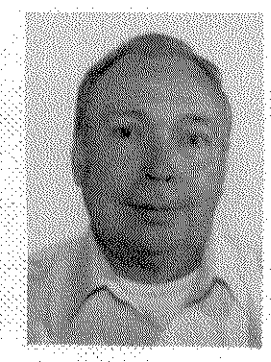

B. W. Lewis

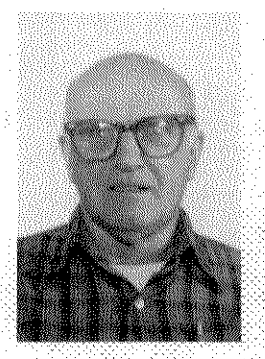
I. M. Miller

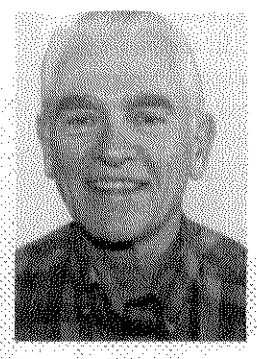

H. J. Cunningham

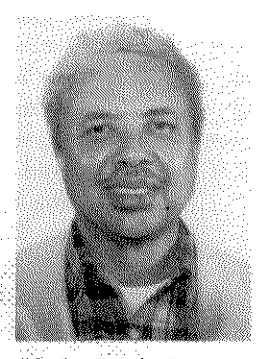

R. W. Hess


C. L. Blizzard


F. D. Clontz


D. M. Ferris


R. M. Gleason


H. L. Whitaker

L. E. Yeatts

Retirement Parties

Whitey Batts will be honored at a retirement luncheon January 22 at 11:30 a.m. in the Langley cafeteria private dining room. Refreshments will be served after attendees have purchased and eaten lunch. Cost for gift and refreshments is $3 for individuals; $4 for couples. Contributions of $2 for the gift only are welcome. Please make reservations with Tim Schott, Mail Stop 238, ext. 3483, by January 19.

James A. "Jim" Dorst will be honored at a retirement social Wednesday, January 27, from 5 to 7 p.m. in the Activities Center. Cash bar and heavy hors d'oeuvres at a cost of $7.50/person or $13/couple includes gift. Contributions of $2 for gift only will be graciously accepted. Please make check payable to Asa Shaw, Mail Stop 126, ext. 2002, by January 22.

A retirement social for **Charlie Tynan** will be held Friday, January 29, from 4:30 to 6:30 p.m. at the Activities Center. Tynan is hosting this informal gathering for his friends; thus, there is no charge. For reservations, contact Glenna Martin or Pat Holland, ext. 3704, or Charlie Tynan at 898-7015 by January 21.

Lee R. Foster, Jr., will be honored at a retirement party Tuesday, February 9, from 6:30 to 9 p.m. in the Activities Center. Cash bar and heavy hors d'oeuvres at a cost of $10/person or $18/couple includes gift. Contributions of $2 for gift only will be graciously accepted. Please make check payable to Grace Girton, Mail Stop 358, ext. 2614, by February 1.

Take Note:

Part-time employment with the LAA is available to NASA employees, contractors, and dependents; minimum age is 18. Duties include bartending, food service and banquet duties, setting up tables and chairs, and cleaning the building. Call Bubba Firman, ext. 3139, if interested.

AL-ANON and AA meetings are held every week during lunchtime at Langley.

Federal Women's Program Honors Beulah Barger

Beulah "Boots" Barger, formerly of Systems Engineering and Operations Directorate, was honored at the Fall Federal Women's Program for her many contributions to the research effort at Langley and for her highly-skilled performance during a career which spanned 26 years.

Barger began her career in 1944 as one of the pioneer women who was hired by the Langley Memorial Aeronautical Laboratory to perform "vital war work."

She served as seamstress for the NACA, the only position of its kind in the Agency. One of her first assignments was to fabricate protective coverings for the engine nacelles of the two B-29 aircraft being used for aeronautical research during World War II.

Barger used many innovative approaches to construct whatever research apparatus was needed as patterns did not exist. For example, when the highly- visible fire retardant "blaze" orange material became available for flight suits, Barger was requested to construct new suits for the Langley test pilots. She ripped apart an old flight suit belonging to each pilot and used the pieces as a pattern to customize the new flight suit.

Other examples of her skills over the years are best expressed through commendations received at the time of her retirement in 1970. A representative of one organization stated, "Barger has performed the difficult task of fabricating parachutes, drag devices, and flotation collars that allowed the safe recovery of scientific payloads worth millions of dollars."

Another remarked, "The contributions of Barger relating to the Water Immersion Simulation Program have been invaluable She fabricated reliable, comfortable safety harnesses and backpacks required to provide buoyancy ballasting of pressure-suited subjects, and she contructed unique one-of-a- kind restraint systems, mockup harnesses, and other research-related equipment."

Still another commented, "In the operation of the Lunar Landing Research Facility (LLRF). She promptly, cheerfully, and skillfully fabricated many covers, straps, harnesses, and cushions for the LLRF vehicle and ground equipment, the lunar walking simulator, the Icarus lunar flying unit, the rotating Space Station simulator, and the foot-controlled maneuvering unit simulators."

Center Deputy Director Paul F. Holloway on behalf of the Federal Women's Program presents Barger with a corsage as a token of appreciation for her many contributions to the research effort at Langley.

Positions Open

The following competitive placement positions are currently open:

88-2: Health Manager, GS-0861-12 or 13, Management Operations Directorate, Personnel Division, Occupational Health Services Office. Closes January 25.

88-4: Supervisory Aerospace Engineer, AST, Structural Dynamics, GM-0861-14 or 15, Structures Directorate, Loads and Aeroelasticity Division, Configuration Aeroelasticity Branch. Closes January 21.

88-3: Supervisory Aerospace Engineer, AST, Fluid and Flight Mechanics Program Management, GS-0861-14, Aeronautics Directorate, High-Speed Aerodynamics Division, Supersonic/Hypersonic Aerodynamics Branch. Closes January 15.

88-5: Supervisory Aerospace Engineer, AST, Structural Dynamics, GM0861-14 or 15, Structures Directorate, Loads and Aeroelasticity Division, Aeroservoelasticity Branch. Closes January 21.

88-6: Secretary-Steno, GS-0318-6 or 7, Aeronautics Directorate, Transonic Aerodynamics Division. Closes January 22.

88-7: Secretary (Stenographer) and Secretary (Typing), GS- 0318-4 or 5, Various Organizations at Langley Research Center. Open Continuous. (Note: This replaces CPP 88-1.)

Harvey's Selects Crew of Month

Harvey's Janitorial Service, Inc., recognizes employee teams who have excelled on their Facility Evaluation Reports. The award committee convened on December 1 and selected Crew #3 as Crew of the Month for November. This crew received a score of 94.14 out of a possible 95 points. Team members are (L to R) Carmen Tursick, Sharon Brown, Deborah Wilkins, Elliott Burgess, Suk Gilbert, Viola Holloman, and Carolyn Smith.

Positions Filled

Patricia R. Whitehead has been named Secretary (Stenography), Office of the Director for Aeronautics, under CPP 87-75.

Barbara A. Pasternak has been named Head, Visual & Printing Services Branch, Research Information and Applications Division, under CPP 87-77.

Fred M. Smith has been chosen Supervisory Aerospace Engineer, AST, Fluid and Flight Mechanics, Experimental Aerodynamics Branch, Space Systems Division, under CPP 87-78.

Ajay Kumar has been selected Supervisory Aerospace Engineer, Computational Methods Branch, High-Speed Aerodynamics Division, under CPP 87-83.

Donald J. Porter, Jr. has been selected AST, Facility Systems Safety; Safety Engineering Branch; Systems, Safety, Quality and Reliability Division; under CPP 87-56S.

Janice L. McCollum has been selected Lead Engineering Technician, Technical Support Section D, Tunnels Operations Branch, Operations Support Division, under CPP 87-82.

Langley Stocked Forms Announced

FORM NO.	TITLE	DATE OF FORM
Revised		
Langley Form 6	Report of Long Distance Telephone Call (Previous Edition Usable)	October 1987
Langley Form 41	LaRC Directory Change Notice (Previous Edition Obsolete)	November 1987
Langley Form 55	LaRC Stock Issue and Turn-In (Previous Edition Obsolete)	September 1987
Langley Form 94	Equipment Issue and Turn-In (Previous Edition Obsolete)	November 1987
Langley Form 119	Request for Move (Previous Edition Obsolete)	September 1987
NASA Form 386	Overseas Travel Order	November 1980
	LaRC Overprint	October 1987
Cancelled		
Langley Form 45	Data Requirements Description	September 1987
Langley Form 47	Documents Requirements List	September 1987

NOTE: If you have a continuing need for LF45 or LF47, contact the Forms Officer, extension 3694, and these forms will be reactivated as organizational forms.

Happenings

LAA SOCIAL will be held Friday, January 22, from 4 to 6:30 p.m. in the Activities Center.

LaRC ALUMNI ASSOC. annual meeting for election of officers will be held Wednesday, Jan. 20, at 8 p.m. in the Activities Center.

TOASTMASTERS. NASA Toastmasters meeting will be held Wednesday, Jan. 27, 11:30 a.m.-1 p.m. in the Activities Center. (Charge one hour to JO A1619.) Resolve this year to improve your speaking, listening, and thinking-on-your-feet skills. Visitors welcome. Call Natalie Johnson, ext. 3483, for information.

SUPER BOWL PARTY, Sunday, January 31, 2 p.m.-? at the Activities Center. Game shown on giant screen. Free popcorn. Keg beer, hot dogs, hamburgers, cold drinks for sale. Come one, come all! For more informations, call ext. 3139.

SKI CANADA. 6 days/5 nights, deluxe lodging, transportation, lift pass, shuttle service. Jan. 23-30. $319. Contact Norman Willey, Mail Stop 386.

VPI BASKETBALL. Peninsula VPI alumni are sponsoring a trip to Blacksburg for the VPI/Louisville game. Bus departs Friday evening, Feb. 26, and returns Sat. afternoon following the game. Lodging at Donaldson Brown, breakfast buffet, 3rd annual "Hokie Celebration" in Bowman Room, and game ticket included in cost: $76 ($78, nonmembers). For information, call Joe Drewery, ext. 4933 or 722-4443 after 6 p.m.

DANCE CLUB. NASA Country-Western Dance Club will hold its monthly dance at the Activities Center, Saturday, January 23, from 7:30 to 11:30 p.m. Dance to continuous music by D.J. Chuck Kessler.

LAA EMPLOYMENT. Part-time employment with the LAA is available to NASA employees, contractors, and dependents; minimum age is 18. Duties include bartending, food service and banquet duties, setting up tables and chairs, and cleaning the building. call Bubba Firman, ext. 3139, if interested.

SKI TRIP to Killington, Vt., March 4-6. $298. Slopeside lodging/double occupancy. Trip includes bus transportation, 3-day ski lift ticket, 2 nights lodging, some meals. For details, call Bill Dorogy, ext. 3041 or 874-3969.

PRAYER BREAKFAST held every Wednesday at 6:30 a.m. in the new section of the cafeteria. Format includes breakfast (purchased individually), sharing a devotional, praying for the needs of the group. Meeting will conclude by 7:30.

FOR SALE: HOME. Hampton/Sanlun Lakes. 3BR, 2 1/2B, 2-story; LR, DR, FR w/FP, eat-in kitchen, attached gar., large fenced yard. Ten min. from NASA. $93,500 or $19,500 and assume 9 1/2% loan. 827-0198.

FOR RENT: CONDO, Hampton Club, 1 BR, ceiling fans, mini blinds, washer/dryer, security system. Two pools, fitness center with hot tub and sauna. $425/mo. Available Feb. 1. Call John, ext. 3897, or Mary, ext. 3348, or 838-7279 after 5 p.m.

Where's My Researcher News?

Amidst calls regarding news and happenings of interest to our Langley employee-retiree-and aerospace enthusiast-audience, your editor also hears from disappointed readers who have received their copy of the **Researcher News** too late to attend a lecture, program, retirement party, or other event of individual significance.

As with any publication, distribution can be a problem and the **Researcher News** is not immune to snarls in the distribution system.

Our Center newspaper is published every other Friday. A schedule of distribution dates and deadlines for each issue from January through June 1988 was published in the December 18, 1987 issue.

All civil service employees and on-site contractors listed in the LaRC telephone directory receive the paper through Center distribution on the day it is published provided the contractor printer delivers the product on schedule.

All retirees and off-Center readers receive their papers via third-class, bulk-rate mail. Herein lies the major problem. Delivery can range from three to ten days depending on the Postal Service. The **Researcher News** leaves Langley before 8 a.m. on the day of publication and is delivered to the main post office on Briarfield Road. From there it is routed to Norfolk for delivery on a lower priority basis as the third class rate dictates.

Your External Affairs Office has repeatedly investigated the possiblity of first-class mailing to our off-Center audience. This endeavor, an obviously intelligent alternative and an almost certain quick-fix, unfortunately carries a price tag of over $12,000. In these days of budget cuts, it is almost understandable that first class delivery of your **Researcher News** is not now possible.

You can help avoid a distribution nightmare by keeping us informed of any change in your address or status. Accurate mailing information is the first step in getting the news to you in a timely fashion. Call 865-3707 or write the editor, **Researcher News**, Mail Stop 115, Langley Research Center, Hampton, Virginia, 23665-5225.

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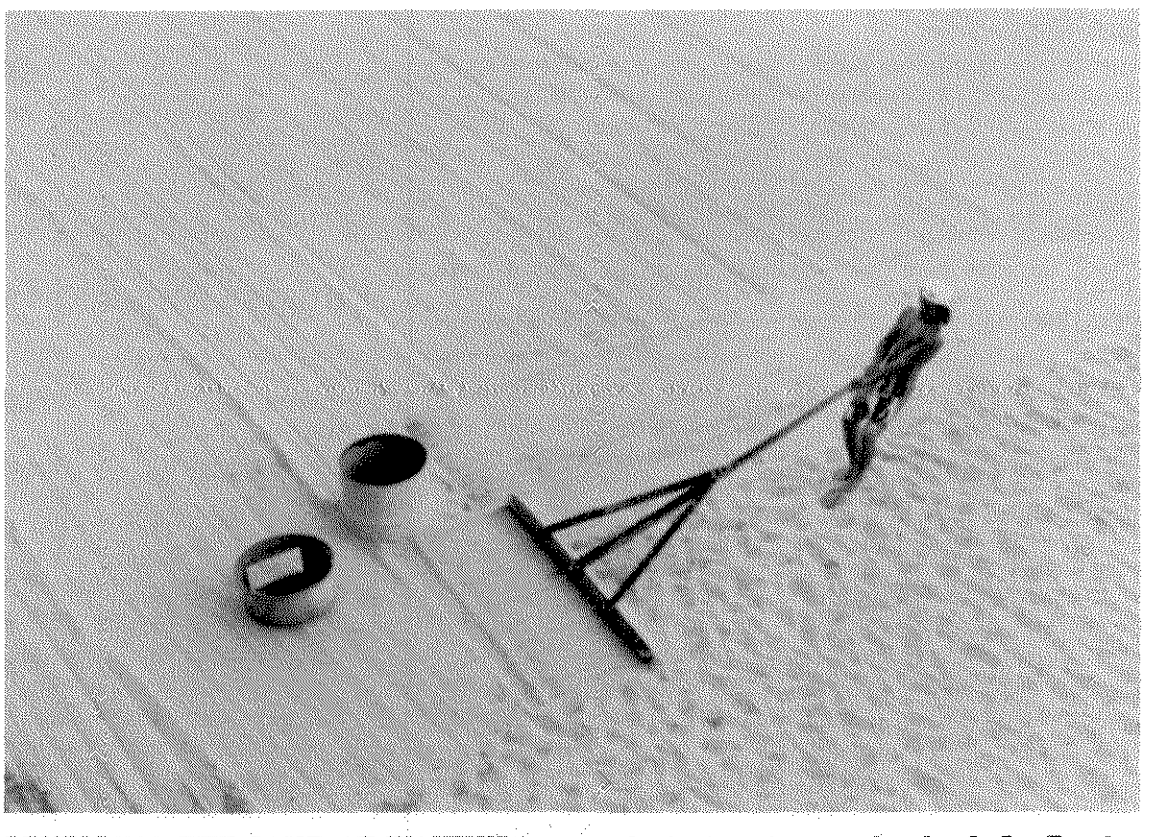
National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

Official Business
Penalty for Private Use $300

Langley Directives Distributed

DIRECTIVES NUMBER	TITLE	DATE	T.S.#	DATE DISTR.
—	Table of Contents to the Langley Management Manual	10-15-87	1564	11-3-87
—	Index to the Langley Management Manual	10-16-87	1565	11-9-87

NOTE: We have added a new column–EFFECTIVE DATE–to the Table of Contents. Many directives have been in the system for several years but are still current. the new column will identify the current date and allay concern as to whether or not a directive is current.



LEVELLING THE SAND AT WAIKIKI, an award-winning picture taken by Q. Isa Daudpota, will become part of a permanent display at the Journey Into Imagination Pavilion presented by Eastman Kodak Company at Walt Disney World/Epcot Center, Fla. The photo is among the winners in the 1987 Kodak International Newspaper Snapshot Awards. As a top winner in the Daily Press/Times Herald summer snapshot contest, the photo qualified for judging in the international competition. Daudpota is a National Research Council research associate in the High-Speed Computational Methods Branch.

NASA
National Aeronautics and
Space Administration

Langley Research Center

Volume 2, Issue 2 January 29, 1988

Bi-weekly Employee and Contractor Publication

News Researcher

NASA's Colladay to Direct DARPA; Ballhaus Named to OAST Post

Dr. Raymond S. Colladay will leave NASA February 1, 1988, to become director of the Defense Advanced Research Projects Agency (DARPA). Dr. William F. Ballhaus, Jr. has been named acting associate administrator for the agency's Office of Aeonautics and Space Technology. Currently, Ballhaus is director, Ames Research Center, Mountain View, California.

Colladay has served as associate administrator for the Office of Aeronautics and Space Technology (OAST), NASA Headquarters, Washington, D.C., since June 1985, following his appointment as OAST deputy associate administrator in April 1982.

NASA Admininstrator James C. Fletcher, commenting on Colladay's appointment as DARPA director said, "All of us at NASA appreciate the leadership and vision that Dr. Colladay has given to reinvigorate the nation's civilian space technology program and to ensure U.S. preeminence in aviation. I know that his understanding of advanced technology and his management and leadership will continue to benefit the nation in his capacity as director of DARPA. We wish him well in this new assignment and look forward to seeing him back at NASA at the end of this Administration."

Colladay has served in a number of engineering and management positions since beginning his career with NASA's Lewis Research Center, Cleveland, Ohio, in 1969.

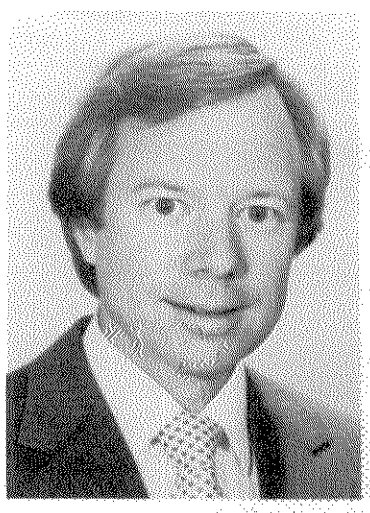
As associate administrator he led efforts for new national capabilities in aeronautical research, for the National Aerospace Plane, and for a revitalization of the nation's space technology program.

Effective February 1, Ballhaus will direct NASA's aeronautics and space technology development programs, as well as be responsible for the institutional management of NASA's Ames, Langley and Lewis research centers.

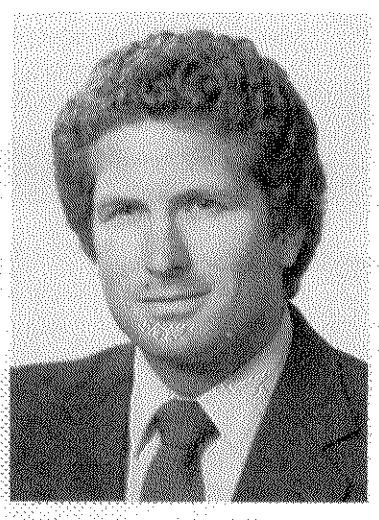
In naming Ballhaus, Fletcher said, "Dr. Ballhaus brings excellent credentials and working familiarity to this post. His leadership will be valued and well utilized during his tenure in this position and we warmly welcome him." Ballhaus will serve in this position for an undetermined period of time. Dr. Dale L. Compton, Ames deputy director, will serve as acting director of the center during Ballhaus' absence.

Ballhaus has served as director of Ames since January 1984. As director, he was responsible for implementation of the Numerical Aerodynamic Simulation facility, a major national computational fluid dynamics research capability for use in aeronautical and other research areas. He also provided leadership and direction for a wide variety of other research and development programs in the fields of aeronautics, space technology, life sciences, space science and flight research.

Prior to directing Ames, he served as the center's director of Astronautics and as chief of the Applied Computational Aerodynamics Branch.



Raymond S. Colladay



William F. Ballhous, Jr.

At a luncheon meeting January 12, 1988, Hampton Roads' public broadcasting station, WHRO, and its Board of Directors expressed appreciation for Langley Research Center's cooperation, assistance, and support. A special resolution adopted by WHRO's Board of Directors honoring Langley was presented to LaRC Director Richard H. Petersen by Jean Canoles Bruce, WHRO Board Chairman.

$30.4 Million Contract Awarded

LTV Selected to Support Scout Launches

NASA has selected the LTV Aerospace and Defense Company, Dallas, Texas, for two contracts to provide systems management and support for launches of the Scout space launch vehicle. Effective Jan. 1, 1988, the 24 month, $30.4 million contracts also include options for a third year of support for an additional $14.2 million.

The NASA awards call for LTV to provide ground crews and technical research and development management services for all Scout launches during the contract period.

Work to be performed under the two contracts include program management; mission integration; systems engineering; standardization and configuration control; launch operations/logistics management; field service support; special programs; and a reliability, quality control and training program.

Scout is a four-stage, solid-propellant launch vehicle produced by LTV for NASA, the Department of Defense and a number of European nations. It is 75 feet long, has a launch weight of 47,000 pounds and carries an average payload of 400 to 450 pounds.

Scout, managed by Langley, has flown more than 100 missions since its first flight in 1960, placing satellites in orbit and conducting various space experiments. It has one of the highest flight reliability records of any of NASA's expendable launch vehicles. Scout has achieved an unmatched 100 percent success rate during the past 10 years and 98 percent during the past 20 years.

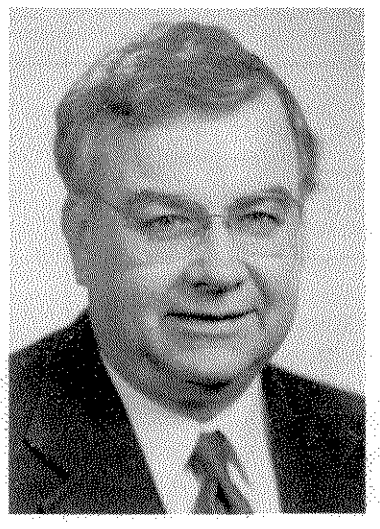
Scout is launched from three sites: Wallops Flight Facility in Virginia, for easterly missions; the Western Test Range in California for polar flights; and Italy's sea-based platform off the east coast of Kenya, Africa, for equatorial missions.

The work will be performed at the Dallas facilities, the three launch sites and Langley.

Langley Colloquium

Briggs to Discuss 'Challenges in Labor Force'

In contrast with the experiences of all other industrialized nations, the size of the labor force of the United States is growing rapidly while, simultaneously, its age, gender and ethnic composition are changing markedly. Consequently, human resource issues pose new challenges to the nation's quest to achieve a fully employed and equitable society.



Dr. Vernon M. Briggs Jr., a labor economist on the faculty of the New York State School of Labor and Industrial Relations at Cornell University, will discuss "The U.S. Labor Force: The Challenge for Adjustment to a Post-Industrial Society," at a Langley colloquium Tuesday, February 9. The lecture will be held in the Activities Center at 2 p.m., followed by a question and answer session and an informal discussion.

In his lecture, Briggs will discuss the technology of the changing workforce. Briggs, who specializes in human resource economics and public policy, says public policies that focus on labor market adjustment will be required if the mentioned developments are to be a boon rather than a bane to the emerging post-industrial and technologically-oriented economy.

Briggs has written extensively on such topics as preparing minority workers for employment in the nation's labor force, immigration, direct job creation policy, rural labor markets and apprenticeship training.

Briggs received a bachelor of science degree in economics from the University of Maryland and a master of science degree and a doctorate in economics from Michigan State University. He has been a staff member at Cornell for 10 years. Previously, he taught in the economics department at the University of Texas at Austin for 14 years.

News Briefs

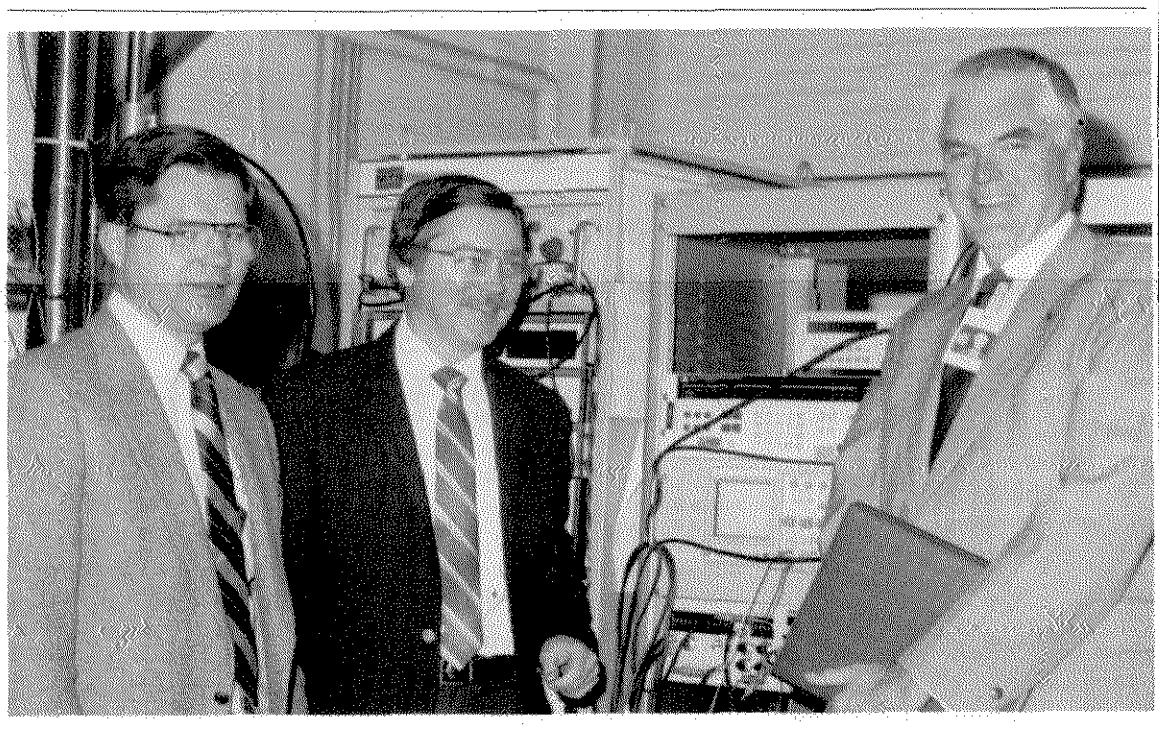
JET PROPULSION LABORATORY, Pasadena, Calif. — Miniature spacecraft, about the size of a coffee can, could be launched by electromagnetic launchers to conduct dozens of different space exploration missions. Earth-orbiting electromagnetic launchers, or railguns, being developed for the U.S. Strategic Defense Initiative Office, would be useful in launching very small, low-cost scientific probes to various destinations in the solar system. Instead of using explosive power to propel a projectile, electromagnetic guns and launchers generate brief but powerful electrical pulses that produce strong electromagnetic forces that accelerate projectiles to extremely high velocities.

HEADQUARTERS, Washington, D.C. — President Reagan has signed a report to Congress creating a joint DoD and NASA program for the development of the Advanced Launch System (ALS). The ALS is intended to provide a launch system that meets long-term national launch needs; is flexible, robust, reliable and responsive; and significantly reduces the costs of launching payloads into space.

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — This month the International Ultraviolet Explorer (IUE), a space-based telescope expected to last only three years, will complete a decade of continuous operation. The IUE has been instrumental in some of the most important advances in modern astronomy. The IUE is credited with the discovery of galactic halos, monitoring volcanic activities on Io, beaming the first images ever recorded of Halley's comet from space, and monitoring the intense emmission of Supernova 1987A.

HEADQUARTERS, Washington D.C. — NASA has announced the selection of 26 research proposals for negotiation of Phase II contract awards in the Small Business Innovation Research (SBIR) program. SBIR Phase II continues the most promising Phase I projects which have indicated feasibility and potential value as research innovations. These 26 selections, valued at approximately $12 million, add to 59 selections announced Dec. 10, and bring the value of the total group of 85 selections to approximately $40 million.

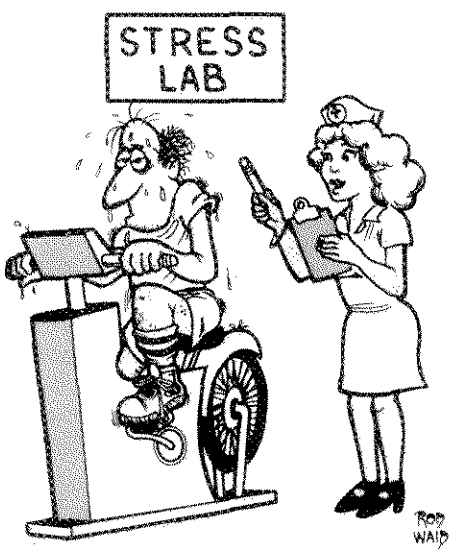
Editor's note: Recent surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017. Request information by release number and headline. See Current News Release information box on page 3.



-photo by Terry Shepard and Sandie Horsey

Dr. Hans Mark (right), Provost of the University of Texas and former Deputy Administrator of NASA, visited Langley recently. Hosted by Chief Schientist Dr. Richard W. Barnwell (left), Mark spoke at length with Dr. John H. Cantrell, Jr., research physicist, Instrument Research Division. Shown in the stress acoustics lab, Cantrell explains the effect of stress on sound velocity. This data is used to assess residual or applied stress in materials.

Lankley



"MR. LANKLEY, YOU ARE DOING QUITE WELL, YOU ARE NEARLY UP TO THREE MINUTES THIS WEEK."

Notes of Thanks

Ernie Millen writes: "I thank the many friends and associates who kindly helped me celebrate retirement. The cards and gifts are appreciated, especially the picture album with autographs. The album will help prolong many memories while living new joys."

Herman L. (Bo) Bohon writes: The warmth and friendship of people at LaRC, including spouses, is no small measure of the attributes which keep the Center strong. Thank you one and all for the lasting impressions you shared on the occasion of my retirement."

A Life-Saving Message

What can **you** do to save a life if you witness someone faint and cease breathing, or faint and have no detectible pulse, or choke on food?

Nothing – unless you know how to provide necessary life-saving techniques, such as mouth-to-mouth resuscitation, external heart massage, or the Heimlich Maneuver, immediately.

All of these life-saving techniques are taught in Cardiopulmonary Resuscitation (CPR) classes conducted by Langley employees.

The Center will conduct CPR classes on February 11-12 at the Activities Center, Building 1222, from 8 a.m. through 4:30 p.m. Successful completion of this training results in certification by the American Heart Association (AHA).

There are three levels to AHA CPR training taught at LaRC: a) CPR techniques for adults; b) CPR techniques for adults, children and infants; and c) CPR techniques for professional rescuers. All levels of training include mouth-to-mouth ventilation, external cardiac compression and obstructed airway techniques for conscious and unconscious victims. All training involves lecture, written test(s) and practical demonstrations. Levels A and B address one-rescuer techniques; level C covers two-rescuers techniques.

Knowing how to give CPR to victims may well be life saving because, once a victim has a heart attack or stops breathing, the faster CPR is given, the better the chance of recovery. After four minutes, the chance of recovery begins decreasing rapidly; usually after ten minutes, successul recovery is rare.

If you are fortunate, you may never have to apply CPR. To learn more about CPR or to enroll, call Jim Norris, ext. 2611.

Location Change for Video Series

The remaining broadcasts in the Mangement Vision Video Conference Series will be shown in Building 1194-A, Room 206.

These telecasts will be from 3 to 5 p.m. on the following Wednesdays:

Feb. 10 – "The Disappearing Middle Manager"
Mar. 9 – "Personal & Organizational Power"
Apr. 13 – "Creativity"
May. 11 – "Corporate Wellness"

Please notify your training coordinator if you plan to attend.

New Courses in the Learning Center

- **America's Wings**, VHS, 30 minutes
- **The 60's Strides Toward the Future**, VHS, 30 min.
- **Research Project X-15**, VHS, 30 min.
- **Quieter, Faster and Safer Aircraft**, VHS, 30 min.
- **Crashes, Hang Gliders and Underwater Planes**, VHS, 30 min.
- **Looking Ahead ... And Back**, VHS, 30 min.
- **Setting the Stage for the Future**, VHS, 30 min.
- **Progress in Aeronautics**, VHS, 30 min.
- **The Perfection Trap (Dr. Fluharty)**, VHS, U-Matic, 1 hour
- **Astounded at the Past**, VHS, 30 min.
- **The Unorganized Manager, Part 3: Lamentations**, VHS, 20 min.
- **The Unorganized Manager, Part 4: Revelations**, VHS, 28 min.
- **The Man Hunt: The Selection Interview**, VHS, 31 min.

In Memoriam

Sympathy is extended to the families of:

John W. Quinn, who died November 11, 1987. Quinn retired from the Operations Support Division after 26 years of service.

Elsie L. Johnson, who died November 29, 1987. Johnson retired from the Transonic Aerodynamics Division after 30 years of service.

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Thursday following the date of this issue.

Managing Editor . . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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 Hosts University Advanced Design Program for Aeronautics

Students and faculty members from United States engineering schools gathered at the Langley Research Center earlier this month for the aeronautics winter conference of the University Advanced Design Program.

The objective of the NASA/Universities Space Research Association University Advanced Design Program is to bring together NASA engineers with students and faculty from U.S. engineering schools by means of integrating current and future NASA space and aeronautics engineering design projects into the university engineering design curriculum.

Approximately 45 faculty members, students and engineers from various NASA centers attended the conference, which was held in the H.J.E. Reid Auditorium, Building 1222, Friday and Saturday, January 8 and 9.

The NASA/USRA University Advanced Design Program has been an effective mechanism for integrating the educational objectives of the university community with the advanced engineering design interest of the NASA centers.

The aeronautics conference provided the opportunity for the universities to report on the results of their design projects. The oral reports were made by students representing the design team who worked on the project during the academic year. Presentations in past years have evoked considerable discussion, particularly among schools that have taken somewhat different approaches to similar design topics.

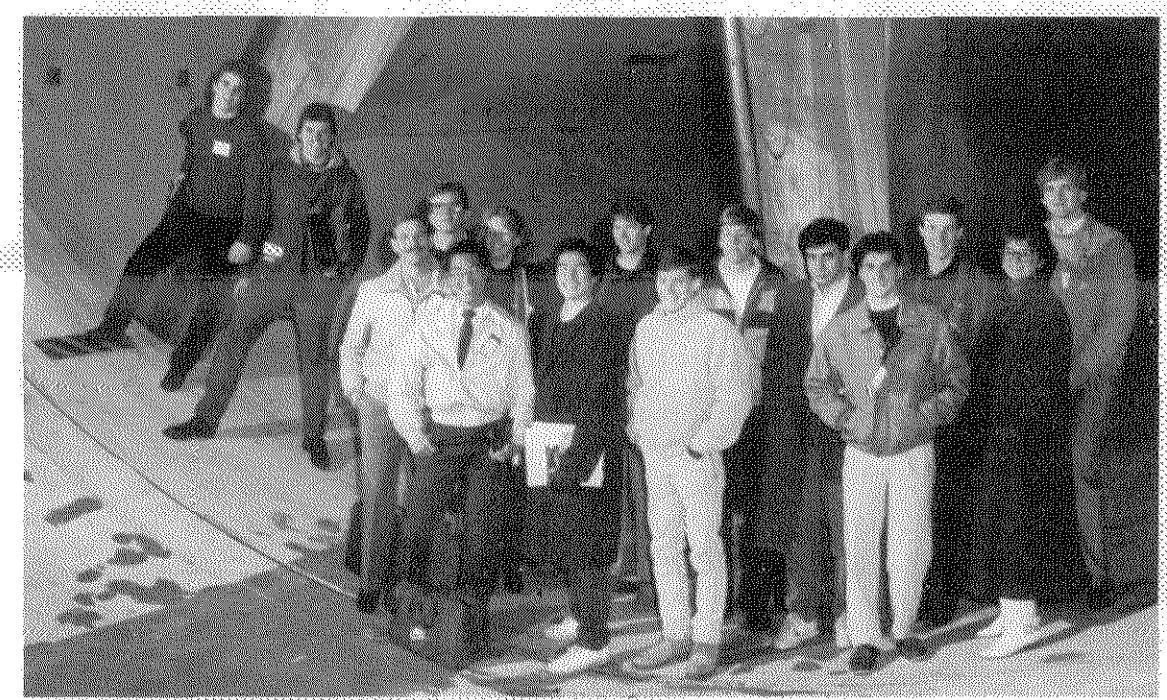
Topics addressed this year at the aeronautics winter conference included "Hypersonic Transport Aircraft for Commercial Transpacific Flight," "The Apollo Lightcraft Project," "High Speed Passenger Transportation System," "Hypersonic Vehicle Design: Advanced Aeronautical Design- Hypersonic Drone," "VSTOL Aircraft Concepts," "Supersonic (M=3-6) Transport," "Supersonic Transport with Transpacific Range," and "High Speed Civil Transport."

While at Langley, conference attendees toured four wind tunnels and were given presentations about the ongoing research at each facility.

The NASA/USRA University Advanced Design Program is operated by the Universities Space Research Association under grants from NASA Headquarters in Washington, D.C.

Universities participating in the winter conference were Case Western Reserve University; Rensselaer Polytechnic Institute; Ohio State University; University of California, Los Angeles; California Polytechnic State University, San Luis Obispo; California State Polytechnic University, Pomona; University of Kansas; and Purdue University. North Carolina State University and the University of Virginia were guests at the conference.

In addition to the Langley Research Center, representatives from NASA's Ames Research Center, Dryden Flight Research Facility, Johnson Space Center and NASA Headquarters attended the two-day conference.



Gathered in the 14- x 22-foot wind tunnel are some of the student participants in the aeronautics winter conference of the University Advanced Design Program. Shown (L to R) are Saulius Bankaitis and Boris Streun, Ohio State University; Bob Bollinger, California Polytechnic State University; Angus Taggart, Case Western Reserve University; Lura Kern and Jerry Yen, University of California, Los Angeles; David McKenna, California Polytechnic State; David Perry, Ohio State; Jeff Tuschhoff, University of Kansas; Sunil Tandon and Stephen Landers, Case Western Reserve; Louis Hendrichs, University of Kansas; Cynthia Alexander and Bob Boyd, Ohio State.

-photos by Fred Jones

Faculty conference participants are (front row, L to R) Barbara Carter, Universities Space Research Association (USRA); Leik Myrabo, Rensselaer Polytechnic Institute; Stan Lowy, Texas A&M University; Carolynne Hopf, USAR; Roger Quinn, Case Western Reserve University; Vicki Johnson, Langley; (back row, L to R) Larry Spencer, NASA Headquarters; Kenneth Sivier, University of Illinois; Larry Richards, University of Virginia; Alfred Johnston and Sue McCown, USAR.

Langley Directives Distributed

DIRECTIVES NO.	TITLE	DATE	T.S.#	DATE DISTR.
Revised				
LMI 1700.3	Attachment A, "The Executive Safety Board and Its Committees"	11-6-87	1566	12-3-87
LMI 4200.1	"Equipment Management Program"	11-6-87	1567	12-24-87
LMI 7920.1	"Utilization of NASA Administrative Aircraft"	11-6-87	1569	12-23-87
LMI 1100.5	Attachment, "Federal Women's Program Advisory Committee"	11-6-87	1570	12-3-87
LMI 1500.5	"Signs and Directory Boards"	11-17-87	1571	12-3-87
LMI 1700.2	"Safety Assignments"	12-2-87	1573	12-31-87
LMI 1040.1	"NASA Langley Duty Officer"	12-2-87	1574	12-31-87
New				
LMD 1200.14	"Redelegation of Authority to Take Action to Waive Claims for Erroneous Payment of Pay and Allowances, and of Travel, Transportation and Relocation Expenses and Allowances"	11-17-87	1572	12-3-87
LHB 1740.6	"Personnel Safety Certification"	OCT 1987	—	12-9-87
Cancelled				
LMI 4200.2	"Property Management - Equipment Visibility Systems (EVB)"	11-6-87	1568	12-7-87

Current News Releases

To receive a copy of these NASA news releases, contact Edith Watts, Mail Stop 146, ext. 3017.

88-1.....NASA Requests Proposals for Advanced X-Ray Astrophysics Facility
88-2.....Acceptance Tests Completed for Three Space Shuttle Main Engines
88-3.....Magnesium-rich Coating Proposed to Store Nuclear Wastes
88-4.....NASA Engineer Proposes Miniature Spacecraft
88-5.....President Reagan Signs Advanced Launch System Report
88-6.....NASA's Colladay to Direct Defense Advanced Research Agency
88-7.....Acting Head of NASA Aeronautics and Space Technology Named
88-8.....NASA Selects Small Business Innovation Research Projects
88-9.....International Ultraviolet Explorer Marks Decade of Research

Self-Help for the Speechless

Langley Toastmasters Promote 'Podium Ease'

Support groups are currently in vogue. It seems every situation, condition or disease has a corresponding "group" to counsel or support the offender, victim, contributor, friend or family.

The person, then, who is, on most occasions, considered organized, intelligent, responsible and communicative but, when asked to speak before a group, is struck speechless, experiences wobbly knees and shaky hands, begins to sweat profusely, or feels as though his/her throat is gradually beginning to close and breathing will soon terminate, can find salvation in Toastmasters International.

Toastmasters is a non-profit self-help organization formed to promote "podium ease."

Established in Santa Ana, California, in 1924 by Dr. Ralph C. Smedley, the club was formed "to afford practice and training in the art of public speaking." Toastmasters has grown to include more than 4,000 clubs in 40 countries.

Its mission has also grown. Toastmasters International helps men and women "learn the arts of speaking, listening, and thinking – vital skills that promote self-actualization, enhance leadership potential, foster human understanding and contribute to the betterment of mankind."

Tha NASA Langley Toastmasters Club was formed in July 1985 and boasts a membership of 23. The club meets from 11:30 a.m. to 1 p.m. on the second and fourth Wednesdays of each month at the Activities Center.

Langley Toastmasters meetings follow a strict agenda designed to build confidence. Members bring their lunch to make the most of the one-and-a- half hour session. Following a short business meeting comes the educational program – the heart of Toastmasters.

The educational program consists of informal "table topic" talks in which several members are called upon to give one-and-a-half minute extemporaneous speeches on a subject of the Topicmaster's choice and four seven-minute prepared speeches followed by observations and suggestions of pre- selected evaluators. To conclude, all present are given the opportunity to evaluate the speakers by voting for the "Toastmaster of the Day."

All aspects of the proceedings, both speeches and evaluations, are strictly timed. The appointed Grammarian listens for and records grammatical errors and mispronounciations. There's even an "ah" counter who records and reports on all non-verbal pauses!

Strict attention to detail – yes – but all comments are made in a **positive** manner. Before any suggestions for improvement are given, all successful aspects of the speech are discussed. A designated "wordmaster" selects and presents a word for the day. Members earn points for incorporating the word into the day's conversation. Thus, Toastmasters presents a positive environment in which to develop communication and leadership skills.

The next Toastmasters meeting is scheduled for 11:30 a.m., February 10, in the Activities Building. NASA retirees, contractors and Air Force personnel are eligible for membership; guests are always welcome. Civil service employees may charge one hour of their time to the training JO A1619.

For further information on the NASA Langley Toastmaster Club, call Natalie Johnson, ext. 3483.

Yaros Attains Toastmaster Milestone

Dr. Steven F. Yaros, aerospace engineer in the Propulsion Aerodynamics Branch and Educational Vice President of the NASA Langley Toastmasters is the first Langley club member to complete the ten speeches outlined in the Toastmasters International Communication and Leadership Program. This milestone was accomplished over a period of about two years. Congratulations, Steve.

photo by Terry Shepard

Officers of the NASA Langley Toastmaster Club were recently installed. The new Board of Directors include (front row, L to R) Natalie Johnson, Administrative Vice President; Ron Harvey, President; Dan Whittaker, Secretary; (back row, L to R) Bob Miserantino, Toastmaster International Area 5 Governor; Ray Whipple, Past President; Brian Luoto, Treasurer; Jim Norris, Sergeant-at-Arms; and Steve Yaros, Educational Vice President.

Club News

Runners Club Race Results

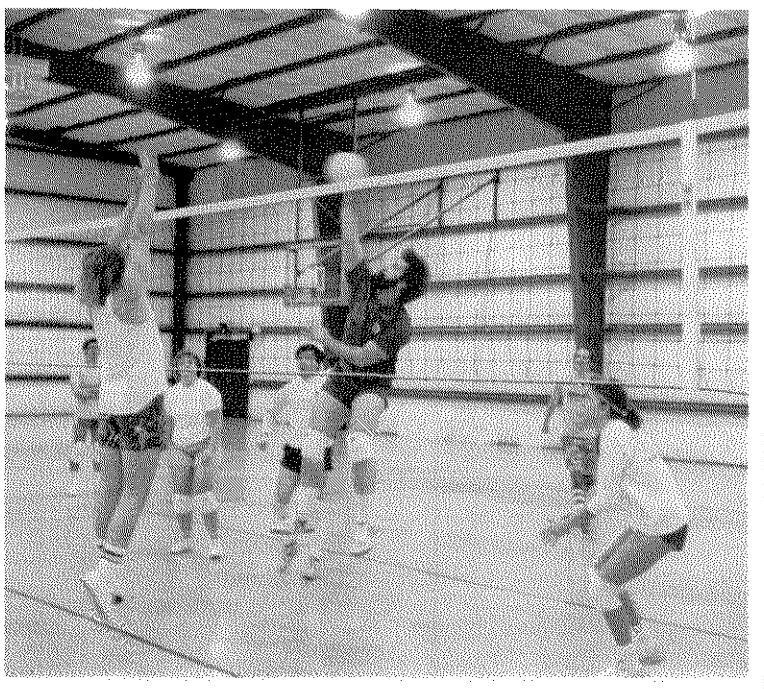
Langley Runners Club announces the following winners of the Interdirectorate Team 5 KM Race:

1st Electronics I – 21 points
(S. Robbins, P. Earls, C. Slominski, B. Ferguson, E. Thorsen)
2nd SE&O – 66 points
(M. Mastaler, M. Motter, A. Rawls, R. Walters, G. Bowen)
3rd Electronics II – 73 points
(J. Plassman, E. Everton, T. Berglind, P. Leary, J. Drozdowski)

CLUB	CONTACT	EXT.	M.S.
Amateur Radio Club	Otis Riggins	3585	257
Apicultural Club	Maywood Wilson	4615	397
Astronomy Club	Hugh Pinkson	2771	188-D
Basketball League	Bill Lawson	3446	238
Bass Club	Mark Lindsay	3141	222
	Richard Chattin	2651	385
Bowling League	Dan Banks	2877	286
Country Western Dance	Sam Sokol	3581	488
Dog Training Assoc.	Mrs. Doris Bryan	898-6273	–
Exercise Club	Donna Speller	4002	157
	Suellen Seabrook	877-6067	–
Golf Association	Mike Taylor	3678	414
Hist. & Archeo. Society	Franklin Farmer	3281	139-A
Karate Club	Guillermo Gonzalez	4621	433
Radio Model Club	Jarrett Huffman	2556	295
Runners Club	Richard Shearer	4508	431
Science Fiction Assoc.	Ivin Clark	3777	473
Soccer Club	Keven Shepard	3561	463
	Barry Smith	3036	231
Softball Association	Noel Talcott	2346	411
Tennis Club	Tom Yager	2796	497
	Ed Waggoner	2601	294
Vegetable Garden Club	Martha Norman	3294	412
	Bill Lassiter	4508	431
Volleyball Club	James Hall	3280	157-A

Bowling Stats

	December 29	January 5	January 12	January 19
Team High Game	972 ACD	928 Spare Change	911 Scramjets	965 ACD
Team High Series	2679 Spare Change	2664 Scramjets	2600 Scramjets	2710 ACD
Male High Game	241 **R. Shearer**	233 **G. Andrews**	234 **D. Gates**	275 **L. Curtis**
Male High Series	591 **K. White**	623 **G. Tennille**	612 **D. Booth**	624 **D. Jones**
Female High Game	230 **R. Frizzell**	220 **M. Aldrich**	190 **R. Koren**	219 **R. Frizzell**
Female High Series	575 **R. Frizzell**	572 **M. Aldrich**	501 **E. Rieger**	549 **R. Frizzell**
Most Pins over Average	89 **B. Askew**	77 **Debby Morris**	78 **R. Windon**	115 **R. Windon**
	81 **R. Shearer**		71 **B. Gaddy**	86 **L. Curtis**



The Volleyball Club was formed this fall comprising 16 teams divided into three leagues. The eight-week initial season came to a close January 19. Shown above is a shot of one action-packed game this season. Watch for B-, C- , and D-League Champions featured in the next issue.

Ski NASA '88

Feb. x4 ..... Wintergreen
Feb. 11 ..... Bryce
Feb. 18 ..... Massanutten
Feb. 25 ..... Wintergreen
Mar. 3 ..... Bryce

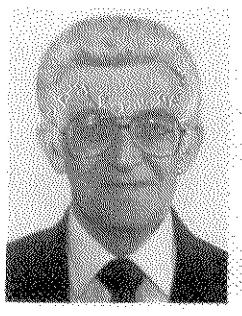
Cost: $39
(transportation and lift ticket)

Questions??

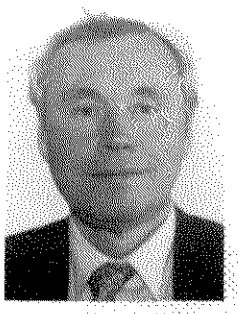
Call Bennett at 599-5585.

Are you concerned about someone's drinking? AL-ANON and AA meetings are held every week during lunch time at Langley. For information call the Clinic, ext 2246, or the Health Office, ext. 2605.

People & Places


C. O. Yokum

M. F. Hartman


R. T. Swann

Recent Retirees

Charles Otis Yokum, Management Support Division, **Mildred Frances Hartman**, Financial Management Division; and **Noel T. Wakelyn**, Materials Division, retired January 1.

Robert T. Swann, Materials Division; **Jean W. Trueblood**, Personnel Division; **Philard C. Fansburg**, Systems Engineering Division; **Deene J. Weidman**, Space Station Office; and **Doris Bailey Vandeveer**, Transonic Aerodynamics Division, retired January 2.

Clara H. Simmons, Low-Speed Aerodynamics Division, retired January 17.

J. W. Trueblood

R. C. Flansburg

D. B. Vandeveer

Retirement Parties

Joe Guarino will be honored at a retirement dinner on February 6 at the Activities Center. The social/cash bar will begin at 6 p.m. with a steamship - round dinner at 7. Cost is $12/person including gift. Donations for gift only will be accepted. Please make check payable to Roger Phelps, Mail Stop 238, ext. 3297, by Feb. 2.

John W. "Billy" Schwartz will be honored at a retirement social Monday, Feb. 8, from 5 to 7 p.m. in the Activities Center. Hors d'oeuvres and beverages will be served at a cost of $6/person, including gift. Contribution for gift only will be graciously accepted. Please make check payable to Charlene Gleaton or Tom Lash, Mail Stop 424, ext. 2156, by Jan. 29.

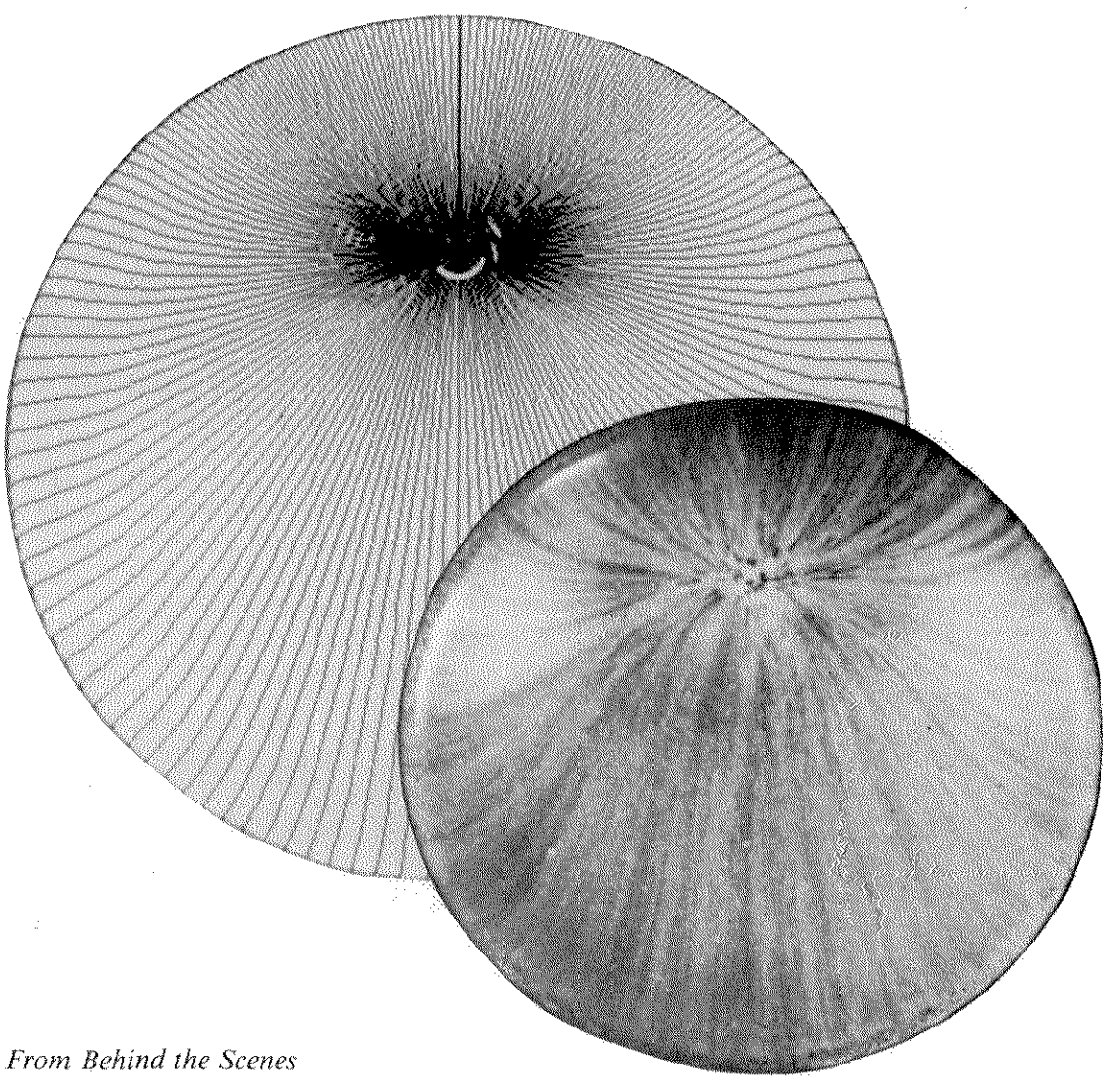
Lee R. Foster, Jr. will be honored at a retirement party Tuesday, Feb. 9, 6:30-9p.m., at the Activities Center. Cost is $10/person; $18/couple. Contributions of $2 for gift only are welcome. Please make check payable to Grace Girton, Mail Stop 358, by Feb. 1.

Doris B. Vandeveer will be honored at a retirement social Thrusday, Feb. 11, at 11:30 a.m. at Yesterday's., Sheraton Inn-Coliseum. Cost is $8/person including gift. Donations for gift only will be graciously accepted. For reservations, call Fran Sabo, ext. 2658, or Marsha Cole, ext. 2673. Make checks payable to Tom Foughner, Mail Stop 285.

Amy O. "Brian" Lupton will be honored at a retirement dinner February 12 from 6:30 to 9 p.m. at the Activities Center. A cash bar will precede the dinner and program. Cost is $12.50/person including gift. Contributions of $2 for gift only are welcome. Please make check payable to George B. Finelli, Mail Stop 130, ext. 3681, by February 5.

Upcoming Workshop

Magnetic Suspension Technology Workshop will be held February 2-4 in the Activities Center. Specialists from NASA, DoD, academia and industry will attend. For further information, contact Claude R. Keckler, Mail Stop 161, ext. 4591.



From Behind the Scenes

Physical vs Numerical Models Depict Similar Scenarios

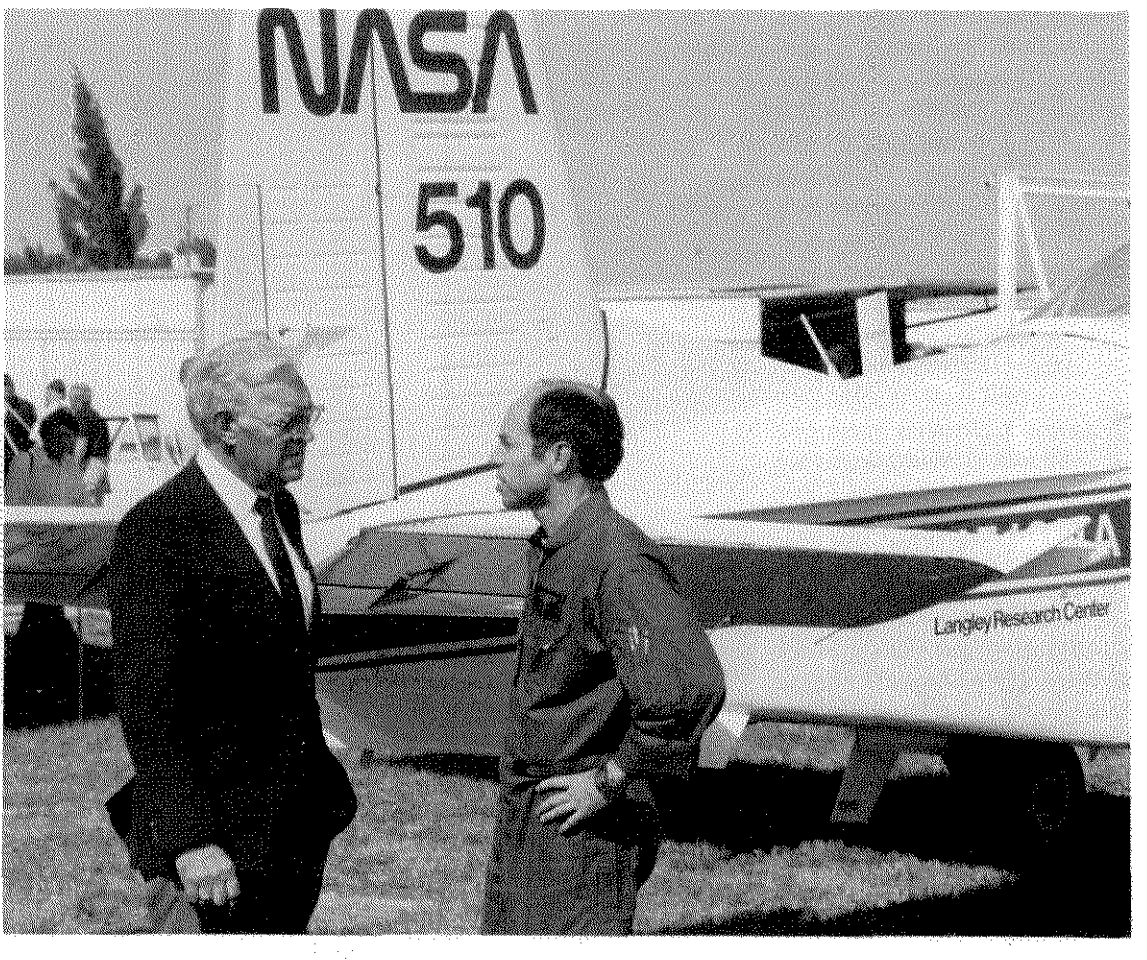
Scenes from nature?

The two mushroom-shaped apparatus are scale models of the Aeroassist Flight Experiment (AFE) as shown from wind tunnel and computer-generated data.

The streamline patterns on the AFE show flow direction on the surface of the blunt forebody. This data is necessary to help locate optimum positions for the dozen experiments that will fly on the proposed Shuttle payload. The experiment will build confidence in and verify computational fluid dynamics (CFD) computer codes.

The AFE ground-based test program and the CFD work has been in progress for nearly two years in the Experimental Aerodynamics Branch and the Aerothermodynamics Branch of the Space Systems Division.

Watch for a detailed account of the Aeroassist Flight Experiment in the next issue.



Langley Research Pilot Phil Brown discusses flight testing with Florida Congressman Tom Lewis during a "Town Meeting" in Stuart, Florida.

Happenings

LAA SOCIAL will be held Friday, February 5, from 4 to 6:30 p.m. in the Activities Center.

LAA BOARD. The Langley Activities Association Executive Board will hold its February meeting, Tuesday, February 9, at 9:30 a.m. in the Activities Center. Concerns to be brought before the board should be addressed to the proper committee member.

AIAA MEETING will be held Monday, Feb. 1, in the Activities Center. Social at 4:30 p.m.; meeting begins at 5. Dr. James Powell, Brookhaven National Laboratories, will present "Anti-matter, the Propulsion System of the Future." For reservations, contact Duane Melson, ext. 2627, or Karen Credeur, ext. 3467.

RUNNERS CLUB will hold the Handicap Ten Miler on Saturday, Feb. 13, in front of the Activities Building. First starting time is 10 a.m. Individual start times will be based on the Fall Intercenter 10 KM results or members standings on club achievement chart. For more information, call Richard Shearer, ext. 4508.

SUPER BOWL PARTY, Sunday, January 31, 2 p.m. – ??? at the Activities Center. Game shown on giant screen. Free popcorn. Keg beer, hot dogs, hamburgers, cold drinks for sale. Come one, come all! For more information, call ext. 3139.

ENGINEERS' CLUB of the Va. Peninsula will meet Thursday, Feb. 4, at the Warwick Yacht Club, Newport News. Social at 6 p.m.; program begins at 7. John Biddle, the world's foremost yachting cinematographer-lecturer, will present "Sailobration '87." Cost is $7/person. For reservations, contact Dick Lane, 380-4605 or 868-0345, or Dan Poulin, 380-3250 or 595-6646, by January 30.

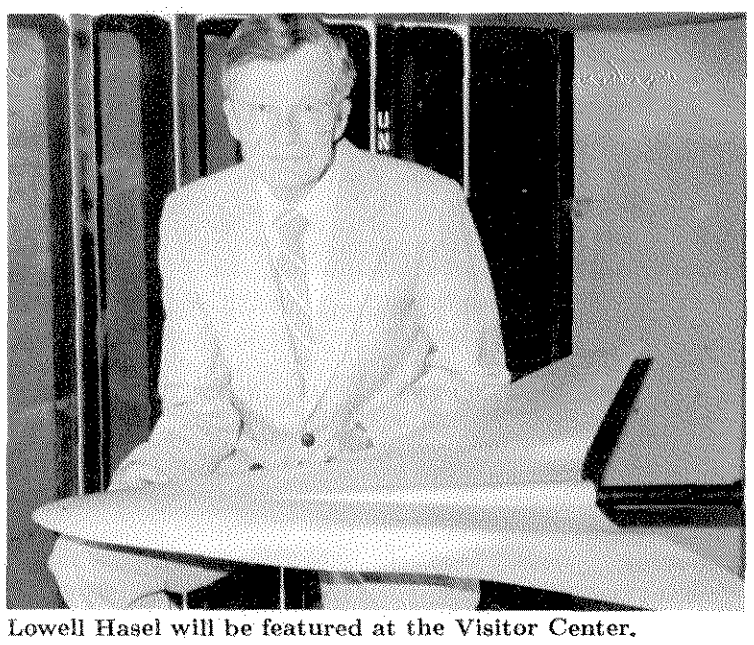
NATIONAL ASSOC. OF RETIRED FEDERAL EMPLOYEES serves the interests of Federal retirees. For more information, contact Ed Howe, president of Peninsula Chapter, at 838-0254.

FOR RENT: ROOM in private home; kitchen privileges, cable TV, use of washer & dryer. Grafton. $200/month. Call 898-8188.

Visitor Center Announces February Programs

The first wind tunnels were built in Europe 30 years before the Wright brothers' successful flight at Kitty Hawk in 1903. Wilbur and Orville Wright built their first wind tunnel in 1901 and tested hundreds of different airfoil shapes.

During February the Visitor Center will focus on wind tunnels and how they have shaped the history of flight. The Visitor Center will have a working model of a wind tunnel on display, providing visitors with a unique view of how a wind tunnel operates.



Lowell Hasel will be featured at the Visitor Center.

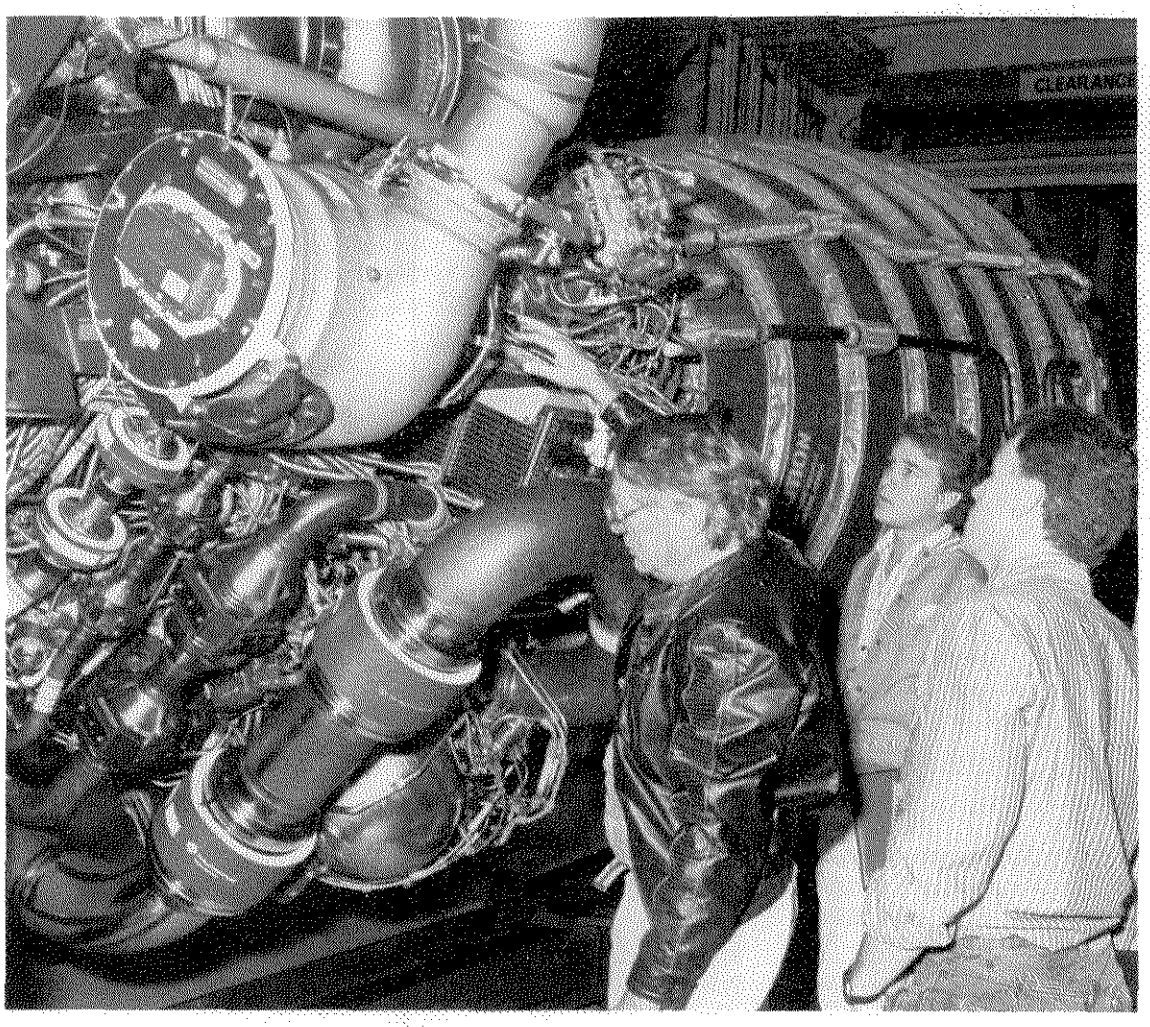
The Winds of Change: Former Chief Scientist Speaks on Wind Tunnels

"It was a huge white building, two blocks long, of astonishing shape: 'Looks like a monster doughnut covered with confectioner's sugar that somebody squashed from two sides so the hole almost disappeared.'" Thus, a white-haired engineer in James Michener's epic novel **Space** described Langley's 16-Foot High-Speed Wind Tunnel. Michener goes on to describe the tremendous strides made in aeronautics due to research done in Langley's wind tunnels.

Former chief scientist Lowell Hasel will present an illustrated lecture on wind tunnels at the Visitor Center on Thursday, February 11, at 7:30 p.m. Hasel will draw from his 36 years of experience at Langley and will show films made during tests of the Spin Tunnel and free flight tests in the 30- x 60- Foot Tunnel.

Hasel reported for his first day of work at Langley in June 1944 and was assigned to the staff of the Model Supersonic Wind Tunnel. When a young engineer in Michener's **Space** showed up at Langley for his first day of work, Michener wrote it this way: "When Mott reported to NACA he was assigned to the operation that stood at the very heart of Langley's contribution to the nation, the vast wind tunnel in which models of the best airplanes in the world were tested and improved upon."

Indeed, virtually every aircraft flying today reflects technology developed at Langley. Models of airplanes to be flown in the next 20 to 30 years are being tested at Langley today.



KENNEDY SPACE CENTER, Florida — Main engine workers perform initial inspections of the first space shuttle main engine (SSME) for the STS- 26 mission. Engine 2019 arrived at KSC's main engine shop in the Vehicle Assembly Building January 6. The engine was shipped by truck from NASA's National Space Technologies Laboratories in Mississippi where the SSMEs are certified for flight. The other two main engines are scheduled to arrive at KSC this month. A cluster of three engines provides the main propoulsion for the Space Shuttle during flight. The SSMEs operate in parallel with the two solid rocket boosters during the initial ascent.

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Langley Research Center

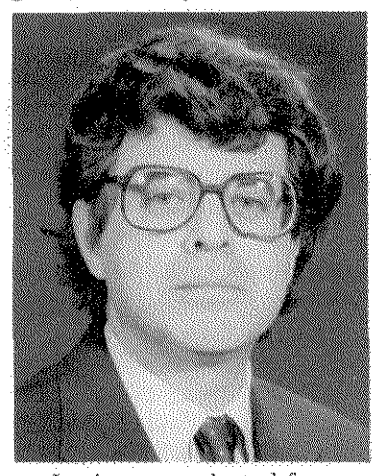
Volume 2, Issue 3 February 12, 1988

Bi-weekly Employee and Contractor Publication

News Researcher

Levine Named Among 1987 Top Technology Talents

Dr. Joel S. Levine, Theoretical Studies Branch, Atmospheric Sciences Division, has been selected as one of the Top Ten Technology Talents of 1987 by **Washington Technology** magazine. The magazine selected ten scientists who represent a broad spectrum of technological research from the nearly 80 nominations submitted by more than 50 organizations in the Washington D.C., Virginia, and Maryland area.



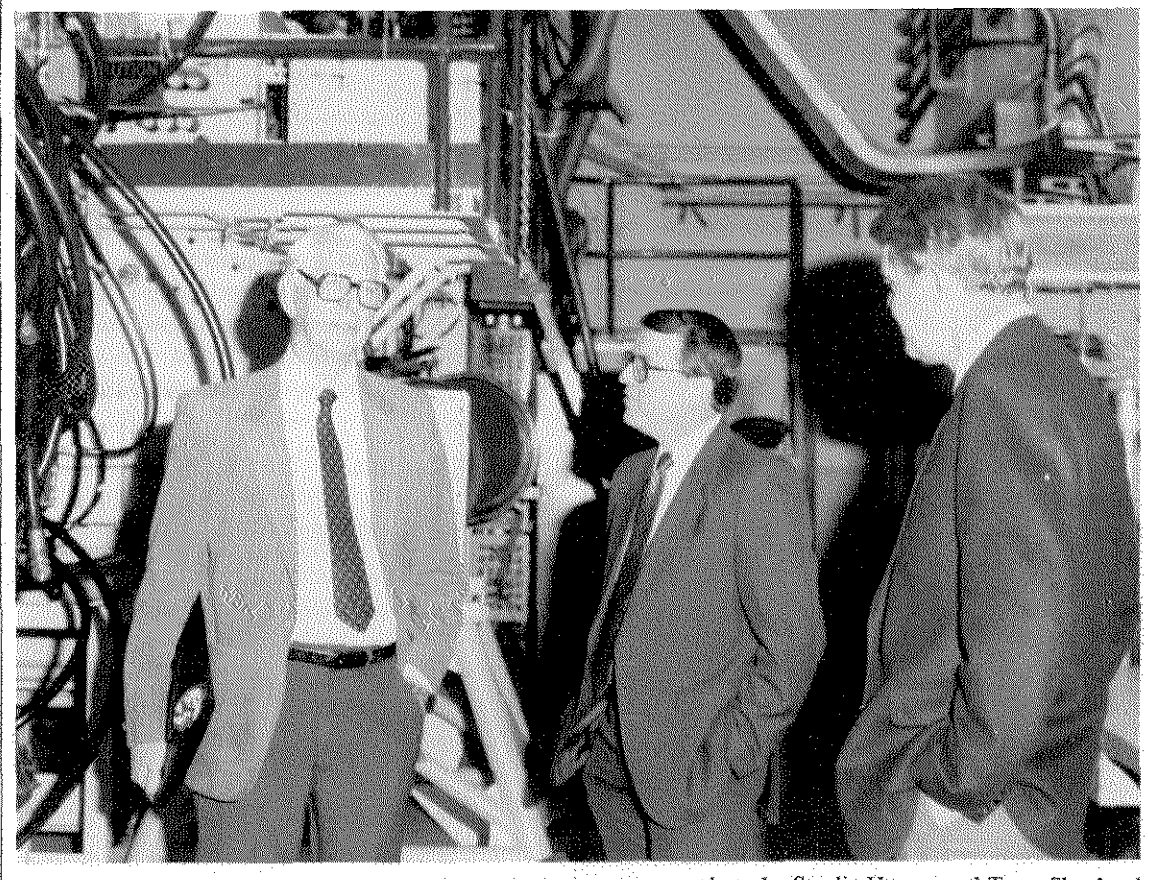
Levine was selected for "his pioneering research into the origin and evolution of the Earth's atmosphere."

Using theoretical computer models and satellite measurements of planets, Levine reconstructed the 4.6-billion-year history of the Earth's atmosphere. His work introduced a new understanding of the evolution of ozone and its change in composition since the Industrial Revolution.

Levine was chosen as Virginia's Outstanding Scientist for 1987. He had been nominated by Langley Director Richard H. Petersen. Recently, Governor Gerald Baliles appointed Levine to the Board of Trustees of the Science Museum of Virginia in Richmond. In this capacity, he serves on the Science Education Committee and Virginia's Outstanding Scientist Selection Committee.

Now a senior research scientist, Levine began his NASA career in July 1970. He is the author or co-author of more than 100 technical papers. The recipient of numerous awards, Levine received the H.J.E. Reid Award for writing Langley's outstanding research paper in 1974. He has also been the recipient of several NASA awards including an Exceptional Scientific Achievement Medal. In 1982, he became the youngest recipient of the New York Academy of Sciences' Halpern Award.

Levine received a bachelor's degree in physics from Brooklyn College of the City University of New York, a master's in meterology from New York University, and a master's in aeronomy and planetary atmospheres as well as a doctorate in atmospheric sciences from the University of Michigan.



-photo by Sandie Horsey and Terry Shephard

NASA Administrator Dr. James C. Fletcher (left) visited Langley on February 4. One of the stops on his tour of the Center was the High-Speed Aerodynamics Complex. Hosted by Langley Director Richard H. Petersen (right), Fletcher is briefed on SCRAMJET research by H. Lee Beach, Jr., Deputy Director for Aeronautics.

Doris Cooper Exudes Pride

Doris Lee Purdie Cooper will address the theme "Undeniably Black, Indisputably Gifted" to commemorate Black History Month. Cooper's presentation is sponsored by the Office of Equal Opportunity Programs and will be held at 1 p.m., Thursday, February 18, in the Activities Center.

Though delighted to make this presentation at Langley, Cooper hopes that in the next century Black history will not be relegated to a 28- or 29-day month but become so ingrained in the scheme of history that her topic will be celebrated daily. Cooper will touch on the struggles, accomplishments, and achievements of Black Americans. She will introduce her audience to many unknown personalities who have overcome obstacles to make worthwhile contributions to society.

A native of Norfolk, Cooper has written, produced, and directed two plays: **Continuity in Blackness** and **On Being Black, A Matter of Pride**. She is the writer and producer of a special Christmas album entitled **Come Let Us Adore Him**, which was presented on WAVY-TV-10, where she formerly served as host of a program entitled "Pride."

All employees are invited to attend and should charge their time to JO A1980.

Child Development Center Expands Care

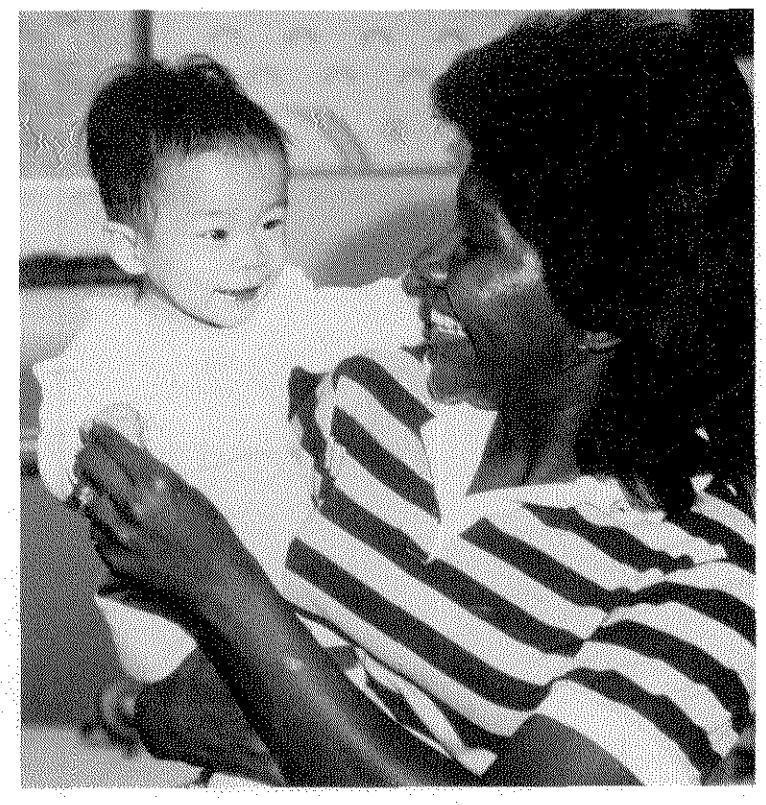
The Langley Child Development Center will open two additional infant care classrooms on Tuesday, February 16. These new classrooms will expand the current capacity of the Infant Program from eight to a total of 24 infants. The newly enrolled children will range in age from six weeks to two years.

The Child Development Center, a branch of the Langley Exchange Council, has been operational at Langley since September 1985 and currently provides comprehensive developmental child care to 42 children of NASA Langley civil servant, contractor and university personnel. With the opening of the two additional classrooms, the center capacity will be 58 children.

The staff of the Child Development Center are trained child care professionals who offer an educational curriculum to the children enrolled. Among the staff are early childhood education teachers, licensed practical nurses and teaching assistants. Developmental assessments are performed on all children and parent conferences are held twice a year. The center provides low staff- child ratios and complies with the accreditation criteria of the National Academy of Early Childhood Programs.

Since opening in 1985, the Child Development Center has been recognized as a high quality, employer-sponsored child care facility by numerous professional, educational and civic groups. The Langley center has been featured in local newspapers and on television. Recently, the Langley Exchange Council Liaison, Buena Crawford, and the Child Development Center Director, Melissa Coleman-White, were invited to address the Governor's Corporate Advisory Commission on Employer's Initiatives for Child Day Care.

Parents interested in enrolling their child/children in the center should call Melissa Coleman-White at 865-2191 for additional information. Orientations for interested parents are held on Wednesdays at 9 a.m. by appointment.



Child Development Center Infant Program Coordinator Cindy Sherman holds Grace Hou, daughter of Dr. Tan Hou, PRC/Kentron employee, and Louise Tso. Grace, now three, has been enrolled in the Langley program since she was six months old.

News Briefs

HEADQUARTERS, Washington, D.C. — NASA has announced a target date of August 1988 for launch of the next Space Shuttle mission, STS-26 This new launch target was selected following a major program assessment, subsequent to the most recent full-scale firing of the redesigned solid rocket motor in December 1987. An internal planning date of Aug. 4 will be used to focus the schedules for individual program elements.

KENNEDY SPACE CENTER, Fla. — A $635,529 contract has been awarded to Jensen Construction Co., Des Moines, Iowa, for modifications to the KSC Space Shuttle Landing Facility. Work to be performed consists primarily of grinding a 3,500-foot section at each end of the runway to smooth the surface texture, removing cross grooves and adding longitudinal "corduroy grooving." The primary purpose of the modifications is to enhance landing safety by reducing Space Shuttle orbiter tire wear during landing operations. (Please note related photo on page 5.)

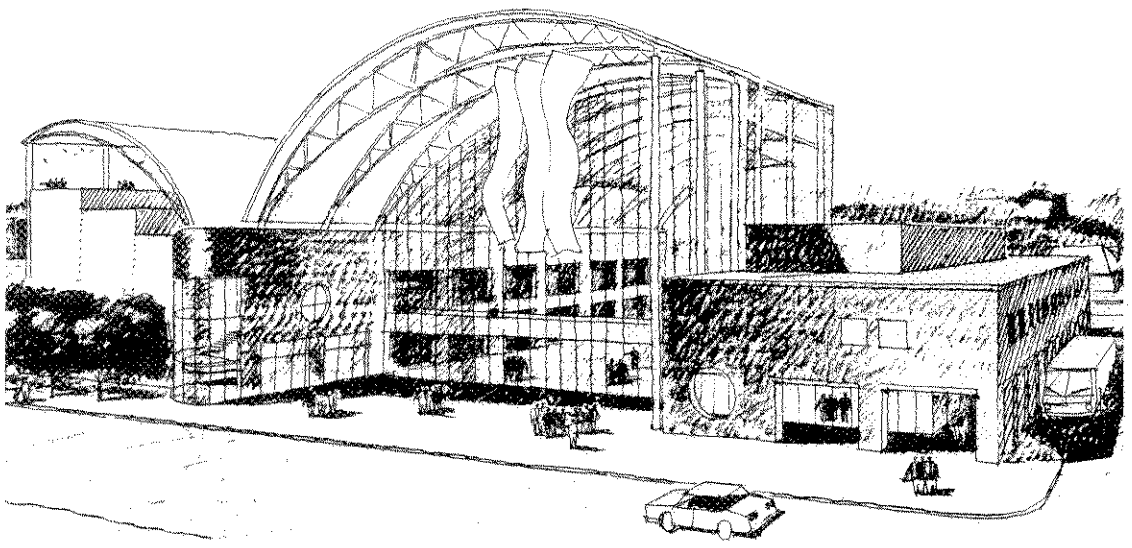
HEADQUARTERS, Washington, D.C. — NASA and the National Space Development Agency of Japan (NASDA) recently signed an agreement for the direct reception by NASA of data from Japan's Earth Resources Satellite (ERS- 1). The agreement was signed by Dr. James C. Fletcher, NASA administrator, and Hiroyuki Osawa, president, NASDA. NASA will have access, for research and applications demonstration purposes, to real-time data from Japan's ERS-1 synthetic aperature radar and optical sensor.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — NASA has scheduled the second test firing in a series of transient pressure test articles at Marshall Space Flight Center's East Test Area in Huntsville, Ala. The test motor will be fired for six-tenths of a second, achieving an expected maximum pressure of 950 PSIA.

AMES RESEARCH CENTER, Mountain View, Calif. — Using NASA's new supercomputer system called the Numerical Aerodynamics Simulation Facility, a researcher has made by far the most in-depth analysis to date of vortex breakdown, a complex phenomenon which can cause loss of life and control for high-performance aircraft. A computer model simulates the air flow field physics associated with vortex breakdown and provides new insights into its causes.

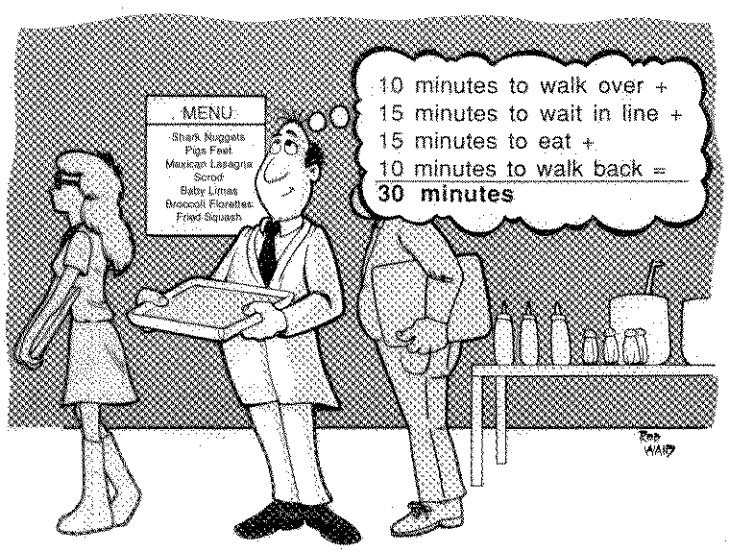
JOHNSON SPACE CENTER, Houston, Texas — NASA has announced crew members for Space Shuttle mission STS-28, currently targeted for late 1988. STS-28 will be a Department of Defense mission aboard the Shuttle orbiter Columbia. The crew will be commanded by Col. Brewster H. Shaw, Jr. Pilot will be Cdr. Richard N. Richards. Cdr. David C. Leestma, Lt. Col. James C. Adamson, and Maj. Mark N. Brown have been assigned as mission specialists.

Editor's note: Recent surveys locally and at the Headquarters level indicate that our readers are interesrted in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017. Request information be release number and headline. See Current News Release information box on page 4.



This artist's rendering of the proposed Virginia Air and Space Center/Hampton Roads History Center shows the striking design planned for the downtown Hampton waterfront. The museum was designed by the firm of Mitchell/Giurgola of New York.

Lankley



THOUGHT FOR THE DAY:

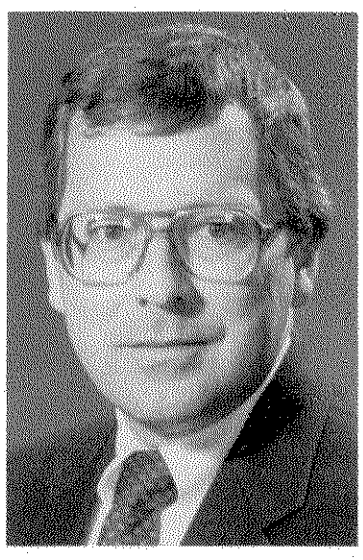
If you expect your children to follow in your footsteps, be sure to make a good impression!

-Contributed by
Ann Wilson
Photographics Section

Editorials

Langley

Headquarters Forum



I would like to take this opportunity to bring you up to date on the progress of the proposed Virginia Air and Space Center. In 1985, Langley started looking at options to enlarge and upgrade the current Visitor Center operation. In addition, we felt that the Visitor Center needed to be moved off-base for security reasons and in order to make it more accessible to the general public.

As a result, the City of Hampton and NASA have been working for the past two years to put together a plan for a new 100,000- square-foot aerospace museum in downtown Hampton. Considerable progress has been made during the recent twelve months.

A world-renowned architect from Manhattan, Romaldo Giurgola, has been commissioned to design the building. The complex includes 40,000 square feet of exhibit space, an 80-seat auditorium, 300- seat IMAX theater, sales shop, offices, library and classrooms. A parking garage, storage space and workshop areas are also planned. The proposed building is very striking and should become a major attraction in this part of the country.

In addition, Krent/Paffett Associates, Inc., a highly respected museum exhibits firm from Boston, has been commissioned to plan and design the exhibits program. Phase I of this project, the conceptual design, was recently completed and the preliminary design review was held on January 25.

Phase II, which includes construction drawings for the building and associated structures as well as the detailed design of the interior exhibits, is now in progress. Ground breaking is currently scheduled for Fall 1988 or whenever Tysinger Motors moves from the downtown property to their new location on Magruder Boulevard.

Fund raising for the $20 million project is going well. A grass roots campaign, chaired by local businessman Tom Chisman, has raised over $3 million during the past twelve months. Governor Baliles has set aside $5 million in state funds for the project. A national fund raising campaign is now underway.

If current plans fall into place as we all anticipate, the Langley Visitor Center would close in about three years and NASA would become an integral part of the new Virginia Air and Space Center.

Developments in air and space technologies have always been topics of popular interest. The current Langley Visitor Center, a small facility, had an attendance of 221,000 in calendar year 1987, making it the third most attended museum, out of 126 state museums, in Virginia. Market studies for the new museum predict the first-year attendance at about 400,000 visitors. Everyone expects the attendance to grow even higher, as long as we can keep the entrance fee at a minimum.

NASA is very pleased to be working with the City of Hampton, the Commonwealth of Virginia, and the Smithsonian's National Air and Space Museum to make this project a reality. The area from Hampton to Kitty Hawk, N.C., has a long and proud history in the birth of air and space. The proposed Virginia Air and Space Center will honor this heritage.

A. G. Price
Head
Office of External Affairs

AIAA Space Station Meeting

AIAA Space Station Utilization I meeting will be held March 7-9 at the Hyatt Regency Crystal City. This meeting will provide potential Space Station users an opportunity to present their requirements early in the C-D phase of development of the Station. For additional information contact program chairman, Richard Halpern, NASA Headquarters, (202)453-1162.

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Thursday following the date of this issue.

Managing Editor . . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

The Emergence of the Aerobrake

Some NASA Researchers Say It's Time to Slow Things Down

On the topic of spacecraft–the Shuttle, planetary probes, communications satellites–a feature sure to awe the observer is the incredible speed at which these vehicles travel. Now some NASA researchers are turning their attention to studying how to slow down a space vehicle and they are looking in an unconventional direction.

Aeroassist–or aerobrake–is the braking method under study. Aeroassist is a generic term encompassing various maneuvers in which a vehicle is slowed down by a planet's atmosphere without making a complete entry. Scientists think the most efficient braking method to achieve a planet rendezvous is to route the vehicle through the upper atmosphere of the planet and decelerate the vehicle by use of its inherent aerodynamic drag. Typical aeroassisted candidate missions are return missions to Earth from locations within the inner solar system and encounters with the planets within our solar system. The vehicle which would accomplish such a mission is referred to as an aeroassisted orbital transer vehicle (AOTV).

The concept of aeroassisted orbital transfer vehicles has been studied since the beginning of the space era. A series of relatively recent studies, though, has focused attention on a class of missions in which a reusable AOTV would be used for the delivery and return of science payloads or cargo, servicing equipment, or transferring personnel between low and high-Earth orbit or the Moon. Planners even envision robots on an AOTV that could fix malfunctioning satellites in orbit or bring them back to the Space Station for repair.

The AOTV concept is only feasible, however, if the vehicle can be slowed down–in an efficient manner–from the rate of speed at which it travels in geosynchronous orbit to rendezvous with communications satellites or upon return from a lunar mission to the lower speed of low-Earth orbit where the Space Station will be located. To date, NASA space vehicles have plunged through the atmosphere on launch from or reentry to Earth. Thus, there is no data base to predict how the sparce gas molecules in the upper atmosphere, which should be sufficient to slow down an AOTV, will affect the speeding vehicle's aerothermal performance.

To obtain this data, NASA has initiated the Aeroassist Flight Experiment (AFE). Four NASA centers are collaborating on this $200 million in-house project that is scheduled to fly on the Space Shuttle in the mid 1990's. The AFE project is managed by the Marshall Space Flight Center. Johnson Space Center is responsible for the development of the aerobrake, the structure that allows the spacecraft to slow down by using atmospheric drag rather than costly fuel. Ames Research Center is developing and testing heat shield materials. Langley is responsible for the definition of the science payload–the instruments that will acquire the crucial flight data– and the management of the science team consisting of researchers from the Ames, Johnson and Langley centers.

Paul M. Siemers, AFE Science Manager, says the preferred vehicle would have a large, blunt forebody, a low ballistic coefficient, be roll controlled and recoverable. If the aerobrake can be made sufficiently light, the aeroassisted vehicle can have twice the payload capability of its all- propulsive counterpart.

The AFE Science Integration Office has been established in the Space Directorate at Langley and manages a team that spans three NASA centers and four Langley directorates. The present AFE science payload consists of fourteen experiments that will obtain fundamental flow field-related data as well as thermal protection system performance data in the simulated AOTV flight environment.

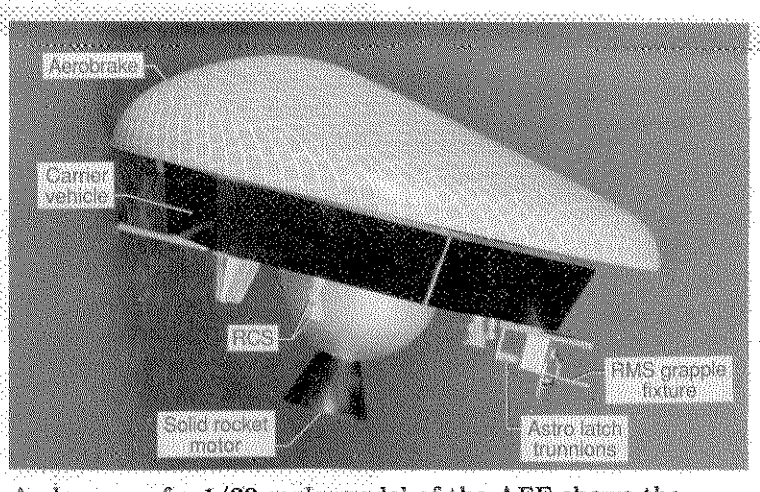
Additionally, Langley has prime responsibility for the aerodynamic and aerothermodynamic wind tunnel testing required to support the development of the vehicle and science design data base. This phase of the program has been progressing over the past three years and is the responsibility of Bill Wells and John Micol of the Space Systems Division, Experimental Aerodynamics Branch.

Finally, Langley is providing computational fluid dynamics support to the project through the efforts of Harris Hamilton, Peter Gnoffo, and Jim Weilmuenster of the Aerothermodynamics Branch.

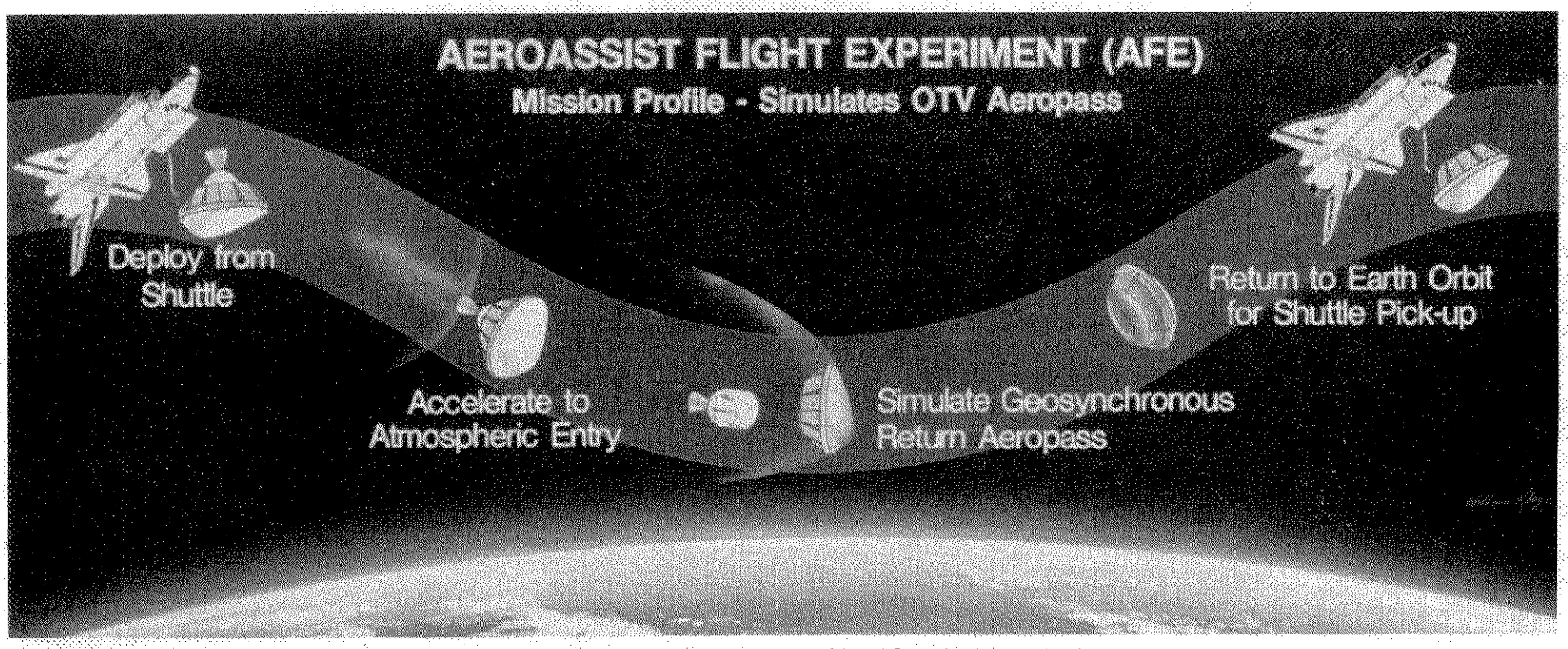
Siemers stresses that, in addition to acquiring the experimental data during the atmospheric pass, a prime requirement of the AFE mission is the recovery of the vehicle and its return to Earth via the Space Shuttle orbiter for post flight inspection. After examining the vehicle and analyzing the data, NASA engineers hope to be able to design the lightest possible AOTV that will withstand the rigors of atmospheric braking.

-photo by Sandie Horsey

Displaying the AFE scale model in two parts are Paul M. Siemers (left), AFE Science Manager, holding the carrier vehicle, and Robert L. Calloway, Deputy Science Manager, holding the aerobrake. Siemers points out one of the instrumented booms located on the carrier vehicle designed to obtain base flow data.



A close-up of a 1/20 scale model of the AFE shows the mushroom- shaped aerobrake covered by a thermal protection system of tiles similar to those used on the Shuttle. The carrier vehicle contains the necessary subsystems required to accomplish the mission, such as reaction control, data, and power.



An Aeroassist Flight Experiment (AFE) mission scenario calls for the AFE to be deployed from the cargo bay of the Space Shuttle. A solid rocket motor (SRM) will accelerate the vehicle to 33,800 feet per second simulating the speed at which a spacecraft travels in geosynchronous orbit. After the burn, the SRM is jettisoned. A dip through the Earth's upper atmosphere is expected to slow the AFE so it can rendezvous with and be retrieved by the Shuttle. Back in the cargo bay, the AFE will be returned to Earth for in- depth analysis.

Senior Management Research Review

The Senior Management Research Review will be held Tuesday, February 16, at 9 a.m. in Building 1219, Room 225. Following the Director's comments and program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENTS	SPEAKER
9:30	Polar Stratospheric Clouds and the Antarctic Ozone Hole	Lamont Poole (Space/ASD)
9:45	Hypersonic Flows in Chemical and Thermal Nonequilibrium	Peter Gnoffo (Space/SSD)
10:00	Development of Low Resistance Contacts to High Temperature Superconducting Materials	Charles Byvik (Electronics/FED)
10:15	Effect of Leading-Edge Bluntness on Flatplate Transition	Ivan Beckwith (Aeronautics/HSAD)
10:30	Algorithm to Architecture Mapping Model (ATAMM)	Paul Hayes (Flight Systems/ISD)
10:45	Characterization of Structural Metallics with High Strength and Toughness for Cyrogenic Applications	Keith Bird (Structures/MD)

Note of Thanks

Jean Trueblood writes: "Many thanks to all who attended my retirement party and contributed to the gifts. It was wonderful to see so many of my friends and co-workers gathered to celebrate this event with me and my family. I will always remember this very special evening and the great experience of working at Langley."

In Memoriam

Sympathy is extended to the families of:

Vetris D. Bolin, who died December 7, 1987. Bolin retired as an electronics technician after 22 years of service to NASA.

Cecil Burcher, Sr., who died December 12, 1987. Burcher retired in May 1982 from the Fabrication Division.

Thelbert L. Gammage, who died December 12. Gammage retired from the Fabrication Division after 32 years of service.

Thomas L. Coleman, who died December 16. Coleman retired from the Army Research and Technology Laboratory after 33 years of government service.

John L. Eason, who died December 17. Eason retired from the Operations Support Division after 21 years of service.

Thomas A. Harris, Sr., who died December 30 in Los Alamitos, California. Harris retired in 1968 as a research assistant to the associate director.

John R. Dawson, Sr.,, who died January 19. Dawson was an aeronautical and hydrodynamics research engineer and retired after 42 years of service to NASA.

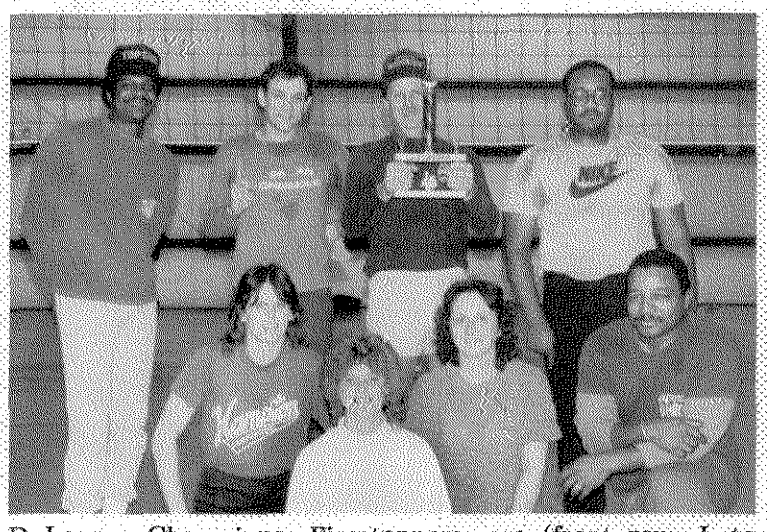
John B. Parkinson, who died in North Palm Beach, Florida. Parkinson, former chief of Langley's Hydrodynamics Division and aerodynamics program manager at NASA Headquarters, retired after 39 years of service.

Volleyball Club Concludes Season

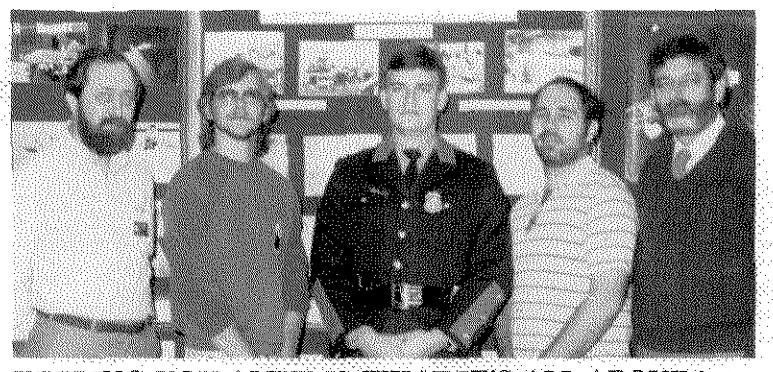
photos by Jim Hall

B League Champions, Stacked Deck, are (front row, L to R) Frank Quinto (kneeling), Quitty Hernandez, Kamran Fouladi, (back row, L to R) Beth Plentovich, Susan Althoff, Duane Melson, Bill von Ofenheim, and Neil O'Connor.

C League Champions, Jiants, are (front row, L to R) Tom O'Mara, Nancy Murawski, Joe Visintainer, Rachel Jasinski, Suzy Fulton, Louis Glaab, (back row, L to R) Melissa Proffitt, Gene Morelli, and Bill Nelson. Not pictured are Terry Leary, Phil Arcara, Holly Meyer, Mical Downing, Rick Wydever, and Tim Holden.



D League Champions, Firestoppers, are (front row, L to R) Christi Muldowney, Suzzane Laxton, Jackie Hellman, Chick Lee, (back row, L to R) Bill Johnakin, Steve Laxton, Carl Hellman, and Victor Howard. Not pictured are Steve Veneris, Leela Johnakin, Steve Cappendick, Chris Carrier, Jeff Barbour, Tony Sanzo, and Bryan Eubanks.



KEEPING YOU ALIVE IS WHAT IT'S ALL ABOUT is the message from Virginia State Trooper Steven L. Chumley (center), who advocates the use of safety belts because they save lives as well as because it is now the law in Virginia. Chumley is shown with CMDS safety committee members (L to R) Bill Fogle, Ed Searce, Hayward Glaspell, and John Powell.

Seat Belts Save Lives

Virginia State Trooper Steven L. Chumley was guest speaker at a safety meeting held for the Models and Materials Technology Branch. Invited by Bill Fogle, Composites and Model Development Section (CMDS) safety coordinator, Chumley addressed the new Virginia seat belt law.

Echoing the sentiments of Virginia Governor Gerald L. Baliles, Chumley emphatically stated "keeping you alive is what it's all about!" The statistics are staggering. Over a 12-year period 55,000 lives were lost in Viet Nam; this number is exceeded **yearly** in traffic deaths across the nation.

Safety belts are not new to automobiles, even though the campaigns to get people to buckle up are recent. Reminders ask you to "click it," "to be a put on," and to "buckle up." These messages which bombard us from radio and TV, newspapers and magazines, and even from on-Center safety meetings are provided for a reason – a good reason. Buckling up does save lives.

The grim message is that not all crashes are survivable. The use of safety belts will never replace safe driving habits. A driver always needs to be cautious and drive defensively. But statistics show seat belts are very effective. Safety belt wearers sustain fewer and less serious injuries than non-wearers; the proportion of passengers totally escaping injury rises from 28 percent to 42 percent with the use of safety belts.

Trooper Chumley's presentation had a single purpose: to increase the awareness of the Langley community to the fact that pulling your safety belt and fastening it around you could save your life.

SOME MYTHS AND THE STRAIGHT FACTS:

- **I'm a good driver; it won't happen to me.** You may be a good driver, but what about the other person? One out of every three persons will be involved in a serious automobile collision.
- **I'm not going far, and I won't be going over 25 mph.** Most collisions occur under 40 mph and within a distance of 25 miles from home.
- **I'd rather be thrown clear of the car.** What does this really mean? It means hitting hard pavement or the ground; being thrown through the windshield, window or partially opened door; hitting a hard object such as a tree; or being run over by your own car or another vehicle. Your chances of remaining alive are many times greater if you remain in the car.

BUCKLE UP, VIRGINIA! IT'S THE LAW:

Occupants of front seats of motor vehicles are required to use safety lap belts and shoulder harnesses.

- Driver is responsible to require riders between the ages of 4 and 16 years to weat appropriate safety belt systems.
- Passenger in front seat 16 years or older is responsible to use seat belts; such **passengers** not using belts can be ticketed.
- Children under four years of age or 40 pounds are required to ride in child restraint seats.

Any person in violation of this law will be subject to a civil penalty of $25 to be paid to the state treasury and credited to the Literary Fund.

For further information on the law, read **Restrain Yourself**, consumer guide to safety belts and child safety seats, available from the Virginia Auto Safety Alliance, 1001 East Main Street, Suite 501, Richmond, VA., 23219.

LaRC Employees Give Gift of Life

There is no greater gift than the gift of self. Langley employees, retirees and contractors give of themselves repeatedly at the American Red Cross Bloodmobiles held at the Activities Center every two months.

In spite of the advances, even the miracles of modern medicine, there is still no substitute for blood. Our blood donors offer a precious gift to their fellowman – the gift of life.

A total of 367 Langley employees, retirees, and contractors donated pints of blood at the November 25 visit of the American Red Cross Bloodmobile.

Achieving gallon status were:

18 gallons — James J. Fay;

11 gallons — John A. Moore and Craig S. Cleckner;

10 gallons — Billy W. Beasley;

9 gallons — Charles G. Marple and E. Eugene Hall;

7 gallons — Mary S. Saylor;

6 gallons — Mary M. Mack, John R. Nayadley, Ricky L. Clark, Robert L. Spruill, Edward E. Crum and Paul W. Kidder;

5 gallons — Melvin L. Jones, Charles J. Wittkopp, James P. Bailey, William D. Castle;

4 gallons — Joseph M. Drozdowski;

3 gallons — William L. Moyer, Gary L. Kidd, Steven X. S. Bauer and John Barrett;

2 gallons — Randy L. Simons, James L. Puffenberger and James H. Hurst;

1 gallon — Russell B. Tatum, Alan W. Henderson, Paul A. Garu, Michael J. Heiusch, Roger A. Hathaway and Julius B. Lovell;

1st Timers – T. Taylor-Kristie, Jerry S. Lyle, Heather S. Utter, James M. Geil, Penny L. Murphy, Michelle T. Ferebee, Barry K. Lawhorne, Wanda L. Seals, Carl R. Elks, Franklin O. Mayhew, Richard T. Wheeler, Bette L. Duncan, Mary J. Ledford.

NASA coordinator for the Bloodmobile visit was Virginia H. Jones; Red Cross coordinator was Barbara Thomas.

A total of 324 Langley employees, retirees and contractors donated pints of blood at the January 27 Bloodmobile visit.

Achieving gallon status were:

10 gallons — Robert Berry, Jr., and William Fernald;

7 gallons — John S. Anderson;

6 gallons — Edward R. Medford, Carl Larsen, Samuel McPherson III, Sandra G. Zumbrum, Charles A. Sweet, Benjamin Guenther and John T. Barclay;

5 gallons — Granville L. Webb, Charles Wittkopp, William L. Terrill and Frank L. Boyer;

4 gallons — Thomas Straganac and Cadd T. Moore III;

3 gallons — William J. Leath, Jr., Mattfiew G. Eubanks, Michael Mastaler, Leigh A. Smith, Michael Raiford and Millard A. Puckett;

2 gallons — Samuel O. Hall, Michael W. Tyree and James B. Hallissy;

1 gallon — James L. Leuci, Susan N. McMillin, Daniel W. Banks, Barry Belvins, Bobby Kessler, Glenn Orusby, Bernard J. Jansen and Thomas Gabany;

1st Timers — Valinita Hicks, Stacy Kissinger and Judy F. McRoy.

NASA coordinator for the Bloodmobile visit was Annette Forrest; Red Cross coordinator was Dot Hudgins.

88-10.....Contract Awarded for Space Shuttle Landing Facility Modifications

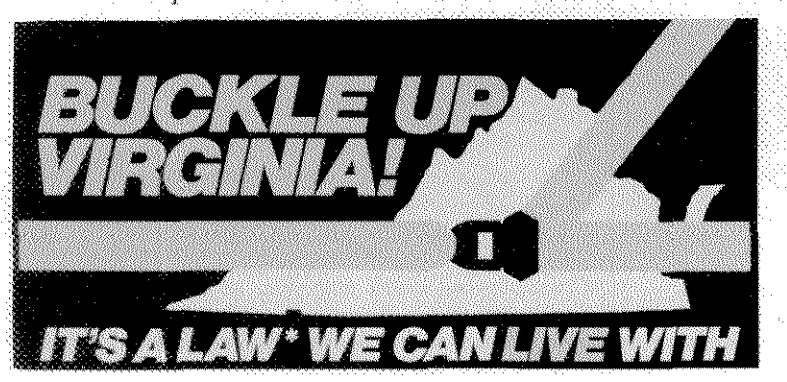
88-11.....NASA Announces New Space Shuttle Launch Date

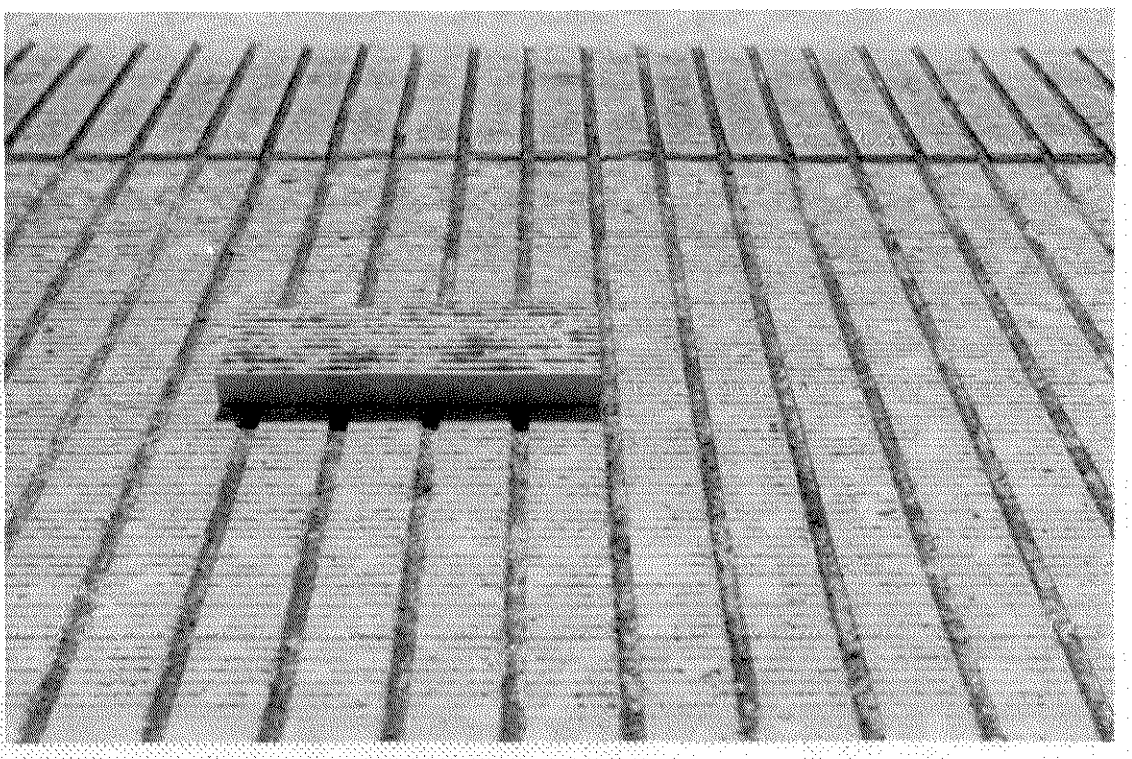
88-12.....NASA and Japanese Space Agency Sign Remote Sensing Data Agreement

88-13.....NASA Supercomputer Studies Aircraft Control Phenomenon

88-14.....Second Space Shuttle Short-Stack Solid Rocket Motor to be Tested

88-15.....Space Shuttle Crew Announced





From Behind the Scenes

Langley Proposes a Smoother Approach

The runway at Kennedy Space Center's Shuttle Landing Facility (pictured from the side in this closeup view) has a rough, longitudinal texture combined with transverse grooves to provide superior traction under wet conditions. This surface also causes accelerated tire tread wear during the Shuttle's landing and rollout.

Tests at Langley's Aircraft Landing Dynamics Facility (ALDF) have verified the acceptability of a smoother runway texture, called a corduroy surface and pictured atop the grooved runway, to reduce tire wear without compromising vehicle handling on a wet surface. The "corduroy solution" will be explored in the next issue.

Positions Open

The following Competitive Placement Positions are currently open:

88-9: (Cancelled) Administrative Officer, GS-0341-11 or 12, Space Directorate. Closes February 12.

88:10: Supervisory Electrical Engineering Technician, GS-802- 11 or 12, Operations Support Division, Electrical Support Branch, Laboratory and Plant Electrical Section. Closes February 12.

88-11: Administrative Officer, GS-0341-11 or 12, Space Directorate. Closes February 19. (NOTE: This replaces CPP 88-9)

Positions Filled

Connie G. Stott has been named Contract Specialist, Purchase Branch, Acquisition Division, under CPP G87-2.

Leslie Ferguson has been selected Secretary (stenography), Electronics Technology Branch, Fabrication Division, under CPP 87-1.

Claude R. Watts, Jr. has been named Supervisory General Supply Specialist, Transportation and Warehousing Section, Logistics Management Branch, Management Support Division, under CPP 87-90.

Jean M. LaNeave has been named Staff Assistant, Office of the Director, under CPP 87-70.

Robert F. Bryant, Jr., has been selected Lead Engineering Technician, Technical Support Section C, Tunnels Operations Branch, Operations Support Division, under CPP 87-84.

Obie H. Bradley, Jr., has been selected AST, Fluid Mechanics, Supervisory Aerospace Engineer, Fluid Analysis Section, Engineering Analysis Branch, Systems Engineering Division, under CPP 87-79.

Panice H. Clark has been named Contract Specialist, Projects and ADP Contracts Branch, Acquisition Division, under CPP-87-89.

Lemuel E. Mauldin, III, has been selected AST, Project Management (Temp. Position), Office of the Chief, Flight Electronics Division, under CPP 87-87.

John Franklin Rogers has been selected Supervisory Aerospace Engineer, AST, Aerospace Flight Systems, Spacecraft Systems Section, Space Systems Engineering Branch, Systems Engineering Division, under CPP 87-85.

Retirement Parties

F. Dolan Clontz will be honored at a retirement party Friday, Feb. 26, at the Activities Center. Social hour begins at 6; dinner is at 7 p.m. Cost is $11/single; $21/couple. Contributions for gift only are welcome. Contact Bill Clarke, ext. 2631, or Billy Beasley, ext. 2311, by Feb. 19.

Homer G. Morgan will be honored at a retirement party on Saturday, Feb. 27, at the Activities Center. Social/cash bar begins at 6:30; followed by dinner at 7:30 p.m. Cost is $11.50/person. Donations of $2 for gift only will be graciously accepted. Send check to Linda Sutherland, Mail Stop 462, by Feb. 16.

Philard "Phil" C. Flansburg has requested no retirement ceremony. In recognition of his dedicated career and contributions to Langley, donations for a gift are being solicited. Please send contributions to Charlene Gleaton, Mail Stop 424, ext. 2156, by Feb 19.

Happenings

LAA SOCIAL will be held Friday, Feb. 19, from 4 to 6:30 p.m., in the Activities Center.

TOASTMASTERS. NASA Toastmasters will meet Wednesday, Feb. 24., at 11:30 a.m. in Building 1218. Toastmasters needs you–the special contributions only you can bring to the organization. Attend as a guest and find out what Toastmasters is all about. For further information, call Natalie Johnson, ext. 3483.

EXERCISE CLASSES. Suellen Seabrook, fitness columnist for the **Daily Press** and **Times-Herald**, conducts exercise classes on Mondays and Wednesdays at 5 p.m. in the Activities Center. Enroll now for the high intensity workout—low impact exercise classes. For more information, call 877-6067.

AFGE MEETING. Next regular monthly meeting of AFGE Local 2755 will be held on Wednesday, Feb. 17, at 4:30 p.m. at Union Office Building 1232B.

PENINSULA ENGINEERS AWARD BANQUET will be held Saturday, Feb. 27 at the Chamberlin. Contact Jeff Davidson, 380-4042, by Feb. 23.

ACM SIGART MEETING will be held Wednesday, Feb. 24, at 7 p.m. at the Western Sizzlin' Restaurant, Cunningham Drive, Hampton. Dr. Christian Wild will speak on the "Use of Learning in the Analysis of Software Specifications." Contact Nancy Sliwa, ext. 3871, for details.

SAILING INSTRUCTORS needed for both junior and adult programs for the Langley Yacht Club summer sailing program. Instructors should be Red Cross certified and have completed the CBYRA instructor program. Call Michael Fletcher, 766-1012, for more information.

BOATING SAFETY COURSES will be offered by the Williamsburg Flotilla of the U.S. Coast Guard Auxiliary. No charge for course except cost of textbooks. Call 220- 1790 for further information.

AMELIA EARHART HERE! A one-woman play celebrating America's "first Lady of the Air" will be held at 8 p.m. on Saturday, Feb. 27, Armstrong Hall Little Theater, Hampton University. Cost is $3 per ticket. For more informationbs, call 727-5417.

swap and shop

FOR SALE: TRUCK, 1984 Dodge truck, Ram 50, 1/2 ton, 4-speed; 66,000 mi. Excellent condition. $2,900. Call 898-4170.

FOR SALE: AUTO, 1976 Dodge Aspen S/W with AC. Good condition. $475. Call Bruce Conway, ext. 3601 or 898-4359.

Take Note:

The following library material was borrowed during the month of December:

International Conference on Numerical Methods in Fluid Dynamics, 2nd, University of California, Berkley, 1970. Proceedings. Lecture Notes in Physics, 8.

Please return to Troy Middleton, Mail Stop 439, or call ext. 4656. Thanks.

Alumni News and Views

The LaRC Alumni Association is pleased to announce the results of the election held recently. One hundred fifteen alumni and guests attended the annual meeting on January 20. A total of 81 ballots were cast to elect 27 members to the Board of Directors for the terms indicated.

Elected for a period of three years: William J. Boyer, John E. Duberg, Betty P. Joyner, Abraham Leiss, Dwight G. McSmith, Mary J. Mesic, Israel Taback, Donald H. Ward, and Joyce M. Wright.

Elected to two-year positions: Emanuel Boxer, Clarence A. Brown, Jr., Edmund A. Brummer, L. Cornell Burcher, T. Melvin Butler, Domenic J. Maglieri, Axel T. Mattson, John P. Reeder, and Richard T. Whitcomb.

Elected for one year: George W. Brooks, Howard B. Edwards, Cornelius Driver, Charles E. Johnson, Katherine Johnson, Agnes Lindler, Robert O. Schade, Fred W. Schmidt, and Sue E. Wilder.

At an organizational meeting on January 28, the following Officers and Committee Chairpersons were elected by the Board of Directors: William J. Boyer, President and Chairman of the Executive Committee; Joyce M. Wright, Vice President; Betty P. Joyner, Secretary; Edmund A. Brummer, Treasurer; Clarence A. Brown, Jr., Finance Committee Chairman; L. Cornell Burcher, Membership Chairman; Cornelius Driver, Nominating Chairman; Donald H. Ward, Program Chairman; Abraham Leiss, Social Chairman, and Sue E. Wilder, Ad Hoc Communications Chairperson.

Accent Reduction Class Offered

Christopher Newport College is offering a 12-week course for non-native Americans who wish to learn the sounds and intonation patterns of "American English." Class strictly limited to 10 students. Call CNC Continuing Education Department, 599-7159, for details.

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Space Administration
Langley Research Center
Hampton, Virginia 23665-5225

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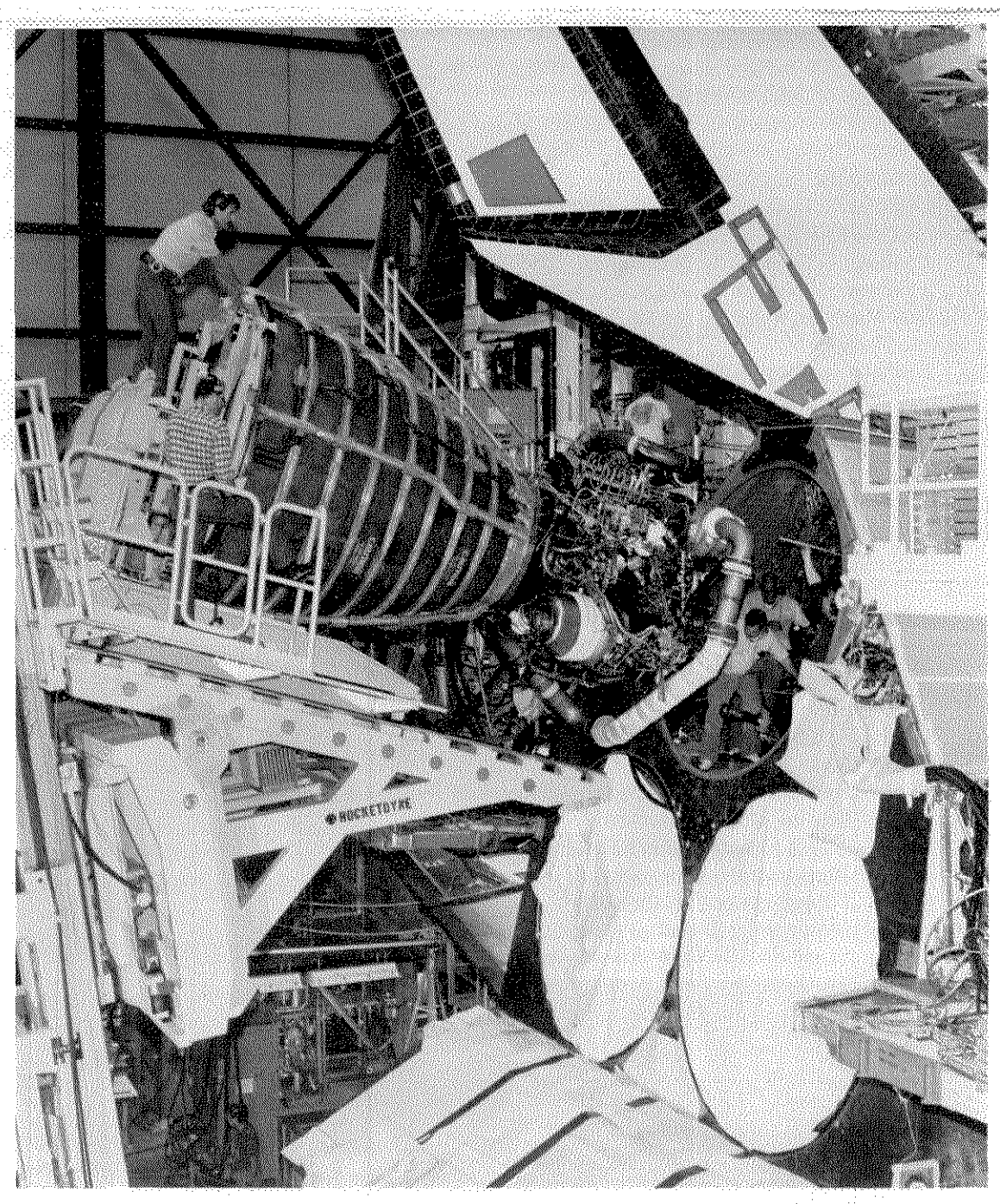
Penalty for Private Use $300

National Engineers' Week is February 21-27, 1988.



KENNEDY SPACE CENTER, Fla. — KSC employees work together to carefully guide a 7,000 pound main engine into the number one position in Discovery's aft compartment. A cluster of three main liquid fueled engines provide the main propulsion for the orbiter and work in parallel with the solid rocket boosters during the initial ascent.

NASA
National Aeronautics and Space Administration
Langley Research Center

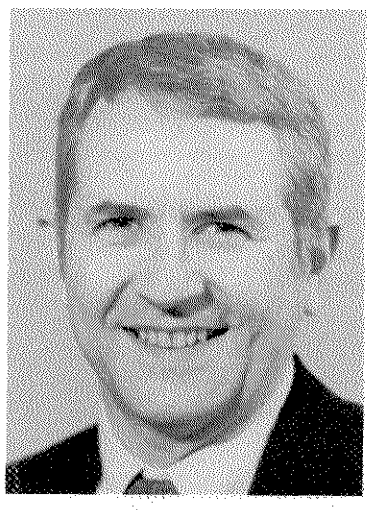
Researcher News

Volume 1, Issue 4 February 26, 1988
Bi-weekly Employee and Contractor Publication

Langley Colloquium

Truly to Address Space Shuttle Recovery

Since the Challenger tragedy January 28, 1986, NASA and its contractors have been working toward the goal of resuming Space Shuttle flights.



Rear Admiral Richard H. Truly, associate administrator for space flight at NASA Headquarters, Washington, D.C., will describe the Space Shuttle recovery efforts to date and plans for the next flight at a Langley colloquium Monday, March 14. His lecture, "Space Transportation Recovery," will be held in the Activities Center at 2 p.m., followed by a question and answer session and an informal discussion.

Truly has been primarily responsible for the recovery efforts of the Space Transportation System since he was named associate administrator in February 1986. Before assuming this position, he was the first commander of the Naval Space Command, Dahlgren, Va., which was established on October 1, 1983. Naval Space Command became the naval component of the U.S. Space Command on October 1, 1985.

'My experience over the last couple of years has been a unique one. I have been in charge of leading an outstanding group of people within NASA and our contractors across the country in recovering the Shuttle.'

In 1983, Truly was commander of the Challenger mission, which was the first night launch and landing in the Shuttle program, and in 1981, pilot of Columbia, significant as the first manned spacecraft to be reflown in space. He was pilot for one of the two-man crews that flew the 747/Space Shuttle Enterprise approach and landing test flights during 1977.

In 1965, Truly was among the first military astronauts selected to the USAF Manned Orbiting Laboratory program in Los Angeles, Calif. He became an astronaut for NASA in August 1969. He was a member of the astronaut support crew and capsule communicator for all three of the manned Skylab missions in 1973 and the Apollo- Soyuz mission in 1975. As a naval aviator and test pilot, Truly has over 7,000 hours in numerous military jet aircraft.

Truly enrolled as an NROTC midshipman at the Georgia Institute of Technology in 1955. He received a bachelor of aeronautical engineering degree and was commissioned an ensign in the U.S. Navy in 1959.

Truly's decorations include the Defense Distinguished Service Medal, Defense Superior Service Medal, two Legions of Merit, Navy Distinguished Flying Cross and the Meritorious Service Medal. His NASA awards include the NASA Distinguished Service Medal, two NASA Space Flight Medals and two NASA Exceptional Service Medals.

Darden, Black Engineer of the Year in Government

Christine M. Darden, aerospace engineer, Advanced Vehicles Division, has been selected 1988 Black Engineer of the Year for Outstanding Achievement in Government.

The Black Engineer of the Year awards were created to pay tribute to Black Americans for their contributions in the areas of science, engineering and technology. The awardees also provide positive role models for minority youth.

Darden and other award winners will be honored tomorrow evening at a banquet held at the Baltimore Convention Center. The banquet is the culminating event of a three-day conference sponsored by Mobil Oil, the Council of Engineering Deans of the Historically Black Colleges and Universities and Career Communications Group, Inc., publishers of **U.S. Black Engineer** magazine.

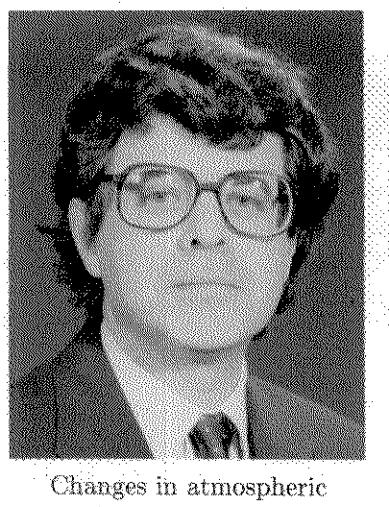
Darden joined the research staff at Langley in 1967 as a data analyst. She is currently senior project engineer in the Civil Aircraft Branch. Her work involves research in analytical methods used in the study of supersonic aerodynamics. Darden is recognized as an expert in the standard methods of sonic boom minimization and has acted in a lead role during Langley's research in this area.

Darden received a bachelor of science degree in mathematics from Hampton University and a master's degree in mathematics from Virginia State College. She received a doctorate in mechanical engineering from George Washington University.

The recipient of a Langley Outstanding Performance Award, Darden has also been cited as an Outstanding Woman of America. She is listed in Who's Who Among Black Americans and has received Hampton University's Twenty-Year Alumnus Award.

Levine to Discuss Global Atmospheric Change at Sigma Series Lecture in Hampton

Ozone in the upper atmosphere absorbs solar ultraviolet radiation and shields the surface of our planet from this biologically lethal radiation. Recent measurements indicate that early springtime levels of ozone in the Antarctic upper atmosphere have decreased 50 percent over the last decade.



Changes in atmospheric composition and chemistry, along with changes in the temperature of our planet, will be assessed by Dr. Joel S. Levine, a senior research scientist at the Langley Research Center, at a special lecture Monday, March 14.

The lecture, "Global Atmospheric Change: An Uncontrolled Experiment," will be held at the Sheraton Inn-Coliseum Hampton at 7:30 p.m. as part of The Sigma Series. The Sigma Series is a series of free public lectures sponsored by the Langley Research Center, the City of Hampton and the Daily Press.

According to Levine, the changes in the Earth's temperature are due to introduction of trace atmospheric gases resulting from industrial, technological and agricultural activities. Some of the activities that are significant sources of atmospheric gases include burning fossil fuels, applying nitrogen fertilizers to enhance agricultural yield, burning forests for land clearing and producing industrial chemicals.

Levine explained that measurements indicate atmospheric levels of several environmentally significant gases are increasing, including carbon dioxide, methane, nitrous oxide and the man-made chlorofluorocarbons. These gases are "greenhouse" gases that impact the temperature of our planet. In addition, nitrous oxide and the chlorofluorocarbons lead to the chemical destruction of ozone in the upper atmosphere.

Levine, who is internationally known for his pioneering research in the areas of atmospheric composition, chemistry and change, and their impact on the origin, evolution and maintenance of life on Earth, was recently selected as Virginia's Outstanding Scientist for 1987 and as one of the Top Ten Technology Talents of 1987 by **Washington Technology** magazine.

Attention NASA Employees

NASA Scholarships Available

Two college scholarships in the amount of $1,500 each are available for the 1988-89 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.

James O. Pendergraft, son of Odis C. Pendergraft, Jr., aerospace engineer, Propulsion Aerodynamics Branch, won a NASA scholarship in 1983. He attended Virginia Polytechnic Institute, studying electrical engineering and computer science, and graduated in June 1987 with a bachelor's degree in computer science. Pendergraft is now pursuing a master's degree at VPI.

Langley's Pendergraft is most complimentary of the NASA Scholarship Fund. "Not only was it economically beneficial, the application provided a learning experience for my son. The essay he prepared gave him the opportunity to focus on his achievements and his goals. It made quite an impact on Jim."

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 maximum of $6,000 over six calendar years.

Completed application forms must be received at the Johnson Space Center no later than **March 25, 1988**. Late applications will be returned unopened.

Employees are encouraged to take advantage of this educational opportunity. For more information on eligibility requirements and selection criteria or to receive application forms, contact Vernelle Robinson, extensions 2898 or 2691, from 8:30 a.m. to 4 p.m.

News Briefs

HEADQUARTERS, Washington, D.C. — Associate Administrator for Space Station Andrew J. Stofan will retire from NASA on April 1. Stofan was appointed June 30, 1986, to the position responsible for developing a permanently manned Space Station by the mid-1990's. Stofan directed the Space Station program through a difficult period marked by significant progress.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — NASA and Morton Thiokol are examining 72 bolts in the interior of the Space Shuttle solid rocket motor. Replacement of these bolts, which attach the nozzle fixed housing to the nozzle's flex bearing assembly, is being considered. The bolts are threaded all the way to the bolt head instead of having a smooth bolt shank, which may be preferred to assure that special Stat-O-Seal washers located under the bolt heads seal properly.

HEADQUARTERS, Washington, D.C. — NASA has authorized studies to determine the feasibility of launching a new generation of unmanned scientific spacecraft to better understand black holes, distant quasars, nucleosynthesis solar particles and unexplored layers of Earth's atmosphere. These studies were submitted to NASA under the Explorer Concept program, designed to develop intermediate-size scientific experiments.

JET PROPULSION LABORATORY, Pasadena, Calif. — Researchers at JPL are completing the first field tests of a new, sophisticated radar system design intended to fly in space. The system, a multi-frequency imaging radar polarimeter, was tested over the San Francisco Bay area in January and February aboard a DC-8 airplane based at Ames Research Center. The system offers researchers enhanced capability to identify objects on the ground by their radar polarization "signatures."

HEADQUARTERS, Washington, D.C. — NASA has established the Space Station Science and Applications Advisory Subcommittee to continue the coordination and communication activities begun by the Task Force of Scientific Uses of the Space Station. The new subcommittee is a joint subcommittee of three existing NASA Advisory Council committees, the Space and Earth Science Advisory Committee, the Space Applications Advisory Committee, and the Life Sciences Advisory Committee. The function of the subcommittee will be to advise the NASA Office of Space Science and Applications on the new capabilities to be made available by the Space Station program and how these capabilities might be most effectively used for science and application activities.

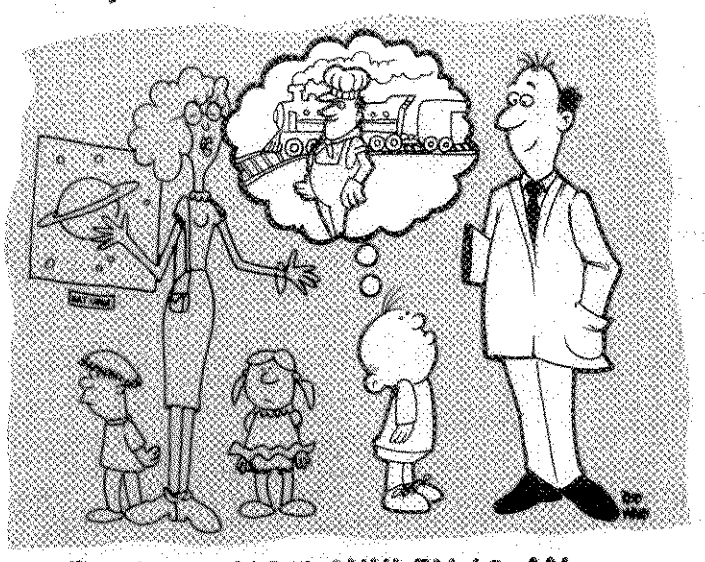
HEADQUARTERS, Washington, D.C. — NASA has successfully launched the first of three suborbital rocket experiments from the Woomera, Australia Range, commencing a second campaign to study supernova 1987A. Two additional rocket experiments are scheduled for launch during a launch window lasting until March 20. The studies are part of a continuing NASA campaign to investigate the supernova through a three-dimensional effort, using sounding rockets, scientific balloons, and one of NASA's research aircraft.

Langley Directives Distributed

DIRECTIVES NO.	TITLE	DATE	T.S.#	DATE DIST.
Revised				
LMI 1600.2	"Access to Langley Research Center (LaRC)"	1-6-88	1575	2-16-88
LMI 1100.20	Attachment, "Undergraduate Training Committee"	1-6-88	1576	2-2-88
LMI 1100.11	Attachment, "Architect-Engineer Selection Board"	1-6-88	1577	2-2-88
LMI 9050.6	"NASA Langley Exchange"	1-8-88	1578	2-2-88
LMI 1100.8	"Manpower Utilization Review Committee and Directorate/Division Promotion Boards"	1-8-88	1579	2-2-88
LMI 7234.1	"Facilities Utilization Program"	1-8-88	1580	2-8-88
LMI 5000.1	"Patents"	1-8-88	1581	2-3-88
LMI 1740.2	Change 1, "Facility Safety Requirements"	OCT 1987	—	2-4-88

NOTE: Directives are available for review in each organizational office. Extra copies may be obtained from the Directives and Forms Management Office, ext. 3511.

Lankley

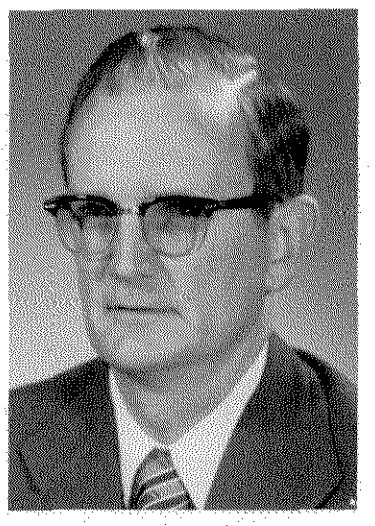


"CLASS, MR. LANKLEY IS AN ENGINEER."

Editorials

Langley

Headquarters Forum



I'd like to take this opportunity to focus on one of my favorite subjects–Langley's superb technician workforce. Indeed, we have outstanding facilities, highly talented personnel of all disciplines, challenging programs and high user interactions–all required for an outstanding research Center–but we have more! And that difference sets us apart from the rest.

Langley's skill-mix structure is especially well-suited to a high technology, dynamic organization where research results are sometimes unpredictable and generate urgent demands for new hardware, test articles or facility modifications. Langley is unique in that we have a very strong in-house technician workforce to provide that extra measure of flexibility and responsiveness needed to support cutting-edge research and technology.

Of Langley's 2,800+ civil service personnel, about one-third are technicians, providing a full range of skills and services in engineering designer, test and evaluation tasks (75), research article/test facility fabrication and repair (270), research test buildup, operations and maintenance (400), ground and flight systems instrumentation support (125), aircraft operations support (25) and other vitally needed tasks (25).

With a strong Engineering Technician Apprentice Program as a primary conduit for the new technician hires each year, bringing them into an environment of highly skilled craftsmen (and craftswomen!) with years, even decades, of experience and expertise, we at Langley have a resultant technician support capability second to none, giving the Langley researcher unparalleled high quality support on a day-in/day-out basis.

In addition to "normal" duties, our technicians have responded in remarkable fashion in recent years to resolve critical Center problems, such as over 100 volunteering to finish insulating the NTF and the more recent major effort in rebuilding the badly deteriorated fan blades of our 16-ft. Transonic Tunnel.

Hats off to our Langley technicians.

Robert L. Swain
Director for Systems Engineering and Operations

To receive a copy of these NASA News Releases, contact Edith Watts, Mail Stop 146, ext. 3017.

88-16.....Stofan to Retire from NASA on April 1
88-17.....Proposals Selected for New Space Exploration Studies
88-18.....NASA Examines 72 Nozzle Bolts
88-19.....Advanced Imaging Space Radar Completes First Field Tests
88-20.....Space Science and Applications Advisory Sub-Committee Established
88-21.....NASA Continues Rocketborne Studies of Supernova from Australia

Announcement: Amateur Radio Exams

Examinations required by the FCC for Technician, General, Advanced and Extra Class Amateur Radio Licenses will be given on Saturday, March 5, beginning at 9 a.m., at the Salvation Army building, 1033 Big Bethel Road, Hampton.

The Examining Team is provided by the Southern Peninsula Amateur Radio Klub (SPARK).

Individuals planning to take one or more exams should bring a completed Form 610, a photocopy of their current license and a check in the amount of $4.55 made payable to ARRL VEC. Candidates must also bring their current 'original' license issued by the FCC and suitable photo identification to be admitted to the examination room. No pre-registration is required. For further information, call Sid Evans, N4IIC, 851-5573.

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Thursday following the date of this issue.

Managing Editor . . Jean Drummond Clough
Editor . . . . . Marny S. Skora
Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

'Looks like corduroy; rides like velvet'

Corduroy Texture Identified as Solution to Shuttle Tire Damage Problem at KSC Landing Site

For the past two years, Langley researchers have been conducting landing tests on Space Shuttle main gear tires to improve tread wear and vehicle steering response during landings on the heavily textured runway at Kennedy Space Center (KSC).

Previous Shuttle landings at KSC have experienced varying levels of tread damage. The tire problem was given a lot of attention following the landing of Mission 51-D in April 1985. Two of the four main gear tires on the orbiter Discovery experienced tread damage and severe shoulder wear. Failure of another of the tires on that mission, though, was attributed to a braking problem rather than runway texture.

Shuttle tires have a very thin tread – only one-tenth of an inch rather than the three-tenths of an inch that is standard for commercial airplane tires. As Shuttle tires hit the runway, a patch of tread rubber and up to two cord layers of the sixteen plys is typically worn away by the textured runway surface as the tires achieve spin-up velocity. Researchers consider some of this damage to be preventable. The effects of continued rollout under crosswind conditions or pilot steering could cause tire failure at the spin-up patch location under extreme conditions. Robert H. Daugherty, aerospace engineer, Impact Dynamics Branch, summarizes the dilemma as a "trade off between tire wear and acceptable friction."

Langley engineers have conducted spin-up and steering wear tests by simulating Shuttle touchdown and rollout at the Aircraft Landing Dynamics Facility (ALDF). Using a single-tire testbed mounted in the facility's large, water-propelled carriage, tests measuring Shuttle tire friction and wear performance were conducted on a simulated KSC runway surface under a variety of texture modifications. These modifications included a smooth concrete surface, smooth-grooved, and "corduroy" surfaces, both grooved and ungrooved.

To verify test data compiled at the Langley site, the Instrumented Tire Test Vehicle (ITTV) was taken to Kennedy. Daugherty and Thomas J. Yager, aerospace engineer, Impact Dynamics Branch, used Langley's ITTV to run comparable tire friction and wear tests on the same texture modifications cut into the existing KSC runway in a small test area.

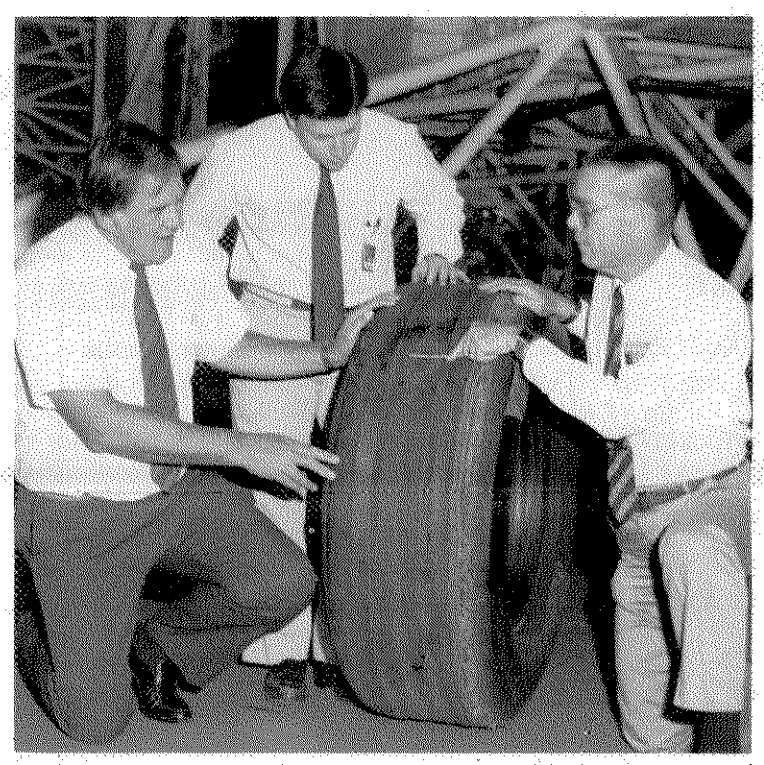
Test results showed the spin-up wear caused by the corduroy surface is comparable to that caused by a smooth surface; however, a smooth surface is unacceptable when wet because of the danger of hydroplaning. To be even more specific, ALDF and ITTV tests validated the preferability of an ungrooved corduroy surface produced by a grinding machine with a four and one-half blades per inch cutting head. Yager alludes to the message printed on the rear of the vehicles that will grind the existing KSC runway to these optimum specifications: "Looks like corduroy, rides like velvet."

Astronauts have long preferred to touchdown on the expansive dry lake bed at Edwards Air Force Base in California rather than the moat-surrounded runway at KSC. Sandy M. Stubbs, aerospace engineer, Impact Dynamics Branch, points out the rationale of landing at the Kennedy site. "Where you want to be is where you ought to land."

Langley tests show that if the touchdown portion of the KSC runway is smoothed, tire spin-up wear could be minimized without compromising vehicle handling on a wet surface.

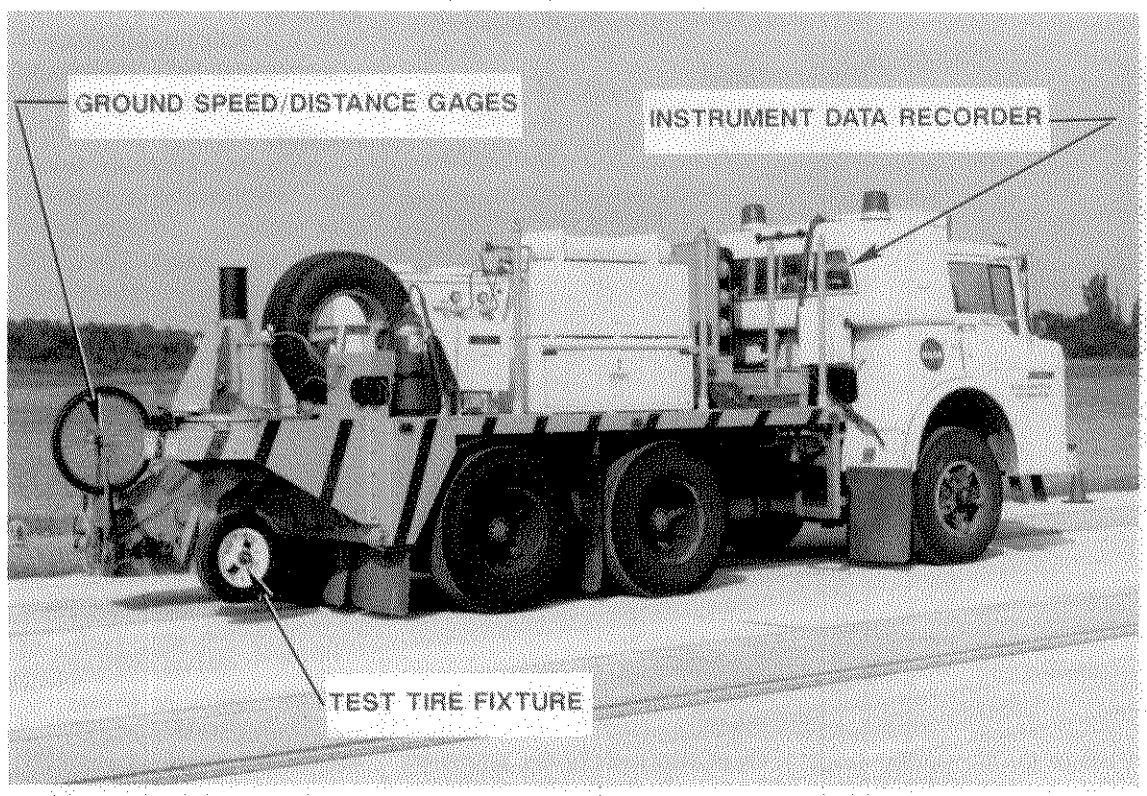
A $635,529 contract has been awarded to the Jensen Construction Co., Des Moines, Iowa. Jensen will grind 3,500-ft. sections at each end of the 15,000- ft. runway to smooth the surface texture, removing cross grooves and adding longitudinal corduroy grooving. Modifications are now in progress and work is expected to be completed by mid-March.

Research is ongoing to improve the tire and brake systems to enhance Shuttle landing safety. Daugherty says Langley researchers have also investigated the rubber compound from which Shuttle tires are made. An upgraded tire, being considered for flight use, would allow the solution to the tire wear dilemma to be utilized wherever the Shuttle lands.

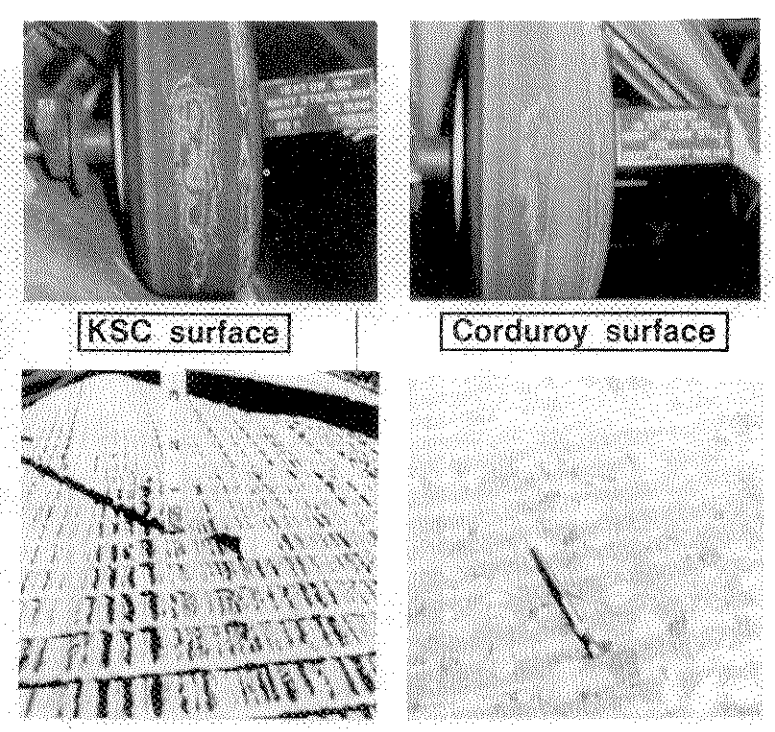


-photo by Don Ward

Sandy M. Stubbs (right) measures the extent of tread wear at the spin-up location on a Shuttle tire as Thomas J. Yager (left) and Robert H. Daugherty (center) look on. All are aerospace engineers, Impact Dynamics Branch, and have been involved in extensive tire/landing gear/runway surface research which has led to the modifications now in progress at the KSC Shuttle Landing Facility.



Langley's Instrumented Tire Test Vehicle (ITTV) tested various runway modifications at the Langley Aircraft Landing Dynamics Facility (ALDF) and on like surfaces cut into a small test area of the KSC runway to verify data identifying "corduroy grooving" as the preferred runway texture for Shuttle touchdown areas.



Spin-up and rollout damage to a Shuttle tire on the rough, transverse-grooved texture of the original KSC Shuttle Landing Facility runway is shown at left. The modified, much smoother, corduroy texture shown at the right causes less spin-up wear. Grinding of both ends of the KSC runway to smooth the surface texture is now underway.

To Your Good Health

-by Nancy Moul

During February, National Heart Month, the American Heart Association (AHA) urges all Virginians to improve their lifestyles and fight back against cardiovascular disease.

To date, more than 63 million Americans have one or more forms of heart or blood vessel disease, according to the AHA. Even though the death rate from heart disease has declined nearly 34 percent in the last 12 years, heart disease remains the number one cause of death in America and Virginia. More than 20,000 Virginians will die from some form of cardiovascular disease in 1988.

Improve your odds against heart disease by following the AHA prescription: stop smoking, control blood pressure, eat a low fat/low cholesterol diet, maintain proper weight and exercise regularly.

HEART PRESCRIPTION

Date: February
Name: Heart Month
Address: American Heart Association

R
X

"Improve Your Odds"

Take a serious approach to cardiovascular disease.

DIET	- Healthy, low fat/low cholestrol diet.
EXERCISE	- Don't hibernate during winter months. Continue to exercise. Good health is a year-round responsibility.
WEIGHT	- Maintain an ideal weight with proper diet and exercise.
CHD* HISTORY	- Have a medical exam & follow doctor's instructions.
ALCOHOL & SMOKING	- "Down & Out" — Down to a minimum or out all together.

AMERICAN HEART ASSOCIATION

M.D. _____
Address _____
DEA No. _____

*Coronary Heart Disease

-by Alice Adams, R.N., and Diane Medley, R.N., Dispensary

A Clarification . . .

Contractor Participation in LaRC Training Courses

Questions have surfaced recently related to contractor participation in NASA-funded training courses.

The Government Employees Training Act states that a person must be a civil service employee in order to have individual tuition or registration fees paid by the government. Therefore, when courses are brought in-house and the cost is based on each person in attendance, only civil service employees can be supported, unless arrangements have been made in advance for the contractor to pay registration fees directly to the company conducting the training.

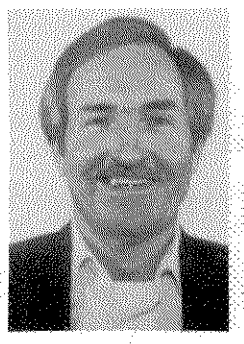
Some course costs are based on a minimum attendance and, when the minimum is satisfied by civil service employees, contractors may attend at no additional cost.

These restrictions do not apply when a course is taught in-house by an instructor who is not receiving a fee for teaching.

The Learning Center courses are available to contractor personnel through the same procedure used for scheduling civil service employees.

The Microcomputer Training Center has changed from an in-house instructor to a contract operation through Comptrain of Virginia Beach. Special arrangements must be made by contractor personnel to pay registration fees if they wish to take hands-on microcomputer training.

A wide variety of self-paced tutorials are available at no cost for use by both NASA and contractor personnel.



T. K. Lusby, Jr.

S. S. Grice

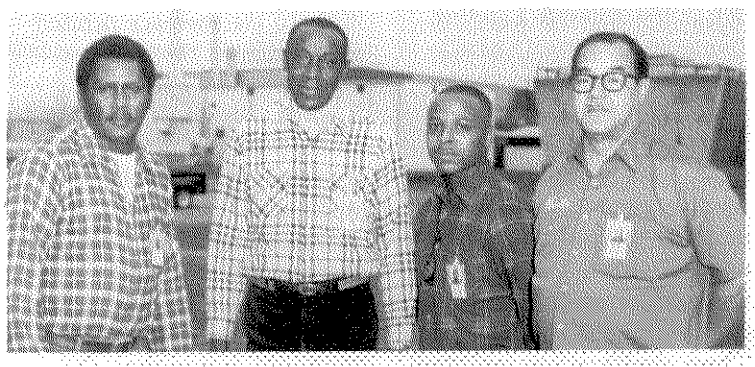
C. D. Folwell

Recent Retirees

Thomas K. Lusby, Jr., Fabrication Division, and **Shirley S. Grice**, Atmospheric Sciences Division, retired January 29.

Charles Daniel Folwell, Systems Engineering Division, retired February 3.

Harvey's Selects Crew of Month

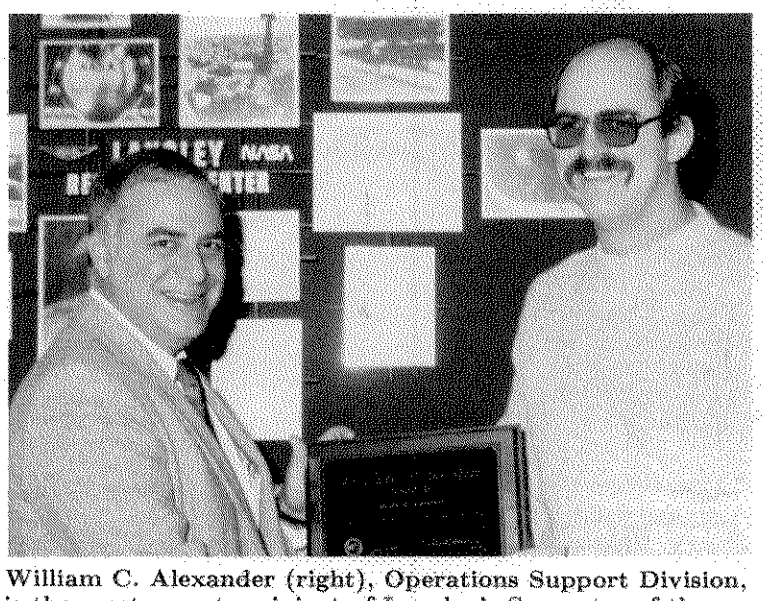


Harvey's Janitorial Service, Inc., recognizes employee teams who have excelled on their Facility Evaluation Reports. The award committee convened on February 1 and selected Crew #1 of the night shift as Crew of the Month for January. This crew received a perfect score of 95 points. Team members are (R to L) William Miles, Charles Gayle, James Banks, and Charles Mann.

Bowling Stats

		January 26		February 2
Team High Game	985	ACD	948	Thunderbolts
Team High Series	2736	ACD	2684	Ballers
Male High Game	232	**G. Koren**	236	**M. Frye**
Male High Series	627	**G. Koren**	609	**J. Halley**
Female High Game	201	**M. Mayo**	220	**B. Williams**
Female High Series	503	**B. Williams**	537	**B. Williams**
Most Pins over Average	78	**G.Brehm**	79	**S. Bauer**
	71	**M. Jones**	70	**J. Fryer**

		February 9		February 16
Team High Game	997	Noise Makers	934	Thunderbolts
Team High Series	2629	Thunderbolts	2624	Ballers
Male High Game	258	**O. J. Cole**	212	**G. Tennille**
Male High Series	641	**O. J. Cole**	581	**R. Russell**
Female High Game	184	**P. Gates**	205	**M. Aldrich**
Female High Series	509	**P. Gates**	566	**M. Aldrich**
Most Pins over Average	77	**R. Rubrecht**	53	**A. Lusk**
	75	**P. Walker**	52	**W. Higgs**



William C. Alexander (right), Operations Support Division, is the most recent recipient of Langley's Suggester of the Year Award. Paul F. Holloway, deputy director, makes the presentation. Alexander recommended the use of an existing steam heater for preheating water which is fed into the cooling coils at the National Transonic Facility.

Positions Filled

U. M. "Woody" Lovelace has been selected AST, Project Management (Temp. Position), Office of the Director for Space, under CPP 87-93.

James L. Dillon has been selected Supervisory Aerospace Engineer, AST, Fluid and Flight Mechanics Program Management, Supersonic/Hypsersonic Aerodynamics Branch, High-Speed Aerodynamics Division, under CPP 88-3.

Positions Open

88-12: Supervisory Electronics Technician, GS-856-11 or 12, Fabrication Division, Electronics Technology Branch, Electronics Fabrication Development Section. Closes February 26.

88-13: Program Analyst, GS-0345-11 or 12, Management Operations Directorate, Industrial Relations Office. Closes February 29.

88-14: Personnel Clerk (Typing), GS-0203-04 or 05, Management Operations Directorate, Personnel Division, Employee Development & Services Branch. Closes March 3.

Voucher Examiner, GS-0540-06 or 07, Financial Management Division, Accounting Branch, Commercial Accounting Section. Closes March 4.

Attention Conference Planners

The audio and video systems in the H.J.E. Reid Auditorium, Building 1222, and in the conference room, Building 1212, have recently been upgraded. Conference planners now have a number of options when using these systems.

A number of microphone and recording systems are now available, including several wireless units. The new video systems are also capable of different interfaces, including VHS, Beta, 3/4 inch recorders; live video signals; and numerous computer systems.

If you have plans to use these facilities and have further questions about the new audio and video systems, please contact Brad Ball, Mail Stop 196, ext. 4255.

NOTE: Because these new capabilities may require the use of an adapter, a converter or other specific hardware, be sure to call EARLY and discuss your needs.

People & Places

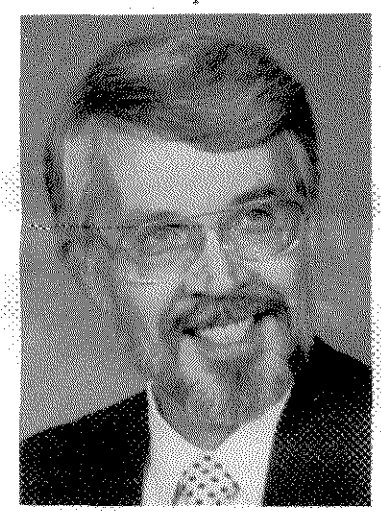
Visitor Center Announces Spring Programs

The first "A" in NASA stands for aeronautics, and improving aeronautical performance, safety and efficiency is a major focus of NASA research. With more than 30,000 secondary applications to date, NASA research has provided a broad range of products and services to the public. The list is as long as it is diverse: medical, industrial and agricultural applications – even technology to improve the performance of sailboats in the America's Cup races and the Voyager in its round-the-world flight.

At Langley, pilots purposely fly special, fully-instrumented research planes into a spin. One of these aircraft, a modified Grumman American Yankee, will be on display in front of the Visitor Center through May. In general aviation, the greatest single cause of fatalities is getting into an unrecoverable spin. Langley researchers try to understand the spin-related factors for each aircraft design and then develop design modifications and procedures for pilots to help them avoid stalls and spins.

Anders to Speak on Drag Reduction

The same technology NASA pioneered to reduce drag on aircraft – riblets – was used half a world away in Australia to reduce drag on the America's Cup winner "Stars and Stripes."



Riblets are tiny, parallel micro-grooves, similar to those found on a record album, which direct air flow and reduce surface friction. Nearly half the fuel used by commercial airliners is burned to overcome skin-friction drag.

On Thursday, March 10, at 7:30 p.m., research engineer Ben Anders will discuss NASA's current drag reduction research, including how riblets were used on "Stars and Stripes."

A special exhibit on display in March will detail applications of riblet technology, including its use on racing yachts. A short video will be shown daily describing riblet technology.

FAA Van on Display at Visitor Center

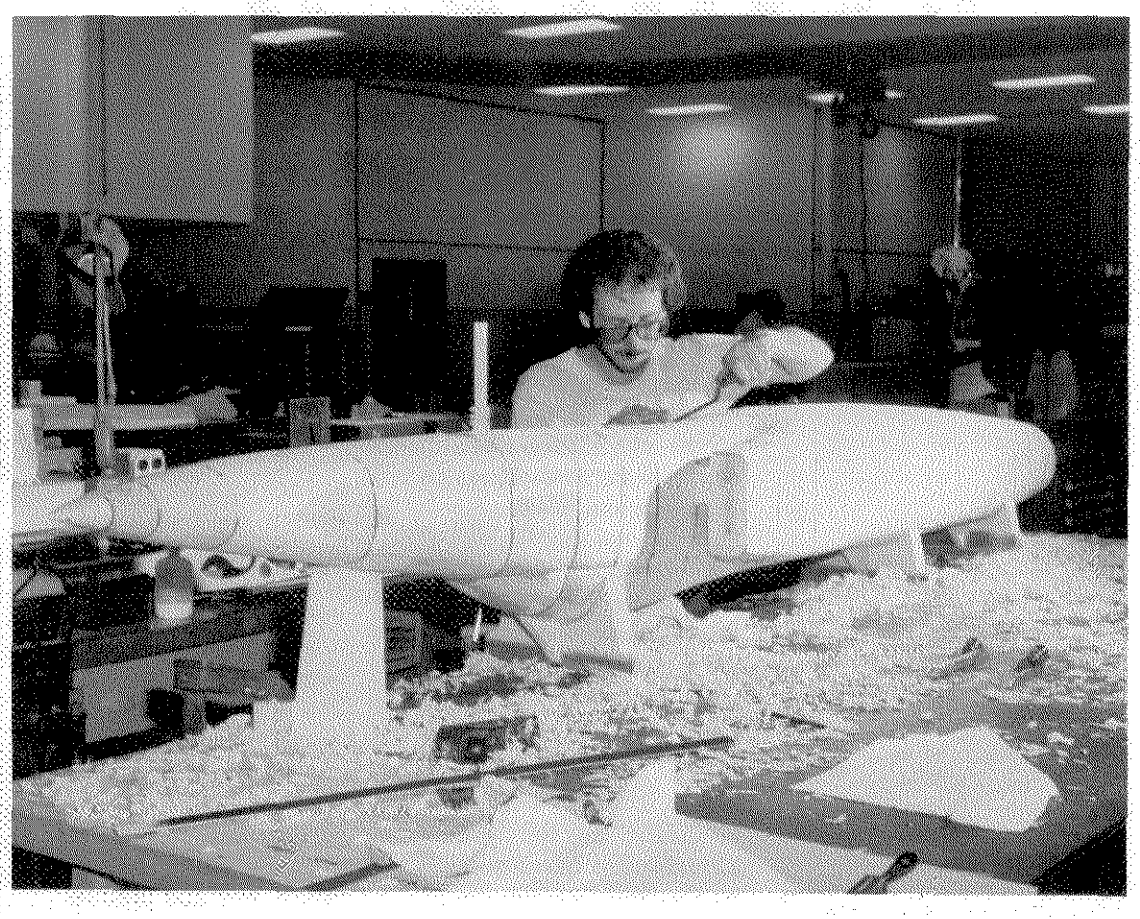
Six airplanes appear on the screen before you, all traveling around 260 miles per hour. A jetliner is on a collision course with another airplane. You reach for the controls and guide the planes through the correct landing procedure. This scenario gives you an idea of what it is like to be an air traffic controller in the Federal Aviation Administration (FAA) Aviation Education Mobile Classroom.

This FAA educational van will be on display at the Visitor Center March 10, 11 and 12, from 8:30 a.m. to 4:30 p.m. The van is equipped with a flight simulator, simulated air traffic control equipment, video presentations and programmed instructions on the latest microwave landing system.

Sitting at the controls of an ATC-610 flight simulator, visitors may use instruments which simulate the conditions of maintaining level flight, climbing, descending and turning an aircraft. Visitors will be able to listen to actual communications between air traffic controllers and pilots. A flight service computer station explains the different types of information available from the FAA, such as how to obtain weather briefings, file a flight plan or obtain a current aviation advisory. The FAA Mobile Classroom puts you in the decision-maker's seat.

Retirement Party

Clyde J. May will be honored at a retirement dinner March 11 at the Activities Center. Cash bar at 6 p.m.; steamship round dinner at 6:30. Cost is $11/person, $21/couple including gift. Donations for gift only will be accepted. Please make checks payable to Virgil S. Laney, Mail Stop 433, ext. 4621, by March 4.



From Behind the Scenes

Langley Modelmakers: the Merlins who Transform Concepts into Reality

A Langley technician completes preparatory tooling of a wooden pattern for an X-29A radio-controlled drop model. Once sanded and sealed, a fiberglass mold will be made from the wooden pattern. The mold will then be used to laminate the fiberglass shell of a research aircraft model.

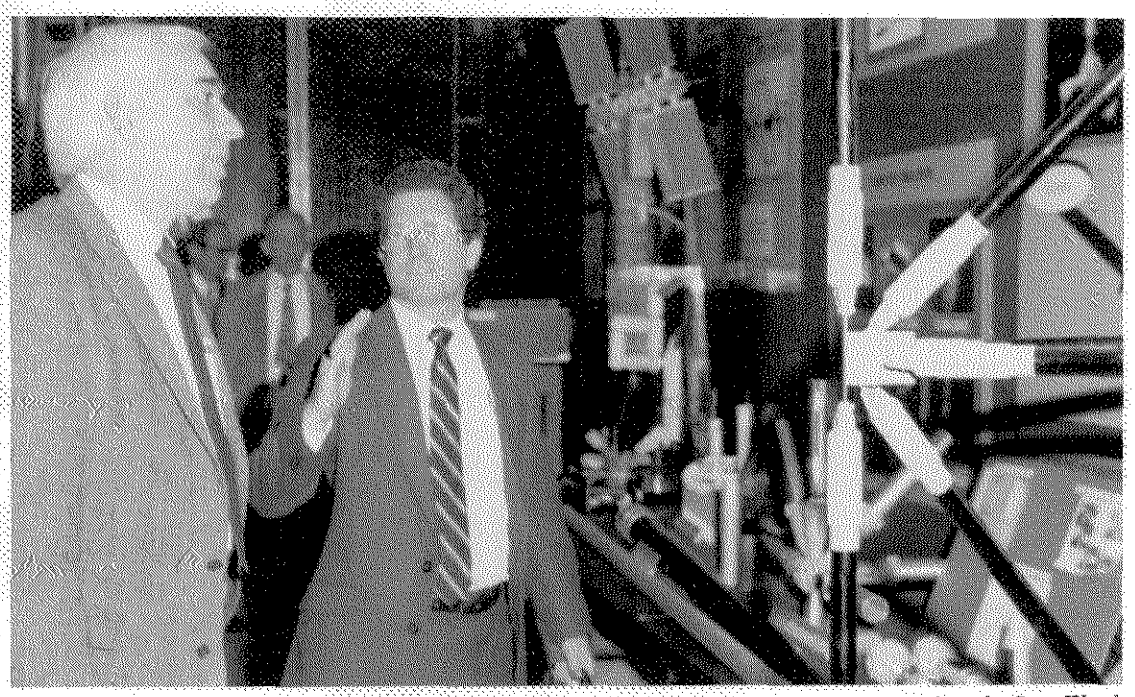
This process—detailed, demanding, and meticulous—is routine procedure in the Composites and Models Development Section, Fabrication Division.

Notes of Thanks

Whitey Batts writes: "I wish to thank all my friends and co-workers for the wonderful retirement luncheon and gifts. I could not have selected a better group of people with whom to work, and I will always cherish the pleasant memories of my association with you over the years."

Joe Guarino writes: "Thanks to the many friends and associates who helped celebrate the occasion of my retirement. The gifts and memorabilia will continue to bring back many fond memories of my career at Langley."

Jim Dorst writes: "I wish to thank all the many friends and associates who most kindly attended my retirement party. All the gifts and cards are greatly appreciated. Noteworthy are the NASA plaque and album which will provide fond memories of my NASA days."



-photo by Don Ward

Dr. William F. Ballhaus, Jr., acting associate administrator, Office of Aeronautics and Space Technology, NASA Headquarters, poses a question to Dr. Martin M. Mikulas, Jr. Mikulas, head, Structural Concepts Branch, discussed on-orbit construction and explained ACCESS and Space Station hardware development to Ballhaus during his visit to Langley on February 17.

Happenings

LAA SOCIAL will be held Friday, March 4, from 4 to 6:30 p.m., in the Activities Center.

LAA BOARD. Langley Activities Association Executive Board will hold its March meeting, Wednesday, March 9, at 1 p.m. in the Activities Center. Concerns to be brought before the board should be addressed to the proper committee member.

DISNEY FILMS. LAA Walt Disney Film Festival will feature "Robin Hood" on Sunday, March 6. Movie time is 2 p.m. and cost is $.50/person. Popcorn and drinks will be available for purchase. For more information, call Vernelle Robinson, ext. 2691.

TOASTMASTERS. NASA Toastmasters will meet Wednesday, March 9, 11:30 a.m.—1 p.m., Hampton Room, Activities Center. Civil service employees charge one hour to JO A1619. Visitors are welcome. Please call Natalie Johnson, ext. 3483, for additional information.

DINNER THEATER. Hilton Junior Woman's Club will present **Greater Tuna** on March 17-19 and 24-26. Dinner at 7 p.m.; performance begins at 8. Cost is $13.50/person. For reservations, call 930-0184.

EXERCISE CLASSES. Suellen Seabrook, fitness columnist for the **Daily Press** and **Times-Herald**, conducts exercise classes on Mondays and Wednesdays at 5 p.m. in the Activities Center. Enroll now for the high intensity workout—low impact exercise classes. For more information, call 877-6067.

HELP, PLEASE! The person to whom William G. Chapin lent the book **Continuum Mechanics**, by Frederick, please contact Chapin at ext. 3234.

swap and shop

FOR RENT: CONDO, N.C. Outer Banks, July 30 — Aug. 6, 1988. Condo sleeps 8, TV/VCR, golf, pools, tennis. $550. Call (804) 776-6216.

Project Expanded in NASA Lab

Hampton Student Finalist in Westinghouse Science Talent Search

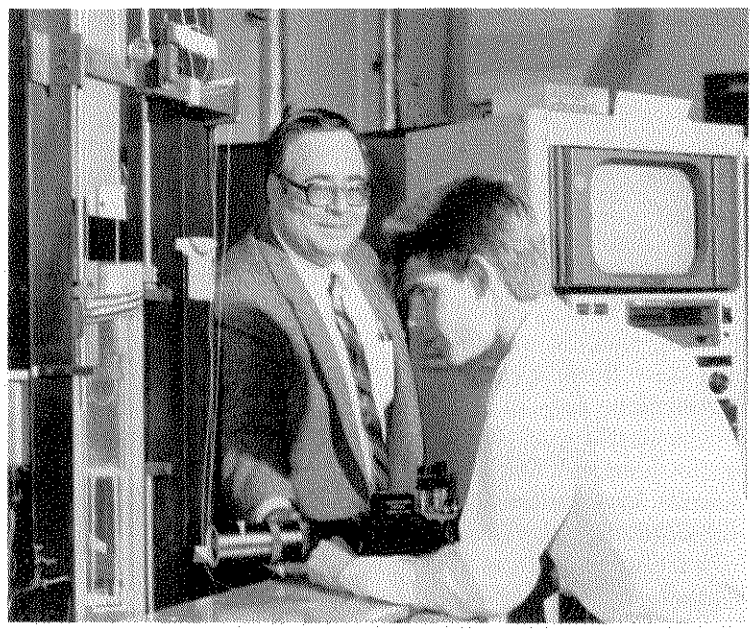
Skin-friction drag reduction is as much a factor in Hampton's Harris Creek as in the waters where the America's Cup races are run.

Jason Reed, senior at Kecoughtan High School and after-school researcher in Langley's Viscous Flow Branch, has been selected a finalist in the Westinghouse Science Talent Search. Reed was chosen one of the nation's forty most scientifically talented high school seniors from a field of 1,339 entries in what is considered the nation's top science competition.

Reed's project explores the use of air bubbles to reduce drag and produce a more efficient marine craft. He constructed an air injection system using porous stone devices to produce bubbles, installed it on a flat-hulled boat, and ran tests in Harris Creek.

For almost six months Reed has been expanding on this project in a Langley lab. Under the mentorship of Dennis M. Bushnell, Dr. Leonard M. Weinstein and Michael J. Walsh, all of the Viscous Flow Branch, Reed has been experimenting with a bubble-wire apparatus in a vertical translated water tunnel to gather additional drag reduction data.

Reed and his fellow winners compete for $140,000 in scholarships and cash awards provided by the Westinghouse Electric Corporation. Final judging takes place in Washington from February 25 through 29. Based on an interview by a panel of eight scientists, ten scholarship winners will be announced.



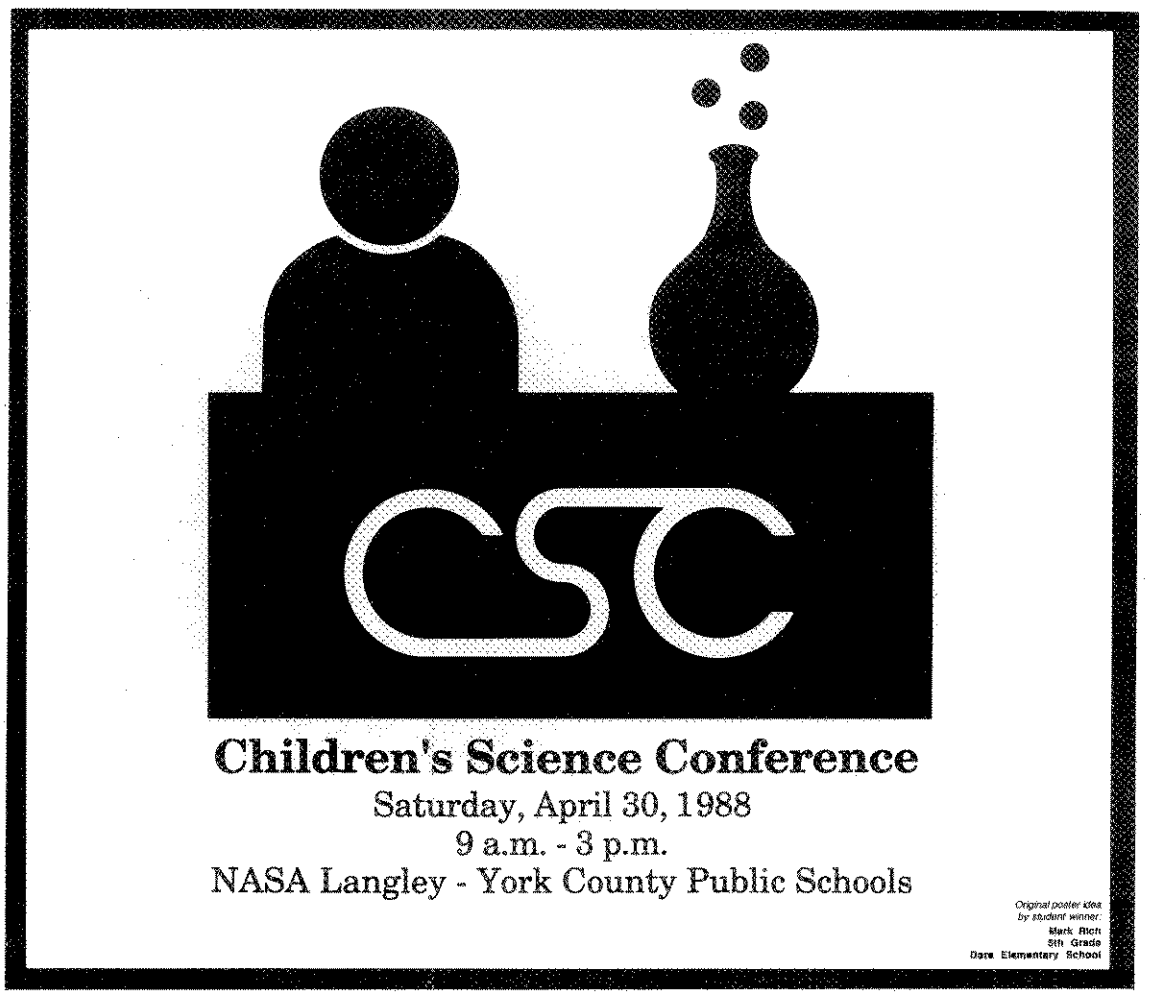
-photo by Sandie Horsey and Terry Shephard

Westinghouse Science Talent Search finalist Jason Reed checks the bubble-wire apparatus in a vertical translated water tunnel as Dr. Leonard M. Weinstein, program mentor, looks on. Weinstein is a group leader in the Turbulent Structures and Modeling Group, Viscous Flow Branch.

Science Conference Logo Winners Announced

Langley Research Center and the York County Schools will co-sponsor a Children's Science Conference at Bruton High School on Saturday, April 30. Two hundred York County students will be selected to participate.

York County fourth- and fifth-graders were invited to create logos to be used for the promotion of the conference. Contest winners are Marc Rich, first place, fifth grade, Dare Elementary School; Tina Louise Smith, second, fourth grade, Magruder Elementary; Stephanie Martin, third, fifth grade, Dare; and William Walker, honorable mention, fourth grade, Magruder. Marc Rich's first place design is the basis for the poster shown below which will be used throughout the county to advertise the conference.



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

NASA
National Aeronautics and Space Administration
Langley Research Center

News Researcher

Volume 1, Issue 5 March 11, 1988
Bi-weekly Employee and Contractor Publication

A first for Langley

Cantrell Awarded Hugh L. Dryden Memorial Fellowship

John H. Cantrell, senior research physicist, Materials Characterization Instrumentation Section, has been awarded the National Space Club's Dryden Memorial Fellowship. Nominated by Center Director Richard H. Petersen, Cantrell is the first Langley researcher to receive this prestigious award.

Cantrell will be recognized "for exceptional scientific achievement in solid state physics applications for NASA space programs" at the Space Club's thirty-first annual Goddard Memorial Dinner to be held March 18 in Washington, D.C.

The Dryden Fellowship was established in 1966 by the Board of Governors of the National Space Club to provide for the further education of a deserving individual in disciplines applicable to science, astronautics and space administration. The scholarship is awarded in memory of Hugh L. Dryden who, during his distinguished career in government service, played a uniquely important role in the development of science-based technology.

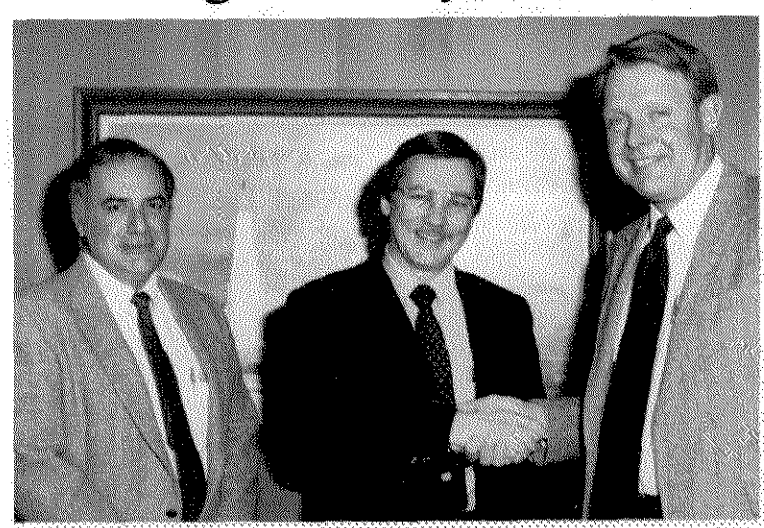


photo by Fred Jones

Center Director Richard H. Petersen (right) and Deputy Director Paul F. Holloway (left) congratulate Dr. John H. Cantrell, recipient of the Hugh L. Dryden Memorial Fellowship. Cantrell will spend an academic year at Cambridge University, England, as winner of this prestigious award presented by the National Space Club.

Cantrell will spend an academic year at Cambridge University, England, where he will work with Professor Archie Howie, head of the Microstructural Physics Group, Cavendish Laboratory. Cantrell's research will focus on developing a deeper, more fundamental understanding of fatigue, stress, defect and damage mechanisms in aerospace materials as they relate to quantitative, nondestructive physical measurement and assessment.

Cambridge is a world class institution in the field of materials science/solid state physics. The faculty, including two Nobel Laureates, is committed to understanding material properties using the most sophisticated, multidisciplinary tools and approaches.

"My research will be both theoretical and experimental," says Dr. Cantrell. "The theoretical research will concentrate on the statistical physics of material microstructures. The experimental work will involve the applications of the scanning electron acoustic microscope to investigate the microstructural properties of materials that most directly influence remaining safe life and that are amenable to a quantitative, nondestructive measurement."

Petersen regards Cantrell as a premier researcher in his field. "The Dryden Fellowship award will allow John to strengthen his capability and provide an infusion of new ideas to an increasingly important NASA technology — Nondestructive Evaluation."

Cantrell earned a bachelor of science degree with honors and a doctorate in physics from the University of Tennessee. He joined the staff of the Langley Research Center in January 1979.

Bobbitt, Holmes Honored

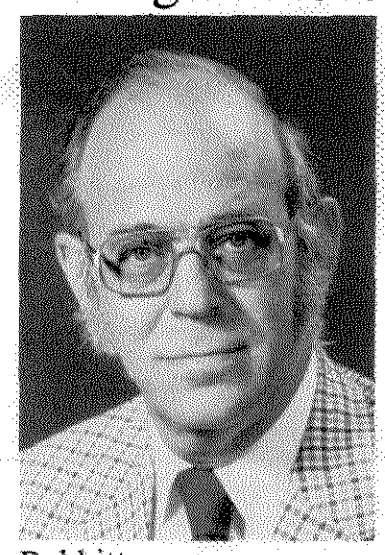
NASA Langley Managers Receive Society of Automotive Engineers Awards

Percy J. "Bud" Bobbitt and Bruce J. Holmes were honored at the Society of Automotive Engineers (SAE) International Congress and Exposition held March 1 at Cobo Hall, Detroit. SAE is the Engineering Society for Advanced Mobility—Land, Sea, Air and Space.

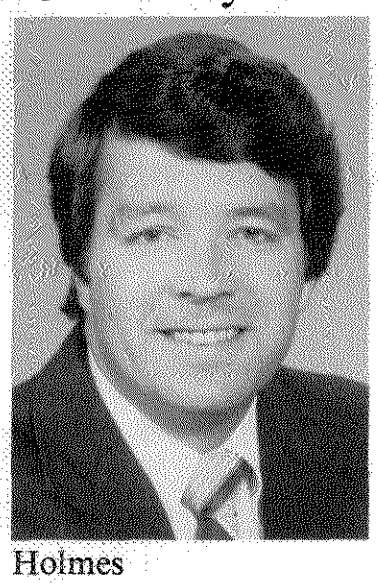
Bobbitt, chief, Transonic Aerodynamics Division, was presented the Forest R. McFarland Award and Holmes, head, Flight Applications Branch, received the SAE Distinguished Speaker Award at the annual Honors Convocation. Both have contributed significantly to SAE's success and the advancement of mobility technology.

The Forest R. McFarland Award recognizes session organizers and committee members who have rendered outstanding service in the organization of technical sessions for SAE meetings and conferences. Bobbitt, founder and chairman of the SAE Aerodynamics Committee, is being recognized by the SAE Engineering Activity Board for his "efforts and leadership in the last three AEROTECH Conferences."

"I thought it important for the committee to participate in the SAE AEROTECH conferences and displays put on each year at the Long Beach, Calif., Conference Center," Bobbitt explains. "In October of 1985, 1986 and 1987, the Aerodynamics Committee organized and expedited an Aerodynamics Conference to compliment the many vehicle-specific conferences put on at the same time by other SAE committees. Our conferences have been a potpourri of theoretical and experimental, military and civil aircraft, and applied and basic aerodynamics."



Bobbitt



Holmes

Bobbitt joined the Langley staff in 1950 as a research engineer. In 1966, he was named acting head of the Applied Mechanics Branch; in 1970, head of the Applied Loads Branch; and in 1973, head of the Theoretical Aerodynamics Branch.

In his present position, Bobbitt is responsible for aeronautical research in fundamental fluid flows and configuration aerodynamics, including stability and control, propulsion system integration and related aerodynamic phenomena. His division serves as support and consultant for the aircraft industry and the military.

Holmes has received the SAE Award for Excellence in Oral Presentations three times in the past four years. The purpose of the oral presentation program, established in 1972, is to maintain the high quality of presentations at SAE technical sessions by recognizing individuals who make outstanding presentations. Only 5 percent of SAE's oral presentors receive this award.

As a result of these accomplishments, Holmes was presented the SAE Distinguished Speaker Award. This award and trophy gives special recognition to speakers who have received the Oral Presentation Award more than twice.

Holmes feels this award provides national recognition for the Langley system of presentation review. "It is common knowledge that Langley speakers are well-rehearsed and offer the highest quality information at technical society meetings. This award is one more indication that the Langley system works."

Holmes began his NASA career in 1977 and much of his research background has involved basic and applied aerodynamic research in the flight environment including research on aircraft as varied as the man-powered Gossamer Albatross, agricultural airplanes, business jets and a supersonic airplane.

In his present position, Holmes is responsible for research in applied aerodynamics and aviation safety with emphasis on subsonic business, commuter and commercial transport airplanes.

State-of-the-Center Address

Langley Director Richard H. Petersen will address Center employees, retirees and support contractors on the state of NASA and the Langley Research Center on March 28 and 29 at the Activities Center.

March 28 1:30 - 2:15 p.m.	Systems Engineering and Operations Directorate (except Operations Support Division)
3:00 - 3:45 p.m.	Space Directorate Structures Directorate
March 29 8:30 - 9:15 a.m.	Aeronautics Directorate Operations Support Division
10:00 - 10:45 a.m.	Electronics Directorate Flight Systems Directorate
1:30 - 2:15 p.m.	Office of the Director Management Operations Directorate

Time should be charged to Job Order Number A - 1980.

News Briefs

HEADQUARTERS, Washington, D.C. — NASA has announced the establishment of a Commerical Development of Space Industry Advisory Group and the selection of Edward Donley, former Chairman and CEO of Air Products and Chemicals, Inc., as the chairman. The group will review the overall NASA program for the commercial development of space and recommend changes it believes will enhance the program and NASA's ability to achieve program objectives.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — NASA has announced it will seek offers to lease, to the U.S. government, useable volume and related services in a commercially developed space facility for five years beginning before the end of fiscal year 1993. At least 30 percent of the facility will be available for commercial use. The facility will provide a crew-tended, shirtsleeve work space and also will be able to operate in an untended, free-flying mode, providing a microgravity environment for periods of four to six months.

JOHNSON SPACE CENTER, Houston, Tex. — Astronauts at JSC have created an Astronaut Science Support Group to provide direct interaction with prospective experimenters on Space Shuttle and Space Station missions. Composed of six astronauts, the group focuses on increasing scientific and engineering flexibility of experiments in space without violating Shuttle operational guidelines.

JET PROPULSION LABORATORY. Pasadena, Calif. — An international team of researchers is using satellites to study how the Earth's tectonic plates move in the Caribbean Sea and Central and South America. Tectonic plates account for such geological phenomena as the formation of mountain ranges and volcanoes. Geodetic studies such as this experiment are expected to aid scientists working on earthquake prediction techniques.

HEADQUARTERS, Washington, D.C. — Manuel (Manny) Peralta has been appointed associate administrator for Management, NASA Headquarters, effective February 28. He has been serving in this post, in an acting capacity, since April 28, 1987.

JOHNSON SPACE CENTER, Houston, Tex. — NASA has announced plans to acquire a Boeing 747-100 jetliner to serve as a second Space Shuttle carrier aircraft (SCA) for the space transportation system. The additional SCA will provide increased ferrying capability and eliminate a potential single-point failure in the space transportation system.

HEADQUARTERS, Washington, D.C. — Dr. James C. Feltcher, administrator of NASA, appeared before the House Subcommittee on Space Science and Applications on the agency's proposed 1989 budget. Fletcher called 1989 a crucial year for NASA which could "make or break" the nation's space program.

JOHNSON SPACE CENTER, Houston, Tex. — Veteran Astronaut Robert A. R. Parker, Ph.D. has been assigned temporary duty in the Office of Space Flight, NASA Headquarters, effective immediately. Parker will serve as director of the Space Flight/Space Station Integration Office, reporting directly to the Associate Administrator for Space Flight, Rear Adm. Richard H. Truly.

HEADQUARTERS, Washington, D.C. — NASA Administrator Dr. James C. Fletcher has announced James B. Odom will assume the duties of associate administrator for Space Station, NASA Headquarters. Odom comes to Headquarters from the Marshall Space Flight Center where he is director of the Science and Engineering Directorate.

Fletcher Responds to Space Commission Report

NASA Administrator, Dr. James C. Fletcher, has sent Congress a letter commenting on the report of the National Commission on Space.

He said the commission presents an "inspiring vision" of American space activity in the 21st century, but that the commission's broad and ambitious goals require a far greater degree of planning to determine which means and directions will serve the nation best.

He noted, for example, that the new National Space Policy calls for a Pathfinder Program to systematically develop technologies needed for future exploration of the solar system.

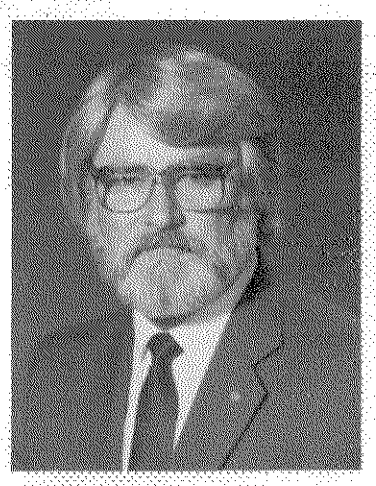
The letter was prepared in response to a Congressional requirement contained in the NASA Authorization Act of 1988. The letter was sent to Sen. Ernest F. Hollings, chairman of the Senate Committee on Commerce, Science and Transportation; Sen. Donald W. Riegle, chairman of the Subcommittee on Science Technology and Space; Rep. Robert A. Roe, chairman of the House Committee on Science, Space and Technology; and Rep. Bill Nelson, chairman of the Subcommittee on Space Science and Applications.

Copies of the letter are available by contacting Edith Watts, Mail Stop 146.

Editorials

Langley

Headquarters Forum



In the July 31 issue of the Langley Headquarters Forum, I mentioned that "Space is the Place" where things are beginning to happen in the technology development area.

The Civil Space Technology Initiative (CSTI) has been successfully advocated by the Office of Aeronautics and Space Technology (OAST) and is alive and healthy with $115 million in the fiscal 1988 budget and $156 million requested for fiscal 1989.

Then, as a significant follow-on to CSTI, the President, in recent weeks, released the National Space Policy and referred to the importance of emphasizing technology development by introducing the Pathfinder program.

The President's budget calls for the addition of $100 million in fiscal 1989 to the technology development responsibilities of OAST to initiate the Pathfinder program. Pathfinder will be earmarked for the development of technology that will make possible NASA's "Bold New Initiatives" of the 90's.

Early in the 90's, NASA is planning to initiate one or more of the four "Bold New Initiatives" that are described in Sally Ride's **Leadership and America's Future in Space.** The four initiatives are: [1] Mission to Planet Earth, [2] Exploration of the Solar System (probably a Mars Sample Return Mission), [3] Outpost on the Moon and [4] Humans to Mars.

The selected initiative or combination of initiatives (the Mission to Planet Earth will most likely be supported in one form or another and may become an international program), will be built on the shoulders of an operational Space Station and Space Transportation System.

Therefore, with CSTI focusing on technology for near Earth orbit missions, Pathfinder will look toward long term missions beyond Earth orbit and into the solar system.

As NASA's premier research center, Langley has been and will be involved in CSTI and Pathfinder. Structures, Flight Systems, and the Space Directorate will team with the Electronics and SE&O Directorates to take on major technology development responsibilities in the areas of high-energy aerobraking, autonomous landers, fault-tolerant systems, in-space assembly and construction, mission studies and possibly others.

The Pathfinder pie is literally being divided up as you read these words.

R. R. "Skip" Nunamaker
Director for Space

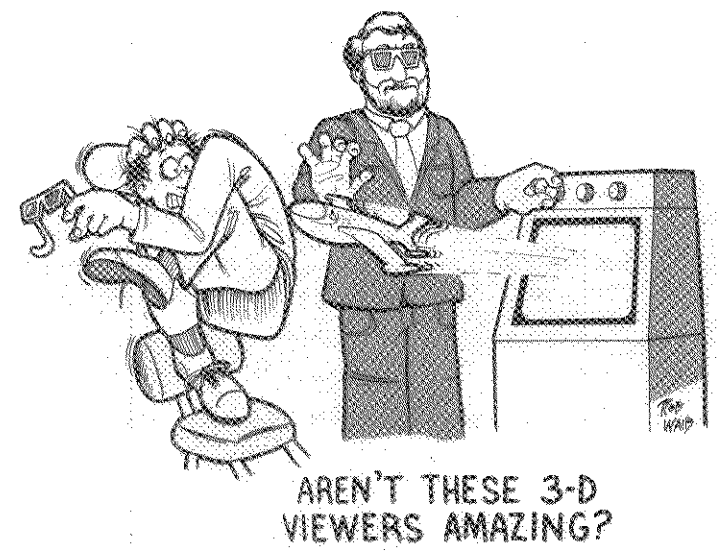
Can You Help?

A Gloucester family is the victim of a fire in which they lost everything. Especially needed are clothing and household items.

Clothing for the following family members is deperately needed: baby boy, three months; girl, a year and a half; girl, three years; girl, four-and-a-half years; boy, ten years, size eight; mother, size seven; and grandmother, size 16.

If you can help, contact Lynn Jenkins, ext. 3334.

Lankley



Superconductivity Lecture Series

Superconductivity will have far-reaching effects on the evolving technologies in power conversion and transmission, magnetic suspension, sensors, and many other fields.

The theory and phenomena of this rapidly emerging and changing technology will be discussed at a Superconductivity Invited Lecture Series to be held in the Activities Center, April 13-15.

Information on current and potential applications will be discussed by experts knowledgable in the fields of computers, power transmission and storage, and generation.

NASA personnel interested in attending the lecture series should contact their division training coordinator for information regarding registration procedure.

The lecture series is sponsored by the AIAA/Hampton Roads Chapter. Dr. Chuck Byvik, Flight Electronics Division, is technical chairman.

News Researcher

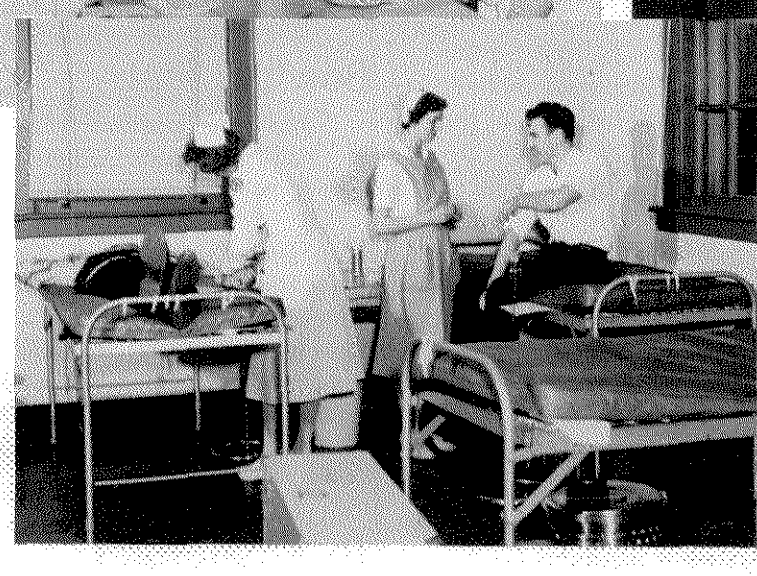
The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Thursday following the date of this issue.

Managing Editor . . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.



1949 --- Today

Langley has participated in ARC Bloodmobiles since 1949. The pictures have changed, but the commitment to helping others remains the same.

-photo by Don Ward

Bloodmobile Coordinator Annette Forrest and Occupational Health Services Head Virginia Jones display recent awards presented to Langley by American Red Cross.

American Red Cross Shouts Praises of Langley Community Commitment

Praises of NASA Langley blood donors rang out loud and clear at the twentieth annual American Red Cross Bloodmobile Recognition Assembly held February 12. Virginia Jones, head, Occupational Health Services, accepted four awards on behalf of Langley employee, contractor and retiree donors.

"My first reaction was one of embarrassment at being called to the podium over and over, but in reality I knew I was overwhelmed with pride at the recognition given to Langley's faithful blood donors," said Jones.

Langley was presented a certificate for consistently making its goal of 330 units of blood per bloodmobile visit. In addition. Langley received the Good Neighbor Achievement Award ribbon for consistently exceeding this goal.

The Hampton Roads Chapter of the American Red Cross (ARC) also presented Langley with a trophy for "most improved in own group." NASA is ranked with other civilian and military organizations such as the Newport News Shipyard, Riverside and Sentara Hampton General Hospitals, and Forts Eustis and Monroe.

The Occupational Health staff is most proud of the record breaker award presented "for exceeding previous yearly blood collections." Red Cross recognition for breaking one's own record began four years ago. The Langley Research Center was presented its fourth record breaker which states "NASA is commended for its support and its employee participation in helping voluntarily meet blood needs of the community's patients." Langley bloodmobiles collected 2,074 units of blood in 1987; this exceeded the 1986 record of 2,052 units.

Commitment to meeting community needs is not something new to NASA. The Langley Research Center has participated in the ARC Bloodmobile program since 1949. As community needs grew, so did Langley's response. In the 1960's NASA Langley supported four bloodmobiles per year and accepted as its goal 150 units per visit. Langley now sponsors six bloodmobiles yearly and the goal per visit has more than doubled.

Pat Stearns, manager, ARC Hampton Roads Chapter, credits the consistently overwhelming NASA response to the administrative and organizational skills of Virginia Jones. "Set up under Virginia is an ideal situation. She sets into action the most perfectly run bloodmobile and has the support of both Center management and Langley employees."

Jones credits bloodmobile coordinator Annette Forrest with the smooth running operation of bloodmobile day and sings the praises of Activities Center manager Pat Gates. "We are continually complimented not only on the facility but on how the facility is ready for Red Cross workers to put the bloodmobile into action. Pat has developed a plan of action complete to the last detail—from floor plan to the availability of phones—to ensure the success of each blood drive. We couldn't do it without Pat," Jones emphasizes.

Al Buchanan, Blood Services Consultant, praises the NASA system. "Langley has probably the best blood collection system anywhere in the area. When we have a critical need, we know where we can turn for a response. What impresses me the most about NASA is the excellent ratio of donors to the employee base. NASA's commitment to the needs of others is a credit to the community."

Langley retiree James J. Fay has recently reached the 18 gallon mark in blood donations. That means he has donated his body's blood supply a dozen times over! "Jim has been one of our real supporters over the years," Buchanan remarks. Jones echoes his sentiments.

To date, NACA/NASA Langley employees, contractors and retirees have donated 43,292 units of blood. That's something to shout about!

Langley Speakers Bureau Spreads NASA's Story Near and Far

The Langley Speakers Bureau is composed of a volunteer staff of civil service and contractor personnel. These volunteers participate in a variety of events providing informational and educational programs to groups across Hampton Roads and within Langley's five-state region.

Langley services Virginia, North Carolina, South Carolina, Kentucky and West Virginia as well as the many requests for presentations in our own area. Ann Suit, head, Speakers Bureau, invites Langley employees, retirees and contractors to join this volunteer force. For information, contact Suit at ext. 3967.

The following is a listing of programs given by Langley volunteers since June.

Roger Breckenridge gave presentations on the Space Station to the Franklin Lions Club, the American Society of Mechanical Engineers, the American Society for Metals, the Peninsula Society of Professional Engineers and the North Carolina Department of Public Instruction, Raleigh.

Tom Campbell spoke to the Armed Forces Communications Electronics Association, Ft. Monroe, on Space Communications.

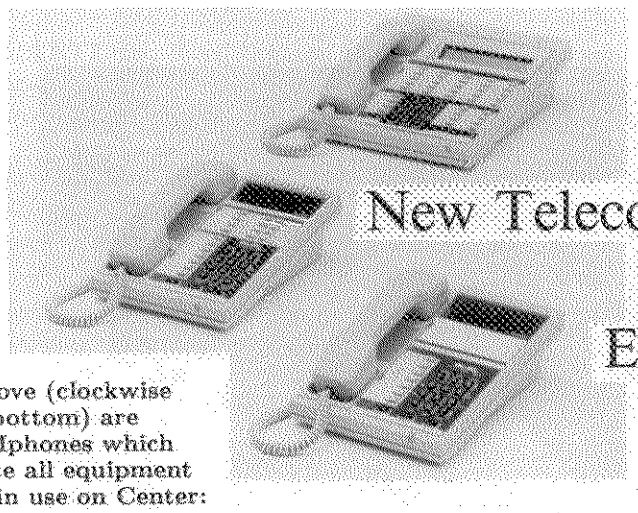
Lenwood Clark presented Careers in Aerospace for the Scout Adventure '87 at Kings Dominion and spoke on the Space Station to the Kings Grant Baptist Church Cub Scouts, the Denbigh High School Social Studies Club, the Langley AFB 1912 Company Grade Officers Council, the Roanoke Chapter of the Virginia Society of Professional Engineers and the Society of American Military Engineers, Charleston, S.C.

Wesley Cofer spoke on Careers in Space Science for the Cooperating Hampton Roads Organization for Minorities (CHROME).

Brian Conner gave a presentation on the Effects of Refrigerants on Ozone to the Refrigeration Service Engineers Society.

Mark Cunningham spoke on the National Aerospace Plane to the Oyster Point Rotary Club.

Continued on page 4.



New Telecommunications System Affects Every Employee

Shown above (clockwise from the bottom) are the ROLMphones which will replace all equipment presently in use on Center: ROLMphone models 120, 240 and 400.

Langley Research Center is now in the process of replacing the present telephone and low-speed data system with a new integrated voice-data system that will provide upgraded features and capabilities to meet current and future needs of the Center. ROLM of Vienna, Va., has been selected by NASA to install the new telecommunications system.

What this means to every Langley employee is a new phone and a new phone number. The new ROLMphones have expanded features allowing automatic redialing, speed system calling, and call waiting. Additional features are also available.

Representatives from each directorate have been selected to gather and disseminate information specifically related to each organization and its requirements for telecommunications services. Every Langley employee will be contacted by their organizational representative to discuss their telecommunications needs. User surveys will be completed for each existing and proposed phone jack in the work area. This information and the needs of the user will help ROLM personnel design a phone system to suit individual requirements.

Three models of ROLMphone telephones will be available and assigned according to the needs of the phone-data system user. The basic phone includes all the features mentioned above. Those with data requirements, such as communicating via a computer terminal, will be assigned a ROLMphone with data capability.

Installation of wire will begin as early as this month and is expected to be completed by June/July at which time installation of the new phones will start. Switch- over to the new system is scheduled for Fall 1988. Prior to switchover, training centers will be established to train all personnel on the new ROLMphones.

It is clear, in the very near future, rotary dialing will be a thing of the past at the Langley Research Center.

Club News

Runners Club Race Results

The Langley 1987 Runner-of-the-Year competition was won by **Pat Leary**. Leary earned 56.88 points by winning her age group in all four races of the NASA Intercenter Competition. Rounding out the top ten were **Frank Rossi, Nancy Hess, Bob Ferguson, Gale Harvey, Al Graham, Jim Johnson, Harry Carlson, Doug Heard** and **Marge Mikula.**

The Langley Runners Club Handicap-Start 10 Miler was held on Feb. 13, a cold, windy Saturday morning! **Gale Harvey** was the winner with a time of 73:00. He was followed by **Al Graham** and **Steve Robbins.**

Bowling Stats

The NASA Tenpin Bowling League bowls on Tuesday nights at Victory Lanes in Grafton. Current standings are:

	February 23		March 1	
Team High Game	1013	Thunderbolts	947	Strikers
Team High Series	2777	Thunderbolts	2704	Spare Change
Male High Game	247	**B. Huffman**	233	**L. Mayo**
Male High Series	631	**B. Huffman**	601	**L. Mayo**
Female High Game	268	**L. Joyce**	191	**M. Mayo**
Female High Series	675	**L. Joyce**	516	**M. Mayo**
Most Pins over Average	91	**L. Joyce**	66	**R. Weber**
			66	**J. Morris**

In Memoriam

Sympathy is extended to the families of:

Hartley A. Soule', who died February 29. Soule' retired from NASA in 1955 and had served as the assistant director of the Langley Research Center.

William C. "Red" Hayes, Jr., who died February 20. Hayes retired from NASA after 27 years, about 14 of which he spent at Langley. Hayes was best known for the at-sea recovery of many of the early astronauts.

Speakers Bureau Volunteer Staff Tell the NASA Story *Continued from page 3.*

Benson Dexter gave a presentation on Composite Materials to the Society of Manufacturing Engineers.

Melvin Ferebee gave a Space Shuttle Update to the University of Richmond Society of Physics.

Bruce Fisher spoke on the Lightning Research Program to the Poquoson Exchange Club and gave a presentation on NASA Storm Hazards and Lightning Research to the 1987 USA TRADOC Aviation Flight Standardization and Safety Committees.

Delma Freeman gave a Space Program Update to the Military Order of World Wars, Virginia Beach, and the Tabernacle Methodist Mens Club, Poquoson.

George Helfrich spoke on Inventions and Patents at Churchland Academy.

Joseph Heyman spoke at the United Nations on NASA Ultrasonic Applications for Mankind.

George Hickman participated in Career Day at Magruder Elementary School, Newport News, and spoke on Black Aviators and Minority NASA Scientists at Magruder Middle School.

Natalie Johnson, Toastmasters speaker, spoke on the NASA Stay-in-School Program at Menchville High School.

Elijah Kent gave a presentation on NASA Careers at Blair Middle School, Williamsburg.

William Kinard presented Agriculture in Space for the Tidewater Greenhouse Growers Association.

Robert A. Kilgore presented Wind Tunnels—the Next Generation at the Virginia Peninsula Economic Development Council Directors' Meeting.

Edward Lawless spoke on the NASA Apprentice Program at Western Branch High School.

Robert B. Lee III gave a presentation on the Continuing Need for Communication in Science at the Portsmouth Science Fair.

James Martin spoke on the Advances in Flight Technology at the Gloucester Rotary Club.

Charles McClinton gave a presentation on the National Aerospace Plane to St. Marks Methodist Men.

H. Craig Neal spoke on the NASA Apprentice Program at Yates Elementary School.

Bob Pegg spoke on the National Aerospace Plane at the Williamsburg Kiwanis Club.

Sharon Perez gave presentations on Scientific Measurements at Dozier Middle School, Newport News, and to the Hampton Lions Club.

Larry Pinson spoke on the Importance of Math and Science in Today's World of Advanced Technology to the Estill County Board of Education, Irvine, Kentucky.

Mike Ponton gave a presentation on Computer Science for the Mathematics Club, Ferguson High School.

E. Brian Pritchard spoke on the Future of the Space Program to the North Suffolk Rotary Club.

Frank Quinto gave a presentation on Space Camp at Syms Middle School, spoke on the Space Shuttle to the American Society of Mechanical Engineers, Old Dominion University and presented Toys in Space at Lucama School, Lucama, N.C.

Richard Rawls gave a presentation on the Space Shuttle to the Peninsula Council of Boy Scouts.

Gregory Riebe spoke on the National Aerospace Plane to the James York Exchange Club.

Lester Rose presented Spinoffs from Aerospace Technology to the Smithfield Kiwanis Club, Indian River High School, Portsmouth Rotary Club, and Bayside High School.

Don Soloway spoke on Robotics to the Institute of Electrical and Electronics Engineers (IEEE).

Cary Spitzer gave a presentation on the Geology of Mars to the Virginia Peninusla Gem and Minerals Society and spoke on Planetary Exploration at the Chesterfield Country Parks and Recreation Center.

John Tanner presented Research Opportunities in Impact Dynamics to the Old Dominion University Chapter, Tau Beta Pi.

Mike Walsh gave a presentation on Riblets to the Port of Hampton Roads Propeller Club.

Judith Watson spoke to the Hampton Wythe Exchangettes on Women in Space.

William Wessel spoke on Safety in the Workplace at the Norfolk State University Physics and Engineering Society Student Seminar.

Bill Williams gave a presentation on Organizational Goals for the Cooperating Hampton Roads Organization for Minorities (CHROME), Old Dominion University.

Kelli Willshire spoke on the Space Station to the Daughters of the American Revolution.

Charles Woerner presented Space Applications for Climate Studies at the Greensville County Ruritan Club.

Robert L. Wright gave a presentation on Aerospace Careers at Westhaven Elementary School, spoke on the NASA Space Program at a Boy Scout day camp and spoke on NASA Careers at Gloucester Intermediate School.

Denna Zacharias spoke on NASA Careers at Moton Elementary School.

Much appreciation is extended to these Langley Research Center employees who have given so generously of their time and talent.

People & Places

Alumni News and Views

Attention, current and prospective Alumni Association members: Reserve Friday, March 25, on your 1988 calendar.

That's the date of the luncheon at the Activities Center and the installation of Alumni Association officers by Center Director Richard H. Petersen. The program will feature an update on the Space Station Program by W. Ray Hook.

Luncheon begins at 11:30 a.m. The cost in $7 per person, payable at the door. Please call Don Ward, 838-1063, or Bill Boyer, 722-0443, by March 21 to make reservations. If you make reservations and are unable to attend and do not cancel before March 21, you will be billed for the cost of the lunch.

Also coming up on March 26 is the Alumni Association's Annual Dance for all former NASA/NACA employees. The dance is **free** and a cash bar will be available.

Come on out to the Activities Center and enjoy socializing with old friends and an evening of dancing to the music of Charlie Johnson's Band. The fun begins at 8 p.m.

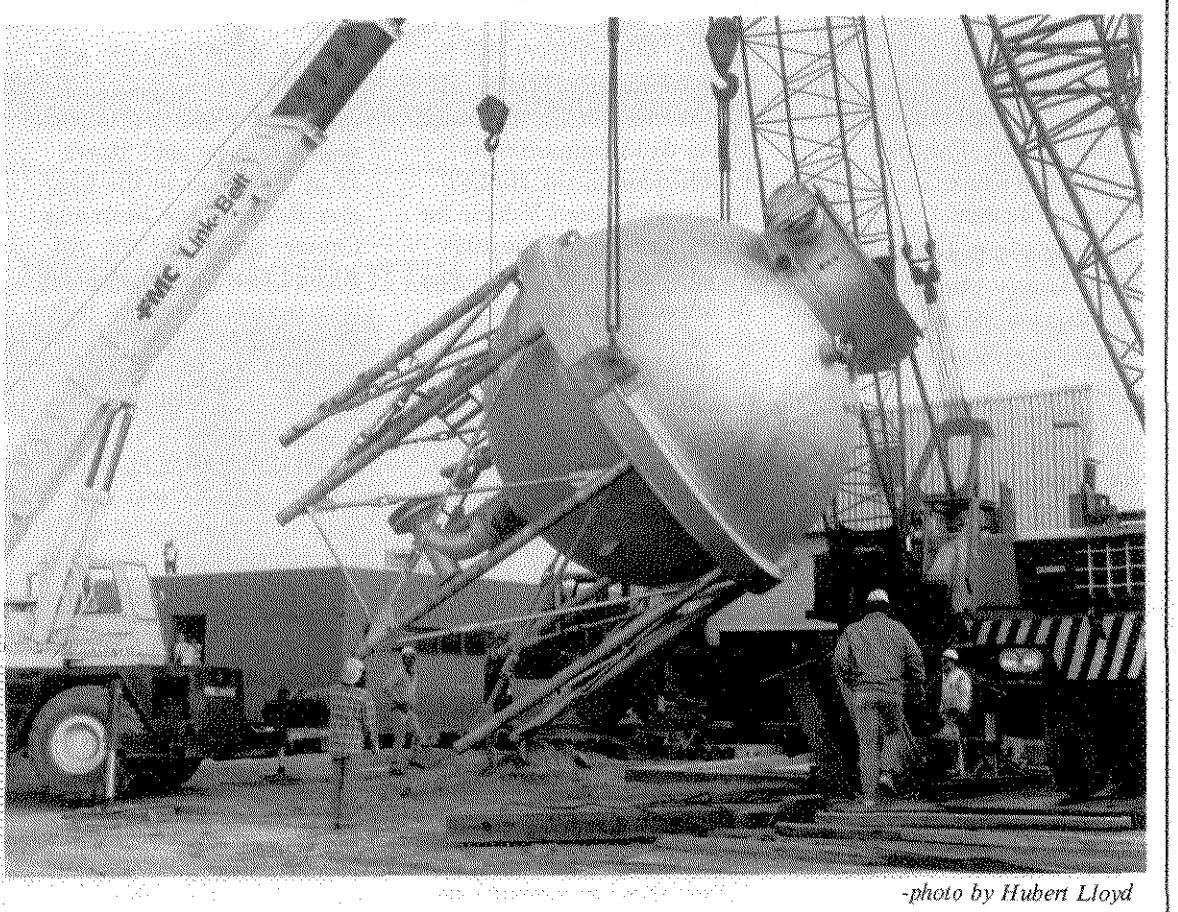
Notes of Thanks

Doris Vandeveer writes: "I would like to thank all my friends who made my retirement party such a wonderful occasion. The album, NASA plaque and gifts will always be a pleasant reminder of our good times. You have a special place in my heart and do come see us in Gloucester."

Bill Tuck writes: "I would like to thank all my friends and co-workers for the memorable retirement reception and gifts, especially the rooster."

F. Dolan Clontz writes: "Thank you for the wonderful retirement party on Feb. 26. Never have I had so many wonderful friends under one roof at any one time. The dinner was great and the program was just what had been predicted—a real barn burner!"

Dean M. Ferris writes: "I wish to thank my fellow workers, friends and family for my recent retirement party. I enjoyed the meal and the gifts were greatly appreciated. Thank you."



-photo by Hubert Lloyd

From Behind the Scenes

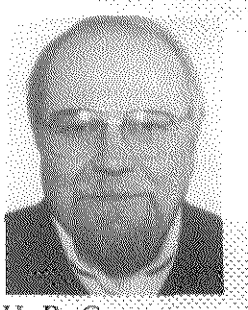
Whoa! Set It Down Right Here

Could these riggers have lassoed a wandering spacecraft?

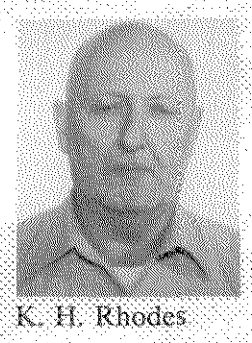
Actually, the liquid oxygen (LOX) run tank for the oxygen enrichment system in the 8-Foot High Temperature Tunnel is being set in place. This is but one phase of one of the tunnel upgrades now in process under the direction of the Facilities Engineering Division.

A complete update on the modifications which will give Langley a unique national facility for research on hypersonic, air-breathing propulsion systems will appear in the next issue.

Recent Retirees



H. R. Compton



K. H. Rhodes

R. H. Kee

Harold R. Compton, Space Systems Division, and **Kenneth H. Rhodes**, Systems Engineering Division, retired February 29. **Rhoda H. Kee**, Financial Management Division, retired March 1.

Retirement Parties

Rhoda H. Kee will be honored at a retirement dinner Wednesday, March 16, at the Fort Monroe Officers' Club. Beef and Burgundy dinner begins at 6 p.m. Cost is $10/person plus $1 for gift. Donations for gift only will be graciously accepted. Please make checks payable to Helen C. Anastasio, Mail Stop 108, ext. 4606, by March 11.

Charles D. Folwell will be honored at a retirement luncheon Wednesday, March 23, at 12 noon in Building 1250 High Bay Area. Cost is $4/person, which includes gift. Contributions for gift only will be accepted. Please make check payable to Charlene Gleaton, Mail Stop 424, ext. 2156, by March 18.

Kenneth H. Rhodes will be honored at a retirement party Wednesday, March 23, at the Activities Center. Heavy hors d'oeuvres and cash bar will begin at 6:30 p.m. Cost is $10/person, $18/couple. Donations to gift only are welcome. For reservations, contact John Gustafson or John Cox, Mail Stop 434, ext. 4571.

Jim Wise will be honored with a retirement dinner at the Fort Monroe Officers' Club on April 1. Cocktail hour is at 6:30 p.m.; prime rib buffet dinner at 7:30. Cost is $11/person including gift. Gift contributions of $2 will be appreciated. Send checks to Maryann Ward or Randy Mixon, Mail Stop 152D, ext. 3871, by March 25.

Senior Management Research Review

The Senior Management Research Review will be held Monday, March 21, at 9 a.m. in Building 1219, Room 225. Following the Director's comments and program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENTS	SPEAKER
9:30	Signal Processing Applications to Aerospace NDE	Patrick Johnston (Electronics/IRD)
9:45	Navier-Stokes Calculations Correlated with Transonic Cryogenic Wind Tunnel Date	Woodrow Whitlow (Structures/LAD)
10:00	Testing the Goodness-of-Fit of Software Reliability Models	George Finelli (Flight Systems/ISD)
10:15	Completed Simulation Study of Airplane Trajectory Guidance During Wind Shear Encounters	David Hinton (Flight Systems/FLMD)
10:30	Free-Flight Investigation of the STOL and Maneuver Technology Demonstrator	Daniel Murri (Aeronautics/LSAD)
10:45	Free-Shear-Layer Turning Angle in Wake of AFE at Incidence in M=10 Air and M=6 CF_4	William Wells (Space/SSD)

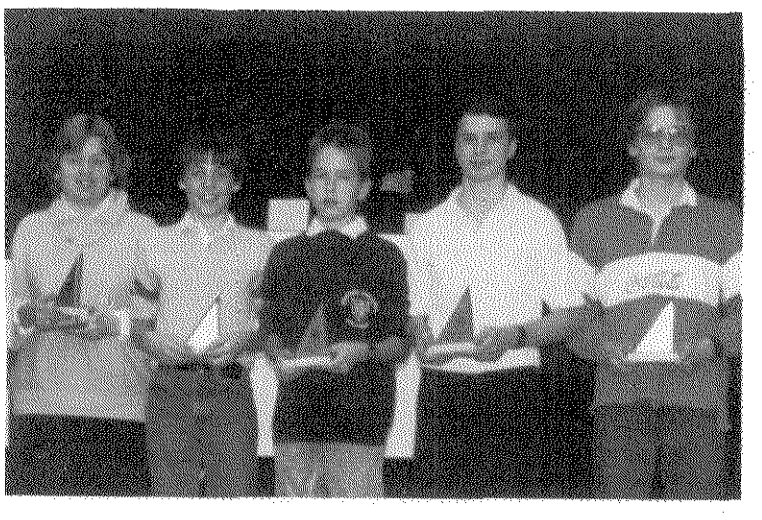
Dozier Students Sweep Math Competition

Dozier Middle School students were victorious in the Peninsula competition of the national MATHCOUNTS program held Saturday, February 20, at Langley.

The seventh and eighth grade students are tested on probability, statistics, linear algebra and polynomials. The competition consists of written tests and fast-paced oral matches.

Dozier eighth grader, David Bradley, was the individual winner; the Dozier team was the competition team winner.

MATHCOUNTS is organized by the Virginia Society of Professional Engineers.



-photo by Arlene Levine

Dozier math coach Norma Rhyther (left) accepts MATHCOUNTS award with her team members (L to R) David Bradley, William McKee, Evangelos Ringas and Michael Fontaine. The Dozier team now advances to the state finals in Richmond, March 26.

Happenings

LAA SOCIAL will be held Friday, March 18, from 4 to 7 p.m. in the Activities Center. Celebrate St. Patrick's Day. Irish drinks and mixed drinks, 75 cents.

DISNEY FILMS. LAA Walt Disney Film Festival will feature "Snow White" on Sunday, March 20. Movie time is 2 p.m. and cost is $.50/person. Popcorn and drinks will be available for purchase. For more information, call Vernelle Robinson, ext. 2691.

TOASTMASTERS. NASA Toastmasters will meet Wednesday, March 23, at 11:30 a.m.—1 p.m. in the Hampton Room, Activities Center. Co-ops, contractors and Air Force personnel eligible to join. Civil service employees charge one hour to JO A1619. For details, call Natalie Johnson, ext. 3483.

NASA VOLLEYBALL spring season begins April 5. There will three co-ed leagues for beginners through experienced players. All NASA employees, contractors and family members are eligible. For an information packet and team entry form, call Bill von Ofenheim, ext. 4322, or Jim Hall, ext. 3280.

AIAA MEETING will be held Wednesday, March 16, in the Activities Center. Dwain Deets will summarize his experiences on the HiMAT Remotely Piloted Vehicle for which he received the 1986 Wright Brothers Lectureship in Aeronautics Award. Social at 6 p.m., dinner at 7, program at 8. Contact Duane Melson, ext. 4260, or Karen Credeur, ext. 7347, for reservations.

NAGS MEETING. The National Association of Government Secretaries' monthly meeting will be held on Tuesday, March 15, at 6:30 p.m. at the Holiday Inn on Mercury Boulevard. "Physical Fitness for Women" will be presented by Pamela Gebhart, Kelsey-Seybold Clinic, P.A. Guests are invited. For further information or reservations, contact Shirley Davis, ext. 2759, or Reachie Hall, ext. 2159.

NASA BASSMASTERS will meet Tuesday, March 22, at 7 p.m. in the Activities Center. Prospective members are urged to attend. For additional information, call Mark Lindsey, ext 3141, or Richard Chattin, ext 2651.

NASA SOFTBALL ASSOC. The organizational meeting for the 1988 softball season will be held March 17 at 4:45 p.m. in the Langley Room of the Activities Center, Building 1222. All current team managers and representatives of new teams interested in joining the association are encouraged to attend.

BLOODMOBILE. The American Red Cross will sponsor a Bloodmobile in the Activities Center, Wednesday March 23, from 9 a.m. to 3 p.m.

VIRGINIA CHORAL SOCIETY will present "Music for Great Spaces," Friday, March 18, at First Presbyterian Church, Hampton, and Saturday, March 19, at Christ & St. Luke's Church, Norfolk. Both concerts begin at 8 p.m. Admission is free, however an offering will be taken. For details, call 851-5515.

FOR SALE: LAWNMOWER, self-propelled 3.5 hp B&S engine, 22 in. cut, bag on side. Used 3 times. Best offer over $100. Call 826-9253 between 4—7 p.m.

Langley submission runner-up

NASA Selects 'Quality' Slogans

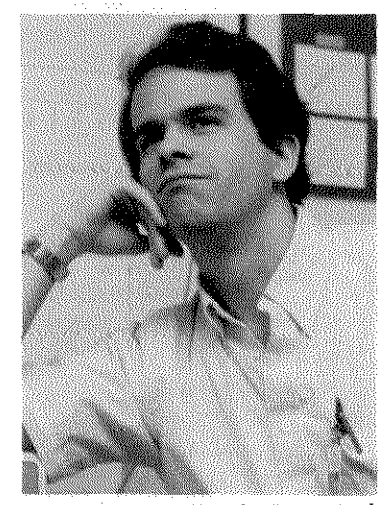
"Quality—A Commitment to the Future" has been selected as the winning slogan in a contest sponsored by NASA Headquarters' Quality and Productivity Improvement Programs Office. Submitted by Steven Faldetta, Lewis Research Center, this slogan was chosen from over 4,200 submissions.

Runner-up slogans were "NASA: Where Quality Shapes the Future," submitted by Christopher Rumsey, Langley, and "NASA Excellence Through Quality," submitted by Roger Drake, Kennedy Space Center, and Joe Richvalsky, Lewis.

Rumsey, research scientist, Analytical Methods Branch, came up with lots of possible entries, but narrowed his possibilities to one. "I like to be creative," explains Rumsey when asked what prompted him to enter the contest. "Many from our office were twisting words to come up with a good theme."

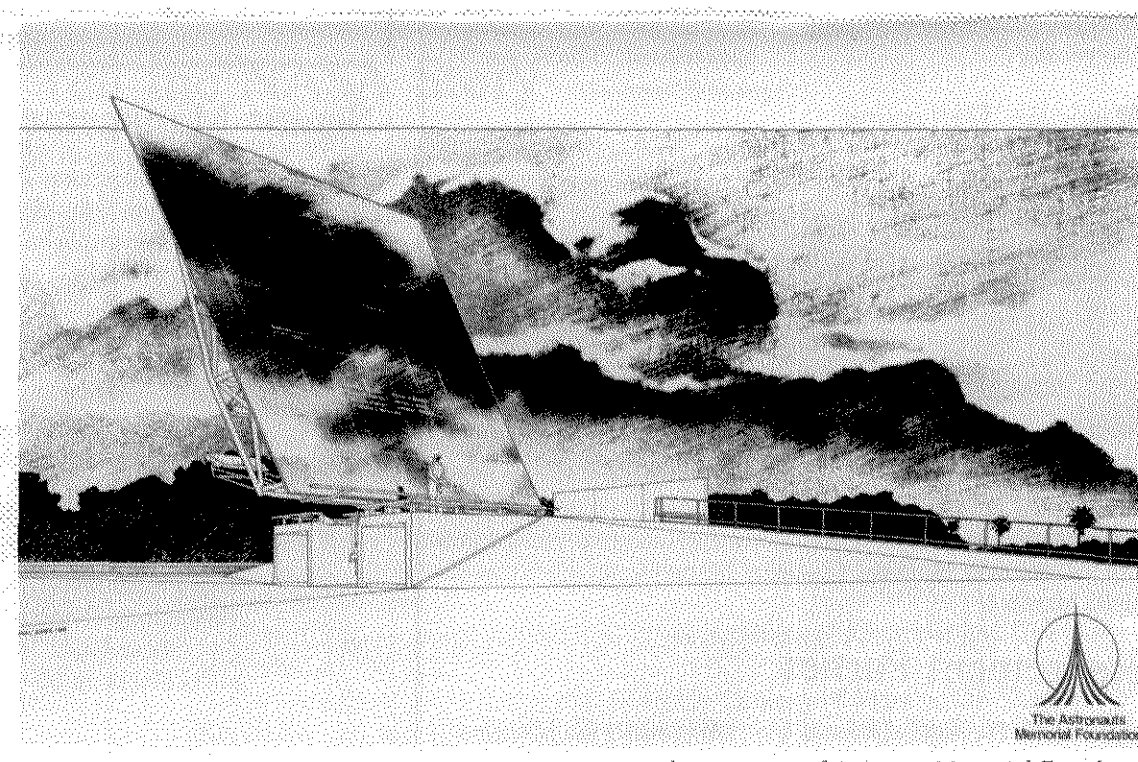
The challenge here lies in saying much in the fewest words possible. Bill Williams, Special Assistant for Productivity Improvement, reports there were over 400 submissions from Langley.

The contest was designed to encourage NASA employees to identify a slogan which highlights NASA's commitment to quality and excellence, and to stimulate an awareness of the value of a quality-oriented culture.



-photo by Don Ward

Langley's Chris Rumsey, runner-up winner in NASA's 'Quality' slogan contest, will be awarded a cash prize of $250.



-photo courtesy of Astronaut Memorial Foundation

A NATIONAL TRIBUTE TO AMERICA'S SPACE PIONEERS. This artist's rendering shows the winning design for the proposed Astronauts Memorial scheduled to be dedicated in 1990. The memorial will be constructed on a six- acre site at the entrance to the Visitor Center at Kennedy Space Center's Spaceport U.S.A.

Design for Astronaut Memorial Chosen

Four San Francisco, Calif., architects will design a national tribute to America's space pioneers. The winning design, "Space Mirror" is the creation of Paul Holt, Marc Hinshaw, Peter Pfau and Wes Jones.

The Astronauts Memorial Foundation has awarded the first prize of $25,000 and the exclusive rights to negotiate the commission for a NASA-approved memorial design to the architectural firm which bears their names.

The proposed memorial, 50 feet wide and 40 feet high, has a mirror-finished surface of granite which tracks the sky, following the sun's movement. The names of 14 fallen astronauts are grouped by final mission and cut like stencils through the granite. Behind each group of names are mirrors which direct sunlight through the names towards the heavens.

The Astronaut Memorial Foundation is a national, non-profit foundation formed in the aftermath of the Challenger tragedy. The foundation has raised over $4 million from the sale of Florida's commemorative Challenger license plates. The memorial is expected to cost $3-$4 million.

Researcher News

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Langley Research Center

Volume 1, Issue 6 March 25, 1988

News Researcher

Bi-weekly Employee and Contractor Publication

NASA Managers Granted Presidential Award for Savings

Government overspending routinely makes the news. A joint team of industrial relations specialists at Langley Research Center and NASA Headquarters is also making headlines—but for the opposite reason. Four NASA managers have been applauded by the President of the United States for significant savings to the U.S. government.

The Langley Research Center Contract Cost Savings Team has been granted a Presidential Management Improvement Award for their efforts which have resulted in approximately $3.5 million in tangible savings at the Center. Langley team members, Arthur R. Friend, Robert L. Huffman, Jr., and Howard R. Puckett, Jr., and Sam C. Geiser, NASA Headquarters, were honored at a White House ceremony March 4.

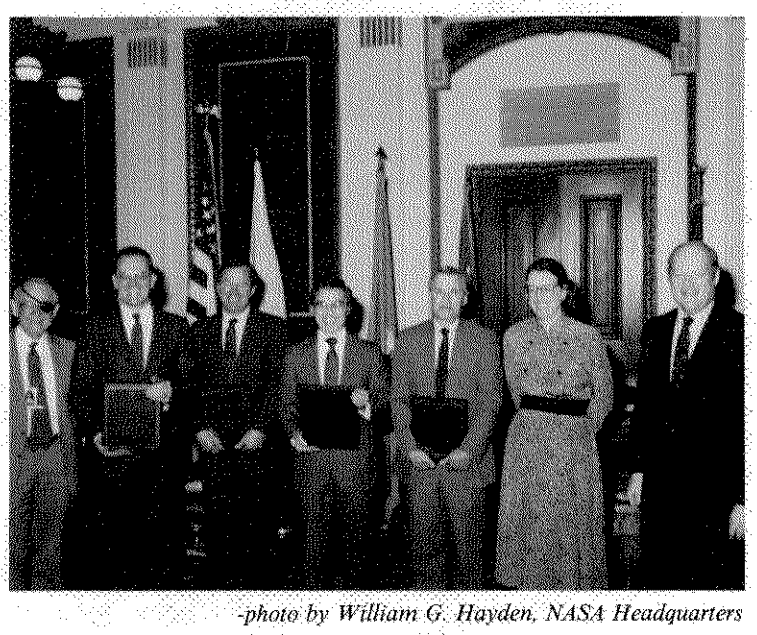
Ronald Reagan in his Inaugural Address promised the American people that a major priority of his administration would be to make government work efficiently and economically. "I am confident that Federal employees will continue to play a very significant role in controlling government expenses and helping to reduce the cost of government to all Americans."

The team was commended for their efforts to control costs under Langley Research Center construction and support service contracts. Through cooperative efforts with the U.S. Department of Labor (DoL), local data has been gathered assisting issuance of periodic wage determinations specifying minimum wages and fringe benefits payable under government contracts.

Resultant savings of taxpayer dollars merited the team Presidential Letters of Commendation, a prerequisite to the Presidential Management Improvement Award.

Approximately 250 letters of commendation were awarded; the seven most exceptional contributions were recognized by Presidential Management Improvement Awards. The Director, Office of Personnel Management, and the Director, Office of Management and Budget, advise the President on final selections.

Langley is the only NASA center to have been honored by this Presidential recognition. The Contract Cost Savings Team follows in the footsteps of the Langley Electric Power Negotiating Team, which was awarded a Presidential Management Improvement Award in 1986.



-photo by William G. Hayden, NASA Headquarters

Shown following presentation of Presidential Management Improvement Awards in the Old Executive Office Building, Washington, D.C., are (L to R) NASA Deputy Administrator Dr. Dale D. Myers; award winners Howard R. Puckett, Jr., Robert L. Huffman, Jr., Sam C. Geiser, and Arthur R. Friend; Office of Personnel Management Director Constance Horner; and Office of Management and Budget Director James Miller.

San Marco Atmospheric Satellite Scheduled for Launch Today

-by Jean Clough

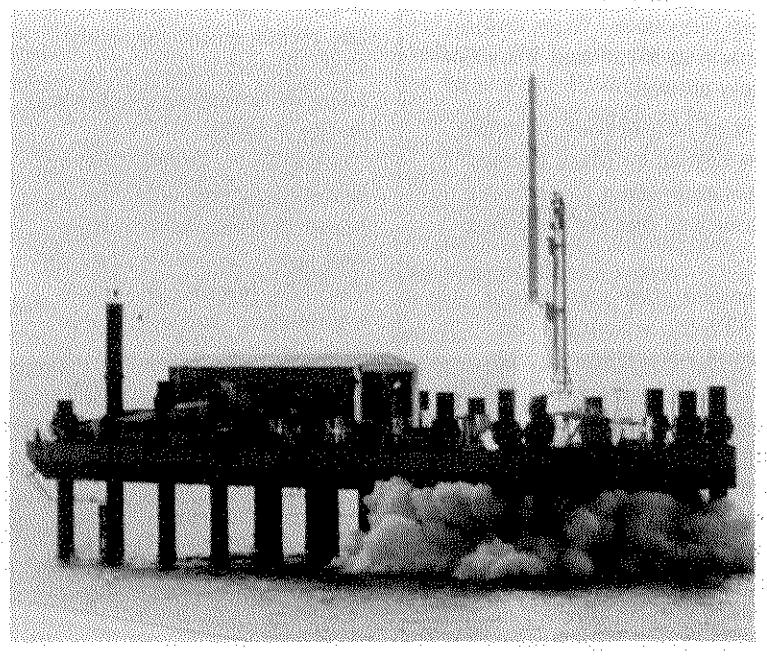
An international satellite, designed to study Earth's lower atmosphere, is scheduled to be launched today from Italy's San Marco Equatorial Range in Kenya. Officials of the University of Rome and NASA report the two-hour window for the San Marco D/L spacecraft opens at 10:16 a.m., Kenya time (2:16 a.m. EST).

San Marco D/L will be placed in a low orbit of approximately 166 by 381 statute miles. Its inclination will be 2.89 degrees, and it will circle the Earth every 100 minutes.

The 522-pound spherical spacecraft will carry five scientific instruments, according to Professor Luigi Broglio, director of the San Marco program for the university. One of the instruments is from Italy, one from West Germany and three from the United States, he said.

The Italian instrument on the spacecraft is the Neutral Atmosphere Density experiment, designed to measure drag forces on the satellite in orbit. Professor Broglio is principal investigator.

The West German instrument is the Airglow Solar Spectrometer, sponsored by the Institut fur Physikalische Weltraumforschung (IPW) in Freiburg. It will measure equatorial airglow, solar extreme ultraviolet radiation, solar radiation from the Earth's surface and from clouds, and the radiation from interplanetary and intergalactic origin reaching the satellite. Principal investigator is Dr. Gerhardt Schmidtke of IPW.



The San Marco platform, from which the Scout vehicle is launched, is named for the patron saint of navigators.

Two of the U.S. instruments are from NASA's Goddard Space Flight Center, Greenbelt, Md. They are the Wind and Temperature Spectrometer to measure neutral winds, neutral particle temperatures and concentrations of selected gases in the atmosphere, and the Three-Axis Electric Field Experiment to measure the electric field surrounding the spacecraft in orbit.

Principal investigators are Nelson Spencer, with the University of Maryland's University Research Foundation, College Park, and Dr. Nelson Maynard, of the Air Force Geophysics Laboratory, Hanscom Air Force Base, Mass. respectively.

The third U.S. instrument is the Ion Velocity Instrument from the University of Texas, Dallas. It is designed to measure the plasma (hot gases) concentration and ion winds surrounding the spacecraft in orbit. Principal investigator is Dr. William B. Hanson.

The launch will mark the fifth time a San Marco spacecraft has been sent into space. The first, San Marco A, was launched from Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Va., on December 15, 1964. The subsequent three launches were from San Marco: San Marco B, April 26, 1967; San Marco C1, April 24, 1971, and San Marco C2, on February 18, 1974.

The spacecraft will be launched on a U.S. Scout rocket, built by LTV Missiles and Electronics Group in Dallas, Texas, according to Ronald E. Adkins, NASA San Marco Project Manager, Goddard Space Flight Center. The Scout is a four-stage, solid propellant rocket, approximately 75 feet in length with a launch weight of 47,520 pounds. Liftoff thrust is 145,942 pounds.

The Scout has an unmatched 100 percent success rate during the last 10 years (12 launches, 12 successes); 98 percent during the past 20 years (53 launches, 52 successes). The Scout program in the United States is managed by the Langley Research Center. Jon L. Van Cleave is Project Manager.

The Scout program at San Marco is unique in that the U.S. Scout launch vehicle is processed and launched by an Italian launch team. There have been eight Scout launches from San Marco and eight successes.

The Kenya range, operated by the Centro Ricerche Aerospazili (CRA), University of Rome, features an unusual launch facility. Located 90 miles north of Mombasa, it is composed of two offshore platforms and a base camp. The platforms are located 2.9 degrees south of the Equator, approximately three miles off the coast in the Indian Ocean where the water is 30 feet deep.

Both platforms–the San Marco, from which the Scout vehicle is launched, and the Santa Rita, which serves as a launch control center–are raised so that the bottom decks stand about 15 feet from the highest known water level.

The San Marco platform, named for the patron saint of navigators, is a rectangular floatable steel barge 90 feet wide, 300 feet long and 13 feet deep.

The Santa Rita platform, named for the patron saint of things impossible, is a triangular platform similar to ones for offshore oil drilling and more commonly known as "Texas Towers." Its sides are 115 feet long.

Daylight Savings Time begins at 2 a.m. Easter Sunday, April 3.

Turn your clocks forward one hour!

News Briefs

HEADQUARTERS, Washington D.C. — The U.S. and The Gambia have signed an agreement under which The Gambia will permit the use of Banjui International Airport as an emergency landing site for the U.S. Space Shuttle. Under the agreement, NASA will locate Shuttle-unique navigational aids equipment at the airport to enhance prospects for a safe landing in the event of a Shuttle emergency during the ascent phase. Work will begin immediately to prepare the site to support the STS-26 mission.

KENNEDY SPACE CENTER, Fla. — Preparations are underway to bring on line two new abort landing sites in northwestern Africa. These sites will be used as contingency landing facilities in the event of a transaltantic abort during the launch of STS-26 and subsequent missions. In addition to The Gambia, a new site located near Ben Guerir, Morocco, has been selected. Foundations for Shuttle approach and landing aids are being laid at the new sites.

JET PROPULSION LABORATORY, Pasadena, Calif. — JPL is designing a sophisticated radar receiving system to help image and track Arctic ice flows and study the remote areas of Alaska and its surrounding seas. The system will initially be capable of receiving signals from three satellites carrying synthetic aperture radar (SAR) which penetrate thick cloud cover and produce data for high resolution images. The basic information to be extracted from SAR data is the description of the ice pack in terms of ice type, flow size, open water distribution and motion of the ice.

HEADQUARTERS, Washington, D. C. — Effectively immediately George W. S. Abbey will assume the duties of deputy associate administrator for the Office of Space Flight, NASA Headquarters. Abbey comes to Headquarters from the Johnson Space Center where he has been special assistant to the center director since November 1987. Prior to that, he had been director of Flight Crew Operations.

AMES RESEARCH CENTER, Mountain View, Calif. — NASA's C-141 Kuiper Airborne Observatory (KAO) departed ARC for Guam to study the sun's atmosphere during the total solar eclipse of March 17-18. By studying the solar atmosphere during the first and last stages of complete occulation, scientists hope to determine a "brightness profile" of the solar atmosphere. Brightness profiles provide the key for modeling the temperature and height distribtuion of the chromosphere, the middle part of the solar atmosphere.

HEADQUARTERS, Washington, D.C. — NASA has issued an updated mixed fleet manifest reflecting current planning for primary payloads for Space Shuttle missions and expendable launch vehicles (ELVs) through Fiscal Year 1993. The manifest is for planning purposes only. Firm Shuttle payload assignments are made during the formal integration process at approximately 19 months prior to launch. The planned next Shuttle launch (STS-26) remains in August 1988.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala., and GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — The next mission of Spacelab—a reusable Space Shuttle-based research facility—will be reconfigured to enhance its capability to study Supernova 1987A, an event that has drawn the attention of astrophysicists from around the world. Separate as well as complimentary observations will be made in x-ray and ultraviolet wavelengths not only of the supernova, but of other specific targets as well.

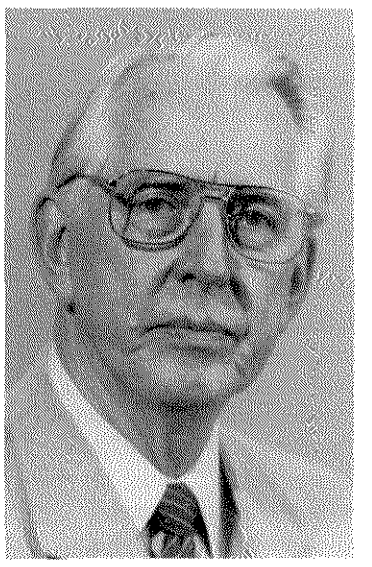
HEADQUARTERS, Washington, D.C. — In a continuing spirit of cooperation in space, the Soviet Space Research Insititute and the Soviet government have agreed to place aboard the spacecraft destined for the Martian moon, Phobos, a plaque commemorating the moon's discovery in 1877 by an American astronomer. The Soviet Phobos mission, due for launch in July 1988, should reach the Martian moon in spring of 1898.

JOHNSON SPACE CENTER, Houston, Tex. — NASA has named crew members for three Shuttle missions scheduled to fly in 1989. Shuttle mission STS-29, scheduled for launch Jan. 19, 1989, will be commanded by Capt. Michael L. Coats (USN). Pilot for the mission aboard Discovery will be Col. John E. Blaha (USAF). Col. James F. Buchli (USMC), Col. Robert C. Springer (USMC) and James P. Bagian, M.D., have been assigned as mission specialists. A five-member crew has been named for Shuttle mission STS-30, slated for launch April 27, 1989. Commanding the four-day mission aboard Atlantis will be Capt. David M. Walker (USN). The pilot will be Col. Ronald J. Grabe (USAF). Norman E. Thagard, M.D., Mary L. Cleave, Ph.D., and Maj. Mark C. Lee (USAF) have been named mission specialists. STS-31 will feature deployment of the Hubble Space Telescope and is targeted for launch June 1, 1989. Col. Loren J. Shriver (USAF) will command the mission. Pilot will be Col. Charles F. Bolden (USMC). Steven A. Hawley, Ph.D., Capt. Bruce McCandless II (USN) and Kathryn D. Sullivan, Ph.D., will fly as mission specialists.

Editorials

Langley

Headquarters Forum



I'm very pleased to have been invited to address the employees of the Langley Research Center through this column. During my past two years at NASA, I have gained a healthy respect for the outstanding work being done here.

Langley has always carried out a vigorous fundamental research program – first in aeronautics and, more recently, in both aeronautics and space. Your center director, Pete Petersen, and his colleagues at NASA Headquarters have been active supporters of a strong research and technology base in the Agency. The Administrator's office strongly endorses this philosophy. At Headquarters, we have worked very hard to keep a solid R and T base program in the NASA budget, even during a very tough budget cycle following the loss of Challenger.

During my recent visit to Langley on February 4, I was very impressed with the depth and breadth of the work being conducted. I was equally impressed with the quality and enthusiasm of the people. My visit reaffirmed the recent employee study that showed morale at Langley is among the highest in the Agency.

You have an excellent research program with the right blend between aeronautics and space technology, an outstanding research staff and a persistent and aggressive management. Langley's 70-year history of achievement has always placed you on the forefront of aeronautical research. I assure you that the Administrator's office will do everything possible to keep this tradition alive.

All of us at NASA have been through a challenging two years. We've worked long and hard. But this year, we'll be seeing the fruits of our efforts with the resumption of Shuttle missions. I am convinced that 1988 is going to be a successful year for NASA and the space program.

I would like to thank you for your critical role in the Space Shuttle recovery. It has taken the entire NASA team to pull this program together, and all of you can be extremely proud of the part you've played.

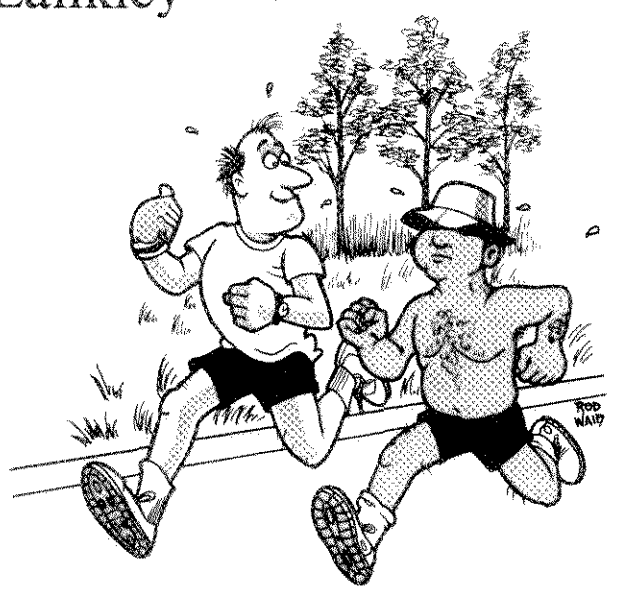
Thank you for your hospitality last month, and keep up the good work.

James C. Fletcher
NASA Administrator

"Women's History Month is a time for us to recognize and salute women's contributions to the American family and to society. . . .Women continue to strengthen the family and enrich our lives with intellectual gifts, creative talents, and an indomitable spirit. . . .I proclaim March 1988 as Women's History Month."

Ronald Reagan

Lankley



State-of-the-Center Address

Langley Director Richard H. Petersen will address employees, retirees and support contractors at the Activities Center:

March 28	1:30—2:15 p.m.	*Aeronautics Directorate Operations Support Division
	3:00—3:45 p.m.	Space Directorate Structures Directorate
March 29	8:30—9:15 a.m.	*Systems Engineering and Operations Directorate (except Operations Support Division)
	10:00—10:45 p.m.	Electronics Directorate Flight Systems Directorate
	1:30—2:15 p.m.	Office of the Director Management Operations Directorate

*Please note the time and date for the *-indicated Directorates have changed since the schedule was published in the March 11 **Researcher News**.

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Thursday following the date of this issue.

Managing Editor . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

Modifications to 8-Foot Tunnel in Construction Phase

Modifications to the 8-Foot High Temperature Tunnel, now underway, will give Langley a unique national facility for conducting research on hypersonic air-breathing propulsion systems. The $23.2 million project is expected to be completed in March 1990.

To date, no existing facility can accommodate full scale ramjet and scramjet live engine testing. When completed, Langley's 8-Foot tunnel will provide true-temperature, high-Mach-number, and large scale testing capabilities.

The modification includes the addition of oxygen to the test stream to make it suitable for combustion studies and supplemental nozzles to expand the test range of the facility. The modified facility will retain its present capability for aerothermostructural and aerothermal loads research for high- speed vehicles and aerospace re-entry vehicles.

Direct liquid oxygen (LOX) injection into the combustor has been selected for the oxygen enrichment system. The system will use an existing low-pressure tank for long-term LOX storage and a large high-pressure LOX run tank that is pressurized from a new high-pressure gaseous nitrogen system. The LOX run tank has been set in place by Williams Rigging Company, a subcontractor to Chicago Bridge and Iron, one of the two major contractors involved in the 8-Foot upgrade.

A 1/12-scale model of the proposed LOX system was installed and evaluated in the Langley 7-Inch High Temperature Tunnel (HTT), a pilot facility for the 8-Foot HTT. This subscale testing proved the concept, provided first-hand experience in handling oxygen and developed operational procedures.

A dual throat/mixer concept with interchangeable nozzle inserts for Mach 4 and 5 will expand the test range of the facility. A section of the existing nozzle will be removed and the mixer will be installed to obtain the desired Mach number and provide high dynamic pressure necessary for ramjet testing.

For operation at Mach numbers 4 and 5, only the nozzle sections will be changed and the mixer flow rates adjusted to obtain the desired conditions. For operation at Mach 7, the entire mixer section will be removed and the original nozzle section reinstalled. To faciliate configuration changes, each of the components will be "floated" on air bearings.

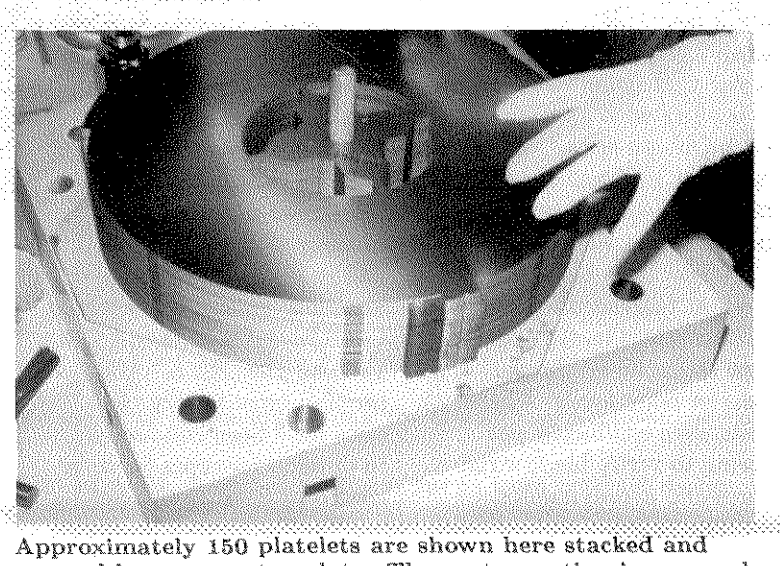
Air transpiration cooling using a platelet concept, pioneered by the Aerojet Techsystems Co. of Sacramento, Calif., will be used to replace the water- cooled convergent section and the film-cooled throat section of the present Mach 7 nozzle. The transpiration concept uses photoetched platelets or thin washers, which are stacked to form a complete coolant distribution system. By varying the design of the platelets and the order of stacking, very precise distribution of the coolant can be obtained.

The new nozzle, composed of approximately 6,800 platelets ranging in dimension from .006 to .060 inches thick, will eliminate persistant problems with water leakage and will significantly reduce the nozzle cooling air requirements. The facility core size and the quality of flow will also be improved. The transpiration cooled nozzle, now being fabricated, is expected to be delivered in July 1988 for fit up in November.

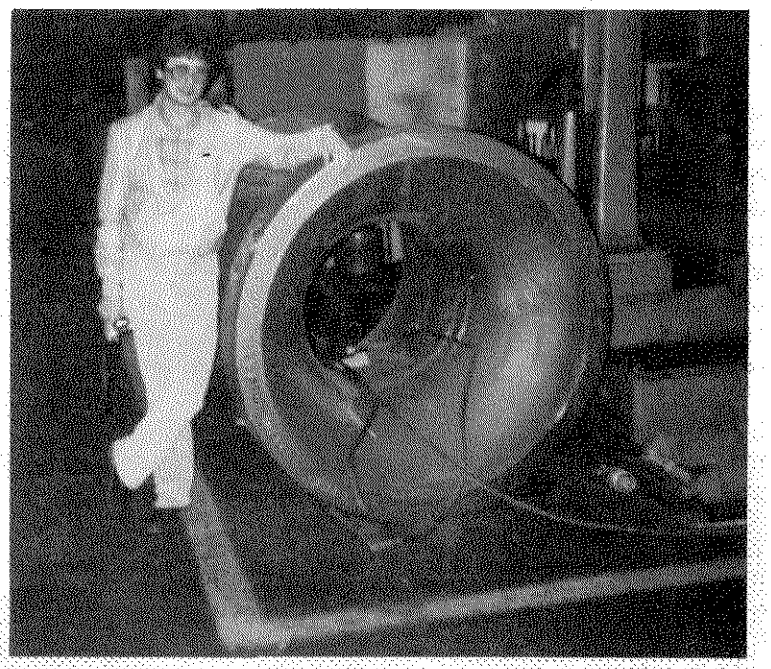
Robert Basford, 8-Ft. HTT Project Manager, Facilities Engineering Division, is excited about the installation of the transpiration cooled nozzle which is a new approach. "It has never been done before in this size. The washers vary in size from 3-feet to around 10 inches in diameter. We're anxious to get the nozzle in and checked out."

Construction external to the facility is now in progress. The tunnel will be taken off line June 1 for a nine-month period during which the interior modifications will be accomplished. Following completion of construction, a period of approximately one year will be required for shake-down and calibration. Thus the facility should be ready for propulsion testing by early to mid-1990.

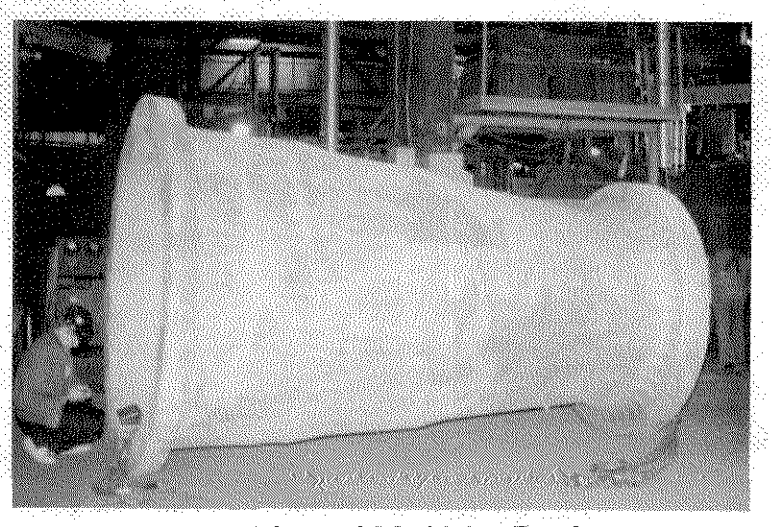
This sample platelet, one of the 6,800 that make up the transpiration cooled nozzle, is about 15 inches in diameter. The platelet is photoetched to allow passage of air inward to cool the inside surface of the nozzle.



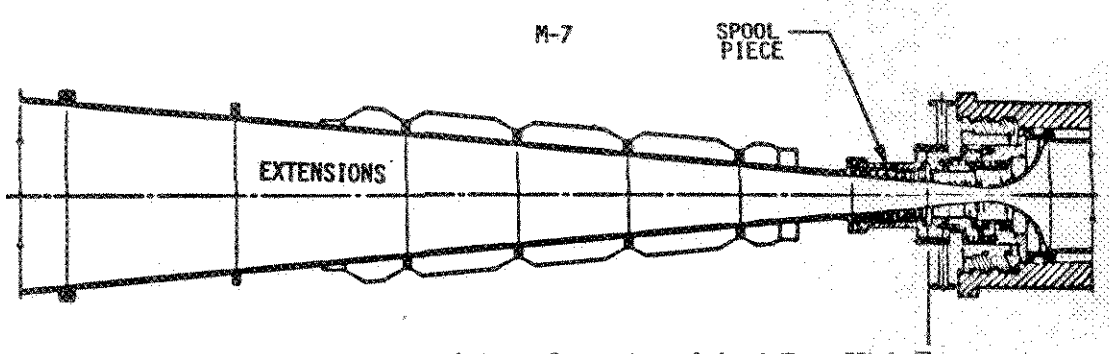
Approximately 150 platelets are shown here stacked and covered by a separator plate. The center section is removed after stacking to form the throat of the tunnel.



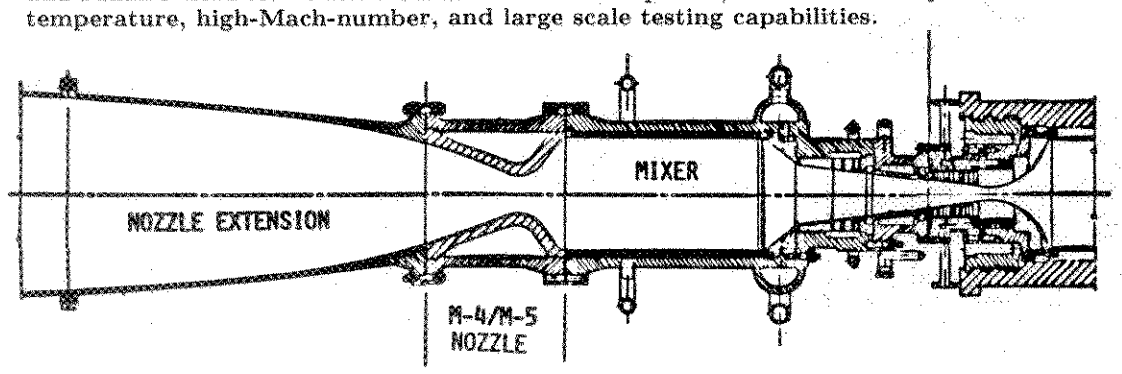
Joe Fleck, Mechanical Engineering Section, stands beside the Mach 4 nozzle insert. The interchangeable Mach 4 and Mach 5 nozzles will expand the test range of the facility.



Linwood Burcher, Advanced Machining Development Section, examines the Mach 4 nozzle extension in the unmachined state. The components will be "floated" on air bearings to ease configuration changes.



The drawing above shows the Mach 7 configuration of the 8-Foot High Temperature Tunnel. The drawing below shows how it will be altered to accommodate the Mach 4 and Mach 5 nozzles. When modifications are completed, the tunnel will provide true-temperature, high-Mach-number, and large scale testing capabilities.



NASA Works to Limit Interior Aircraft Noise

-by H. Keith Henry

The aircraft propeller is making a comeback, but NASA and industry researchers are working to leave propeller noise in the past.

Passenger acceptance of new radically styled, energy-efficient propellers being tested for use on commercial transports of the 1990s is dependent in large part on reducing interior noise levels to those in current jet aircraft.

NASA is working with Lockheed Corporation in a program called the Propfan Test Assessment (PTA) to prove, in flight, what has already been proven analytically and in ground tests: that large, unducted propellers with a radically swept design are a feasible alternative to higher-cost turbofan (conventional jet) propulsion systems.

Flight tests began this week at Lockheed facilities in Marietta, Ga., to examine new technologies for reducing interior noise levels. Flight tests were conducted last spring to verify blade structures and aerodynamics.

The propfan evolved from NASA's Aircraft Energy Efficiency program studies that began in the mid-1970s in response to sharply rising fuel prices.

Researchers estimate that this thoroughly reworked version of the old propeller could save airlines 15 to 30 percent a year in fuel costs, compared with the most advanced turbofan-powered aircraft flying in the 1990s, and still fly as fast as conventional jet transports.

The propfan is efficient because new materials and fabrication techniques allow the blades to be shaped for near optimum aerodynamic efficiency for flight over the entire speed and altitude range of modern jet transports.

The PTA design features eight thin, curved blades with highly swept tips on a single engine shaft. The blades are swept back like the wings of a jet aircraft for greater efficiency at high speeds.

Since 1977, researchers at the Langley Research Center and at Lewis Research Center in Cleveland have been working to understand and control noise generated by these new propfan propulsion systems. Noise from large, uncovered propellers are not muffled by a cowling, as with conventional jet engines. Measurements of propfan noise have been conducted in Langley's Quiet Flow Facility and in its 14- by 22-Foot Subsonic Tunnel, as well as in Lewis' 8- by 6-Foot and 9- by 15-Foot Tunnels, to validate propfan noise theory. Lab tests have been conducted to develop concepts for noise control.

The challenge is to design the interior wall and sound insulation system so that interior noise is no greater than on a conventional jet – without paying a significant weight penalty. This has been accomplished through in-house work and through a number of grants and contracts, all leading to flight tests on the Lockheed PTA test aircraft, a modified Gulfstream II.

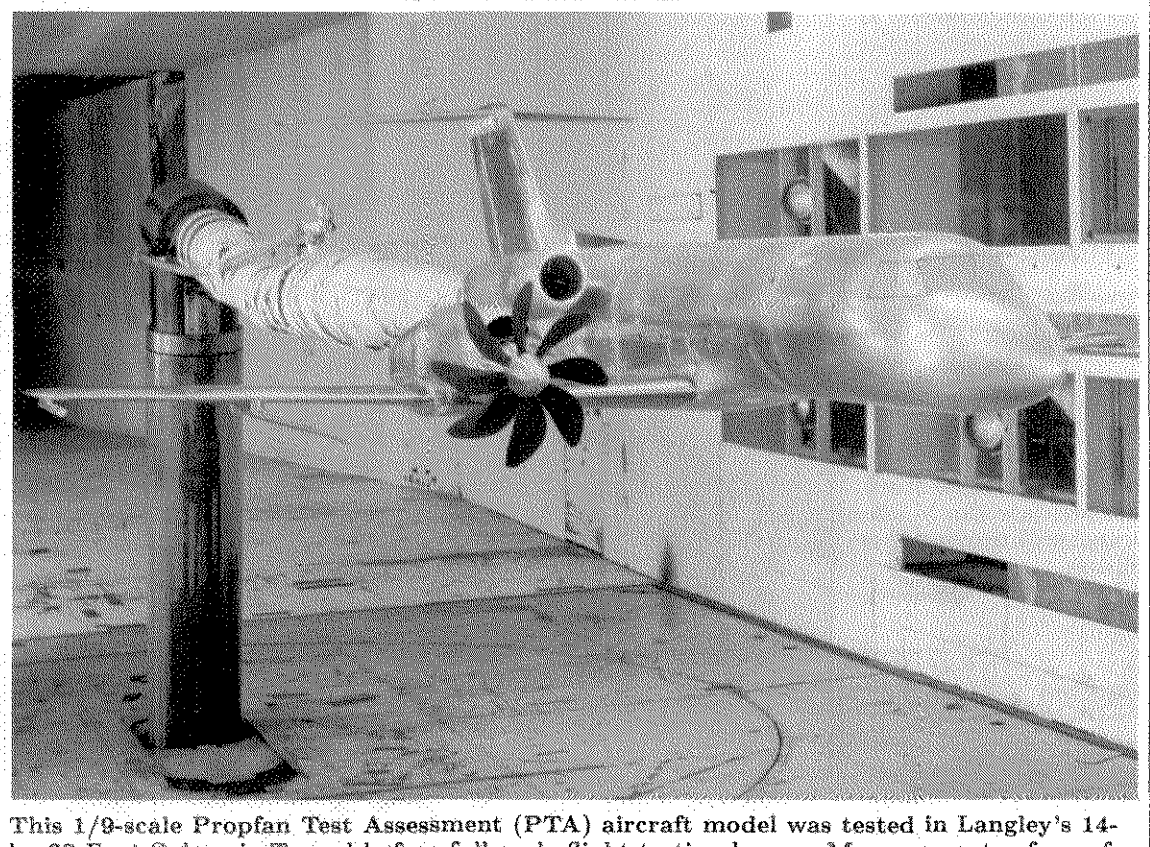
In addition to the propfan engine on its left wing, the commuter- sized aircraft is now modified with an "acoustic treatment test section."

The section has replaced a 10-foot-long circular section of the original interior wall, trim and floor in the mid-section of the cabin. The test section trim stands a little further from the wall, but looks the same as any other trim to the casual observer. The important difference is inside: new tuned resonators (acoustic mufflers) and low-frequency sound-absorbing materials that will provide more isolation per pound between the interior trim and outside structure than current sound-deadening systems.

The experimental section was developed and installed by the Lockheed Aeronautical Systems Company, under a $2.25 million contract with Langley, following ground tests of various cabin noise attenuation designs in a full-scale fuselage section at the company's Santa Clarita, Calif. facility.

Research data will simultaneously be recorded for more than 600 parameters using instrumentation such as microphones, for the acoustics tests, and accelerometers, strain gages, temperature and pressure-measuring gages for blade structures and aerodynamics tests. Ultimately, these data will aid engineers in designing a new generation of propfan-propelled aircraft.

The overall Propfan Test Assessment program is a $56 million program sponsored by NASA's Lewis Research Center, Cleveland, to verify the aeroelastic and acoustic scaling of high-speed turboprops.



This 1/9-scale Propfan Test Assessment (PTA) aircraft model was tested in Langley's 14- by 22-Foot Subsonic Tunnel before full-scale flight testing began. Measurements of propfan noise were conducted in the tunnel to validate propfan noise theory. Additional wind tunnel data verified safety- of-flight aerodynamics and that theoretical design and analysis methods accurately predict airflow about the engine for design purposes.

Club News

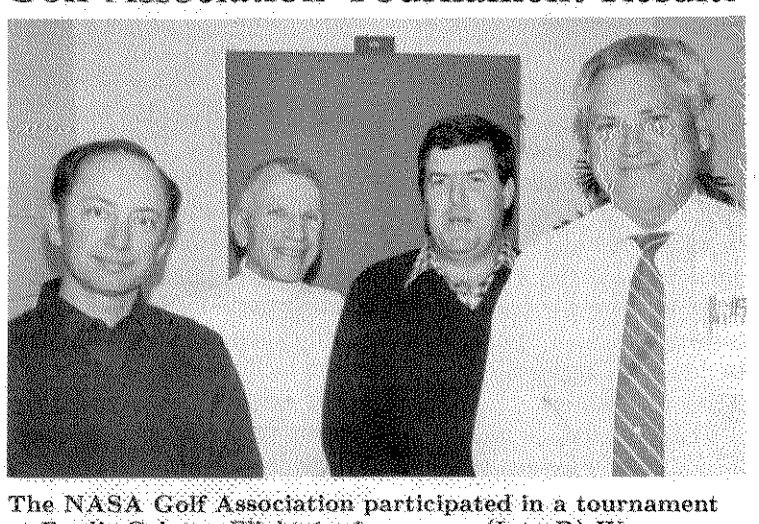
Tennis Club is in the Swing

The Langley Tennis club is planning a very active year with ten tournaments, four different ladder play competitions and an indoor doubles play night.

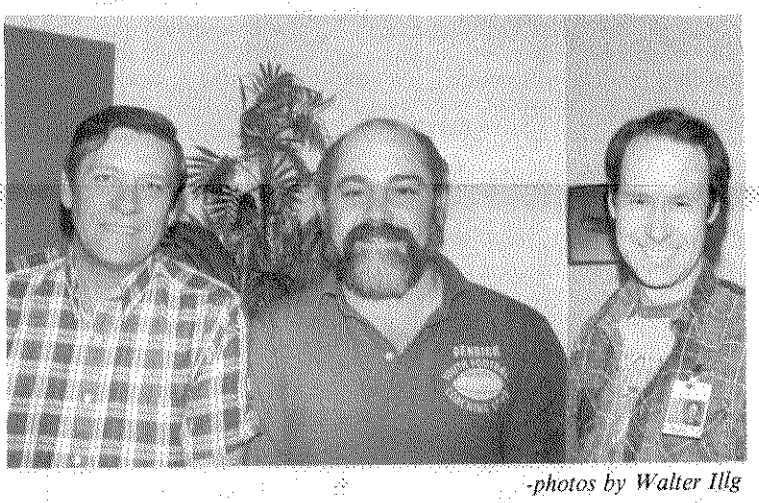
Tennis instruction classes will be available and, hopefully, the new tennis backboard facility will be completed this Spring. A mixed doubles and a women's doubles league is also planned.

Annual club dues are $5. Membership forms can be obtained at the LAA office or by contacting Dick Rountree, ext. 4637, or Tom Yager, ext. 2796.

Golf Association Tournament Results



The NASA Golf Association participated in a tournament at Ford's Colony. Flight 1 winners are (L to R) Wayne Oakley, Walter Illg, Mike Taylor and Don Ewton.



-photos by Walter Illg

Flight 2 winners in the Ford's Colony Tournament are (L to R) Ron White, Don Smith and Bob Bryant. Not pictured is Dick Shaw.

An added note: What a difference one putt can make! After a horrendous seventeen holes, Illg canned a ten-foot putt on the eighteenth for a net-3 that saved first place.

Bowling Stats

The NASA Tenpin Bowling League bowls on Tuesday nights at Victory Lanes in Grafton. Current standings are:

	March 8	March 15
Team High Game	921 Spare Change	932 Spare Change
Team High Series	2622 Spare Change	2714 Scramjets
Male High Game	243 **G. Andrews**	242 **B. Thaxton**
Male High Series	615 **B. Huffman**	614 **B. Thaxton**
Female High Game	234 **M. Aldrich**	228 **P. Gates**
Female High Series	571 **M. Aldrich**	567 **P. Gates**
Most Pins	71 **B. Thaxton**	87 **W. Higgs**
over Average	67 **M. Aldrich**	75 **P. Gates**

Runners Club Intercenter Competition

NASA Intercenter Competition sponsored by the Langley Runners Club will be held April 2—May 1. Ten KM races will be on April 4, 14, 19 and 27; two mile races will be on April 6, 11, 21 and 25. Races start at 5 p.m. on Doolittle Road next to Building 1200.

In addition, a two mile race will be held April 13 on the Bethel High School track at noon.

All NASA employees, retirees, on-site contractors and co-ops at work earn points for Langley by participating. Walkers are welcome and earn points in all races.

In the Fall 1987, Langley finished fourth in the ten KM and fifth in the two mile among the NASA centers. For more information, call Richard Shearer, ext 4508.

People & Places

Current News Releases

To receive a copy of these NASA News Releases, contact Edith Watts, Mail Stop 146, ext. 3017.

88-33.....Space Shuttle Emergency Landing Site Agreement Signed
88-34.....NASA Prepares New Abort Landing Sites for Shuttle Missions
88-35.....NASA Designing Radar to Track Arctic Ice Flow, Study Alaska
88-36.....Abbey Named Deputy Associate Administrator for Space Flight
88-37.....NASA Airborne Observatory Embarks on Solar Eclipse Expedition
88-38.....NASA Issues Updated Mixed Fleet Manifest
88-39.....Next Spacelab Mission to Study Supernova
88-40.....NASA Works to Limit Interior Aircraft Noise
88-41.....Soviet Craft Will Carry Commemorative U.S. Plaque to Martian Moon
88-42.....NASA Announces Three New Shuttle Crews

Cafeteria Promotes Heart-Healthy Dining

The boss takes his office staff to lunch . . . you have a dinner date . . . these opportunities don't have to be something to avoid if you are trying to watch your fat, calorie and cholesterol intake. Several restaurants in this area and across the country have joined forces with the American Heart Association (AHA) to help make those decisions easier . so you can *Dine to your Heart's Content.*

The LaRC Cafeteria is one of the local eating establishments which has adopted the AHA's *Dine to your Heart's Content* program through the efforts of Richard Weeks, cafeteria manager, and the local AHA office.

Menu selections which meet specific AHA dietary guidelines for cholesterol and fat as approved by registered dietitians are identified with a heart symbol.

These dietary guidelines have been designed to stress the importance of continued awareness of cholesterol, fat and calorie intake when eating out. A registered dietitian serving as an AHA volunteer has identified acceptable menu items served at the Langley cafeteria. The menu will continually be updated by nutrition experts to ensure that the specific program criteria are being met.

Participation in this national program demonstrates the concern of cafeteria management for its patrons through offering a wider selection of healthful foods at a reasonable cost. Look for the heart symbol for guidance in heart- healthy dining!

Position Open

88-19: Management Assistant, GS-0344-05 or 06. Management Operations Directorate, Industrial Relations Office. Closes April 5.

Retirement Parties

Eugene C. Naumann will be honored at a retirement luncheon Wednesday, March 30, at 11:30 a.m. in the conference room of Building 648. Cost is $5/person including gift. Contributions to gift only are welcome. Please make checks payable to Raymond Kvaternik, Mail Stop 340, ext. 2661, by March 28.

William H. Mayes will be honored at a retirement luncheon Wednesday, March 30, at 11:30 a.m. at Sam's Seafood Restaurant. Cost is $10/person. Contributions of $2 for gift only will be graciously accepted. Please send cash or check to Sherry Ellis, Mail Stop 463, ext. 3561, by March 25.

Betty C. Farmer will be honored at a retirement luncheon Friday, April 1, at 11:30 a.m. in the Activities Center. Cost of $8.50/person includes gift. Contribution to gift only will also be accepted. Make checks payable to Athena Markos, Mail Stop 125A, by March 25.

Upcoming Workshop

Third NASA/SAE Interior Noise Workshop will be held April 11-12, at the Radisson Hotel, Hampton. For additional information, call Clemans A. Powell, Mail Stop 463, ext. 3561.

-photo by Sandie Horsey

From Behind the Scenes

A Peek Over An Artist's Shoulder . . .

Graphic artist Bill Kluge is in the midst of preparing visuals for the annual State-of-the-Center Address.

Called upon daily to provide visual support, graphics products range from original design, illustration and camera ready mechanicals for printed material . . . to color conceptual renderings in watercolor, gouache, acrylic and airbrush techniques for research publications, conference presentations and briefings . . . and even design, specifications and art direction for exhibits on aerospace themes.

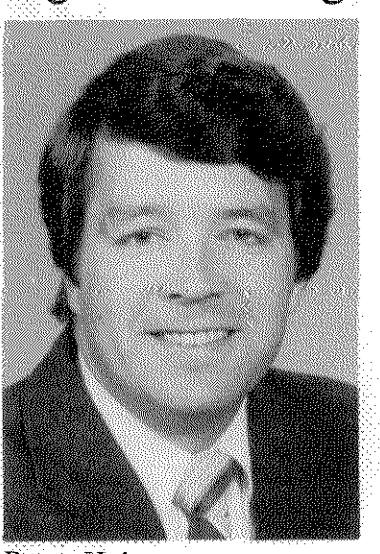
The Graphics Section, Research Information and Applications Division, provides full service graphics support to the research and administrative communities at Langley.

April Programs at Visitor Center

Holmes Presents High-Tech Drag Reduction

A key to the Voyager's successful round-the-world flight was NASA's research in laminar flow control. This means controlling the layer of air next to an airplane's surface, keeping it smooth to reduce aerodynamic drag and to dramatically lower fuel consumption.

On Thursday, April 14, at 7:30 p.m., Dr. Bruce Holmes will discuss laminar flow research and its use on the Voyager and general aviation aircraft. Holmes is head of the Flight Applications Branch. In this position, he is responsible for research in applied aerodynamics and aviation safety with emphasis on subsonic business, commuter and commerical transport airplanes.



Bruce Holmes

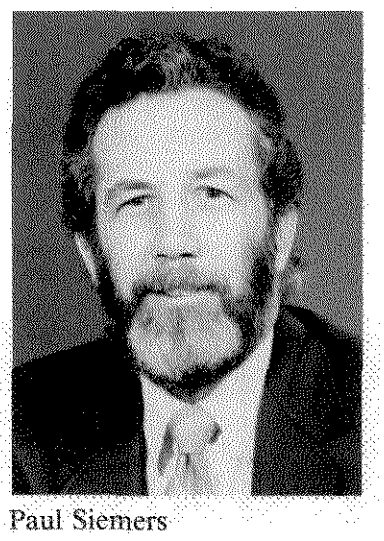
Throughout the month, visitors will be able to view the pattern of airflow by means of a display using special lenses and cameras to transfer these images onto a screen. A streamlined nacelle (jet engine covering) tested for laminar flow will be on display. In addition, a short video discussing laminar flow technology will be shown daily.

Siemers Discusses Aerobraking: the AFE

Paul M. Siemers will discuss the Aeroassist Flight Experiment (AFE), on Wednesday, April 6, at noon in the Visitor Center theater. This presentation is part of the Spring Guest Lecture Series sponsored by the Visitor Center and the AIAA-Hampton Roads Section Student Branch.

Siemers, AFE Science Manager, will discuss the flight test program designed to obtain technological data for an aeroassisted orbital transfer vehicle (AOTV). AOTVs would be used for the delivery and return of science payloads or cargo, servicing equipment or transferring personnel between low- and high-Earth orbit or the Moon.

The aeroassist concept is scheduled to be tested in the mid-1990s when a payload will be launched from the Shuttle cargo bay into geosynchronous or lunar orbit and then brought into low-Earth orbit by aerobraking maneuvers.



Paul Siemers

Happenings

LAA SOCIAL will be held Friday, April 1, from 4 to 6:30 p.m. in the Activities Center.

EASTER EGG HUNT. The Langley Activities Association will sponsor an Easter Egg Hunt Sunday, April 10, at 2 p.m. on the Activities Center grounds. Cost is $1/child.

AIAA SPRING TRIP to Washington D.C.—Paul Garber Aircraft Restoration Facility, Smithsonian National Air and Space Museum and new AIAA Headquarters building— Wednesday, March 30. Bus leaves Activities Center at 6 a.m. Cost is $5 to Duane Melson, Mail Stop 159, by 4 p.m. March 28. Trip limited to 39 people.

AIAA LECTURE SERIES on Superconductivity, April 13-15, in the Activities Center. Pre-registration requested. For more information, contact Ian MacConochie, ext 4963.

NASA GARDEN CLUB. Garden plots, 20- x 40-feet, available. Club dues are $5. Call Martha Norman, ext. 3294, for additional information.

TOASTMASTERS. The NASA Toastmasters Club will meet Wednesday, March 23, 11:30 a.m.-1 p.m. in the Hampton Room of the Activities Center. Visitors are welcome. Call Natalie Johnson, ext. 3483, for further information.

WANTED: Additional member for carpool from Williamsburg area to West Area on 8 a.m. shift. Call Preisser, ext 2619.

FOR SALE: BED, full-size with mattress and box springs, and matching dresser. Also extra, non-matching dresser. Great starter set or good for college. $225. Call 249-2246 after 5 p.m. weekdays.

LOST: WEDDING BAND at LAA gym on or about Friday, March 4. If found, please call 865-1554/daytime or 865-2546/evening. Reward.

FOUND: FLOPPY DISK. Found on March 11 on the sidewalk between buildings 1148 and 1293A. To claim, call Suzanne in Security, ext. 2453.

HELP: Will the person who borrowed the PC TEXdisks in boxes, kindly contact Cheryl Winstead, ext. 2561.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
FY 1989 BUDGET SUMMARY
(Millions of Dollars)

	FY 1988	FY 1989
Research and Development	$3294.5	$4446.7
Space Station	392.3	967.4
Space Transportation Capability Development	609.8	631.1
Space Science and Applications	1575.8	1859.6
Space Applications	566.3	562.3
Commercial Programs	73.7	57.9
Aeronautical Research and Technology	334.8	414.2
Space Research and Technology	223.6	390.9
Transatmospheric Research and Technology	52.5	84.4
Safety, Reliability and Quality Assurance	14.1	22.4
Tracking and Data Advanced Systems	17.9	18.8
Space Flight, Control, and Data Communication	3810.7	4841.2
Shuttle Production and Capability Development	1088.3	1400.5
Space Shuttle Operations	1838.0	2405.4
Space and Ground Networks, Communications and Data Systems	884.4	1035.3
Construction of Facilities	178.3	285.1
Research and Program Management	1743.0	1915.0
TOTAL BUDGET SUMMARY	**$9026.5**	**$11488.0**

The NASA budget submitted by President Reagan to the Congress in February.

Truly Positive About Shuttle Recovery Program

Rear Admiral Richard H. Truly, associate administrator for space flight, sees as his job "to provide the necessary wherewithall to do NASA's business in space." A positive attitude about the Space Shuttle recovery program and NASA's return to manned space flight emanated as Truly spoke to Langley employees at the March 14 colloquium.

Truly noted Langley Reseach Center contributions to the Shuttle program—three decades of research and technology—and to the recovery effort— redesign of solid rocket booster (SRB) seals, complex analysis of the structure of the SRB aft skirt, and a proposed crew escape option. "You played a part, made a difference, and I appreciate it," Truly said.

Admittedly morale after the loss of the Challenger was low, Truly reports, but "the morale today is sky high." The field centers have never worked more closely. The astronauts have been an integral part of the decision making. "We're together as one team, ready to fly."

Truly emphasized that all risk can never be removed from the program. To remove all the risk from a flying program would mean to stay on the ground. "And we don't intend to do that," Truly said.

Truly feels the Fiscal Year 1989 budget is at the core of our future in space. "The budget provides the nation a choice of where we want to be in the future." A self-proclaimed optimist, Truly regards the NASA budget as constrained but affordable—a means for the nation to get back to leadership in space.

-photo by Sandie Horsey

Rear Admiral Richard H. Truly studies a grooved section of Langley's 1/4-scale SRB O-ring test apparatus held by Cynthia L. Lach, aerospace engineer, Fatigue and Fracture Branch. Lach explains Langley's investigation of the effects of temperature, vibration, surface finish and the like on O-ring sealing in support of the SRB redesign program. Truly was briefed on a number of Langley programs prior to his presentation on the Shuttle Recovery Program to LaRC employees.

Researcher News

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Permit No. G-27

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

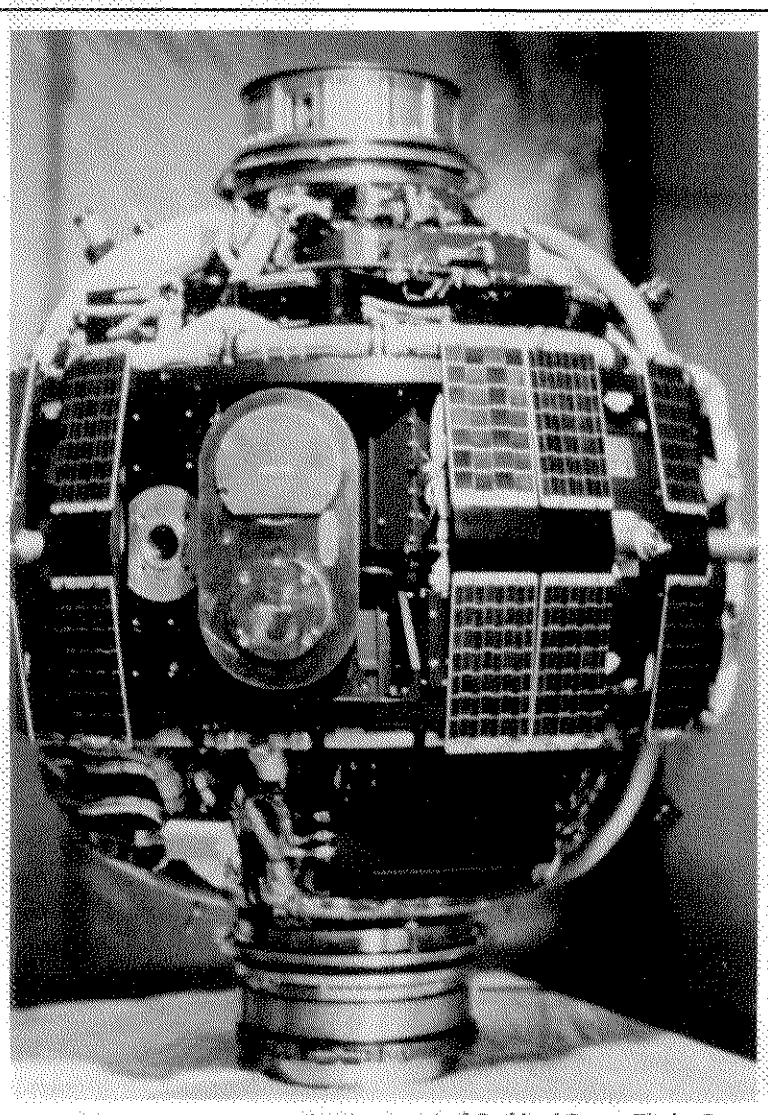
Official Business
Penalty for Private Use $300

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 2, Issue 7 April 8, 1988

News Researcher

Bi-weekly Employee and Contractor Publication



-photo courtesy of Goddard Space Flight Center

The San Marco D/L spacecraft, an international satellite designed to study the lower atmosphere, was launched on a U.S.-supplied rocket by an Italian launch crew.

Scout Launched Successfully

The Langley-managed Scout launch vehicle soared successfully into low Earth orbit Friday, March 25, carrying the San Marco atmospheric spacecraft. The spacecraft was launched from Italy's equatorial range in Kenya at 2:50 EST.

The 522-pound spherical spacecraft, designed and built by the University of Rome's Centro Ricerche Aerospaziali and managed by the Goddard Space Flight Center, carried five scientific instruments—one from Italy, one from West Germany and three from the United States. Two of the U.S. instruments were from

The expendable launch vehicle performed nominally, placing the spacecraft into an elliptical orbit of 2.9 degrees inclination.

Spacecraft housekeeping checks have been performed and the systems are functioning normally. Data comes down through a tracking station located at the launch site and from there is sent, electronically, to Rome.

-photo by Sandie Horsey

Cafeteria Manager Richard Weeks seems to have just the right items on the menu to please each and every visitor to the Langley cafeteria. This furry visitor with the floppy ears hopped in last Friday with Easter treats for everyone.

Bigelow Selected for Penn State Management Program for Women

Dr. Catherine A. Bigelow, a research engineer at the Langley Research Center, has been accepted for the Management Program for Women at Pennsylvania State University.

The management program is appropriate for women with recently acquired management responsibilities who must learn to supervise and motivate other professionals. New managers may have been contributing technical skills for many years and recently have chosen to enter management.

In her position in the Fatigue and Fracture Branch, Bigelow manages five employees in the analyzing and testing of composite materials, particularly in areas of computational fracture mechanics and metal matrix composites. In addition, she monitors two research grants and one large research contract in computational fracture mechanics.

Bigelow says that she is very interested in learning more about management skills and techniques. "I feel that the opportunities for women in technical management within NASA are unlimited and exciting," she explained. 'Penn State program will be an excellent way to gain a basic grounding in a variety of areas of management. The skill that I will learn in a program of this nature will be very beneficial, not only to me personally, but also to my employing organization."

Bigelow has worked in the Materials Division at Langley since January 1979 and has specialized in finite element analysis and metal matrix composites. The author or co-author of 25 technical papers, she has received a NASA Tech Brief Award and a NASA Award of Recognition for her research and testing of composite materials.

A native of Vermont, Bigelow received a bachelor of science degree in civil engineering from the University of Vermont in June 1975. She earned master of science and doctorate degrees in civil engineering from Georgia Institute of Technology in June 1977 and December 1984, respectively.

NASA-Langley to Host Transonic Symposium

Significant advances have been made in computer hardware, theoretical and computational methods, applications, experimental facilities and testing techniques. These advances now provide NASA with capabilities in the transonic regime which were hardly envisioned six years ago.

Approximately 100 NASA, industry and university associates will gather at the Langley Research Center April 19-21 to assess the state of the art in the various transonic flow disciplines and take a glimpse of future directions. Emphasis will be placed on steady, three-dimensional, external, transonic flow and its simulation, both numerically and experimentally.

During the NASA Transonic Aerodynamics Symposium, papers will be presented on topics such as the National Transonic Facility; wind tunnel and flight experiments; airframe propulsion integration characteristics; application/validation of computational fluid dynamics for configuration, analysis and design; three-dimensional mesh generation; computational support of the X-29 advanced technology demonstrator flight experiment; turbulence and modeling in transonic flows; compressible boundary-layer stability; and instrumentation advances for transonic testing.

The three-day conference will be held in the Langley Activities Center, building 1222, beginning at 8 a.m. with a welcome by Dr. William F. Ballhaus, acting associate administrator for aeronautics and space technology at NASA Headquarters, Washington, D.C., and Richard H. Petersen, Langley director.

General chairman of the symposium is Percy J. Bobbitt, chief of Langley's transonic aerodynamics division. Other Langley participants are James L. Thomas, Edgar G. Waggoner, Linwood W. McKinney, Jerome T. Foughner Jr., Walter E. Bruce Jr., Blair B. Gloss, James M. Luckring, Charles H. Fox Jr., William P. Henderson, Bobby L. Berrier, Richard D. Wagner, Dennis W. Bartlett;

Dal V. Maddalon, William D. Harvey, Charles D. Harris, William G. Sewall, Dan M. Somers, Manuel D. Salas, Lawrence E. Putnam, John T. Batina, David A. Seidel, Robert M. Bennett, Herbert J. Cunningham, Samuel R. Bland, Richard L. Campbell, Harry L. Morgan, James C. Ferris, Laurence K. Loftin Jr., Robert A. Kilgore, David A. Dress, Perry A. Newman, Veer N. Vatsa and Raymond E. Mineck.

Langley Colloquium

Artificial Intelligence for Fighter Aircraft

The Pilot's Associate Program is an application of the Strategic Computing Program, sponsored by the Defense Advanced Research Projects Agency. Its objective is applying artificial intelligence and advanced computing architectures to single-seat, advanced fighter aircraft. The goal of the program is to improve the pilot's situational awareness through intelligent information and workload management.

The Pilot's Associate Program and its major functions will be discussed at a Langley colloquium by Captain Carl Lizza of Wright Patterson Flight Dynamics Laboratory, Dayton, Ohio. The lecture, "The Pilot's Associate: Artificial Intelligence for Fighter Aircraft," will be held Monday, April 11, in the Langley Activities Center, at 2 p.m. A question and answer session and an informal discussion will following the lecture.

Lizza is the technical director for the Pilot's Associate Program. His research focuses on integrating artificial intelligence, conventional algorithms, parallel processing, and symbolic computing into a real-time, man-in-loop simulation environment.

News Briefs

HEADQUARTERS, Washington, D.C. — NASA has received a $3.2 million check from United Technologies Corporation's Pratt & Whitney, West Palm Beach, Fla., as last year's recoupment for the Agency's Refan and Engine Component Improvement (ECI) programs. The funds, presented to Dr. James C. Fletcher by William C. Missimer, President of Pratt & Whitney's Government Engine Business, will be deposited in the U.S. Treasury.

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — A programmable implantable medication system (PIMS) has been developed by the Johns Hopkins University Applied Physics Laboratory using technology employed on NASA's Viking Missions to Mars. This technology was made available through the Agency's technology utilization program. Once PIMS passes its clinical trial, the device will free an estimated one million insulin-dependent diabetics from their daily injections of the pancreatic hormone.

HEADQUARTERS, Washington, D.C. — Negotiations between NASA and the European Space Agency (ESA) on a bilateral memorandum of understanding for cooperation in the design, development, operation and use of the permanently manned civil international Space Station complex have been successfully completed. The continuation of cooperation between NASA and ESA marks the end of more than 2 years of negotiations on the technical and programmatic framework between the two agencies in the largest cooperative civil space project ever undertaken.

HEADQUARTERS, Washington, D.C. — NASA in cooperation with the Council of Chief State School Officers invites American students to participate in a national competition to name NASA's replacement Space Shuttle orbiter. The new orbiter, designated OV 105, is under construction by Rockwell Internation and is scheduled for completion in April 1991. To enter, elementary and secondary school students will form teams and research a name. Each team will prepare a related classroom project to support and justify the name selected. Entries must be post-marked December 31, 1988.

HEADQUARTERS, Washington, D.C. — Eight finalists have been selected for the NASA Excellence Award for Quality and Productivity for 1987. The finalists are Bendix Field Engineering Corp., Columbia, Md.; Boeing Computer Support Service, Inc., Huntsville, Ala.; General Electric Co., Spacecraft Operations-Valley Forge, Philadelphia, Penn.; Lockheed Engineering & Management Services Co., Houston, Tex.; Lockheed Space Operations Co., Titusville, Fla.; Pan Am World Services, Inc., National Space Technology Laboratories, Miss.; Rockwell International, Rocketdyne Div., Canoga Park, Calif.; and Rockwell Internaional, Space Transportation Div., Downey, Calif.

Editor's note: Recent surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017. Request information by release number and headline. See Current News Release information box on page 3.

Skylab Revisited

Our nation's goal for a permanently manned Space Station with the next decade gives impetus to reflections on Skylab, the world's first, highly successful manned space station.

On May 11, a unique conference will be held at the Von Braun Civic Center and the Alabama Space and Rocket Center in recognition of the fifteenth anniversary of Skylab. Speakers and panelists will include designers, engineers and astronuats involved in this significant milestone in our nation's history of manned space flight.

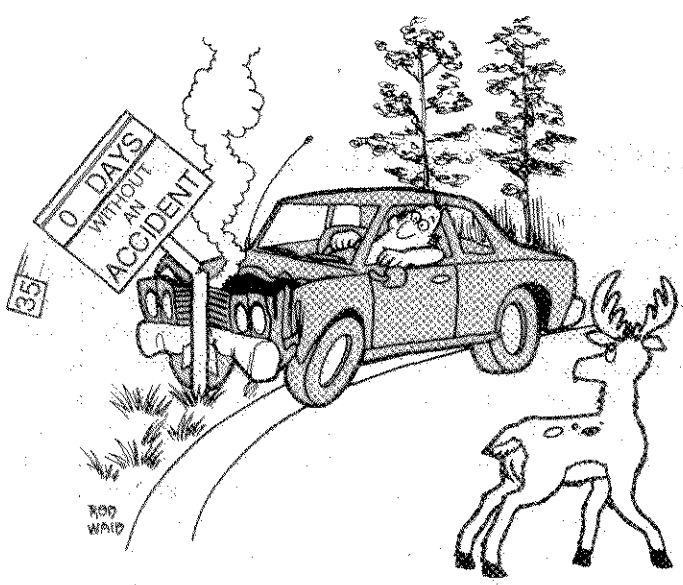
This conference will bring together many of the actual participants of Skylab and will present a comprehensive overview of the broad scope of the project, its impact on current research activities and it implication for Space Station.

Skylab Revisited is sponsored by the National Space Club, Huntsville Committee; NASA; the University of Alabama in Huntsville; the AIAA, Huntsville Chapter; and the Chamber of Commerce, Hunstville/Madison County. For further information regarding the conference and for registration details, contact Ms. Karen Mack, Director of Conferences and Marketing, Division of Continuing Education, University of Alabama in Huntsville, Tom Bevill Center, Huntsville, Ala.

In Memoriam

Sympathy is extended to the family of Samuel K. Gibbs, who died March 16. Gibbs, an engineering technician, retired from NASA in 1972 after 28 years of service.

Lankley



Editorials

Langley

Headquarters Forum

Walt Lempert, IRD, developed a method to measure the hydroxyl (OH) concentration and gas temperatures in a 2,000 degree F. combustor gas flow using ultraviolet absorption by OH. And we now have a high-efficiency, tunable solid- state laser material, Ti:sapphire, for use in satellite borne lidars thanks to the work of Chuck Byvik's battalion in the Flight Electronics Division (FED).

Jeanne Huffman's crew in Technical Editing have developed the procedures and systems necessary to edit and format your literary gems in a day or so, when the deadlines are tight. And the drumbeat goes on . . . .

A list of them all would surprise you and me, for most of the items, neither of us have ever heard of. Nevertheless, each of them is necessary for our Center to so successfully fulfill its research mission. Further, they contribute strongly to the building of an advocacy for NASA in the private sector, especially when they spawn new business.

My request to you, dear reader, is the next time you see something that qualifies as significant—say something to those providing it—for, directly or indirectly, you are benefitting from it too.

W. D. Mace
Director for Electronics

I recently received a letter from someone in Aeronautics commending a person in the Instrument Research Division (IRD) for outstanding contributions to his research project . . . contributions which the author judged to be enabling in nature.

It is not unusual to receive letters such as this . . . nor are the plaudits reserved for civil servants. Members of the Langley family who happen to be on an NPS contract are often cited too. My objective here is to call attention to these contributors, for often times their work is taken for granted.

A presumptive dependence upon the supporting research and the research support elements at Langley is embedded in our culture—as well it should be—they are always there and they always deliver. And further, what they deliver frequently represents a breakthrough in their own discipline—breakthroughs that are quickly exploited commercially by others.

I think a listing of such contributions over, say the last five years or so, would surprise us all, both in terms of their technical quality and the number of organizations from which they came.

As examples, did you know that Cecil Nichols in the Facilities Engineering Division (FENGD) came up with a way to reduce the cost (by 3,000 times) of polystyrene latex spheres which we use to seed a tunnel flow for the purpose of enhancing measurements of that flow? Or that the real-time simulation data net developed by Dan Crawford's team will not only serve Langley's needs well into the future, but has spawned a company that has sold the equipment to 80 or more users nationwide?

Safety Urges You to Be Aware

Since the tragic loss of Challenger, the NASA team, implementing a recommendation of the Rogers Commission and the House Science and Technology Committee, established the Office of Safety, Reliability, Maintainability and Quality Assurance (SMR&QA) headed by George A. Rodney, who reports directly to the NASA Administrator. The functions of the new office are independent of other NASA program responsibilities.

The enhanced program divides safety into three areas—institutional safety, operational safety and system safety—and a risk management program has been implemented as well as a safety information system.

The Langley Research Center has had an outstanding year safety-wise, but our safety officials remind you that even the most innocent distraction can be a safety hazard as today's cartoon suggests. At Langley, the number one safety priority is you. See the safety update on page six.

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff. Address contributions to the Editor, Mail Stop 115, telephone 865-3707. Articles are due at noon on the Thursday following the date of this issue.

Managing Editor . . . Jean Drummond Clough
Editor . . . Marny S. Skora
Photographs . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

NASA-Langley Scientists Receive SAMPE Award

Paul M. Hergenrother and Norman J. Johnston were honored at the 33rd International Society for the Advancement of Material and Process Engineering (SAMPE) Symposium and Exhibition held recently in Anaheim, California.

Hergenrother, senior polymer scientist, Polymeric Materials Branch, and Johnston, chief scientist, Materials Division, were presented the Everett S. Frye and Harvey L. Parry Award. The award recognizes the best paper in the field of reinforced non- metallic composite materials presented at the preceding symposium. The award-winning paper was entitled "High Performance Thermoplastics."

The SAMPE is an international society providing continuing education in new materials technology and processing and technical forums in which engineers and scientists can exchange ideas. As the only technical society encompassing all fields of endeavor in materials and processes, SAMPE provides a unique and valuable forum for scientists, engineers, technicians, and corporations

Hergenrother joined the Langley Research Center in 1980 after holding various technical and management positions at Mellon Institute and Koppers Co. in Pittsburgh, Pa.; Whittaker Corporation, San Diego, Calif., and Boeing Aerospace Company, Seattle, Wash. He is internationally known for his work in high performance organic polymers. He is the author or co-author of more than 100 publications and is the holder of numerous patents.

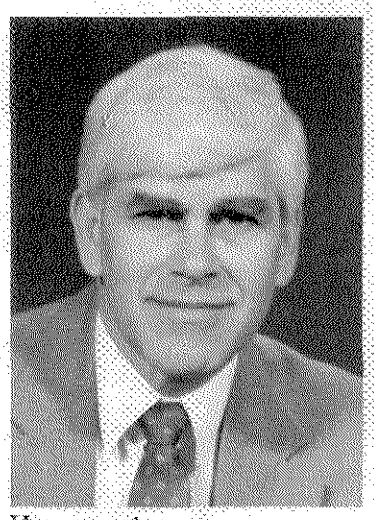
Hergenrother has received several NASA awards, including a NASA Medal for Exceptional Scientific Achievement. He is also the recipient of the Distinguished Lecture Award presented by the Society of Polymer Science, Japan.

In his present position, Hergenrother is responsible for the development of high performance/high temperature polymers for potential use as structural resins on aerospace vehicles.

Johnston joined the Langley Research Center is 1967. After receiving a doctorate in organic chemistry from the University of Virginia, he spent two years at General Electric Research Center, Schenectady, N.Y., and three years as an assistant professor at Virginia Tech. He is internationally known for his work in polymer chemistry and composites on which he has lectured extensively.

In 1982, Johnston shared the best technical paper award with T. Kevin O'Brien, U.S. Army Aviation Systems Command at the 27th National SAMPE Symposium and Exhibition. Johnston has received several NASA special achievement and group awards.

As chief scientist, Materials Division, Johnston is responsible for the advancement of composite technology. In this capacity, he conducts innovative research and coordinates composite activities with other organizations at Langley.



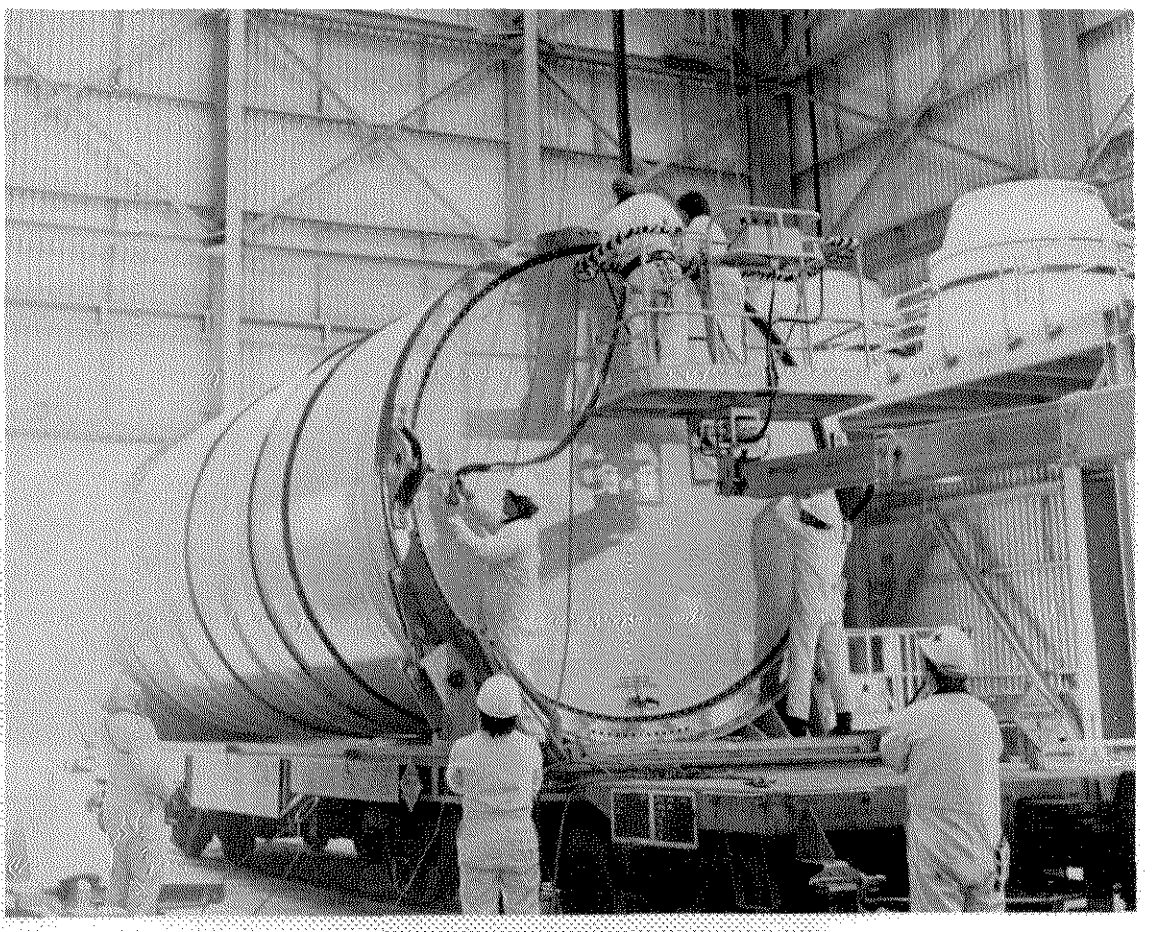
Hergenrother

Johnston

Current News Releases

To receive a copy of these NASA News Releases, contact Edith Watts, Mail Stop 146, ext. 3017.

88-43.....NASA Aviation Technology Provides Return on Government Investment
88-44.....Negotiations Completed on NASA/ESA Space Station Agreement
88-45.....NASA Technology Aids Diabetics
88-46.....Shuttle Orbiter-Naming Competition Announced
88-47.....Eight Firms Selected as NASA Quality and Productivity Finalists



KENNEDY SPACE CENTER, Fl. — Technicians prepare the STS-26 left aft segment for processing in the Rotation Processing and Surge Facility. Booster processing for flight kicked off with the segment's timely arrival on March 2. Since the aft segment is the first piece to be stacked on the mobile launcher platform, its delivery is a critical milestone. Discovery is scheduled to be launched from Launch Pad 39-B in August, resuming flight of the Space Transportation System.

Safety says 'Be Aware'

Safety Office Reports 1987 Record Safety Year

A discussion on safety generally conjures up thoughts of lists and lists of rules and regulations, policies and procedures, DOs and DON'Ts.

In talking with Langley Research Center safety heads, however, an atmosphere of confidence and calm pervades, and a genuine concern for people and a respect for property is obviously first priority.

Bill Wessel, safety manager and head, Safety Engineering Branch, reports with pride that Langley has had another outstanding year in the area of safety. "We have a unique situation at Langley. There's grass-roots support for safety in the facilities and from line management all the way up to the Office of the Director."

The Langley community resembles a small city. From a safety standpoint, Wessel says Langley's infrastructure has everything but residences. It contains fabrication and machine shops; a foundry; wind tunnels; chemical, radiation and pyrotechnic research laboratories, administrative support facilities; a cafeteria; libraries and classrooms; roads, grounds and vehicle traffic; electrical substations; and air and utility distribution systems. Langley real estate is valued at $1.5 billion and the community is populated by nearly 5,000 employees, both civil servants and support contractors.

Within this framework, Langley has generally been an Agency leader in safety and safety awareness. "Research can be risky," Wessel says, "and we're in the risk management business. Our goal is to make the Langley Research Center a safe and effective place to work for everyone. The Safety Office has never been better staffed, nor has our staff been better trained. And we have never been more challenged."

Langley has obviously risen to the challenge. 1987 saw only five lost time accidents in the civil service complement; 19 lost time cases for contractors. This represents a frequency of accident rate of .17 and 1.19, based on 200,000 hours worked, for government employees and contractors respectively. The overall Agency lost time accident rates for 1987 were .35 and .87 for the 200,000 hours.

While statistics tell part of the story, the success of Langley's safety efforts can be traced to the programs and procedures that have been implemented to ensure heightened sensitivity to safety.

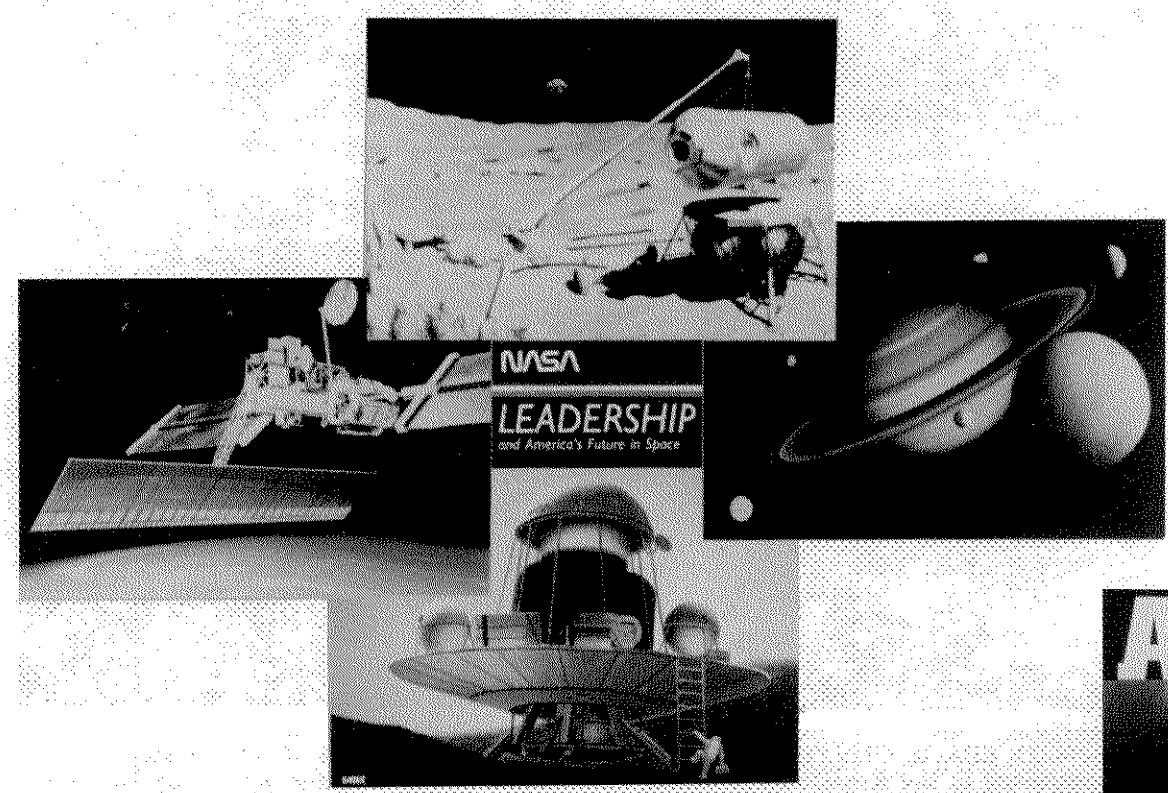
Research and operations personnel are active participants in defining safety policies. And checks and balances are in place—safety analyses, established standard operating procedures, emphasis on training, and regular review and inspection programs have been implemented.

Clarence Breen, senior safety specialist, is quick to point out that safety is a "people business. While it is our job to identify shortcomings and point out weaknesses, the Langley safety staff always tries to suggest a solution, provide training or offer safety equipment to remedy an unsafe situation. I'm a student of ergonomics—the mutual adjustment of man and the machine." That combination offers a safety challenge . . . one that has been accepted at Langley.

It becomes apparent that the focus of the Langley safety office is not **Beware**, but rather **Be Aware**.

YEAR OF 19

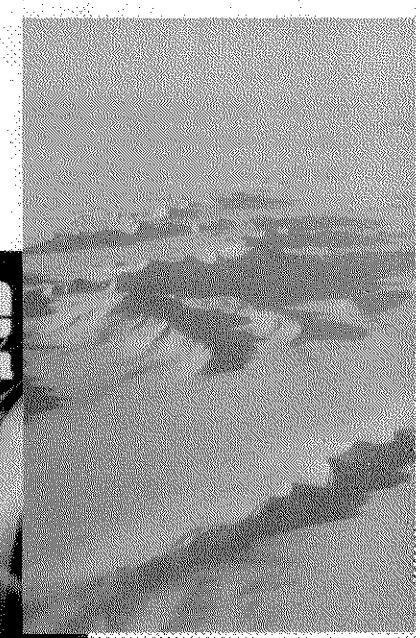
Center Director Richard H. Petersen spoke to employees, support contractors and retirees on the state of NASA and the Langley Research Center. Petersen called 1988 a "Year of Decision" both for the country, because it is a presidential election year, and for NASA and the U.S. space program. Following are excerpts from Petersen's message.



The Sally Ride study, conducted at the request of the NASA Administrator, outlined four bold new initiatives to restore U.S. leadership in space. The candidate initiatives are (clockwise from left) Mission to Planet Earth; Outpost on the Moon; Exploration of the Solar System; and Humans to Mars.

"President Reagan has clearly stated in a new national space policy that the U.S. will strive for leadership in space. He has proposed a budget for FY 1989 which is adequate to support a world-class program. This is a 'Year of Decision' in which the public, the Congress and the next President will decide whether we are willing to pay the price to be leaders in space."

"It's impossible to catalog the many achievements whic
happen each year. I'm always reluctant to name a few, bec
many. But consider the following examples:



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— Langley UV-Dial and
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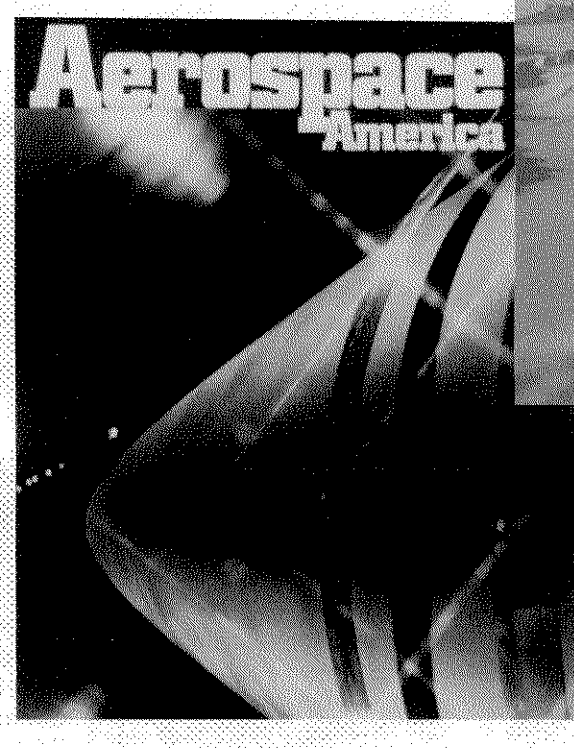

• LAMINAR FLOW — the Large Eddy Breakup Device

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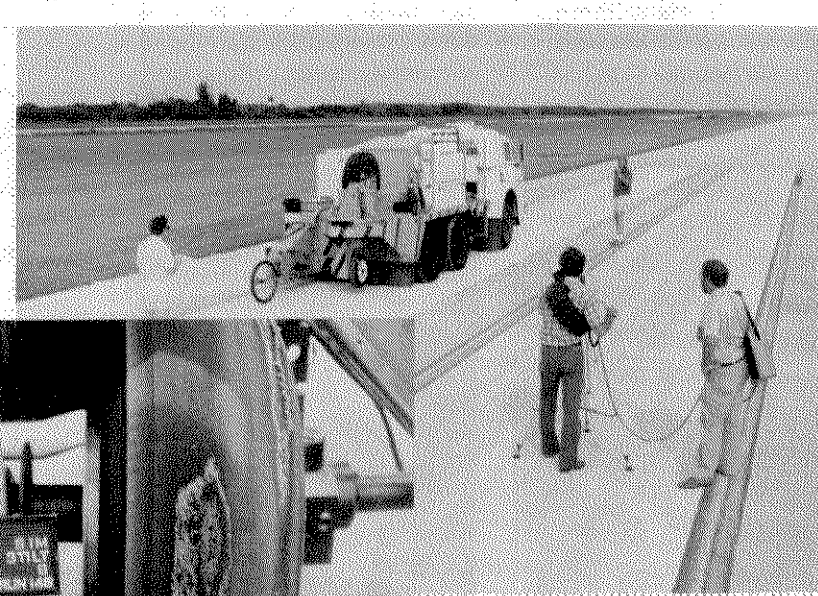
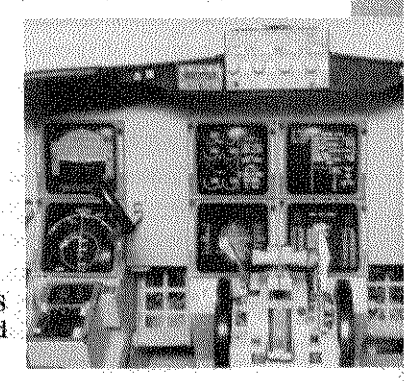


• CONTINUED SUPPORT OF SHUTTLE RECOVERY — Tire Research and Modification to KSC Runway



• ATOPS AIRCRAFT RETURNED TO FLIGHT STATUS — Advanced Display System and Computers

State of the Center Address

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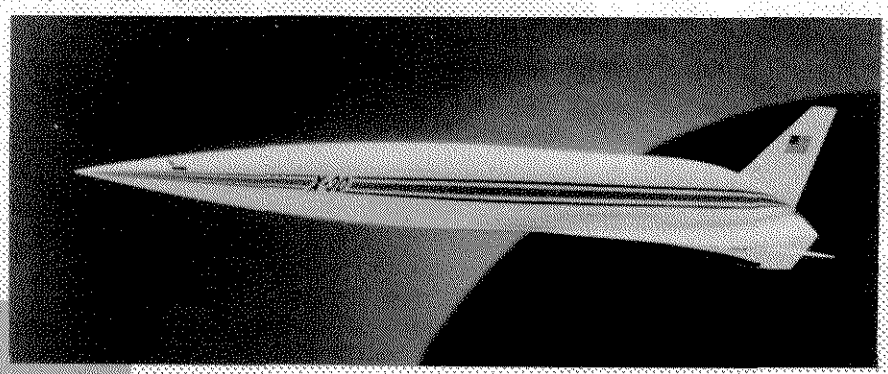
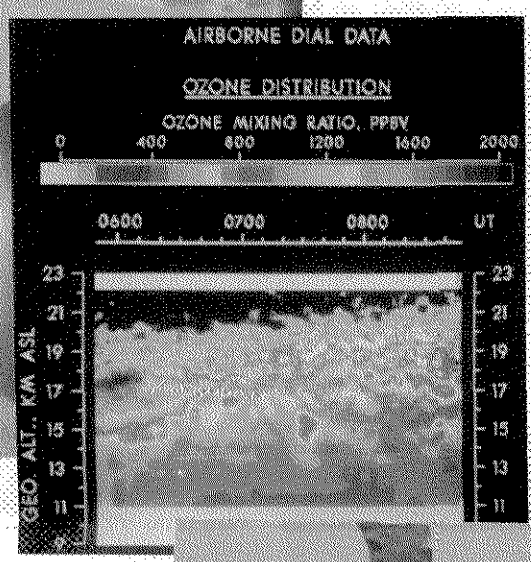


• NATIONAL AEROSPACE PLANE PROGRAM — Engine/Airframe Down Select Process



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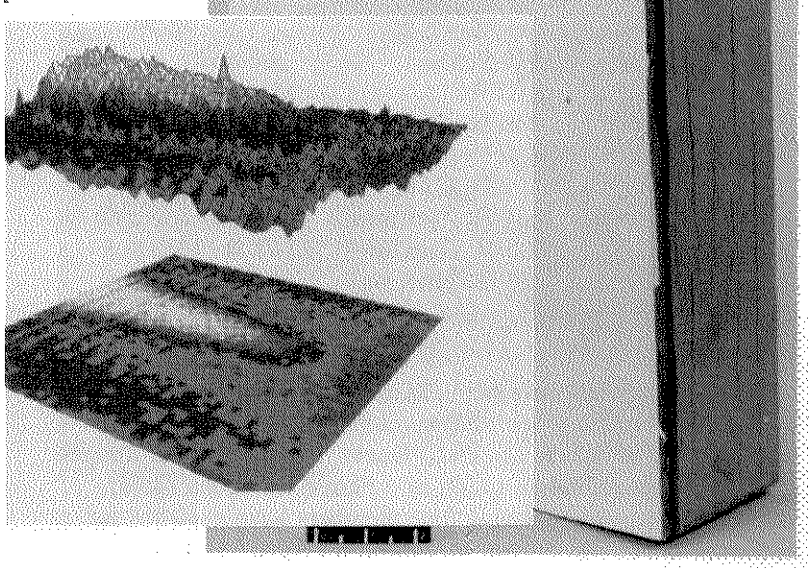
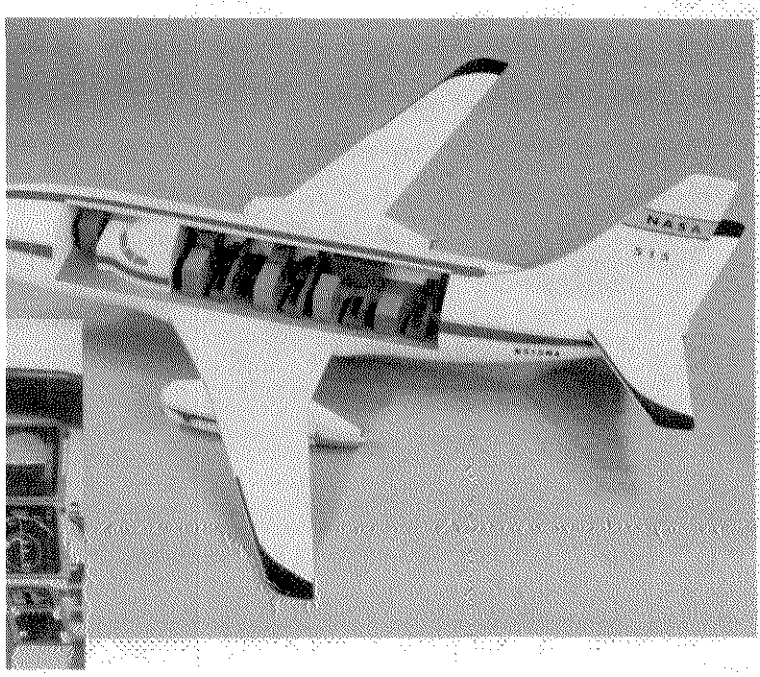




As a result of the recent strategic planning session, Langley's primary goal is INCREASED FUNDING FOR BASIC RESEARCH. Goals in the areas of aeronautics and space are enumerated below:

AERONAUTICS

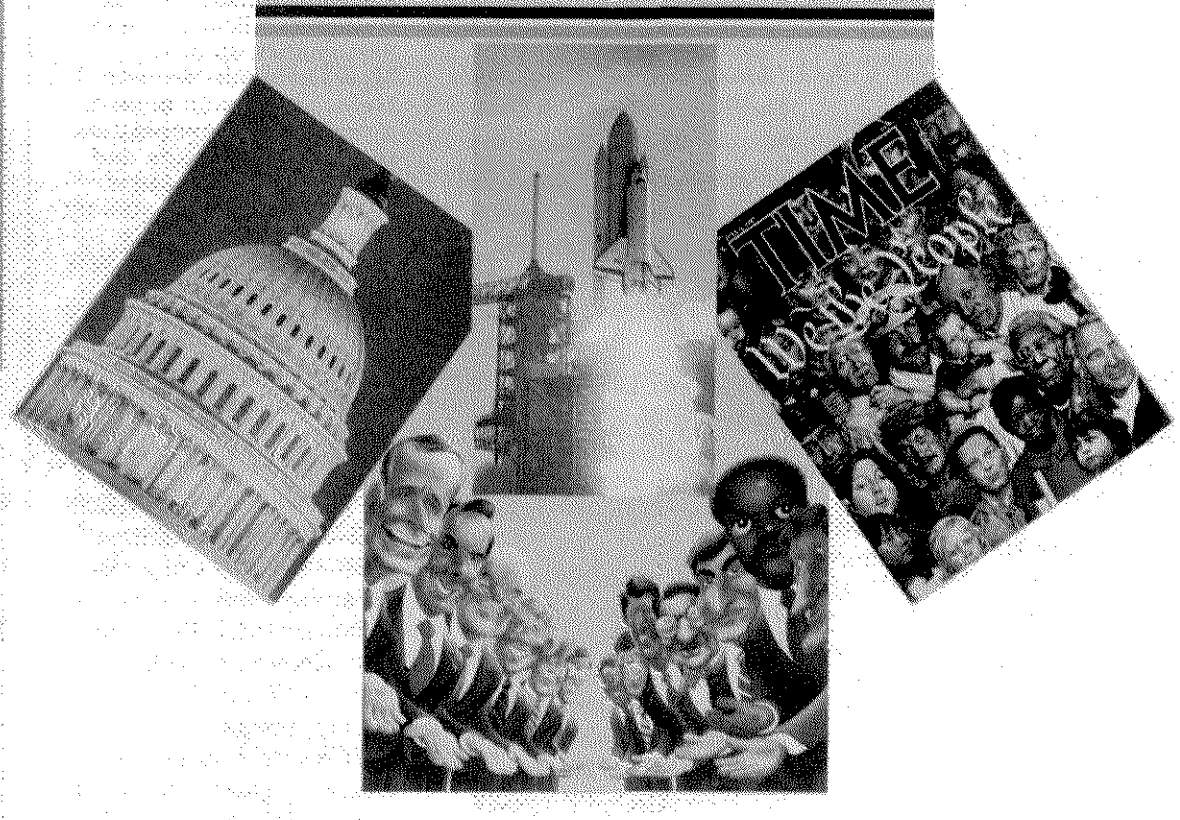
- Achieve full operation of NTF
- Increase generic hypersonic research
- Advocate high speed transport aircraft research
- Advocate manpower for wind tunnel operations

SPACE

- Obtain approval for EOS experiments
- Obtain approval for AFE experiments
- Develop major role in Pathfinder 'transfer technology'
- Assure lead role in Pathfinder 'on-orbit construction'
- Advocate technology for 'Mission to Planet Earth'

"In summary, 1988 is a year of decision for the U.S. space program and NASA. President Reagan has provided a national space policy and FY 1989 budget proposal which will allow us to maintain a world-class space program. But it is going to be a very difficult year in Congress and the results are impossible to foresee. As U.S. citizens, all of us should be involved in the political process during this year."

YEAR OF DECISION



"Langley continues to be a major asset, both to NASA and to the U.S. Our achievements are widely recognized. Thanks to all of you for your hard work. I know you will continue your outstanding efforts and 1988 will be another year of solid achievement for the Langley Research Center."

Editor's note: The State of the Center Address was videotaped for the convenience of Center employees and retirees unable to attend the scheduled presentations. Copies of the address may be checked out of the technical library for viewing.

Employees Honored for CFC Contributions

Sixty Langley employees and four retirees were honored at a special reception Wednesday, March 30, at the Ramada Inn in Newport News for their contributions to the 1987 Combined Federal Campaign.

These employees and retirees have been named to the Keel Club, established by the United Way in 1980 to recognize Peninsula residents who give $500 to the local CFC and/or the United Way. At the reception, the honored guests were presented plaques "in special recognition of distinguished support and leadership in providing for the human care needs of our community."

Langley retirees receiving awards were Edwin C. Foudriat, Robert MacLachlan, William H. Phillips and Erma T. Walker.

Employees receiving plaques were Richard R. Adams, Susan L. Althoff, Charles P. Blankenship, Robert E. Boughner, Emedio M. Bracalente, Michael D. Bray, James J. Buglia, Michael F. Card, Preston I. Carraway III, James P. Chamberlain, Kenneth N. Cole, Jeanne D. Covington, Sidney C. Dixon, Joseph W. Drewry, Barbara J. Durling, Douglas Dwoyer;

Jarrell R. Elliott, Robert E. Grandle, James L. Harris, Gale A. Harvey, Gael M. Hawkins, Jane S. Hess, Robert V. Hess, Gerald F. Hill, David A. Hinton, Paul F. Holloway, Harlan K. Holmes, Jacob A. Houck, Dorothy T. Howell, Robert J. Huston, Winfred S. Kenner, Pierce L. Lawing, Mary H. Lewis, William D. Mace, Eric I. Madaras, Ralph J. Muraca, Stewart L. Ocheltree;

Joan I. Pitts, Joseph A. Poslik, Frank P. Quinto, Edward J. Ray, Reginald C. Rose, Richard A. Russell, William I. Scallion, David R. Schryer, Dewey M. Smith, Samuel Sokol, Michael R. Sorokach Jr., Jerry C. South Jr., Dean W. Sparks, Dean W. Sparks Jr., M. Leroy Spearman, Joseph W. Stickle, Robert L. Swain, John A. Tanner, Susan J. Voight, Randall Voland, Joe David Watts, Bruce A. Wielicki and Charles V. Woerner.

The CFC is the only fund-raising drive sanctioned by the government for employee solicitation. The money collected during the campaign, which was supported by over 27,000 federal employees last year, enables participating organizations to help meet the needs of the people in our community.

Positions Open

The following competitive placement positions are currently open:

88-19: Management Assistant, GS-0344-05 or 06, Management Operations Directorate, Industrial Relations Office. Closes April 8.

88-21: Support Services Supervisor, GM-342-14 or 15, Management Operations Directorate, Management Support Division. Closes April 8.

88-22: AST, Facilities Systems Safety, GM-801-13 or 14, Systems Safety, Quality and Reliability Division, Safety Engineering Branch, Safety Engineering Section. Closes April 22.

S88-1: Employee Relations Specialist, GS-0230-07 or 09, Management Operations Directorate, Personnel Division, Employee Development and Services Branch, Employee Relations Section. Closes April 15.

Positions Filled

Donald R. Beasley has been selected Supervisory Quality Assurance Specialist, Quality Assurance and Inspection Office, Fabrication Division, under CPP 87-91.

Diana L. Park has been selected Secretary (Stenography), Acquisition Division, under CPP 87-92.

Carolyn A. Wells has been selected Contract Specialist, Projects and ADP Contracts Branch, Acquisition Division, under CPP S87-1.

Rodney H. Ricketts has been selected Supervisory Aerospace Engineer, AST, Structural Dynamics, Configuration Aeroelasticity Branch, Loads and Aeroelasticity Division, under CPP 88-4.

Paula A. Ware has been selected Secretary (Stenography), Transonic Aerodynamics Division, under CPP 88-6.

Diane S. Wieting has been selected Administrative Officer, Office of the Director for Space, under CPP 88-11.

Lori J. Jones has been selected Secretary (Stenography), Specifications and Contract Coordination Office, Facilities Engineering Division, under CPP 88-7.

Stephanie J. Stockum has been selected Secretary (Typing), Metals and Materials Technology Branch, Fabrication Division, under CPP 88-7.

Tamara L. Croom has been selected Secretary (Stenography), Subsonic Aerodynamics Branch, Low-Speed Aerodynamics Division, under CPP 88-7.

Janet M. McKenzie has been selected Supervisory Employee Relations Specialist, Employee Development and Services Branch, Personnel Division, under CPP 88-8.

Gordon G. Degear has been selected Program Analyst, Industrial Relations Office, under CPP 88-13.

Karen E. Ridlon have been selected Personnel Clerk (Typing), Employee Development and Services Branch, Personnel Division, under CPP 88-14.

Wendy Klich (right), daughter of Mr. and Mrs. Phillip J. Klich, was named first runner-up in the Miss Hampton-Newport News scholarship pagent, a preliminary competition to the Miss Virginia and Miss America pageants. Wendy is pictured with Tami Elliott, who was crowned Miss Hampton-Newport News. Phil Klich is an aerospace engineering technician, Systems Engineering Division.

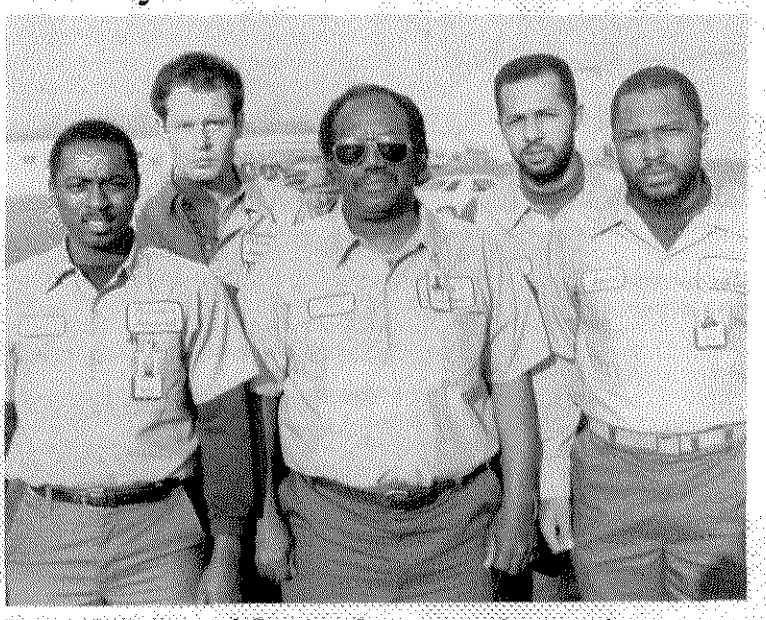
Video Conference

The Management Vision Video Conference entitled "Individual and Corporate Creativity" will be shown in Building 1194A, Room 206. The telecast will be from 3-5 p.m. on Wednesday, April 13.

This program, featuring Karl Albrecht, examines the creative organization as well as the creative person. Topics to be addressed include management approaches that foster creatvitiy; dissemination of information; and activities to exercise creative power.

Please notify your training coordinator if you plan to attend.

Harvey's Selects Crew of Month



Harvey's Janitorial Service, Inc., recognizes employee teams who have excelled on their Facility Evaluation Reports. The award committee convened on March 3 and selected the Versatile Maintenance Crew as Crew of the Month for February. This crew received a perfect score of 95 points. Team members are (L to R) Dwayne Artis, Thurman Felker, Alexander Edlow, Lawrence Lovett, Jr., and Warren James.

Club News

Skywatchers Host Observation

The Skywatchers Astronomy Club will host an observing session on Friday, April 22. A variety of telescopes will be available for viewing the stars, moon, and planets.

Observation will be from 8 p.m.-midnight. The observatory is Building 1231, which is located between the credit union and the hangar, Building 1244.

The public is invited to join club members in an evening of telescopic viewing of the heavens. If skies are cloudy on April 22, the observing will take place on Saturday, April 23.

Bowling Stats

The NASA Tenpin Bowling League bowls on Tuesday nights at Victory Lanes in Grafton. Current standings are:

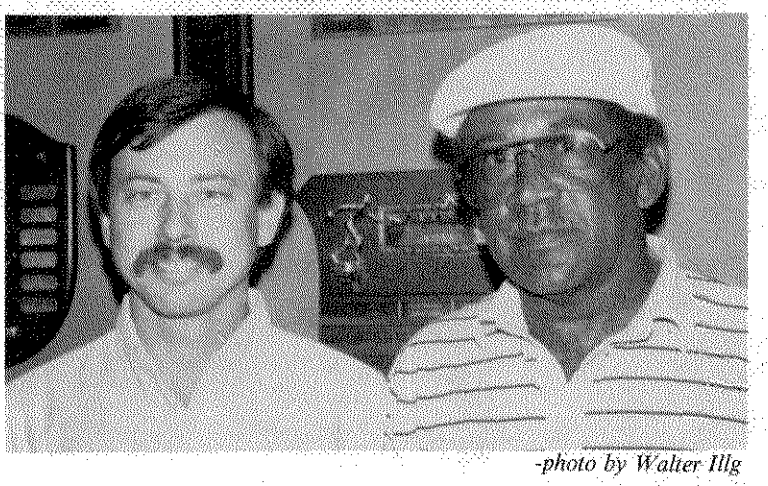
	March 22	March 29
Team High Game	977 Strikers	967 ACD
Team High Series	2663 ACD	2686 ACD
Male High Game	246 **B. Huffman**	247 **R. Rubrecht**
Male High Series	629 **W. Williams**	706 **R. Rubrecht**
Female High Game	204 **P. Gardner**	200 **R. Lord**
Female High Series	537 **S. Ziehmann**	567 **M. Aldrich**
Most Pins	83 **P. Gardner**	75 **R. Muraca**
over Average	66 **B. Huffman**	66 **P. Gardner**

Runners Club Race Results

The Langley Runners Club Team placed first in the Open Division of the Shamrock Marathon on March 19 in Virginia Beach. Team members are **Pete Earls** (2:48:58), **Chip Trepte** (2:58:31), **Jim Johnson** (3:03) and **Steve Robbins** (3:04).

In addition, the following four members have qualified for and plan to run the Boston Marathon on April 18: **Pete Earls, Chip Trepte, Jim Johnson** and **Bob Ferguson**

Golf Association Tournament Results



-photo by Walter Illg

The NASA Golf Association participated in a Four-Man Captain's Choice Tournament held at Langley's Red Course on March 25. Tournament winners are (L to R) Robert Fox and Arthur Robinson. Not pictured are Alfred Thomas and Joseph Phillips.

People & Places

Langley Supports Bloodmobile

A total of 324 Langley employees, retirees and contractors donated pints of blood at the March 23 visit of the American Red Cross Bloodmobile.

Achieving gallon status were:

16 gallons — Billy Dancy;

14 gallons — Richard Holt;

13 gallons — Paul Culotta;

12 gallons — Brickey Hughes and Raymond Midden;

10 gallons — Ceylon Short;

6 gallons — Weldon Staton, Ricky Clark and Hugh Gentry;

5 gallons — Edward Self, Michael Stubbs, Jerry Allen and Richard Antcliff;

4 gallons — Michael Mitchell;

3 gallons — Barry Brimmer, Harold Neal and Ray Seals;

2 gallons — Bradley Crawford, Jeffrey Hyle, Joseph Sikora, Timothy Wood, Randy Michaelson, Daniel Fisher, Jimmy Case and Susan Althoff;

1 gallon —Margaret Heaney, Charlie Debro, Sean Britton, Wayne Davis, Patricia Martin and Larry Farrow;

1st Timers — Nancy Casper, Jeffrey D. Bland, Roderick Harvey, Mary Blount, Jeffrey Johnson, Ruby R. Hogge, Stephen Lucas, Timothy Rothgeb, Pete Veneris and Daniel Perey.

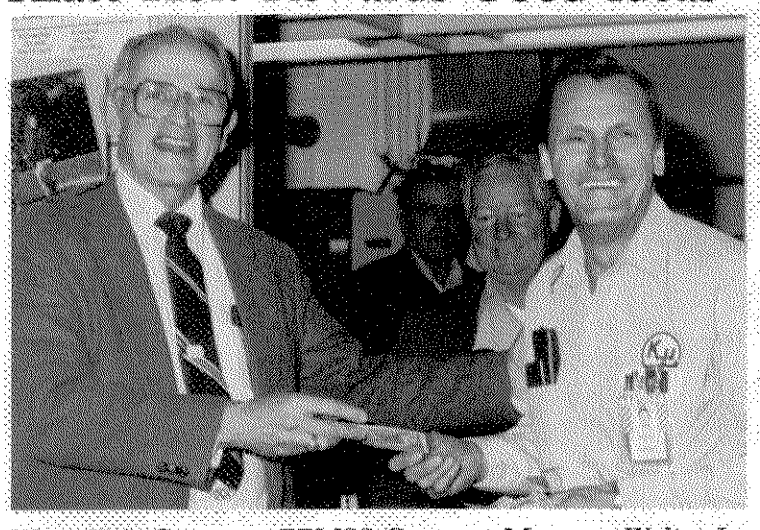
NASA coordinator for the Bloodmobile visit was Annette Forrest; Red Cross coordinator was Barbara Thomas.

Center Director Richard H. Petersen (right) presents William J. Boyer with the gavel which symbolizes his responsibilities as the President of the newly- formed NASA Langley Alumni Association. Petersen installed Alumni Association officers Boyer, President; Joyce M. Wright, Vice President; Betty P. Joyner, Secretary; and Edmund A. Brummer, Treasurer.

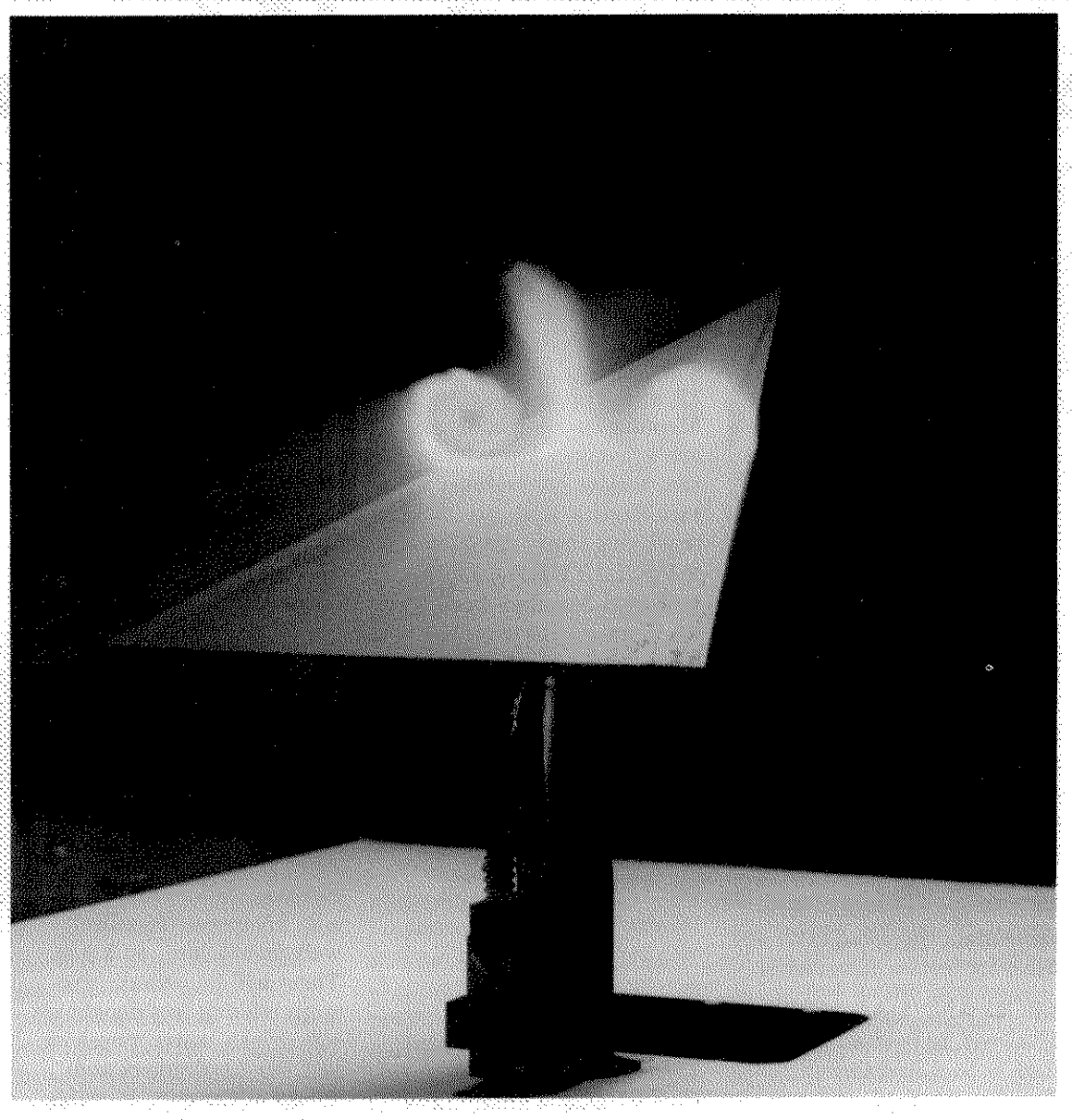
photos by Paul Bagby

Petersen and Boyer display the Langley Alumni Association Banner, a gift from Center employees. A committee headed by Clarence A. Brown, Jr., designed the alumni logo which appears on the banner.

Klate Holt Rewards Good Ideas



Klate Holt Company FEMSS Contract Manager Walter L. Sykes (left) presents a cash award of $100 to the Quarterly Suggestion Award winner, George Burton (left), as co-workers watch. Burton's suggestion was to wash asbestos-contaminated light fixtures and air duct sections removed from Building 1250 so disposal costs could be drastically reduced. Burton is an insulation supervisor.



From Behind the Scenes

BART's Looking at You . . . .

Does Langley's Basic Aerodynamics Research Tunnel (BART) house a ghost, a glimpse of which is captured in this eerie photograph?

Actually this is one instant in a flow visualization process produced by the intense, highly-directional light of an argon laser. The laser beam passes through optics and oscillating mirrors to produce a laser light sheet which illuminates smoke in the tunnel making the air flow over the generic delta wing visible.

The data gathered—primarily visual and qualitative in nature—is useful in determining how complex flow patterns evolve. Flow visualization is a contribution of the Photo-Optical Instrumentation Section, Instrument Research Division.

Senior Management Research Review

The Senior Management Research Review will be held Monday, April 11, at 9 a.m. in Building 1219, Room 225. Following the Director's comments and program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENTS	SPEAKER
9:30	Fillet Required to Mitigate Necklace Vortex at Supersonic Speed	Balakrishnan Lakshmanan (Aeronautics/ODU)
9:45	Boundary-Layer Transition Measurements in the Unitary Plan Wind Tunnel	Robert Hall (Aeronautics/TAD)
10:00	Transport Systems Research Vehicle Research System Completed	David Holmes (Flight Systems/ATOPS)
10:15	Shape Sensitivity Analysis of Wing Characteristics	Jean-Francoise Barthelemy (Structures/IRO)
10:30	Measurement of ASTOVL Aircraft Sonic Fatigue Loads Using Model-Scale Jets	Paul Pao (Structures/ACOD)
10:45	Weather Teleconnection Patterns and Outgoing Longwave Radiation	Thomas Charlock (Space/ASD)

Notes of Thanks

Rhoda Kee wrties: I wish to express my deep appreciation to my friends and co-workers for the lovely retirement party and gifts. I have enjoyed knowing and working with you during my years at NASA and will miss all of you."

Clyde May writes: "Thanks to all my friends and co-workers for the wonderful retirement dinner and gifts. I will always cherish the pleasant memories of my association with a great group of people."

Homer G. Morgan writes: "My family and I thank all our friends and my co-workers for a memorable retirement party. We appreciate the time and effort of those who participated as well as the wonderful gifts."

Happenings

THERE WILL BE NO LAA SOCIAL next Friday, April 15, due to a major conference banquet.

EASTER EGG HUNT. The Langley Activities Association will sponsor an Easter Egg Hunt, Sunday, April 10, at 2 p.m. on the Activities Center grounds. Cost is $1/child.

LAA BOARD. The Langley Activities Association Executive Board will meet Tuesday, April 12, at 7 a.m. in the Activities Center. Concerns to be brought before the board should be addressed to the appropriate committee member.

TOASTMASTERS. NASA Toastmasters will meet Wednesday, April 13, 11:30 a.m.-1 p.m. Location for this meeting has been changed to Building 1218 conference room. Civil service employees charge one hour to A1619. Visitors are welcome. Please call Natalie Johnson, ext. 3483, for further information.

LFCU ANNUAL MEETING will be held at Tabb High School Auditorium, Tuesday, April 12, at 7 p.m. Voting for Langley Federal Credit Union Board of Directors will take place at the meeting and in branch offices from April 6-12. Membership in the LFCU is open to all NASA employees, continuing service contractors and their families.

NAGS MEETING. The National Association of Government Secretaries' monthly meeting and "Game Night" will be held Tuesday, April 19, at 6:30 p.m., Holiday Inn, Mercury Boulevard. Guests are welcomed. For information and/or reservations, contact Reachie Hall, ext. 2159, or Shirley Davis, ext 2759.

APICULTURE CLUB will meet Monday, April 18, at 7 p.m. in the executive dining room of the cafeteria, Building 1213. All interested in beekeeping are welcome and encouraged to attend. For more information call Wilson, ext 4615.

AIAA MEETING will be held Monday, April 18, in the Activities Center. W. Hewitt Phillips will present "Flying Qualities from Early Airplanes to the Space Shuttle." Social at 4:30; program at 5:30 p.m. Cost: $5/members; $2/students. Contact Duane Melson, ext. 2627, or Karen Credeur, ext. 3467, by April 14.

AFGE LOCAL 2755 will meet Wednesday, April 20, at 4:30 p.m., in the union office, Building 1232B.

MARCH OF DIMES TEAMWALK. AFGE 2755 is sponsoring a NASA Teamwalk for the March of Dimes Teamwalk America. The walk will be Sunday, April 24, on the trails in Newport News Park. It is a 25 kilometer (16 miles) walk from 9 a.m. to 3 p.m. There will be periodic rest stops offering free doughnuts, soft drinks, water, popsicles and free hamburgers and drinks at the end. Portable bathroom facilities will be placed at each rest stop. The walk is open to all NASA employees and contractor personnel and their families. Special T-shirts are being considered for the occasion. Those interested should call Melvin Jones, ext. 3141, or Janice McCollum, ext. 2400, to sign up and receive a sponsor sheet.

ENGINEERS CLUB of the Va. Peninsula will meet April 20 at Plantation Bar-B-Q, 1975 Cunningham Drive, Hampton. Dr. Roger Breckenridge, LaRC, will present an overview of the U.S. Space Station. Cash bar at 6:30; dinner at 7; presentation at 8 p.m. Cost is $11/person. Persons wishing to attend the program only are also asked to make advance reservations so adequate seating can be arranged. Please call Dan Poulin, 380-3250 or 595-6646, for information and reservations.

VIRGINIA STAGE CO. will close its ninth season with August Wilson's Pulitzer Prize drama, **Ma Rainey's Black Bottom**, which runs April 12-30. A play about the birth of the blues and the strength of the human spirit, **Ma Rainey** examines the struggle of Black musicians in America in the 1920s. For ticket information, call 627-1234 or 874-1234.

NEEDED: ROOMMATE(S) to share a two- or three-bedroom home in Langley area. Contact Claudio Egalon, ext. 3036 or 253-4471. Leave message.

NEEDED: HOME/APT. TO RENT. Jim Hansen, Langley Historian-in-Residence, is looking to rent a home or apartment for family of four from early June to early Sept. Phone (205) 821-1833 or write Department of History, Auburn University, Auburn, Alabama, 36849.

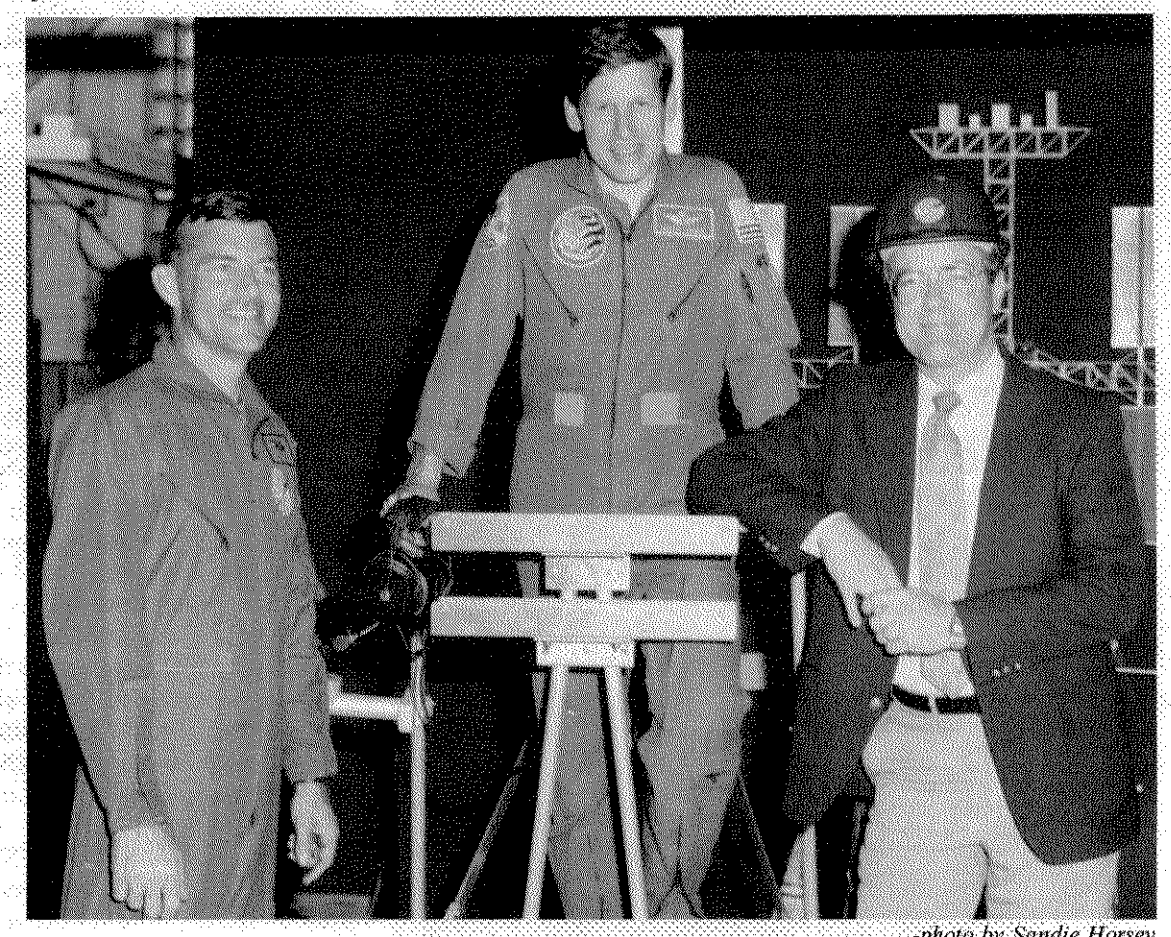
BOY SCOUT TROOP 14 is collecting newspapers to be recycled at the Beaconsdale Shopping Center in Newport News. To support recycling and the Boy Scouts of America, drop your newspapers in the container at Beaconsdale. For information, contact Ron Harvey, ext. 2032.

CALLIGRAPHERS GUILD of the Peninsula will hold a general meeting at the Peninsula Fine Arts Center, Sunday, April 17, from 2-4 p.m. The program will examine papermaking. Call Karen Forster, 249-3079, for details.

RUN FOR PREVENTION OF CHILD ABUSE. A 5K run sponsored by the Oyster Point Exchange Club, May 7, at Oyster Point Park. Sign-up forms and details are available from John Romaine, 253-9120. Following the run, plan to enjoy the Corporate Challenge, featuring sports competition, music by "Slapwater," food booths and beer tent.

FOR SALE: CHINA. Noritake China, Warrington pattern, complete six-piece place setting, service for 12, plus 14 serving pieces. $1,000. Call 898-5113 after 5 p.m.

FOR SALE: COFFEE POT. West Bend, 30-cup, insulated. Ideal for buffet dinners, parties or Church activities. Excellent condition. $15. Call 898-5113 after 5 p.m.



-photo by Sandie Horsey

Astronauts Jim Voss (left) and Woody Spring (center) visited Langley recently to do 1-g practice experiments in space station assembly methods using the Mobile Transporter (MT), previously called the Mobile Remote Manipulator System (MRMS). The MT will be shipped to Marshall Space Flight Center this month for neutral buoyancy tests. Joining the astronauts at the completion of the practice session is WVEC-TV 13 reporter Joe Flanagan (right). Flanagan dons a hard hat just as he did several weeks ago when he strapped himself into the space construction device for filming of a "Joe's Job" segment which will appear on Channel 13 in May. This time Flanagan was glad to leave space construction to the experts!

Researcher News

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Langley Research Center

Volume 2, Issue 8 April 22, 1988

Langley Researcher News

Bi-weekly Employee and Contractor Publication

-photo courtesy of Ames-Dryden Flight Research Facility

SHUTTLE ESCAPE SYSTEM TEST. A Navy parachutist slides down a pole to exit a C-141 aircraft as part of tests to evaluate one of two proposed Space Shuttle escape systems. For these tests, the jumpers, using a lanyard attached to the pole, slide down a pole extending from the aircraft flying at approximately 200 knots at an altitude of about 10,000 feet. The tests were conducted by NASA's Johnson Space Center in cooperation with the U.S. Air Force and Navy. For more information on the telescoping pole crew escape system which will be incorporated into the orbiter Discovery, see "Return to Flight: STS-26" on page 3.

Brooks Named Floyd Thompson Fellow

Dr. David R. Brooks, a research scientist in the Atmospheric Sciences Division, is the 1988-89 recipient of the Floyd L. Thompson Fellowship at NASA's Langley Research Center.

The Thompson Fellowship Program was established in 1977 to encourage the development of research potential among the Langley staff. The Fellowhip allows researchers who have demonstrated continued growth in research to spend up to 12 months at an educational or research institution. It is named in memory of Dr. Floyd L. Thompson, Langley Director from 1960 to 1968. Thompson joined the Langley staff in 1926, retired in 1968 and was a consultant to the NASA Administrator until January 1973.

Brooks will spend one academic year at Drexel University, Philadelphia, conducting research on analytic representations of the bidirectional behavior of the Earth's radiation as viewed from space.

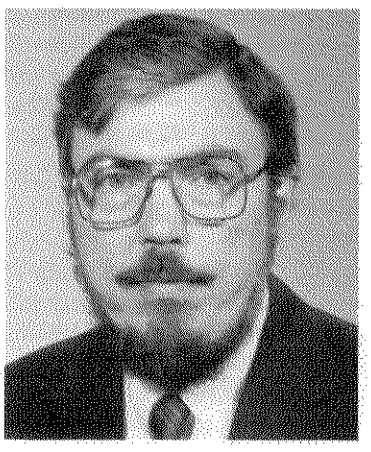
"This work will make use of recently archived data from the Earth Radiation Budget Experiment (ERBE) and data from other satellite sources," Brooks explained. "The models will seek a consistent description of the behavior of radiances for a variety of cloud conditions ranging from clear to overcast over specific geotypes."

The ERBE is the first space-based Earth radiation budget experiment to devote substantial resources to developing a complete end-to-end measurement interpretation system through the integration of spacecraft hardware and analysis software.

Brooks said that a secondary objective is to correlate ERBE radiance data with meteorological measurements made during the Genesis of Atlantic Lows Experiment (GALE) in 1986. This project involves detailed meteorologial measurements taken off the United States' mid-Atlantic coast between mid-January and mid-March 1986. GALE data are archived and managed by Drexel.

Brooks will be collaborating with Dr. Fred House, Department of Physics and Atmospheric Science, who is a member of the ERBE Science Team and has done extensive work in preparation for the release of ERBE data. Brooks said House has been involved in all major satellite-based programs to measure the Earth's radiation balance and is an internationally recognized expert in this field.

"The injection of new ideas into ongoing analysis of ERBE data and post-ERBE missions will assure Langley Research Center's continued prominence in this field," Brooks said. "On-site access to the GALE data set



at Drexel will provide me with a unique opportunity to view an interesting subset of ERBE data from a different perspective and should stimulate interest in ERBE results in another part of the atmospheric science community."

Brooks explained that "with the potential for additional Earth radiation budget projects in the 1990's, such as experiments on the proposed Earth Observing System, it is essential that we continue to conduct collaborative efforts to promote development of the best possible analytic approaches to post-ERBE missions."

Brooks' career began in June 1963 at the Langley Research Center, where he has conducted research into the behavior of the Earth's radiation field. Assigned to the Radiation Sciences Branch, he has specialized in satellite data analysis and satellite mission analysis.

Scout to Launch Navy Navigation Satellites

Two U.S. Navy Navigation Satellites are scheduled to be launched aboard a NASA Scout rocket April 25 from Vandenberg Air Force Base, Calif. The 8-minute launch window for the SOOS-3 mission (Stacked Oscars on Scout) opens at 6:57 p.m., Pacific Daylight Time.

The pair of Oscar satellites, each weighing 141 pounds, will be placed into a 600-nautical-mile circular polar orbit. The Oscars are part of the Navy's long-established, continuous all-weather global navigation system.

Scout-launched Navy navigation satellites have been used for all- weather global navigation since July 1964, originally to support Navy fleet ballistic missile submarines. Made available to non- Navy users in 1967, the spacecraft have since been adapted for diverse civilian uses, such as commercial shipping, charting for offshore oil and mineral deposits and land survey projects. The system provides position information within one-tenth of a nautical mile anywhere in the world.

The upcoming launch marks Scout's 110th flight, and follows closely on the heels of the successful Scout San Marco D/L launch which took place March 25 from the San Marco range in the Indian Ocean. Two additional Scout launches, both for the Navy, are presently manifested in 1988: NOVA-II, scheduled for June; and SOOS-4, targeted for August.

The Scout program is managed by NASA's Langley Research Center. The 73-feet-long, four stage, solid-propellant rockets are built by the Missiles Division of LTV Missiles and Electronics Group, Dallas, Texas.

Aerospace Mechanisms to be Addressed at NASA-Langley Symposium

The problems of designing, fabricating, testing and using aerospace mechanisms will be addressed at the 22nd Aerospace Mechanisms Symposium at Langley May 4-6.

Approximately 30 papers will be presented and participants will travel from Europe, as well as China and Africa to attend the three-day meeting, sponsored by NASA, California Institute of Technology and Lockheed Missiles and Space Company.

The symposium provides a forum for personnel active in the field of mechanisms technology, as well as providing a source of information for others with an interest in this field.

Each session will feature at least four papers; session topics include mechanisms for large space structures; mechanisms applicable to large, flexible, deployable structures; quick- acting valves and deployment mechanisms; analyses pertinent to the reliability of mechanisms; lessons learned in the use of aerospace lubricants; Space Station mobile transporter and other telerobotic mechanisms; panel discussion regarding training and development of new engineers, reliability versus maintainability of mechanisms, and guidelines for using lubricants in aerospace applications; rotary joint concepts for Space Station applications for simultaneous transfer of fluids and gases under pressure; and Space Shuttle topics and mechanisms.

At the close of the symposium, the Dr. George Herzl Award will be awarded to the author of the best paper. The award is based on content, delivery and visual aids and was established in honor of Herzl, Lockheed Missiles and Space Company, a co-founder of the Aerospace Mechanisms Symposia.

Langley employees participating in the symposium include Nathan D. Watson, host chairman; Clarence P. Young Jr., Elvin L. Ahl, Jesse D. Timmons, Melvin Lucy, Johnny W. Allred, Dorsey E. White, Peyton B. Gregory, Walter W. Hankins, Randolph W. Mixon, John F. Rogers, Obie H. Bradley Jr., and John A. Costulis.

Reservations should be sent to Ann S. Rockey, Mail Stop 433. Enclose a check, payable to the 22nd Aerospace Mechanisms Symposium, for $90 which covers technical sessions and proceedings, dinners, receptions and coffee breaks. For more information, call Mrs. Rockey at 865-4621.

News Briefs

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — NASA and the European Space Agency (ESA) have selected the scientific investigations to be conducted on two spacecraft programs as part of a joint NASA and ESA solar terrestrial research program. More than 130 U.S. scientists will participate in the two space flight missions called Solar and Heliospheric Observatory (SOHO) and Cluster, a set of four spacecraft. Approximately twice that number of scientists will participate from the 13 ESA member nations.

AMES RESEARCH CENTER, Moffett Field, Calif. — A computer- generated display system to aid close-in spacecraft maneuvers has been developed at NASA Ames. The display can precisely depict a spacecraft's position relative to other vehicles and objects, allowing rapid, accurate monitoring and response. The system can be placed aboard spacecraft such as the planned U.S. Space Station to help conduct and monitor "proximity operations," such as docking and berthing orbital vehicles and rendezvous between two or more vehicles.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — As of press time, the third full-duration test firing of NASA's redesigned Space Shuttle solid rocket motor (SRM) was scheduled for 1 p.m. MDT, April 20, at Morton Thiokol's Wasatch Facility, Utah. The verification and qualification test program, to certify the SRM redesign, reuires five full-duration tests of the motor prior to the resumption of Shuttle flights in August 1988.

Editor's note: Recent surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017.

Langley Directives Distributed

DIRECTIVES NUMBER	TITLE	DATE	T.S.#	DATE DISTR.
Revised				
LMI 4220.1	"Standards for Office Furniture and Furnishings"	2-17-88	1582	3-23-88
LMI 5000.2	Attachment A, "Procurement"	2-17-88	1583	3-17-88
LMI 1700.3	Attachments A and B, "The Executive Safety Board and Its Committees"	2-17-88	1584	3-28-88
LMI 1020.1	Attachment, "NASA Seal, Insignia, Logotype Program and Astronaut Badges, and Flags"	2-17-88	1585	3-23-88
LMI 1100.31	Attachment, "Library Committee"	2-17-88	1586	3-17-88
LMI 2200.3	"Technology Transfer Agents"	2-17-88	1587	3-30-88

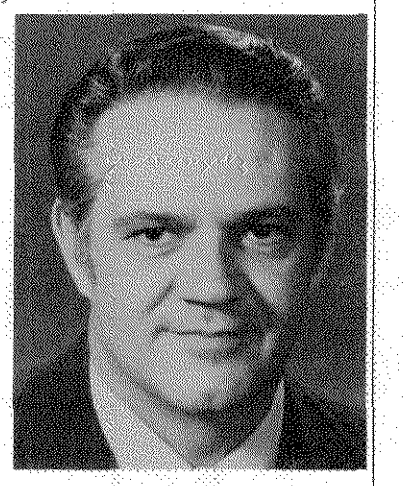
NOTE: Directives are available for review in each organizational office. Extra copies may be obtained from the Directives and Forms Management Office, ext. 3511.

Kirby, Assistant FENGD Chief, Dies

Dr. Cecil E. Kirby, assistant chief, Facilities Engineering Division, died Thursday, April 14 in Riverside Hospital. He had been employed at Langley for 25 years.

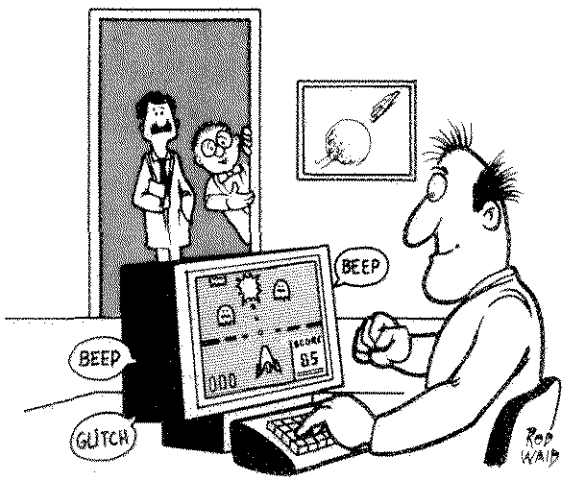
John Knemeyer, acting deputy director, Systems Engineering and Operations, regarded Dr. Kirby "as an extremely competent manager and engineer. He was highly respected by all of us in Systems Engineering and Operations, who were privileged to work with him. We will miss him."

Kirby began his NASA career as an aerospace engineer in the Flight Vehicles and Systems Division. From 1966 to 1968, he was the group leader for the Rocket Motor Group. He served as assistant section head, Flight Vehicles and Mechanical Systems Section, from 1969 to 1972. From 1972 to 1975, he was head of the Facilities Systems Section, FENGD. After a one-year assignment at NASA Headquarters, he was head of the Systems Design Branch for three years prior to his current position.



Kirby is survived by his wife, Jane, and their three sons.

Lankley



"Since we got the computer Lankley just can't seem to tear himself away from his work."

Editorials

Langley
Headquarters Forum

How about a carbon fiber composite automobile in your future? Carbon fiber composites are lighter than aluminum, stronger than steel and stiffer than titanium. They are resistant to road salt corrosion; they do not rust; and they are virtually dent proof.

A lifetime warranty is issued for the latest automobile body constructed of this "space age" material. For a mere $125,000 you could be the proud owner of this new Stutz Bearcat II. A hand-rubbed, Milanese burled walnut interior fininsh is included at no extra cost.

Langley researchers pioneered many of the advances in carbon fiber composites. From a laboratory curiosity in the 1960s, carbon fiber composite technology has progressed to aircraft applicaitons in lightly loaded structures. Langley's broad research program in composite materials and structures includes basic research in matrix resins, fatigue behavior, damage tolerance, structural concepts, fabrication technology and environmental stability.

With the NASA- ACEE (Aircraft Energy Efficiency) program in the late 70s, the research was accelerated to validate the laboratory technologies in full-scale airframe components. Selected flight tests were conducted to evaluate in-service performance. For example, 2,000,000 flight hours were obtained on Boeing 737 carbon fiber composite spoilers.

Today, empennage structures such as horizontal stabilizers and vertical fins on the latest commercial transport aircraft, Boeing 757 and 767, contain carbon fiber composite parts. General aviation has taken advantage of these materials with the Beech Starship and the Avtek 400 having most of the airframe constructed of carbon fiber composites.

While carbon fiber composites have been successful as structural materials, we have not yet achieved our ultimate goal. We need a major breakthrough to permit carbon fiber composites to be introduced into the highly loaded, primary aircraft structure—the wing and fuselage of commercial transport aircraft. Aircraft weight savings could be greater than 30 percent.

After the pause from the NASA-ACEE program, we are now moving more aggressively toward this goal. A new NASA-Advanced Composites Technology Program is scheduled to start in FY 1989. Funding for this five-year program is expected to exceed $100 million. Langley will lead this effort.

Primary emphasis will be on innovative structural concepts and materials to make effective use of carbon fiber composites in primary aircraft structures. This is a most challenging program that will require the best talents of Langley, the aerospace industry and many universities to reach our goal.

Carbon fiber composites have affected out lifestyles—tennis rackets, fishing rods, automobiles and aircraft. This list will grow in the future.

C. P. Blankenship
Director for Structures

Langley Stocked Forms Announced

New		
LF 102	NASA LaRC Identification Badge Request (Destroy old form, N-1353)	Nov. 1987
LF 103	Official Visitor—Badge Request	Nov. 1987
LF 105	Application for NASA LaRC Vehicle Identification Decal (Destroy old form, N-1514)	Nov. 1987
Cancel		
NHQ 94	NASA Bi-weekly Payroll Register (printed in-house)	Jan. 1988
NF 1502	NASA Master Employee Account (printed in-house)	Jan. 1988
Revised		
LF 55	LaRC Stock Issue and Turn-In Slip (Nov. '85 edition will be issued until supply is exhausted.)	Sept. 1987

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Thursday following the date of this issue.

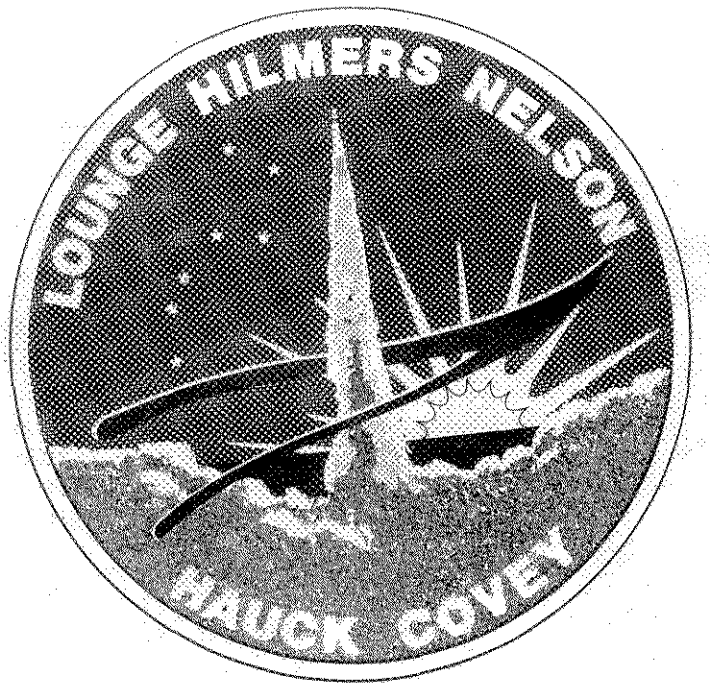
Managing Editor . . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

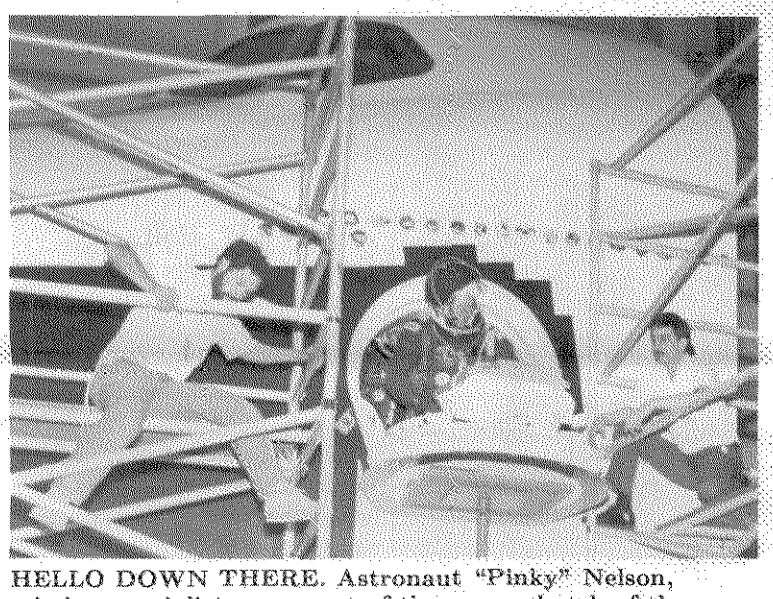
Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

Return to flight: STS-26



STS-26 INSIGNIA. The STS-26 crew patch, designed by artist Stephen R. Hustvedt, embraces four themes. The sunrise represents a new beginning; the stylized launch and plume, a safe mission; the dark vector, which symbolizes aeronautics on the original NASA insignia, represents building upon the traditional strengths of NASA; and the seven-starred Big Dipper, in remembrance of the seven astronauts who died aboard the Challenger.



HELLO DOWN THERE. Astronaut "Pinky" Nelson, mission specialist, peers out of the escape hatch of the crew compartment trainer in the Shuttle mockup and integration laboratory during a crew station review held March 10.

-photos courtesy of Johnson Space Center

READY-SET-GO. Astronaut David C. Hilmers, mission specialist, slides out of the full fuselage trainer in the Shuttle mockup and integration laboratory. This phase of training is connected with quick/safe egress from the spacecraft on the ground.

Safety First

Pole Chosen for Crew Escape System

A telescoping pole, chosen as the egress method for the Space Shuttle's new crew escape system, will be incorporated into the orbiter Discovery prior to the STS-26 flight in August.

Tests conducted in February and March, using a fixed pole extending through a hatch-like opening in a C-141 aircraft, demonstrated that the pole would provide adequate orbiter clearance in an emergency egress situation.

Navy parachutists, approximately the sizes of astronauts from the smallest to the largest, completed a total of 66 jumps using a lanyard attached to their parachute harness to slide down the pole and descend to a safe landing. Analysis of aerodynamic and photographic data showed that all the jumps provided the necessary clearance margins.

The telescoping pole, designed and manufactured at Johnson Space Center, Houston, is made of lightweight aluminum and steel and weighs 241 pounds. The pole housing attaches to the orbiter's middeck ceiling and is 126.75 inches long. The primary extension is 112.54 inches (arched length) and the end extension is 32.65 inches.

For launch and landing the unextended pole will be oriented toward the closed crew hatch. During on-orbit operations, the pole will be repositioned toward the middeck lockers and be stowed on the ceiling such that it will not interfere with the various flight crew activities in the middeck area.

The selection of the telescoping pole, over an alternative tractor rocket extraction system, was made at NASA Headquarters by National Space Transportation System Director Arnold D. Aldrich following a review of system design, test performance and flight hardware status.

"The NASA-contractor team has done a fantastic job in providing both the tractor rocket and telescoping pole systems to support the next Shuttle flight," Aldrich said. "The telescoping pole was selected as it has shown to be safer, simpler to operate, lighter weight and easier to support than the tractor rocket system, while meeting all escape system performance requirements."

This decision completes the crew escape system package. Already approved and implemented are the orbiter primary crew hatch jettison capability and crew support equipment—a partial pressure suit, oxygen equipment, a parachute, a life raft and survival equipment for each crew member.

The pole escape system provides crew escape capability from the orbiter during controlled, gliding flight following failures or difficulties during ascent or entry where landing at a suitable landing field cannot be achieved. Previous procedures for ascent contingency aborts, where no landing site could be reached, required orbiter ditching in the ocean, a condition which has been shown by structural analysis to be extremely hazardous.

The side hatch jettison system also can be highly beneficial for certain ground contingencies following non-normal landings. A crew escape slide, similar to those provided on commercial airliners, has been implemented in conjunction with the jettisonable hatch to support rapid, post-landing contingency egress.

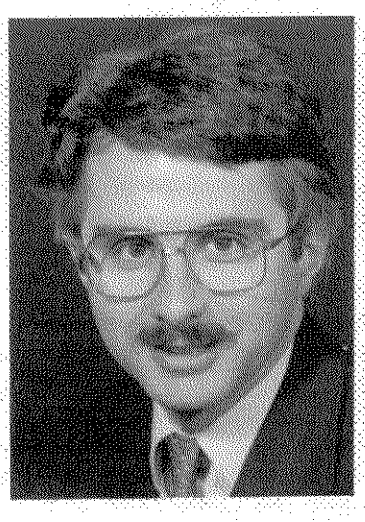
Be an Eye Witness to Return to Flight

Langley Research Center has been allotted a limited number of NASA Causeway vehicle passes for the STS-26 launch. Center employees, contractors and retirees who will be in the Florida area and desire to view the launch may call Ann Suit, ext. 3967, to reserve passes which will be distributed shortly before launch. Passes will be granted on a first come-first serve basis.

MEET THE CREW. The five veteran astronauts assigned to the STS-26 mission use a bit of orchestrated humor to demonstrate the aft-zip feature on the new partial pressure suit that is expected to become a fixture on Space Shuttle flights. Shown (L to R) are Frederick "Rick" Hauck, commander; George "Pinky" Nelson, David C. Hilmers and John "Mike" Lounge, mission specialists; and Richard O. Covey, pilot. The crew was in Johnson Space Center's Shuttle mockup and integration lab to participate in a review involving methods of safely egressing the Shuttle under various emergency conditions.

Visitor Center Programs

Storm Hazards Research: Where Lightning Strikes Twice



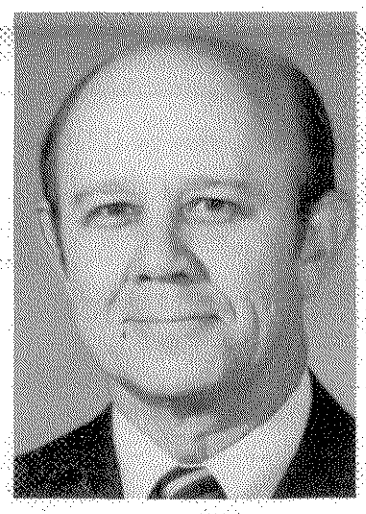
Would you get on a plane that had been hit by lightning 714 times and flown through 1,500 thunderstorms in six years? NASA Langley test pilots would, and they do—regularly. During May the Visitor Center will highlight Langley's flight safety research to improve storm hazard detection and avoidance.

On Thursday, May 12, at 7:30 p.m., Bruce Fisher will speak on aircraft storm hazards and the phenomenon of aircraft-triggered lightning. The increasing use of such new technologies as composite materials and digital avionics compounds lightning-related problems on aircraft.

As Storm Hazards Project Engineer, Fisher was one of the flight test engineers flying in the rear cockpit of the F-106B airplane during research flights when approximately 260 strikes were experienced by the airplane. Fisher will show film footage of the lightning strikes in mid-flight shot by cameras mounted on the plane.

On exhibit during the month will be a section of the F-106B which has undergone the multitudinous lightning strikes. In addition, photos of lightning strikes on Langley's research aircraft and a special panel display detailing NASA's efforts to improve flight safety will be on display.

Next-Generation Launch Vehicles



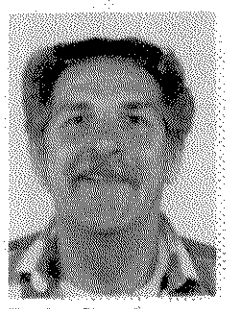
Dr. Gerald Walberg will discuss next-generation space launch vehicles on Wednesday, May 11, at noon in the Visitor Center theater. This presentation is part of the Spring Guest Lecture Series sponsored by the Visitor Center and the AIAA-Hampton Roads Section Student Branch.

Walberg, chief, Space Systems Division, will identify the major space transportation technology initiatives which must be addressed during the next several decades.

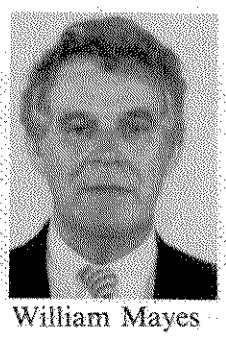
He will also review the program recently proposed by the National Commission on Space, pointing out its remarkable similarity to the program proposed in 1970 by George Meuller, then NASA Director of Manned Spaceflight.

Recent Retirees

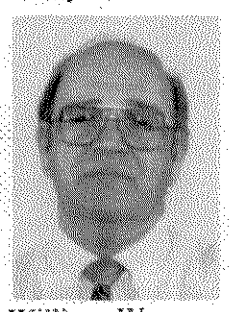
Betty Farmer



Dale Gwaltney



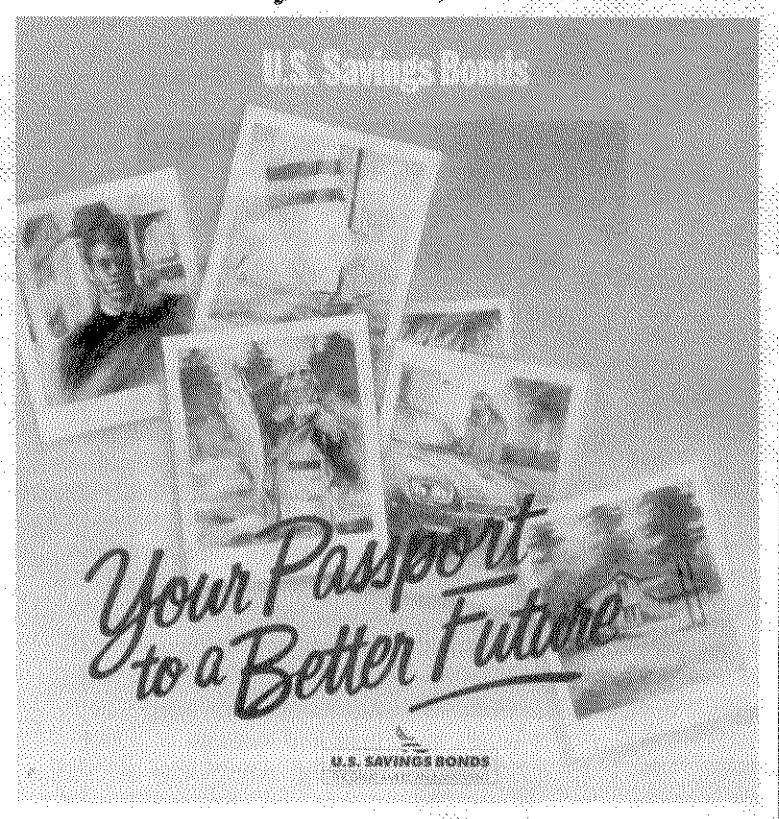
William Mayes



William Wassum

Betty C. Farmer, Analysis and Computation Division, **Dale Atwood Gwaltney**, Operations Support Division, **William H. Mayes**, Acoustics Division, and **Donald Lee Wassum**, High-Speed Aerodynamics Division, retired April 1.

Langley Savings Bond Drive May 16-27, 1988



Harvey's Selects Crew of Month

Harvey's Janitorial Service, Inc., recognizes employee teams who have excelled on their Facility Evaluation Reports. The award committee convened on April 1 and selected Crew #1 as Crew of the Month for March. This crew received a score of 94 out of a possible 95 points. Team members are (L to R) Rosalyn Johnson, John Hitchcock, Daisy Brown, Barbara Morton, Sandra Bennett and Joe Ann Foster.

Club News

Bowling Stats

The NASA Tenpin Bowling League bowls on Tuesday nights at Victory Lanes in Grafton. Current standings are:

	April 5	April 12
Team High Game	924 Scramjets	882 Scramjets
Team High Series	2526 Scramjets	2550 Ballers
Male High Game	223 **B. Huffman**	243 **A. Frizzell**
Male High Series	603 **W. Bowser**	608 **A. Frizzell**
Female High Game	171 **R. Frizzell**	195 **R. Frizzell**
Female High Series	490 **M. Aldrich**	503 **M. Aldrich**
Most Pins	52 **P. Delozier**	74 **A. Frizzell**
Over Average	51 **D. Rieger**	68 **G. Brehm**

Runners Club Intercenter Competition

Final races for the NASA Intercenter competition will be a 2 Mile race on April 25 and a 10 K race on April 27. Both races start at 5 p.m. on Doolittle Road. Walkers are welcome in both races. All NASA employees, retirees, on-site contractors and co-ops at work earn points for Langley by participating. For more information about the races or the Runners Club, call Richard Shearer, ext. 4508.

Look for Nancy Turner, a former PRC/Kentron employee, in the USA Women's Olympic Marathon Trials on May 1 in Pittsburg, Pa. She left Langley last year to concentrate on her training and qualified for the trials at the Shamrock Marathon in April 1987 with a time of 2:48.

Positions Open

88-22: AST, Facilities Systems Safety, GM-801-13 or 14, Systems Safety, Quality and Reliability Division, Safety Engineering Branch, Safety Engineering Section. Closes April 22.

88-23: Supervisory Printing Specialist, GS-1654-11 or 12, Research Information and Applications Division, Visual and Printing Services Branch, Publications Section. Closes April 22.

Positions Filled

Robin K. Rubrecht has been selected Supervisory Electrical Engineering Technician, Laboratory and Plant Electrical Section, Electrical Support Branch, Operations Support Division, under CPP 88-10.

C. Wayne Williams, Jr. has been selected Supervisory Electronics Technician, Electronics Fabrication Development Section, Electronics Technology Branch, Fabrication Division, under CPP 88-12.

Marie W. Hall and **Delores K. Felty** have been selected Voucher Examiners, Commercial Accounting Section, Acounting Branch, Financial Management Division, under CPP 88-15.

Martin Edward Leatherman has been selected Production Controller, Contractual Resources Section, Resources and Contracts Branch, Fabrication Division, under CPP 88-16.

Mail Room Relocating

The central mail room located in Building 1219 is scheduled for relocation to the back area of **Building 1206—Shipping and Receiving** today, April 22.

For your convenience, park in the rear of the building and use the service window provided inside. All outgoing mail must be received by 3 p.m. for delivery to the post office. Mail received after 3 p.m. will be delivered to the post office on the following day.

Hours of mail room operation are 7:30 a.m. to 3:45 p.m. For information regarding mail service, please call Barbara Newton, ext. 4057.

Speakers Bureau

The Langley Speakers Bureau participated in a variety of informative and educational programs during March. Much appreciation is extended to these Langley employees who give so generously of their time and talents.

John Micol spoke on Hypersonic Research at East Burke High School, Icard, N.C., on March 4.

Lance Bush gave a presentation on the Future of the NASA Space Program for the Falling Creek Elementary PTA, Richmond, March 8.

Jane Hess presented NASA Spinoffs to the Peninsula Chapter of the Military Order of the World Wars, March 9.

Dr. Christine Darden spoke on Aerospace Careers at the Central Virginia Magnet School, Lynchburg, March 10.

Greg Riebe gave a presentation on the National Aerospace Plane for the Lynhaven Kiwanis Club, Virginia Beach, March 10.

Bruce Fisher spoke on Storm Hazards Lightning Research at a meeting of the Warwick Rotary Club, March 14 and for the TRADOC Flight Detachment, Fort Monroe, on March 22.

Lester Rose presented Spinoffs from Aerospace Technology to the Insurance Claims Association, March 14.

Robert L. Wright presented A Look at the 21st Century to the Lynchburg Society of Engineering and Science, March 14, and spoke on NASA Careers to the Denbigh High School Honorary Math Society, March 16.

Lenwood Clark gave presentations on the Space Station for the Armstrong School Cub Scout Banquet, March 17, and at the 37th Annual Tidewater Science Fair, Deep Creek High School, on March 26.

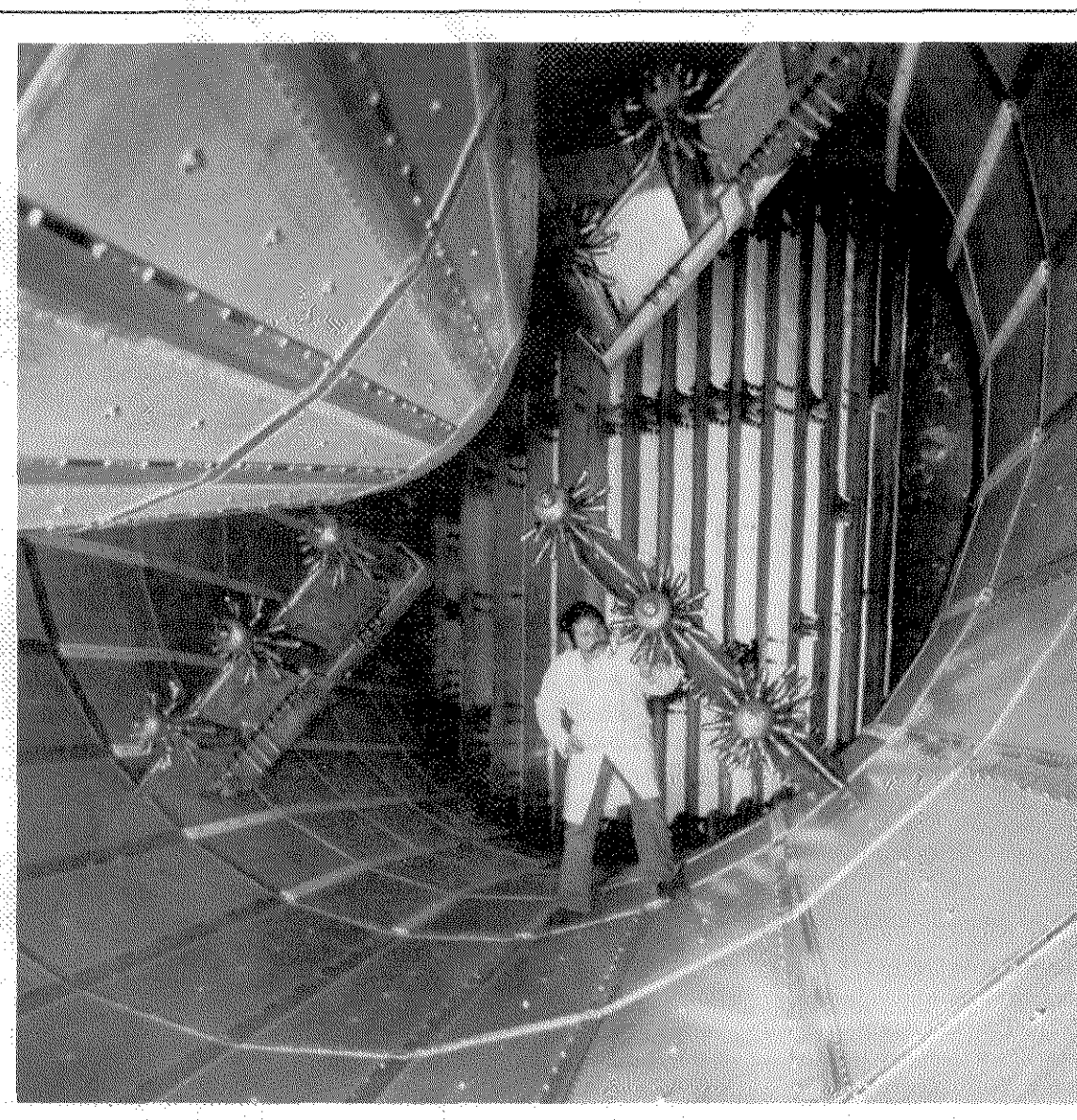
James F. Meyers spoke on Laser Velocimetry at Old Dominion University, March 18.

Dr. Robert Kilgore gave a presentation on Aeronautics in Japan at the Fox Hill United Methodist Church, March 21.

Robert Nunamaker spoke on the NASA Space Program at an IEEE Symposium, March 23.

Charles Eldred gave a Space Shuttle Program Update for the Virginia Peninsula Retired Officers Association, March 24.

Mark Shipman presented GOES Satellite Imagery for Aircraft-Based Studies of Tropospheric Chemistry in Remote Regions at Northwestern High School, Rock Hill, S.C., on March 31.



From Behind the Scenes

Checking a Space-Age Sprinkler System

An engineering technician inspects the liquid nitrogen (LN_2) injection nozzles in the National Transonic Facility (NTF). Each of four struts consists of three pipelines containing 79 nozzles for a total of 316 injectors. Through the nozzles LN_2 is sprayed into the tunnel at a controlled rate, much like spraying water from a garden hose.

The NTF is a unique national facility using cryogenic (extremely cold) nitrogen gas to test models of advanced aircraft and spacecraft designs that will fly in or through the transonic speed range.

Keeping this space-age sprinkler system in working order is a contribution of Technical Support Section D, Operations Support Division.

To your Good Health

Heart at Work: Controlling Hypertension

May is National High Blood Pressure Month. Three educational seminars related to high blood pressure control and a series of blood pressure screenings at sites throughout the Center will be held during May.

All three brown-bag educational programs will be held in Building 1208, Room 129, from 11:30 a.m. to 12:30 p.m.

- May 6 – "Coronary Heart Disease, Risk Factors, Cholesterol and Diet," conducted by the nursing staff of the Occupational Medical Center.
- May 11 – "More About Cholesterol," conducted the the LaRC nursing staff.
- May 25 – "Blood Pressure and Exercise: Their Relationship," presented by Tracye Nuzzo, M.S., Exercise Physiologist at the NASA-LaRC Fitness Center.

Blood pressure screenings will be held according to the following schedule:

- Cafeteria, 11:15 a.m. to 12:30 p.m., May 2, 12, 18, 24, and 27.
- Building 643, 1:30 to 2:30 p.m., May 10 and 19.
- Building 1209, 1:30 to 2:30 p.m., May 9 and 13.

Once again, supervisors are encouraged to support employee participation. Detection and control of high blood pressure can increase life expectancy and save lives.

HR Health and Fitness Center

An Invitation to Be Fit

The Hampton Roads Health and Fitness Center invites NASA employees—civil service and contractor—and their spouses or guests to use the facility free of charge from Sunday, May 1, to Saturday, May 7.

The Center is also offering employees and contractors a substantial reduction on regular membership rates. NASA employees can become members for $35 per month and a one-time initiation fee of $50 per person.

Call 766-2658 for more information.

Traffic Safety System Approved

These Are Points You Don't Want To Make

A new point system for traffic and parking violations was recently approved by the Executive Safety Board and Center management. The primary purpose of this new point system is to help promote safety awareness and safe vehicle operating practices on Center.

This new system is defined in a March 17 revision to LMI 1700.7, "Traffic Regulations," which was recently distributed. It is similar to the Virginia and Air Force point systems.

Points will be assigned for various traffic violations. The number of points assigned for speeding varies from 15 for driving at more than 15 mph over the speed limit to two points for driving one to five mph over the limit.

Other point assignments include items such as ten points for failure to obey traffic signs which result in an accident with injuries or property damage, five points for failure to obey traffic control instructions, five points for parking in a fire lane, and one to five points for other parking violations. The specific points assigned for various violations are cited in the new revision to LMI 1700.7.

Points will remain on a person's LaRC record for 12 months. An accumulation of 15 or more points in a 12-month period can result in suspension of on- Center driving privileges of 15 days for the first such accumulation. Appeal processes for traffic citations and suspensions are outlined in LMI 1700.7.

Division chiefs or appropriate contract managers will receive copies of citations; however, no report will be made to state or local governments for on-Center traffic violations.

Violations of LaRC traffic rules by Langley Air Force Base (LAFB) or other military employees will be reported to appropriate military authorities for action. NASA and contractor employees will continue to be subject to military regulations when driving on LAFB property.

The LaRC point system will provide consistent application of penalties for traffic rule violations and straightforward administrative processes. The primary purpose of the sanctions (suspension of driving privileges on Center) is to "get the attention" of repeat violators or those who flagrantly disregard safe driving practices.

It is hoped that this new system will encourage people to slow down, drive more carefully and safely, and conform to Center traffic and parking regulations.

Happenings

LAA SOCIAL will be held Friday, April 29, from 4 to 6:30 in the Activities Center.

COUNTRY-WESTERN DANCE Club will hold its monthly dance at the Activities Center, Saturday, April 23, from 7:30 to 11:30 p.m. Dance to continuous music provided by Chuck Kessler.

TOASTMASTERS will meet April 27, 11:30 a.m. to 1 p.m., in the private dining room of the cafeteria. Visitors are welcome. Please call Natalie Johnson, ext. 3483, for further information.

STARQUEST, narrated by Leonard Nimoy, is featured at the Virginia Living Museum through mid-June. Starquest tells the story of man's fascination with the skies and space exploration from ancient times to the future. Call 595-1900 for show times and admission charges.

DISNEY WORLD/EPCOT bus trip is scheduled for June 17-21. Two full day passes to facilities, one day pass to Wet 'n Wild. Cost varies according to number in party. Contact Velma Martin, ext. 2196 or 728-0317, for more information.

VA. CHORAL SOCIETY will conclude the season with the annual "Just for Fun" concert featuring popular songs from the 50s and 60s and a selection of Broadway tunes. Performances will be given at Phi Beta Kappa Hall on the campus of William and Mary, Williamsburg, on Saturday, May 7; at the Chrysler Museum Theater, Norfolk, on May 13; and at Ogden Hall on the campus of Hampton University, Hampton, on May 21. All concerts begin at 8 p.m. Tickets are $3, available at the door. For details, call 851-5515.

SOCCER CLUB. Anyone interested in playing soccer is welcome to attend Thursday afternoons at 4:45 p.m. adjacent to the Activities Building. For further information, call Kevin Shepherd, ext. 3561, or Barry Smith, ext. 3036.

ELIZABETH RIVER RUN, 10 K run from Armed Forces Staff College to Norfolk's downtown waterfront will take place Saturday, April 30. Race is designed for recreational runners in the community. Prizes! Call ext. 3707 for registration forms.

DINNER THEATER. "Good Night, Ladies" will be presented by Trinity Youth Players, April 28, 29 and 30, in the fellowship hall of Trinity United Methodist Church, Newport News. Dinner at 6:30, play follows. For reservations or ticket information, call the church office weekdays, 244-4051, or Mrs. Bains, 245-6187, nights and weekends.

FOUND: GLASSES. A pair of prescription glasses has been found on Taylor Road, near Building 1230. To claim, contact Phil Brown, ext. 2590.

FOUND: SUNGLASSES. A pair of prescription sunglasses has been found in training room 106, Building 1194. To claim, contact Sherry Sullivan, Learning Center, ext. 3014.

NEEDED: ROOMMATE(S) to share a two- or three-bedroom home in Langley area. Contact Claudio Egalon, ext. 3036 or 253-4471. Leave message.

HELP: Will the person who borrowed the PC TEX disks in boxes, kindly contact Cheryl Winstead, ext. 2561.

LaRC ALUMNI ASSN. Board of Directors Meeting will be held April 28, at 10 a.m., in the first floor conference room, Building 1218.

FOR RENT: HOUSE, Hidenwood/Deep Creek area. 3BR, lg LR, kit., fenced yard, appliances. Pets allowed. $495/month. Available May 1. Call 898-4485.

FOR RENT: CONDO. 3 BR, 2 BA on desirable Willoughby Spit, Norfolk. 20 min. to NASA/LAFB. $650/month. Prefer one-year lease; six- month lease accepted. Call Jim, 1-588-8617, evenings or weekends.

FOR SALE: SAILBOAT. Morgan 28, shoal draft (3'), 1/B Engine, 5 sails, 5 berths, good headroom. Excellent cruising boat. Coast Guard documented. Recently hauled. Reduced to $12,500. Call 851-0552.

FOR SALE: KEYBOARD. Yamaha PSR-32 portable keyboard with rythme case. Like new. $395. Call 898-5557 after 5 p.m.

FOR SALE: KEYBOARD. Commodore 64 personal computer keyboard. Like new. $175. Call 898-5557 after 5 p.m.

LAA Discount Tickets Available

The Langley Activities Association sells discount tickets and passes to area entertainment sites. Take advantage of the following savings:

Busch Gardens one-day pass (regularly $17.95)			**$15.50**
Kings Dominion one-day pass (regularly $16.96)			**$14.50**
Water Country one-day pass (regularly $12.95)			**$11.00**
Colonial Williamsburg Patriot Pass		Adult:	**$22.50**
		Child:	**$11.50**
	Royal Governor	Adult:	**$19.00**
		Child:	**$ 9.75**
	Basic Admission	Adult:	**$15.00**
		Child:	**$ 8.25**
Movies	**$3.25**	Coliseum Cinema I & II	
		Riverdale Twin	
		Beechmont	
		Martin of Williamsburg	

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

ANTENNA PARKED IN LOW-EARTH ORBIT. Having completed its life as a highly successful test article, this deployable antenna is now "parked" in a place of honor at Harris Corporation headquarters, Melbourne, Fla. As a result of the program, led by a Langley and Harris Corporation development team, significant contributions were made to the acceptance of deployable antennas for future space applications, including the Space Station. The concept is already operational as part of the Tracking and Data Relay Satellite System.

NASA
National Aeronautics and Space Administration
Langley Research Center

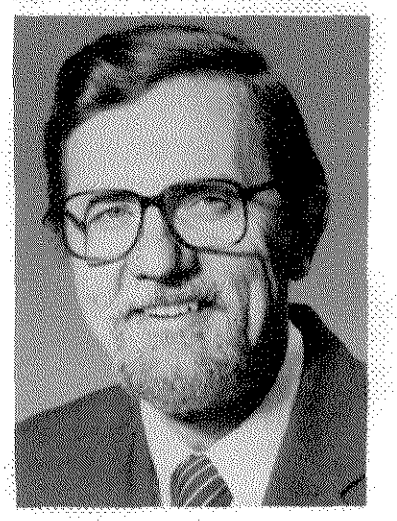
Volume 2, Issue 10 May 6, 1988

Researcher News

Bi-weekly Employee and Contractor Publication

Hearth Presents Special Langley Colloquium

The National Laboratories in the United States represent a significant investment of resources, facilities and trained people. These laboratories have made sizable contributions in the past; however, the role of America's universities and industry in the technology innovation process has changed in recent years. In addition, the process itself is undergoing change.



Dr. Donald P. Hearth, former director of the Langley Research Center and now associate vice president for research at the University of Colorado in Boulder, will discuss "The National Laboratories–Past and Future" at a special Langley colloquium Wednesday, May 18. The lecture will be held in the Activities Center, building 1222, at 3:30 p.m., followed by a reception for Langley employees from 4:30 to 6 p.m. A cash bar will be available for refreshments.

In his lecture, Hearth will discuss the changes that are needed in the technology innovation process. According to him, partnerships must be developed between America's National Laboratories, universities and industry to maximize the contributions of the National Laboratories to technological advances and the economic vitality of the country.

Hearth was director of Langley from 1975 to 1985. He was responsible for the center's aeronautical and space research programs, as well as the center's facilities, personnel and administration.

Scout Launches Two Navy Navigation Satellites

Langley's Scout Project Office reports that the Scout launch, which took place April 25, was successful and that the spacecraft is performing as planned.

Two U.S. Navy navigation satellites were launched from Vandenberg Air Force Base, Calif. The pair of satellites, Stacked Oscars on Scout (SOOS-3), are part of the Navy's long-established, continuous all-weather global navigation system. The Oscar satellites, each weighing 141 pounds, were placed into a 600-nautical-mile circular polar orbit.

One of the two Oscars will join the longest-lived satellite in the navigation system—Oscar 13—which remains operational more than 20 years after being launched by a Scout rocket. The second Oscar in the stack will be stored in orbit for future use.

The four-stage, solid propellant rocket motor vehicles are built by the Missles Division of LTV Missiles and Electronics Group, Dallas, Texas.

Lewis Wins Collier Trophy for Advanced Turboprop Program

Lewis Research Center and the NASA/Industry Advanced Turboprop Team have been selected by a committee of distinguished aerospace leaders from throughout the United States to receive the 1987 Robert J. Collier Trophy. The trophy is awarded annually by the National Aeronautic Association for the greatest achievement in aeronautics or astronautics in America demonstrated by actual use in the previous year.

Lewis and the Turboprop Team are being honored for developing the technology and testing advanced turboprop propulsion systems that offer dramatic reductions in fuel usage and operating costs for subsonic transport aircraft.

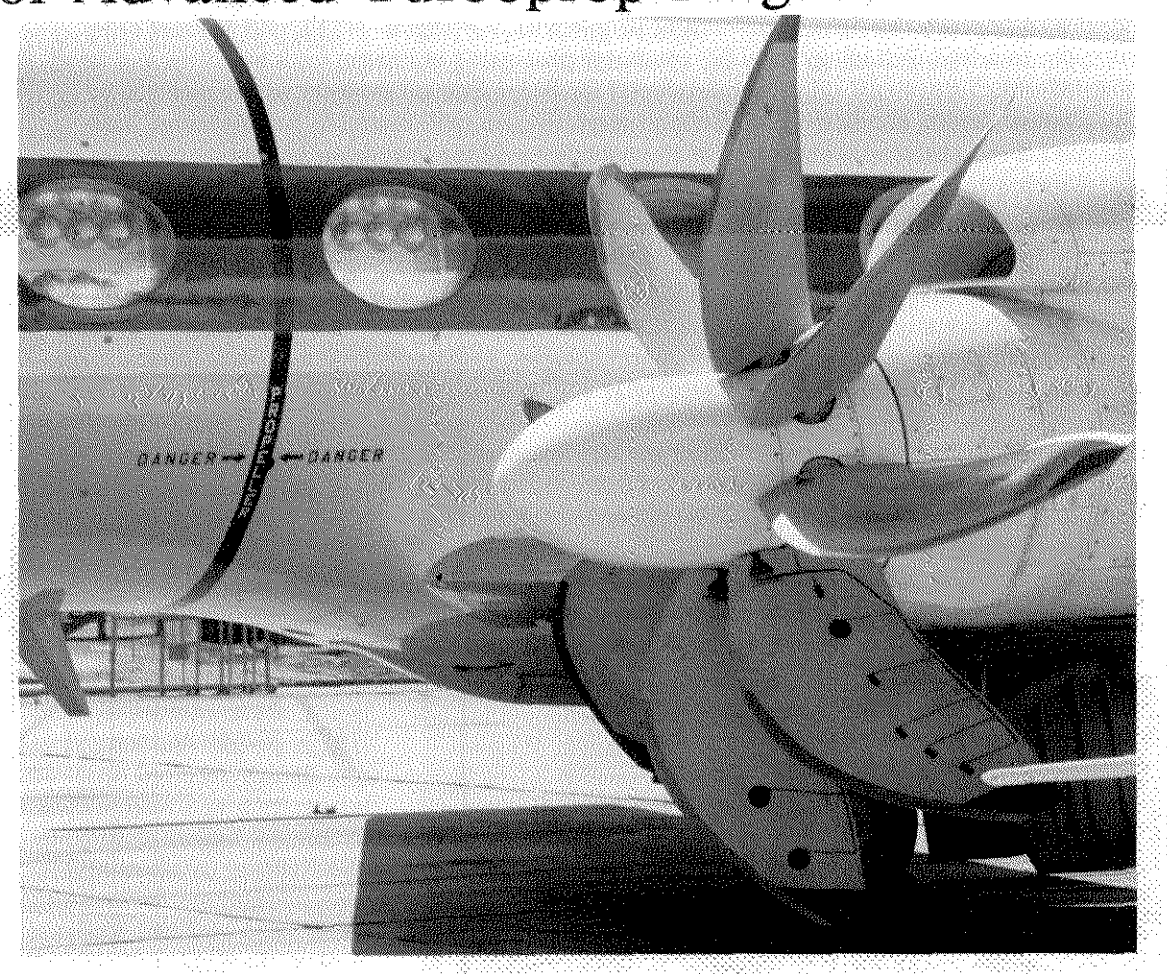
A series of successful flight and ground tests have demonstrated that advanced turboprop propulsion systems can reduce fuel burn by 25 to 30 percent over future turbofan engines with equivalent levels of advanced technology. This reduction in fuel usage should lower direct operating costs of future airliners by up to 15 percent.

Gigantic gold beads or acoustic mufflers? See page 3.

To reap the benefits of this major advance in aeropropulsion technology, the U.S. aviation industry is currently developing several new engines and aircraft that incorporate advanced turboprop propulsion systems.

The initial concepts for the award-winning advanced turboprop propulsion systems orginated in the mid-1970s in response to rapidly increasing fuel prices resulting from the initial OPEC oil embargo. Cooperative research by Lewis and Hamilton-Standard resulted in advanced propeller designs featuring thin, highly swept and twisted blades. In the early 1980s, Lewis also worked with GE Aircraft Engines on the concept of a dual spool, gearless, counter-rotating engine. The feasibility of achieving major improvements in aerodynamic efficiency with these unique propellers operating at high speeds (Mach 0.8) was subsequently demonstrated in wind tunnel tests at NASA and industry facilities.

This led to a major NASA/industry/university program to develop the related aerodynamic, structural, mechanical, and acoustic technologies required to verify the performance of these systems in ground and flight tests. Managed by the Advanced Turboprop Project Office of the Propulsion Systems Division at Lewis, the program incorporated technical expertise from Lewis, Ames, and Langley, and from more than 40 industrial contracts and 15 university grant efforts.



-photo courtesy of Lockheed Aeronautical Systems Co.

An advanced turboprop is mounted on a Gulfstream II jet. A series of successful flight and ground tests have verified that the advanced turboprop propulsion system —eight highly swept propeller blades powered by a turboshaft engine—can achieve greater efficiency and use less fuel than conventional turbofan powered aircraft while operating at comparable speeds. This accomplishment has netted Lewis Research Center and the NASA/Industry Advanced Turboprop Team the 1987 Collier Trophy. A series of tuned resonators installed for cabin acoustic tests is visible in the windows of the aircraft. Read about Langley's contributions to the Advanced Turboprop program on page 3.

The program reached its goals in 1987, when three series of flight tests verified the readiness of advanced turboprop propulsion technology for commercial engine systems development. The flight testing included: 1) the NASA/GE/Boeing flight tests of the gearless counter-rotating Unducted Fan (UDF) engine on a B-727 aircraft; 2) the NASA/Lockheed Propfan Test Assessment of a single-rotation advanced turboprop on a Gulfstream II aircraft; and 3) extensive GE/McDonnell Douglas flight tests on an MD-80 aircraft. In addition, a joint venture of Pratt/Whitney and Allsion has conducted extensive ground tests of a geared counter-rotating propfan propulsion system in preparation for flight tests on an MD-80 aircraft later this year.

The Collier Trophy will be presented May 13 in Washington, D.C., at the Annual Robert J. Collier Trophy Dinner. The award was established in 1911 and was first presented to Glenn Curtis for achievements in developing a seaplane. It has been presented annually since then, with the most recent award recognizing the round-the-world flight of the Voyager aircraft.

News Briefs

HEADQUARTERS, Washington, D.C. — NASA Administrator Dr. James C. Fletcher announced that the moon, rather than Mars, may be the best initial destination for possible U.S./USSR manned missions. "Going to the moon together would give the two leading space-faring nations in the world an opportunity to build a stable base for further cooperation, which could, one day, lead to a cooperative mission to Mars."

NATIONAL SPACE TECHNOLOGY LABORATORIES, Miss. — NASA has announced the selection of 20 research projects to develop new public and private sector applications of space-based and airborne remote sensing technologies. Funding of the projects represents the initiation of a new 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.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — NASA has submitted to the Congress its acquisition plan for the Space Shuttle Advanced Solid Rocket Motor (ASRM). The plan contains NASA's strategy for a full and open competition to produce an ASRM into the Shuttle system. This will result in substantive improvements in flight safety design margins, reliability and performance.

LANGLEY RESEARCH CENTER, Hampton, Va. — NASA Langley has selected Unisys Corp., McLean, Va., for negotiation of a contract for scientific computer operations, programming and analysis support services. Estimated value of the contract is $32.2 million. The contractor will provide support services for the operation of Langley's central scientific computer complex, used by all segments of the Center in carrying out research programs through analytical studies, real-time simulations and experimental data reductions.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — Morton Thiokol, Inc., has conducted the fifth and final short- duration solid rocket motor Nozzle Joint Environment Simulator (NJES) firing test at its Space Operations facility in Utah. The overall objective of the nozzle joint test is to evaluate the performance of the redesigned case-to-nozzle joint with verified defects.

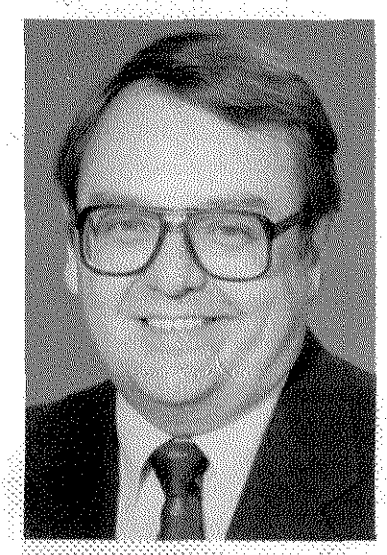
NATIONAL SPACE TECHNOLOGY LABORATORIES, Miss. — NASA and the Johns Hopkins Wilmer Eye Institute, Baltimore, Md., will use space technology to develop a device to improve the sight of millions of people with low vision. NSTL and Wilmer scientists plan to adapt technology used for computer processing of images from satellites and head-mounted imaging systems originally developed for Space Station projects to enhance vision. The planned device, the Low-vision Enhancement System, will resemble "wraparound" sunglasses and will custom-tailor images of the outside world for low-vision patients.

HEADQUARTERS, Washington, D.C. — NASA has announced the selection of nine universitites to conduct long-term research into promising areas of space engineering and technology. The nine university-based centers, chosen from 115 applicants, are eligible to receive up to $500,000 for the first year and over a million a year for a mininum of four years. This year's selection of University Space Engineering Research Centers includes new opportunities for university speciliization such as Mars mission technologies, extraterrestrial materials, in-space construction and large space-based observatories.

Editor's note: Recent surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. copies are available by contacting Edith Watts, Mail Stop 146, ext 3017. Request information by release number and headline.

Editorials

The Langley Exchange Works for You



In the early years of the National Advisory Committee for Aeronautics (NACA), the employees formed a number of clubs to offset the lack of social and cultural activities available in the local area. This loose confederation of employee clubs was referred to as "The Noble Order of the Green Cow" or "The Green Cow" for short.

About 1922, one of the clubs within this group originated operation of the first "lunch room" or cafeteria in Building 587 in the East Area.

In April 1943, the NACA Exchanges were organized to "promote health and efficiency of laboratory personnel and to promote morale in the organization." Later the Langley Activities Association (LAA) was created to bring a cohesive formal structure to the NACA clubs. The National Aeronautics and Space Administration's (NASA) Langley Exchange was created with the formation of the new Agency in 1958.

The Langley Exchange Council oversees the Langley Exchange operations and reports to the Center Director. The Langley Exchange has four major branches: 1) the Langley Activities Association, 2) the Cafeteria and Vending Services, 3) the Souvenir Counter at the Visitor Center, and 4) the Langley Child Development Center (LCDC). The Langley Exchange operates primarily with nonappropriated funds generated through vending and Souvenir Counter sales. The employee services branches (the Cafeteria, LAA and LCDC) operate on a non- profit, break-even basis.

The Langley Exchange provides funds to the Exchange Branches for activities that benefit Center employees. For example, the Langley Exchange recently funded a new gymnasium erected adjacent to the Activities Building. By constructing the gym, the Langley Exchange provided a site for the establishment of the fitness center for NASA personnel, a component of the Occupational Health program.

The Langley Exchange Council has representatives from the Space, Aeronautics, Electronics, Management Operations, and Systems Engineering and Operations Directorates. The Langley Exchange Council meets quarterly and welcomes suggestions, criticisms or compliments from Center employees.

A. J. "Jerry" Hansbrough
Chairman, Langley Exchange

Members of the Langley Exchange Council are (front row, L to R) Buena Crawford, Management Operations (MO); Jerry Hansbrough, Chairman; Dr. Christine Darden, Aeronautics; (back row, L to R) Jimmy Wilson, MO; Dick Layman, MO; Joe Drewery, Space; and Geoff Tennille, elected. Absent from the group is Jesse Timmons, Systems Engineering and Operations. The Langley Exchange Council welcomes suggestions, criticisms or compliments from Center employees.

NACA Reunion

Planning is complete and announcements have been mailed for NACA Reunion IV, a gathering of former employees of the National Advisory Committee for Aeronautics. NACA Reunion IV will be held at the Red Lion Inn, San Jose, Calif., on September 30 and October 1-2, 1988.

A full schedule of activities has been arranged including a Friday night Western buffet, a Saturday night banquet, and a farewell champagne bruch on Sunday. For those who wish to see something of the local area, Saturday tours have been arranged, including visits to NASA Ames or a local winery.

The organizing committee is anxious to contact all NACA people who have not already received final information and reservations forms. All former employees and military detailees and their spouses are invited to the reunion and can receive a copy of the announcement by writing: NACA Reunion IV, P. O. Box 6-1988, Mountain View, Calif., 94042.

Lankley

Young Lankley's first "manned" space flight.

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Thursday following the date of this issue.

Managing Editor . . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

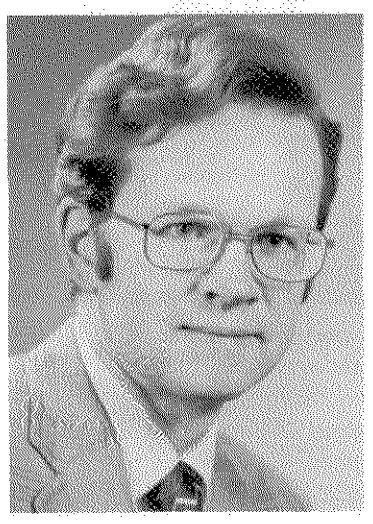
Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

Hinners to be Guest Speaker

NASA Honors Employees at Awards Assembly

NASA will honor employees who have made outstanding contributions in aeronautical and aerospace research during the past year at the Annual Honor Awards Ceremony Wednesday, May 11.



Dr. Noel W. Hinners, NASA associate deputy administrator (institution) and chief scientist at NASA Headquarters, will be the guest speaker for the ceremony, which will begin at 1:30 p.m., in the Activities Center.

At NASA Headquarters, Hinners assists and, when appropriate, acts for the administrator and deputy administrator in the management of institutional matters at NASA. In his role as chief scientist, he is the principal advisor to the administrator and to senior management on agency-wide aspects of NASA's scientific activities.

He joined NASA in 1972 as director of lunar programs in the Office of Space Science at NASA Headquarters. From 1974 to 1979, he was NASA associate administrator for space science. He was director of the Smithsonian Institution's National Air and Space Museum prior to being appointed director of the Goddard Space Flight Center in 1982, a position he held until his current appointment.

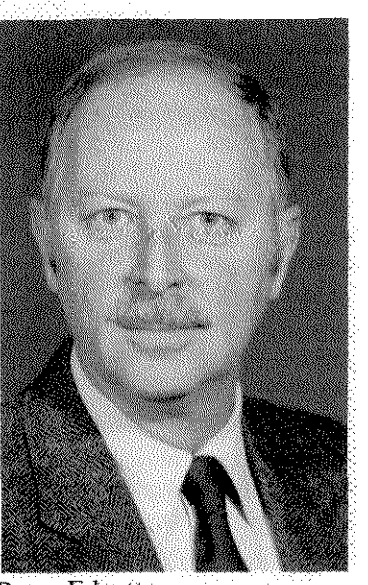
Hinners was educated at Rutgers University, California Institute of Technology and Princeton University where he received a doctorate in geochemistry and geology in 1963.

Langley employees receiving awards during the ceremony will be featured in a future issue of **Researcher News**.

Jones Retires as Head, Occupational Health Services; Edgette Named Successor

Virginia H. Jones, Head, Office of Occupational Health Services, retired April 29 with more than 25 years of government service. Peter Edgette, Lt. Colonel (retired), U.S. Army, has been named to succeed Jones.

Virginia H. Jones



Peter Edgette

Jones joined NASA in 1962 as an occupational health nurse. In 1973 she was assigned to the health office, managing the Workers' Compensation Program and providing technical guidance and coordination for the physical examination program.

She was named head of the office in 1980, where she managed a comprehensive program of medical support services for Langley employees, including the bloodmobile, employee assistance program and the fitness center. She has received three Special Achievement Awards and a NASA Headquarters award for her outstanding contributions to the fireld of occupational health. During this time, she also served as the technical representative to the contracting officer for the medical contract which operates the dispensary.

Edgette came to NASA from Fort Eustis, where he served as the hospital administrator for the U.S. Army since 1985. As an officer in the U.S. Army, he was in the Medical Service Corps, retiring in 1987. He also served as an aviation electronics technician in the U.S. Navy from 1958 to 1962.

He has specialized in hospital administration, contract negotiation and aviation, logging 2,000 hours in fixed, multi- engine and rotary wing aircraft.

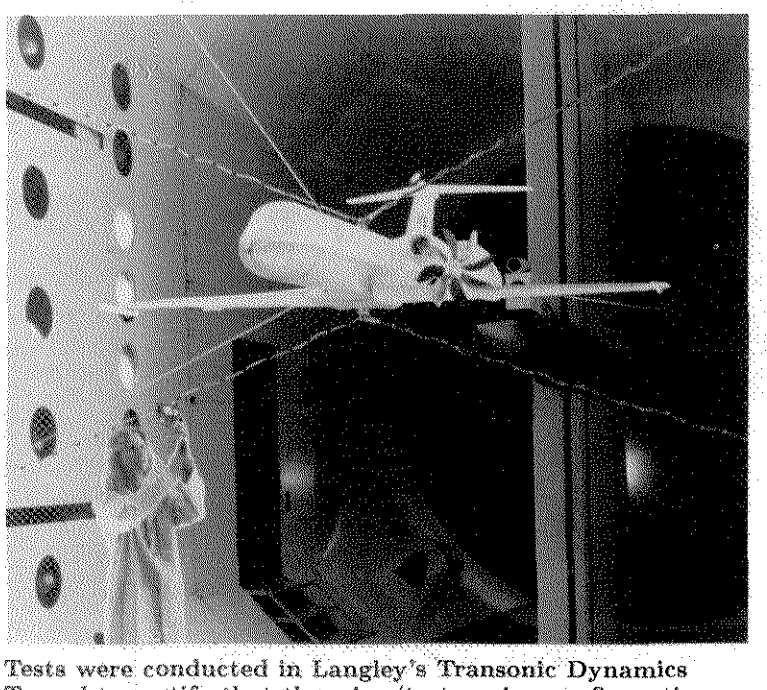
A native of Niagara Falls, New York, Edgette received a bachelor of arts degree in sociology from Niagara University, Niagara Falls, in 1967, where he received the distinguished military graduate award. He received a master of arts degree in public administration from the University of Northern Colorado in 1975 and a master of science degree in hospital/health care administration from Baylor University in 1977.

Langley Researchers Contribute to Advanced Turboprop Program

Langley researchers have been working with the Lewis team since 1976 on the Advanced Turboprop Project. Langley's thrust has been in the areas of interior noise control and propulsion integration.

David G. Stephens, chief, Acoustics Division, explains Langley involvement in acoustics as four fold: "We have been working to understand and predict the noise of the advanced turboprop, to understand and predict the transmission of that noise through the structure, to develop a light-weight, efficient noise flow treatment and then to conduct subjective testing to better understand passenger and community reaction to these new sounds." Langley Structures, Aeronautics and Systems Engineering and Operations Directorates have had primary involvement in the NASA/Lockheed Propfan Test Assessment (PTA) project.

The advanced turboprop with its large, unducted propellers featuring thin, curved blades with highly swept tips has proven to be a feasible alternative to higher-cost turbofan (conventional jet) propulsion systems. Passenger acceptance of the new, radically styled, energy efficient propeller is dependent, in large part, on reducing interior noise levels to the level of current jet aircraft.



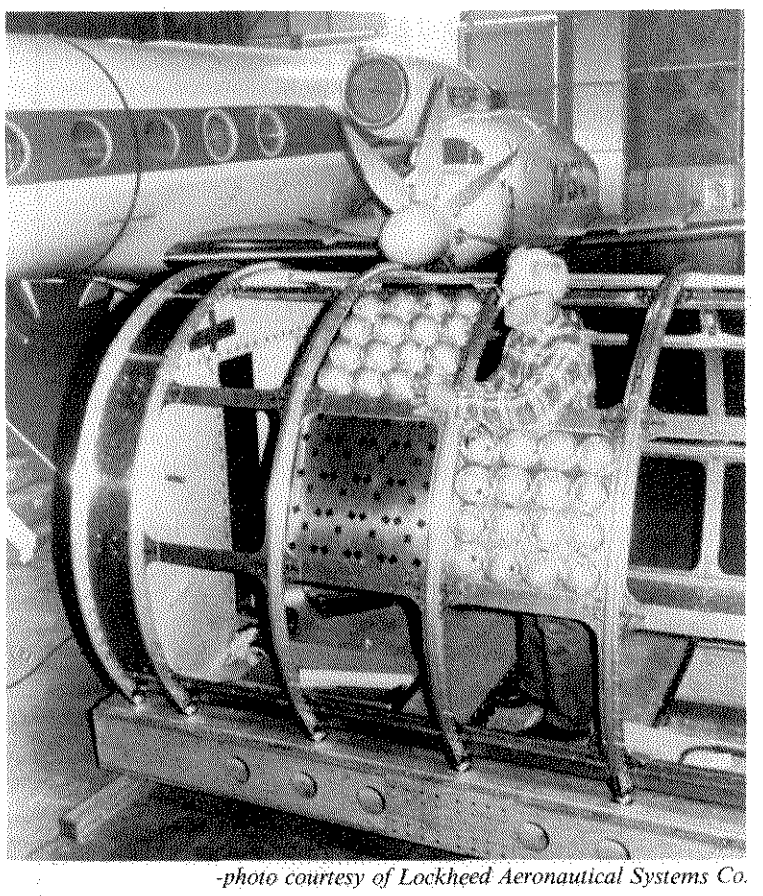
Tests were conducted in Langley's Transonic Dynamics Tunnel to certify that the wing/test engine configuration was flutter free.

In the new propfan propulsion system, noise from large, uncovered propellers is not muffled by a cowling, as with conventional jets. Tests in Langley's Quiet Flow Facility and the 14- x 22-Foot Subsonic Wind Tunnel provided measurements of propfan noise and aerodynamic performance.

Langley's challenge has been to design an interior wall and sound insulation system to control the interior noise but, at the same time, keep the system light- weight. This has been accomplished through in-house work and contract effort with Lockheed Aeronautical Systems Company, California. A system of tuned resonators (acoustic mufflers) and low-frequency sound absorbing materials will provide isolation from the outside structure.

Langley wind tunnel tests were also conducted in the 16-Foot Transonic Tunnel to determine how to best integrate the propulsion system with the airframe and in the Transonic Dynamics Tunnel to certify that the wing/test engine configuration was flutter free.

In short, Langley researchers have made significant contributions in both technology development and, more recently, in the flight demonstration program.



-photo courtesy of Lockheed Aeronautical Systems Co.

A Lockheed aerospace worker prepares the interior acoustic test assembly for installation in a G-II Gulfstream jet modified to serve as the Propfan Testbed. Aluminum resonators, shown close up on page 1, are designed to reduce noise generated by the propfan. Lockheed is under contract with NASA to perform acoustical tests on the propfan system.

The genius of Viking at work on Earth

Kelliher Receives Technology Transfer Award

Viking, the automated spacecraft which landed on Mars in 1976, carried an x- ray fluorescence spectrometer—developed under the guidance of Warren C. Kelliher—to analyze chemical elements in the Martian soil.

Today, technology which made the Viking mission successful is finding Earth use in geological explorations and water quality monitoring. And Kelliher has been selected by the Federal Laboratory Consortium (FLC) to receive a special award for excellence in technology transfer.

In a spinoff of Viking instrumentation, Kelliher, aerospace technologist, Facilities Engineering Division, has developed portable element analyzers for both geologic and toxic waste site surveys. This techology has been transferred to the Bureau of Mines and the Environmental Protection Agency (EPA).

X-ray fluorescence is a commonly used laboratory technique for determining the composition of samples. An x-ray source irradiates the sample, causing it to emit x-rays at various energies characteristic of the chemical elements in the sample. A spectrometer then measures the energy levels of the x-rays emitted for analysis of the sample's composition. The Viking system was highly miniaturized for compactness and extremely economical in power consumption. These qualities made it attractive for conversion to a portable, Earth-use instrument.

To fulfill a need identified by the Bureau of Mines, Kelliher investigated modifying the Viking instrument to produce a portable geological exploration unit. The unit successfully identifies at least 60 elements and their relative concentrations in ore samples at the site. The device was accepted by the Bureau of Mines and commercialized in 1985.

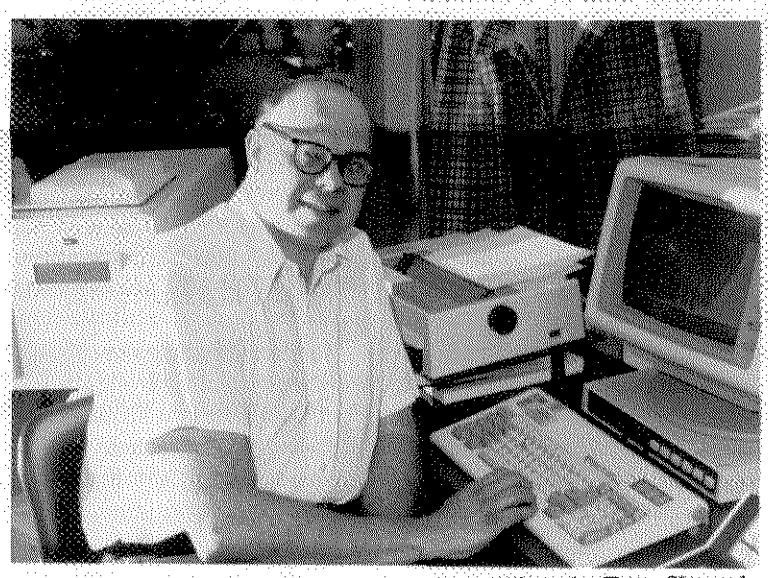
Next, in response to an EPA need for on-site screening of waste sites to identify areas contaminated by hazardous chemicals, Kelliher guided the development of a van-portable element analyzer system that enables preliminary soil or water analyses to be performed on-site. The system was demonstrated successfully to EPA in September 1987. Commercialization efforts have been initiated by Kelliher and the Technology Utilization Office with three major instrument companies.

These instruments offer significant benefits to both federal and state government agencies. On-site characterization of chemical elements will greatly increase the productivity of regulatory agency survey teams. The system also permits mapping of contaminated areas by direct measurements rather than taking grid core samples for lab analysis.

Kelliher will be honored at the FLC Spring Semiannual Meeting in Washington, D.C., on May 17. The FLC was formed in 1974 to facilitate transfer of federally developed technology into the public and private sectors. Currently there are over 300 research and development labs represented in the consortium.

Kelliher began his NASA career in 1962 as part of the Polymer Group, Structures Directorate. From 1972-1977, he was involved with the Viking Project. From 1978 to the present, he has worked in the Facilities Systems Branch.

Kelliher and his wife, Pat, live in Hampton.

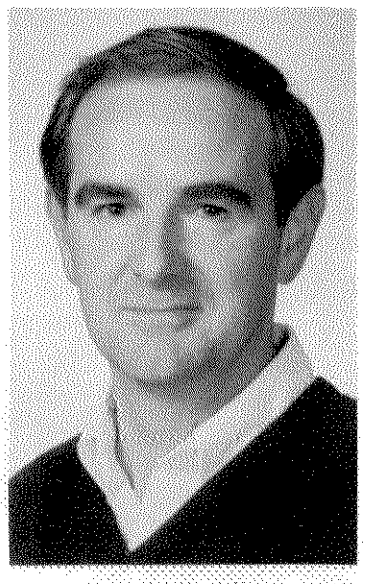


-photo by Terry Shepard

Warren C. Kelliher demonstrates prototype 2 of the portable element analyzer system in his laboratory. Prototype 2 uses a detector that is thermoelectrically- cooled. This eliminates the need for liquid nitrogen (LN_2) and the inconvenience involved in keeping the LN_2 cool.

Langley Colloquium and The Sigma Series

NASA Colloquium Features Lecture on Viruses



Viruses are tiny pieces of genetic information "perfectly engineered" to reprogram the functions of its host towards production of millions of copies of itself. They are major causes of disease and death in human and animal populations; cause problems such as AIDS, herpes, flu, hepatitis and rabies; and are involved in certain types of human cancer.

Dr. Iain (John) Hay, professor of microbiology at the F. Edward Hebert School of Medicine, Uniformed Services University of the Health Sciences, Bethesda, Md., will discuss "Perfectly Engineered Viruses" at a Langley colloquium Monday, May 16. The lecture will be held in the Activities Center at 2 p.m., followed by a question and answer session and an informal discussion.

That evening, Hay will give the same lecture at the Hampton Holiday Inn-Coliseum at 7:30 as part of The Sigma Series. The Sigma Series is a series of free public lectures sponsored by the Langley Research Center, the City of Hampton and the Daily Press.

In his lecture, Hay will discuss human viral diseases, the varied structure of virus particles, the basis for virus growth and its preemptive ability over the host cell, and new ways in which genetic engineering and other molecular techniques are being used to design antiviral vaccines and chemotherapeutic agents.

According to Hay, children and young adults are particularly prone to viral diseases, both for biological and social reasons. "We have been successful at combating some viral diseases, such as polio, but new problems continue to surface for which we have no effective prevention or cure, such as AIDS," Hay explained. "We are now beginning to understand the basic molecular biology of virus growth and structure and have started to use this knowledge to fight disease."

Hay has a doctorate degree in molecular virology from the University of Glasgow, Scotland. He was associate professor of biochemistry and senior member of the Medical Research Council Virology Unit at the Glasgow Medical School before moving to Bethesda in 1978.

Langley Directives Distributed

DIRECTIVES NO.	TITLE	DATE	T.S.#	DATE DISTR.
Revised				
LMI 2200.1	"Requests from Foreign Countries for Reprints and Unclassified NASA Reports"	2-23-88	1588	4-11-88
LMI 1700.7	"Traffic Regulations"	3-17-88	1590	4-11-88
LMI 2540.2	"Telephone Services"	3-17-88	1591	3-28-88
LMI 3713.1	Attachment A, "Equal Opportunity Program (EOP)"	3-17-88	1592	3-30-88
LMI 3410.1	"Employee Development and Training"	3-25-88	1593	4-11-88
LMI 1440.6	"Records Management Program"	2-23-88	1594	3-28-88
LMI 1100.4	Attachment, "Langley Research Center (LaRC) Productivity Review Committee"	2-23-88	1595	3-28-88
LMI 1100.6	Attachment, "Employee Suggestion Committee"	2-23-88	1596	3-28-88
Cancelled				
LMI 1110.14	"Langley Experimental Facilities Advisory Committees (EFAC)"	3-10-88	1589	3-30-88

NOTE: Directives are available for review in each organizational office. Extra copies may be obtained from the Directives and Forms Management Office, ext. 3511.

UW-WT Is 50

That's engineer-speak announcing the golden anniversary of a wind tunnel.

The F. K. Kirsten Wind Tunnel of the University of Washington is celebrating its 50th anniversary this year.

Run by undergraduate students, primarily of the Department of Aeronautics and Astronautics, the tunnel has provided valuable industrial-type experience and training for half a century.

A dinner gathering of present and past employees, customers, and friends of the Kirsten Wind Tunnel is planned for Monday, July 25 at the UW Center for Urban Horticulture.

For information and dinner reservations, please contact the office of Prof. William H. Rae, Jr., Associate Director, Kirsten Wind Tunnel, University of Washington, FS-10, Seattle, Washington 98195, or call (206) 543-0439.

Call for Papers

The Workshop on Computational Aspects in the Control of Flexible Systems will be held in Williamsburg on July 12-14. One-page abstracts of proposed presentations are requested by June 1. Contact Lawrence W. Taylor, Jr., ext. 3716, for detailed information.

Send PRs to Mail Stop 373

Purchase Request processing has a permanent home! The Purchase Request clerk is now located in Building 1206, Room 103. The new Mail Stop is 373. Please make this change to expedite the processing of PR's.

Additionally, all correspondence related to Shipping and Receiving, Warehouse (Building 1240) and Liquid Nitrogen (LN_2) should be sent to Mail Stop 373.

A dream takes shape

Langley Father-and-Son Team Build Light Aircraft

Like father, like son . . . the love of flying permeates the Adkins family. This father and son team, both NASA Langley employees, have realized a dream— they have built and are now flying their own airplane, a Rutan-designed long-ez.

Built in the backyard workshop of their Hampton home, Bill and Jim Adkins recently flew their home-built craft onto the NASA runway and parked in front of the hangar. Admirers surveyed the structure and questions abounded.

The two-place airplane is the culmination of over three years of work. Bill Adkins, research technologist, Operations Support Division, admits, "I've wanted to build an airplane since I was a kid. It's a long, drawn-out, expensive operation." Adkins teamed up with his son Jim, a modelmaker, Fabrication Task Facility, Fabrication Division, and together they modeled their dream.

Adkins and Adkins took flying lessons together in the spring of 1982 at Curtis Eads Flying School in Chesapeake. A veteran flyer, Eads gave the Adkins team instruction and flying experience. This, coupled with their innate fascination with aeronautics, gave Bill and Jim the confidence to pursue their dream.

The pair carefully chose the design for their flying machine based on speed, versatility and economy. Jim insists they made no aerodynamic deviations from the Rutan design but took liberties in aesthetic areas. "We came up with innovations to make difficult areas easier to work with or ideas on how to better construct parts we needed. Many of our solutions are now springing up as 'inventions' of other light aircraft enthusiasts," notes Jim.

"When we started building, there were seven such airplanes in the world," Bill recalls. "Now there are several hundred." As an EAA technical advisor, Bill Adkins often flies to meet other airplane builders and he shares with them his experiences and building techniques.

The Adkins team has amassed 16 years of experience working at NASA and this tenure is evidenced in the approach and methods they employed in building their light aircraft. Jim used many of the techniques he learned in the apprentice school and has employed during his eight years as a modelmaker.

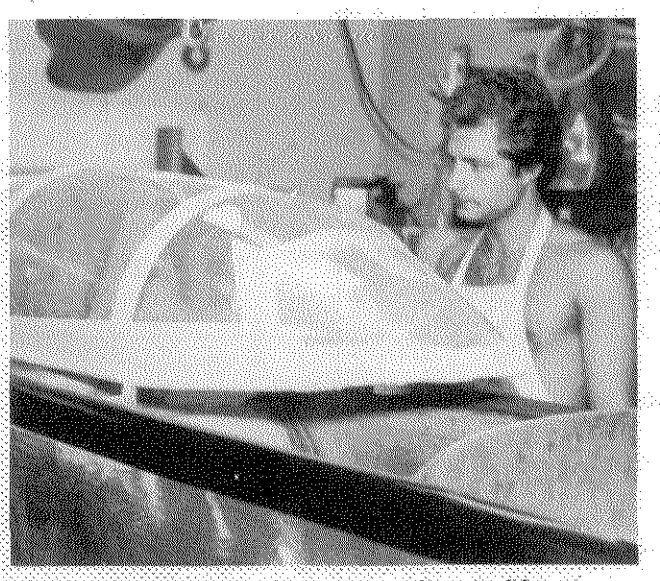
Both Adkins had enough foresight to document each stage of construction and the pictures really tell the story.

LANGLEY RESEARCH CENTER, Hampton, Va. — Langley employees Jim (front) and Bill Adkins fly their home-built, Rutan-designed, light aircraft to NASA Langley. The culmination of over three years of work, the Adkins team have made their dream take shape.

Friends and co-workers were on hand for the "fly-in." Bill (left photo) and Jim Adkins answer questions and share building techniques with admirers.

-Langley photos by Paul Bagby

Bill Adkins is shown fairing in the nose section of the Adkins long- ez.

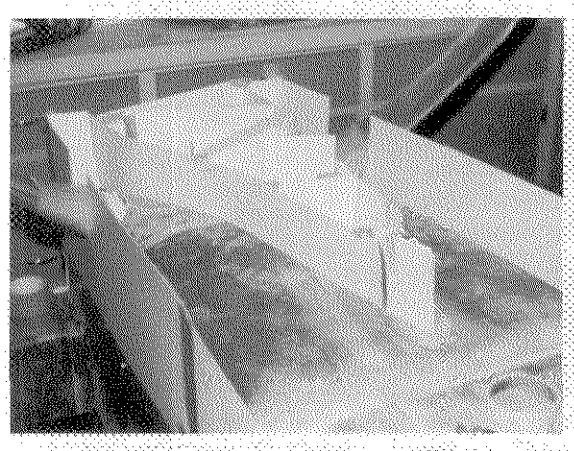


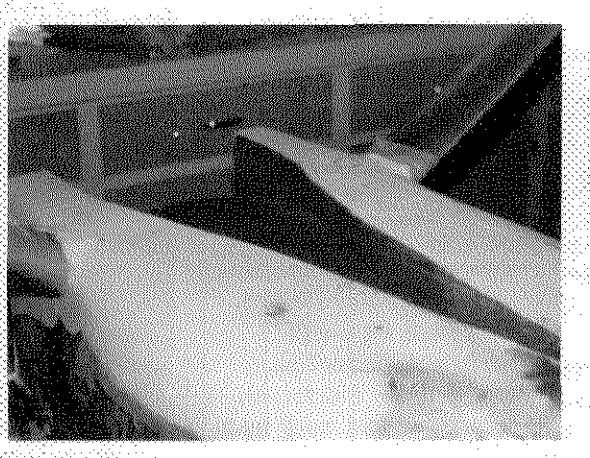
Jim Adkins is shown attaching the pre-blown canopy to the fuselage.

Knew you'd ask that question . . .

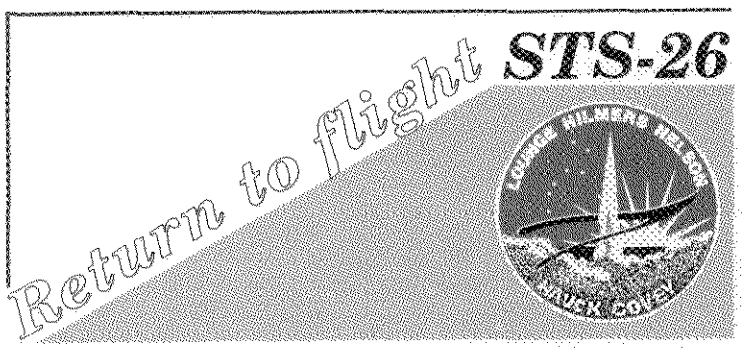
Of course, this wouldn't be a complete story without at least one crisis. And, yes, Bill and Jim admit that the project outgrew the facility! But the growth was carefully calculated and accommodations were made. The right wing extended to the right wall and touched the ceiling of the workshop and there was a similar situation on the left. Ultimately a circular area was scooped out of one wall for the nose of the aircraft to fit into.

Once the landing gear was permanently attached, however, the craft could no longer be tilted to allow exit/entry into the work area. The solution: this time they cut out a portion of the front wall of their workshop just high and wide enough to accommodate the left strake.





One modification to the original design which shows Langley influence on the builders is the NACA inlet which the Adkins chose to employ for a cleaner-looking, faster-moving aircraft. The photo on the left shows preparations for sculpting out the inlet. Photo on right shows the completed modification.



SRM Status Report

The third full-duration test firing of the redesigned Space Shuttle solid rocket motor was successfully conducted April 20 at Morton Thiokol's Wasatch Facility in Utah.

The 126-foot long, 1.2-million pound motor, designated Qualification Motor-6 (QM-6), underwent a full-duration horizontal test firing of two minutes. The test was the first of three full-duration firings designed to qualify the design features of the flight configuration of the redesigned solid rocket motor.

Two previous full-duration tests, Development Motors 8 and 9, successfully evaluated primary and alternate elements of the solid rocket motor. Two remaining full-duration tests, Qualification Motor-7 (QM-7) and Production Verification Motor-1 (PVM-1), will be conducted prior to the next Space Shuttle flight. Those tests are planned for June and July.

OASIS Instrumentation Will Record Shuttle Environment

Instrumentation to record the environment experienced by Discovery during the STS-26 Space Shuttle mission has been reinstalled in the Orbiter's payload bay and has been checked out.

OASIS (Orbiter Autonomous Supporting Instrumentation System) is designed to collect and record a variety of environmental measurements during various in- flight phases of the orbiter. The primary device is a large tape recorder which is mounted on the aft port side of the orbiter. The OASIS recorder can be commanded from the ground to store information at a low, medium, or high data rate. After Discovery's mission, the tapes will be removed for analysis.

The information will be used to study the effects on the orbiter of temperature, pressure, vibration, sound, acceleration, stress and strain. It will also be used to assist in the design of future payloads and upper stages.

On STS-26 launch day, the system will be turned on nine minutes before Discovery's liftoff to begin recording at high speed recovering high fidelity data. Following the first burn of the orbital maneuvering system, it will then be switched to the low data rate. It will be commanded again to high speed for subsequest OMS burns.

NASA is flying OASIS aboard Discovery in support of the Inertial Upper Stage (IUS) program office of the Air Force Space Division. The system was developed by Lockheed Engineering and Management Services Company under a NASA contract. Development was sponsored by the Air Force Space Division.

Harvey's Presents Service Awards

The Contract Manager, Harvey's Janitorial Service, Inc., recently presented Meritorious Service Awards to members of the Versatile Maintenance Crew. The award recognizes consistent outstanding service to their dual mission of cleaning LaRC Tunnels and supporting other custodial crews. John M. Huckless, contract manager, presents plaques to Tunnel Rats (L to R) Thurman Felker, Dwayne Artis, Lawrence Lovett, Jr., Warren James and Alexander Edlow.

-photo by Don Ward

VIRGINIA HOUSE OF DELEGATES HONORS IR-100 WINNERS. Delegate Shirley Cooper presented Langley IR-100 winners with a House of Delegates Resolution commending their contributions to air travel safety. Shown are (L to R) Lee Person, David Middleton, Cooper, Center Director Richard H. Petersen, Raghavachari Srivatsan and Leonard M. Weinstein.

Legislature Honors Langley Research Center

The Virginia House of Delegates has passed two resolutions honoring Langley Research Center.

House Joint Resolution No. 58, offered on January 22 and recently passed, designates July 20 of each year as Aerospace Exploration Day in Virginia and also designates July 16 through July 24 as Aerospace Exploration Week in the state of Virginia. Patrons of the resolution were Delegates Bloxom and Stieffen and Senators Fears and Andrews.

The resolution points out that "from the very earliest years, Virginians and Virginia have been part of the aerospace explorations effort." Singled out in the document as leading institutional aerospace pioneers are Virginia's NASA Langley Research Center, established in 1917, and the NASA Goddard Space Flight Center Wallops Flight Facility, in use since 1945.

A second resolution, House Joint Resolution No. 205, offered on January 26 and now passed, commends members of the staff of Langley for their contributions to air travel safety. Patrons of this resolution were Delegates Christian, Steiffen, Diamonstein, Maxwell, Cooper, Grayson and Senators Scott and Andrews.

In a special ceremony held April 15 at the Visitor Center, Delegate Shirley Cooper recognized Langley's 1987 IR-100 winners. Honored for the development of the takeoff performance monitoring system (TOPMS) were David Middleton, aerospace engineer; Lee Person, research pilot; and Raghavachari Srivatsan, aerospace engineer working at Langley under a NASA grant with the University of Kansas. Their award-winning device may one day help airline pilots take off and land more safely.

Also commended by the Virginia Legislature and honored by Mrs. Cooper was Dr. Leonard M. Weinstein, group leader, Turbulent Structures and Modeling Group. Weinstein has developed a device which detects and measures the thickness of ice accumulation on the outside of aircraft. Ice thickness is critical to aircraft safety and performance.

Through these two documents the Virginia General Assembly recognizes and commends "the notable efforts and contributions to mankind of the Langley Research Center."

Video Conference

The Management Vision Video Conference entitled "Corporate Health Promotion: Impact on Productivity and Liability" will be broadcast on Wednesday, May 11, from 3-5 p.m. The telecast will be received in Building 1194-A, Room 203/204.

This program, featuring George J. Pfeiffer, will examine how employee health and wellness not only reduce financial losses, but improve employee morale and boost productivity. Pfeiffer will structure a state-of-the-art health promotion system based on individual, organizational and work team strategies.

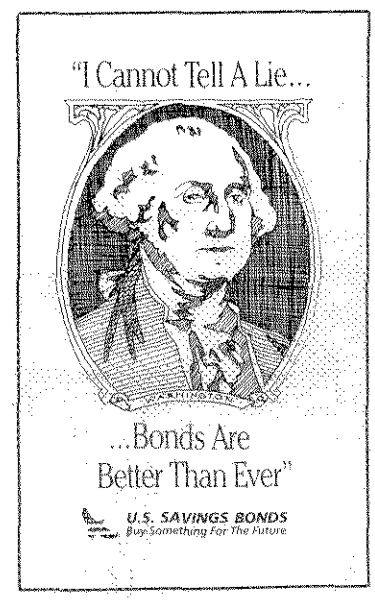
Please notify your training coordinator if you would like to attend.

—Hawaii—

Take a two-week trip to the Hawaiian Islands, October 21—November 3, 1988.

The tour features round trip air via United Airlines from Norfolk; 7 nights on Waikiki Beach; 3 nights on Maui; 2 nights on Hawaii at Kona; 1 night on Hawaii at Hilo; Dine-Around Dinner voucher for Waikiki; Moments in History tour; Cross-Island tour of Hawaii including Volcanoes National Park; Iao Valley and Lahaina tour; authentic Hawaiian luau and much, much more! For additional information or brochure, call Ernie Greene, ext. 2312 or 838-567, or Dan Crawford, ext. 3284 or 877-3053.

Savings Bond Drive May 16-27, 1988



Position Open

The following competitive placement position is currently open:

88-24: AST, Technical Management, GM-0801-14, Systems Safety, Quality and Reliability Division, Safety Engineering Branch, Safety and Environment Management Section. Closes May 31.

People & Places

MAY 22, 1988, SUNDAY
Activities Center, LRC

Bingo ★ Horseshoes ★ Volleyball ★ Fellowship ★ Raffle
Bar-B-Q ★ Hot dogs & beans ★ Potato salad ★ Cole slaw
Soft drinks ★ Beer

All employees and alumni are invited

Adults	**$4.00**	*For tickets and reservations contact*
Under 12	**$2.00**	*Abraham Leiss at 877-2939*
Under 6	**Free**	*Deadline May 15, 1988*

Sponsored by the Langley Research Center Alumni Association and the Langley Research Center

Alumni News and Views

Attention Alumni Association members and prospective members: Plan to attend the picnic on the grounds of the Activities Center, May 22, starting at 2 p.m. The cost is $4 for adults, $2 for children 6 to 12, and children under six will be admitted free. The menu will include hot dogs and bar-b-que and all the trimmings.

Fun things are planned including Bingo (with prizes), horseshoes, tennis, etc. The admission charge includes one free Bingo game as well as all food and beverages. In the event of rain, festivities will move inside the Activities Center.

The picnic is open to all Langley employees, contractors, and friends. Round up the family, invite your friends, and make it a fun day for all. Call Abe Leiss for advance tickets, or purchase them at the picnic.

Picnic Rules Set

Langley employees and contractors are reminded of the following rules for reserving the picnic grounds at the Activities Center.

- Call Pat Gates, ext. 2058, maximum of 60 days in advance, with request for use of the picnic area.
- Follow up with written letter of confirmation within 24 hours of telephone reservation.
- The Langley Activities Association reserves the right to designate picnic location.

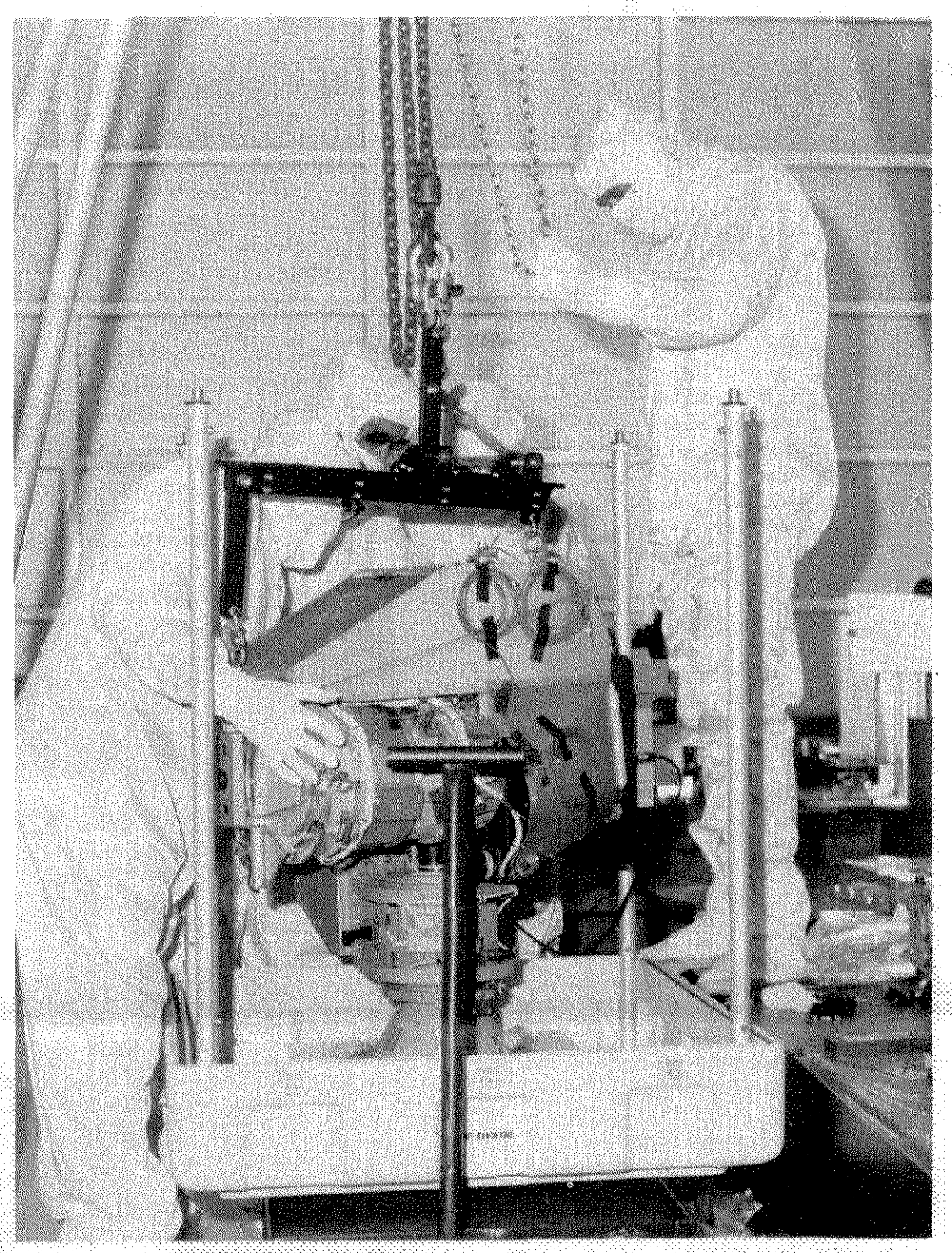
Upcoming Workshops

Advanced Hypervelocity Facility Workshop will be held May 10-11 in Building 1212, Room 200. For additional information, contact Willian L. Scallion or Robert D. Witcofski, Mail Stop 408, ext. 3984.

AIAA 6th Applied Aerodynamics Conference will be held June 6-8 at the Fort Magruder Inn, Williamsburg, Va. For information on registration or program content, call (202) 646-7539.

Hogge's Suggestion Implemented

Acting Deputy Director Robert L. Swain (right) congratulates Barry N. Hogge, supervisory engineering technician, on an award-winning suggestion as Kenneth N. Cole, chief, Operations Support Division, looks on. Hogge suggested a modification to the Configuration Management Program documentation to assure continuous updating in the recertification of pressurized systems.



From Behind the Scenes

Who Are Those Masked Men?

Workers in clean suits load the Halogen Occultation Experiment (HALOE) into a protective shipping container prior to transporting it from Building 1202 to Building 1250 for a Sun-look test to align the Sun sensor to the telescope. The test is scheduled to begin today and will be completed in one to two weeks.

The HALOE satellite instrument is being fabricated and tested at Langley for flight on the Upper Atmosphere Research Satellite (UARS) to be launched by late 1991. HALOE will measure seven gases which are critical to understanding atmospheric chemistry. An eighth channel will measure atmospheric carbon dioxine absorption to provide pressure data needed for the data inversion process.

Senior Management Research Review

The Senior Management Research Review will be held Monday, May 16, at 9 a.m. in Building 1219, Room 225. Following the Director's comments and program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:30	Aeroassist Flight Experiment Guidance "Quiet Time"	William Suit (Flight Systems/GCD)
9:45	Are We Depleting Global Ozone: Results of the Ozone Trends Panel	Patrick McCormick (Space/ASD)
10:00	Impact of Minimized Sonic Booms	Kevin Shepherd (Structures/ACOD)
10:15	15-Year Flight Service Summary of Composite Components on Aircraft	Benson Dexter (Structures/MD)
10:30	Unsteady Time-Accurate Computations Over Pitching Airfoils Using the Navier-Stokes Equations	Christopher Rumsey (Aeronautics/LSAD)
10:45	Developments in Real-Time Raster Graphics for Primary Flight Displays	William Kahlbaum (Electronics/ACD)

Happenings

LAA SOCIAL will be held Friday, May 13, from 4 to 6:30 p.m., in the Activities Center.

LAA BOARD. The Langley Activities Association Executive Board will meet Tuesday, May 10, at 7 a.m. in the Activities Center. Concerns to be brought before the board should be addressed to the appropriate committee member.

TOASTMASTERS. NASA Langley Toastmasters will meet May 11, 11:30 a.m. — 1 p.m. in Building 1218 Conference Room. Civil service employees should charge one hour to JO A-1619. Guests are welcome. Call Natalie Johnson, ext. 3487, for further information.

APICULTURE CLUB will meet Monday, May 16, at 7 p.m. in the executive dining room of the cafeteria, Building 1213. All interested in beekeeping are welcome. For more information, call Wilson, ext. 4615.

WATER COUNTRY Armed Forces Special, May 14-31. Tickets $6.75 on sale at LAA office, Activities Center.

MARTIAL ARTS classes, from beginner to black belt, are held Mondays and Wednesdays from 5 to 6:30 p.m. in the NASA gym. New students will be accepted between May 2 and May 25. For details, contact Roy Albang, ext. 3737, or Guillo Gonzalez, ext. 4621.

COUNTRY COME-BACKS FESTIVAL sponsored by Hampton Parks and Rec at Bluebird Gap Farm, Saturday, May 21, from 10 a.m. to 4 p.m. A family event. For information, call 727-6197

AIR/SPACE AMERICA '88, America's big, new, high technology trade exposition and air show. May 13-22. Brown Field, San Diego, California. Call (619) 294-8808 to register.

VA TECH PIG PICK'N will be held at the Mariners Museum park at 4 p.m. on Saturday, May 14. Proceeds benefit the Peninsula Chapter Academic Scholarship Fund. Tickets are $10 and can be purchased from Dave Conner, ext. 4313, Joe Drewry, ext. 4933, or Mike Marcolini, ext. 2645.

NAGS MEETING. The National Association of Government Secretaries will meet on Tuesday, May 17, at 6:30 p.m., Holiday Inn, Mercury Boulevard. A program on "Color Coordination" will be presented by Leslie Deas of Beauti-Control. Guests are welcome. For information and/or reservations, contact Reachie Hall, ext. 2159, or Shirley Davis, ext. 2759.

AMIGASIG. Anyone now using or considering buying an Amiga for work or home who is interested in starting a NASA-based SIG for Amiga users, please contact Don Lansing, Mail Stop 125A, ext. 2070, or Myron Sothcott, Mail Stop 125B, ext. 3874.

VEGGIES ANYONE? A local vegetarian dinner group is being formed. Vegetarians and other interested people are invited to participate. For more information, call Karen Looney, 930-1253.

INTERESTED IN FLYING? Or learning to fly? Consider Tidewater Flying Club. Three Cessna aircraft based at Patrick Henry. For more information, contact Tapscott, 898-6234, or Kepley, 867-8831.

swap and shop

FOR RENT: FURNISHED HOME in York County–Edgehill. Available September '88—June '89. AC, washer/dryer, dishwasher, woodstove. 20 min. from Langley. No children or pets. rent negotiable. Call 898-6517 evenings and weekends.

FOR RENT: TOWNHOUSE. Denbrook Station, Old Denbigh Blvd. 3BR, 2 1/2 BA, FP, all appliances. $450 per month. Available Aug. 1. Prefer one- year lease. One month security deposit required. Call 877-8263 evenings.

FOR SALE: BOAT. 1984 Renkin, 19 1/2 ft., I/O, 120 HP Mericruiser, galv. trailer, electric wench. Low miles, excellent condition. $7,900. Call 826-4344.

FOR SALE: AUTO. 1966 Ford Mustang (classic), 6-cylinder, automatic transmission, royal blue, clean interior, AM/FM stereo cassette player, very good condition. Asking $2,800. Call 868-6745.

Toys for Our Tots

The Langley Child Development Center needs donations of toys in excellent condition. The following items are especially desired:

- Plastic Balls
- Crib Activity Centers
- Musical Crib Mobiles
- Baby Dolls
- Baby Doll Bed
- Stuffed Animals
- Building Blocks
- Duplos, Legos, etc.
- Trucks
- Plastic Farm Animals
- Tea Sets
- Sand Box Toys
- Rocking Chairs
- Puzzles for 2-4 year olds
- Children's Kitchen Unit
- Children's Records
- Children's Tapes

Clean out those attics and get a tax write-off too! Deliver items to the Child Development Center, Building 1231A.

AA and AL-ANON meetings are held on-Center. For more information, call the Health Office, ext. 2605, or the Occupational Medical Center, ext. 2246.

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

News Researcher

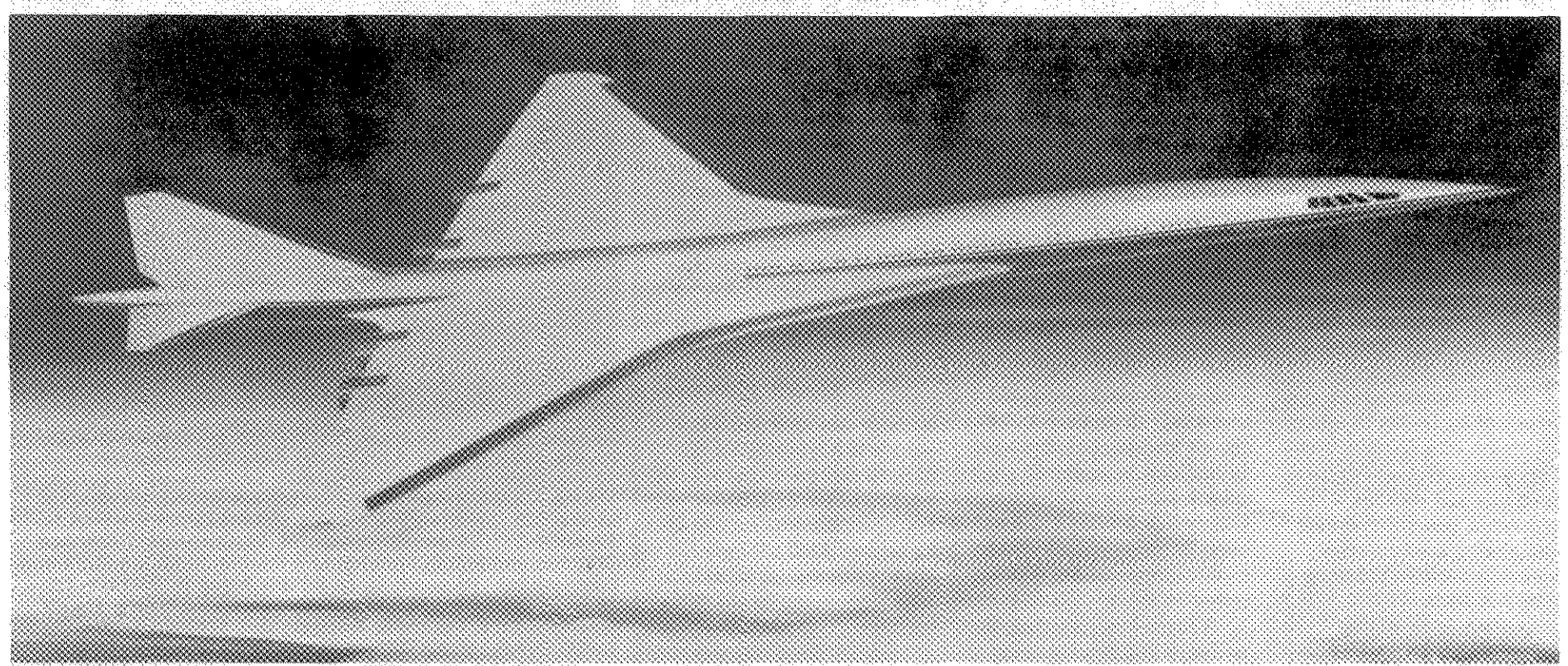
-photo courtesy of the White House

PRESIDENTIAL CONGRATULATIONS! Paul F. Holloway, Deputy Director, receives a Distinguished Presidential Rank Award from Ronald Reagan in a special ceremony in Washington, D.C. The President conferred on Holloway the rank of Distinguished Executive in the Senior Executive Service for "sustained extraordinary accomplishment in management of programs of the U.S. Government and for leadership exemplifying the highest standards of service to the public, reflecting credit on the career civil service."

NASA
National Aeronautics and Space Administration
Langley Research Center

News Researcher

Bi-weekly Employee and Contractor Publication



MORE EFFICIENT SUPERSONIC TRANSPORT. Airline passengers in the year 2000 could cross the Pacific from Los Angeles to Toyko in about four hours in a Mach 2.4 high-speed, civil transport, similar to this artist's concept, according to NASA-Langley-sponsored studies. The new aircraft, whatever its exact speed, will not only fly faster than the Concorde but will carry two to three times as many passengers up to twice as far as the Concorde. NASA is working to identify critical technologies and to reduce the economic risk to American industry. It would then be up to industry to build and sell a high- speed, civil transport. For more information on the next generation supersonic transport, see page 2.

Holmes to Attend Carnegie Mellon Executive Seminar

Harlan K. Holmes, Head, Electro-Mechanical Instrumentation Branch, Instrument Research Division, has been selected to attend the Senior Executive Seminar at Carnegie Mellon University, Pittsburgh, May 22 through June 10.

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 sectors.

Holmes, who was selected for the seminar in a NASA-wide competition, said, "I would expect to obtain a clearer picture of the federal budget process and develop a clearer insight into the mechanics of strategic planning, particularly as it affects a research organization."

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.

"Sharing experiences with management personnel from diverse organizations will unquestionably assist me in developing new ideas for productivity improvements

and strategy formulation," Holmes explained. "I will share with other participants my 15 years experience in managing a technical organization where research and development of new technology is the product."

In his position at Langley, Holmes directs instrument research and development activities in acoustics, structural dynamics, force, strain, aerodynamic boundary layer parameter sensing,, skin friction, model deformation and modern, large scale wind tunnel data acquisition systems. These areas impact virtually all aeronautics research activities at the center.

Prior to joining NASA, Holmes served in the U.S. Army as an instructor at the U.S. Army Corps of Engineers, Ft. Belvoir, and a research engineer at Buffalo Forge Co., Buffalo, New York.

AIAA Hampton Roads Section Holds Annual Awards Banquet

NASA Employees Elevated to AIAA Ranks

Twenty NASA Langley Research Center employees have been selected for the rank of Fellow or Associate Fellow by the American Institute of Aeronautics and Astronautics. The honor will be bestowed upon them at the annual AIAA Hampton Roads Section Awards Banquet Monday, May 23, at the Langley Activities Center.

Elevated to the rank of Fellow are Dennis Bushnell, Wilmer Reed III and Dr. Gerald Walberg. Named to the rank of Associate Fellow are Dr. Robert M. Bennett, Dr. John P. Drummond, Dr. John W. Edwards, George C. Greene, Dr. Ferdinand Grosveld, Brantley R. Hanks, Ray V. Hood, Robert J. Huston, Laurence D. Leavitt, Robert R. Lynch, Dr. Chuh Mei, David S. Miller, Dr. Raymond Montgomery, A. Gary Price, Wallace C. Sawyer, Lawrence W. Taylor Jr., and James L. Thomas.

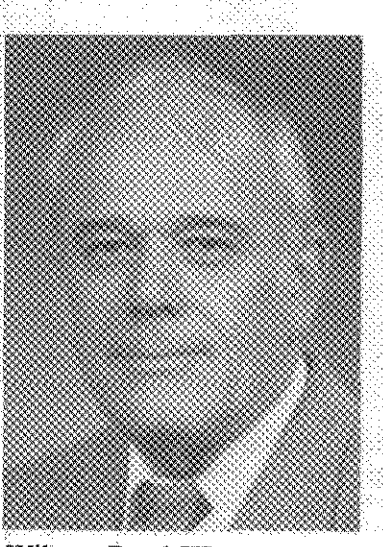
Individuals are selected for these ranks by AIAA in recognition of professional standing and outstanding personal contributions to arts, sciences or technology of aeronautics and astronautics.

Following the awards presentation, Richard E. Gillespie, executive director of The International Group for Historic Aircraft Recovery (TIGHAR), will present a program entitled "Project Midnight Ghost and Other Stories."

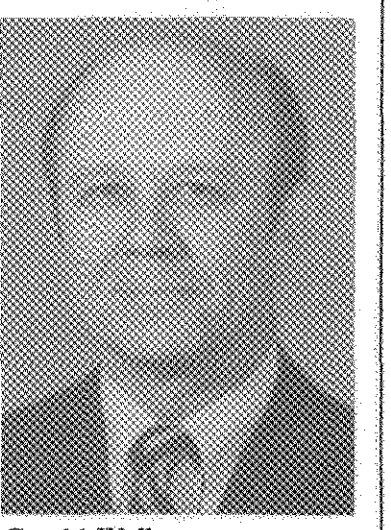
Project Midnight Ghost concerns TIGHAR's attempt to locate the White Bird, a French plane that took off from Paris May 8, 1927, 12 days before Lindbergh began his historic flight. It is reported by some that the White Bird crashed in Maine. If true, then the French pilots, Nungesser and Coli, could have also crossed the Atlantic Ocean, even though Lindbergh was the first to successfully fly non-stop from New York to Paris. Videotapes and vugraphs will be shown of the investigations conducted in this effort.

TIGHAR is a non-profit foundation dedicated to promoting responsible aviation archaeology and historic preservation. Incorporated in 1985, TIGHAR's activities include compiling and verifying reports of rare and historic aricraft surviving in remote areas, conducting investigations and recovery expeditions in cooperation with museums and collections worldwide, and serving as a voice for integrity, responsibility and professionalism in aviation historic preservation.

Dennis Bushnell



Wilmer Reed III



Gerald Walberg

News Briefs

HEADQUARTERS, Washington, D.C. — "The civil space program will be stopped in its tracks" if Congress approves an FY 89 budget level now being considered by the House of Representatives, NASA Administrator James C. Fletcher warns. "Lack of adequate funding for NASA will literally paralyze the program and bring to a halt the 30 years of progress that began after the shock of Sputnik in 1957." Fletcher insists the U.S. will be reduced to a second or even a third-rate power in space unless NASA is given the resources it needs to do its job.

MARSHALL SPACE FLIGHT CENTER, Hunstville, Ala. — MSFC is scheduled to test fire the fourth in a series of transient pressure test articles (TPTA) at its East Test Area in Huntsville. The test is part of the Space Shuttle solid rocket motor (SRM) redesign program and the final required TPTA test prior to resumption of Shuttle flights.

Editor's note: Recent surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017. Request information by release number and headline. See Current News Release information box on page 3.

Market for More Efficient SST Projected

-by H. Keith Henry

NASA has announced the results of an 18-month study showing that growth in trans-Pacific air travel would justify designing and building a new supersonic passenger airliner and placing it into service sometime between the years 2000 and 2010.

According to studies sponsored by NASA Langley, the world's next generation commercial supersonic transport would be markedly different than the Concorde which currently links North America with Europe.

The new plane would cruise at two to three times the speed of sound and carry two to three times as many passengers up to twice as far as the Concorde. The transport also will be profitable and an environmental "good neighbor," the studies said.

The civil supersonic transports envisioned in these studies, however, should not be confused with hypersonic transports, the present focus of the National Aero-Space Plane concept, jointly under study by NASA and the Defense Department.

According to the studies conducted by the Boeing Commercial Airplanes, Seattle, and the McDonnell Douglas Corp., Long Beach, Calif., conditions necessary to pursue the high-speed civil aircraft needs can be met. These conditions are: for the nation to aggressively pursue advanced high-speed technology development; for the air transportation market to continue its positive growth pattern; and for the U.S. industry to accept that manufacturing a high-speed civil transport makes good economic sense.

A flight from Los Angeles to Tokyo in a conventional subsonic jet takes more than 11 hours. In a Mach 2.7 aircraft, for example, the same trip would take less than 4 hours.

The Boeing studies indicate that, by the year 2000, a fleet of 1,200 large, subsonic aircraft would be needed to carry the estimated world-wide, long-range traffic of 315,000 passengers per day. By comparison, less than 800 supersonic transports, each carrying 247 passengers as far as 5,000 nautical miles, could serve the same market. The company suggests that improvements in airframe and propulsion technology should allow the range to increase to 6,500 nautical miles after a few years of service.

The studies show that flight speeds above Mach 4 are too costly and would require substantial technology development, delaying operational service. They indicate research should focus on the high-Mach range of conventionally fueled, long range, high-speed transport.

Timeliness in providing a viable and competitive vehicle is important for the U.S. to capture a major portion of the high-speed transport market, estimated to be over $200 billion. This market could be an important factor in the U.S. sustaining a positive balance of trade in the aerospace market.

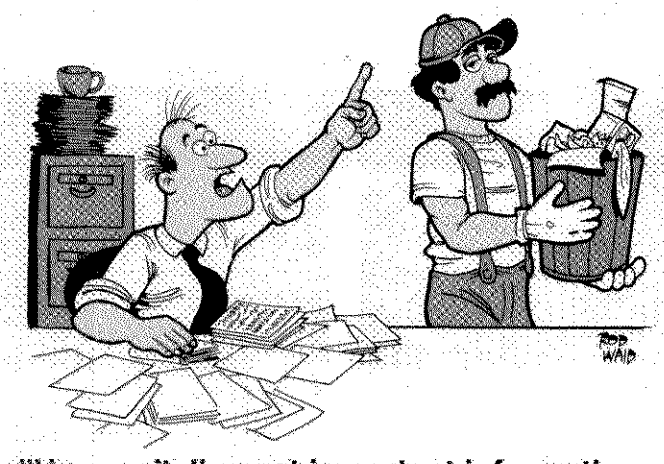
Results show that continued emphasis on reducing the takeoff weight is a key to achieving economic viability and environmental acceptability. Use of new, lightweight composite materials (metallics/plastics) and design innovations are very important.

Firm guidelines for the study required that high-speed, civil transports meet environmental criteria. The list of important environmental topics included noise and atmospheric chemistry. Other current NASA programs also seek to find economically viable answers to environmenal questions.

There are important comparisons to be made between the U.S. program in the 1960's and 1970's for supersonic transport. Many technologies are much more advanced today. Yet much research and technology development is required before any new supersonic transport could be economically successful. In fact, new technology will have to reduce Concorde-level fares (in terms of cost per passenger mile) by a factor of seven. Future work must be conducted from the very beginning with a high regard for environmental needs and economics.

Unlike the earlier program in the United States, the U.S. government is unlikely to participate as a financial partner. However, NASA has a clear charter to identify critical technologies and to reduce the economic risk to American industry in those technology areas. It then would be up to industry to build and sell the high-speed, civil transport on their own.

Lankley



"Hey, wait, I've got important information filed in there!"

Senate Lauds Langley

Langley Director Richard H. Petersen accepts congratulations from George A. Rodney, Associate Administrator, Safety, Reliability, Maintainability and Quality Assurance, NASA Headquarters, and displays the plaque he received at the U.S. Senate Productivity Awards Banquet held in Richmond. The award, sponsored by Senators Trible and Warner, recognizes Langley as a finalist in the public sector competition. Pictured (L to R) are Joyce R. Jarrett, Director, Quality and Productivity Programs Office, NASA Headquarters; Petersen; Rodney; and William L. Williams, LaRC Productivity Officer.

NASA-Langley to Honor Inventors at Luncheon

Thirty-six Langley Research Center inventors who received United States patents in 1987 and recipients of Langley's Technology Transfer awards will be honored at the annual Inventors' Luncheon Thursday, May 26, at the Sheraton Inn- Coliseum.

Robert L. Swain, acting deputy director, will present the awards. John E. O'Brien, general counsel, NASA Headquarters, Washington, D.C., will be the guest speaker for the occasion.

Langley employees are recognized annually for inventions which have been determined to be a significant value in the advancement of the aerospace technology program of NASA.

Inventors receiving awards will be Paul H. Hergenrother, Hans- Juergen C. Blume, Eric S. Stewart, John H. Cantrell Jr., William T. Yost, L. Robert Jackson, Randall C. Davis, Allan H. Taylor, Colossie N. Batts, Vernon L. Bell (retired);

Stephen S. Tompkins, Melvin C. Lucy, Edward A. Crossley Jr., David P. Haynes (retired), Howard C. Jones, Irby W. Jones, Martin M. Mikulas Jr., Marvin D. Rhodes, J. Wayne Simonton (retired), Ronald K. Clark, Harold G. Bush, James B. Robertson, Richard M. Wood, H. Douglas Garner;

Terry L. St. Clair, Charles F. Bryan Jr. (retired), Robert W. Hess (retired), William T. Davis (retired), Pamela A. Davis, Henry L. Kelley (Army), John C. Wilson (Army), Laurence J. Bement, James W. Bailey, Michael J. Walsh, John B. Anders, Jerry N. Hefner and Gregory R. Wichorek.

Since a large number of researchers participate in technology transfer activities at the Langley Research Center, eight employees will be honored with Technology Transfer awards for their accomplishments during 1987. A plaque will be presented as the top award to Paul M. Hergenrother, Materials Division, for "outstanding initiative and achievement in the transfer of materials technology to the industrial and public sectors."

Certificates will be awarded to Dr. Terry L. St. Clair, Materials Division; Dr. Jag J. Singh, Instrument Research Division; James L. Rogers Jr., Interdisciplinary Research Office; Dr. Joseph L. Heyman, IRD; Allan H. Taylor, Low-Speed Aerodynamics Division; Dr. Allan J. Zuckerwar and Irvin M. Miller, IRD, for "excellence in promoting the transfer of NASA technology to the industrial, biomedical and public sectors."

In addition, the following 12 Langley contractor employees had patents issued in 1987: Stephen J. Havens, Robert G. Bass, Mark S. Sinsky, John W. Connell, Gregory A. Dries, Jalaiah Unnam, Richard E. Wallsom, J. Kermit Jensen, Annmarie O. Egli, James W. Bailey, Shubha Maudgal and J. Richard Pratt.

Langley Joins Nation in Recognizing Small Business

President Reagan proclaimed the week of May 8-14 as Small Business Week in recognition of the vital role played by our nation's 14 million small businesses. "Small Business: Working for America" was the theme chosen for this year's celebration.

National Small Business Week sets the stage each year for small business firms throughout the country to be recognized for their accomplishments. Since 1967, awards commemorating this honor have been presented to selected small business firms as a joint government/industry project. NASA Langley Research Center's nomination, Analytical Services and Materials, Hampton, has been selected to receive the Small Business Administration's Administrator's Award for Excellence. The award was presented May 12 in Washington, D.C., during the Twenty-first Annual Joint Industry/SBA Small Business Procurement Conference and Awards Banquet.

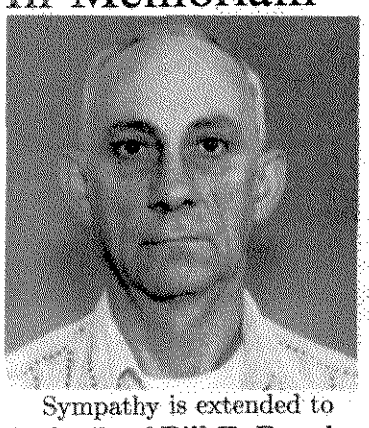
Langley also celebrated Small Business Week by attending the Eighth Annual Small Business Contracting Day at Norfolk Scope. The goals of the day were to alert the small business community to procurement opportunities with federal, state and local governments and to seek additional small business and small disadvantaged suppliers for government procurements.

It is NASA policy to place a fair proportion of its total purchases and contracts for supplies, research and development, and services with small business concerns. Each year, NASA Headquarters in Washington, D.C., sets socioeconomic program goals for contract awards at each center. For FY 1988, Langley's goals for contract awards to small business, to minority/disadvantaged firms, and to women-owned firms are $78 million, $15 million and $4.3 million, respectively.

Current News Releases

88-60.....NASA Administrator Sounds Alarm on Proposed Budget Cuts
88-61.....Space Shuttle Transient Pressure Test Article-4 Firing Scheduled
88-62.....Market for More Efficient, Supersonic Transport

In Memoriam



Sympathy is extended to the family of **Bill T. Baugh**, engineering technician, Operations Support Division, who died April 8. "Bill was highly respected for his technical and mechanical ability and his willingness to help with any job in the lab," says Bob Stewart, technician supervisor, Structures and Materials Lab. "He will be missed by his friends and coworkers." Baugh had been employed at NASA Langley for 25 years.

OEA Sees Three Graduate

Three employees in the Office of External Affairs have completed requirements for graduation from local colleges.

Jean Clough, public afairs specialist, graduated May 15 from Christopher Newport College. She received a bachelor of arts degree in political science, concentrating in public management.

Pam Verniel, secretary, and Margaret Hunt, freedom of information officer, will receive associate in applied science degrees in management from Thomas Nelson Community College June 15.

Upcoming Conferences

Fluctuating Pressure Loads Workshop will be held June 2-3, in Building 1209, Room 180. For additional information, contact Dr. William E. Zorumski, Mail Stop 460, ext. 2618.

CEBAF 1988 Summer Workshop will be held at Christopher Newport College, June 20-24. Users who are interested in influencing the direction of the experimental program or who are interested in collaborating with CEBAF for the purpose of constructing some of the experimental equipment for this program should plan to attend. The fifth annual Users Group meeting will be held on Wednesday, June 22. For more information, call CEBAF, 249-7100.

Langley Nominee Wins SBA Award

Small Firm Big Asset to Langley Research

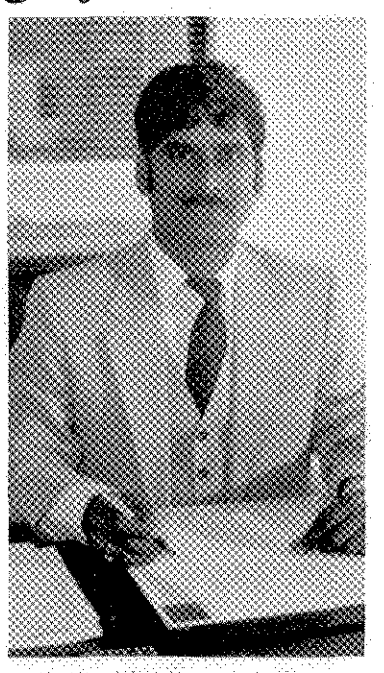
Dr. Jalaiah Unnam, president of Analytical Services and Materials, Inc. (AS&M), considers his young company an "extra pair of hands for NASA." Located just a mile and a half outside the gate of the Langley Research Center in Hampton, Unnam leads a small business involved in varied areas of research—aeronautics, structures, materials, electronics, computer system integration, and instrumentation.

NASA Langley's nominee for the Small Business Prime Contractor of the Year, Analytical Services and Materials has been awarded the Small Business Administration's (SBA) Administrator's Award for Excellence. The award was presented in Washington, D.C., on May 12 during the Twenty-First Annual Joint Industry/SBA Small Business Procurement Conference and Awards Banquet.

Formed in 1983, AS&M principals had had a long-standing research relationship with Langley from the mid-70s. Unnam graduated from the India Institute of Technology in Madras with a bachelor's degree in metallurgy and earned his master's and doctoral degrees in materials science from Virginia Polytechnic Institute and State University. From 1975 to 1983 he was a visiting professor for VPI working at NASA Langley in the area of metal-material composites. During this time Unnam worked with many of the scientists who would join him at AS&M.

Unnam credits the success of his firm to his dedicated employees. "Our major asset is the pool of extremely skilled and motivated scientists and engineers, some of whom are recognized worldwide for their contributions to aeronautics and space research." Winners of numerous awards and holders of two patents as well as the International Soaring Society's Award for the most significant contribution in recent years, the AS&M staff numbers only 60. But Unnam has been very selective in his recruitment and has amassed a staff of knowledgeable and motivated individuals involved in electronic hardware and computer software design and development to fulfill specific needs that exist today in aerospace research and technology.

AS&M scientists and engineers have assisted in several programs of vital interest to Langley and to the Agency. Notably, AS&M has participated in the redesign and analysis of the 7- X 10-Foot Wind Tunnel fan blades, the Shuttle solid rocket booster field joint and aft-skirt redesigns, the National Aerospace Plane Program engine and airframe concept reviews, and the laminar flow control Supercritical Airfoil Experiment.



Jalaiah Unnam

A. Vernon Vann, LaRC Small Business Specialist, was pleased to nominate Unnam and his associates for the SBA award. "AS&M has earned the reputation in the technical community as a leader in state-of-the-art research and development and is an active participant in educational program support. Dr. Unnam's willingness to respond to the needs of both the government and the community demonstrates a fine example of small business as the backbone of the American economy."

Visitor Center Volunteer Has 'Right Stuff'

-by Ellen A. Lockwood

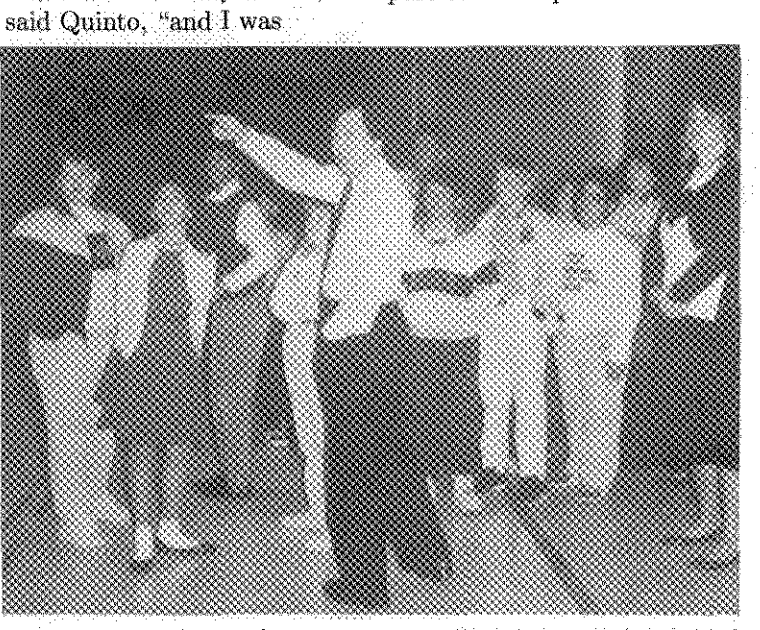
Born in Guatemala, the son of two Chinese immigrants, Frank Quinto came to the United States at the age of ten and later majored in Aerospace Engineering at Virginia Tech. Now, just eight years after graduation, he is operations engineer of Langley's 14- x 22-Foot Subsonic Wind Tunnel. And recently he was one of more than 30 volunteers honored for their contributions to the NASA Langley Visitor Center.

"I think it's important to educate the public on the tremendous impact NASA technology has on their lives," said Quinto. "I've found that volunteering at the Visitor Center has been an excellent way to do this—it brings the space technology of NASA 'down to earth' to the public."

"Frank has made an outstanding contribution to the Visitor Center for five years," said Museum Director Richard Mackin. "Frank brings to the Visitor Center his tremendous expertise in space and aeronautics, enhanced by his outgoing personality, his desire to contribute and his facility in dealing with both Visitor Center staff and visitors of all ages."

Quinto's interest in space began just two years after his arrival in the U.S. when he saw his first televised space launch. "I was only twelve," said Quinto, "and I was fascinated by the idea that man could travel in space."

Quinto's future plans are set firmly is space. "I'd like to be a mission specialist working in the Shuttle or in the Space Station," said Quinto. "I see space as man's frontier, and I'd like to be a part of this exploration."



Frank Quinto (center), wind tunnel operations engineer and Visitor Center volunteer, points out the movable walls in the 14- x 22-Foot Subsonic Wind Tunnel to a group of local elementary school students.

Positions Open

88-24: AST, Technical Management, GM-0801-14, Systems Safety, Quality and Reliability Division, Safety Engineering Branch, Safety and Environment Management Section. Closes May 31.

88-25: Project Management (Temporary Position), GS-0801-15, Space Directorate. Closes June 1.

Positions Filled

Robert McNie Connell, Jr., has been selected Quality Assurance Specialist, Quality Assurance and Inspection Office, Fabrication Division, under CPP 88-17.

Michael G. Fleck and **Edward N. Kerlin** have been selected Production Controllers, Contractual Resources Section, Resources and Contracts Branch, Fabrication Division, under CPP 88-18.

Susan Leuci has been named Secretary (Typing), Research and Services Contracts Branch, Acquisition Division, under CPP 88-7.

Rebecca Boles has been named Management Assistant, Interdisciplinary Research Office, under CPP 88-19.

Retirement Party

A retirement social honoring Andrew G. Swanson, chief, Management Support Division, will be held Tuesday, May 31, at 5 p.m. in the Activities Center. Cost, including gift, is $7/person. Please respond by May 23 to Gail Lanning, Mail Stop 123, ext. 3511.

Video Available

Aviation Week Video Magazine will be received on Center each quarter.

Available now is "The World's Aerobatic Teams." This video is available in VHS format from the Teacher Resource Center, ext. 3017. The tape is copyrighted and may not be reproduced; it will be loaned on a first come- first served basis. Running time is one hour.

U.S. SAVINGS BONDS
Paying Better
Than Ever

Club News

Bowling Stats

The NASA Tenpin Bowling League bowls on Tuesday nights at Victory Lanes in Grafton. Current standings are:

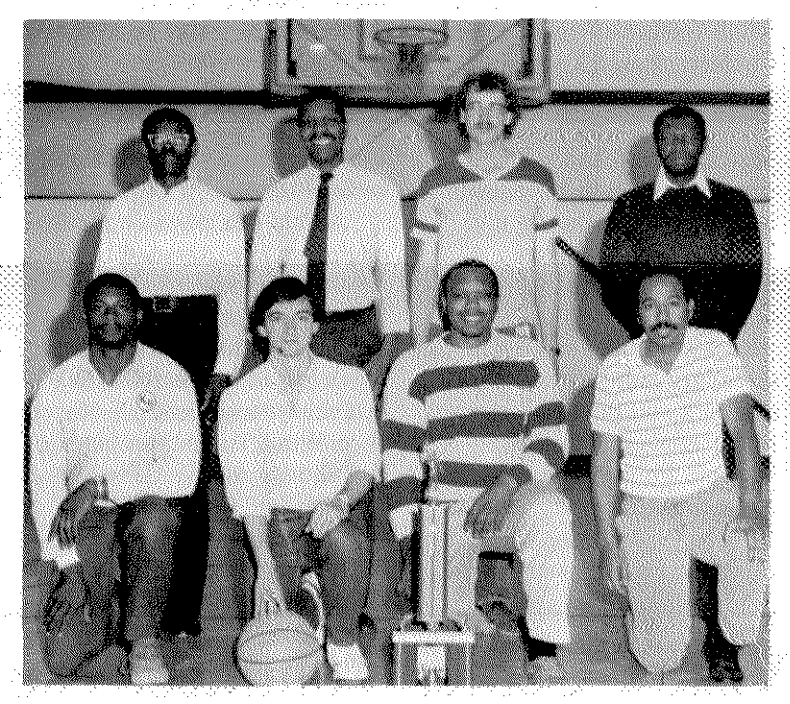
	April 19	April 26
Team High Game	915 Noisemakers	981 Scramjets
Team High Series	2622 ACD	26389 Scramjets
Male High Game	235 **C. Neal**	256 **B. Huffman**
Male High Series	588 **G. Koren**	672 **W. Williams**
Female High Game	192 **B. Williams**	213 **M. Aldrich**
Female High Series	520 **M. Aldrich**	521 **M. Aldrich**
Most Pins over Average	77 **C. Neal**	76 **B. Huffman**
	68 **R. Windon**	60 **W. Williams**

	May 3	May 10
Team High Game	962 Thunderbolts	897 Ballers
Team High Series	2754 Thunderbolts	2616 ACD
Male High Game	256 **B. Huffman**	244 **E. Mathis**
Male High Series	683 **B. Huffman**	614 **L. Curtis**
Female High Game	212 **R. Frizzell**	207 **R. Frizzell**
Female High Series	552 **B. Williams**	524 **R. Frizzell**
Most Pins over Average	85 **G. Keat**	81 **E. Mathis**
	75 **B. Huffman**	71 **J. Gardner**

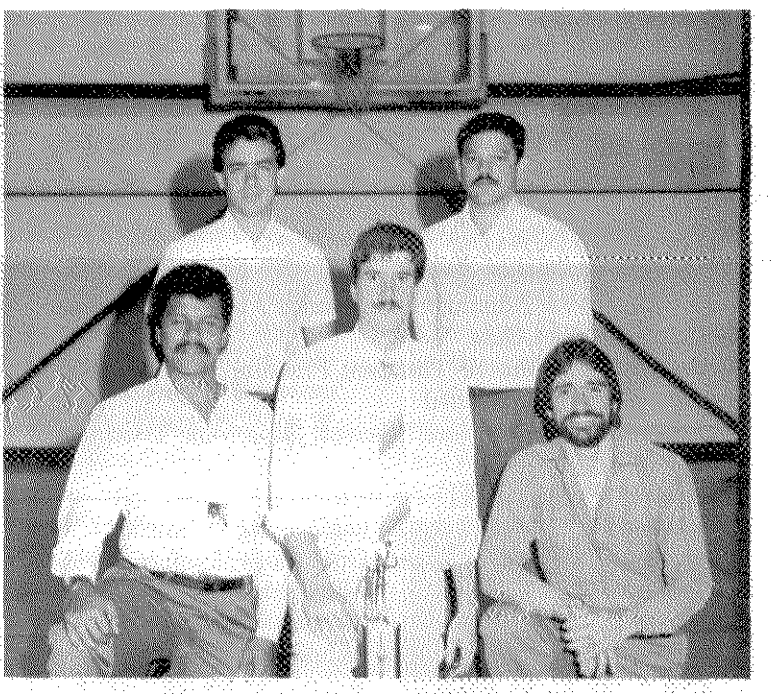
Golf Association Tournament Winners

Team winners for the NASA Golf Association tournament at Ft. Eustis are (L to R) 1st Flight, Bob Faison and Warren Nichols; 2nd Flight, Earl Knight and Don Beasley; 3rd Flight, George Geiger and Bob Gates.

Basketball Association Announces League Champs



NASA A-League Basketball champions, the Stars, are (front row, L to R) Bruce Jones, Christopher Cruz, Warren Atkins, Joe Whiting; (back row, L to R) Weldon Staton, Darnell Williams, Glen King, and Willie Watson, player-coach. Team members not pictured are Robert Lee III, Earl Williams, Kenny Barton and Gregory Brauckmann.



NASA B-League Basektball champions, the Tarzans, finished first in the regular season and won the post-season tournament. Team members are (front row, L to R) Guillo Gonzalez, Chris Mouring, Carlos Miro; (back row, L to R) Tony Busquets and Luis Gutierrez. Team members not pictured are Douglas Arbuckle, Steve Sliwa and Robert Stallings.

NASA C-League Basketball champions, the Ballers, finished first in the regular season and won the post-season tournament. Team members are (front row, L to R) Stephen Geissinger, James Ward, Mark Frye, Lewis Horsley, captain; (back row, L to R) Richard Hagan, Gregory Keat, Jeff Anderson and James Leiffer, player-coach. Team members not pictured are Glenn Robins and Ron Weber.

-photos by Don Ward

NASA D-League champions, the NADS, are (sitting, first row, L to R) Phil Brown, Mark Lord, Charles Wittkopp, Robin Tutterow; (second row, L to R) Terry Clark, Brian Strayder, William Berrios, Joe DeLorme, Brad Strayder; (third row, L to R) Kurt Detweiler, Steve Elkins, Bobby Davis and Jim Pike.

Printing Contractor Chosen for Researcher News

Enhance Graphics, Virginia Beach, has been awarded a contract to print Langley's employee/contractor publication, the **Researcher News**. The one-year contract was awarded May 3 and commences with the printing of this issue.

The **Researcher News** has been coming to you courtesy of the Publications Section, Research Information and Applications Division, since January while contract details were formulated, bid let and proposals reviewed by the Government Printing Office (GPO) Printing Procurement Office located in Oyster Point Industrial Park.

The staff of the **Researcher News** would like to thank the Langley reproduction staff for the quality product they have produced during this interim period. Not only has print quality been top-notch, distribution time on Center has been extemely efficient.

Due to contract specifications, deadline dates for submissions to the **Researcher News** need to be altered. Articles and announcements for publication consideration must be submitted by noon on **Tuesday**, May 24, for publication in the next issue. For your convenience, an updated listing of deadline and distribution dates follows.

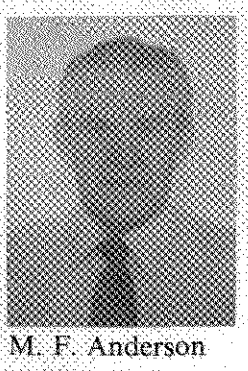
New Deadline Dates

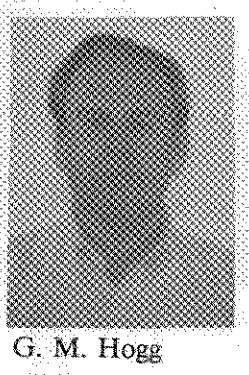
The **Researcher News**, an official publication of the Langley Research Center, is published every other Friday by the Office of Public Affairs. Listed below are **Researcher News** deadline and distribution dates for the remainder of 1988. Please clip and save.

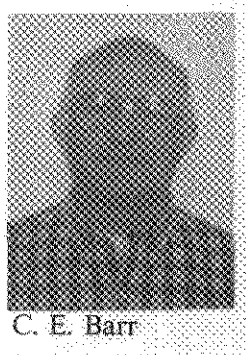
Deadline	Distribution
May 24	June 3
June 7	June 17
June 21	July 1
July 5	July 15
July 19	July 29
August 2	August 12
August 16	August 26
August 30	September 9
September 13	September 23
September 27	October 7
October 11	October 21
October 25	November 4
November 8	November 18
November 21	December 2
December 6	December 16

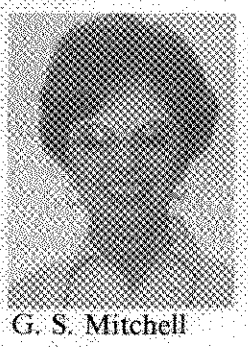
Articles should be submitted to the editor, Mail Stop 115, by noon on the deadline date for inclusion in the noted issue.

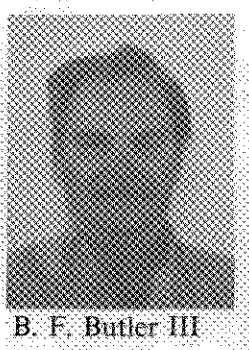
Recent Retirees


M. F. Anderson


G. M. Hogg


C. E. Barr


G. S. Mitchell


B. F. Butler III

James R. Tyeryar, Operations Support Division, retired April 18.

Merle F. Anderson, Business Data Systems Division, **George M. Hogg** and **Anthony J. Muller**, Fabrication Division, retired May 2.

Charles E. Barr, Low-Speed Aerodynamics Division, and **Geneva S. Mitchell**, Personnel Division, retired May 3.

Benjamin F. Butler, III, Fabrication Division, retired May 5.

-photo by Fred Jones

From Behind the Scenes

The Printed Word--- A Powerful Information Source

Press operator, Jim Anderson, and lithographer co-op, Kelly Brewer, inspect the first several pages of a NASA technical report.

The Publications Section prints and disseminates research information, operates a distribution center for Langley announcements, and serves as the Agency's printing plant for the publication and distribution of NASA formal-series technical documents.

The print plant is a service that affects every Langley employee–civil service and contractor alike. Everything from technical papers to notices of on-Center road closings, classified documents and information on job openings, conference proceedings and the weekly cafeteria menu comes to you via the Publications Sections, Research Information and Applications Division.

Langley Recognizes Speakers Bureau Members

Langley Director Richard H. Petersen officiated at the First Annual Speakers Bureau Recognition Assembly held April 12 in the Activities Center. Petersen thanked each speaker for helping to spread Langley's story. "It is through you, your careful preparation and delivery of informative talks, that our fellow citizens have the opportunity to learn more about our successful efforts that will benefit them, our state, our nation and the world."

Speakers Bureau members address civic organizations, church groups, engineering societies, military assemblies. They present educational programs at local schools and participate in awards banquets. Petersen noted that topics offered are widely diversified. "Through you our community is learning more and more about many different, on-going programs at Langley."

The sixty members of the Langley Speakers Bureau gave more than 125 presentations locally, throughout Virginia and in our five-state region during 1987. Those speakers who spoke more than three times on Langley's behalf were presented a Speakers Bureau pin. Lenwood Clark, Space Station Office, was named "Speaker of the Year" and was presented a plaque.

-photo by Sandie Horsey and Terry Shepherd

SPEAKERS BUREAU SUPER STARS. Ten members of the Langley Speakers Bureau were presented pins during a recognition ceremony recently. Award winners are (front row, L to R) Frank Quinto, Shelley Canright, Robert L. Wright, Lenwood Clark, Lester Rose; (back row, L to R) George Hickman, Roger Breckenridge, Roger Hathaway and Robert Pegg. Center Director Richard H. Petersen (back row, right) officiated at the ceremony. Not pictured is Speakers Bureau award winner John Tanner.

Happenings

LAA SOCIAL will be held Friday, May 27, from 4 to 6:30 p.m. in the Activities Center.

ALUMNI ASSOC. PICNIC, Sunday, May 22, starting at 2 p.m. Tickets are $4/adults, $2/ children under 12, children under 6 are free— includes all food, beverages and one free bingo game. Picnic is open to all Langley employees, contractors, and friends.

BLOODMOBILE. The American Red Cross will sponsor a Bloodmobile in the Activities Center, Wednesday, May 25, from 9 a.m. to 3 p.m.

TOASTMASTERS. NASA Langley Toastmasters will meet Wednesday, May 25, 11:30 a.m.—1 p.m. in the private dining room of the cafeteria, Building 1213. It's Bosses' Day—supervisors of Toastmasters are especially invited to attend. Call Natalie Johnson, ext. 3483, for information.

WATER COUNTRY Armed Forces Special, May 14–31. Tickets are $6.75 and are on sale at the LAA office, Activities Center.

VIRGINIA CHORAL SOCIETY will conclude the season with its annual Just For Fun pop concert featuring the big-band sound of the 40s, popular songs of the 50s and a selection of Broadway medleys. The last performance will be Saturday, May 21, at Ogden Hall, on the campus of Hampton University. The concert begins at 8 p.m. Tickets are $3, available at the door. For information, call VCS at 851-5515.

AMERICAN HELICOPTER SOCIETY LUNCHEON will be held on Wednesday, May 25 at 11:30 a.m. at the Sheraton Inn-Coliseum. Guest speaker will be Rodney H. Ricketts, head, Configuration Aeroelasticity Branch. Non- members welcome. For reservations, call Sandy Shackelford, 878-2208, by 4 p.m. May 23.

COUNTRY COMEBACKS FESTIVAL sponsored by Hampton Parks and Rec at Bluebird Gap Farm, Saturday, May 21, from 10 a.m. to 4 p.m. A family event. For information, call 727-6197.

COMMUNITY APPRECIATION DAY. Langley Air Force Base will be open to the public from noon to 5 p.m. on June 12. Day's activities will feature F-15 and A-10 aerial demonstrations, aircraft displays, and numerous exhibits and booths. Free. Plenty of parking will be available.

NEEDED; ROOMMATE(S) to share a two- or three-bedroom home in Langley area. Contact Claudio Egalon, ext 3036 or 253-4471. Leave message.

WANTED: BOOKSHELVES to organize and store reference materials in lab. Will arrange transportation from your facility. Call Bryan Hefner, Building 1299, ext. 3631, Mail Stop 490.

LOST: JACKET. A man's tan MacGregor jacket with a single key on a ring in the pocket has been lost in the vicinity of the cafeteria. Please contact Jim Wise, ext. 3871.

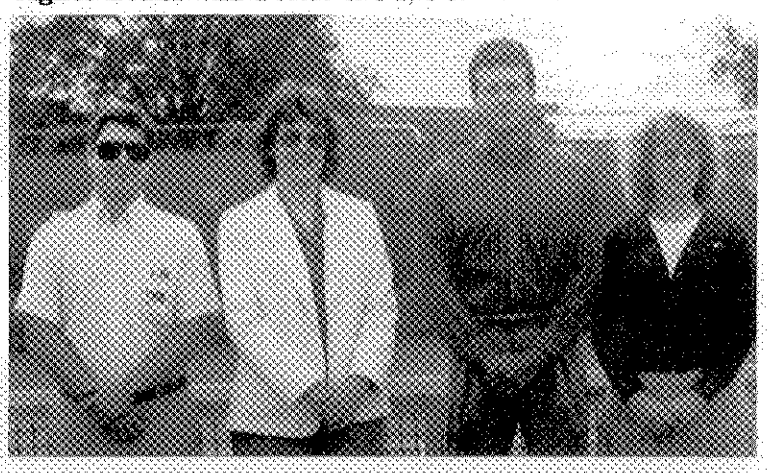
FREE: DOGS. To good home, 2 female poodle/terriers, ages 4 and 7. Very affectionate. Call 865-8638, leave message.

FOR SALE: MOBILE HOME, 1982 Tidwell mobile home on wooded lot at Patrick Henry park, 14x70 with 3 BR, 2 BA, FP, covered deck, storage shed. All appliances plus washer and dryer included. Assume for 11 1/2 years. $18,900/ Call 875-1403.

FOR SALE: MOBILE HOME. Enlarged 1 BR, 10 x 50 with skiring and mini-blinds. A/C, refrigerator and stove included. Newly painted and carpeted. Ideal for new employee. $3,500 neg. Call 865-8638, leave message.

Tennis Club Tournament Winners

The Langley Tennis Club announces winners of the Spring/Summer Ladder Tournaments. On a very windy evening, **Dennis Bartlett** edged out **Charlie Bryant**, 7-6(7-4), 3-6, 6-4, to win the Men's Championship Ladder. In another close three set match, **Bob Daugherty** came back over **Joe Zalameda**, 4-6, 6-1, 6-3, to win the All Players Ladder. The Women's Ladder was won by **Carol Weiseman** over **Agnes Evans** with a score of 6-1, 6-0.



Finalists in the Spring/Summer Ladder Tournament are tennis club members (L to R) Bob Daugherty, Agnes Evans, Dennis Bartlett, and Carol Wieseman. Not pictured are Charlie Bryant and Joe Zalameda.

Notes of Thanks

Betty C. Farmer writes: "To all my many friends at NASA I want to say thank you for making my retirement party such a memorable day for me. The gifts will be a constant reminder of how blessed I have been over the past 30 years to have so many friends."

Sadie Boyer would like to thank all NASA Langley employees and contractors who supported her in the recent Langley Federal Credit Union election for the Board of Directors.

Jim Wise writes: "Many thanks to my friends and co-workers for the wonderful retirement party. It was a very enjoyable experience for me and my family. The gifts, kind words, and pleasure of your company were greatly appreciated and will always be remembered.

-photo by Terry Shepherd and Sandie Horsey

THE ASTRONAUT CANDIDATES, Class of 1987, toured Langley recently. One stop on their whirlwind tour of facilities was a visit to Building 1293B. Posed in front of the Hoop Column Antenna are (front row, L to R) Major James S. Voss, USA; Commander Bruce E. Melnick, USCG; Mae C. Jemison, M.D.; C. Michael Foale, Ph.D.; N. Jan Davis, Ph.D.; Lt. Kenneth D. Bowersox, USN; and William F. Readdy; (back row, L to R) Gregory J. Harbaugh; Captain Thomas D. Akers, USAF; Commander Kenneth S. Reightler, Jr., USN; Lt. Commander Mario Runco, Jr., USN; Major Donald R. McMonagle, USAF; Captain Andrew M. Allen, USMC; Captain Curtis L. Brown, Jr., USAF; and Major Kevin R. Chilton, USAF.

Langley Savings Bond Drive . . . May 16-27, 1988

Researcher News

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Langley Research Center
Hampton, Virginia 23665-5225

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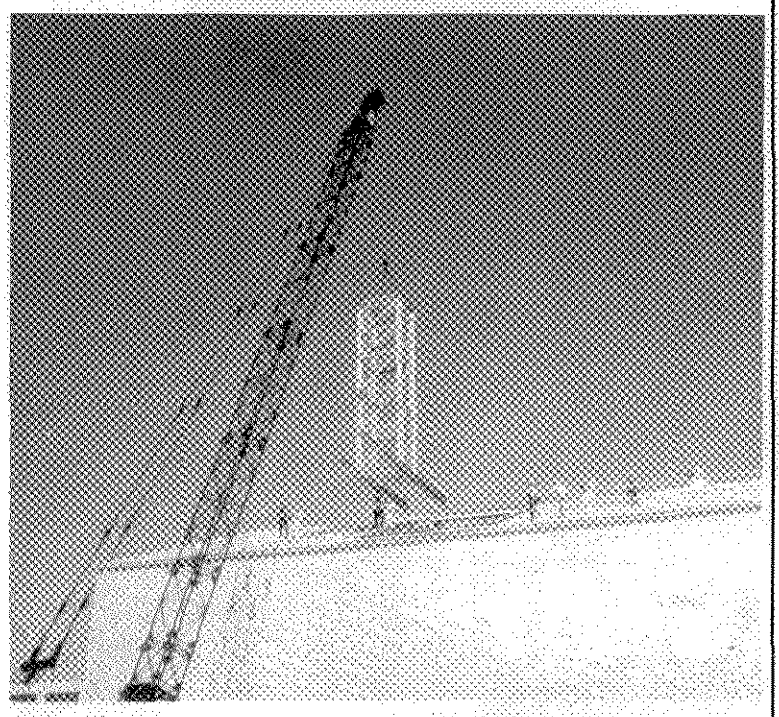
National Aeronautics and
Space Administration
Langley Research Center

Volume 2, Issue 11 June 3, 1988

News Researcher

Bi-weekly Employee and Contractor Publication

MT Moves to MSFC



The Mobile Transporter (MT), which will be used to construct and maintain the Space Station and to aid in construction and repair of spacecraft using Space Station as a fabrication site, is lowered into the Neutral Buoyancy Simulator (NBS) at Marshall Space Flight Center, Huntsville.

A portion of the roof on the NBS had to be removed to allow the MT, the largest structure to be tested in the facility, to be lowered into the water. The full-scale working model will undergo simulated zero gravity tests at Marshall, with engineers and astronauts evaluating the equipment and assembly procedures.

Langley research engineer Judith Watson and Booth Thompson, contract engineer at Marshall, are dressed in scuba gear to assist in the installation of the MT. The Marshall tests will be compared to the 1-g (earth gravity) tests recently completed by engineers in Langley's Structural Concepts Branch.

Swanson Retires from NASA Langley

Andrew G. Swanson, chief of the Management Support Division at NASA's Langley Research Center, will retire today after 37 years of government service.

Swanson began his career with NASA's predecessor agency, the National Advisory Committee for Aeronautics, in June 1951, as an aerospace engineer in the Pilotless Aircraft Research Division. He has held the positions of head of the Vehicle Performance Section; assistant head, Flight Projects Branch; technical assistant to the Director of Flight Projects; chief of the Programs and Resources Division; and chief of the Business Data Systems Division. He has served in his present position since 1985.

A native of Michigan, Swanson received bachelor and master of science degrees in aeronautical engineering from Purdue University in Indiana in 1951 and 1957, respectively. In 1964 he earned a master of science degree in industrial management from Massachusetts Institute of Technology as a Sloan Fellow.

Swanson, who has written 14 research papers, is a member of the U.S. Coast Guard Auxiliary and the Williamsburg Amateur Radio Club.

Swanson and his wife, Joanna, live in Williamsburg. They have two children.

Henderson To Receive Aerodynamics Award

William P. Henderson, head, Propulsion Aerodynamics Branch, Transonic Aerodynamics Division, has been selected to receive the 1988 Aerodynamics Award given by the American Institute of Aeronautics and Astronautics.

The award is presented annually "for meritorious achievement in the field of applied aerodynamics recognizing notable contributions in the development, application and evaluation of aerodynamic concepts and methods." The presentation will take place June 7 during the AIAA 6th Applied Aerodynamics Conference in Williamsburg.

Henderson will be recognized specificially "for outstanding contributions to the development of fighter and transport aerodynamic technology, particularly in the formulation of innovative propulsion integration concepts and associated computational fluid dynamics technology."

He has been responsible for formulating, directing and implementing experiments and analytical research programs in the area of airframe/propulsion integration since he was named branch head in 1975. He began his Langley career in July 1958 as an aerospace engineer in the 7- by 10-Foot Tunnel and in 1973 was appointed assistant head of the Fluid Dynamics Branch.

Henderson received a bachelor of science degree in physics from the University of Georgia in 1958 and a master's degree in engineering administration from George Washington University in 1985.

Henderson and his wife, Martha, live in Newport News. They have two children.

Nancy Sliwa Addresses Ride Committee Work

In the period subsequent to the Challenger accident, NASA has faced uncomfortable scrutiny concerning its alleged lack of focused vision for space activities. Numerous reports have surfaced, by various commissions and special interest groups, offering suggestions for space goals. Few of these, however, suggest priorities to be used in the face of continued limited funding. Likewise, these reports fail to resolve their recommendations with crucial issues facing NASA today.

One of Dr. Sally Ride's enduring legacies to NASA has been the formation of a group of NASA technical people to provide the "young perspective" on such issues. The activity of this group and its resultant recommendations to NASA senior management will be presented at a Langley colloquium.

Nancy Orlando Sliwa, Langley's representative to Ride's task force, will discuss "Examining NASA's Goals and Roles: The Sally Ride Committee at Work" Monday, June 13. The lecture will be held in the Activities Center at 2 p.m., followed by a question and answer session and an informal discussion.

According to Sliwa, the NASA technical group was chartered by the NASA Strategic Planning Committee after Ride's departure from NASA, and has continued to work for the past year examining the options available to NASA in focusing its vision of space activities in light of current issues.

Sliwa was appointed to the task force by Langley Director Richard H. Petersen. It is composed of a representative from each NASA center, each with more than five and less than 10 years experience in NASA.

She received bachelor and master of science degrees in computer science from Old Dominion University in 1981 and the University of Pennsylvania in 1986. She has been a member of the Langley staff since 1981 working for the Automation Technology Branch in the application of artificial intelligence to telerobots.

News Briefs

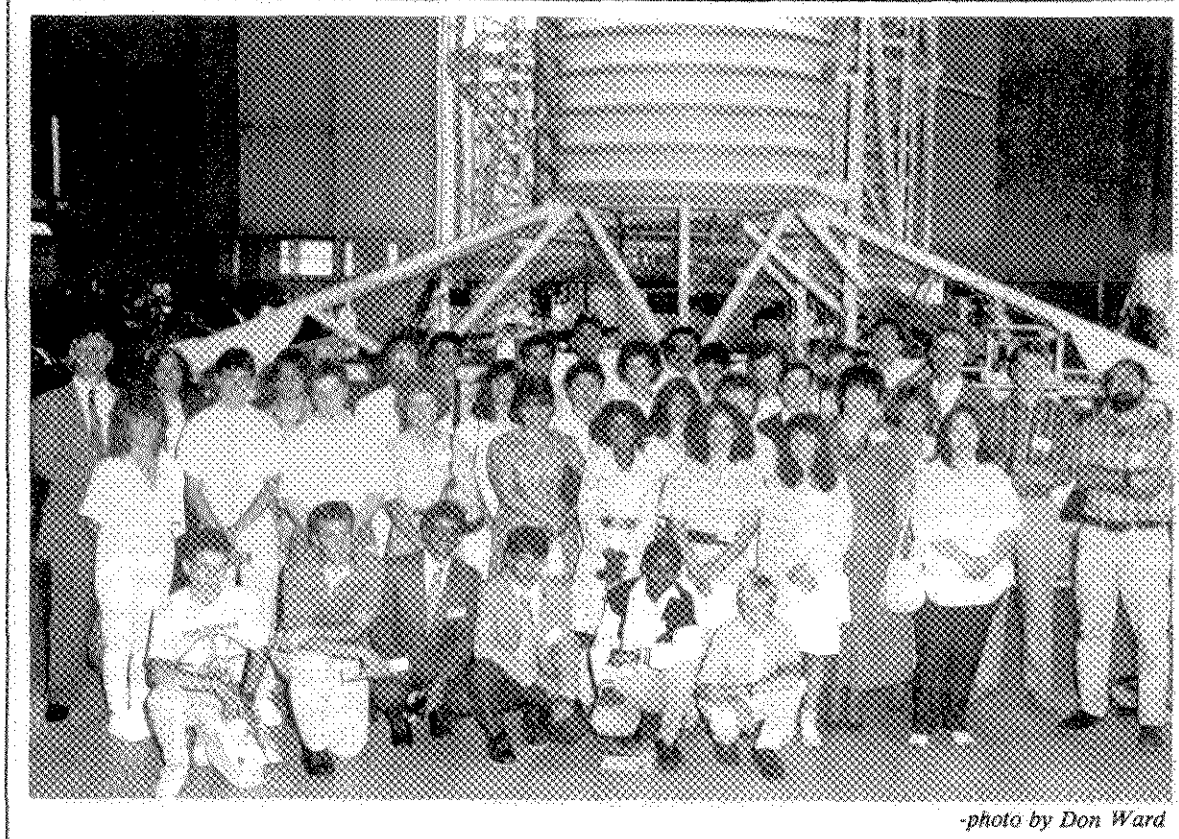
AMES RESEARCH CENTER, Mountainview, Calif. — A group of scientists and engineers presented its conclusions and recommendations to NASA's Office of Space Station. The group, composed of individuals from NASA, industry, the National Science Foundation and the National Institute of Health, examined ways the Space Station could be used to conduct small- to- moderate size space experiments that could be developed quickly and inexpensively and which, in some cases, need relatively rapid initial deployment and/or reflight.

JET PROPULSION LABORATORY, Pasadena, Calif. — Newly proposed radar pictures of the surface of planet Venus show what may be geologically- recent volcanic activity and impact cratering, including possible volcanic mountains and broad lava flows and fields like those which make up the Hawaiian Islands. Bright rings, seen in highland regions on Venus, are believed to be material thrown out from below the surface by volcanoes or by meteor impacts.

LEWIS RESEARCH CENTER, Cleveland, Ohio, and KENNEDY SPACE CENTER, Fla. — NASA and the Department of Commerce have awarded a firm, fixed-price, $200,236,553 contract to General Dynamics Space Systems Division, San Diego, Calif., for expendable launch vehicle (ELV) transportation services for the Department's National Oceanic and Atmospheric Administration (NOAA). Consistent with the provisions of the President's recent National Space Policy, this contract is the first U.S. Government procurement of commercial launch transportation services and ushers in a new era in the commercialization of space.

HEADQUARTERS, Washington, D.C. — NASA is looking for a lot of good ideas—from America's small businesses—and has issued its sixth annual Small Business Innovation Research (SBIR) program solicitation. SBIR is a competitive program that is expected to result in more than 200 Phase I contracts, totalling about $10 million, to small, high-technology businesses this year. The awards are expected to be announced in November.

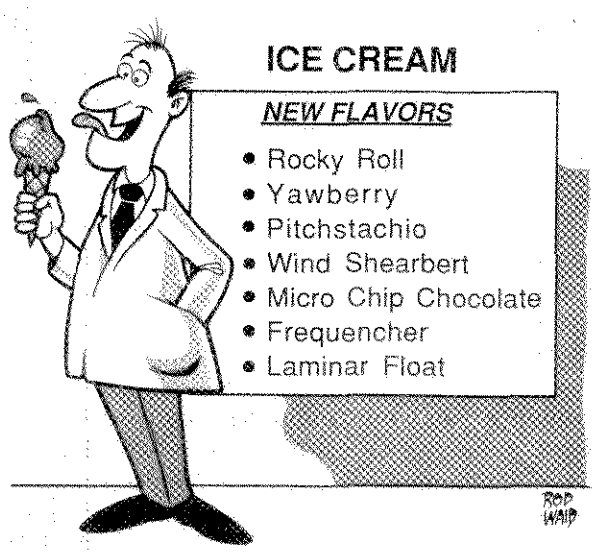
Editor's note: Recent surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017.



-photo by Don Ward

SCIENCE FAIR WINNERS AT LANGLEY. Aspiring young scientists from the five-state region of North Carolina, South Carolina, Kentucky, Virginia and West Virginia toured Langley on Science Fair Winners Day. Shown above with their parents and teachers, the group visited the Aircraft Landing Dynamics Facility, a unique national test facility which evaluates a variety of aircraft landing gear systems and components under closely controlled conditions. The group stands in front of the old landing loads track carriage. The facility has been upgraded to double the speed capability of the new carriage to 250 miles per hour.

Lankley

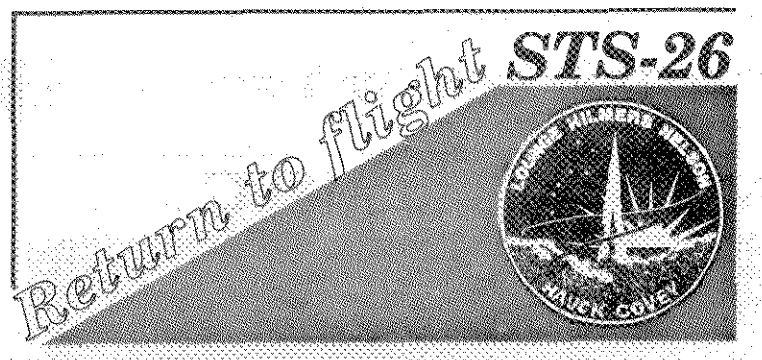


Langley Stamp

An airmail stamp honoring air engineering pioneer Samuel P. Langley is ready to be released by the U.S. Postal Service.

The stamp design shows Langley wearing a straw hat and a bow tie. In the background is one of Langley's inventions—the unmanned Aerodrome No. 5, the first American heavier-than-air flying machine to make a free flight of any significant length.

For information on how to obtain first-day cancellations of the Langley stamp, contact the editor, Mail Stop 115, ext. 3707, by June 10.



KENNEDY SPACE CENTER, Fla. — Morton Thiokol technicians install the external tank attach ring onto the STS-26 left aft segment in the Rotation Processing and Surge Facility (RPSF). This ring provides the aft attach points between the solid rocket boosters and the Shuttle's huge external fuel tank. A recent modification to the ring has been extending it to go around the circular segment (360 degrees). Before, the ring went around 270 degrees of the segment. Over 800 pins hold the ring in place around the segment.

NASA Announces Two-Year Astronaut Selection Cycle

NASA has announced plans to conduct astronaut candidate selections on a two-year cycle and has scheduled the next class of candidates for 1990. Previously, NASA has selected astronaut candidates as needed, with selections the last ten years occurring in 1978, 1980, 1984, 1985 and 1987.

The two-year process will moderate the demand on resources required for candidate selection and training while maintaining the manpower levels necessary to meet mission requirements.

The next selection cycle will begin July 1, 1989, the cutoff date for applications. Applications received after that will be eligible for consideration in the next cycle. Nominees also will be submitted by the military services at the same time. After six months of screening, medical evaluation and interviews, selections will be announced in January 1990 and candidates will report to the Johnson Space Center in July.

The selection process will begin again in July 1991 with the cutoff for applications to be considered in the 1992 selection. The number of selections made every two years will be based on projected requirements.

NASA will continue to accept and review applications from the general public on an ongoing basis. Applicants for the Astronaut Candidate Program must be citizens of the U.S.

Applications can be obtained by writing to the NASA Lyndon B. Johnson Space Center, Astronaut Selection Office, AHX, Houston, Texas, 77058.

News Researcher

The Researcher News, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Tuesday following the date of this issue.

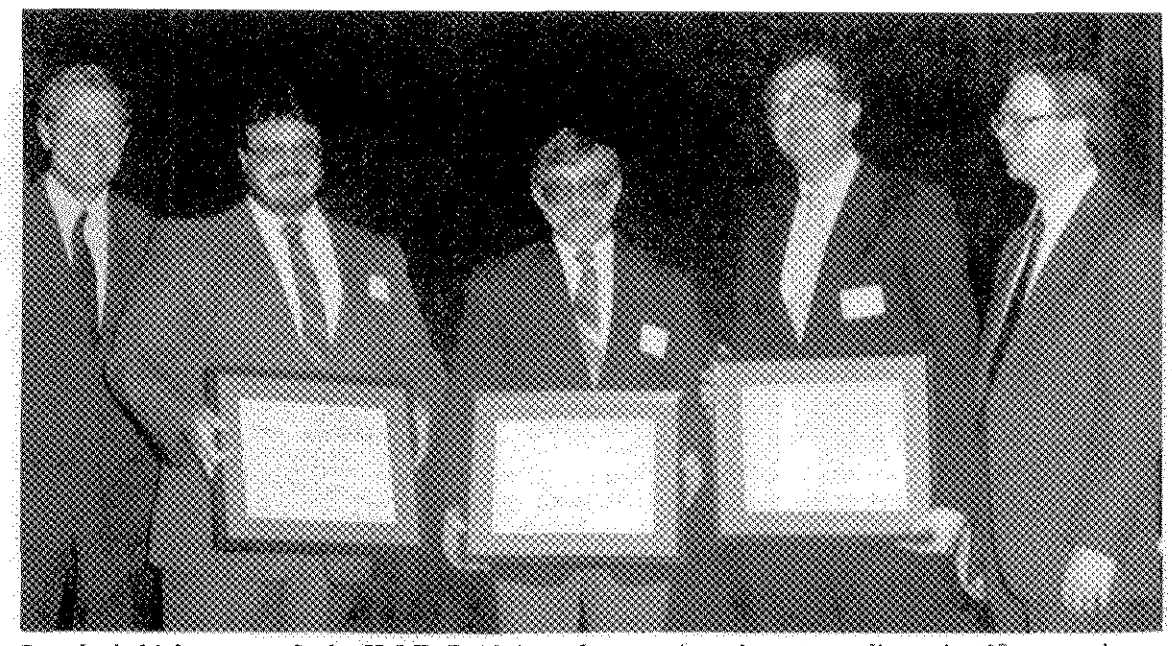
Managing Editor . . . . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

H.J.E. Reid Award



Langley's highest award, the H.J.E. Reid Award, recognizes the outstanding scientific or engineering paper written by a Langley Research Center employee or group of employees. Center Director Richard H. Petersen (left) and NASA Associate Deputy Administrator (Institution) Dr. Noel W. Hinners (right) pose with Reid Award winners (L to R) John R. Micol, Charles G. Miller III, and Peter A. Gnoffo cited for their paper entitled "Laminar Heat-Transfer Distributions on Biconics at Incidence in Hypersonic-Hypervelocity Flows."

NASA Honor Awards - Outstanding Leadership Medal

-photos by Sandie Horsey and Paul Bagby

Charles P. Blankenship (center) is presented a NASA Outstanding Leadership Award by Center Director Richard H. Petersen (left) and NASA Associate Deputy Administrator (Institution) Dr. Noel W. Hinners (right). Blankenship, Director for Structures, was recognized "for outstanding leadership and continued technical and managerial contributions to the Agency's structures technology programs."

Joseph S. Heyman (center) is presented a NASA Outstanding Leadership Award by Center Director Richard H. Petersen (left) and NASA Associate Deputy Administrator (Institution) Dr. Noel W. Hinners (right). Heyman, research physicist, Instrument Research Division, was recognized "for outstanding and effective leadership in creating, nurturing and sustaining a world-class program in nondestructive evaluation research and its practical application for NASA and the aerospace industry."

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, were recognized for their accomplishments at the Annual Honor Awards Ceremony held in the H.J.E. Reid Auditorium May 11.

Dr. Noel Hinners, Associate Deputy Administrator (Institution), and Richard H. Petersen, Langley Director, presented the NASA medals and Langley awards. They were assisted by Robert L. Swain, Acting Deputy Director, who read the citations.

Langley Volunteer Service Awards

A number of our employees are engaged in numerous voluntary efforts in the local communitites, serving with community organizations and providing leadership to various projects aimed at improving the quality of life for all. These federal employees, who devote their off-duty time and talents to such voluntary efforts, deserve recognition and appreciation for their exemplary community service. Volunteers service awards were presented to:

Robert M. Baucom, "For outstanding contributions in enhancing the quality of life for handicapped persons."

David D. Shuster, "For outstanding volunteer service in organizing anti-drug programs, coaching Odyssey of the Mind school teams, and significant contributions as a member of the Community Service Board."

William R. Wiley, Jr., "For dedicated and unselfish giving of time, talents and energy to the youth of the Peninsula area."

Langley Public Service Awards

This award is given to non-NASA citizens and organizations to show appreciation for contributions made to Langley Research Center in the accomplishment of its missions, functions, services or operations as a public service.

George R. Hayes, Langley Air Force Base, "For dedication to duty resulting in an extremely cooperative relationship between Langley Air Force Base and NASA Langley Research Center."

City of Hampton, "For dedicated service in the operation of the Refuse-Fired Steam Generating Facility (RECOUP) resulting in performance exceeding all design criteria.

Langley Group Achievement Awards

Special Achievement Awards for Group Accomplishments recognize groups and individuals for performance substantially beyond expectations on a specific assignment or job function. The services awarded are in the public interest and are connected with, or related to, official employment. Receiving group awards were:

Continued on page 6.

NASA Ho

Exceptional Service Medal

Robert F. Berry, Jr.

"For outstanding achievements in nondestructive testing technology and the development of specifications and standards as applied to aerospace systems criteria."

Charles F. Bradshaw

"For design and development of the highly reliable Spin Recovery Parachute System for Light Aircraft, enabling safe exploration of out- of-control flight conditions."

Jarrell R. Elliott

"For exceptional service in the conduct and leadership of Langley's program in applied aircraft control theory resulting in significant advances in the development of the state of the art in aircraft controls technology."

Vernon T. Helms III
(deceased)

"For exceptional service in advancing hypersonic aerothermodynamic testing techniques and their subsequent application to the technology development for advanced space transportation systems."

Charlie M. Jackson, Jr.

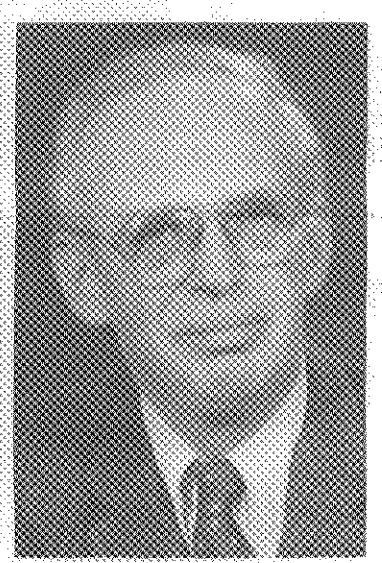
"For significant contributions in the area of aircraft aerodynamics research which has led to increased understanding of the physical phenomena of high-speed flow and advanced the state of the art in design of civil and military aircraft."

Virginia H. Jones

"For exceptional dedication and service in developing and nurturing superior Langley Research Center health care programs."

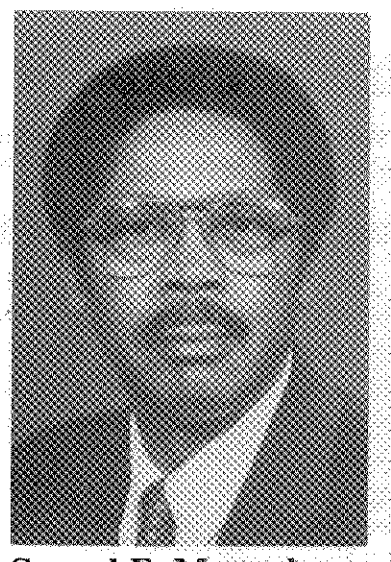
Frederick A. Kern

"For outstanding leadership in NASA's metrology/calibration programs."



Frank S. Kirkham

"For outstanding leadership and contributions in the field of advanced fighter aircraft design."

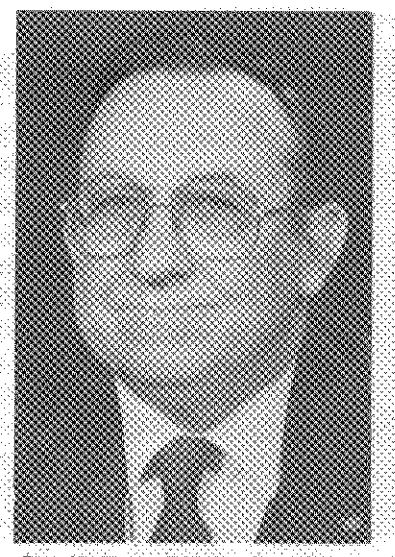


Samuel E. Massenberg

"For exceptional service and leadership in the administration of Langley's university programs, assuring effective application of university talent to the Center's diverse research programs."

Harold N. Murrow

"For outstanding contributions to the measurement and understanding of atmospheric characteristics; particularly turbulence and wind shear."



Cecil E. Nichols, Jr.

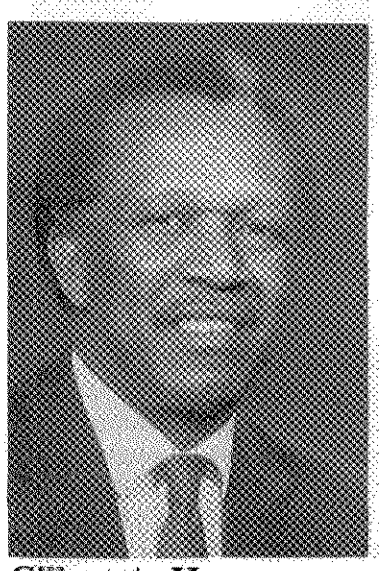
"For exceptional service in development of a seeding system for use with the laser Doppler velocimeter measurements in research wind tunnels."

Joseph R. Struhar

"For outstanding achievement in the development of automated financial management systems and creative leadership demonstrated in the management of a diversified financial activity."

ɪr Awards

Equal Opportunity Medal



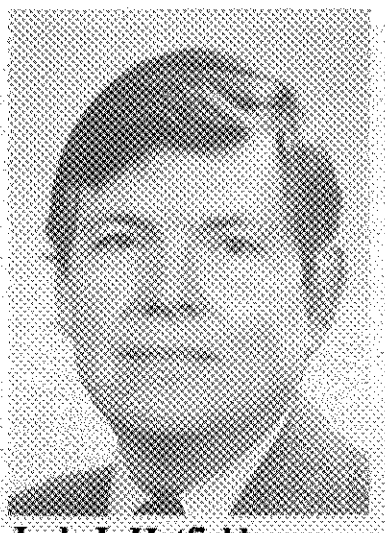
Gilbert A. Haynes

"For the outstanding national contribution of extending to underrepresented minorities the opportunities of a challenging career in science and engineering."

Exceptional Engineering Achievement Medal

Douglas L. Dwoyer

"For outstanding leadership in development of computational methods for hypersonic flows, encouragement and training of younger researchers in numerical methods, and application of numerical analysis to understanding of the physics of complex fluid flows."

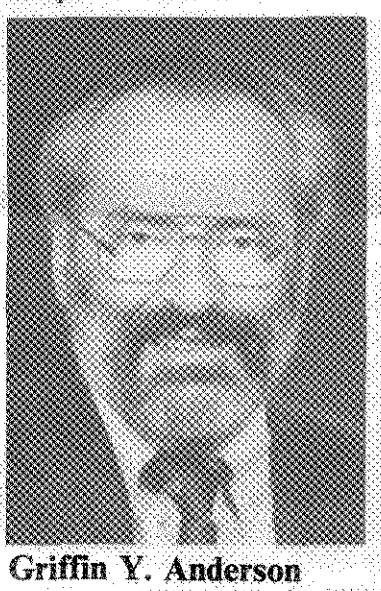


Jack J. Hatfield

"For outstanding leadership and technical contributions toward advancing technology for practical application of electronic display systems and crew station interfaces for aeronautical and space vehicles."

Jaroslaw Sobieski

"For originating and developing mathematical concepts for the multidisciplinary optimization of aerospace vehicles, including the concepts of multilevel decomposition and optimal sensitivity analysis."



Griffin Y. Anderson

"For exceptional engineering achievements in the development of airframe-integrated scramjet engine technology."

Martin M. Mikulas, Jr.

"For exceptional engineering achievements in the design and construction of large space structures."

Michael J. Walsh

"For demonstrated excellence in the area of viscous drag reduction leading to the development of 'riblet technology'."

Exceptional Scientific Achievement Medal

M. C. Bailey

"For contributions in theoretical electromagnetics for the advancement of large space antenna system technology for future space applications."

Graeme A. Bird

"For achievements in rarefied-gas dynamics and development of the direct simulation Monte Carlo technique, which has provided the first realistic method for analyzing rarefied flow effects over entry vehicles."

John H. Cantrell, Jr.

"For accomplishment in solid-state physics and nondestructive materials analysis through a fundamental contribution using nonlinearity as the deterministic basis of material properties."

Mohammed Hussaini

"For pioneering studies of boundary-layer transition physics and development of highly accurate computational methods for conducting such studies."

Awards

Langley, NASA Recognize Group Accomplishment

Continued from page 3.

Advanced Color Display System Development Team, "For efficient and reliable system development of the advanced color displays aboard the NASA Transport Systems Research Vehicle."

Boeing 757 Wing Noise Survey and Natural Laminar Flow Glove Flight Test Team, "For outstanding execution, management and technical direction of the Boeing 757 Wing Noise Survey and Glove Flight Test Program which demonstrated that substantial laminar flow can be obtained on a modern, commercial transport wing with wing-mounted engines."

CAP-TSD Development Team, "For development and validation of a computational method for the transonic aeroelastic analysis of complete airplane configurations."

Compact Range Measurement Team, "For outstanding efforts in improving the productivity and quality of research results obtained in the compact range through laboratory modifications and enhancements to the operations procedures."

DNW Rotor Aeroacoustics Measurement Team, "For planning, conducting and interpreting a complex rotor model aeroacoustics test in the DNW wind tunnel with subsequest major contributions to the basic understanding of rotor broadband and blade vortex interaction noise sources."

Earth Radiation Budget Experiment Data Validation and Archival Team, "For outstanding contributions to the validation and archival of the first Earth Radiation Budget Experiment (ERBE) satellite data."

8-Foot High Temperature Tunnel Nozzle Design Team, "For highly innovative, critical synthesis and application of design and analysis procedures resulting in nozzle designs which will produce extremely high- quality flow at Mach 4, 5 and 7."

F-106B Vortex Flap Design and Fabrication Team, "For outstanding effort in the mechanical design, fabrication and installation of the f-106B Vortex Flap System."

Federal Employees Retirement System Implementation Team, "For outstanding implementation of the new Federal Employees Retirement System (FERS)."

LaRC Advanced Flight Simulation system Development and Implementation Team, "For design and implementation of an advanced realtime flight simulation subsystem which achieved international application and significantly improved flight simulation research capabilities at Langley Research Center."

LaRC Crew Escape Studies Team, "For outstanding accomplishments in the quick response design, analysis, and testing associated with developments of unique Shuttle Orbiter crew escape concepts."

Langley Research Center's 70th Anniversary Celebration Team, "For leadership and significant contributions in support of Langley Research Center's 70th Anniversary Celebration."

LaRC Super*Zip Performance Investigation Team, "For developing and conducting the unique Super*Zip separation joint failure investigation and margin demonstration test programs."

Manned Mars Mission Accommodation Task Force, "For timely establishment of Space Station Requirements for accommodation of the Manned Mars Mission and demonstrating the versatility of the Space Station design."

Mission-Oriented Terminal Area Simulation Facility Development Team, "For outstanding contributions in development of Langley Research Center's Mission-Oriented Terminal Area Simulation Facility."

National Transonic Facility Submarine Test Team, "For design, fabrication and testing of a U.S. Navy submarine model in the National Transonic Facility to provide time-critical data for the design of a new class of submarine."

1986 LaRC Systems Safety, Quality and Reliability Audit Committee, "For excellent accomplishment in reviewing and reporting on Langley Research Center's safety, reliability and quality assurance program."

SAGE II Data Processing Team, "For outstanding achievement in developing the SAGE II data retrieval scheme and generating the SAGE II data products for archival."

Security Services Branch Team, "For highly effective support of classified research programs, projects, and tests."

Shuttle Orbiter Ascent Separation Study Team, "For demonstrating the feasibility of aerodynamically separating the Shuttle Orbiter from the external tank as the solid rocket boosters fire during ascent."

Solid Rocket Motor Nondestructive Evaluation Team, "For advancing nondestructive technology applied to the Shuttle solid rocket motors for improving their reliability for space missions."

Space Station Systems Engineering Analysis Team, "For sustained high-level performance and multidisciplinary engineering analyses which supported an Agency-wide redefinition of the Space Station Configuration and Assemble Sequence."

Supersonic Twin-Jet Resonance Research Team, "For exceptional effort in the scientific discovery of supersonic twin-jet resonance effect and development of applied technology for aircraft fatigue loads analysis and reduction."

TIMER Concept Development and Experiments Team, "For development of the TIMER air traffic control concept and experiments which have been instrumental in resolving critical issues for the next generation air traffic control system."

Transonic Dynamic Tunnel Data Acquisition System Design, Implementation and Management Team, "For excellence in design, implementation and management of the new Data Acquisition System for the Langley Transonic Dynamic Tunnel."

Unsteady Flow Characteristics of Laminar Separation on Airfoils Team, "For invention, development and application of a unique sensor and data reduction technique for detailed measurements of steady and unsteady flow characteristics of laminar separation bubbles and reattachment."

NASA Group Achievement Awards

The National Aeronautics and Space Administration bestows singular honor in recognition of achievements by the following groups and individuals:

NASA/American Helicopter Society Rotorcraft Noise Reduction Program Team, "For outstanding accomplishment in originiating and implementing an innovative, cooperative government-industry program which has significantly expanded technology for designing and building rotorcraft to meet noise reduction goals."

Biomass Burn/Biospheric-Environmental Impact Measurement Team, "For obtaining a unique set of measurements leading to improved characterization of the impact of forest fires on the biosphere, the soil and the environment."

F-14 Variable Sweep Transition Flight Experiment Team, "For outstanding execution, management and technical direction of the NASA F-14 Variable Sweep Transition Flight Experiment which established a boundary-layer transition data base for swept wings at transonic speeds."

Hypersonic Computational Fluid Dynamics Team, "For developing and demonstrating computational fluid dynamics analysis tools making possible the design of hypersonic airbreathing vehicles, in particular, the National Aero-Space Plane."

New Efficient Narrow Bandwidth Titanium-Doped Sapphire Laser Team, "For significant accomplishments in rapidly advancing the technology of titanium-doped sapphire laser materials and line narrowing techniques for efficient solid-state DIAL applications."

Shuttle Alternate Solid Rocket Booster Field Joint Design and Development Team, "For development of an alternate conceptual design of the Solid Rocket Booster Field Joint for the Space Shuttle."

16-Foot Transonic Tunnel Fan Blade Repair Team, "For exceptional contributions in the development of innovtive repair concepts, unique fabrication procedures and reinstalling the 16-Foot Transonic Tunnel fan blades with minimal interruption of critical aeronautical research."

Solid Rocket Booster External Tank Attachment Ring Redesign and Analysis Team, "For timely understanding of the structural behavior of the Space Shuttle Solid Rocket Booster External Tank Attachment Ring and its successful redesign and analysis."

Space Shuttle Orbiter Main Gear Tire Test Team, "For developing Space Shuttle Orbiter tire friction and wear models which will improve the safety of Shuttle landing operations."

Transport Systems Research Vehicle Display Systems Engineering and Development Team, "For successful development and engineering of the advanced color display system for the NASA Transport Systems Research Vehicle."

Positions Open

88-25 Personnel Clerk (Typing), GS-0203-04 or 05 (1 or more vacancies), Management Operations Directorate, Personnel Division, Placement and Position Management Branch. Closes June 6.

88-34: AST, Project Management (Temporary Position), GS-0801-15, Space Directorate. Closes June 9.

88-33: Supervisory Electronics Engineer, AST, Electromagnetics, GM-0855-14, Office of Director for Flight Systems, Guidance and Control Division, Antenna and Microwave Research Branch. Closes June 6.

88-35: AST Project Management, GM-0801-14 or 15, Space Directorate, Space Station Office. Closes June 14.

Positions Filled

Harold A. Orr has been selected Supervisory Printing Specialist, Publications Section, Visual and Printing Services Branch, Research Information and Applications Division, Management Operations Directorate, under CPP 88-23.

Rebecca Bales has been named Management Assistant, Industrial Relations Office, under CPP 88-19.

Upcoming Conferences/Workshops

Workshop on Space Environmental Effects on Materials will be held June 29-30 at the Activities Center. For additional information, contact Bland A. Stein, Mail Stop 188B, ext. 2125.

Eleventh International Conference on Numerical Methods in Fluid Dynamics, cosponsored by the Langley Research Center and the Institute for Computer Applications in Science and Engineering (ICASE), will be held June 26-July 1 at the College of William and Mary, Williamsburg. For information, contact Emily Todd, ext. 2514.

FATHER'S DAY GIFTS for those aerospace enthusiasts are on sale now at the Visitor Center Souvenir Counter.

Lockwood Named Tourism Professional of the Year

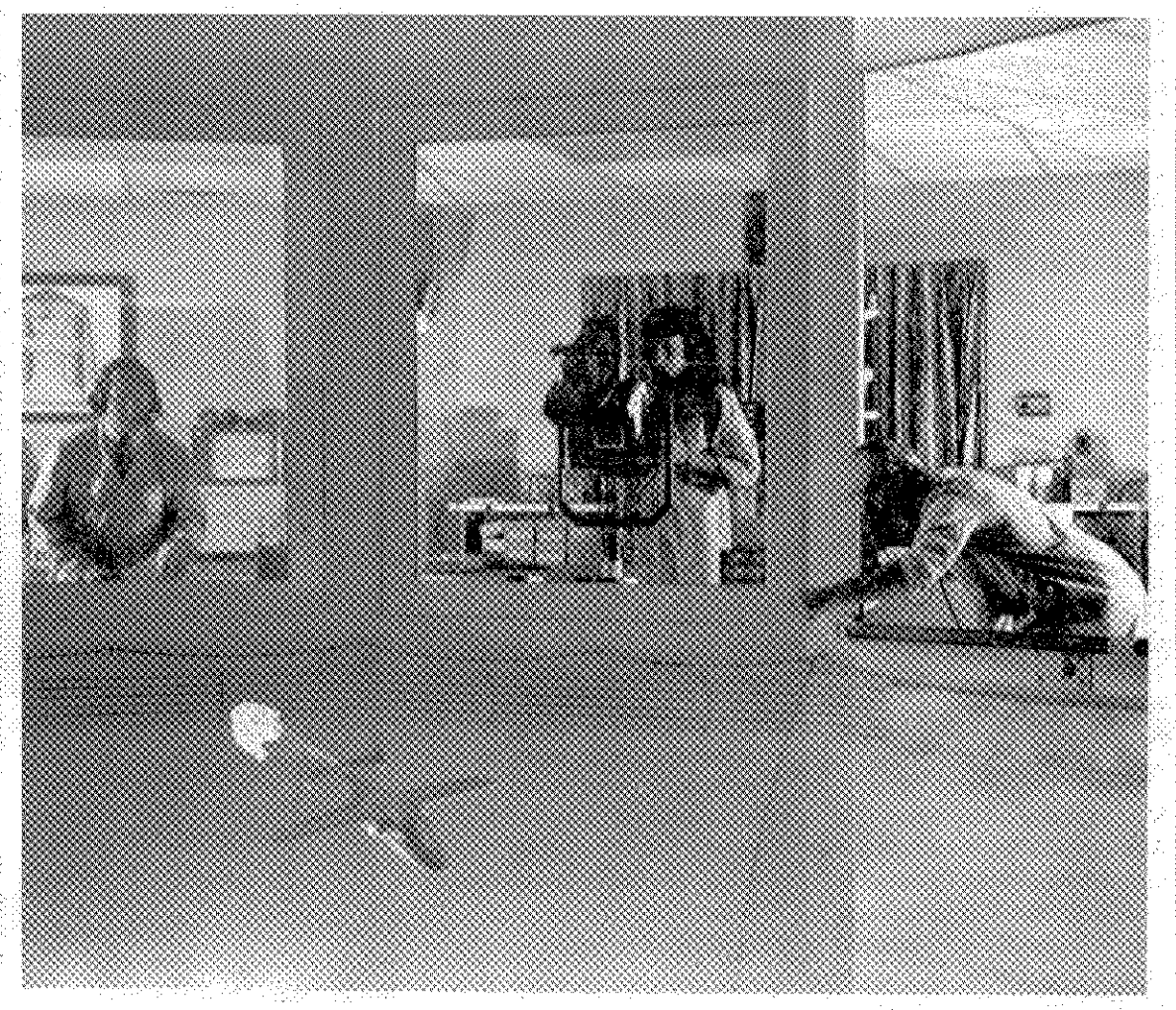
Ellen A. Lockwood, Visitor Center public relations specialist, has been named the Virginia Peninsula's Tourism Professional of the Year for 1988.

Lockwood, elected by her peers in the tourism industry, received the award at the third annual National Tourism Week luncheon sponsored by the Virginia Peninsula Tourism and Conference Bureau. Special events highlighting National Tourism Week, May 15-21, were held throughout the Virginia Peninsula.

"Ellen has done an outstanding job promoting both the NASA Visitor Center and the Virginia Peninsula," explains Lee Ann Sink, acting director of the Virginia Peninsula Tourism and Conference Bureau. "She has escorted travelwriters and tour groups, participated in sales missions, trade shows and special events."

In addition to marketing the Visitor Center, Lockwood is also responsible for informing the public of Visitor Center program offerings; she directs media relations and community interactions. An employee of JL Associates, Inc., Lockwood began her career at NASA in June 1987 after three years as marketing officer at The Mariners' Museum.

Lockwood earned a bachelor's degree in marketing and a master's in business administration from Virginia Tech. She is currently pursuing a second master's degree in English and writing at Old Dominion University. Lockwood was recently recognized at the Seventh Annual Writers' Conference sponsored by Christopher Newport College. Her 1500- word essay, a light look at communications during the Civil War, won honorable mention in the non-fiction category.



From Behind the Scenes

Ready, Set, Spin . . . .

Spin: a maneuver, controlled or uncontrolled, in which an airplane descends rapidly toward the earth while rotating about a vertical flightpath with the wing stalled; a major cause of fatal aircraft accidents.

A T-46 Air Force trainer is being tested in Langley's Spin Tunnel to determine the size parachute needed for emergency spin recovery. A three-person test team conducts the test. Marshall Hungness (right), the technician, launches the model into the 20-foot vertical tunnel; Ronald Hermansderfer (left), the engineer, controls the air speed of the tunnel and observes the spin characteristics of the model; and Rhonda Manis (center), the camera operator, records the test on 16-mm film and video tape. Later, the film data is read to verify the visual data recorded during the test.

Two types of tests—free spin and rotary balance tests—are conducted on trainer, fighter, and attack-type aircraft for the Air Force and the Navy and on general aviation airplanes by the Spin Tunnel Group, Flight Dynamics Branch, Low-Speed Aerodynamics Division.

Think Hawaii

A few additional spaces have been obtained for the two-week, three-island Hawaiian tour departing from Norfolk October 21 and returning November 3.

For more information or for brochures, call Ernie Greene, ext. 2312 or 838-0567, or Dan Crawford, ext. 3284 or 877-3053.

Retirement Party

A retirement dinner honoring **Forrest F. Bruce** will be held Saturday, June 25, at 5:30 p.m. at the Knights of Pythias Hall in Poquoson. Cost including gift is $9/person. Please respond by June 17 to Charlene Gleaton, Mail Stop 424, ext. 2156.

In Memoriam

Sympathy is extended to the families of:

Virgil S. Ritchie, who died May 12. Ritchie retired from NASA in 1973.

Kenny Rexrode, Jr., who died May 21 as the result of injuries received in a traffic accident on April 30. Rexrode retired from NASA as a technician.

Harvey's Selects Crew of Month

Harvey's Janitorial Service, Inc., recognizes employee teams who have excelled on their Facility Evaluation Reports. The award committee convened on May 2 and selected Crew #7 as Crew of the Month for April. This crew received a score of 93.8 out of a possible 95 points. Team members are (L to R) Josie Knight, Linwood Burgess, Selina Lynch, Walter Briscoe and Barbara Herbert.

Complexity Exists in the Simplest of Things

Langley Librarian Wins Writing Contest

"My mother uncapped the mysterious bottle and plunged a tiny wand inside. Drawing it out with deliberate drama, she blew through its ringed end, and clear, effervescent bubbles grew, broke free and floated toward the hedgerow. Like all five-year-olds, I found my untrained lungs incapable of imitating my mother's magical ability to breathe shape into liquid light."

So begins Susan A. Motley's award-winning entry in the Seventh Annual Writers' Conference and Contest sponsored by Christopher Newport College. Motley, information specialist at Langley's Technical Library, won first place in the non-fiction category with her 1200-word article entitled "Liquid Light."

Motley, assigned for the past three years to reference and inter-library loan, has been a Langley employee for eleven years. A former English teacher for Hampton Public Schools, she earned a bachelor's degree in English literature from James Madison University and a master's in library science from Catholic University. She has published numerous articles and book reviews, most recently in **Technology Review, CD-Rom Review** and **The Daily Press.**

Intrigued by the simplicity and sensual delight captured in the bloom of a bubble, Motley chose the topic to point out that "the transient nature (of a bubble) hides its important role in the daily cycle of life."

Did you know bubbles play a key role in the formation of rain drops? Or that the same phenomenon that propels drops like fireworks from a glass of champagne, also makes your skin feel sticky at the beach where surfside bubbles deposit salt from the ocean into the air. In fact, Motley says, scientists estimate that several billion tons of salt and several hundred million tons of organic matter are injected into the atmosphere each year by bursting bubbles alone.

Motley is convinced that these "irridescent, floating globes of shimmering light teach us that even the smallest, seemingly insignificant action is an intricate, essential component of the continuation or the destruction of life on earth."

Motley has recently been contacted by the editor of the **Calypso Log**, a publication of The Cousteau Society, who has agreed to publish "Liquid Light" in an upcoming issue. Congratulations, Susan!

Happenings

LAA SOCIAL will be held Friday, June 10, from 4 to 6:30 p.m. in the Activities Center.

LAA BOARD. The Langley Activities Association Executive Board will meet Tuesday, June 14, at 7 a.m. in the Activities Center.

BINGO CANCELLED for Thursday, June 16, due to the NASA- sponsored Chamber of Commerce Annual Pig Pickin'. Bingo will resume as usual on Thursday, June 23.

COUNTRY-WESTERN DANCE at Activities Center, Saturday, June 18, 7:30—11:30 p.m. Dance to continuous music by Chuck Kessler. Contact Sam Sokol, ext. 3541, for details.

VSC GOLF. The First Annual Golf Tournament and All American Cookout to benefit the Virginia Stage Co. will be held on Thursday, June 23, at 1 p.m. at Cypress Point Country Club in Va. Beach. For information, call 627-6988.

LAFB COMMUNITY APPRECIATION DAY. Langley Air Force Base will be open to the public on June 12.

LOST: GLASSES in a brown hard shell case. Bifocal, gold frame, rimless. Please call Gordon Jones, at 596-7837.

FOR SALE: DR SET. Bassett dining room table w/ leaf, 6 upholstered chairs, 2-piece lighted china cabinet w/glass doors, and buffet in excellent condition. Originally $2,400. A steal at $1,200. Call 865-0586 after 4 p.m. weekdays.

FOR SALE: AUTO, 1969 Mustang fastback, rebuilt hipo 351 W w/5K miles, Cragar SS/T rims on good tires. PS, AC, parts, auto megashifter, GC. $3,000 neg. Call 898-5113.

FOR RENT: CONDO. Time-share condo at Kitty Hawk, N.C., Sept. 4-10. Located at MP 7 1/2, fully furnished, 3 BR, 2 BA, jacuzzi, poolside, oceanfront, tennis. $550 OBRO. Call 722-8245 after 5 p.m.

FOR RENT: HOME 4 BR/3 BA house in Brandywine, York County, 15 minutes from NASA/LAFB from August '88—July '89. Fireplace, large yard, furnished or unfurnished, many extras. Children/pets OK. $700/mo. Call 898- 6471.

Visitor Center Announces Summer Programs

Space Exploration: Learning From the Past to Build the Future

When NASA was established in 1958, there were no astronauts and no jet passenger planes. More people crossed the Atlantic by ship than by air. Now, just 30 years later, man has landed on the moon, put two research spacecraft on Mars, and made regular Shuttle flights into space.

Wait until you hear about the next 30 years—manned outposts on the moon and Mars, robotic exploration of other planets in the Solar System, scientific laboratories in space, and much more.

This summer, the Visitor Center will focus on both the history and the future of space exploration. The film "Pioneering the Space Frontier," a look into the next 50 years of space travel, will be shown daily June through August in the Space Gallery theater.

A special exhibit, on display throughout the summer, gives a visual perspective of NASA's past and future space missions—a historic photo-montage commemorating three decades of space flight and colorful illustrations of the space missions planned for the next 30 years.

At the VC during June

Space Travel -- Highway to the Stars

In February 1962, John Glenn carved a path into space as the first American to orbit the Earth. Greater avenues then opened with the Gemini, Apollo, and Space Shuttle programs. In the early 21st century, spacecraft will travel regularly to the Moon, Mars, and the Space Station.

On Thursday, June 9, at 7:30 p.m., Dr. Theodore A. Talay, lead engineer for the LaRC Shuttle II study, will discuss aerobraking technology, which is necessary to control high speed atmospheric reentry. This technology was instrumental in the Mercury and Gemini programs and is essential for missions to Mars and the Moon in the coming decades.

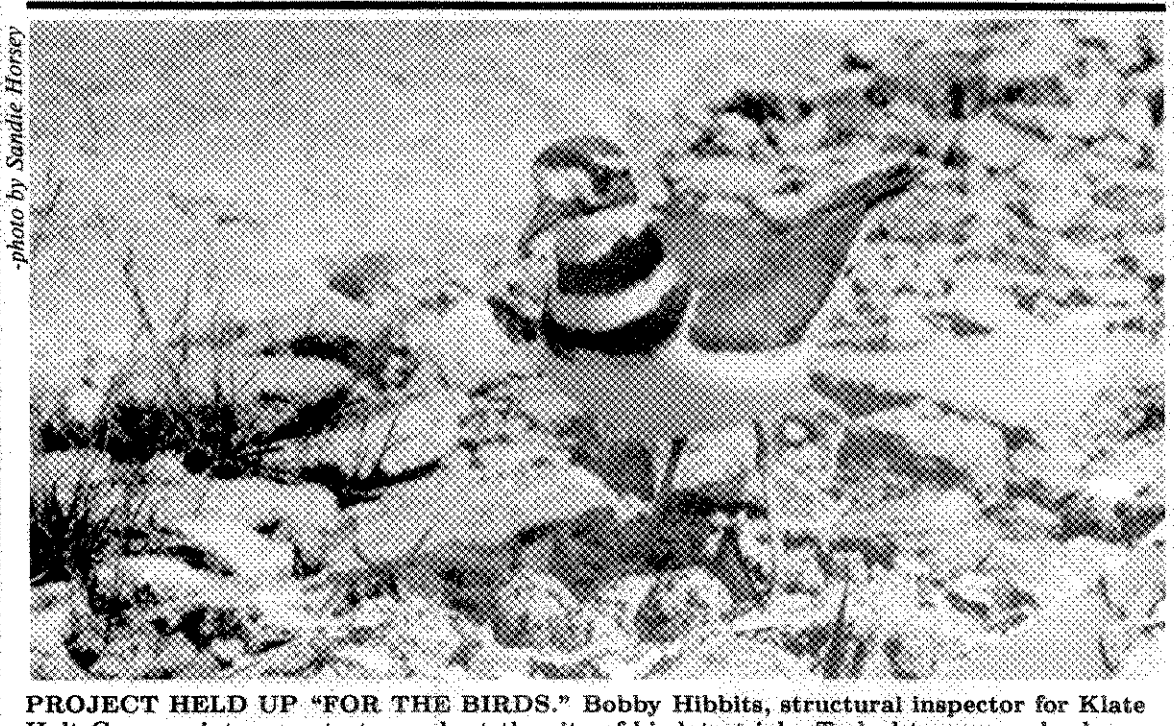
The film "History of Space Travel," about John Glenn's historic flight on Friendship 7, will be shown in the Visitor Center theater daily.

What's Happening with Space Station?

Lenwood Clark will review the current status of the Space Station program on Wednesday, June 9, at noon in the Visitor Center theater. This presentation is part of the Spring Guest Lecture Series sponsored by the Visitor Center and the AIAA-Hampton Roads Section Student Branch.

"The international scope of the Space Station program," notes Clark, "makes it the most complex and challenging program ever attempted by NASA, and potentially the most rewarding."

Clark, senior project engineer in Langley's Space Station Office, will highlight Langley's role in determining the evolutionary growth of the Space Station to support the nations's recently revised space policy of "expanding human presence and activity beyond Earth orbit into the solar system."



-photo by Sandie Horsey

PROJECT HELD UP "FOR THE BIRDS." Bobby Hibbits, structural inspector for Klate Holt Co., ran into a protest march at the site of his latest job. Tasked to remove broken concrete and pour a new concrete pad for a storage and outdoor stacking site, Hibbits was repeatedly driven away by this vociferous bird. Upon further investigation, it was discovered that mamma bird was issuing a strong warning to all intruders who set foot into her domain. Close examination reveals four pale, blotched eggs that blend in with the rocky terrain the killdeer has chosen for her nest. Walt Hoggard, Systems Safety, Quality and Reliability Division, contacted the State Animal and Wildlife Protection Bureau and was informed that the *Charadrius vociferus* is a protected species. Hoggard has "deferred to Mother Nature and Father Time" and postponed the project. He also hopes to leave some of the broken concrete in the area as we're informed the killdeer has returned to this spot to nest for the past several years.

Researcher News

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Space Administration

Langley Research Center
Hampton, Virginia 23665-5225

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NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 2, Issue 12 June 17, 1988

Bi-weekly Employee and Contractor Publication

News Researcher

Evelyn Harris Honored by Cooperative Education Association

Evelyn Myers Harris, coordinator of Langley's Cooperative Education Program, has been awarded the Charles F. Kettering Award by the Cooperative Education Association, Incorporated (CEA). The award was presented at the Association's 25th Anniversary celebration in Cincinnati, Ohio.

The Kettering Award was established in 1978 and is presented annually to an individual in business, industry or government for outstanding contributions to the philosophy and practice of cooperative education. The award is named in honor of the late Charles F. Kettering who was, until his retirement in 1947, director of General Motors Research Laboratories.

Harris is the first woman to receive the Kettering Award and NASA Langley is the first organization in Virginia and the second government agency to be honored in this manner by the CEA.

Harris was nominated for this prestigious award by Geraldine O. Garner, Director of Cooperative Education, Virginia Commonwealth University. The nomination was supported by officials from Rensselaer Polytechnic Institute, Virginia Tech, the University of Cincinnati, Southeastern Training Center for Cooperative Education, Purdue University, Old Dominion University, Michigan State and several former co-op students who are now employed at Langley Research Center.

Malcolm "Pat" Clark, assistant head, Employee Development and Services Branch, regards Harris' selection for the Kettering Award as "national recognition of a person who is dedicated to cooperative education as well as a government agency that supports the concept of cooperative education to its highest level."

Harris began her NASA career as a secretary in 1960. She was assigned to the Personnel Division in 1973 where she planned, organized and developed a co-op program in the field of secretarial science. Under her direction, Langley's cooperative education program has expanded to include engineering and administrative programs and places students from colleges and universities across the country. The program provides a solid experience base for students and a recruiting source of high- quality employees for the Center.

The recipient of several NASA Achievement Awards, Harris is actively involved in cooperative education on the local, state, regional and national levels.

She and her husband, Bob, Operations Support Division, live in the Hilton section of Newport News.

Krodel Selected Chief, Management Support Division

Ronald R. Krodel has been named chief, Management Support Division. He replaces Andrew G. Swanson who retired from government service June 3.

In his new position, Krodel will be responsible for a variety of logistic and administrative support services for the center. These duties include records management; central, micrographic and engineering drawing files; supply and equipment management; intra-center transportation; shipping and receiving; security operations; and real property and organizational space utilization.

Krodel came to Langley in 1959 and has been a procurement assistant, supply technician, contract administrator and a procurement agent. He was head of the Property Management Branch from 1974 until October 1984 when he was named assistant chief of the division.

Under NASA's Career Development Program, Krodel was assigned to NASA Headquarters in Washington, D.C. from 1985 to 1986, where he worked on administrative and facilities projects within the Office of Management and the Office of Aeronautics and Space Technology. Upon his return to Langley, he became the assistant to the chief, Acquisition Division, responsible for various technical and administrative functions in support of multi- faceted procurement activities.

Krodel has received several NASA special achievement and outstanding performance awards throughout his career. In 1978 he received a certificate of recognition from the William A. Jump Memorial Foundation.

Krodel and his wife, Janie, live in Hampton. They have three children.

Langley Researchers Honored by Governor for Scientific Contributions

Governor Gerald L. Baliles has presented certificates of recognition to three Langley Research Center scientists who have made significant contributions to science and technology and whose contributions have come to fruition in the past year.

Warren C. Kelliher, Facilities Engineering Division, was cited for "outstanding work in the development of a portable element analyzer for a wide range of environmental applications;"

Dr. Roland L. Bowles, Flight Management Division, received an award for "outstanding work in leadership and technical contributions toward reducing wind shear hazard risks for aircraft operations;" and

Dr. Lamont R. Poole, Atmospheric Sciences Division, was recognized for "outstanding work in the development of a theoretical model to explain the role of polar stratospheric clouds in the observed springtime depletion of ozone in Antarctica."

The Governor presented the awards at a Science and Technology luncheon held May 24 at Fisherman's Wharf in Hampton. The event was sponsored by the City of Hampton and the Virginia Air and Space Museum.

-photo by Don Ward

Langley Director Richard H. Petersen (left) and Langley retiree and Hampton Vice Mayor Melvin T. Butler (seated) look on as Governor Gerald L. Baliles (right) makes a few final comments after making special presentations to Langley researchers (L to R) Warren C. Kelliher, Dr. Lamont R. Poole and Dr. Roland L. Bowles.

The portable element analyzer developed by Kelliher has significant benefits to both federal and state government agencies in permitting regulatory agencies to survey and map areas contaminated by hazardous chemicals. This not only allows a more efficient evaluation of toxic waste sites, but improves the effectiveness of site surveys by eliminating the need for a sampling technique to identify specific locations of contamination.

The advantages of this instrument to screen and identify toxic wastes on site have also been recognized by the Environmental Protection Agency and the Federal Laboratory Consortium. Kelliher was given the Consortium's 1988 Special Award for Excellence in Technology Transfer earlier this month.

Bowles' research efforts have substantially contributed to flight safety, particularly in the area of wind shear associated with microbursts. Microbursts are small intense downdrafts which, upon striking the ground, spread out into a circular vortex radiating in all directions. When encountered at low levels on approach or takeoff, the pilot usually has little time to react correctly to maintain safe flight conditions. Between 1964 and 1985, there were at least 26 accidents and three incidents involving 626 fatalities and 235 injuries where wind shear was the direct cause or a contributing factor.

Bowles has directed and contributed substantially to the development of a three-dimensional cloud-scale numerical wind shear model, which provides a better understanding of the meteorological phenomenon. It is providing industry with a validated, high-resolution

Continued on page 2.

News Briefs

HEADQUARTERS, Washington, D.C. — NASA has invited the U.S. private sector to express interest in commercially using the Space Shuttle's jettisoned external tanks. Interested American companies and non-profit organizations are asked to submit information concerning proposed uses for the tanks and associated technical and financial information to NASA's Office of Commercial Programs within 90 days.

HEADQUARTERS, Washington, D.C. — Presentation of mission scenarios to a Blue Ribbon panel of government aerospace managers and specialists was the final activity of a three-month "Mars Mission" course conducted by NASA for 20 students of the District of Columbia. The students were divided into U.S. and Soviet groups and, through role play, each developed a manned Mars mission using their country's resources.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — NASA has been notified that two privately-owned production facilities will be proposed as sites for development of the Space Shuttle advanced solid rocket motor. These sites, in Alabama and Utah, will be considered along with a government- owned site to be identified later by NASA.

HEADQUARTERS, Washington, D.C. — Negotiators from NASA and the Government of Japan have reached agreement in substance on the text of a memorandum of understanding (MOU) for cooperation in the detailed design, development, operation and utilization of the permanently-manned civil Space Station. The Japanese Science and Technology Agency will serve as NASA's counterpart in implementing this MOU.

Editor's note: Recent surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017. Request information by release number. See Current News Release information box on page 5.

Governor Honors Langley Scientists

Continued from page 1.

data base for use in their own research, certification and training activities. It also enables analytical assessment of the detection capability of proposed wind shear sensors.

Bowles has also made a significant technical contribution in the identification of hazard-risk criteria for assessing the risk associated with a detected microburst. His work has been broadly accepted among airframe and avionics industries both in the United States and internationally.

Poole's research contributions include the development of a theoretical model for the formation and growth of polar stratospheric clouds, critical to current theories explaining the Antarctic springtime ozone depletion phenomenon.

He has worked with a large international science team successfully integrating airborne data with satellite data to direct mission planning and to investigate polar stratospheric clouds. He developed an advanced computer program for analyzing the data from a laser radar system. He used the laser radar data with satellite aerosol data to develop his theoretical model of the polar stratospheric cloud formation and ozone depletion.

Poole's efforts have brought him international recognition because of their importance to the polar and potentially the global environment.

NASA Langley Selects Cray for Contract Negotiations

by Jean Drummond Clough

NASA Langley Research Center, Hampton, Va., has selected Cray Research, Incorporated, Minneapolis, MN, for negotiation of a contract for supercomputer augmentation to the center's Central Scientific Computer Complex. The estimated value of the contract is $58.7 million.

It is anticipated that the 5-year contract will be awarded in July 1988, and will cover the total installment purchase plan including all options.

Services to be provided include a supercomputer capability that will provide a factor of eight times the current supercomputing resource capacity at Langley; computational bandwidth (CPU speed and memory capacity) to allow major computational advances to be incorporated into center research programs; on-line storage that will support the very large amounts of data that are required to allow effective use of the supercomputer; ancillary processors connected to the supercomputer to provide pre-processing and post-processing, file manipulation and storage, graphics processing and workstation access;

In addition, the capability will include a hierarchy of low- speed, medium-speed and high-speed networks that will provide for the integration of the supercomputer, ancillary processors, mass storage subsystems and user access and the full integration of the components of the system using the open system architecture. The architecture includes the use of industry standard system software (UNIX) and industry standard communication protocols (the DOD TCP/IP).

The contractor shall furnish all the supplies and services required to provide the components that comprise the supercomputer augmentation. This includes site preparation, installation, integration, testing and documentation to establish the new system as fully operationl and to provide system maintenance, hardware and software, for the life of the contract.

Optional items will provide for expanding the augmentation system in the early 1990's if experience and demand analysis indicates that these expansions will provide an effective method of satisfying requirements.

NSTL Renamed Stennis Space Center

NASA's National Space Technology Laboratories (NSTL) has been officially renamed the John C. Stennis Space Center by Executive Order of the President.

President Reagan signed the order to rename the NASA center for the distinguished Mississippi senator who is retiring after 41 years of service to the nation and the state.

The president's executive order sites Stennis as steadfastly supporting the nation's space program since its inception. "He has demonstrated visionary leadership and has consistently worked to assure U.S. world leadership and preeminence in space."

NASA Administrator James C. Fletcher said, "John C. Stennis has served as the father of NSTL since he led the efforts for its creation."

At NSTL, director Jerry Hlass said, "(Stennis') close association with our center has contributed significantly to the growth and progress we have experienced over the past 27 years."

During the period between the Apollo and Space Shuttle programs, Stennis was instrumental in helping NASA achieve full utilization of the installation's facilities. Today, the NASA center employs more than 5,400 people and is the home of 18 federal and state agencies engaged in environmental, oceanographic and defense-related activities.

Scout Launch Set for June 15

The 111th flight of a Scout, smallest in NASA's stable of expendable launch vehicles, is to boost an advanced Navy navigation satellite, NOVA-II, into polar orbit. Launch, as of press time, is scheduled for June 15.

A total of four Scouts have been manifested for flight in 1988. The first two were successfully launched on March 25 and April 25 from the San Marco Range in the Indian Ocean and from WSMC, respectively. Launch number four, again for the Navy, is presently targeted for August and will be launched from California.

Scout rockets—73-feet tall, four-stage solid propellant space workhorses— are built by the Missiles Division of LTV Missiles and Electronics Group, Dallas, Texas. The Scout program is managed by the Langley Research Center.

Lankley

"Wait a minute. Is this Conference Room A?"

Upcoming Conferences

The 11th International Conference on Numerical Methods in Fluid Dynamics will be held June 27-July 1 at the College of William and Mary, Williamsburg. For details, contact Emily Todd, ext. 2514.

Workshop on Space Environmental Effects on Materials will be held June 28-30 in the Activities Center. Contact Lou Teichman, ext. 3027, for details.

Thermoplastics for Space Working Group Meeting will be held July 6-7 in Building 1218, Room 107. Contact Darrel R. Tenney, ext. 2361, for additional information.

Workshop on Computational Aspects in the Control of Flexible Structures will be held July 12-14 at the Royce Hotel, Williamsburg. Contact Lawrence W. Taylor, Jr., ext. 4591, for further details.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

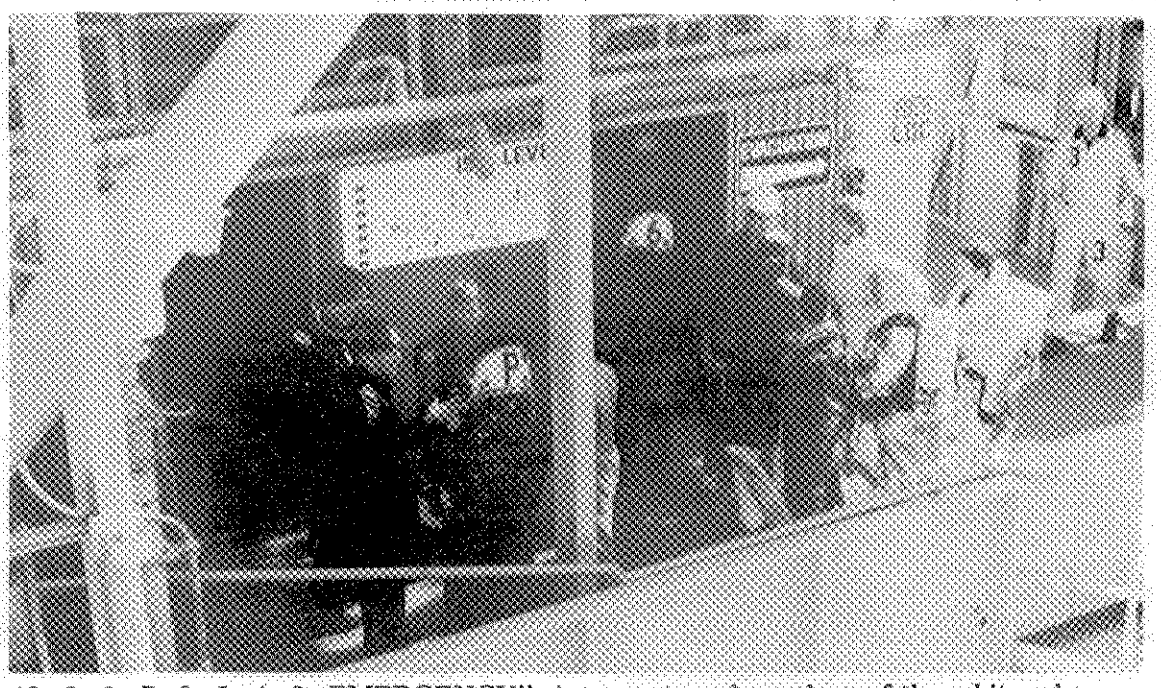
The privilege of advertising articles in this publication is restricted to the staff and retirees of the Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Emergency!

Egress Simulations Conducted at KSC

Two separate emergency simulations, involving a Space Shuttle launch and a landing were conducted recently at Kennedy Space Center. Members of the astronaut corps, rescue teams and launch team participated.

The tests were intended to familiarize astronauts and members of the launch team, fire/rescue team, ice team and the close-out crew with evacuation routes, emergency equipment and procedures. The emergency exercises also validated two important support areas: recent upgrades to the launch pad's emergency escape system and new procedures developed as a result of a similar test in November 1986 and in preparation for Space Shuttle mission STS-26.



10...9...8...7...6...5...4...3...EMERGENCY!! Astronauts and members of the orbiter close-out crews participate in a simulated emergency egress exercise on the 195-foot level of the launch pad at Kennedy Space Center.

Mock Disaster at Shuttle Launch Simulated

Seven astronauts participated in the emergency egress launch simulation. The simulation crew included Frank Culbertson, commander; Ken Cameron, pilot; and mission specialists Kathy Thornton, Carl Meade, David Low, Pierre Thuot and Jay Apt. This is the same crew, with the exception of Cameron, who participated in the November 1986 exercises.

Simulation events corresponded to events that occur at the T-minus-2-hour mark in a shuttle countdown. To make the test as real as possible, none of the team members knew the type of emergency situation or the exact time of the emergency.

Just as in a normal launch countdown, the NASA test director, the biomedical officer and safety officer were at their consoles in the Firing Room. The closeout crew was in the White Room at Pad B preparing for the flight crew's arrival and the fire/rescue personnel were in position in an armored personnel carrier about 1 mile from the launch pad.

Members of the flight crew left the Operations and Checkout building in the Astrovan enroute to the pad to begin simulating entry into the Orbiter's cockpit. During entry, referees at the launch pad revealed the nature of the emergency and handed out cards indicating a particular physical condition that the participants feigned for the exercise.

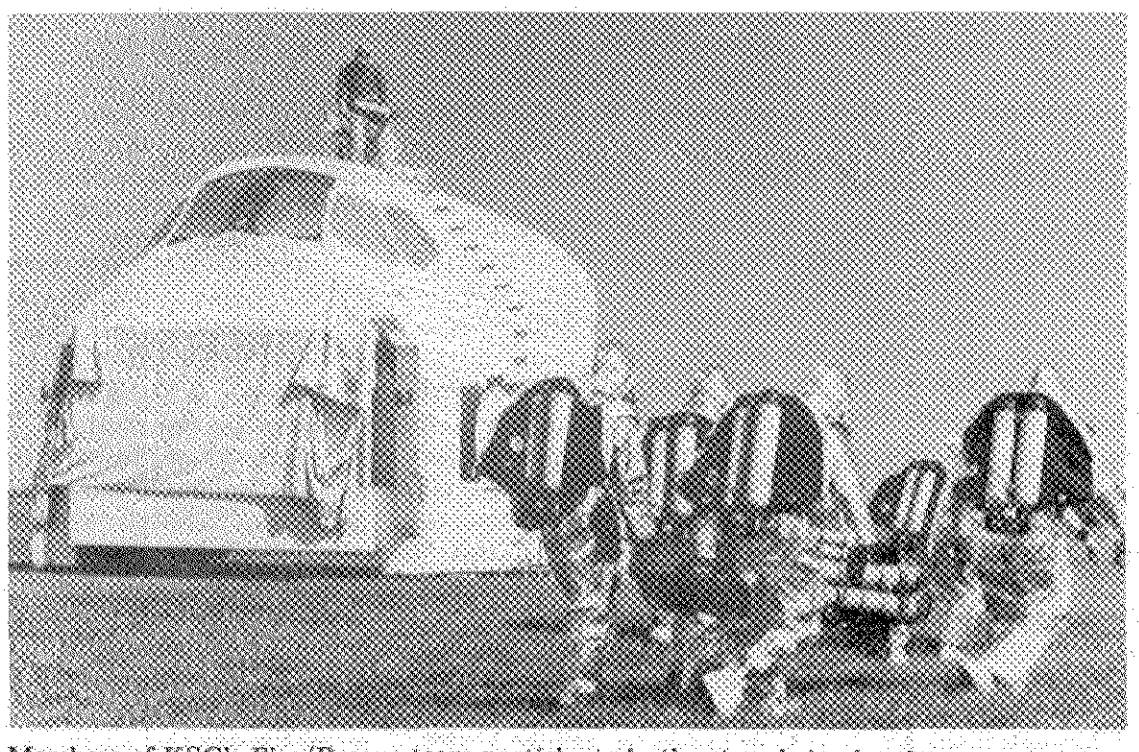
"Victims" were put in slidewire baskets, but the baskets were not released. The baskets were released with sandbags, and the participants regrouped at the slidewire landing area. Participants climbed back into the baskets and rescue forces removed those with simulated injuries and took them into the nearby underground bunker.

As the exercise unfolded, fire rescue personnel and the crew, some of whom had simulated injuries, boarded the emergency tracked vehicles and departed for the heliport site. A triage site was set up for emergency medical care and stabilization. Some participants were transported via helicopter to nearby hospitals. The exercise ended when victims were rolled into hospital emergency rooms.

In a recent upgrade to the launch pad's emergency escape system, slide-wire baskets have been rated to hold three instead of four people. They have been modified to incorporate a side exit, a flame- protective covering over the existing webbed material, and an anti-roll-back brake to stop the basket more quickly.

Emergency Shuttle Landing Tests KSC Rescue Staffs

-photos courtesy of Kennedy Space Center



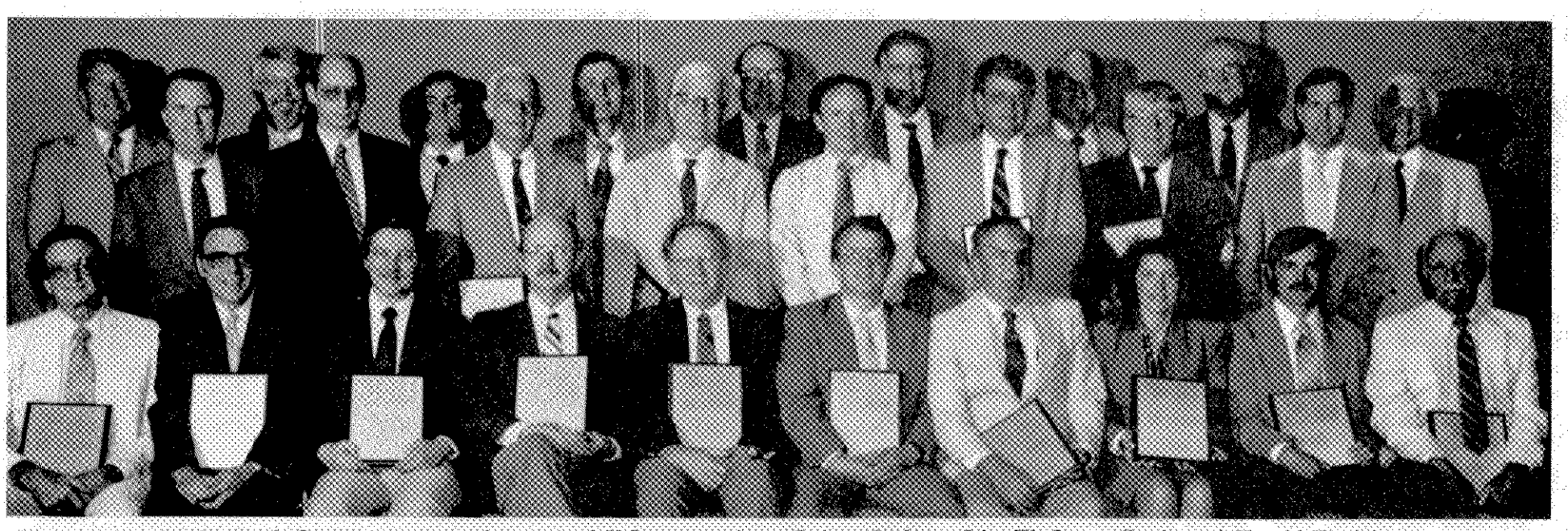
Members of KSC's Fire/Rescue team participate in the staged simulated emergency at the shuttle landing facility. Scenario participants help crew members escape the shuttle simulator, a shell of the orbiter's forward structure.

An area close to KSC's Shuttle Landing Facility (SLF) was the stage for the emergency landing simulation. The scenario indicated that the orbiter had landed on a remote KSC site and was damaged, and the flight crew needed assistance in leaving the orbiter.

A shuttle simulator, a shell of the orbiter's forward structure, simulated the damaged craft. Astronauts were not involved in this exercise except to observe. Flight crew members were simulated by members of KSC's biomedical staff, fire/rescue members, and a member of the Vehicle Integration Test Team.

Manning consoles in the firing room for this exercise was the landing recovery director (LRD), biomedical personnel and safety personnel. Three Department of Defense helicopters supporting the exercise were in place on the SLF apron. A triage site was set up at the Mate-Demate Device.

The exercise began when the LRD confirmed there had been a simulated emergency landing. At that time, helicopters deployed rescue crews to the site of the landing. While crews rescued members of the flight crew, the helicopters went back to the SLF to refuel in preparation for potential medevac to hospitals. Members of the simulated flight crew and rescue crew were transported to the triage site by helicopter.



Thirty-six Langley Research Center inventors who received U.S. patents in 1987 were honored at the annual Inventors' Luncheon held May 26. Honorees include (first row, L to R) William T. Davis, William T. Yost, John H. Cantrell, Jr., Ronald K. Clark, Stephen S. Tompkins, Eric C. Stewart, Robert W. Hess, Pamela A. Davis, Howard C. Jones, David P. Haynes; (second row) George F. Helfrich, patent counsel, Marvin D. Rhodes, John C. Wilson, H. Douglas Garner, Michael J. Walsh, Randall C. Davis, L. Robert Jackson, Irby W. Jones; (back row) Harold W. Adams, patent attorney; John B. Anders, Jr., Jerry N. Hefner, Laurence J. Bement, Terry L. St. Clair, Allan H. Taylor, Hans-Juergen C. Blume, Gregory R. Wichorek, Melvin C. Lucy. Inventors not pictured are Paul M. Hergenrother, Colossie N. Batts, Vernon L. Bell, Edward A. Crossley, Jr., Martin M. Mikulas, J. Wayne Simonton, Harold G. Bush, James B. Robertson, Richard M. Wood, Charles F. Bryan, Jr., and Henry L. Kelley.

photos by Sandie Horsey

Eight Langley researchers received Technology Transfer awards for their accomplishments during 1987. Shown (front row, L to R) are John Samos, technology utilization office, and awardees Darrell R. Tenney (receiving for Paul M. Hergenrother), Jag J. Singh, Irvin M. Miller; (back row) Joseph S. Heyman, Terry L. St. Clair, and Allan H. Taylor. Not pictured are Paul M. Hergenrother, James L. Rodgers, Jr., and Allan R. Zucherwar.

Amendments to the Technology Innovation Act allows Langley patent holders to receive royalties for their inventions. Royalties are generated when patents are licensed to private industry. Royalty awardees are (front row, L to R) Robert L. Fox, Anne K. St. Clair, Donald J. Progar; (back row) Randall C. Davis, John D. Buckley, Terry L. St. Clair and George F. Helfrich, patent counsel. Not pictured are Robert J. Swaim, David F. Johnston, Ernest W. Millen, Thomas T. Bales and Dick M. Royster.

Harvey's Selects Crew of Month

Harvey's Janitorial Service, Inc., recognizes employee teams who have excelled on their Facility Evaluation Reports. The award committee convened on June 1 and selected Crew #2 for the Crew of the Month for May. This crew received a score of 94.3 out of a possible 95 points. Team members are (L to R) Joyce Snow, Cynthia Woodard, Annie Melton, Jean Bond, Patricia Coats, and Vincent Brooks.

Proceedings Printed

Proceedings of the Eighteenth Lunar and Planetary Science Conference, 64 papers which outline current developments in planetary geology and petrology, particularly of the Moon and the solid planets in the solar system, is now available. Published March 1988; ISBN 0-521-35090-5; $65. For order information, contact Cambridge University Press, 32 East 57th Street, New York, N.Y. 10022.

Bowling Stats

The NASA Tenpin Bowling League bowls on Tuesday nights at Victory Lanes in Grafton. Current standings are:

	May 17	May 24
Team High Game	926 ACD	904 Ballers
Team High Series	2605 Ballers	2619 Spare Change
Male High Game	242 **R. H. Jones**	225 **W. Williams**
Male High Series	605 **R. H. Jones**	627 **W. Williams**
Female High Game	225 **M. Aldrich**	192 **R. Frizzell**
Female High Series	589 **M. Aldrich**	492 **R. Frizzell**
Most Pins	73 **R. H. Jones**	72 **G. Schuster**
Over Average	60 **H. Gerringer**	60 **J. Richardson**

Apiculture Club Meets

The NASA Langley Apiculture Club will meet Monday, June 20, at 5 p.m. at the club apiary located adjacent to Building 1244 and the garden lots. The club beehive will be inspected and instructions on nectar flow management will be conducted by Ronnie Henk, club apiarist.

All interested in beekeeping are welcome. For more information, call Wilson, ext. 4615.

Children's Programs Planned

During July the Visitor Center will feature "Life in Space," a program that follows life aboard the Space Shuttle from launch to landing. The program will include a lecture, movie and demonstration. An astronaut's food tray and actual samples from a typical meal will be displayed.

The program is divided into two sessions: programs for children, ages 4-8, are scheduled from 2-3 p.m.; children, ages 9-12, at 3-4 p.m. For additional information, or to register, call the Visitor Center, 865-2855.

Av Week Video

Aviation Week Video Magazine will be received on Center each quarter.

Available now is "Flight Deck." The one-hour program, including dramatic flight footage, lets you experience life aboard an aircraft carrier.

This video is available in VHS format from the Teacher Resource Center, ext. 3017. The tape is copyrighted and may not be reproduced; it will be loaned on a first come-first served basis.

Correction:

Apologies to Marshall Hungness and Ronald Hermansderfer whose identies were reversed in the *From Behind the Scenes* photo on page 7 of the June 3 **Researcher News**. Hermansderfer is shown launching the model into the spin tunnel; Hungness controls the air speed of the tunnel and observes the spin characteristics of the model.

-Editor

Employees Support Bloodmobile

A total of 318 Langley employees, retirees and contractors donated pints of blood at the May 27 visit of the American Red Cross Bloodmobile.

Achieving gallon status were:

14 gallons — Sue Wilder;

13 gallons — Victor E. Delnore;

12 gallons — Herbert Leybold;

9 gallons — Pendelton Jackson;

8 gallons — George Link, Richard Chattin and Earl Knight;

7 gallons — Clyde Lowe, William Woods and Richard Herndon;

6 gallons — Lloyd Nelson;

5 gallons — John Ellingsworth and Susan Halligan;

4 gallons — Dennis Holloway, Randy Woolard and Gregory Kent;

3 gallons — Bessie Sample, David Hahne, Luckey Thomas and Lamont Poole;

2 gallons — Timothy Harris, Basil Shader and Wayne George;

1 gallon — Carl Hellman, III, Gretchen Murri, Inez Jenkins, Ronald Hare, Bernice Beeber, Jeffrey Flamm, Steve Lee, Marion Jones, David Giltman, Samuel James, Gerald Alexander, Edward Lawless and John Hopkins;

First timers — Donald Oliver, Gene Monroe, Mary Thomas, Marc Portamova and William Prosser.

NASA coordinators for the Bloodmobile visit were Annette L. Forrest and Peter Edgette; Red Cross coordinators were Barbara Thomas and Helen Lax.

Current News Releases

To receive a copy of these NASA News Releases, contact Edith Watts, Mail Stop 146, ext. 3017.

88-68.....NASA Invites Expressions of Interest for Use of External Tanks

88-69.....Local Students Chart Course for Mars Mission

88-70.....NASA/Japan Negotiators Complete Negotiations on Station Agreements

88-71.....Companies Plan Private Facilities to Build NASA's Advanced Motor

Take Note:
'Tone Up' and Catch the Savings

The Stock Management Section has contracted with a local vendor to recharge the toner cartridge for the HP Laser Jet Plus Printer, NSN 6850-01-216-6823. There will be an approximate savings of $35 for each cartridge that is recharged. This savings will be realized by the customer in the reduced price of the toner cartridge. Please return empty toner cartridges to Mail Stop 382, per the instructions provided with the cartridge.

To make this endeavor successful, the cooperation of all the users is needed. If you have any questions, please contact Suzanne Scarborough Melson, ext. 2815.

Monarch Contestants Needed

LAA Plans for 1988 Carnival

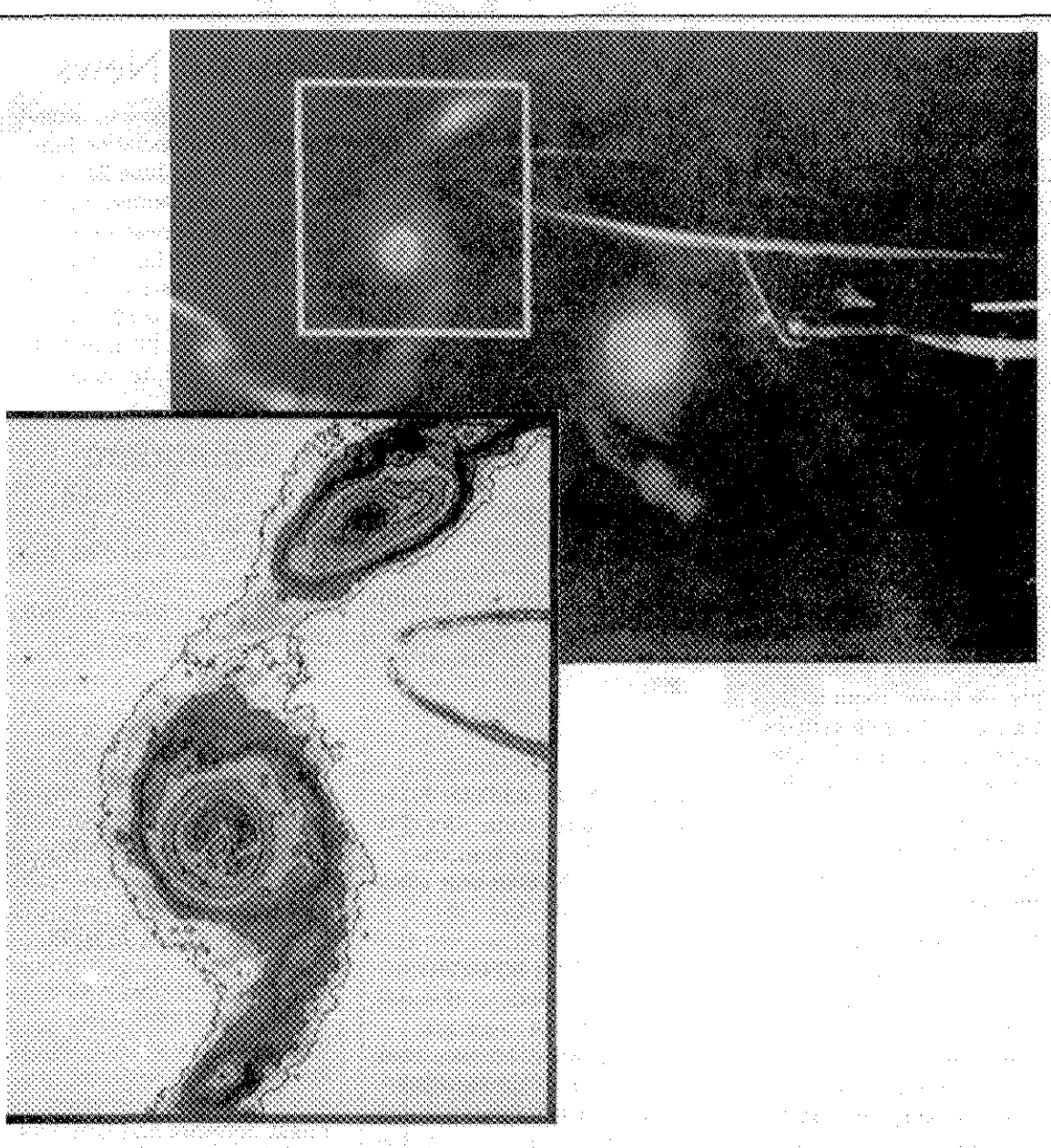
The Langley Activities Association has announced plans to hold its annual Carnival Friday and Saturday, August 19 and 20, at the Activities Center.

The association is seeking contestants to run for the 1988 Carnival Monarch. The contestant selling the most Carnival raffle tickets will be crowned Carnival Monarch on Friday evening and will reign over all events.

NASA Langley and contractor employees are invited to become contestants. Names should be submitted to Paula Ware, Mail Stop 285, no later than June 27. Contestants will be featured in the July 29 issue of the **Researcher News**.

Other activites planned during the weekend include raffle drawings, game booths, a casino, rides, an arts and crafts show and souvenirs. Food and beverages will be sold. Cash prizes, ranging from $50 to $1,500, will be given away throughout the two-day festivities.

Anyone interested in working the Carnival or displaying their arts and crafts should call Pat Gates, ext. 2058, for further information.



From Behind the Scenes

Image Processing Uncovers Underlying Flow Dynamics

A camera captures a barely discernable swirl created during a wind tunnel experiment that contains valuable aerodynamic information.

In the enlarged detail, enhanced flow-visualization has been achieved by applying digital image processing techniques to the area noted in the square. The enhanced image reveals hidden information about the structure of the flow field which dramatically improves analysis capabilities for the researcher.

The processing was performed interactively in minutes with a Gould IP8500 image processing system and special software developed by the Flight Software and Graphics Branch, Analysis and Computation Division.

The Senior Management Research Review will be held Monday, June 27, in Building 1219, Room 225. Following the Director's comments and program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:30	Liquid Oxygen Contamination Monitor	Allen Zuckerwar (Electronics/IRD)
9:45	Low-Acceleration Research Facility	Gary Martin, GWU (Space/SSD)
10:00	Multigrid Solution of the Euler Equations on Unstructured and Adaptive Meshes	Dimitri Mavriplis, ICASE (Aeronautics/TAD)
10:15	Significance of the Small-Crack Effect for Fatigue Design	Edward Phillips (Structures/MD)
10:30	"Timer" Simulation and Flight Evaluations Demonstrate Potential to Improve Airport IFR Throughput for Conventially Equipped Aircraft	Leonard Credeur (Flight Systems/FLMD)
10:45	Model Reduction Techniques for Reliability Analysis of Large, Complex Systems	Sally Johnson (Flight Systems/ISD)

Notes of Thanks

The **Gloucester family**, victims of a fire that burned their home and belongings, writes: "Many thanks to all the caring people who helped our family in a time of need. Your thoughtfulness was greatly appreciated. God bless you all."

Barbara R. Saylor, the traffic lady at Gate 5, wishes to thank Langley personnel who sent cards and flowers during her recent hospitalization.

Virginia Jones writes: "I thank everyone for the beautiful send- off you gave me at my retirement luncheon. I appreciate your attendance, the gifts, and especially the TV. Stay healthy and, remember, fitness is fun."

Happenings

LAA SOCIAL will be held Friday, June 24, from 4 to 6:30 p.m. in the Activities Center.

FATHERS DAY GIFTS on sale at the Visitor Center Souvenir Counter. Open daily 8:30 a.m. to 4 p.m.

BUSINESS CARDS, formerly available for order from Pat Gates in the Activities Center, will now be available for order at the Visitor Center Souvenir Counter. For more information, call ext. 2198.

TOASTMASTERS. NASA Langley Toastmasters will meet Wednesday, June 22, 11:30 a.m. to 1 p.m., in the private dining room of the Cafeteria. Co-ops, retirees, military, contractors—all are welcome. Civil service personnel charge one hour to A1619. Call Natalie Johnson, ext. 3483, for further information.

VOLLEYBALL PLAYERS: The gym has been reserved Thursday afternoons, from 4 p.m.—?, for pick-up games through July 7. For more information, contact Margo Heaney, ext. 3819.

AIAA PICNIC will be held Wednesday, June 29, from 4:30 to 8 p.m. on the grounds of the Activities Center. Families, including children, are invited. Cost for members and guests is $5; non-members, $6; students, $3; children ages 6-12, $2; children under 6 are free. For reservations, call Karen Credeur, ext. 3467, or Ferd Grosveld, ext. 3561, by noon on Monday, June 27.

WANTED: BOOKSHELVES. Needed to organize and store reference materials in lab. Will arrange transportation from your facility. Call Bryan Hefner, ext. 3631.

FOR SALE: AUTO. 1971 Ford Country Sedan, PS, PB, AC, 351W, Poor cosmetic condition. $400 or best offer. Call 898-3768. bye

FOR RENT: STUDIO. Time-share condo at Hyannis, Cape Cod, MA. July 2-9. Fully furnished, kitchen, pool, sauna. $495. Call 851-8248 or (617) 861-0473 after 6 p.m.

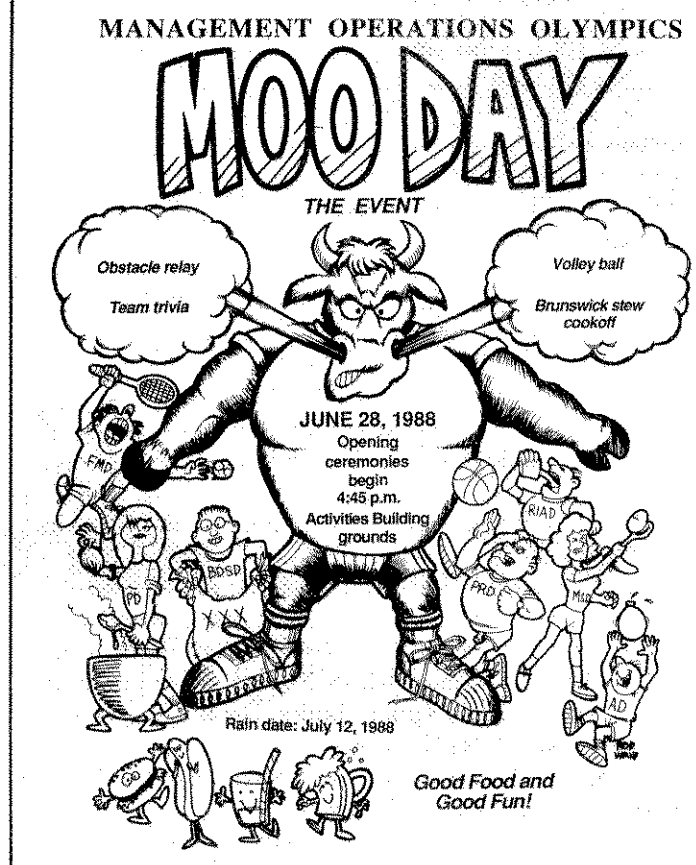
Alumni News

Make plans now to attend the Alumni Association luncheon at noon, June 24, at the Activities Center. Bruce D. Fisher will speak on the NASA Aircraft Lightning Program. Spouses are welcome. The cost is $7. Call Don Ward, 838-1063, or Bill Boyer, 722-0443, to make reservations.

In Memoriam

Sympathy is extended to the family of **Earl L. Councill, Jr.**, who died May 30. Councill retired as an aeronautical engineer in 1976 after 40 years of service to NASA.

PLEASE HELP. Will the borrower of the MACTEX Manual please return it to Bob Grandle, Mail Stop 461, ext. 2645, as soon as possible.



Position Open

88-38: Supervisory Electronics Engineer, GM-0855-14, Office of Director for Electronics, Analysis and Computation Division, Flight Software and Graphics Branch. Closes June 21.

Position Filled

Lucille H. Gonyea has been selected AST, Facilities Program Management, Facilities Program Development Office, Systems Engineering and Operations Directorate, under CPP 87-88.

Retirement Party

James E. Hill will be honored at a retirement party Saturday, July 9, at 5 p.m. in the Activities Center. Cost including gift is $7. Please respond by July 1 to Becky Sample, Mail Stop 166B, ext. 2032.

BULK RATE
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Researcher News

Meet 'Mr. NASA'--Have Story, Will Travel

-by Ellen A. Lockwood

They call NASA AEROVAN lecturer Dale Christensen "Mr. NASA." No small wonder.

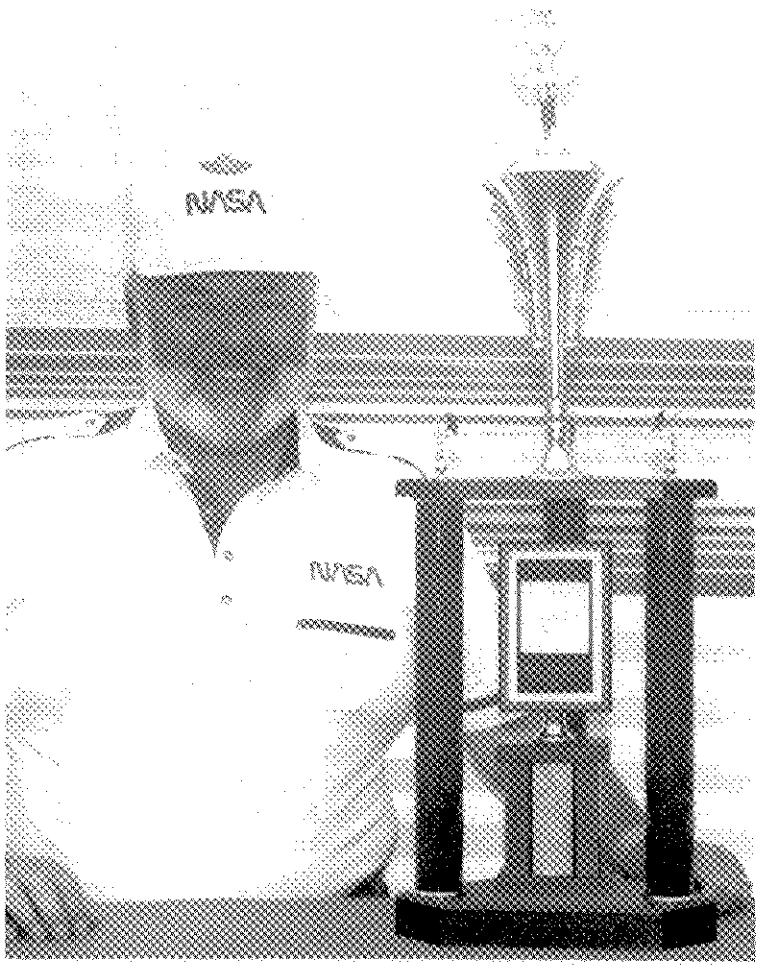
For the last five years, Christensen has traveled with one of NASA's two AEROVANs to trade shows, air shows and aeronautical colleges throughout North American, giving lectures on NASA aeronautics and giving tours of the AEROVAN. These walk-through trailers feature educational exhibits on NASA aeronautical research including safety, energy efficiency and improvements in passenger comfort and convenience.

Christensen is well-versed in the subject of aeronautics. "I started flying when I was 14," he explains. "Back then it cost $4.50 for 30 minutes of dual time in a J-3 Cub." A retired Air Force pilot, Christensen holds two Distinguished Flying Crosses, a Meritorious Service Medal and fourteen Air Medals. He flew over 200 combat missions in the F-4 Phantom during his tour in Vietnam.

What's the best part about his job? Dale Christensen enjoys the positive reaction and support of the people he greets and educates. "The children are so enthusiastic and knowledgeable about high-tech matters these days, and it's fun to be driving down the road and get a wave and a 'thumbs up' signal from the cars that pass."

But as knowledgeable as children are, Christensen is often reminded he still has much to teach them. Recently he was speaking to a group of first graders. He began his talk, "How many of you know what NASA is?" One lone hand went up. "Yes?" said Christensen. The child stood up and looked at his peers. Quite seriously he explained, "That's way down by Bermuda."

Christensen has recently been recognized for his efforts. The AEROVAN lecturer was awarded a trophy for the most educational display at the annual Engineers' Fair at the University of Florida in Gainesville.



NASA
National Aeronautics and
Space Administration

Langley Research Center

Volume 2, Issue 13 July 1, 1988

Researcher News

Bi-weekly Employee and Contractor Publication

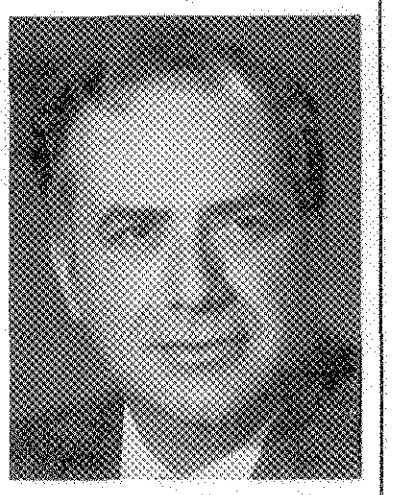
VIRGINIA CONSTITUTION OAK PLANTED. Two white oak seedlings have been planted on the grounds of the Langley Research Center to celebrate the ratification of the U.S. Constitution by Virginia in 1788. The seedlings were presented to Langley by the Garden Club of Virginia and the Virginia Department of Forestry. Shown above are (L to R) Robert L. Swain, acting deputy director, Elizabeth Zimmerman, Huntington Garden Club, Nancy Horgan, Hampton Roads Garden Club, and George Palko, Work Control and Contracted Services Branch.

Holloway Completes Harvard Business School Advanced Management Program

Paul F. Holloway, deputy director, recently completed the 102nd session of the Advanced Management Program (AMP) at Harvard Business School in Boston, Massachusetts.

Holloway was one of 159 graduates of the rigorous 11-week program for senior corporate executives. The practice-oriented program employs an innovative, three-tier curriculum to prepare corporate leaders to deal with issues and problems facing top level management in the next decade.

While at Harvard, Holloway studied with other senior executives from around the world representing 31 countries. The program began with a discussion of general management tools, covering such topics as corporate finance, marketing, management systems and organizational behavior. After an examination of important recent developments in business strategy formulation and implementation, the AMP focused on the issues of corporate management. This segment provided the program's major emphasis and dealt with such topics as corporate strategy and organization, ethical considerations in corporate decision- making, management succession, and business, government and media relationships.



Dixon Retires From Government Service

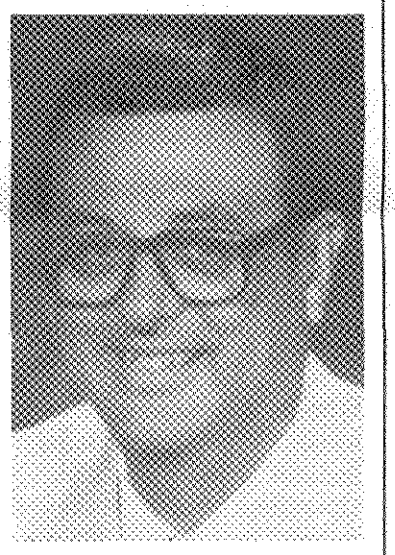
Dr. Sidney C. Dixon, chief of the Structural Dynamics Division, retires today after more than 30 years of government service. Dixon lead the division responsible for research in aeroservoelasticity, spacecraft dynamics, unsteady aerodynamics, configuration aeroelasticity, and landing and impact dynamics.

Dixon began his career with NASA's predecessor agency, the National Advisory Committee for Aeronautics, in 1958 as a research engineer in the Structures Research Division. He became head of the Design Studies Section in 1970 and head of the Thermal Structures Branch in 1974. Before joining NASA, he served in the U.S. Navy from 1955 to 1958.

A native of Durant, Oklahoma, Dixon received a bachelor of science degree in mechanical engineering in 1955 and a master of science degree in applied mechanics in 1963, both from the University of Virginia. He earned a doctorate in engineering mechanics from Virginia Polytechnic Institute and State University in 1967.

The author or co-author of more than 20 technical publications, Dixon is an associate fellow in the American Institute of Aeronautics and Astronautics. In 1986 he received a NASA Exceptional Service Medal "in recognition of outstanding leadership and contributions in the field of aerothermal loads, hypersonic vehicle structures and aeroelasticity."

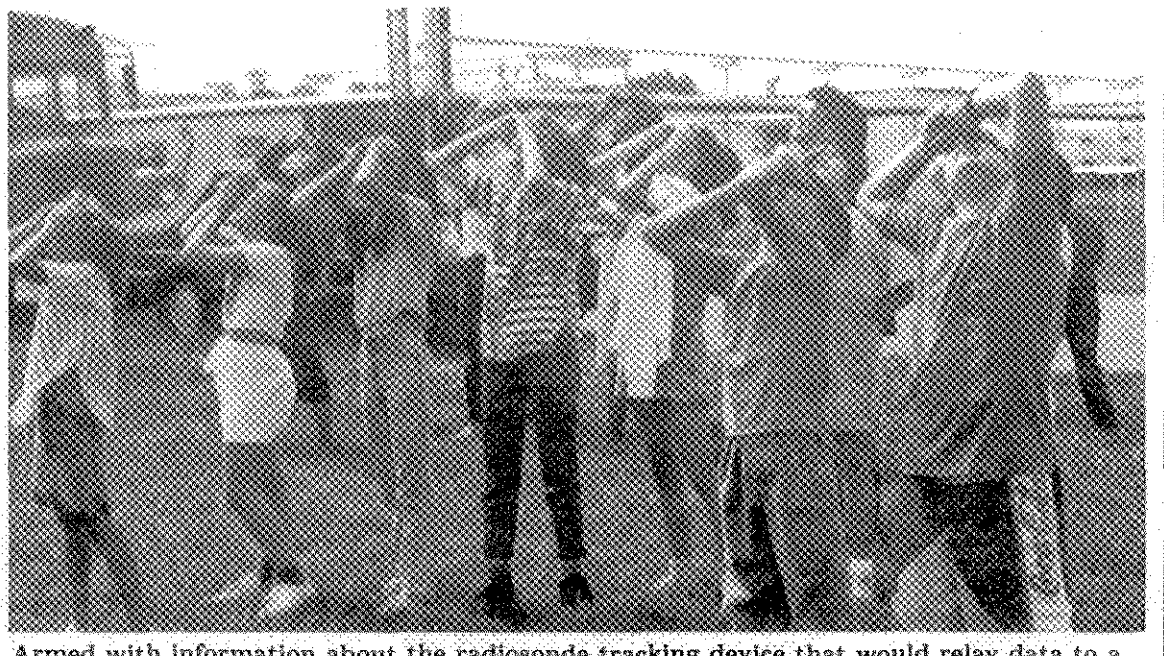
He and his wife, Marion, live in Gloucester Point. They have three children.



Up, Up and Away! Forecasting the Weather Turns Kids On to Science

-photos by Sandie Horsey

A highlight in the specially designed science curriculum for fourth grade students at Poquoson Elementary School was a balloon launch in which they participated at Langley Research Center. Carl Purgold, Field Experiments Branch, releases a weather balloon from a shipboard launcher device as students watch.



Armed with information about the radiosonde tracking device that would relay data to a pc computer nearby, the fact that the balloon would expand to a size ten times bigger than it was at launch as it reached the upper atmosphere, that the humidity sensor would indicate when the balloon passed through clouds — the reaction of students and adults alike was the same. All eyes were riveted upward, despite the glare of the sun, and everyone watched and watched and watched until the balloon drifted out of sight. Read about the year-long meteorological program, a cooperative venture of Langley's Atmospheric Sciences Division and Poquoson Elementary School, that ignited the interest of 50 fourth grade students in science. Story on page 3.

News Briefs

JOHNSON SPACE CENTER, Houston, Texas — NASA astronaut Sherwood "Woody" Spring has announced that he will leave NASA in August of this year to accept an assignment as Director of the U.S. Army Space Program Office in Fairfax, Va. Spring will report for duty September 1 for nine months of familiarization and training before assuming his responsibilities as director in June 1989.

HEADQUARTERS, Washington, D.C. — John E. O'Brien, NASA's general counsel, will retire July 2. O'Brien has completed over 32 years of federal service, 26 years with NASA. He has accepted a position with the law firm of Steptoe and Johnson, Washington, D.C.

HEADQUARTERS, Washington, D.C. — Negotiations among the U.S., Canada, Europe and Japan on the framework for international cooperation in the Space Station program have been completed. Completion of these talks marks the end of more than two years of complex negotiations on the design, development, operation and utilization of the permanently manned civil Space Station. Negotiators from all four partners have submitted the texts to their respective governments for consideration in accordance with their internal procedures. Signature of the agreements is expected later this summer.

NASA Scholarships Awarded

The NASA College Scholarship Fund, Inc., has awarded 1988 scholarships to David M. Fishbach, son of Lewis Research Center employee, Laurence H. Fishbach, and Harold R. Collard Jr., son of Ames Research Center employee, Harold R. Collard Sr. These scholarships are awarded under a program endowed by author James C. Michener.

Applications were restricted to dependents of NASA employees who are planning to major in science or engineering fields. Some 89 applications were received from all except one of the NASA field centers and installations. Applications were submitted by 11 dependents of Langley employees.

Fishbach graduated from Cleveland Heights High School where he ranked four out of a class of 707. He had a 4.052 grade point average and scored 1490 out of 1600 on the Scholastic Aptitude Test. He will attend Cornell University this fall and pursue a degree in engineering.

Collard graduated from Mountain View High School in Mountain View, Calif., ranking eight out of 299 students and scoring 1350 on the SAT. He plans to pursue a career in biology and biochemistry, studying at Harvard University.

The NASA College Scholarship Fund, Inc., was established in October 1982 as a nonprofit foundation for the purpose of awarding scholarships to the dependents of NASA employees. The endowment was established by a substantial gift of James A. Michener. Other benefactors have since made contributions to the fund, including NASA employees who have used the designation method in their center's Combined Federal Campaign.

To date the fund has awarded 12 scholarships to young people from seven NASA centers. Tax deductible contributions may be made to the fund at Mail Code AH12, Johnson Space Center.

Positions Open

G88-3 - Engineering Technician, GS-802-4, Operations Support Division, Tunnels Operations Branch, Technical Support Section "C," closes July 8.

G88-4 - Engineering Technician, GS-802-4, Fabrication Division, Models and Materials Technology Branch, Materials Processing and Development Section, closes July 8.

Thanks!!!

Thanks to the personnel of the Microgravity Science Laboratory, Information Processing Technology Branch, for submitting the quote from a 1903 **New York Times** editorial section that serves as a basis for this week's cartoon.

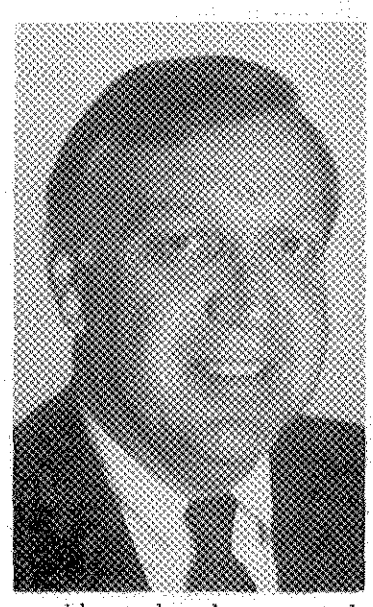
"Lankley" is anxious to get into all the facilities on Center and portray what is really happening at Langley. The editor invites submissions of cartoon ideas and scenarios. Please direct your contributions to Lankley, c/o The Editor, Mail Stop 115.

Lankley

"We hope that professor Langley will not put his substantial greatness as a scientist in further peril by continuing to waste his time and the money involved in further airship experiments. Life is too short..."
-The New York Times, editorial, 1903-

Langley

Headquarters Forum



You all know the old saying about being up to your waist in alligators and forgetting that the mission was to drain the swamp? At NASA, so many alligators exist in the Congressional, Interagency and International swamps, it is too often too easy to forget that the agency's primary mission is to increase man's knowledge.

NASA's battles on Capitol Hill over funding, the intense negotiations within the Executive Branch over the National Space Policy, and the development of the largest international joint R& D venture in history, the Space Station, are indeed a formidable gaggle of crocs.

NASA will ultimately prevail in all these dismal swamps, but it may be to no avail–we may fail in our primary mission–if the scientists and engineers **for** the future are not available **in** the future.

Pick up a newspaper and note the national decrease in average SAT scores, the growing illiteracy rates, the seeming inability of much of the younger generation to, like, uh, converse, and the fact that this intellectual decline runs counter to a worldwide trend towards incrased technological complexity.

To drain this swamp NASA has placed greater emphasis on the activities of the Educational Affairs Division leading to the development of aerospace engineers, scientists, technicians and other disciplines critical to sustaining our country's leadership role in aeronautics and space. From "Spacemobiles" sparking elementary and secondary student interest on the ground, to Space Science Student Involvement Programs (SSIP) conducting experiments here and in space, to Summer High School Apprenticeship Programs (SHARP) at each center, to the new Space Grant College Program and to Graduate Student Research Programs, NASA can take pride in its leaderhip in scientific and technical education.

This is but a continuation and expansion of the historic role this agency has played in education. From the days when man began exploring the environment above the ground, to the halcyon days of the Apollo program, the principle charge to NASA was not just "get us up and back," it was to learn all that was possible to learn and to pass that knowledge on. The chauvanistic pressures laid on American by Sputnik would not alone have created sufficient political force necessary to fund such a magnificant scheme as the Apollo program. Rather, a recognition by American parents that their children were not keeping up their technical education in a growingly competitive world created the political will to invest in the future huge sums the country dedicated to educational programs.

The same problem exists again today and, lacking a national "crash" program to resolve it, NASA is making incremental contributions to the cause. The educational explosion America generated twice before in its history–the G.I. bill after WWII and the science/math program after Sputnik–are needed even more today. My question is: What will it take for the country to accept the need for a renewed investment? If **Glasnost** is real and **Mir** doesn't have the same impact as Sputnik, what will it take?

H. Hollister Cantus
Associate Administrator
Office of External Relations
NASA Headquarters

H. Hollister Cantus was appointed Associate Administrator for External Relations in February 1987. In this capacity, Cantus is responsible for NASA's congressional, international, intergovernmental and industry relations. This new position demonstrates the Agency's desire to place renewed emphasis on its relationships with the various external constituencies of the civil space program.

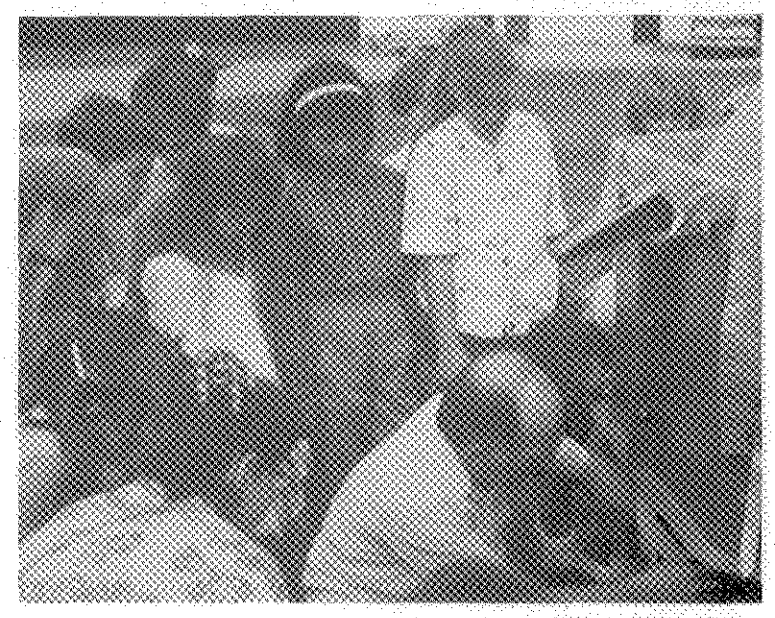
Anyone interested in selling or purchasing
Carnival Tickets
call Pat Gates, ext. 3139.

Changes in the Weather Affect a Change in Attitudes Toward Science

There's nothing as unpredictable as the weather—or is it? Just ask fifty fourth grade students from Poquoson Elementary School who, with the aid of their teacher and Langley's Atmospheric Sciences Division, have integrated meteorology into their educational curriculum.

Weather is an all-important element in our daily activities. We are physically and, very likely, psychologically connected to the atmosphere. Inevitably, our daily planning—from how we dress to what we do—is dependent on the weather. What better way to ignite the interest of children in the study of science than by probing a factor that is encountered daily, provides immediate feedback, and requires no fee, rental, or admission charges.

The weather is there for the encountering. Why not learn more about it? That's the feeling shared by Vickie Connors, Chemistry and Dynamics Branch, and Carol Mitchell, Poquoson Elementary School (PES). This dynamic duo combines a local expert on weather, Connors, willing to share her expertise, and a very creative teacher, Mitchell, eager to spark the enthusiasm of her students. The result has been a year-long investigation of a scientific phenomenon that has spanned the entire fourth-grade curriculum and spilled over into the entire school.



Carl Purgold (center) inflates the weather balloon attached to the shipboard launcher device as Poquoson Elementary School fourth graders watch.

Langley Supports a Science-Integrated Curriculum

On the NASA end, Connors set up a program of experts to introduce the students to the science of research meteorology. With the full support of Dr. James D. Lawrence, Jr., chief, Atmospheric Sciences Division, NASA researchers gave freely of their skills, insights, experiences and time in this cooperative venture.

Connors visited the PES classroom and introduced primary atmospheric processes—cold fronts, severe weather, anticyclones—that affect out lives locally. She also explained how to interpret and understand weather charts. The bait had been taken; the kids were hooked on science.

Scott Bachmeier, PRC Kentron, supplied basic weather forecasting rules. He taught the class how to use cloud types and motion, air temperature and pressure, and past weather to predict future weather. The students immediately applied what they had learned and began to forecast the weather for their school each day.

Dr. Peter Brimblecombe, noted author and visiting scientist from Oxford University, introduced the problem of air pollution through an investigation of history and medieval art plus hands-on experiments.

In February, the Global Meteorological Data Facility hosted a mini-symposium for the students on a wide range of issues. Mark Shipman, Data Management Office, spoke on global climate change, Bachmeier discussed satellite meteorology, and Don Cahoon, PRC Kentron, elaborated on careers in the atmospheric sciences.

Spurred by Connors' discussion of remote sensing from space and the challenges of measuring trace gases in the troposphere, a student research project was initiated that involved the careful examination of 56 surface weather charts for selected weather events. Fourth grade students Charlie French and Christina Silcox, spokespersons for the class, presented project results to the NASA Measurement of Air Pollution from Satellites (MAPS) research group meeting on June 6.

A highlight of the program was the balloon launch hosted by Gerald C. Purgold, Field Experiments Branch, which involved a close-up look at the shipboard launching system and the data tracking-retrieval system. The students participated in the launch, tracked the balloon by computer, and later toured the Visitor Center during their visit to Langley.

After launch Purgold shows PES students (L to R) Claire Fredericks, Tilottoma Mukhopadyay, and Erick Zohn equipment that records tracking data relayed from the weather balloon. The students can see their classmates outside in the launch area on the monitor above.

School Reacts to the Challenge of Science

Changes in the class and the classroom mirrored the "adoption" of this fourth grade class by their mentors at NASA. Carol Mitchell's classroom became a weather station. Students made and learned to read simple weather instruments. The barometer, hygrometer, thermometer, anemometer, wind vane and rain gauge became as necessary a part of the student's routine as paper, pencil, ruler and crayons.

Simple charts were posted and students began to make daily weather observations and recorded the data. When it proved prudent to graph the data to analyze weather trends, science spilled into math.

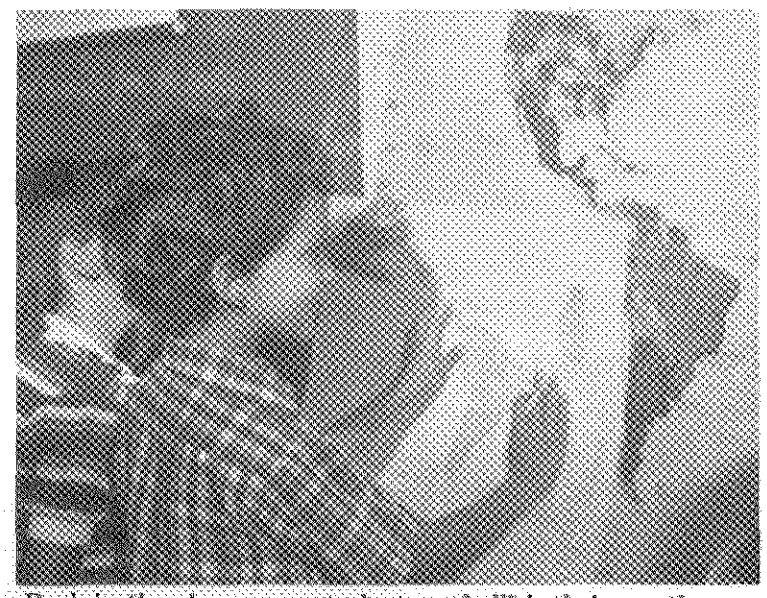
The students learned that civilization has always felt the urge to record visually important events. The masters of the 18th century were examined—but this time the students looked carefully at the background in the paintings and it was the sky that was examined. The fourth graders made their own water color paintings of the area's stormy, foreboding skies and well as the floating, cumulus-filled blue skies. Science had spilled into art.

Dr. Brimblecombe led the students through history and art into a discussion of air pollution and sparked an interest in the now-popular ozone level. Posters by the fourth-grade-level advocacy group pleaded protection of our environment. Science had spilled into health.

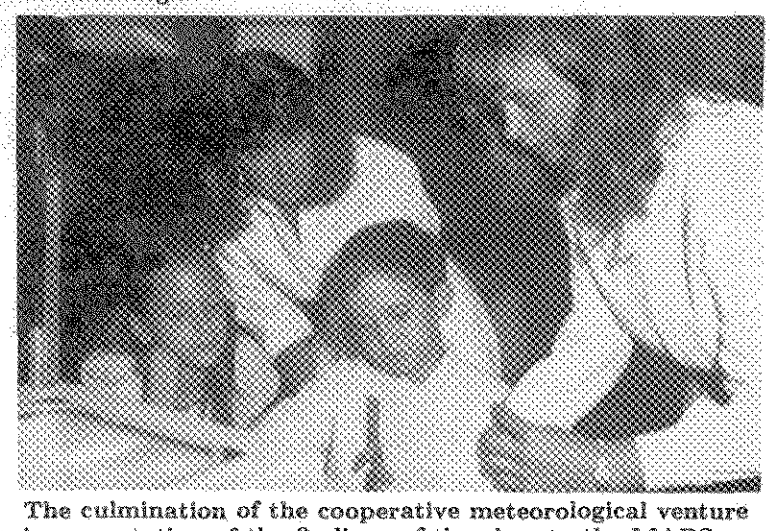
The nine-year-olds discovered the television weather channel and found themselves watching the evening news with special attention directed to the weather report. This prompted daily weather forecasts over PES News, the school's in-house TV station. News and weather reports were supported by creative commercials. Science had spilled into writing, public speaking and drama.

A new vocabulary crept into the classroom. "Weather is the envelope in which we live." Speech became more picturesque. "Snow is like a blanket that covers our fading summer grass." Metaphors and similies were not artificial any more, but a means of expressing a new idea. "The wind is an unseen friend." Science had spilled into all areas of language arts.

Extended weather study activities carried the class through the entire school year. There was never a question of the success of the project since that day in December when all meteorological indications predicted snow and Mrs. Mitchell's fourth grade class also predicted snow. The day was bright, not unseasonably cold, and much too clear. But shortly before school was dismissed, as if on command, large white flakes obscured the view from every window. The shout—in unison—from the fourth grade gave credence to science: "It's snowing!!"



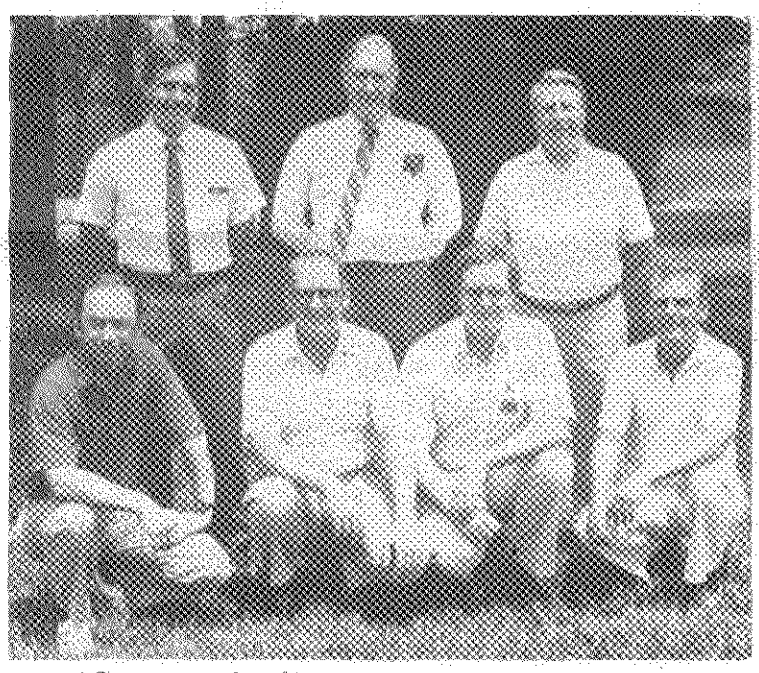
Back in the classroom, students embellish their weather maps with continents located by latitude and longitude coordinates. Devin Trippe consults the world map to verify his drawings.



The culmination of the cooperative meteorological venture is presentation of the findings of the class to the MAPS research group. Christina Solcox and Charlie French are assisted by their teacher Carol Mitchell (left) and NASA mentor Vicki Connors (right) as they preview their vugraphs.

Quality Circle Receives Awards

The "Centsible Circle," Payroll Section, was presented Quality Circle Achievement Awards by Joseph Struhar, chief, FMD, for their contributions related to reducing the overcrowded conditions in the payroll office. Awardees are (front row) Marion Chaltry; (second row) Marie Storms and Mary Bayless; (third row) Barbara Reed, Shirley Boswick and Anita Runkel; (fourth row) Struhar, C.M. "Skippy Cole and Charles Sibbers. Not pictured are Letty Bright and Joyce Fly.



Golf Association Announces Tournament Winners

Net score winners of the NASA Golf Association tournament held May 13 at the Sleepy Hole golf course are (front row, L to R) Wayne Oakley, championship flight; John Mixon, first flight; Delwin Croom, Jr., second flight; and Bobby Gates, third flight. Gross score winners are (back row, L to R) Robin Rubrecht, championship flight; Forrest Dickinson, first flight; Herb Thornton, second flight; and (not shown) Conway Rogers, third flight.

Participants Sought for Management Development Programs and Fellowships

Langley is seeking participants for FY 1989 management development programs and management fellowships. These programs and fellowships offer a good opportunity for career development and a broadening of one's administrative and managerial perspective.

Management education programs at the Office of Personnel Management Executive Seminar Centers in Oak Ridge, Tenn.; King's Point, N.Y.; Denver, Col.; and Washington, D.C., are two-week programs covering a variety of topics. These programs are open to GS/GM-13 and above who have not attended one of the OPM programs in the last five years.

Management education programs by the Brookings Institution are for senior-level managers, GM-15 and above. Many of these one-week programs are offered in Williamsburg and cover broad policy issues.

The following nationally prestigious management fellowship programs are available:

Carnegie-Mellon University's Senior Executive Seminar;
Dryden Memorial Fellowship;
Harvard University's
-Mid-Career Master in Public Administration
-Program for Management Development
-Senior Executive Fellows Program
-Senior Managers in Government Program;
ICAF (Industrial College of the Armed Forces);
Massachusetts Institute of Technology's Advanced Study Program;
Penn State Management Program for Women;
Simmons College's
-Program for Developing Women Executives
-Program for Developing Women Managers;
Sloan Programs
-MIT
-Stanford;
Syracuse University's Maxwell Mid-Career Development Program; and
Federal Executive Institute's Executive Excellence Program

The required grade level is GS-12 for the Penn State and Simmons College programs; however, it is GM-14 or Senior Executive Service for others. Langley nominees must enter an agency-wide competition for final selection to these fellowship programs.

In addition, a Langley management fellowship is available. It is for the College of William and Mary's Executive Master of Business Administration Program and may be of interest to managers in the administrative support area.

Information concerning these programs and a list of recent participants who can provide further information about a specific program are available in each division office and the Training and Education Section, ext. 2611. Applications may be initiated by individuals but must go through the appropriate division or project office channels for approval at the directorate level. The nomination deadline is late July.

Current News Releases

To receive a copy of these NASA News Releases, contact Edith Watts, Mail Stop 146, ext. 3017.

88-72.....Astronaut Spring Reassigned to Army Space Post
88-73.....O'Brien to Retire from NASA
88-74.....Space Station Negotiations with Partners Successfully Completed

Retirement Parties

Emmett "Lew" Bryant will be honored at a retirement luncheon at 11:30 a.m. Friday, July 15, in the NASA Cafeteria. Cost, including refreshments and gift, is $5. Donations for gift only are welcome. Please respond by July 8 to Taumi Daniels, mail stop 238, ext. 3483.

Joe DeGinder will be honored at a retirement party at the Activities Center Monday, July 11. The heavy hors d'oeuvres, cash bar reception will begin at 6:30 p.m. Cost, including gift, is $8 per person or $15 per couple. Separate gift donations are welcome. Please send cash or check to Beverly Taylor or Boyd Wilfong at mail stop 386.

Position Filled

Betty S. Burnes has been selected as an Employee Relations Specialist in the Personnel Division.

NASA Tech Briefs

Joseph R. Struhar, chief, Financial Management Division, received an Equal Opportunity Award "in recognition of superior achievements in hiring, motivating and advancing minorities and women in the Financial Management Division." Also receiving an Equal Opportunity Award is Dr. Sheila T. Long, a researcher in the Materials Division. Long is cited "in recognition of personal commitment and leadership in advancing the ideals of equal opportunity through mentorship of minorities and females within the scientific environment at Langley Research Center. Acting Deputy Director Robert L. Swain presented the awards.

Directive Changes Announced

DIRECTIVES NO.	TITLE	DATE	T.S.#	DATE DISTR.
Revised				
LHB 4050.1	"Facility Standard and Interchangeable Spare Parts and Equipment"	March 1988	–	4-19-88
LMI 9050.6	Attachment C, "NASA Langley Exchange"	4-14-88	1597	4-28-88
LMI 4300.2	"Recovery of Precious Metals and Strategic and Critical Materials"	4-27-88	1598	5-6-88
LHB 1040.2	"NASA Langley Duty Officer's Handbook"	Dec. 1987	–	5-5-88
LMI 1300.3	"Use of Center Facilities by University Investigators"	5-2-88	1599	5-25-88
LHB 1740.4	Change 1, "Facility System Safety Analysis and Configuration Management	April 1988	–	6-1-88
Cancellation				
LHB 2310.1	"Resource Management System Reference Manual"	5-2-88	–	5-25-88

People & Places

Speakers Spread NASA Story

Members of the Langley Speakers Bureau carry the NASA story to area groups and organizations. The gift of their time and talent is greatly appreciated. To become a member of the Speakers Bureau, contact Ann Suit, Mail Stop 154, ext. 3967.

Dr. Bruce Holmes, **John Anders**, and **Bruce Fisher** spoke at the David Dick Symposium, Hampton Roads Academy, on April 29. Holmes presented Laminar Flow and its Contribution to the Voyager Flight; Anders, NASA Drag Reduction goes Down Under; and Fisher, Storm Hazards Research—Where Lightning Strikes Twice.

Frank Quinto spoke on NASA Aerospace Careers at Kempsville High School, May 6.

Jean Peters-Do presented Laser and Fiber Optics at Park Elementary School, Chesapeake, May 10.

Joseph Johnson spoke to the United Methodist Mens Club on Dynamic Model Testing Techniques, May 15.

Leroy Spearman gave a presentation on the History of Aviation to the Men of Hidenwood Presbyterian Church, on May 18.

George Hickman and **Charles Jenkins** gave a Modal Analysis Demonstration at the Career Fair, Willard Model School, Norfolk, May 20.

Peter Edgette spoke on Health Careers at Syms Middle School, May 20.

Melvin Ferebee gave a presentation on Science and Engineering Careers at Portsmouth Career Day, May 21.

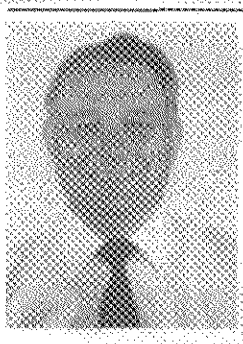
Lester Rose spoke to the Society of Allied Weight Engineers, Ft. Monroe, on Spinoffs from Aerospace Technology, May 24.

Lenwood Clark gave a presentation on Space Station to the Young Astronauts at Syms Middle School, May 24.

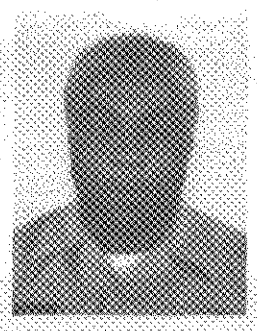
Upcoming Conference

HYFIRE Flight Experiments Planning Workshop will be held July 14-15 in Building 1209, Room 180. For additional information, contact Dee Zacharias, Mail Stop 356, ext. 4995.

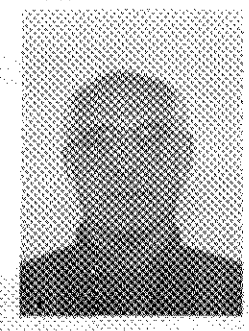
Recent Retirees



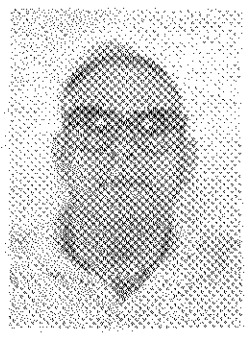
B. F. Moore



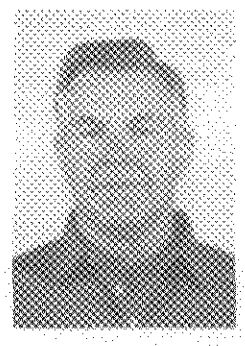
J. E. Hill



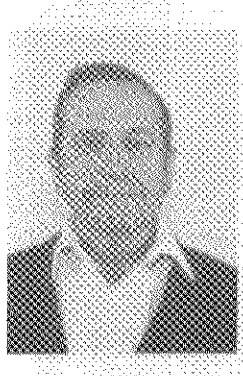
F. F. Bruce



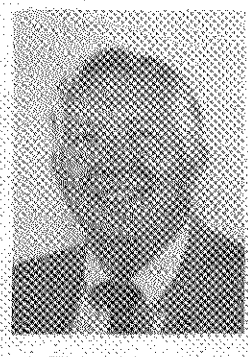
J. T. Guy



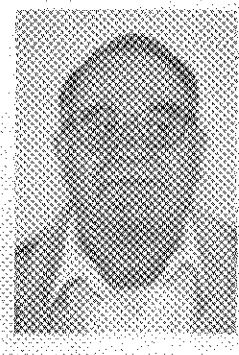
E.J. Roberts



E. L. Bryant



J. E. Jordan

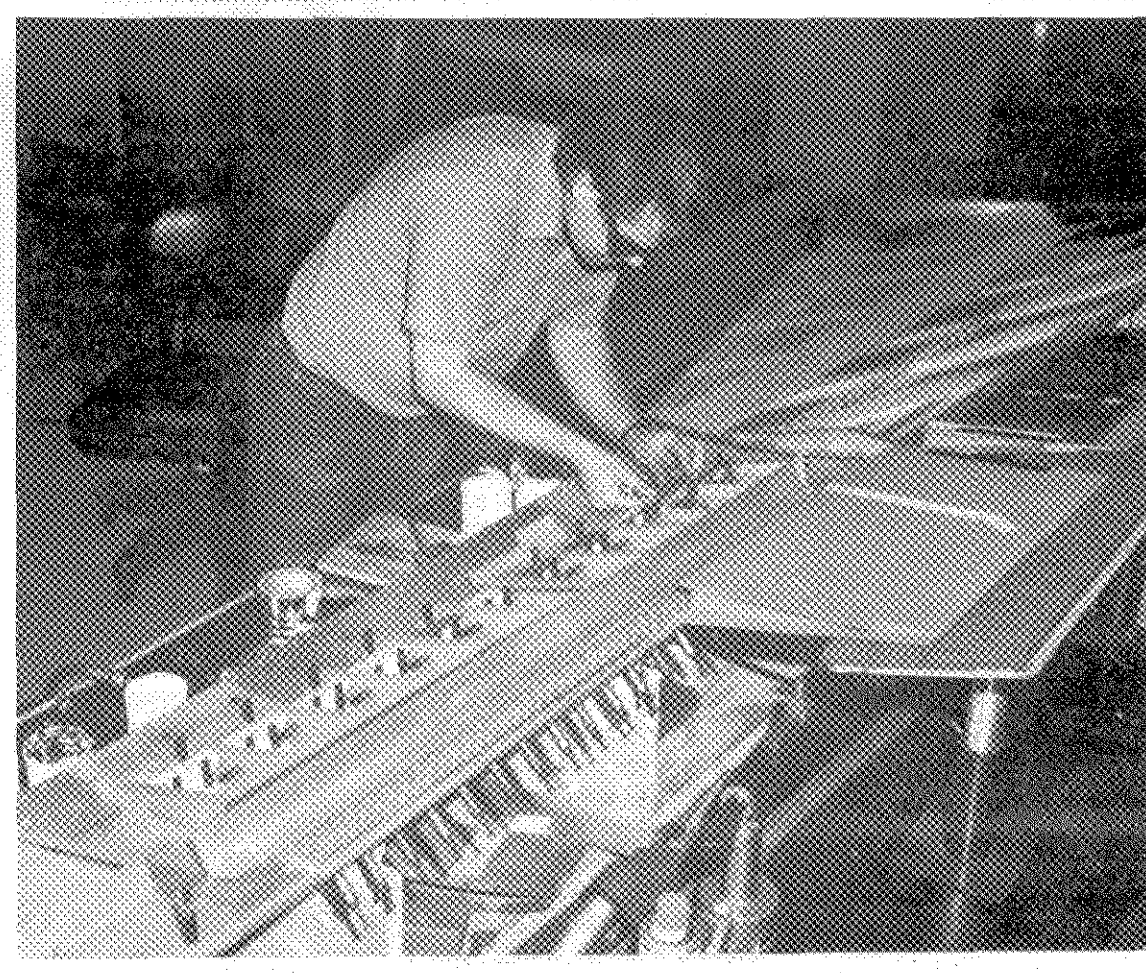


E.R. Dunnigan

B. F. Moore, Research Information and Applications Division, retired May 20.

James E. Hill, Operations Support Division, and **Jimmie C. Miller**, Facilities Engineering Division, retired May 31.

Forrest F. Bruce, **Joseph T. Guy** and **Edward J. Roberts**, Systems Engineering Division; **Emmett L. Bryant** and **Johnny E. Jordan**, Instrument Research Division; and **Ernest R. Dunnigan**, Fabrication Division, retired June 3.



From Behind the Scenes

Langley's in a "Flap" Over the F-106B

An engineering technician mounts the support structure for a new type of wing leading-edge flap, which was manufactured on-Center in the fabrication shop in Building 1232A.

Following almost 3,000 hours of wind tunnel testing and hundreds of computer design hours, Langley's F-106B aircraft has been fitted with a vortex flap, a sharp extension of the basic swept wing. The altered design demonstrates a new technology which purposely detaches the airflow and forms a tornado-like vortex to reduce drag.

Flight testing of the vortex flap commences this month. The experiment is the culmination of a two-year involvement by the Metals Technology Development Section, Fabrication Division.

Scout Rocket Launched Successfully

A NASA Scout rocket, carrying a U.S. Navy navigational satellite- -NOVA II, was successfully launched June 15 from Vandenberg Air Force Base, Calif.

The vehicle, which left the launch pad at 11:54 p.m. PDT, three minutes into the window, performed well and the spacecraft orbited within the desired parameters for the mission.

The NOVA II satellite, which weighed 385 pounds, is part of the Navy's continuous all-weather global navigation system.

The Navy Navigation Satellite System is the nation's only fully- operational worldwide satellite navigation system. It has served the military and more than 60,000 civilian users for more than two decades by providing position information within one-tenth of a nautical mile anywhere in the world.

This was the 111th launch for Scout, a four-stage solid propellant rocket that has now placed 27 Navy navigation satellites in orbit. The Scout was designed and built by the Missiles Division of LTV Missiles and Electronics Group. The Scout program is managed by the Langley Research Center.

AN AWARD-WINNING AMERICAN IN PARIS. Michael C. Fischer (left), the NASA representative to the Advisory Group for Aerospace Research and Development (AGARD) in Paris, is congratulated by Joe Rodgers, U.S. Ambassador to France, for his prize-winning watercolors displayed in a recent art show held at the U.S. Embassy. Fischer, formerly from Langley's Aeronautics Directorate, frequently displayed his paintings in art shows in the Hampton Roads area before accepting his current position with AGARD. Fischer's three-year assignment in Paris will end in July 1989.

Happenings

LAA SOCIAL will be held Friday, July 8, from 4 to 6:30 p.m. in the Activities Center.

LAA BOARD. The Langley Activities Association Executive Board will meet Tuesday, July 12, at 7 a.m. in the Activities Center. Concerns to be brought before the board should be addressed to the appropriate committee member.

TIDEWATER DINNER THEATER tickets are available at the LAA office for $20 weekdays and $21 weekends.

LUNCH COUNTER, located in the bar area of the Activities Center, reopens for the summer June 27. Sandwiches, salads, chips and soft drinks will be available.

BIBLE FELLOWSHIP meets every Wednesday at 7 a.m. in the NASA Cafeteria for breakfast and a study of the book "Proverbs." The cafeteria opens at 6:15 Call Joe Zalameda, ext. 3036, for further information.

CARNIVAL. The LAA is looking for Carnival workers for August 19 and 20. Anyone interested in helping the LAA or displaying arts and crafts at the Carnival should call Pat Gates, ext. 2058.

TOASTMASTERS. The NASA Langley Toastmasters will meet Wednesday, July 13, in the Activities Center from 11:30 a.m. to 1 p.m. Improve skills in speaking, listening and "thinking on your feet." Visitors are welcome. Call Natalie Johnson, ext. 3483, for information.

MACINTOSH USERS. The first meeting of the NASA Langley Macintosh Users Group will be held Friday, July 15, at 1:30 p.m. in building 1230, room 270. For more information call Alan Dail, ext. 3036.

FOR SALE: Girl's 10-speed bike, photographic print washing drum, keyboard synthesizers, Commodore 64 software and 1541 disk drive, large 4-section wall unit with shelves and drawers, drum humidifier. Call 898-6517 evenings and weekends.

FOR SALE: FORD MUSTANG (classic), 1966, royal blue, clean interior, VGC, 6 cylinder, AT, AM/FM stereo cassette player, $2,800. Call 868-6745.

FOR SALE: DODGE TRUCK, 1984 RAM 50, 1/2 ton, 66,000 miles, new tires, EC, $2,500 neg. Call Babcock, 898- 4170.

July Programs at VC

Man on the Moon: From Apollo to Lunar Base

An estimated 600 million people around the world watched as man took his first steps on the moon during the highly successful Apollo program. Building on the legacy of Apollo, a lunar base—now in the planning stages— would support scientific research and exploration of the moon's mineral-rich resources.

On Thursday, July 7, at 7:30 p.m., NASA researcher John B. Hall will discuss the present plans for building a permanent outpost on the moon by the year 2006. Hall will present a proposed scenario which begins with an unmanned spacecraft that will orbit the moon and map the moon's surface searching for minerals and suitable landing sites. NASA astronuats will be landed on the moon in the year 2000 to establish a permanent base by the year 2006.

Hall explains, "the permanent base will include facilities to house up to 24 astronauts, conduct science and astronomy experiments, mine the lunar regolith to produce building materials, and produce liquid oxygen for crew use as well as to provide propellant for transporting materials and crew between the Earth and the lunar surface."

The film "Apollo 11: The Eagle Has Landed," presenting highlights of the first lunar landing, will be shown in the Visitor Center theater daily in July.

July 16-24 is both the nationally recognized Space Week and Virginia Aerospace Education Week. Check with the Visitor Center, 865-2855, for special programs and activities.

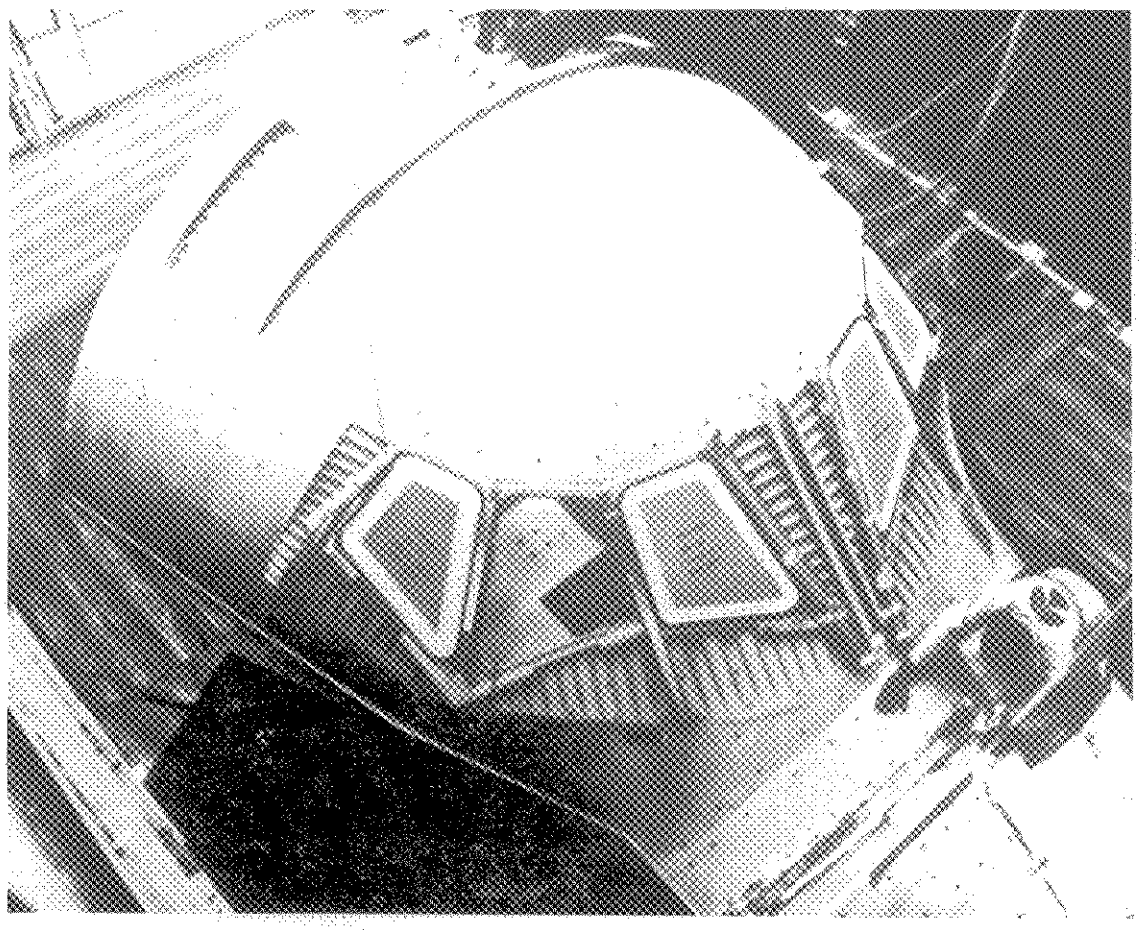
Laminar Flow Control for Transport Aircraft

Albert Braslow will discuss laminar flow control for transport aircraft on Wednesday, July 20, at noon in the Visitor Center theater. This presentation is part of the Spring Guest Lecture Series sponsored by the Visitor Center and the AIAA-Hampton Roads Section Student Branch.

Braslow, former project scientist, Laminar Flow Control Project Office, will give an overview on the development of laminar-flow control technology during its 50-year history. He will also discuss factors that have inhibited its use as well as recent advances that appreciably increase the possibility of successful applications to aircraft. "We are now closer to application to commercial aircraft than ever before," says Braslow.

Examples of slotted and perforated surfaces will be on display following the presentation.

Students Invited to Name the Orbiter



-photo courtesy of NASA Headquarters

Shown above is the crew compartment of the new Orbiter OV 105 at Rockwell International, Downey, California.

NASA, in cooperation with the Council of Chief State School Officers, is sponsoring a contest for America's school students to name NASA's replacement orbiter, scheduled to fly in early 1992. The name chosen should not only identify an American spacecraft but also should capture the spirit of America's mission in space. Teachers are invited to work with their students on the orbiter-naming project which is to be completed during the fall. Entries must be postmarked by December 31, 1988.

Researcher News

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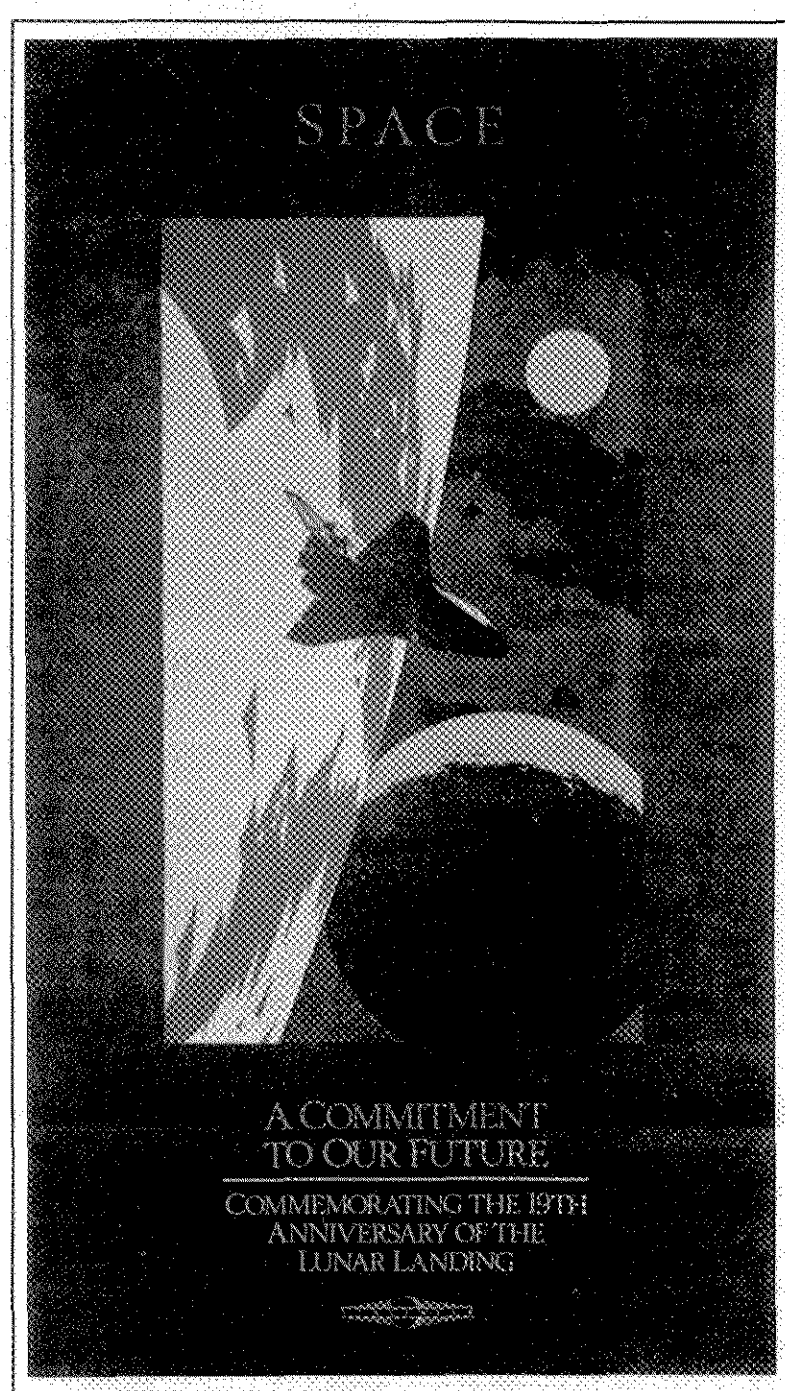
Langley Research Center
Volume 2, Issue 14 July 15, 1988

Researcher News

Bi-weekly Employee and Contractor Publication



SPACEWEEK '88 challenges Americans to take a long look at the American space program and make a commitment to support NASA's programs—from the Space Station to manned missions to Mars. Spaceweek is celebrated annually from July 16 through 24.

Spaceweek '88 Focuses on a National Commitment to Space

A major question for Americans in 1988 is: "Will we regain and maintain our leadership in space or will our country continue to be a second-class power in space?

"President Reagan's aggressive new space policy will fall upon the next administration for implementation," says Dennis Stone, president of Spaceweek. "Space supporters must act during this election year to ensure that it doesn't fall on deaf ears."

Spaceweek, observed July 16-24, is an annual national celebration of mankind's exploration of the "next frontier." The theme for Spaceweek '88 is "Space: A Commitment to Our Future."

"That theme was selected in part because of the need for Americans, during this presidential election year, to take a long look at the American space program and make a commitment to support NASA's programs—from the Space Station to manned missions to Mars," says Stone.

Headquartered in Houston, Spaceweek was created in 1980 by a handful of volunteers, and events were held in two cities. The staff has since grown to more than 100 volunteers who disseminate information to a network of more than 70 cities from coast to coast which participate in the celebration.

Spaceweek honors major landmark events in the history of U.S. space exploration, such as the anniversary of the first footsteps on the Moon by U.S. astronauts, the anniversary of Viking I's touchdown on Mars and the anniversary of the first East-West handshake in space between U.S. and Soviet crews.

NASA Managers Receive Presidential Meritorious Awards

Two NASA Langley Research Center managers have been presented Presidential Rank of Meritorious Service awards for superior service to the federal government during 1987.

Charles P. Blankenship, director for Structures, and Percy J. Bobbitt, chief of the Transonic Aerodynamics Division, were presented the awards by Dale D. Myers, NASA deputy administrator, during a special ceremony at Goddard Space Flight Center, Greenbelt, Maryland.

Charles P. Blankenship

Percy J. Bobbitt

Awards were presented to managers of the Senior Executive Service "for sustained superior accomplishment in management of programs of the U.S. Government and for noteworthy achievement of quality and efficiency in the public service."

As director for Structures, Blankenship manages all work in materials, structural mechanics, structural dynamics and acoustics. He began his NASA career in 1961 at the Lewis Research Center in Cleveland, Ohio, as a U.S. Air Force officer assigned to Lewis. After completing his service in 1964, he became a materials engineer at Lewis, conducting fabrication development projects for nuclear propulsion system components. He later served as a section and branch head, managing material technology programs for various power and propulsion systems.

Blankenship transferred to the Langley Research Center in July 1980 as chief of the Materials Division, directing research on advanced structural materials such as metals, polymers and composites; structural characteristics of materials; damage tolerance and integrity of aerospace vehicle structures; and application of advanced materials to aircraft and space vehicles. He was appointed to his present position in July 1983.

A native of Bluefield, West Virginia, Blankenship received bachelor and master of science degrees in metallurgical engineering from Virginia Polytechnic Institute and State University in 1960 and 1962, respectively.

He and his wife, Gayle, live in Poquoson. They have two sons.

Bobbitt has been on the Langley staff since January 1950. In his present position since 1977, he is responsible for the division that conducts aeronautical research in fundamental fluid flows and configuration aerodynamics, including stability and control, propulsion system integration and related aerodynamic phenomena.

His division includes some of the country's most unique wind tunnel facilities and provides support and consultation for the nation's aircraft industry and military services. Theoretical, analytical and experimental research conducted in the division is aimed at closely simulating actual flight.

Previously, Bobbitt served as the head of several branches within the division at Langley, concentrating on the development of theoretical methods for the prediction of the aerodynamic characterization of complete aerospacecraft, from low-speed to those appropriate for entry into the earth's atmosphere.

In addition to the Presidential Rank Award, Bobbitt has also received a NASA Exceptional Service Medal and a NASA Exceptional Engineering Achievement Medal for his contributions.

A native of Petersburg, Virginia, Bobbitt received a bachelor of science degree in aeronautical engineering from Catholic University in 1949.

He and his wife, Jeanne, live in Newport News. They have two children.

Update: September Shuttle Launch Planned

Rear Admiral Richard H. Truly, NASA Associate Administrator for Space Flight, has updated the target for the upcoming Shuttle launch to early September and indicated that he is very pleased with the progress of preparations for STS-26. The new launch target was selected following a major review covering all aspects of the Shuttle program and Truly's subsequent report to NASA Administrator Dr. James C. Fletcher.

Discovery was rolled out to the Kennedy Space Center Launch Pad 39B on July 4, a most unique and joyous Independence Day parade. KSC Director Forrest S. McCartney spoke to about 2,000 employees who cheered as the Shuttle was moved out of an assembly hangar to start the 4.2-mile trip to the pad. "It's been a long two-and-a-half years...It's been a team effort....This is a proud day," McCartney presented astronaut David Hilmers, STS-26 mission specialist, with a book containing signatures of more than 15,000 center personnel who have labored to return the Shuttle to flight.

A flight readiness firing (FRF) of Discovery's main engines and liquid propulsion system is targeted for July 24. The final full-scale, full-duration test firing of the redesigned Shuttle solid rocket motor (SRM) prior to STS-26 will be production verification motor (PVM-1), also planned for late July.

In summary, Truly said, "Hard work by a lot of people is paying off and the Shuttle program is coming along nicely."

News Briefs

HEADQUARTERS, Washington, D.C. – NASA astronaut Dr. Anthony England will leave NASA in October 1988 to accept a position with the University of Michigan as professor of electrical engineering. He will head the university's space remote sensing research for the electrical engineering and computer sciences department at Ann Arbor. England was selected as an astronaut in August 1967, serving as support crewman for Apollo missions 13 and 16, and a mission specialist for STS-51F (Spacelab-2).

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — A five-and-a- half-day ground system test of NASA's Hubble Space Telescope (HST) was conducted at GSFC. The fourth in a series of ground system tests, this test simulated almost a week of space flight operations and involved direct communication with the HST located in a clean room at the Lockheed Space and Missile Company, Sunnyvale, Calif. The HST is scheduled to be carried into space on board Discovery in June 1989.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — NASA has announced that it will negotiate a contract with the Hercules Aerospace Co., Magna, Utah, to improve the nozzles of solid-fueled rocket motors. The work is part of the agency's Solid Propulsion Integrity Program. The value of the contract is expected to be approximately $12.5 million.

HEADQUARTERS, Washington, D.C. — NASA Administrator Dr. James C. Fletcher has accepted the NASA Advisory Council's report detailing strategic plans for the Life Sciences Program, a critical component of manned space missions. Chaired by Nobel Laureate Frederick C. Robbins, M.D., the study committee produced a report entitled "Exploring the Living Universe: Strategic Plan for NASA Life Science," which focuses on the health and safety of human space crews.

JET PROPULSION LABORATORY, Pasedena, Calif. — NASA's Seasat satellite, launched ten years ago, ushered in a new era of space research focusing on unsolved questions of the world's oceans and weather. Seasat carried a payload of five scientific instruments unlike any package on previous remote-sensing satellites. Seasat tested a payload of advanced sensing instruments and, during its three-and-a-half-month mission, collected oceanographic information comparable to a century's worth of observations from a fleet of ships.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — Morton Thiokol, NASA's prime contractor for the Space Shuttle solid rocket motor, conducted the seventh Joint Environment Simulator (JES) test at it Space Operations facility in Utah. JES tests are short-duration, ignition pressure tests using full-scale motor hardware to form two field joints. The tests are used to evaluate the redesigned joints.

Editor's note: Recent surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017. Request information by release number and headline. See Current News Release information box below.

LIGHTS...CAMERA...ACTION! Teacher-in-Space finalist Judy Garcia (third from left) produced a career video during her two year apprenticeship at Langley. Shown are the "stars" of the video production (L to R) Carter Ficklin, Kendra Gaither, Garcia, Thien Khuu, Shelley Canright, and Marissa Marriott. The students are from Davis Middle School in Hampton. Canright, public information specialist from Langley's Office of Public Services, portrays the teacher. The video, which focuses on Langley and the broad application of its research findings, will be used as a training tool nationally and internationally.

Langley

Headquarters Forum

Aircraft flight research began at Langley in 1919 with performance tests of a JN4H, "Jenny," to compare data with early wind tunnel tests. Today, as in 1919, flight research is essential to our mission in aeronautics to study the problems of flight with a view toward practical solutions.

One such problem of modern day flight has to do with the design of flighter aircraft. Advanced fighters need to go very fast and, therefore, need highly swept-back wings. On the other hand, fighters also need efficient high lift for combat maneuvers and for short field takeoffs and landings which are best attained with unswept wings. The designer's dilemna, then, has been to find the best compromise between the conflicting requirements for high speed and for high maneuverability. This problem has been extensively studied by Langley researchers, both computationally and experimentally, and a potential solution to the designer's dilemna, called a vortex flap, will soon be flight tested on the Langley F-106B aircraft.

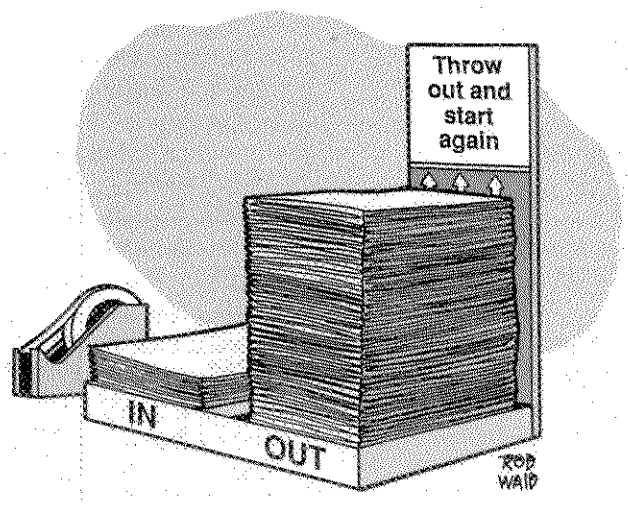
The basic idea is relatively simple: a swept wing at angle of attack produces a vortex which emanates from the leading edge and trails back over the wing upper surface. This leading-edge vortex contributes to the lift of the wing but also produces a relatively large drag component. The vortex flap is a specially designed leading-edge device which, when deflected, intensifies and traps the vortex on the surface of the flap in a way that produces a thrust force which helps to overcome the vortex drag while retaining its contribution to lift. Wind tunnel tests of a vortex flap on a model of the F-106B aircraft indicate a 30-percent improvement in lift-to-drag ratio and a 15- percent increase in maximum lift.

The vortex flap is an excellent example of the kind of Langley research that can be carried all the way from idea, to calculations, to sub-scale tests, to flight validation, and provide "real world" feedback to the researchers. This project is being carried out as a totally in-house activity. Wind tunnel tests and simulator studies have involved researchers in several Divisions from three Langley Directorates. Mechanical design of the flaps was carried out by Langley engineering support people. The flaps were fabricated in Langley shops and installed on the aircraft by our own technicians. Instrumentation has been designed and is being installed on the aircraft by Langley instrumentation specialists. Taxi tests will begin in late July and the first flight will take place about a month later.

A new idea, an old aircraft, and a lot of Langley ingenuity are coming together to lead the way for future fighter aircraft to achieve improved performance in both speed and maneuverability. Watch the skies above Langley in the months ahead. You may just get a glimpse of the future.

Roy V. Harris, Jr.
Director for Aeronautics

Lankley



Current News Releases

To receive a copy of these NASA News Releases, contact Edith Watts, Mail Stop 146, ext. 3017.

88-80.....Astronaut England to Leave NASA
88-81.....NASA Begins Ground Systems Tests of HST
88-82.....Solid Propulsion Integrity Program Contractor Selected
88-83.....NASA Administrator to Receive Life Sciences Program Plans
88-84.....NASA Satellite Technology Aids Future Space Research Missions
88-85.....NASA Updates Plans for Shuttle Launch
88-86.....Final Shuttle Motor Joint Test Scheduled at Morton Thiokol

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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

Speakers Bureau

Members of the Langley Speakers Bureau present the NASA story to groups and organizations throughout the community and the five-state region Langley serves. Presentations made in June include:

Lester Rose presented Spinoffs from Aerospace Technology to the Society of Allied Weight Engineers, Hampton Roads Chapter, on June 2, and to the Newport News and the Oyster Point Rotary Clubs on June 10.

Bob Pegg spoke to the Hampton-Chesapeake Lions Club on the National Aerospace Plane on June 2.

Bruce Fisher gave a presentation on Storm Hazards Lightning Research to the Virginia Beach Chapter of the 99's on June 7.

Lenwood Clark spoke on the Space Station at the AIAA Lecture Series on June 8 and to the Peninsula Retired Mens Club on June 29.

Donald and **Bob Baals** presented Wind Tunnels of NASA at the Virginia Aviation Museum on June 16.

Charles Cockrell spoke on Computers as a Design Tool to Applied Dynamics International on June 20.

Delma Freeman gave a presentation on the Space Shuttle to the Poquoson Kiwanis Club on June 21.

Paul Stough spoke at Hampton University on Airplane Spinning on June 28.

Many thanks to these NASA spokespersons who give freely of their time and talent.

Want to Buy a Carnival Ticket?

For your convenience, the following facility coordinators have volunteered to distribute LAA Carnival tickets in their immediate area:

BLDG	FACILITY COORDINATOR
1149	Ginny Anderson
1192	Joe Haggerty
1195C	Steve Devan
1202	Gin Marks
1205	John Crosby
1208	Erby Harris
1220	R. Ingram & E. Hicks
1225	Murray Wilson
1229	Jackie Smith
1237A	John Hunt
1237B	Larry Farrow
1251	William C. Phaup
1293	R. M. "Bob" Ely
1297, 1297 A&B	Jim Richardson

Please support your annual LAA Carnival, August 19 and 20. For additional Carnival information, call the LAA Office, ext. 3139.

Note of Thanks

The family of **Searcy Smith, Jr.** wishes to thank all those who expressed sympathy and kind thoughts during our time of loss.

Positions Open

The following Competitive Placement Positions are currently open:

88-45: Supervisory Electronics Engineer, AST, Electronic Instrumentation Systems, GM-0855-13 or 14, Instrument Research Division, Electro-Mechanical Instrumentation Branch, Dynamic Systems Instrumentatiion Section. Closes July 29.

88-46: Aerospace Engineer, AST, Aerospace Flight Systems, GS-861-9, Systems Engineering Division, Systems Development Branch, Mechanical Systems Section. Closes July 22.

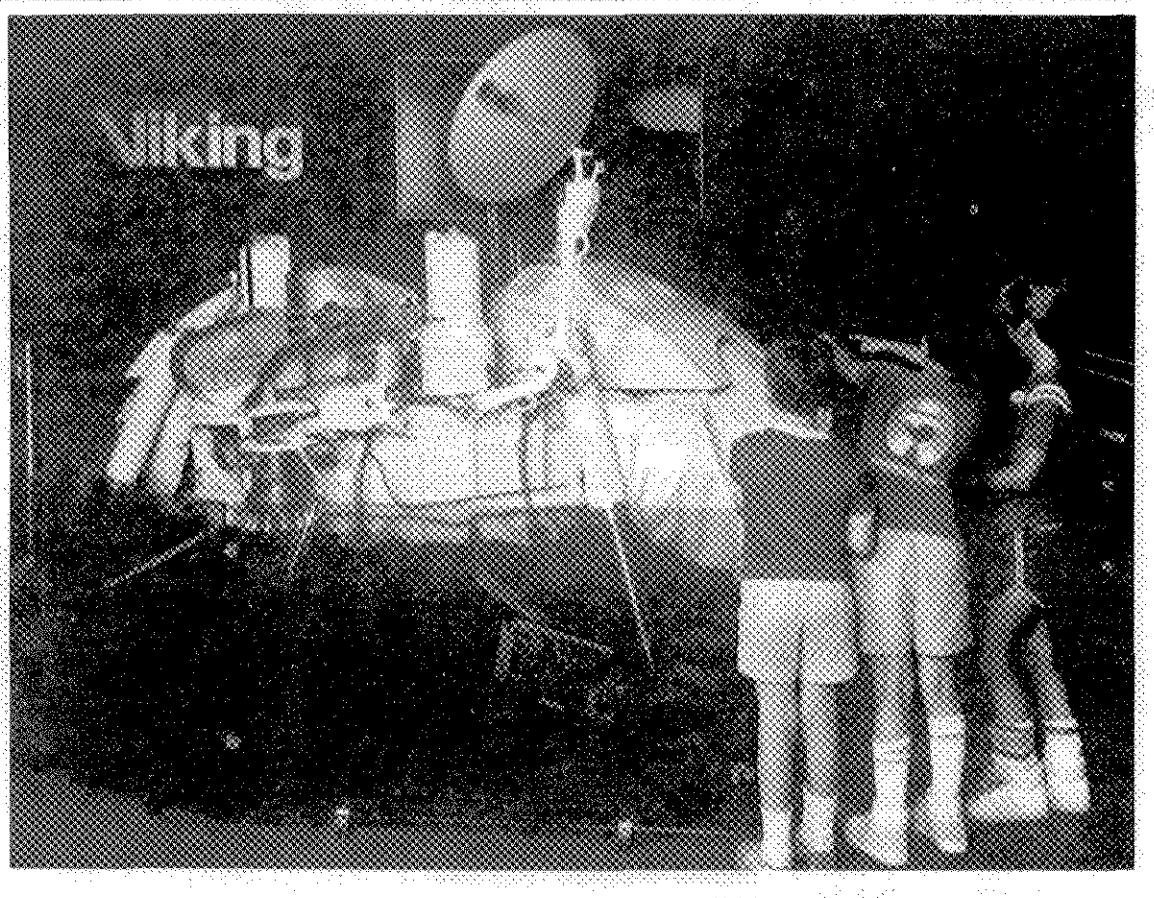
Take Note:

WHRO-TV, Channel 15, will present *Top Gun and Beyond*, a look at high-speed fighter planes and how technology has changed the nature of flying, on Tuesday, July 26, at 8 p.m.

Chamber Days at Kings Dominion

Kings Dominion has announced Virginia Peninsula Chamber Days July 15—18 and 23—25.

Discount coupons for $5 off the regular general admission are available at the Activities Center, Building 1222, ext. 3139. With the special chamber coupons, Langley employees, their family and friends can enjoy the rides, shows and attractions at Kings Dominion for $11.95 during these specified days in July.



From Behind the Scenes

Visitor Center Visualizes NASA Research

Three young visitors are intrigued by the Viking Mars Lander, one of two spacecraft that explored the surface of the "red" planet. This is but one of the more than 50 exhibits on display at the Visitor Center, located in Building 1202.

Also on exhibit are the Apollo 12 Command Module, a scale model of the Space Shuttle, a moon rock, a vertical spin tunnel, a display of the cockpit of the future . . . the aeronautics and space galleries offer a visual representation of the efforts and accomplishments of the Center and the Agency.

Special programs and theater presentations make the Visitor Center an excellent addition to your summer plans. Bring the family, neighbors, out-of-town guests and let the Visitor Center staff help you tell the NASA story.

The Visitor Center is managed by JL Associates, Inc., of Hampton.

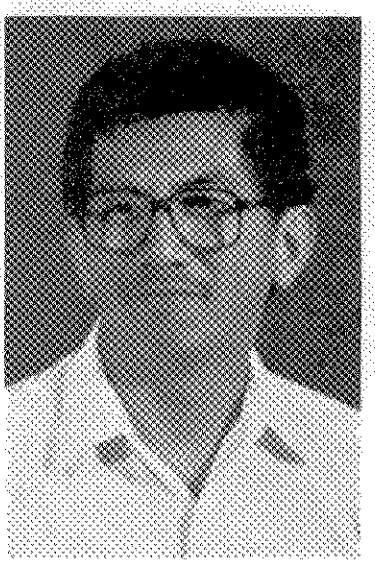
Visitor Center Celebrates Spaceweek, Aerospace Education Week

July 16-24 is both the nationally recognized Spaceweek and the Virginia Aerospace Education Week. Both will be commemorated with a special lecture on Thursday, July 21, at noon in the Visitor Center theater. NASA researchers Long Yip and David Robelen will speak on the use of radio-controlled models to study stall and spin flight characteristics.

As part of a broad research program at the NASA Langley Research Center on stall/spin flight safety, powered model flight tests have been conducted on dynamically scaled radio-controlled models to determine the stall departure and spin resistance characteristics in flight.

Yip and Robelen use these models to augment wind tunnel tests. Radio- controlled models are instrumented to provide quantitative flight data for comparison with wind tunnel data.

On display will be modified models of a Beech Sundowner, a Piper Arrow, and a Cessna 210.



Long Yip

David Robelen

Retirement Party

Freda Bloch Anderson will be honored at a retirement social Wednesday, August 10, at the Activities Center. Contact Pat Holland, Mail Stop 356, ext. 2303, for further information.

Acquisition Division Party

The Acquisition Division will hold a party August 26, at 4:30 p.m., on the grounds of the Activities Center. Current employees, retirees, procurement "alumni" including those working in other areas on Center, in other jobs, even those working out of state are invited. Please mark this date on your calendar and start contacting other alumni. For more details, call Jim Taylor, (804) 249- 2246 after 5 p.m. weekdays.

Happenings

LAA SOCIAL will be held Friday, July 22, from 4 to 6:30 p.m. in the Activities Center.

ALUMNI ASSOCIATION Board of Directors will meet Thursday, July 28, at 10 a.m. in the Activities Center.

BLOODMOBILE. The American Red Cross will sponsor a Bloodmobile on Wednesday, July 27, from 9 a.m. to 3 p.m. at the Activities Center.

TOASTMASTERS. NASA Langley Toastmasters will meet Wednesday, July 27, 11:30 a.m.—1 p.m., in the Hampton Room of the Activities Center, Building 1222. Visitors are welcome. Call Natalie Johnson, ext. 3483, for further information.

LUNCH COUNTER, located in the bar area of the Activities Center, is open for the summer. Sandwiches, salads, chips and soft drinks are available from 11 a.m. to 12:30 p.m. daily.

APICULTURE CLUB will meet Monday, July 18, at 6 p.m. in the executive dining room of the cafeteria, Building 1213. All interested in beekeeping are welcome and encouraged to attend. For more information, call Wilson, ext. 4615.

USAF TACTICAL AIR COMMAND BAND will present free concerts at 7 p.m. at Mill Point Park on Tuesdays beginning July 26 and at 6 p.m. at the Williamsburg Lodge on Wednesdays beginning July 27.

swap and shop

YORKTOWN ARTS FOUNDATION seeks the donation of an IBM- compatible pc, computer monitor/display and printer. Contribution is tax deductible. Contact Gary, ext. 2733, or Carol Beasley, 898-3076, for details.

WANTED: Male to share spacious townhouse in York Country near Washington Square. $250/mo. plus 1/2 utilities. Washer/dryer, CA, FP in country kitchen. Immed. occupacy. Call 890-0520.

FOR RENT: TOWNHOUSE in Denbrook Station. 3 BR, 2 1/2 B, all appliances. $450/mo. Utilities not included. 20 min. to LaRC. Contact Mary Lewis at 565-1380 after 7 p.m.

FOR SALE: AUTO. 4-door Chevette. Runs good, needs new brake system and a few minor repairs. $100 or best offer. Call 851-7836.

The Senior Management Research Review will be held Monday, July 25, at 10 a.m. in Building 1219, Room 225. Following the Director's comments and program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
10:30	Quantitative Flow Determination in Chemical Vapor Deposition Reactors	Ivan Clark (Flight Systems/ISD)
10:45	Development and Application of UV Absorption to Measure OH and Temperature in Scramjets	Burton Northan (Aeronautics/HSAD)
11:00	Shuttle Infrared Leeside Temperature Sensing (SILTS) Experiment STS 61-C Flight Results	David Throckmorton (Space/SSD)
11:15	Development of Articular Dynamic Analysis of Spacecraft Systems (ADASS) Capability	Brent Robertson (Space/Analytical Mechanics Assoc., Inc.)
11:30	Computational Atmospheric Wave Propagation	Willie Watson (Structures/ACOD)
11:45	General Failure Theory for Compression-Loaded Laminates Validated by Experiments	Mark Shuart (Structures/SDD)

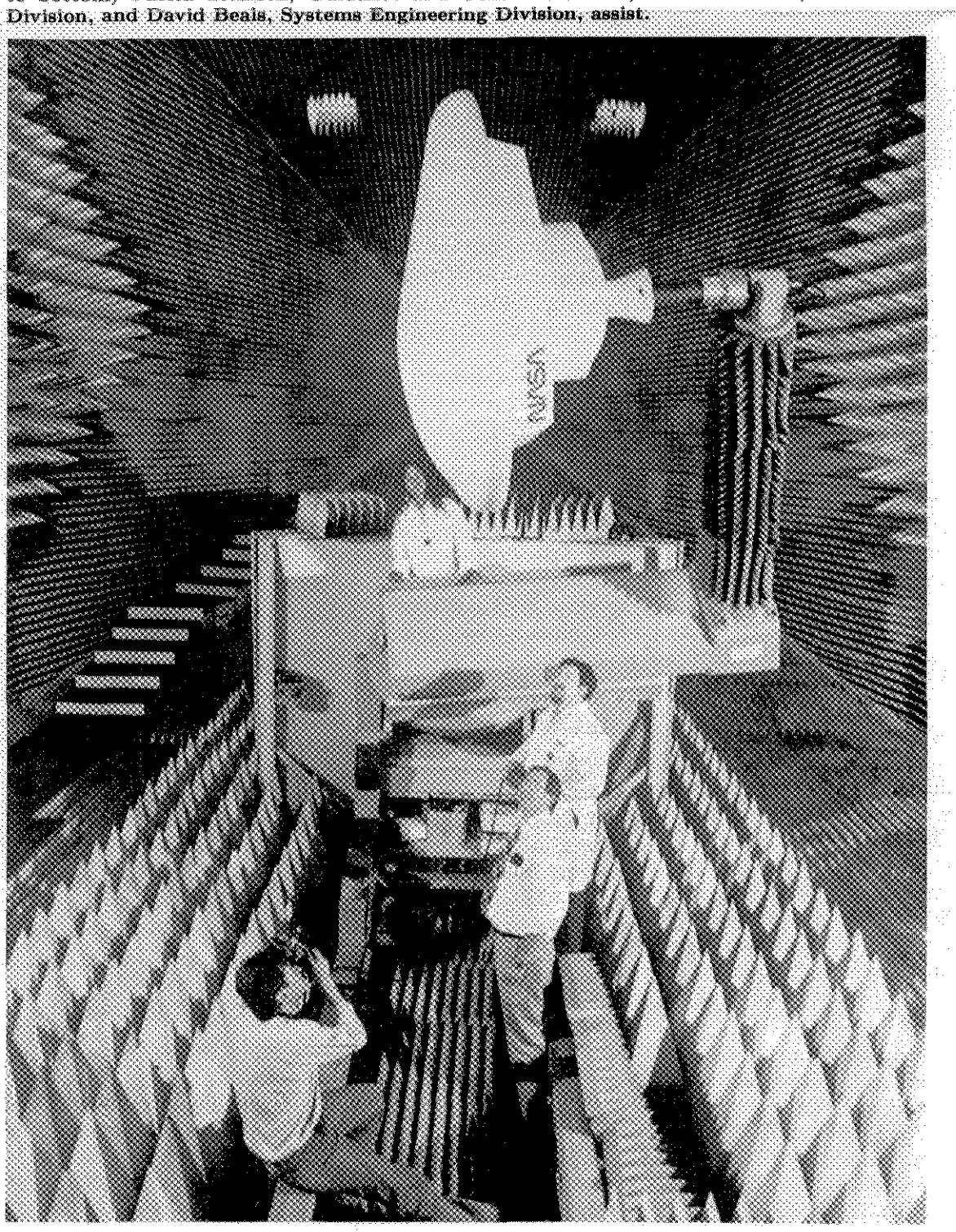
Photographers at Work: A Picture of a Picture

Langley photographer Fred Jones captured the pose shown below of Starlight's Roger Ressmeyer (foreground) taking photographs of the Aeroassist Flight Experiment (AFE) model in the anechoic chamber. Ressmeyer photographed a number of Langley facilities for possible inclusion in **National Geographic** magazine's November story on America's future in space.

The 40-percent scale model is undergoing antennae diagnostic tests for the AFE program. These antennae tests are being conducted for the Aft Flow Ionization Experiment, using radiated signals from the antennae to determine when "blackout" occurs.

The amount and duration of the radio "blackout" period will allow research scientists to better understand the flight environment as a payload is transferred from high- to low-earth orbit and to determine the level of ionization in the atmosphere surrounding the vehicle. This information will be valuable in determining the heating rates of a vehicle as it enters and exits the atmosphere and the survivability of larger vehicles.

Below: Photographer Roger Ressmeyer, working on a story for *National Geographic* magazine, captures the Aeroassist Flight Experiment (AFE) in Langley's anechoic chamber as (top to bottom) Pacita Tiemsen, Guidance and Control Division, David Giltinan, Fabrication Division, and David Beals, Systems Engineering Division, assist.



Spaceweek '88: A Commitment to Our Future...July 16-24

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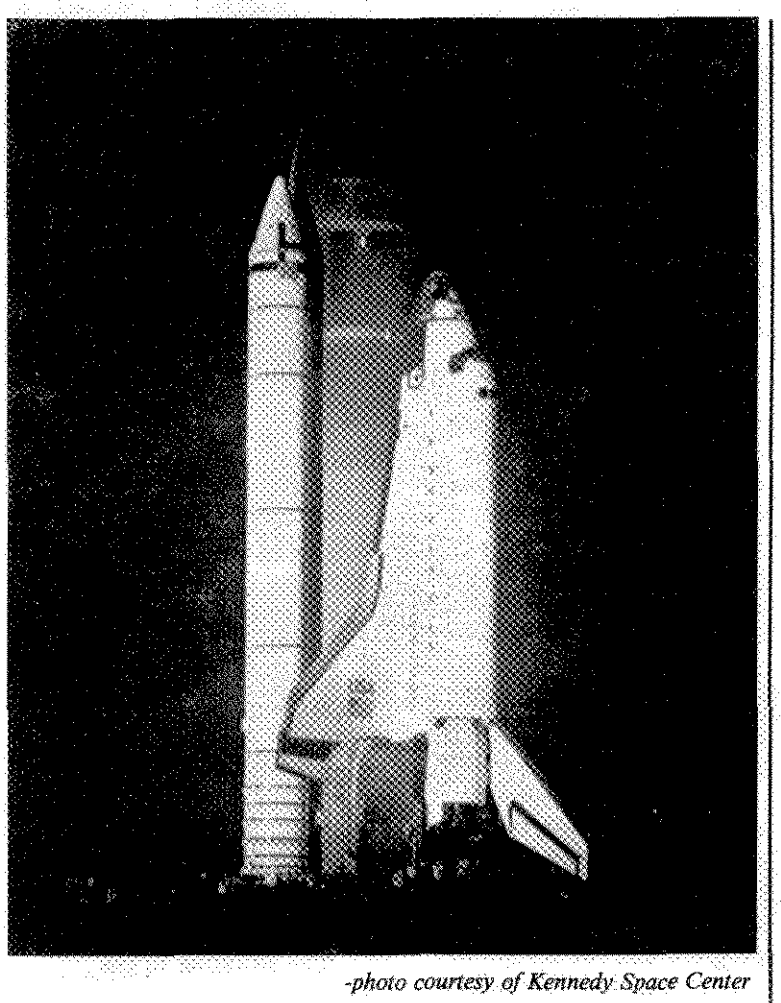
Researcher News

Volume 2, Issue 15 July 29, 1988

Bi-weekly Employee and Contractor Publication



-photo courtesy of Kennedy Space Center

DISCOVERY STANDS AT LAUNCH PAD 39B AT KENNEDY SPACE CENTER. As of press time, the Flight Readiness Firing (FRF) of the Space Shuttle Discovery's main engines had been rescheduled for July 28, despite the presence of a small oxidizer leak in an Orbital Maneuvering System pod. Cape engineers say the problem is a seal on a vent line just above the nitrogen tetroxide tank. The leak has been stabilized by draining and purging the line.

NASA Aero/Space Programs Featured at EAA Convention

NASA returns to Oshkosh, Wis., today through Aug. 5, for the 36th Annual Experimental Aircraft Association (EAA) International Aviation Exhibition with a new exhibit entitled "The Leading Edge in Aeronautics and Space Technology."

Other NASA highlights include an appearance by astronaut Marsha S. Ivins and an expanded NASA craftsmanship exhibit.

More than 24 NASA speakers will participate in convention technical forums, with topics ranging from advanced cockpit displays to Space Station and its electrical power system.

Astronaut Ivins, an EAA member, will make a special audio-visual presentation Saturday evening, July 30, in the EAA Theater in the Woods.

In front of the NASA exhibit building will be an unusual exhibit—an Air Force truck powered by a new type of engine. A joint technology development project between NASA and the Department of Energy has resulted in a promising technological advance.

Inside the exhibit building, visitors will review exhibits on improving materials, ever-increasing power, advancing aerodynamics and controls, vertical and short-takeoff and landing aircraft, hypersonic flight, safety in flight and space exploration and utilization.

Back by popular demand is an expanded NASA craftsmanship exhibit, operated by technicians from the Langley and Lewis research centers. The exhibit highlights fabricated crafts with displays of selected metal and composite structures, aeronautical models, test equipment and data measurement hardware.

Three NASA aeronautics field centers supporting the NASA exhibit this year are Lewis Research Center, Cleveland, Ohio; Langley Research Center, Hampton, Va., and Ames Research Center, Mountain View, Calif., which includes Dryden Flight Research Facility at Edwards Air Force Base, Calif. The Marshall Space Flight Center, Huntsville, Ala., and the Johnson Space Center, Houston, are providing exhibit materials.

Headquarters Selects Langley Managers for Professional Development Program

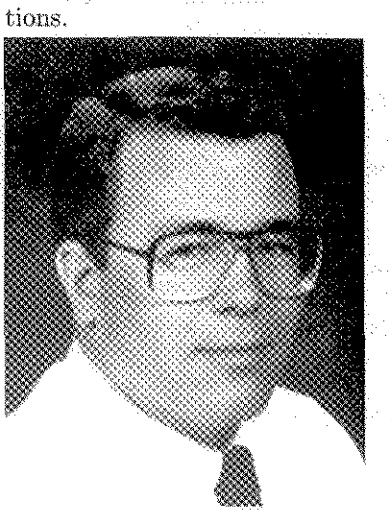
Four Langley Research Center managers have been selected to participate in NASA's Professional Development Program (PDP) for the next 12 months.

James R. Burley II, aerospace engineer AST, Crew/Vehicle Interface Research Branch, Flight Management Division, will be assigned to the Aircraft Guidance and Navigation Branch at Ames Research Center, Mountain View, California.

Raymond S. Calloway, electronics engineer AST, Flight Instrumentation Branch, Flight Electronics Division, will be working in the Information Sciences and Human Factors Division in the Headquarters Office of Aeronautics and Space Technology.

Mary L. Sandy, head, Office of Public Services will be assigned to the Office of the Associate Administrator for Communications at NASA Headquarters.

Jesse D. Timmons, head, Systems Development Branch, Systems Engineering Division, will be working in the Headquarters Office of Space Science and Applications.



While at Ames, Burley will be involved in the development of display formats for a new helmet-mounted display device currently under procurement at Langley. Piloted simulation studies will be carried out in the Vertical Motion Simulator at Ames to evaluate the utility of various display concepts.

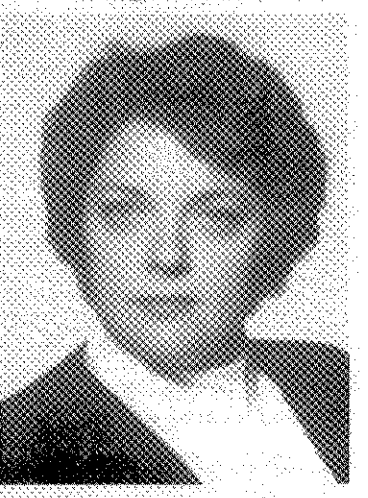
Collaterally, Burley will be assigned to the Human Factors Research Division investigating Subjective Workload Assessment Testing (SWAT) techniques which will be used during the piloted simulation tests.

"The Professional Development Program will allow me to enhance my technical knowledge of display design and human factors by working with state- of-the-art technology and experts in these fields. The knowledge gained and personal contacts established will enhance the flow of information and coordination between NASA centers."

Calloway will work with Lee B. Holcomb and Ray V. Hood, directors of the Information Sciences and Human Factors Division at Headquarters. He will be responsible for the aeronautical sensors program, the transport element of the aeronautical controls and guidance program and elements of fault-tolerant system program. He will also develop a management information system for use in tracking focused technology programs.

"My career goal is to increase my experience in the areas of project and program management. My role as project manager for the 720 Crash Response Data System inspired me to learn more about the techniques of motivating and managing people. In my pursuit of a degree in engineering administration, I am learning theories of management and I plan to pursue a more active leadership position at NASA. Learning agency functions and operations including resources and funding procedures will enhance my career opportunities in line and program management."

At NASA Headquarters, Mary Sandy will report to Bill Sheehan, associate administrator for Communications for most of the year. Initially, she will be assigned to the NASA News Room doing media relations work and evaluating the effectiveness of approaches taken with the media in achieving a full and balanced coverage of NASA. She will assist the public affairs officer for Space Flight with media relations for the STS-26 and 27 missions.



Sandy will also work with the co-located public affairs officer for the Office of Aeronautics and Space Technology, where she will plan and develop relevant public affairs programs.

Additionally, Sandy will be assigned to the Office of Congressional Affairs beginning in January 1989 as the new administration takes over and the new Congress is in session. "This will provide a wonderful opportunity to better understand the legislative process, NASA's relationships with Congress and how things really happen "On the Hill,'" Sandy explains.

Timmons has been assigned to Dr. Shelby Tilford, director for the Office of Earth Science and Applications, at NASA Headquarters. He will be working on the Earth Observation System (EOS) polar platform, integrating instruments to the platform.

"I have been involved in numerous projects over the years and have been directly exposed to how they are formulated, managed, funded and implemented from the center's viewpoint. I look forward to exposure to the constraints, rationale and procedures utilized by Headquarters to formulate decisions to select and support projects. This experience will be valuable to me, to LaRC, and to the agency in assessing ongoing and future projects."

News Briefs

HEADQUARTERS, Washington, D.C. — An ad hoc committee, assembled to review safety risk management in the national Space Transportation System program, has completed its report, finding that there has been "a positive change in attitudes" by NASA and its contractors toward safety. "Roles and responsibilities have been clarified, safety risk assessments have improved and the commitment to safety over schedule is freely articulated," the report states.

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — The most comprehensive ground test ever conducted with NASA's Hubble Space Telescope (HST) has been called a success by NASA despite the challenge of an unplanned anomaly which provided an unexpected bonus. The "full-up test" was designed to simulate almost a week of space flight operations. The problem, thought to be a timing incompatibility between the science instruments and their computer, was circumvented and proved the established team able to resolve problems involving an extremely complex and sopisticated spacecraft.

HEADQUARTERS, Washington, D.C. — NASA has announced that 15,000 schools across the nation have responded to an invitation to participate in the national competition to name the new Space Shuttle orbiter. Orbiter-naming projects must be completed during the fall semester and entries must be postmarked by December 31, 1988.

KENNEDY SPACE CENTER, Florida — After 143 Florida launches of the Delta expendable launch vehicle, NASA has officially transferred custody of Launch Complex 17 and East Coast Delta launch operations to the U.S. Air Force. Formal handover of the two-pad complex, located at Cape Canaveral Air Force Station, Fla., was effective July 1.

HEADQUARTERS, Washington, D.C. — The Student Space Station, a 42- by 12-foot, cylindrical, fiberglass tank, was unveiled at the Davis Planetarium, Jackson, Miss. Thirty-one Mississippi sixth and seventh graders participated in an intensive 14-day workshop culminating in a simulated space flight mission. For 96 hours, eight students and their teacher simulated being astronauts in the station with the remaining 23 students manning the mission control center. Dr. Robert Brown, director of Educational Programs at NASA Headquarters, believes "students and educators of the Student Space Station are sending the nation a clear message that space development is critical to the lifeline of our future. They want to be a part of it. They are working to prepare for it."

AMES RESEARCH CENTER, Mountain View, Calif. — As NASA's Pioneer 11 and Voyager 2 pass through the outer reaches of the solar system and NASA's Pioneer 10 speeds far beyond the planets, these distant spacecraft are measuring drastic changes in the flow patterns of the solar wind – a million-mile-an-hour stream of charged particles which constantly boils off the Sun. NASA scientists have discovered a connection between the speed changes in the solar wind (near the spacecraft) and periodic changes in the Sun itself.

HEADQUARTERS, Washington, D.C. — The appointment of Edward A. Frankle as general counsel of NASA has been announced by Dr. James C. Fletcher, agency administrator. Frankle has been deputy general counsel since Oct. 27, 1985. He succeeds John E. O'Brien, who retired from NASA on July 2 to enter private practice.

STENNIS SPACE CENTER, Mississippi — NASA will hold dedication ceremonies August 3 at noon EDT for the newly-renamed John C. Stennis Space Center in Hancock County, Miss. The occasion will also mark the Senator's 87th birthday. Formerly the National Space Technology Laboratories, the center was named for Mississippi's retiring senator by an executive order signed May 20 by President Reagan.

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — NASA's Space Shuttle Emergency Mission Control Center (EMCC), formerly located at Goddard, has been moved to NASA's Tracking and Data Relay Satellite Ground Terminal in White Sands, N.M. In the event of an emergency evacuation of Mission Control at Johnson Space Center, a 14-member flight control team would fly to White Sands. There they would maintain communications with the Shuttle, calculate data necessary for immediate return of the crew and relay that data to the Shuttle commander. The Goddard Network Director Gary Morse will communicate with the Shuttle commander through Goddard's ground network or the Tracking and Data Relay Satellite System (TDRSS) while the mission control team flies to New Mexico.

Editor's note: Recent surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017.

Lankley

LANKLEY CELEBRATES HIS FIRST ANNIVERSARY AS NASA'S BEST-LOVED CARTOON ENGINEER.

Laughter is the Best Medicine

Meet LANKLEY's creator, Rod Waid, and Waid's other comic creations, the Sky School Baron and his sidekicks, in the feature article on page 5.

Position Open

The following Competitive Placement Position is currently open:

88-53: Quality Assurance Specialist, GS-1910-9 or 10, Fabrication Division, Quality Assurance and Inspection Office. Closes August 4.

Langley

Headquarters Forum

A recent **Daily Press** editorial put it well: "Do Americans want a 'world class' civil space program and, if so, are they willing to pay for it?"

You and I hope the answer is, "Yes."

NASA is at a critical crossroads. When we got together in March for my fourth State of the Center address, I called 1988 a "year of decision." I pointed out that important budget and political events of the coming months would have a profound effect on the direction of the agency's program for years to come. Langley will also feel the effects. To maintain our own robust program we must be able to draw on—and contribute to—a strong program at the agency level.

Since I shared my concerns with you, NASA Administrator Jim Fletcher has begun to publicly make the case for a strong NASA program and the budget to back it up. Speaking before a group in Washington, D.C., he said, "While I remain optimistic about the launch of the Space Shuttle, I believe Americans must know that the long-term future of the space program hangs in the balance this year. The program's future rides on the outcome of current budget deliberations in Congress. And the outlook is grim."

There is still a good fight ahead. It's not too late to let our feelings be known—as private citizens—to Congressional decision makers and political candidates at this crossroads in our nation's space program.

The President's budget request for FY 89 is $11.5 billion, a $2.5 billion increase over current funding—yet barely adequate to ensure that the space program recovers and begins to move out on the road to leadership in the decades ahead. This is the President's first budget request since reviewing recommended space goals and adopting a National Space Policy early this year. The proposed increase of $2.5 billion—despite the very severe budget restrictions in FY 89—reflects the realization of the Administration that we cannot have a "world class" program without significant increases in funding.

But, as of mid-July, we are not doing well in Congress. The House has passed the NASA appropriation bill at a level of $10.7 billion. They cut Space Station from a proposed $967 million to $900 million and cut other critical programs by about $700 million. Of particular importance to Langley were reductions in the CSTI and Pathfinder programs totalling about $100 million. These cuts almost eliminate the proposed increases in space research and technology which are so important to the future capabilities of the U.S. in space.

The situation in the Senate is worse. They have passed an appropriation of $10.1 billion for NASA. The details are similar to the House bill, but Space Station is reduced to $200 million. That level of funding would probably require terminating the current program and starting over to plan a much smaller manned space program. Efforts are underway to obtain $600 million of DOD funding or to find other means to raise the final budget to the $10.7 billion figure—which appears to be the best NASA can expect.

A budget of $10.7 billion is not adequate to support a "world class" U.S. space program, but it will allow us to "limp along" for one more year. The next President will then have to decide (with Congress!) whether the U.S. is willing to pay the price for a "world class" program. I believe that a budget of

See Crossroads on page 5.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

Shaping a Dream

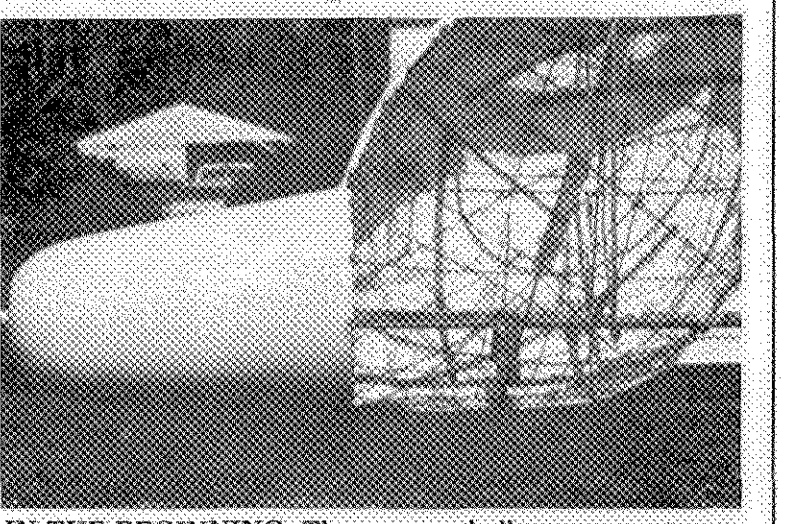
Craft on Display August 5, 6 and 7

Employee Interests Range from High in the Sky to Deep in the Sea

Mention NASA and thoughts turn to air and space. The natural inclination is to look upward. But one Army employee assigned to NASA and a former contractor employee are looking in quite a different direction. Using the research and development (R&D) expertise employed here, Pacita I. Tiemsin and Jeffrey Knutson have built a one-atmosphere manned submersible—a submarine.

Their joint accomplishment, the *Pacita I*, will be on display at the Visitor Center August 5, 6 and 7.

Tiemsin, an electronics engineering technician in the Antenna and Microwave Research Branch, and Knutson, a former PRC Kentron employee in the Instrument Research Division, share a common dream . . . "to do ocean exploration in a shirt-sleeve environment." If a craft had been available that would give them unrestricted access to shallow water, they admit they would have skipped the design and construction phase and simply made the purchase. But such a craft, one of high performance that does not need a ship dedicated to it or a crew of ten or so to support it, does not exist. So the two did the next best thing—they designed and built their own.



IN THE BEGINNING. The pressure hull—crew quarters—was shaped from a plaster mold fashioned over a wire structure.

. . . about the design and construction

Operational to 400 feet, the 15-foot, 2,000-pound craft has been six years in the making. The prime design feature has always been comfort. Knutson notes that in many manned submersibles, you have to lie on your stomach to get a good view. "Our prime consideration is comfort. Our aim is to feel as though you are never hurried. We want a craft you can sit in for hours and hours and snoop around; one that it suitable for the depths yet does not compromise the comfort." And the design and engineering of the *Pacita I* seems to be consistent with that goal.

Designing and molding the pressure hull—in space terms, the crew compartment—occupied the first three years of the endeavor. "The design was developed to accommodate the human body comfortably and still have access to the viewports without getting into any strange positions," Knutson reiterates. A plaster mold formed over chicken wire mesh was laid up with successive layers of epoxy resin to form the pressure hull. The hull contains from 90 to 190 layers of fiberglass, depending on the desired thickness for specific areas. This was followed by months and months of sanding and smoothing to form the shape.

Next came the testing phase. When the pressure hull was fully assembled with hatch cover and windows, it was hydrostatically tested in a make-shift testing tank. Pressure conditions verified, Tiemsin and Knutson proceeded to design the rest of the submersible.

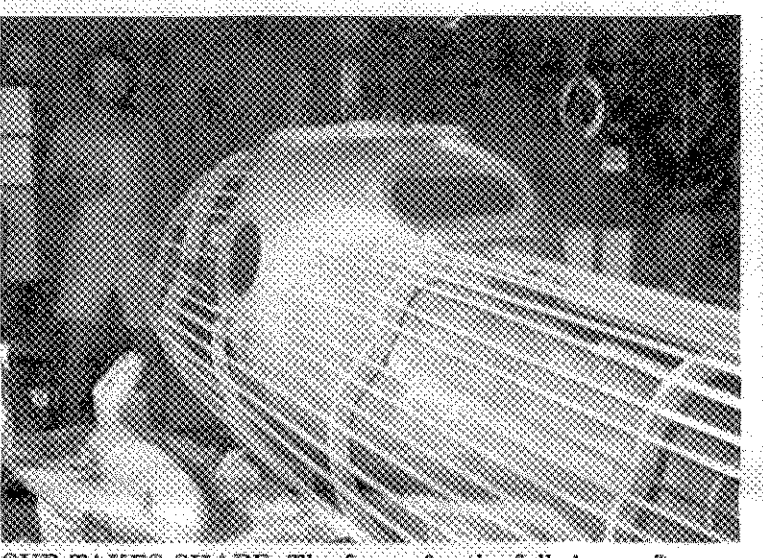
A one-sixth scale model of the proposed design was made from clay. From this, measurements were taken to form patterns for the various frames which were fashioned out of wood. "Then there was lots and lots more of that terrible fiberglass work to complete the structure."

Next valve fittings and feed throughs were constructed and, as Tiemsin can attest, thousands of feet of wire were installed. All the time the comfort factor was uppermost in consideration. "That's why it has a surface ventilation system which you wouldn't find on most submersibles," Knutson explains. The probability of long periods on the surface preceeding and following a dive dictates a means to supply continuous fresh air regardless of surface wave action. The system changes the air completely every three minutes, is automatic and has the ability to digest inadvertently injested water.

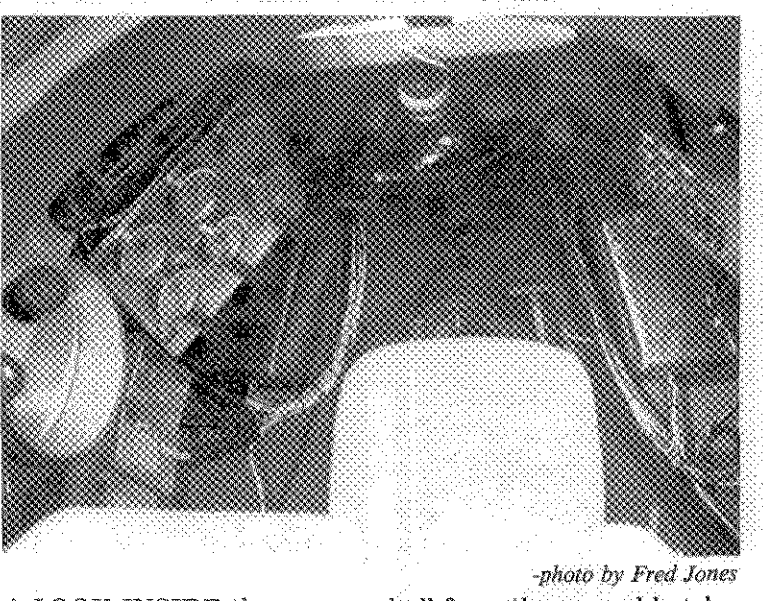
The electronic control system employed assures extreme ease of operation, another top priority. The operator is able to concentrate on the mission rather than tedious vehicle steering and maneuvering tasks. After achieving neutral bouyancy, all propulsion, steering and maneuvering is accomplished by two small joysticks which actuate the motor control circuitry.

To test the electronic system, Knutson used six headlights to simulate motor activity. "I could sit inside and, with the oscilloscope mounted on a board, I was able to debug the electronic control system by watching the lights."

In December 1987 they conducted the first pool test. The initial test was to make sure the ballast system worked properly—"that we could go up and down at will. We found out that the weights were not distributed properly and had to do some redesign. But's that's the purpose of testing."



SUB TAKES SHAPE. The frame for the full size craft was fitted with wood molds which were covered with cardboard and then fiberglass. The wood and cardboard were then removed.



-photo by Fred Jones

A LOOK INSIDE the pressure hull from the opened hatch shows the gages that will give the explorer immediate feedback on all systems.

. . . about the designers

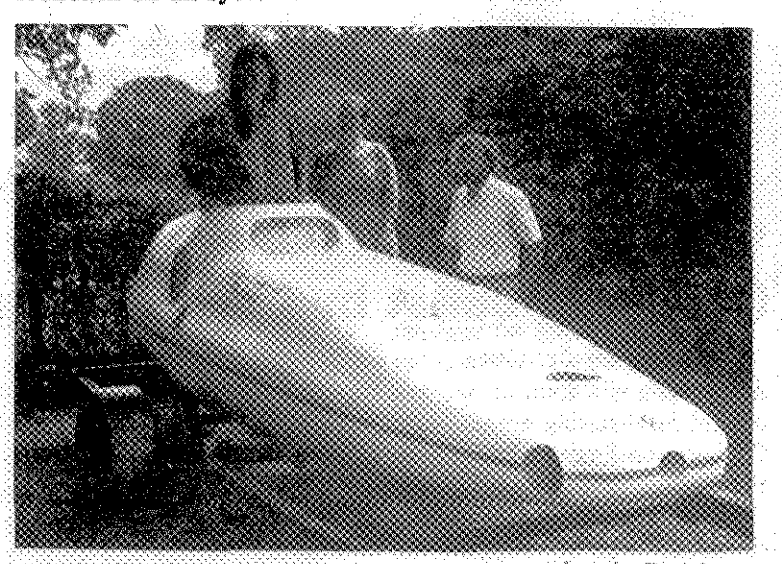
Tiemsin has always had a love for ocean exploration. Born in the Philippines, she has been surrounded by water for a good portion of her life. Like many of us, she has seen the ocean surface. Unsatisfied with that limited view, she has always wondered what was beneath. Teamed up with Knutson, whom she met working in a wind tunnel at Langley, she is on her way to making her dream a reality.

She earned a degree in chemistry after study at Adamson University in the Philippines and Old Dominion University. She is now pursuing a master's degree in environmental engineering at ODU.

Knutson refers to himself as essentially uneducated; his formal education ended at high school graduation. It is obvious from this accomplishment alone that he has a master's degree in experience. Knutson credits his 20 years experience in R&D labs with the ability and the perserverance to initiate and complete a project of this technical magnitude. A look into his workshop indicates that he has the expertise to design and construct his dream craft. And when a machine or tool he needs to do the job doesn't exist, he makes it.

With Knutson heralding the design end of the project and both combining their skills during the construction phase, they have meshed their areas of expertise into a winning team. The duo plans to launch the *Pacita I* in August.

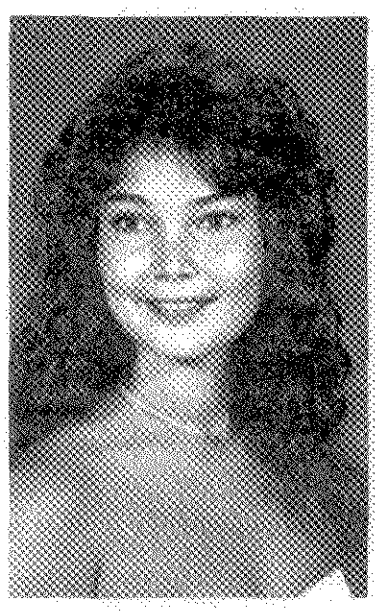
For a close-up look at a manned submersible—a personal submarine—don't miss the debut of the *Pacita I* at the Visitor Center August 5, 6 and 7. Tiemsin and Knutson will be available to talk about the project and answer questions.



-photo by Fred Jones

THE FINISHED PRODUCT. Tiemsin (left) and Knutson (right) show Lindy Perkes (center), Visitor Center program manager, the completed craft which will be on display August 5-7.

Carnival Monarch Contestants



Adair L. Adams
Advex Corp.

Susan Boulais
SC Security, Inc.

Valinita L. Hicks
Fabrication Division

Tina L. Hawks
Structural Dynamics Division

Patricia E. Jackson
Flight Electronics Division

Kim Wagner
Kiate Holt Co.

Brenda L. Selby
Systems Engineering Division

Tracie M. Schultz
Fabrication Division

Vote for the Contestant of your choice. Cast your ballot by buying a Carnival ticket!

The Langley Activities Association will sponsor its biggest fund-raising event, Carnival, on Friday and Saturday, August 19 and 20.

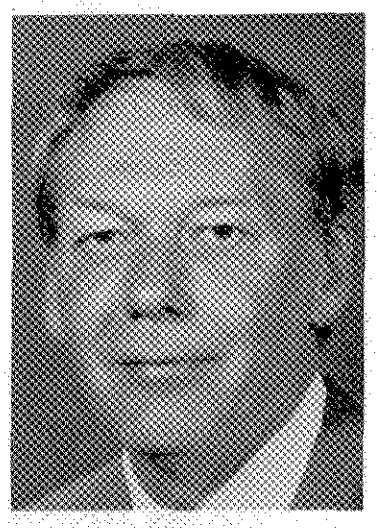
Eight Carnival Monarch contestants will be vieing for your support. Raffle tickets may be purchased from the LAA Office, Carnival Monarch contestants, various facility coordinators or members of the LAA Executive Board.

The contestant selling the most raffle tickets will be crowned Carnival Monarch on Friday evening and will reign over all events. The Carnival Monarch will also be awarded a cash prize of $300; first runner-up will receive $150; second runner-up, $100; third runner-up, $75; and fourth runner-up, $50. Each contestant will also receive two tickets to Busch Gardens.

Support the Carnival. Vote for the contestant of your choice . . . cast your ballot by buying a Carnival ticket.

At the VC during August

Mars Exploration: Man's Second Home



Mars is the only potentially inhabitable planet in our solar system besides Earth. The Viking Project, managed by Langley, landed two spacecraft on Mars in 1976 after traveling almost half a billion miles from Earth. Today, NASA researchers are planning an unmanned Mars mission for the late 1990s, to be followed by a manned mission in the early 21st century.

Dr. Bernard Garrett will discuss the Humans to Mars initiative, including present plans for visiting Mars and establishing a permanent Mars outpost in the early 21st century, at 7:30 p.m. on August 11 in the Visitor Center theater.

NASA in collaboration with other appropriate agencies, is developing a balanced program to support manned and unmanned exploration of the solar system. One of these programs, the Humans to Mars initiative, will be translated from this general goal into specific missions.

By 1993, NASA's new Office of Exploration will complete the mission and systems definition in sufficient detail, that, if there is a national decision to go forward with the Humans to Mars program as the "priority mission," it can be accomplished shortly after the turn of the century, around 2005. Crucial issues in health, life support, and operational capabilities have to be resolved before commitment of humans to mission that could be up to three years in duration.

Garrett is head of the Spacecraft Analysis Branch, Space Systems Division. He has received ten NASA and Langley awards, including the NASA Exceptional Service Medal.

Daily during August, the film **19 Minutes to Earth**, about the Viking mission to Mars, will be shown in the Visitor Center theater. The term "19 Minutes" refers to the time it took for a signal to reach Earth from Mars.

Robotics: An Answer to Real World Problems?

Donald Soloway will discuss "Robotics at NASA Langley" on Wednesday, August 17, at noon, in the Visitor Center theater. This presentation is part of the Summer Guest Lecture Series sponsored by the Visitor Center and the AIAA-Hampton Roads Section Student Branch.

Soloway, aerospace technologist in the Automation Technology Branch, will address Langley's role in the development of robotics for space applications.

After defining robotics in a general sense, Soloway will break this technology into its major research components and describe Langley's research initiatives in the areas of control, sensors, human factors and operator interface, system architecture and intelligence.

Soloway points out that, "Each of these areas promises great potential for growth. None of them alone defines robotics. Only through the integration of all these areas does robotics become meaningful technology, applicable to real world problems."

Phone Note:

Please make the following pen and ink changes to your June 1988 copy of the on- site telephone directory:

Stott, Connie G.	Extension 2408
Stubbs, Timothy P.	Extension 3258

Cartoonist Urges Us to Smile

Lankley is One Year Old; Humor is Ageless

If you believe work is no laughing matter, think again. So says **USA Today** in documenting the value of humor.

Humor can be a potent tool in the workplace. "Humor can ease tension, improve morale and increase efficiency," claims Peter Disberg, professor of graduate studies at California State University and the author of six books on humor.

The ability to laugh at oneself is the mark of a highly evolved personality and great maturity. The new format of the **Researcher News**, which debuted a year ago, introduced the comic character LANKLEY, charged with the task of revealing the lighter side of life at Langley Research Center.

Created by graphic artist Rod Waid, LANKLEY embodies the aura of the "typical" scientist/engineer. LANKLEY allows us to peek into the facilities and labs on Center. LANKLEY invites us to see beyond the intense research that is our mission to the camaradarie that exists, the team effort that goes into scientific breakthroughs and the frustrations that deter success.

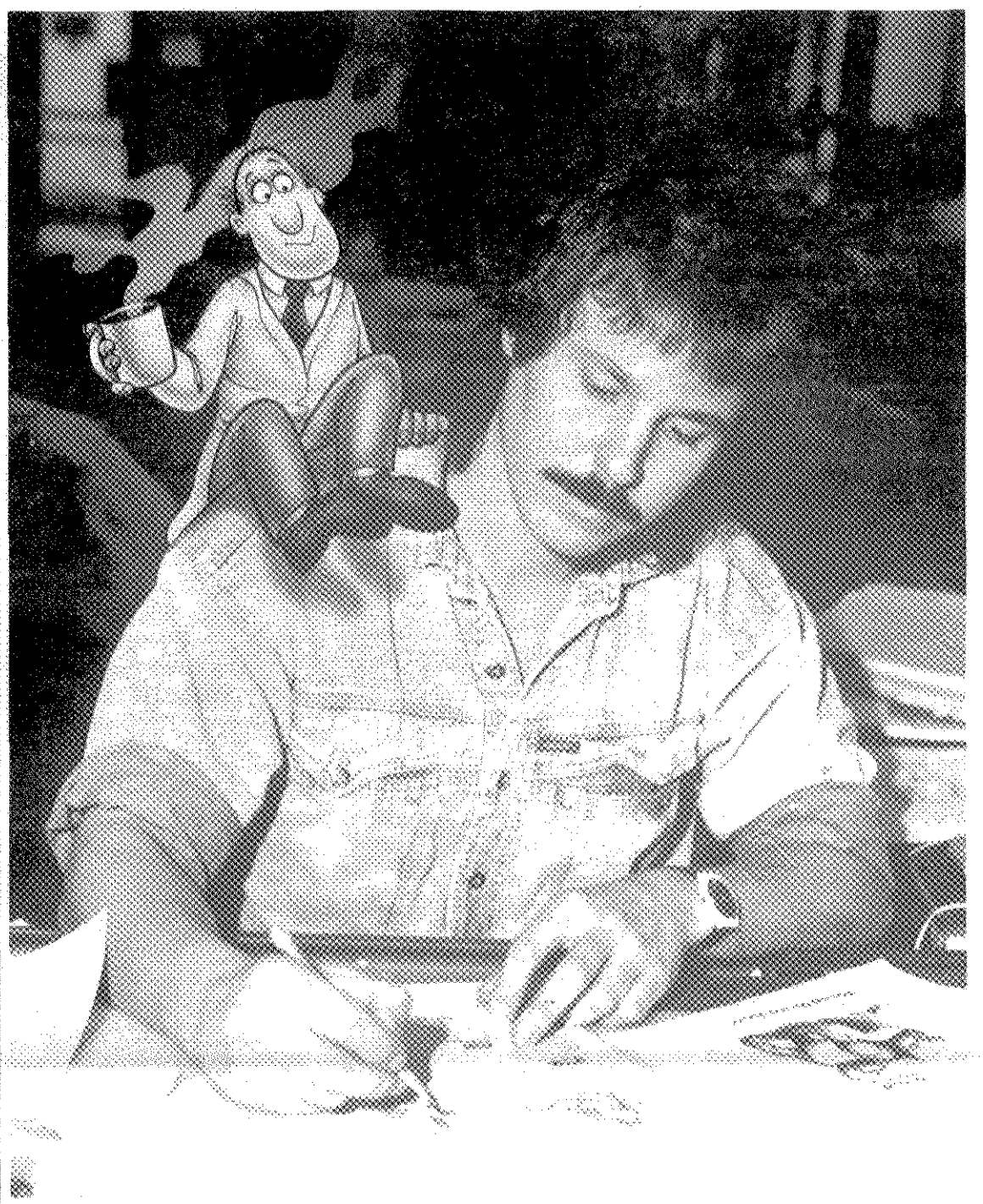
Charles Darwin claimed that emotions can be intensified through facial expressions. The genuine good feeling you get after hearing a joke or watching a funny film is enhanced by the physical act of smiling. LANKLEY urges you to smile.

Waid has accepted this challenge and, every two weeks, places his creation into the LaRC environment. The intent is to make you more aware of the range of the Langley mission and, ultimately, to make you smile. The staff of the **Researcher News** closely scrutinizes subject matter before submitting cartoon ideas to Waid. The series goes to great lengths not to offend any person, working group or situation. The purpose of the series is, again, to make you smile.

An employee of Hew-Es-Co, Rod Waid began his career at NASA in May 1986. He is a 1979 graduate of Menchville High School and holds an associate degree in commercial art from Thomas Nelson Community College. While LANKLEY is but a small part of his work in Langley's Graphics Section, Waid enjoys cartooning, which he has taught as an after school opportunity for the Newport News Public Schools.

His most recent cartoon creation is the Sky School Baron and his sidekicks, created for the second annual Sky School held this month in Virginia Beach. Sky School, a hands-on aeronautics program, is co-sponsored by the Virginia Beach Public Schools, ABACUS Temporary Services, Old Dominion University and Langley Research Center. Waid's Sky School Baron Activity Book was a big hit with the eighty students, seventh through ninth graders, and 25 teachers from the Greater Hampton Roads area who participated in Sky School.

Editor's note: We hope you are comfortable enough with LANKLEY to invite him into your workplace. Cartoon ideas are welcome and should be submitted to LANKLEY, c/o the Editor, Mail Stop 115.



-photo by Sandie Horsey

From Behind the Scenes

Comic Character Gives Insight into Life on the Lighter Side at Langley

Meet Rod Waid, Langley Research Center graphic artist and creator of the comic character LANKLEY. Waid's depiction of the "typical" engineer/scientist appears in each issue of the *Researcher News.*

Waid is an employee of Hew-Es-Co, a Poquoson-based company on contract to NASA Langley for graphics, technical editing, technical typing and typesetting support services.

Harvey's Janitorial Service, Inc., recognizes employee teams who have excelled on their Facility Evaluation Reports. The award committee convened on June 30 and selected Crew # 9 for the Crew of the Month for June. This crew received a score of 94 out of a possible 95 points. Team members are (L to R) Clara Challenger, Janie Gayle, Betty Ball, Pimja Webb, and Theresa Hill. Not pictured is crew member Joyce Johnson.

NASA at the Crossroads

Editorial continued from page 2.

$10.1 billion, as the Senate envisions, is a disaster! It will send a clear message that the U.S. will be "second class" in civil space programs.

It's my feeling that if the agency doesn't get at least $10.7 billion in FY 89, we must terminate the current Space Station program and replan NASA's future with the emphasis on unmanned space science and application.

Without Station we should, of necessity, forfeit our leadership in manned space flight, and concentrate instead on "Mission to Planet Earth," with satellites to study our planet in detail and unmanned probes to study the solar system. Substitutes for the Station—space platforms and expanding Shuttle capacity to function as an orbiting laboratory—would not allow learning about human space flight of long duration, nor would they lead to future manned missions to the Moon or Mars.

Those are the unpleasant alternatives if the President's budget is severely reduced. His budget proposal is not extravagant. It merely allows NASA to do its job for now. It would fund Space Station development, get the Shuttle flying again at a sensible flight rate, permit us to move ahead with exciting science projects and begin to develop the advanced technology that will one day enable humans to explore the solar system.

The **Daily Press** concluded its editorial by saying that America has seen other nations match and surpass it in areas such as military hardware, communications, automobiles and electronic gadgetry ranging from TVs to coffee makers. "The nation," it advised, "shouldn't settle for the back seat now in space exploration."

I hope you will join me in the next few months in supporting the decisions required for the United States to remain a "world class" space power. By making the right decision at this critical crossroads, we will ensure a good start down the path of continuing U.S. space leadership.

Richard H. Petersen
Director
Langley Research Center

Happenings

LAA SOCIAL will be held Friday, August 5, from 4 to 6:30 p.m. in the Activities Center.

LAA BOARD. The Langley Activities Association Board of Directors will meet on Tuesday, August 9, at 7 a.m. in the Activities Center. Concerns to be brought before the board should be addressed to the appropriate chairperson.

TOASTMASTERS. NASA Langley Toastmasters will meet Wednesday, Aug. 10, 11:30 a.m.-1 p.m., in the conference room of Building 1218. All are welcome. Civil service employees charge one hour to A1619. Please call Natalie Johnson, ext. 3483, for further information.

WASHINGTON D.C. TRIP. A fall bus trip to the National Theater to see *Me and My Girl* has been planned for October 1-2 with overnight accommodations at the new Grand Hyatt. Bus will depart from and return to LaRC. Plenty of time for sightseeing and shopping, and a 4-hour stop at Potomac Mills. Costs range from $120/person quad to $160/person double and includes transportation, hotel and orchestra theater seat for the Saturday matinee. Retirees and contractors are welcome. Contact Donna Speller, ext. 4002, for details. One-half payment is due August 8; second-half due September 8.

USAF TACTICAL AIR COMMAND BAND will present a series of free concerts during August on Tuesdays at 7 p.m. at Mill Point Park, Hampton, and on Wednesdays at 6 p.m. at the Williamsburg Lodge. Concerts will be held from August 2-24 and are open to the public.

MOTORCYCLE RIDER TRAINING: Riding and Street Skills program at Thomas Nelson and Tidewater Community Colleges. Preparation for state licensing exam plus 10 percent insurance discount. For more information, contact Dennis McMillan, ext. 3421.

FRISBEE: Ultimate Players wanted. Just moved here from CA and am looking for people that throw a disk! Call George, 827-0020 or 851-6807.

VA TECH SEAFOOD FEAST will be held Monday, August 1, at 6:30 p.m. at Captain George's Seafood on Mercury Blvd. Head basketball coach Frankie Allen will be guest speaker. Cost is $16, and includes buffet and beer. For tickets, call Charlie Whittington, 874-2596.

NIGHT ON THE NILE. An evening of Middle Eastern dance to benefit the Leukemia Society will be held Sunday, July 31, beginning at 7 p.m. at After Dark Restaurant and Lounge, 2000 W. Mercury Blvd. Admission: $3 donation. Sponsored by Caravan East.

Retirement Party

"Freddie" Bloch Anderson will entertain her friends at her retirement social Wednesday, August 10, from 4:45 to 7 p.m. at the Activities Center. Deadline for reservations is August 2. Reservations and contributions toward a gift are being accepted by Pat Holland, Mail Stop 356, ext. 2303. A cash bar will be available at the social.

FREE: DOG 4-year-old male Golden Retriever free to good home. Call 865-7162 evenings and weekends.

WANTED: ROOMMATE, female to share new 3 BR/2 BA house off Saunders Rd., $250/mo. plus 1/2 utilities. Washer, dryer, dishwasher. Available Aug. 1. Contact Cathy, ext. 2576.

LOST: GLOVE. Rawlings softball glove lost at Field #3, adjacent to Bldg. 1230. If found, please call Bob Huffman, ext. 3883.

CAMPER. 1964 16-foot Shasta Camping Trailer. Good condition. Sleeps 4. Stove, sink, refrigerator, commode. $700. Call 868-6745.

Space Station Named

The President has announced that the permanently-manned Space Station being developed by the United States, Canada, Europe and Japan will carry the name "Freedom."

The name Freedom was recommended by a team of NASA representatives and international partners. The yearning for freedom is a basic human emotion, and freedom of the individual is a value shared by all the nations that will work together to build and use the Space Station.

In a literal sense, the Space Station will provide freedom from the confines of Earth's gravity, enabling scientific and technological research, new commercial uses of space, and opening the way for continued human exploration of space.

The name was selected from more than 700 suggestion sent to NASA from its employees, its contractors, the international partners and the general public. Twenty-seven Langley employees submitted forty thought- provoking names for possible consideration. Cathy Schauer, Office of Public Services, said "The creative efforts that went into the recommendations (submitted by Langley) highlight the importance employees at the Center place on Space Station."

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Researcher News

Display Extended Through Weekend

-photo by Fred Jones

A full-scale slice of NASA's Space Station Habitation Module is on display through July 31 at the Visitor Center. The large 14-1/2-foot-diameter "doughnut" is a mockup of the Space Station's interior design. The Space Station will be a permanently staffed "laboratory in space," operating 24 hours a day, 365 days a year by the late 1990s. This is the only scheduled display of the module in the Tidewater area.

NASA
National Aeronautics and
Space Administration

Langley Research Center

News Researcher

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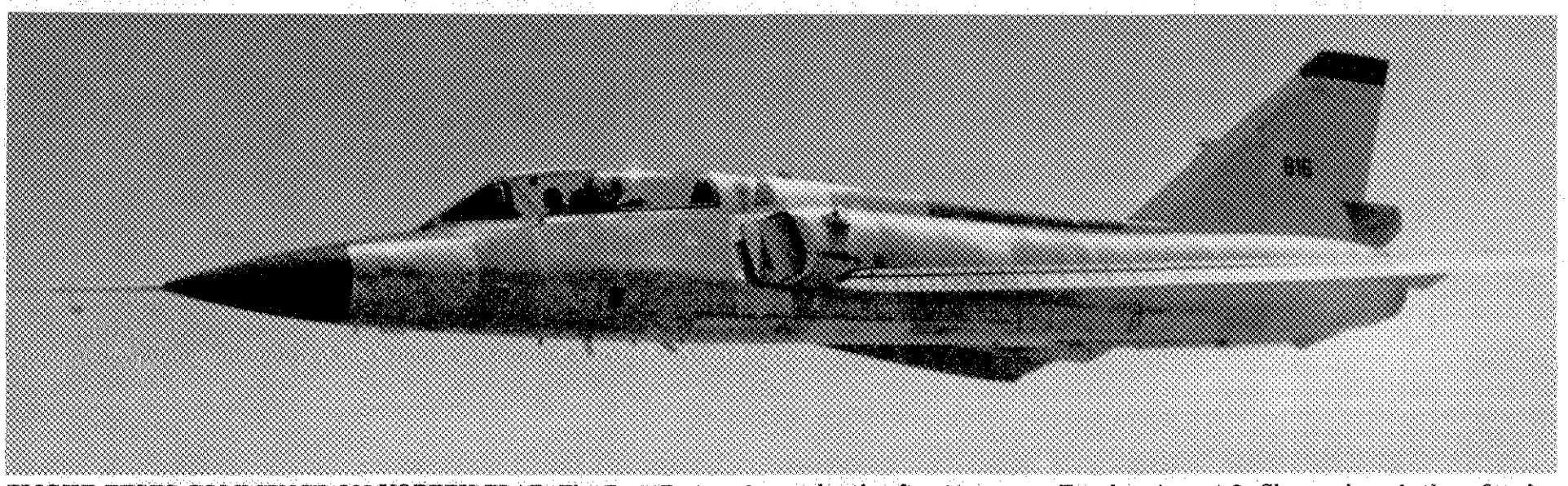


FLIGHT TESTS COMMENCE ON VORTEX FLAP. The F-106B aircraft at Langley Research Center is being used in a technology demonstration of a new type of wing leading edge—the vortex flap. The world's first flight of the vortex flap, piloted by Langley research pilot Phil Brown, occurred shortly after 11 a.m. on Tuesday, August 2. Shown above is the refitted vehicle photographed in flight by Langley photographer Don Ward. Read more about this totally in-house flight research project in the next issue.

Summer Population Explosion

Cafeteria lines and parking lots are bulging this summer as programs bring on board college and university researchers, graduate students, and teachers and students from the five state area and beyond.

The Governors School for the Gifted held closing ceremonies August 5. Beginning in late June this residential program made Langley "home" to 24 talented individuals, rising juniors and seniors who possess a high level of ability in math and science and have demonstrated outstanding achievement in these areas.

Each student spent six week performing "real life" science with a NASA mentor. The program, sponsored by the Virginia Department of Education, offers career exploration to bright students who are considering careers in science or engineering.

The SHARP program, an eight-week opportunity for local high school juniors and seniors, holds closing ceremonies today. Twenty students, all with above average GPAs and strong career interests in science, engineering or math, participated in an intensive apprenticeship program.

As apprentices, the students learn and earn. Following orientation, they are assigned wo work with a NASA mentor in a specific technical area. SHARP is a feeder program that is helping to build a pool of potential applicants for future employment in the field of science and engineering.

Seventy-four college and university students from across the United States are doing research at Langley this summer under the Langley Aerospace Research Summer Scholars (LARSS) Program. This eight-week program is intended to give high caliber, highly motivated engineering and science students an opportunity to conduct research in a federal laboratory. The college seniors and first- year graduate students work under the supervision of a Langley researcher who act as mentor for the summer.

Students aren't the only ones studying this summer. College and university faculty and teachers from the five state area have traded lesson plans and classroom for notebooks and research labs as they participate in NASA-sponsored programs.

Educational workshops NEWMAST (NASA Education Workshop for Math and Science Teachers) and NEWEST (NASA Education Workshop for Elementary School Teachers) involved 21 and 19 teachers from June 20 to 26 and July 10 to 22 respectively. Each workshop involved the educators in a broad range of aerospace activities which they can share with their colleagues and students when they return to the classroom.

College and university faculty members became part of the Langley research team through the NASA/ASEE Summer Faculty Fellowship Program. This summer 36 faculty members from institutions of higher learning across the country have teamed up with Langley scientists on a research project of mutual interest.

Read more about the NASA summer programs and the corresponding population explosion on pages 2 and 3.

Stephens Named Acoustics Division Chief

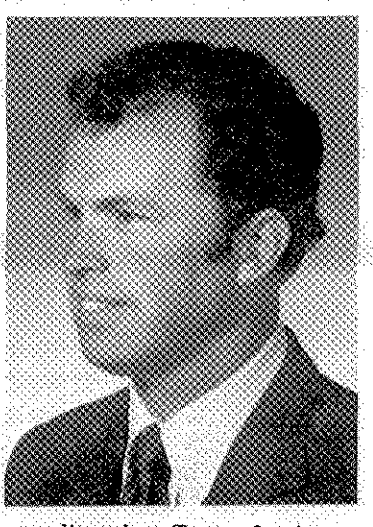
David G. Stephens, former assistant chief of the Acoustics Division, has been selected chief of the division.

The Acoustics Division is the largest government research facility in the United States devoted to aircraft noise reduction. The division is responsible for identifying aircraft noise issues of national and international importance and directing research programs to resolve these issues.

Noise technology is being developed for general aviation systems, helicopters, advanced turboprops and future supersonic and hypersonic aircraft. The incorporation of noise technology resulting from NASA research has significantly contributed to the large reductions of noise demonstrated by modern aircraft.

Stephens joined the Langley staff in 1959 as an aerospace engineer specializing in structural dynamics and fluid mechanics of space vehicles. He was appointed head of the Environmental Systems Section in 1969. He was a Sloan Fellow at Stanford University from 1970 to 1971. In 1971, he returned to Langley as head, Structural Dynamics Branch, and in 1973, became head, Noise Effects Branch, which was later renamed the Structural Acoustics Branch. In 1983, he became assistant chief of the Acoustics Division.

The author of over 70 technical papers and journal articles and the holder of four patents, Stephens is a member of the American Institute of Aeronautics and Astronautics and the Institute of Noise Control Engineers. He is a fellow in the Acoustical Society of America, which has recognized Stephens for his "contributions to understanding the effects of noise on people and structures." He was awarded a NASA Exceptional Service Medal in 1981 "in recognition of outstanding achievements in planning, implementing and leading research programs on human response to noise and structural acoustics."



Stephens and his wife, Janet, and their two children live in Yorktown, Va.

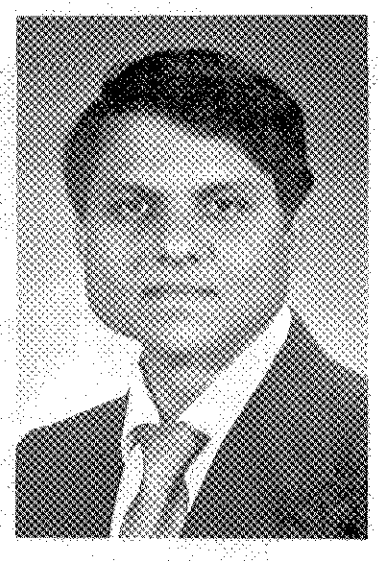
Joshi Elected to IEEE Board of Governors

Dr. Suresh M. Joshi, senior research scientist in the Guidance and Control Division, has been elected to the Board of Governors of the Institute of Electrical and Electronics Engineers (IEEE) Control Systems Society.

The IEEE is the largest professional engineering society in the world. The Control Systems Society represents one of the major technical areas within the IEEE. The Society's Board of Governors provides technical leadership and makes major policy decisions; it is also responsible for appointing officers, committee chairmen, editors and associate editors for the society's technical journals.

Joshi is internationally recognized for his research on control of large, flexible structures. He has also conducted extensive research on optimal control and stability theory and applications to various aerospace systems including the modeling and control of a super-accurate instrument pointing system for the Space Shuttle program.

The recipient of many awards, Joshi received the DuMont prize for outstanding academic achievement from Rensselaer in 1973. He is listed in "Who's Who in Technology Today," "Who's Who in the South and Southwest," and "Jane's Who's Who in Aviation and Aerospace." The author or co-author of nearly 100 technical papers, he is also the author of a forthcoming book entitled **Control of Large Flexible Space Structures.**



News Briefs

JET PROPULSION LABORATORY, Pasadena, Calif. — Scientists and engineers from JPL and the National Radio Astronomy Observatory (NRAO), Socorro, N.M., are working together in the high plains of central New Mexico to improve the ability to receive spacecraft signals from the vicinity of planet Neptune. The researchers are currently testing a new deep-space communications system with NASA's Voyager 2 spacecraft, which will fly past the eighth planet next year. Adding the 27 radio telescopes of the NRAO's Very Large Array to JPL's Deep Space Network will more than double the ability to capture Voyager's signal.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — MSFC has issued a request for design proposals for a new, space-based remote sensing instrument to measure wind characteristics, thereby permitting scientists to better understand and contribute to weather predictions on Earth. The Laser Atmospheric Wind Sounder will be an advanced light detection and ranging (LIDAR) instrument. The sounder will provide real-time global wind profiles for the lowest weather-producing layer of the Earth's atmosphere.

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — NASA will launch three huge balloons in Canada in August to search for cosmic rays, including those that could provide evidence of galaxies made of antimatter. Antimatter consists of particles with electrical charges opposite those of "common" matter, which constitutes Earth's material. When antimatter and matter collide, there is a mutual and complete annihilation, releasing energy far greater in proportion than energy released by nuclear fission or fusion. Whether antimatter could ever be created in sufficient supply and harnessed to provide useful energy is a challenging question.

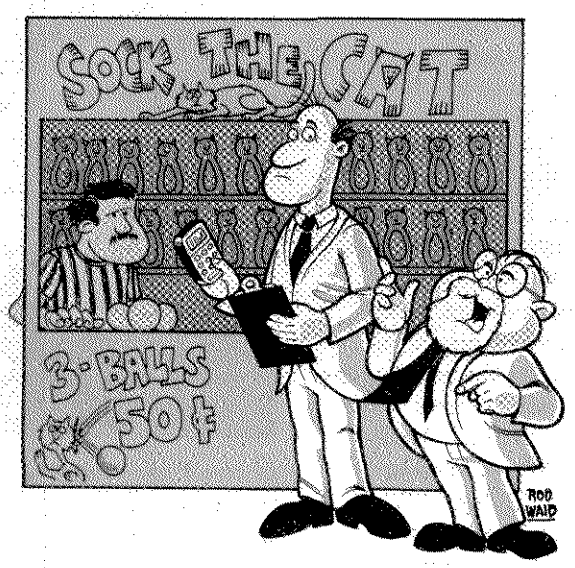
MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — MSFC has selected Science Applications International Corp., San Diego, Calif., for final negotiations leading to the award of a contract to perform a study aimed at developing an engineering technology base to improve the bondlines of solid- fueled rocket motors. The value of the contract, including options, is expected to be approximately $21 million and will run for two years, with three one-year options to extend.

KENNEDY SPACE CENTER, Fla. — Helping small and minority- owned businesses learn how to conduct business with the government is the topic of a seminar sponsored by NASA, Florida Congressman Bill Nelson and the Small Business Administration. The three-day National High-Tech Expo, to be held Aug. 21-24 in Orlando, Fla., will include workshops and opportunities to talk with counselors from successful contractors as well as federal, state and city governments.

Editor's note: Recent surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017. Request information by release number and headline. See Current News Release information box below.

NEWMAST—NASA Education Workshop for Math and Science Teachers, held July 10 through 22, gave over 20 seventh- through twelfth-grade teachers from the five-state area an overview of aerospace endeavors. Langley administrators, scientists, engineers and technicians worked to bring NASA technology and information to these teachers through lectures, tours and hands-on experiences. NEWMAST program coordinator was Dennis Scott; Arlene Levine was NASA coordinator for the program.

Lankley



"Laminar flow has nothing to do with it, just throw the ball!"

Skilled Evaluation Team Assembled

Langley Accepts EOS Evaluation Task

A team of Langley scientists and engineers have been assembled to provide technical and management evaluation of Earth Observing System (EOS) instrument proposals. LaRC senior management responded to a request by NASA Headquarters for technical assistance in assessing proposals generated from a recent Announcement of Opportunity. Center Director Richard H. Petersen has assigned a high priority to the 13- week evaluation activity.

The evaluation team is made up of a core-group of approximately 20 technical personnel who will be involved full time, from mid-July to late October. This core group will be supported by an additional 30 people and several consultants who will evaluate specific disciplines as required. The team is composed of technical experts from twelve Langley divisions as well as contractor personnel.

Leon Taylor, director of the EOS evaluation team, feels Langley was selected by NASA Headquarters because "LaRC has the necessary broad level of skills required to perform the evaluation. Langley is also recognized throughout the Agency for doing a thorough job." Taylor has assembled a team of senior people who are qualified to make judgements on management and technology concepts as well as assess the technical risks involved. He feels those on his team were chosen as a result of their expertise, specific skills and abilities. Their participation in the evaluation effort is recognition by management and their peers of that expertise.

Taylor has structured the evaluation process into a three-team unit that mirrors the three science panels directed at the Headquarters level to evaluate the science aspects of the proposals. One Langley team is being led by Reginald M. Holloway, Flight Electronics Division (FED); Holloway will be assisted by systems engineers Julius B. Lovell, Systems Engineering Division (SED) and John A. Dodgen, Science and Technology Corp. Team two is led by Dr. Nathan D. Watson, SED; Watson is assisted by Antony Jalink, Jr., FED, and Andy Wright, retired. Lemuel "Ed" Mauldin, III, FED, leads the third team, assisted by Robert T. Sherrill, SED, and Dr. Stephen J. Katzberg, Information Systems Division (ISD).

EOS is a science mission to advance the understanding of the Earth system on a global scale by developing a deeper understanding of the components of that system, the interactions among them and how the Earth's environment is changing. The EOS mission will provide systematic, continuing observations from low Earth orbit, including the atmosphere, the oceans, the land surface and the solid Earth.

Among the problems in Earth science that require such a multidisciplinary approach are the potential for climate change related to the increase in atmospheric carbon dioxide. The potential human consequences are the depletion of the ozone layer, El Nino-related modifications to weather patterns and acid rain. The key to progress on these and other issues in Earth science during the 1990s will be to approach the Earth as an integrated system.

Of the 77 proposals submitted in response to the EOS Announcement of Opportunity, Langley will evaluate 61. Final selection of proposals by NASA Headquarters will be based on a total, balanced, science theme.

Current News Releases

To receive a copy of these NASA News Releases, contact Edith Watts, Mail Stop 146, ext. 3017.

88-102.....Special Communications System Prepared for Neptune Encounter
88-103.....Proposals Sought for Space-Based Laser to Study Global Winds
88-104.....NASA ASRM Production and Testing Sites Announced
88-106.....Balloon Campaign Will Seek Evidence of Antimatter Gravity
88-107.....Contractor Selected for Solid-Fueled Rocket Motor Bondline Study
88-108.....NASA Co-sponsors Small and Minority High-Tech Business Expo

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . Jean Drummond Clough
Editor . . . . . Marny S. Skora
Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

Educators Trade Classroom for Research Lab

How much radiation is too much exposure for an astronaut on a space mission of extended duration? Is it helpful to know the eye scan pattern of air traffic controllers? Questions as diverse as these are being studied this summer by 36 faculty members from over 28 colleges and universities across the country.

For a quarter of a century, NASA and the American Society for Engineering Education (ASEE) have co-sponsored the NASA/ASEE Summer Faculty Fellowship Program. Most of the fellows, chosen from a field of 151 applicants, arrived June 6 and conclude their study at NASA today.

John Spencer, chairman of the Department of Architecture, Hampton University, is administrator of this year's program. The purpose of the program, Spencer explains, is to give university faculty members the opportunity to become involved in research at NASA laboratories.

The faculty fellows spend ten weeks working with a Langley associate on a research project of mutual interest. The program is designed to further the professional knowledge of engineering and science faculty members; to stimulate an exchange of ideas between participants and NASA; and to enrich and refresh the research and teaching activities of the participants' institutions.

Dr. Samuel Massenberg, head of the Office of University Affairs, feels the program provides a valuable network for the educators. A number of first year fellows return, by invitation, for a second year of research. Many keep in contact with their NASA colleagues and encourage their students and their peers to participate in NASA programs. Still others continue their research studies under NASA grants.

Dr. Kakkattukuzhy Isaac, assistant professor of aerospace engineering at the University of Missouri, Rolla, agrees. "A program such as the NASA/ASEE Summer Faculty Fellowship is one of the best ways to establish contact with the national labs." Dr. Isaac has returned for his second year at NASA. He has been working with Jerry Pellett and Burt Northam in the Hypersonic Propulsion Branch developing an analytical model for the combustion of hydrogen and air for the NASP program. Of special interest is the role of contaminants on the extinction and re-ignition of the hydrogen-air diffusion flame.

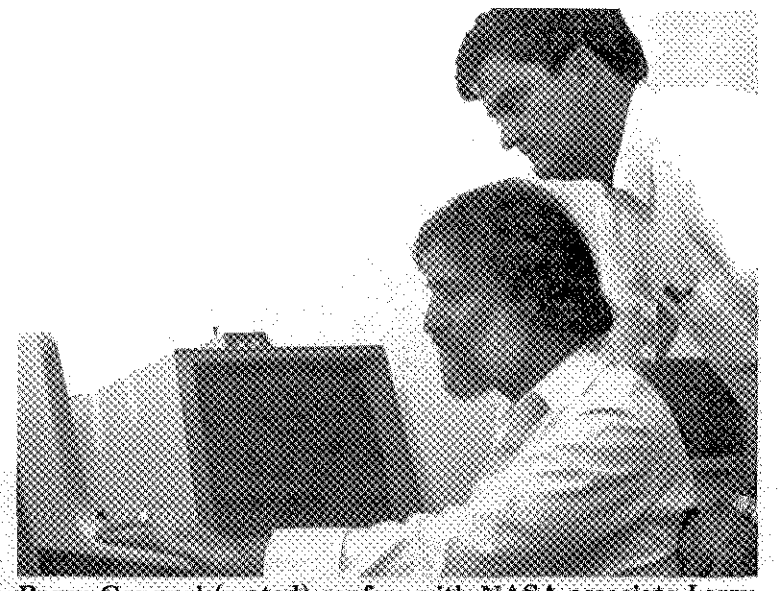
The opportunities for networking also prompted Linda Newcomb, assistant professor of airway sciences at Hampton University, to apply as a faculty fellow. At the University, she is working in the area of air traffic control under a NASA grant. This summer she has been involved in a baseline controller study under the direction of Hugh Bergeron, Flight Management Division. The prime purpose of the study is to gain oculomotor data on air traffic controllers in a normal environment. Specifically, Newcomb is interested in where the controllers look while on the job—their eye scan patterns—to determine what visual displays would assist the controller. The second purpose is to develop baseline data from which comparisons could be made to determine if computers could feasibly assume ATC responsibilities.

Dr. Barry Ganapol, professor of nuclear and energy engineering at the University of Arizona, is another second year returnee. Under the direction of Larry Townsend and John Wilson, High Energy Science Branch, Ganapol is investigating how galactic cosmic rays—radiation—affect astronauts in prolonged duration in space. This study is especially significant in view of U.S. Space Station and flight to Mars initiatives.

Dr. Greg Byrd, meterologist and assistant professor at the State University of New York, is working with Roland Bowles, Vehicle Operations Research Branch, on the problem of microburst (windshear) hazard to aircraft. As a meterologist Byrd would generally look at the windshear problem from an environmental viewpoint; this summer he is attacking the problem from the aircraft performance angle. "I am gaining a better understanding of the microburst phenomenon and a great deal of experience with computer simulation modeling," Byrd said.

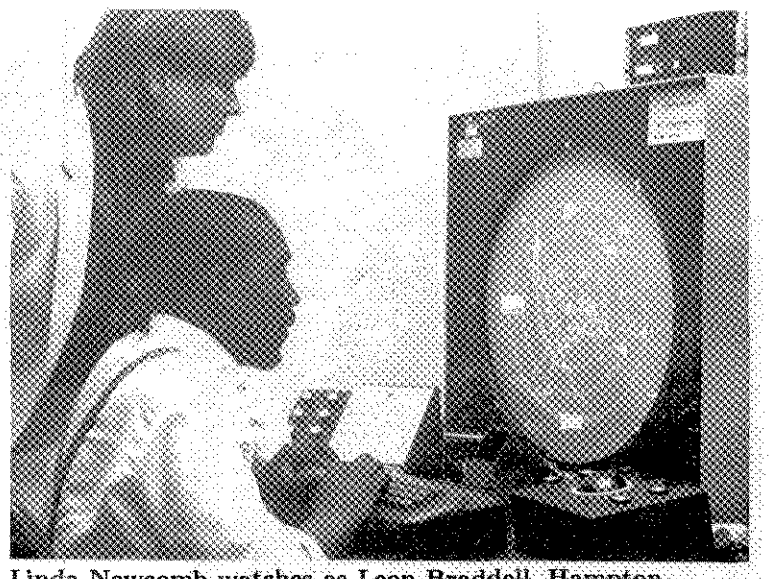
Of the 36 educators involved in the program, 16 are studying at NASA Langley for the first time; 10 are returning for a second year and a continuation of their previous research; and 10 have been invited back to continue research that has been several years in progress. Eighteen Langley divisions are involved in the NASA/ASEE Summer Faculty Fellowship Program.

-photos by Sandie Horsey



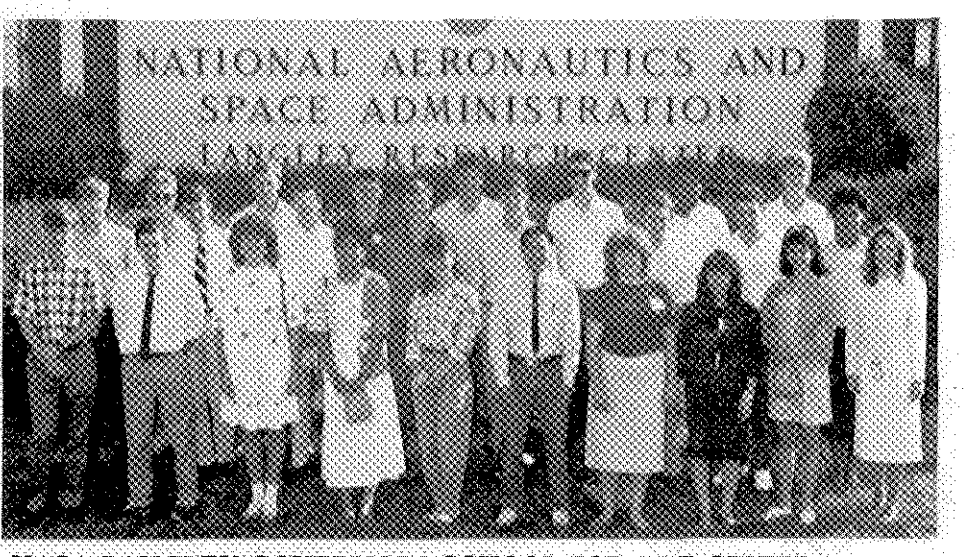
Barry Ganapol (seated) confers with NASA associate Larry Townsend regarding the set of benchmark solutions he has developed for the galactic cosmic ray transport equation.

Isaac Kakkattukuzhy checks the flame on the oppose jet burner in the High-Speed Combustion Lab.

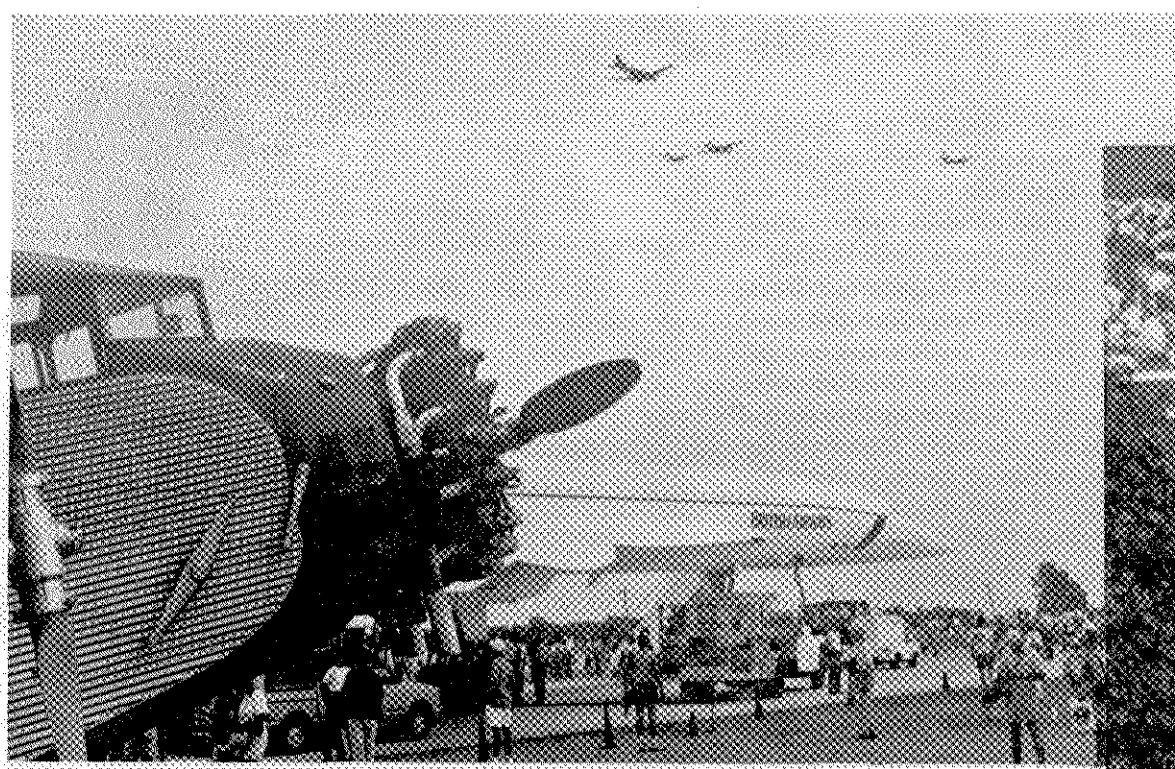


Linda Newcomb watches as Leon Braddell, Hampton University senior, checks a display in the MOTAS (Mission Oriented Terminal Area Simulation) Lab.

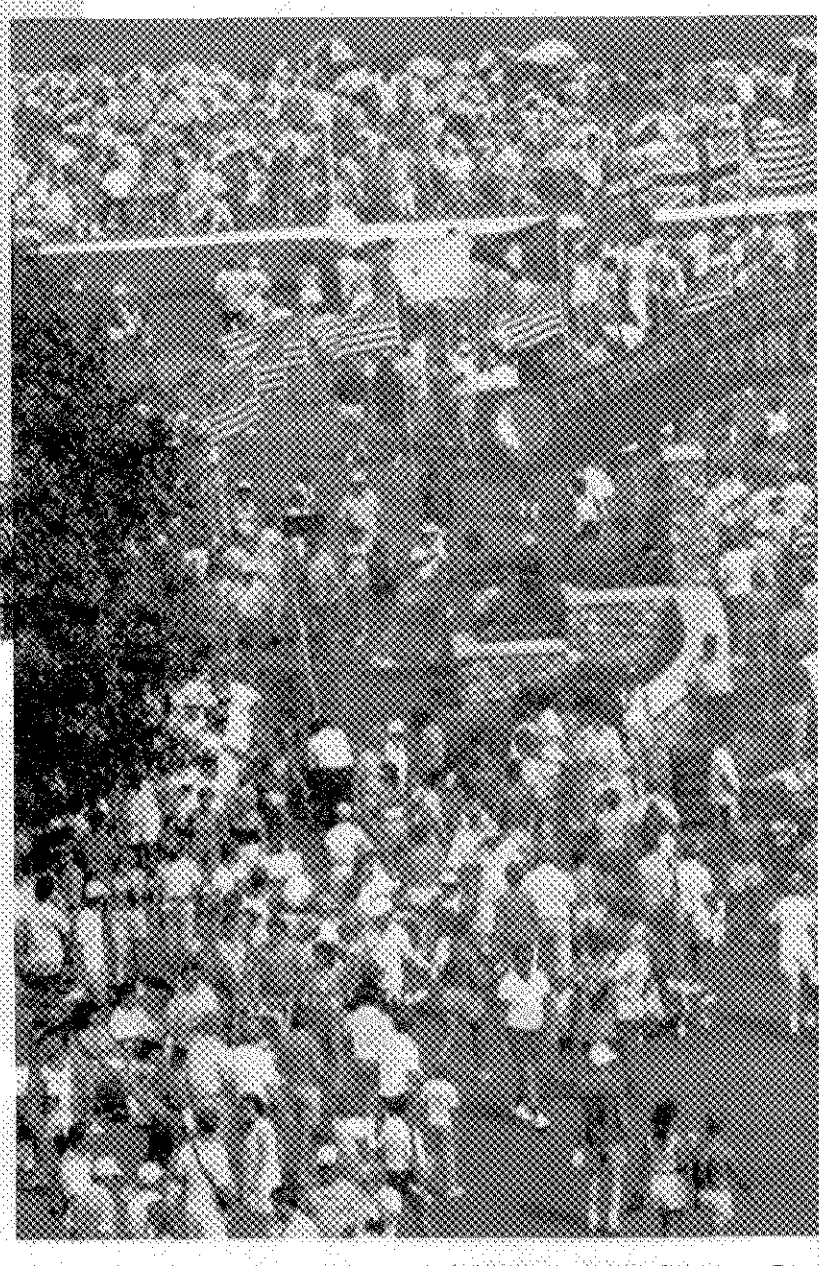
SHARP—Summer High School Apprenticeship Research Program is an eight-week program for students with career objectives in science, math or engineering. 1988 participants are: (Front row, L to R) Marvin Graham, Anthony Vann, Tim Curry, Gerard Tabb, Alvin Reaves, Michael Alexander; (Middle row, L to R) Zanette Larrimore, Administrative Assistant; Desa Burton, Tekoia Fitten, Kynia Starkey, Sherrian White, Devin Melvin, Toya Williams, and Walt Darden, Program Coordinator; (Back row, L to R) Dawn Boney, Michelle Trower, Je'Neiss Lucas, Britta Borwn, Stephanie Garland, Shahanna Keisler, and Teresa Jones. Not pictured is Roderick Lynch.

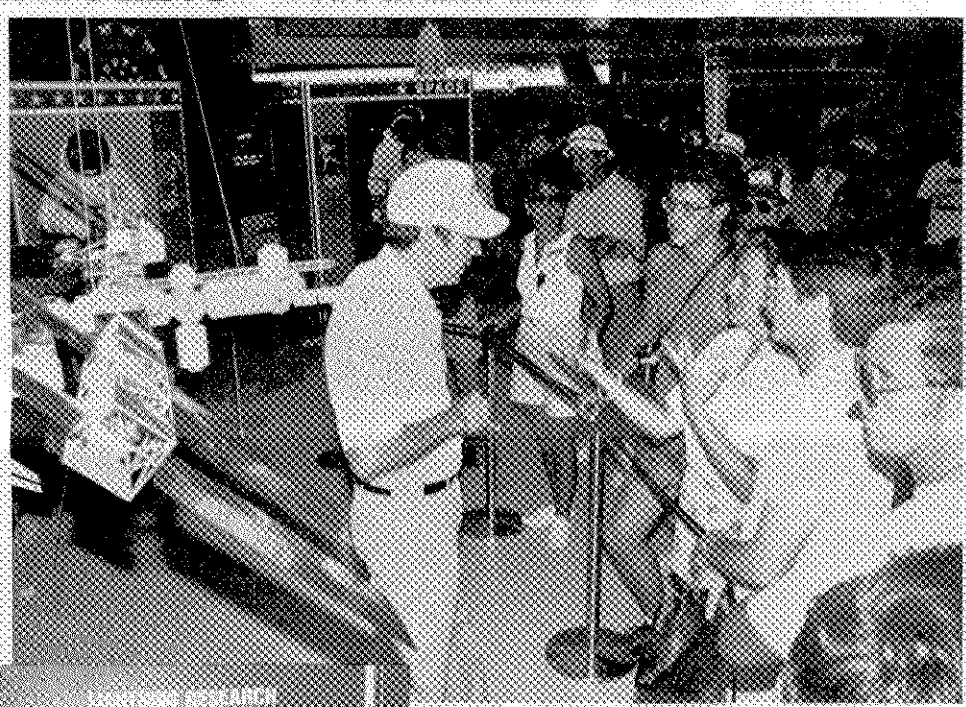


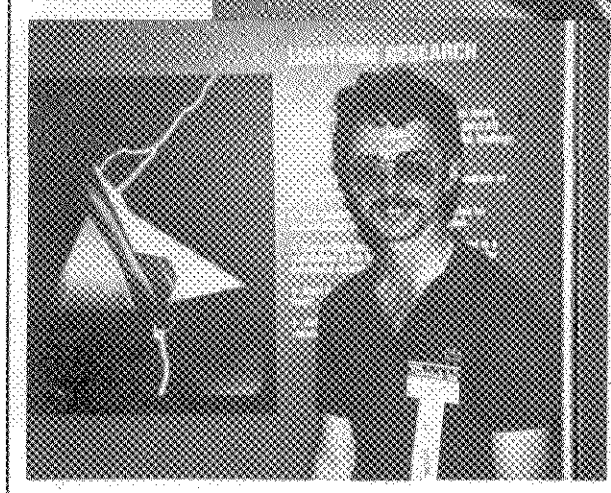
NASA LANGLEY GOVERNORS SCHOOL FOR THE GIFTED is a six-week residential program that provides rising seniors the opportunity to perform science and engineering tasks under the direction of a NASA mentor. 1988 participants are: (Front row, L to R) Geoffrey Coram, Michael Sarver, Jori Church, Marieden Hernandez, Kristine Goodwin, Dan Sepdham, Wendy Moore, Kim Yang, Dianne Newman and NASA Coordinator Nancy Kent; (Middle row, L to R) Lonnie Fender, Winston Polhamus, Brian Lambert, Matt Maddox, Tomjay Paul, Lee Walker, David Rostker, Angela Reese; (Back row, L to R) Jeff Musik, Robert Estep, Ted Dinklocker, Eric Treschuk, Jeff Brown, Portia Lewis, and Sean Allbee.



THE OLD AND THE NEW—A Ford Tri-motor and the Concorde.







Lankley

"Lankley! That's not what we meant by **wheel pants** !"

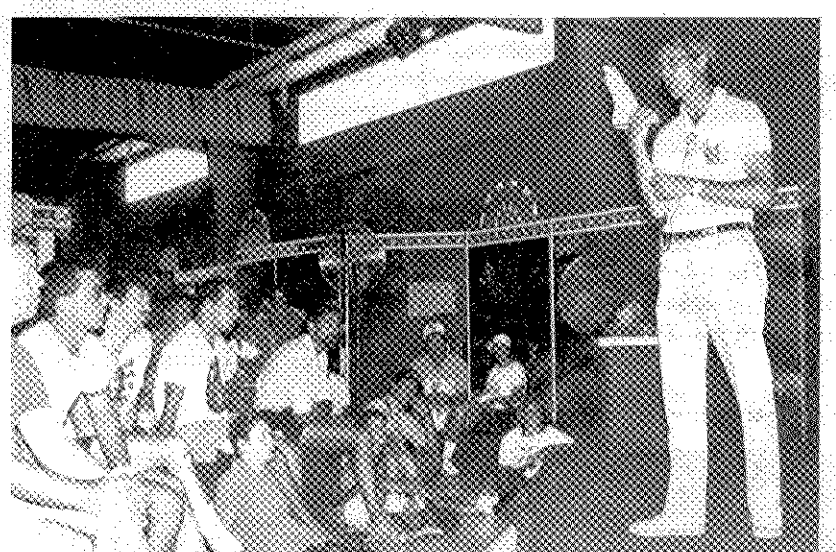
'Something Sp

Beginning on July 29, Os
the aviation capital of the w
Wittman Field had parked
more takeoffs and landings t
planet. Oshkosh became hor
every state and nearly 75 fo

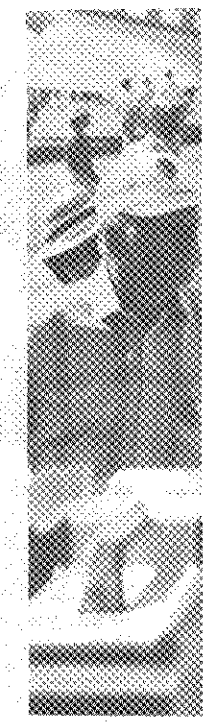
An ongoing love affair be
the main attraction at Oshk
information characteristic of
Convention the world's large

NASA returned to Oshk
"The Leading Edge in Aero
NASA speakers were major
experts" forum program. Pl
was something special in the

Stop for a moment. Take
sin. Catch the spirit of aviat



PROGRAMS—Back by popular demand, the NASA craftsmen.

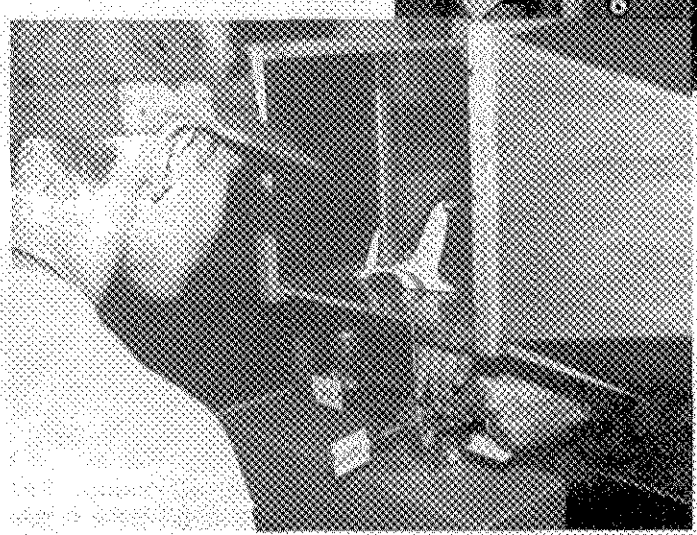


-photo by Donald C. Huber

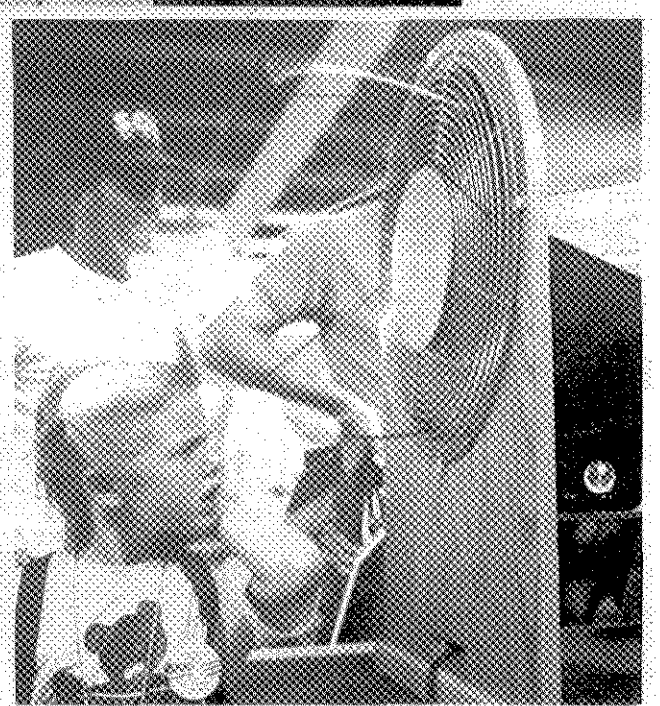
B-1B BOMBER—military's latest technology.

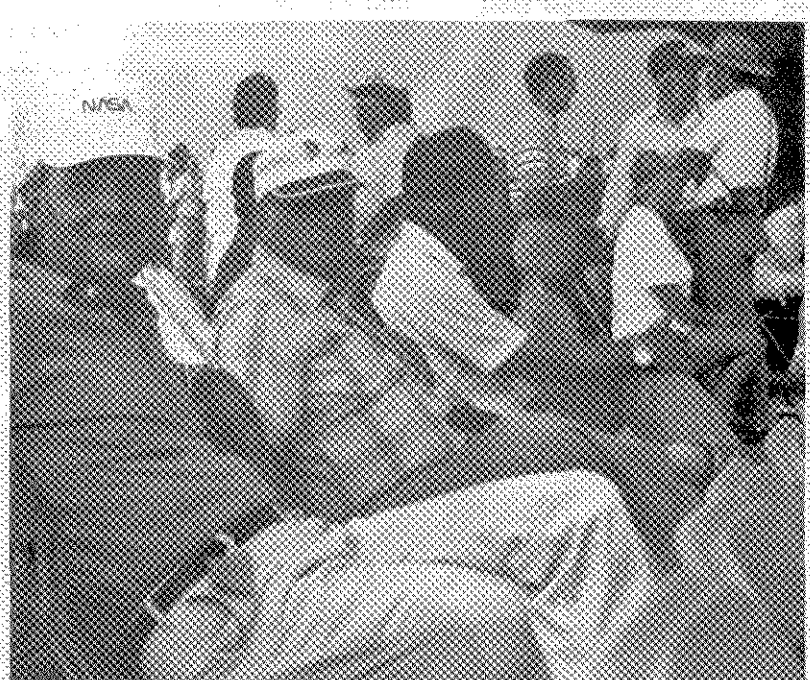
ial in the Air'

h, Wisconsin, was, once again,
Before sunset on August 5,
airplanes and experienced
any other airport on this
aviation enthusiasts from
countries.
people and airplanes was
8. The friendly exchange of
osh made the EAA Annual
tdoor classroom.
ill an all-new exhibit entitled
s and Space Technology."
ibutors to the "learn from the
people...programs....There
t Oshkosh '88.
'armchair journey" to Wiscon-
hat is Oshkosh!

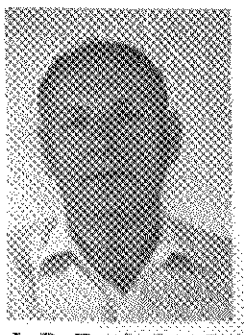


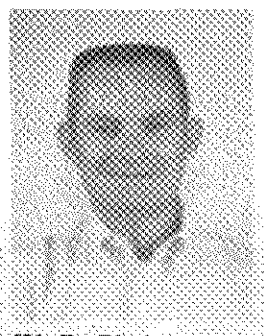
-photos by H. Keith Henry



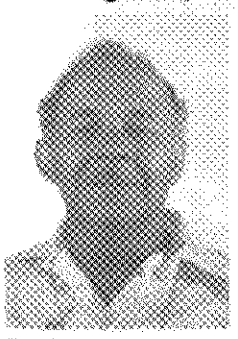


PEOPLE—Center Director Pete Petersen joins early astronauts Neil Armstrong and Jim Lovell.


J. P. Deginder, Jr.


W. R. Phelps

W. S. Langford


B. O. Smith

Recent Retirees

F. B. Anderson

Joseph P. Deginder, Jr., Fabrication Division, **Curtis L. Shriver**, Guidance and Control Division, and **William R. Phelps**, Instrument Research Division, retired July 1.

Wardell S. Langford, Jr., Fabrication Division, **Beatrice T. McFall**, Acquisition Division, and **Benjamin O. Smith**, Office of Public Services, retired July 29.

"Freddie" Bloch Anderson, Projects Division, retired July 30.

Coolidge R. Presnell, Operations Support Division, retired August 1.

Kenneth "Paul" Resler, SC Security, retired July 1 after over 24 years of service to NASA Langley. O. J. Cole, Jr., security officer, and Capt. W. L. Jones, contract manager, agree that Resler, a valued and dedicated team member, will be missed on Center.

Retirement Parties

Johnny E. Jordan will be honored at a retirement party held at the Fort Monroe Officers' Club on Friday, September 9. A cash bar will be provided from 6:30 to 7:30 p.m. and a prime rib buffet will begin at 7:30. The cost is $13.50/person or $24/couple which includes gift. Contributions to gift only will be gratefully accepted. Please respond to David Rhodes, Mail Stop 236, ext. 3234, by September 2.

William R. (Roger) Phelps will be honored at a retirement dinner, Friday, September 16 at 7:30 p.m. at Sammy and Nicks restaurant, Mercury Blvd. Cost, including gift, is $13/person or $24/couple. Please respond by Sept. 9 to Paul Roberts, Mail Stop 238, ext. 2098.

Position Open

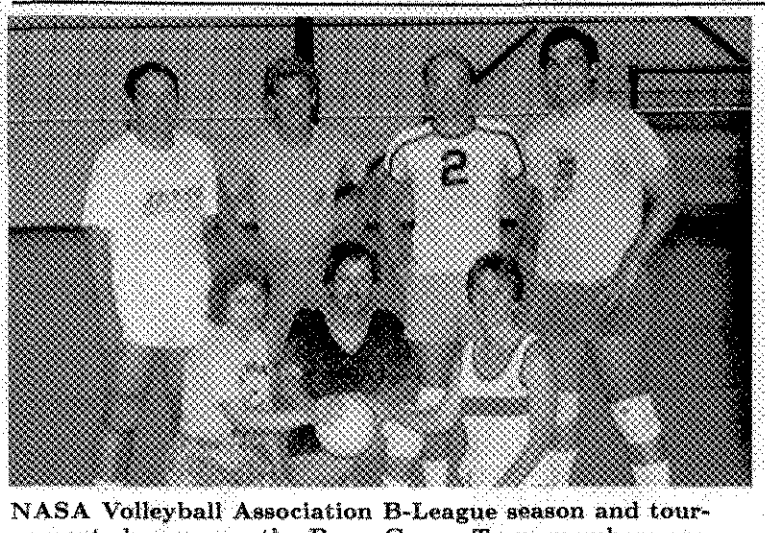
88-54: AST, Experimental Facilities Development, GS-801-14 or 15, Office of Director for Systems Engineering and Operations, Facilities Engineeering Division. Closes August 18.

Langley Stocked Forms Announced

FORM NO.	TITLE	DATE OF FORM
New		
SF 86A	Continuation Sheet for Questionnaire for Sensitive Positions	October 1987
Revised		
LF 2	Forms Supplies Requisition	March 1988
LF 30	Bond Change Form	April 1988
LF 33	Drawing Record Card	July 1988
LF 41	LaRC Directory Change Notice	May 1988
LF 54	Request for Special Leave or Excused Absence (Previous Editions Obsolete)	April 1988
LF 104	Request for Key	April 1988
LF 168	Payroll Multiple Address Form (Previous Editions Obsolete)	May 1988
LF 190	Metrology Control Document	April 1988
SF 86	Questionnaire for Sensitive Positions (After Sept. 1988, only Oct. 1987 edition will be accepted.)	October 1987
Canceled		
LF 60	Material Certification (Replaced by Organizational Form FD N-1545)	June 1988

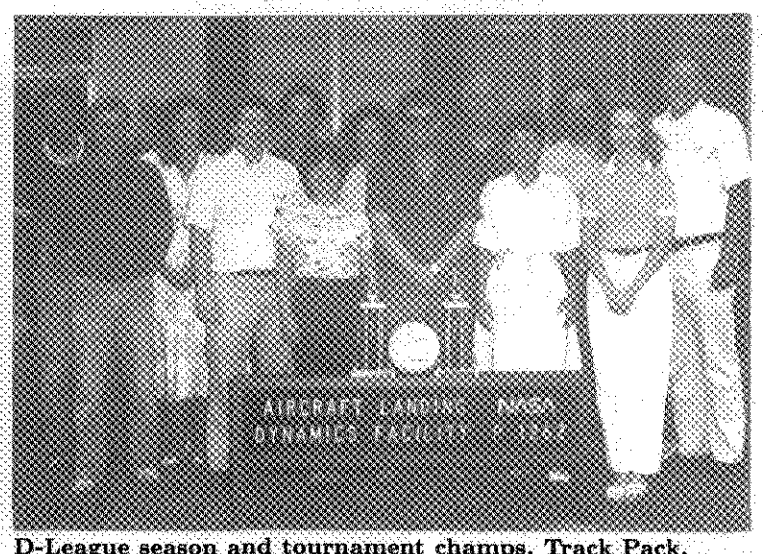
Langley Directives Distributed

DIRECTIVES NO.	TITLE	DATE	T.S.#	DATE DISTR.
Revised				
LHB 1047.1	Change 1, "Disaster Control Data—Hurricanes and High Tides, LaRC Buildings and Equipment"	May 1988	—	6-8-88
LMI 1500.4	"Mail Processing"	6-14-88	1600	6-30-88
LMD 1200.21	Attachment, "Redelegation of Personnel Authority"	6-14-88	1601	7-11-88
—	Table of Contents of Langley Management Manual	6-22-88	1602	7-21-88
—	Index to Langley Management Manual	6-23-88	1603	7-21-88
LMI 1100.23	"Langley Research Center (LaRC) Productivity Programs"	7-14-88	1604	7-25-88
LMI 7410.3	"Acquisition of Commercial Services"	7-15-88	1605	7-25-88
LMI 1100.19	"Committee for University Research Proposals (Fund for Independent Research)	7-15-88	1606	7-21-88


NASA Volleyball Association B-League season and tournament champs are the Brew Crew. Team members are (Front row, L to R) Pam Hess, Bob Hess, Margo Heaney; (Back row, L to R) Mac Jackson, Mike Brewer, Jim Hall and Bill LaMarsh.

C-League season champs, FFBERS, are (left to right) Wade Jackson, John Whitcomb, Mary Swain, Gretchen Murri, Steve Johnson, captain, James Reeder, Reggie Brown, and Rod Martin. Not pictured are Cathy Bigelow, Dave Dawicke, Cindy Lach and Ed Phillips.

C-League tournament champs, Sunsetters, are (Front row, L to R) JoAnne Qualls, Debbie Badi, Doug Stanley, Tricia Romanowski; (Back row, L to R) Garry Qualls, Erick Vedeler, Paul Garn, Melvin Ferebee, Mark Persons, Dave Pidgeon and Brian Secor. Not pictured are Kay Wurster, Jessica Woods, Jeff Farmer and Danny Millman.


D-League season and tournament champs, Track Pack, are (left to right) Phil Robinson, Vern Boyd, Tina Hawks, Bob Daugherty, Wayne Hollenbaugh, Karen Jackson, Pam Davis, Willie Wilkerson, Jim Shipp, Mercedes Lopez, Al Garner, Lisa Jones, and Tom Yager. Not shown is Dave Young.

Just Get the Job Done!

. . . A Treatise on Enlightened Supervisory Techniques

-by Allan C. Hanrahan

"Visitors coming!"

Back in the bad old days, those words were sufficient to propel the electronics grunt bunch of the Fabrication Division into a Martian Fire Drill (don't want to offend any earthly ethnic group, don't you know).

It was pandemonium: All the troops, with stark terror etched in their faces, would fitfully emerge from the trenches, uttering funny animal-like sounds as they lurched and scurried, panic-stricken, in all directions. (It was a bad, bad time, I gotta tell ya!)

But over time, the psychological ploy employed to finagle employees into doing work outside their J.D. (Job Description) began to wear thin. Then, too, visitors really did begin coming to this world of suddering irons and howgozit devices, prompting a union jurisdictional battle: affiliation with the Performing Artists of America or the Actors' Guild?

There were the Actor's Guild proponents: scratching and alternately mumbling or shouting "Stella!" All the time the Performing Artists of America advocates cavorted around waving their capes and quoting Shakespeare, while management lolled about, all-knowing, "Waiting For Godot." (That was a weird time, I wanna tell ya!)

Then came this psychology Age of Englightenment, with its "confrontational counseling" and "relational therapy." For example, you have to confront your problems and differences, and talk them out (or punch your antagonist in the nose), and you must relate to everyone and everything—even the furniture.

That's what this piece is all about, these good new days of "pop psych" and the new-wave relating.

Consider the accompanying photographs. You probably perceive them to be of James E. Bell, Jr., an engineering technician and the training coordinator in the Electronics Branch of the Fabrication Division, assuming the guise of a drill instructor ordering the troops to assemble furniture.

Wrong, fresh-mint breath!

Jim Bell is having a confrontational dialogue with his co-workers; let's listen in.

"Put that table together the way I forgot to tell you to put it together, Mister. Do you hear ME-E-E-E!?"

(That's confrontational alright.)

Now if we could just hear him use the new "relating" techniques of today's school of psychology. Let's listen further—maybe we'll get lucky.

"Okay, Mister, relate that desk top to its side legs. Do you hear ME-E- E-E!?"

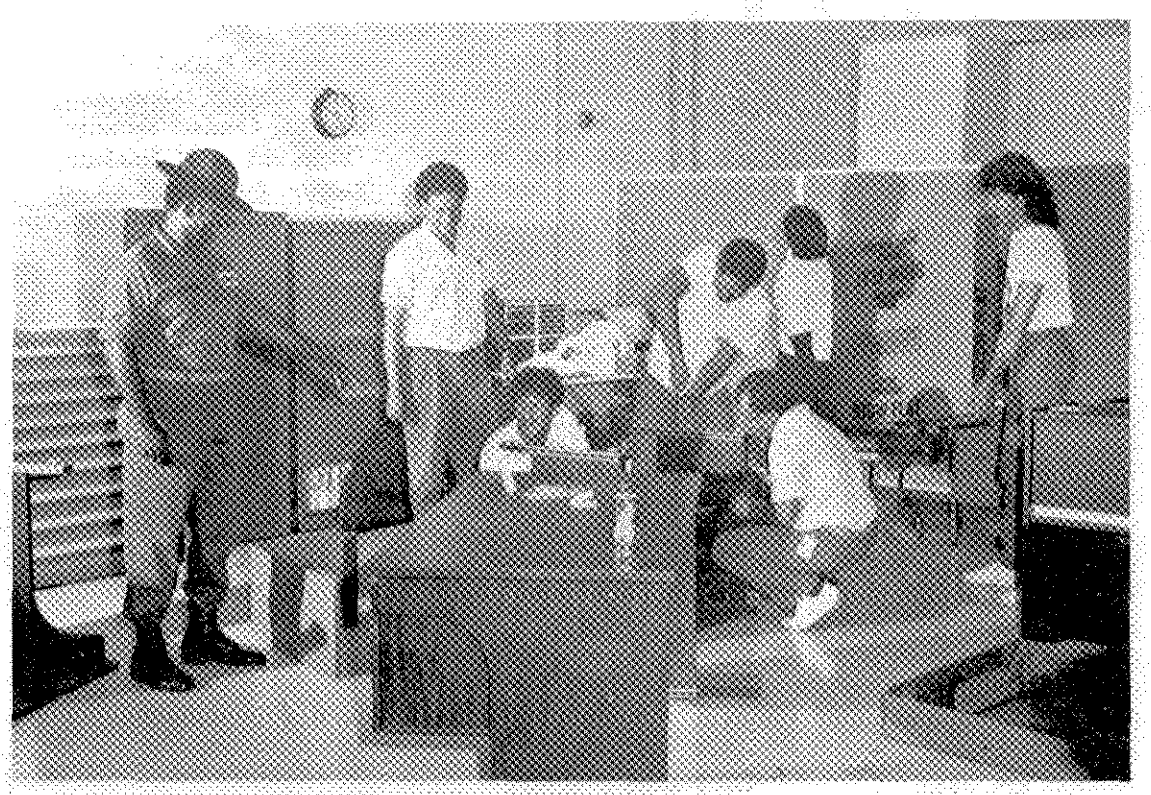
"Yes, sir."

"I don't HEAR-R-R YOU-U-U-U!"

"YES, SIR!"

(Isn't the new school of psychology so much more subtle and conciliatory than that of the past?)

Would you like for Mr. Bell to come conduct seminars in your shop or office the next time you get new furniture?



ORDER GIVEN. Jim Bell uses new interpersonal relations techniques in directing co-workers—all engineering technician trainees in the Electronics Technology Branch of the Fabrication Division—in the assembling of new furniture.

-photos by Don Ward

ORDER RECEIVED. Salute! Acknowledging mis-directions are (L to R) Ben Copeland, Jim Smith, Gene Monroe, John Hopkins, Greg Draughon and Don Kepley.

!!! Carnival Prizes !!!

Cast your vote for Carnival Monarch by buying a Carnival ticket.

Carnival, sponsored by the Langley Activities Association, will be held Friday and Saturday, August 19 and 20. This is the biggest fund-raising event of the year. Bring the whole family and win prizes, prizes, prizes!

Friday, August 19, 5 to 10 p.m.
6 p.m. drawing.....VCR
9 p.m. drawing.....$500 cash
10 p.m. drawing.....$1200 cash

Saturday, August 20, 12 noon to 10 p.m.
6 p.m. drawing.....Color TV
9 p.m. drawing.....$500 cash
10 p.m. drawing.....$1500 cash

$50 drawing every 30 minutes *

*You or a member of your immediate family must be present to win all drawings except for the 6, 9 and 10 p.m. grand drawings.

See you at Carnival...good food...good fun...prizes!

Senior Management Research Review

The Senior Management Research Review will be held Monday, August 15, from 9 to 11 a.m., in Building 1219, Room 225. Following the Director's comments and program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:30	Analysis of Free Shear Flows Using a Spectral Compressible Linear Stability Code (SPECLS)	Michele Macaraeg (Aeronautics/HSAD)
9:45	Computational Validation of a Parabolized Navier-Stokes Solver on a Sharp-Nose Cone at Hypersonic Speeds	Lawrence Huebner (Aeronautics/Dynamic Engineering Inc.)
10:00	Laser Data Base	Patricia Cross (Electronics/FED)
10:15	Development of a Chemistry/Transport Model of the Middle Atmosphere	William Grose (Space/ASD)
10:30	Nonlinear Results Indicate that the Linear Analysis Used in the Design of the ETA Ring is Conservative	John Dorsey (Structures/SDD)
10:45	A Rule-Based Script Generator for Command of Telerobotic Systems	Eric Cooper (Flight Systems/ Planning Research Corp.)

In Memoriam

Sympathy is extended to the families of:

Dorothy P. Wright, who died June 14. Wright retired from NASA as a branch secretary in 1986 after 30 years.

Warren J. Price, who died June 28. Price retired from NASA in 1979 after 33 years of service.

Marvin E. Quisenberry, who died June 30. Quisenberry retired from NASA in 1978 after 28 years of service.

Happenings

FOOTBALL TICKETS. Discount tickets to William & Mary football games are available through the Langley Activities Association. For further information, call the LAA Office, ext. 3139.

MARS VACATION PACKAGE, promotion to benefit the Virginia Air and Space Technology Center, is on sale at the Visitor Center Souvenir Counter for $5.

TOASTMASTERS. NASA Langley Toastmasters will meet Wednesday, August 24, 11:30 a.m. to 1 p.m., in the Activities Center. Could your communications skills stand improvement? Be a guest and find out how Toastmasters can benefit you. Call Natalie Johnson, ext. 3483.

BOWLING. Anyone interested in participating in the NASA Tenpin Bowling League, please contact Pat Gates, ext 2058.

BUSINESS CARDS, formerly available from Pat Gates in the Activities Center, will now be available for order at the Visitor Center Souvenir Counter. For more information, call ext. 2198.

AIAA TRIP to the Flying Circus Air Show and Hot Air Balloon Festival, Bealeton, Va., Saturday, Aug. 20. Bus leaves Activities Center at 10 a.m.; Washington Square parking lot at 10:105 a.m. Cost of Circus/Festival ticket is $8/adult; $4/children under 12; children under 3, free. Call Karen Credeur, ext. 3467, or Ferd Grosveld, ext. 3561, for reservations by Aug. 18. In case of rain in Bealeton, trip will be delayed to Sunday. Call 865-2111 Saturday morning for decision.

FITNESS CENTER ITEMS will be on sale at the Visitor Center Souvenir Counter August 15-18.

BAY DAYS' RAFT RACES. If your secret dream is to build and pilot your own vessel, register for Bay Days' Raft Races to be held September 10. For additional information, call 727-6197. Registration deadline is September 2.

AA AND AL-ANON meetings are held on center. For more information, call the Health Office, ext. 2605, or the Occupational Medical Center, ext. 2246.

FOUND: RING. Wedding band found in cafeteria on July 21. Contact Security Office, ext. 2452, to claim.

LOST: GLOVE. Louisville Slugger 125 softball glove lost July 28 after 5 p.m. on Field #1. If flound, please return to Steve Bene, Bldg. 1238B, ext. 2651, or call Annette Alie at 930-0990. Reward.

WANTED: ROOMMATE. Male to share spacious townhouse in York County near Washington Square. $250/mo. plus 1/2 utilities. Washer/dryer, CA, FP in country kitchen. Immediate occupancy. Call 890-0520.

FOR SALE: AUTO. 1969 Dodge Coronet, 318 V-8, 4-dr sedan, one owner, AT, PS, PB, AC, looks good, runs well. $450. Call 596-3991 evenings.

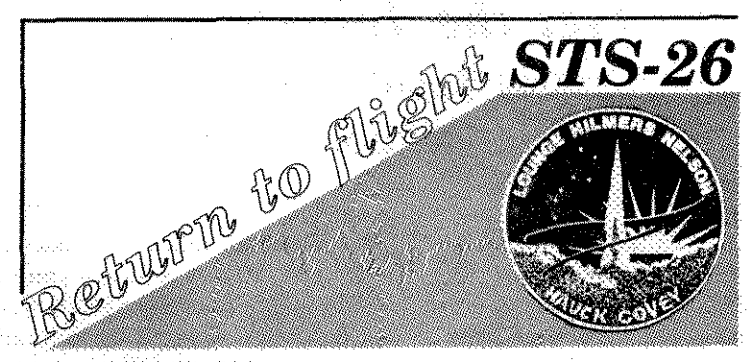
FOR SALE: SAILBOAT. 14 ft. Sunfish-type sailboat, fiberglass. Good condition. $200 or BRO. Call 898-4198.

FOR RENT: EXECUTIVE SUITE, Windward Towers, waterfront, 1 BR, many ammenities. Owner will pay association dues. $725/month. Available immediately. Call Edith Lichtenstein, 596-8484 or 595-6674.

Av Week Video

The latest **Aviation Week** video, "X-Planes, covers the X-series from the x-1 through x-30. To borrow the VHS tape, call Edith Watts, ext. 3017.

The tape is copyrighted and may not be reproduced; it will be loaned on a first come, first served basis.



Press Briefing/Crew Press Conference

Background briefings and an astronaut press conference for the 26th Space Shuttle mission will be held at the Johnson Space Center, Houston, on Monday, August 22. These events will be carried by NASA Select television and will be shown on Center in Room 115, Building 1201, the Video Conference Center located across from the Cafeteria. Limited seating is available and will be on a first come, first served basis.

Background briefings will cover an overview of the flight, hardware and software changes to the Shuttle system made since the Challenger accident, the crew escape system and associated equipment, the launch decision process and organizational changes in NASA, and the payloads to be carried on the flight.

The briefings begin at 9 a.m. EDT and should be completed by 5 p.m. The astronaut crew press conference will begin at 2 p.m. EDT.

Dial-A-Shuttle Service Returns

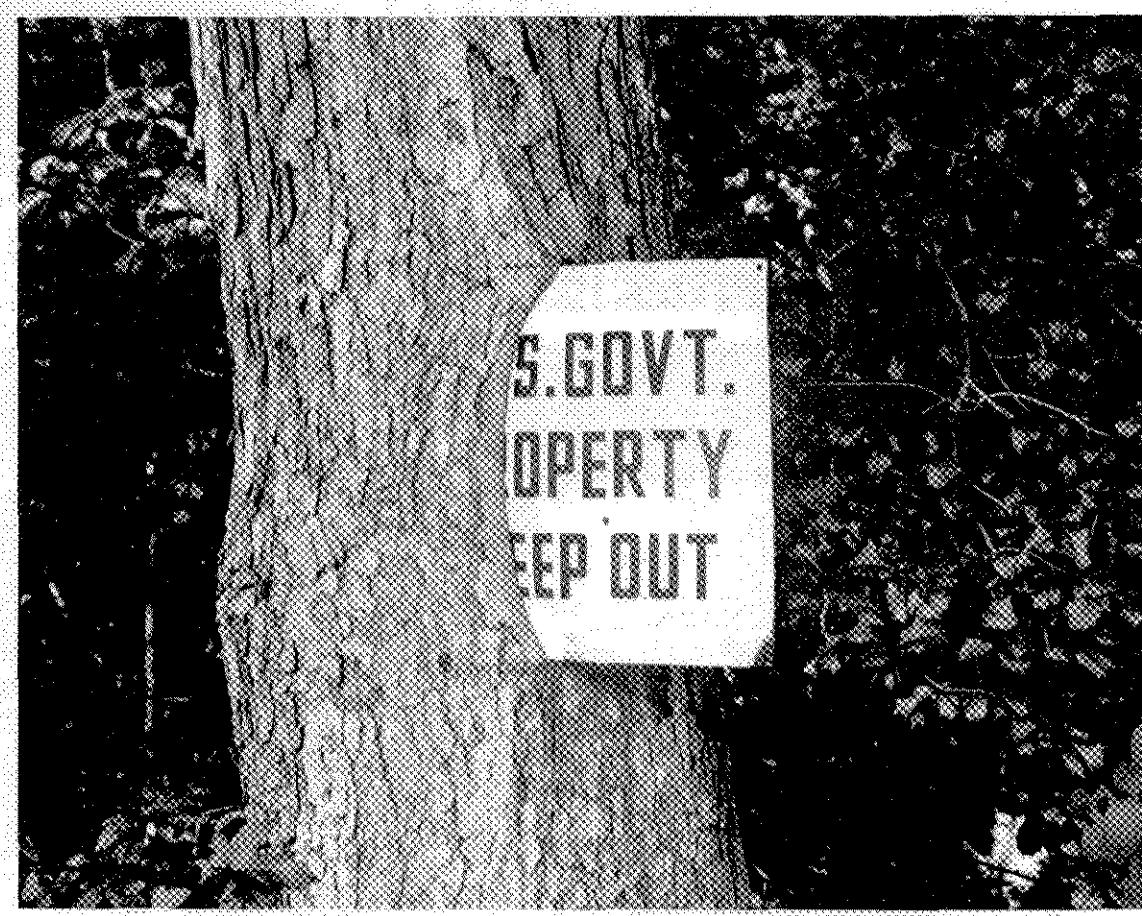
When the Space Shuttle Discovery launches, you can be involved in America's return to space. A special call-in telephone service called Dial-a-Shuttle will provide live broadcasts of conversation between the Space Shuttle astronauts and Mission Control.

Produced by the National Space Society (NSS), Dial-a-Shuttle will operate continuously throughout the mission, providing, when available, real-time live communications.

Callers in the United States can listen in on the astronauts by dialing 1-900-909-NASA. Toll charges for listeners are $2 for the first minute and 45 cents for each additional minute. Under a new FCC tariff plan, NSS will receive a portion of these toll charges.

The 24-hour Dial-a-Shuttle service, broadcast from the Johnson Space Center and produced with the cooperation of NASA, will begin two hours before launch and will conclude with the post-landing press conference after the four-day mission.

When and if the possibility arises, announcers will broadcast the sky coordinates of Shuttle sightings.



COULD THIS BE THE SITE OF A STRATEGIC PLANNING MEETING OR HAS THE GOVERNMENT GONE TOO FAR? This is the question asked by Langley head photographer, Bill Salyer, who couldn't pass up this photo opportunity observed on his way home in the Williamsburg area.

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

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 2, Issue 17 August 26, 1988

News Researcher

Bi-weekly Employee and Contractor Publication

Langley Plans Combined Federal Campaign Events

August marks the time of year when the Langley Research Center begins to develop plans for its Combined Federal Campaign.

This year Langley Director Richard H. Petersen has launched the campaign by selecting a committee led by H. Milton Holt to oversee campaign activities.

Langley will conduct a one-day solicitation on Wednesday, October 5, preceded by a kickoff meeting for division chairmen, key solicitors and new employees on Tuesday, September 27, from 2 to 3 p.m. in the Activities Center.

This is the only time during the year that government employees are asked to consider the needs of others by contributing to many worthy health, welfare and community service organizations. The funds provided to these agencies permit them to relieve suffering, provide care for the young, aged, homeless and hungry, bring hope to the depressed, and to improve the quality of life for everyone, not only on the Virginia Peninsula but around the world. It is the one campaign which helps people—our families, friends and neighbors— all year long.

Petersen has asked that Langley continue to support the campaign as the Center has in the past. Let's continue that tradition this year by putting others before ourselves.

Remember that most of the CFC gifts are used directly to make the Peninsula a better place to live and raise our families. The money you contribute may some day help a member of your own family. Give generously to the Combined Federal Campaign.

photo by Sandie Horsey

CFC COMMITTEE CHOSEN. Langley's Combined Federal Campaign committee for 1988-89 has been named by Director Richard H. Petersen. Committee members are (L to R) Jo Ann H. Woodcock, Information Systems Division, Secretary; James P. Arrington, Assistant Chief of the Space Systems Division, Co-Chairman; Jean Clough, Office of External Affairs, Publicity Chairman; Thomas Vranas, Fabrication Division, Pattern Markers Union; H. Milton Holt, Chief of the Information Systems Division, Chairman; Cassandra G. Favor, Financial Management Division, Financial Chairman; Roscoe C. Edge, Personnel Division, NASA-Union Liaison; and Joyce M. Wright, Langley Alumni Association. Not pictured are Ben J. Schlichenmayer, Operations Support Division, American Federation of Government Employees Union, and A. Gary Price, OEA, Langley's representative to the Peninsula CFC.

Sliwa Receives Fellowship for Stanford Sloan Program

Dr. Steven M. Sliwa, assistant chief of the Guidance and Control Division, has been selected for the Stanford Sloan Fellowhsip Program for 1988-89. The executive development fellowship program offers Sliwa an opportunity to spend an academic year at Stanford University where he will pursue a master of science degree in management.

The program is designed for middle managers who have been clearly identified as potential top executives moving from narrow fields of specialization into general management. Sliwa says he has been transitioning from researcher to manager with increasing levels of responsibility and hopes to be able to build a strong foundation for his advancement as a manager and leader through both formal class work and informal associations experienced in the program.

"I hope that I will be able to accelerate the further development of my management skills through the Sloan program's intensive course of study," Sliwa explained. "I think the insight gained from other Sloan fellows' perspectives, especially those from large corporate or financial organizations, will be useful as I help to implement government research programs of the future that are designed to have maximum positive effect upon the growth of the U.S. economy."

Steven M. Sliwa

Sliwa joined the Langley staff in September 1978 as an aerospace technologist. He has served in several branch-level positions at Langley and on a temporary managerial assignment at NASA Headquarters. In his present position, Sliwa is responsible for planning, advocating and leading research in the development of guidance and controls technology and microwave systems for aerospace vehicles.

The author of 31 technical papers, Sliwa has received three outstanding performance citations for his work. He is a senior member of the American Institute of Aeronautics and Astronautics.

Sliwa and Willshire Selected for Simmons Graduate School of Management

Two Langley aerospace technologists have been selected for the Simmons College Graduate Management Development Program.

Nancy Orlando Sliwa of the Automation Technology Branch, Information Systems Division, and Dr. Kelli F. Willshire of the Technology Office, Space Station Office, will attend an eight-week program to better prepare themselves for high levels of management.

The program, started in 1977, has gained wide response and recognition for its unique curriculum and excellent education. The curriculum is divided into functional and behavorial courses.

The functional courses cover accounting, finance, operations, marketing, quantitative skills, management information systems, strategy and economics and the relationships of a specific function to the organization as a whole.

The behavorial courses examine the complexities of managing people in organizations and develop strategies and the practical skills necessary to be an effective manager. In addition, these courses examine the differences between male and female behavior in organizations, analyze the implications of these differences and encourage participants to adopt strategies for implementation at work.

Nancy O. Sliwa

Kelli F. Willshire

Sliwa believes "NASA will have a critical need for competent and dedicated management in the near future." She said, "I have a very strong loyalty to NASA and wish to make a significant contribution to its future. I feel my innate talents make me suitable for technical management, and my multiple research interests require that I direct a team to pursue them. I expect the Simmons program will equip me to shoulder significant management responsibility by teaching me techniques for managing both programs and people.

A member of the Langley staff since 1981, Sliwa works with computer techniques attempting to make human-controlled robotic devices more intelligent and adaptable so they can safely be used in future space operations, such as the construction of the Space Station Freedom.

Willshire says one of her career goals is to become a top-level manager with NASA. "I expect all the functional areas to be of benefit to me in striving for that goal," she explained. "However, I am particularly interested in studying methods for increasing and quantifying productivity of engineers and scientists and for the effective introduction and use of automation technology for these types of individuals."

Willshire began her NASA career in 1979 as an engineering research psychologist in the Acoustics Division and now promotes automation and robotics technology development for Space Station Freedom.

News Briefs

HEADQUARTERS, Washington, D.C. — Gary L. Tesch has been appointed NASA deputy general counsel. Tesch joined NASA in 1968 as a procurement law specialist in the Office of General Counsel at NASA Headquarters. Between 1980 and 1982, he served as the chief counsel of NASA's Goddard Space Flight Center. In 1982, he returned to NASA Headquarters as associate general counsel (contracts) and have served in that capacity until the present appointment.

SPACE SCIENCE TELESCOPE INSTITUTE, Baltimore, Md. — Astronomers at NASA's Space Telescope Science Institute and the University of California at Berkeley have uncovered the most distant galaxy yet seen. Called 4C41.17, the newly-discovered galaxy is located at an estimated distance of 15 billion light years—more than 90 percent of the distance to the visible limits of the universe.

HEADQUARTERS, Washington, D.C. — Admiral Richard H. Truly, NASA associate admininstrator for space flight, and his management council decided to proceed with changing out the hydrogen bleed valve on Discovery's main engine 2 prior to the flight readiness firing (FRF). Truly indicated, "We are opting for a procedure which will give us additional confidence to move forward to the FRF. I am very pleased with the efforts of the teams who did the troubleshooting on this situation and also with those who took us through our recent countdown simulation activities."

JOHNSON SPACE CENTER, Houston, Texas — JSC has signed a definitive contract with Boeing Military Airplanes, Wichita, Jan., to modify a Boeing 747-100 aircraft for use as a second Shuttle Carrier Aircraft (SCA). Space Shuttle orbiters are ferried "piggy-back" atop the SCA from any Shuttle landing site to orbiter processing facilities at the Kennedy Space Center, Florida. The additional SCA will provide backup ferrying capability.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — The fifth and final test firing of NASA's redesigned Space Shuttle solid rocket motor, prior to resumption of Shuttle flights, was scheduled for 1 p.m. MDT Thursday, Aug. 18, at Morton Thiokol's Space Operation facility near Brigham City, Utah.

HEADQUARTERS, Washington, D.C. — In a step to encourage the growth of a strong U.S. commercial space industry, NASA has agreed to provide six, shared Space Shuttle flights for a privately developed and financed middeck augmentation module. SPACEHAB, Inc., based in Washington, D.C., has initiated final design and construction of a pressurized module that will augment the existing pressurized volume of the Space Shuttle middeck. The company is marketing access to the module and its support facilities on a commercial basis.

Terry L. St. Clair

Anne K. St. Clair

Leonard M. Weinstein

SPACE ACT AWARDS were recently presented to three Langley employees. Terry L. St. Clair and Anne K. St. Clair were recognized for their development of a process for preparing highly optically transparent/colorless aromatic polyimide film. Leonard M. Weinstein invented an ice detector for aircraft that can accurately determine the presence and thickness of ice and control devices to remove it. Space Act Awards provide recognition of and monetary reward for those scientific and technical contributions that have helped to achieve NASA's aeronautical and space goals.

Langley

Headquarters Forum

"If you don't know where you're going, any road will take you there."

We've all heard this before—it is the fundamental reason why, in 1985, the Center Director and the Senior Staff began a formal process of strategic planning.

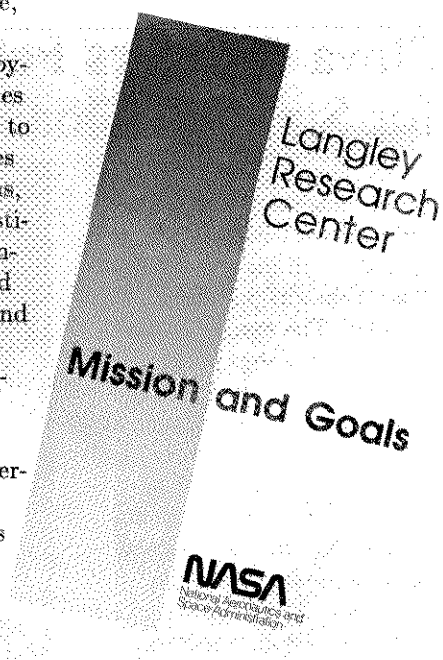
Under the able leadership of then-Associate Director Bob Bower, a planning process was developed which is very much in use today. In addition to monthly meetings where issues—such as how to organize and manage the new Control Structures Interaction research program—are discussed, off-site retreats afford the opportunity to discuss issues such as: Is the content of our research program consistent with our mission and goals? Does our training and development program adequately support the needs of our employees? What should our hiring plan be for specific skills during the next several years?

Often I am asked for a copy of our strategic plan and I eagerly respond that the Mission and Goals brochure, which was recently distributed to all of our employees, is our plan. It delineates what we are, what we plan to continue to be, and provides the basis for major decisions, both programmatic and institutional. The strategic planning process, which resulted in the Mission Statement and Goals, provides the process wherein the Senior Staff decide appropriate courses of action for the Center.

In addition to the Center-level planning process, each of the directorates has planning activities in place which are complementary. For each of the goals outlined in the Mission and Goals brochure, objectives have been developed which provide the focus for the directorate decision makers.

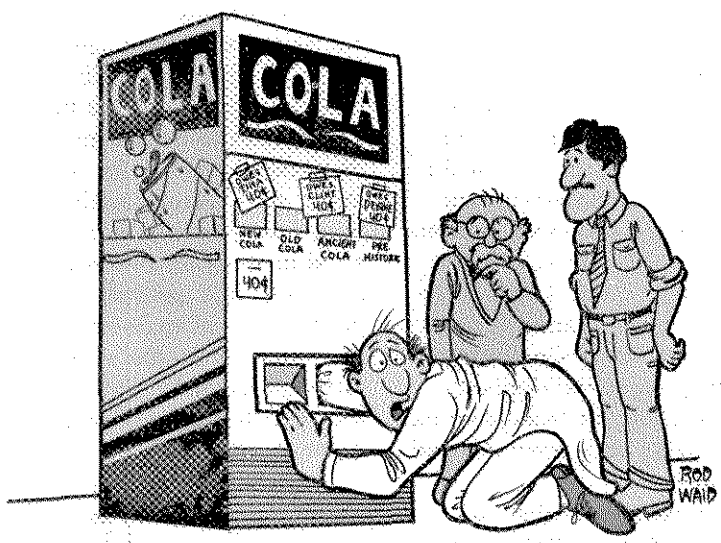
We feel that a successful strategic planning process is critical to the future of the Center, and that it is important that everyone understands what we are trying to do.

Sidney F. Pauls
Associate Director



Additional copies of the LaRC Mission and Goals statement are available by contacting Edith Watts, Mail Stop 146, ext. 3017.

Lankley



"QUICK, SOMEONE PUT IN 40 CENTS!"

Scout Rocket to Lauch Navy Navigation Satellites

As of press time, NASA plans to launch two U.S. Navy navigational satellites aboard a Scout rocket August 24 from Vandenberg Air Force Base, Calif.

The pair of Oscar satellites weighs 141 pounds each and will be placed into a 600-nautical-mile circular polar orbit. The Oscars are part of the Navy's long established continuous all-weather global navigation system.

The Navy Navigation Satellite System has served the military and more than 60,000 civilian users for more than two decades by providing position information within one-tenth of a nautical mile anywhere in the world. Over the years the spacecraft have been adapted for diverse uses such as commercial shipping, charting of offshore oil and mineral deposits and land survey programs.

This 112th Scout launch marks the fourth and final Scout scheduled for launch this year and the second launch for the SOOS program. Successful missions this year were the Scout San Marco D/L launched March 25 from the San Marco range platform in the Indian Ocean, and SOOS-3 launched April 25 and NOVA-II launched June 15, both from Vandenberg.

The Scout program is managed by Langley Research Center. The four stage, solid-propellant rockets are built by the Missiles Division of LTV Missiles and Electronics Group, Dallas, Texas.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865-3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

In-House Flight Research Experiment in Flight Test Phase

Vortex Flap Promises Increased Maneuverability for Fighter Aircraft

Take an old aircraft and a new concept. Gradually add the intuitive minds and skilled hands of over 200 Langley researchers, engineers and technicians. The result is a flight research experiment that promises to increase the maneuverability of swept wing fighter aircraft by as much as 20 percent.

Flight testing of the vortex flap research experiment began this month. First flight occurred shortly after 11 a.m. on Tuesday, August 2. Initial results delighted team members who reported "no surprises"— a good sign indicating verification of research expectations.

Phil Brown, NASA research pilot, was in the cockpit for the first flight. "Although pitch stability was reduced by adding the vortex flap to the F-106B, the airplane has, so far, proved to be only slightly more demanding to fly than the basic airplane and considerably easier to control than the simulator," notes Brown.

Flight testing of the vortex flap follows five years of study encompassing nearly 3,000 hours of wind tunnel testing and hundreds of computer design hours as well as a series of high-speed taxi tests conducted in late July.

Ron Smith, flight project engineer, estimates that approximately 220 people on Center were involved in one way or another. Support for the vortex flap experiment spanned three Directorates. "It's been a Center project from beginning to end, involving lots of truly committed people and making maximum use of existing resources," says Smith.

The vortex flap is an addition to the front of the wing designed to improve the performance capabilities of swept wing aircraft. The concept, identified in the late 70s, promises to address the dilemma faced by designers of fighter aircraft: speed vs maneuverability. Highly swept wings assure speed; but unswept wings are preferrable for the high lift needed for combat maneuvers and short takeoffs and landings.

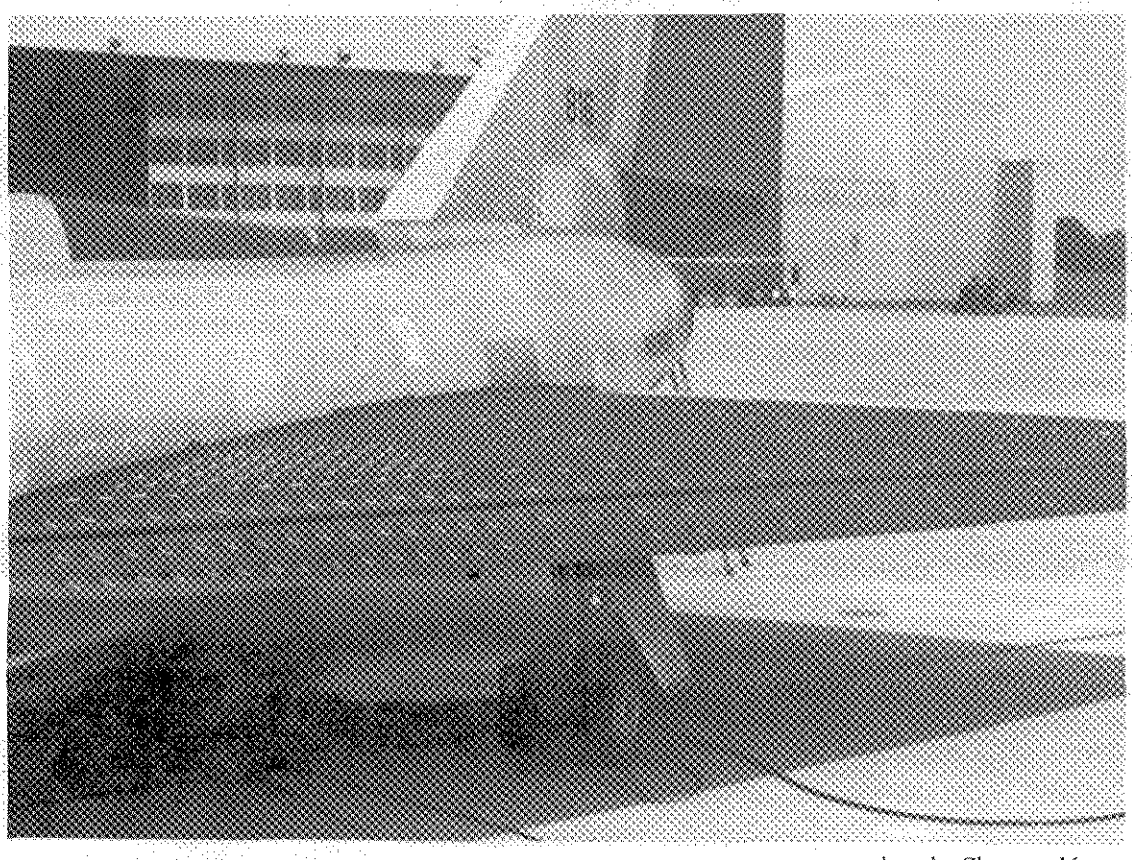
'Watch the skies above Langley in the months ahead. You just may get a glimpse of the future.'
-Roy Harris

Even more radical than just extending the forward edge of the wing, the vortex flap is a **sharp** extension of the leading edge. This sharp extension, deflected downward, purposely detaches the airflow over the wing and forms a tornado-like vortex on the flap, thereby creating a suction force that reduces drag.

The Langley F-106B was identified as the focus aircraft for this flight research experiment. Chosen from three candidate vehicles, the F-106 offered the right wing sweep and the relative ease of structural modifications to accommodate the vortex flap.

Principal investigator Jim Hallissy teamed with Neal Frink to do a preliminary assessment of the realistic constraints of the aircraft that had to be dealt with in designing the vortex flap. Taking a 30-year old airplane and refitting it to evaluate the concept was their challenge. Hallissy cites one example: "We needed to find out just how much of the wing could be modified. For instance, we were not permitted to penetrate the fuel cells. Since most of the wing is used to store fuel, structural modifications could be made only in the wing leading edge and tip areas."

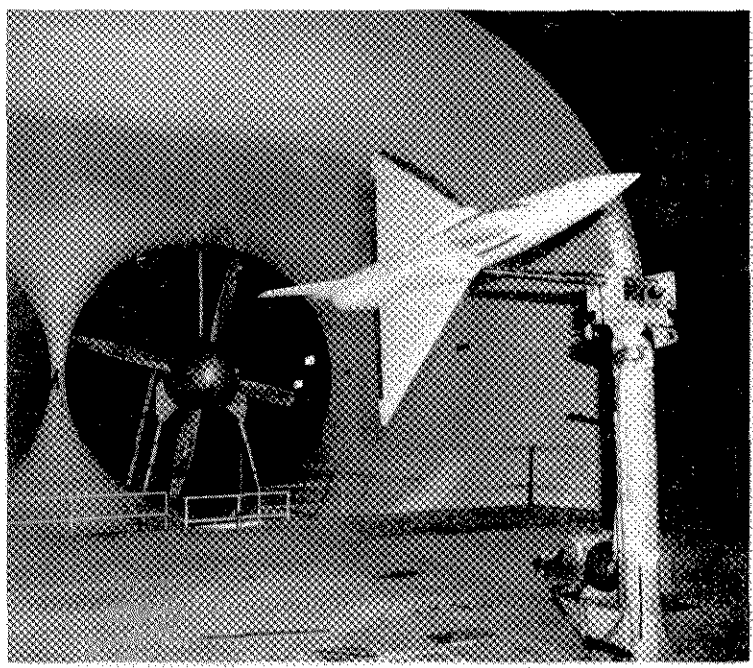
(See Vortex Flap on page 4.)



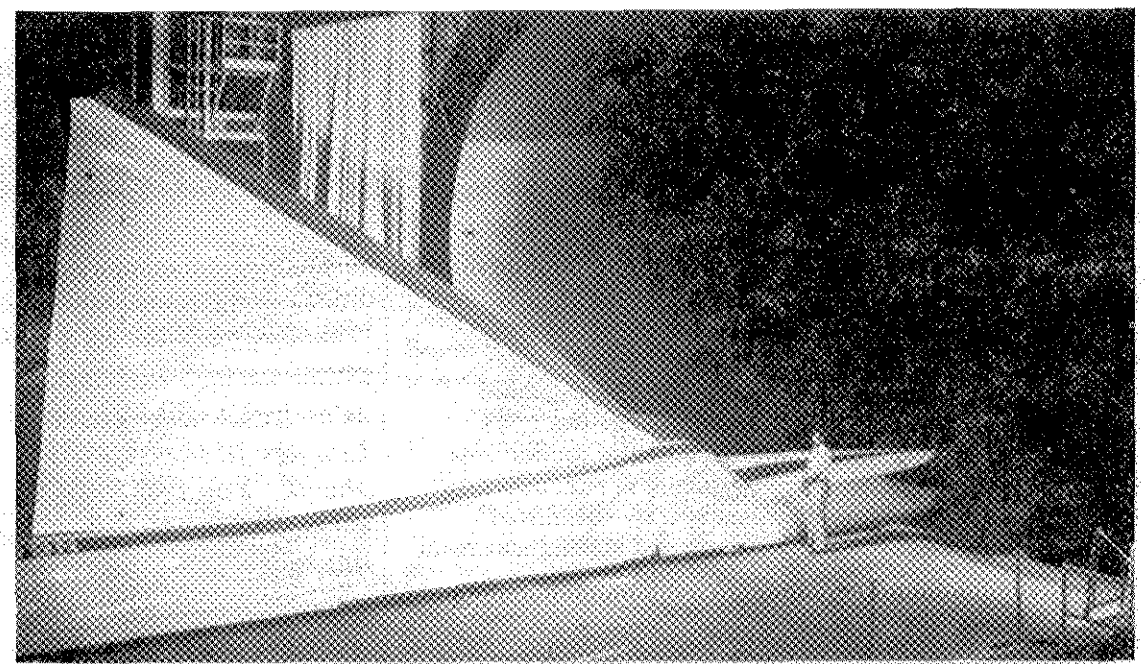
-photo by Clements Mayes

A close up look at the vortex flap—a sharp extension to the leading edge of Langley's F-106B. Now in the flight test phase, the vortex flap experiment promises to increase the maneuverability of swept wing fighter aircraft by as much as 20 percent.

Ron Smith, flight project engineer, estimates about half the Center employees involved in the vortex flap experiment were present for this group photograph taken in front of the refitted F-106B.



WIND TUNNEL TESTING. A 15-percent-scale model of the F-106B with the vortex flap is set up for dynamic stability tests in the 30- by 60-ft. tunnel.



F-53 TESTED IN THE FULL SCALE TUNNEL. A full scale F-106 sawed in half—and dubbed the F-53—underwent static stability and control tests at Langley.

Vortex Flap Experiment: An Extensive In-House Effort

(Continued from page 3.)

As a result of that assessment, several design points were identified around which initial shapes for the vortex flap were developed. From the geometry developed here, airplane model parts were built and tested in the 7 ft. by 10 ft. wind tunnel and later in the transonic tunnels at Langley and Ames.

Low-speed evaluations on a 15 percent scale model were conducted by a team assembled by Joe Johnson. Additional testing was performed on a full-scale F-106 that had been sawed in half (dubbed the F-53) and tested in the Langley 30 ft. by 60 ft., full scale wind tunnel.

Flight characteristics and handling qualities were further investigated through a piloted-simulation study developed by Jay Brandon and piloted by NASA research pilot Phil Brown and USAF test pilot Al Wunschel. Computational, wind tunnel and simulation data gathered, the engineers were called in.

Joe Pride and his team were involved in the mechanical design and fabrication of the vortex flap—a program he refers to as "an ambitious use of in-house resources."

Garland Goodwin, engineering specialist, PRC Kentron, describes his function as "the translation from theory to practice." He was tasked by Pride to "find a way to put that **theoretical** flap on that **real** F- 106."

In 1985 an engineering feasibility study commenced to investigate how the research concept would be integrated to the airplane. Pride's concern was what the loads on the aircraft would be in flight and how to size the structural members. "Our major job in engineering," says Pride, "was to come up with the basic structural design. We had to turn out 70-75 drawings and then do the proper analysis work."

Over a period of two years a lot of fabrication people—from the fab shop, the machine shop, the model shop—were involved. "It was an extensive in-house effort." A few changes along the way were necessary as we tried to custom fit to an airplane that was manufactured over 30 years ago, Pride adds.

'It's been a Center project from beginning to end, involving lots of truly committed people and making maximum use of existing resources.'

-Ron Smith

The flaps were fabricated on Center and installed on the aircraft by Langley technicians. Instrumentation was designed and installed by Langley instrumentation specialists. Three-hundred-nineteen orifices for wing pressure measurements have been installed and 65 strain gages for real-time load path monitoring have been activated.

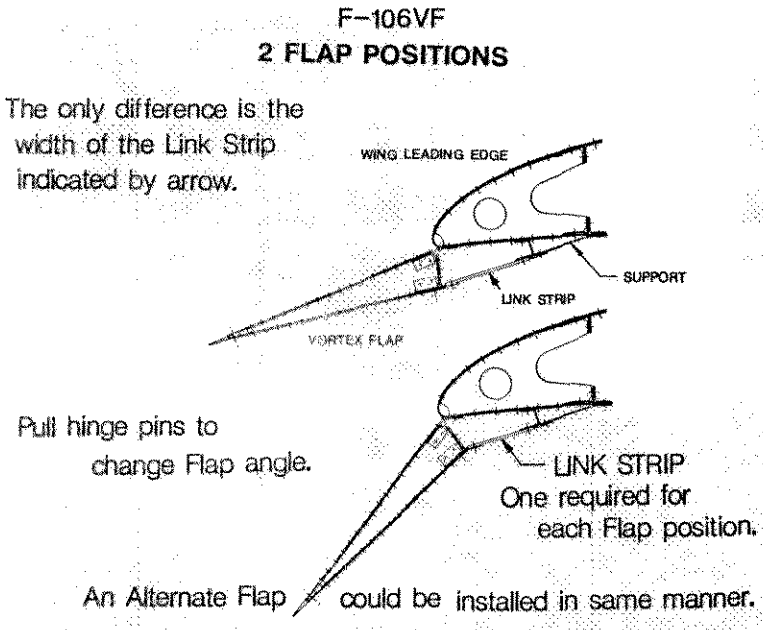
The strain gages and dynamic sensors are monitored on the ground via telemetered data link. Computers instantly review the output against pre-determined limits. If a limit is approached, a warning is radioed to the test pilot to unload the aircraft by limiting the test maneuver. There were no alarms during the first flight!

Roy Harris, director for aeronautics, remarked in a recent **Researcher News** editorial: "The vortex flap is an excellent example of the kind of Langley research that can be carried all the way from idea, to calculations, to sub-scale tests, to flight validation, and provide 'real world' feedback to the researchers."

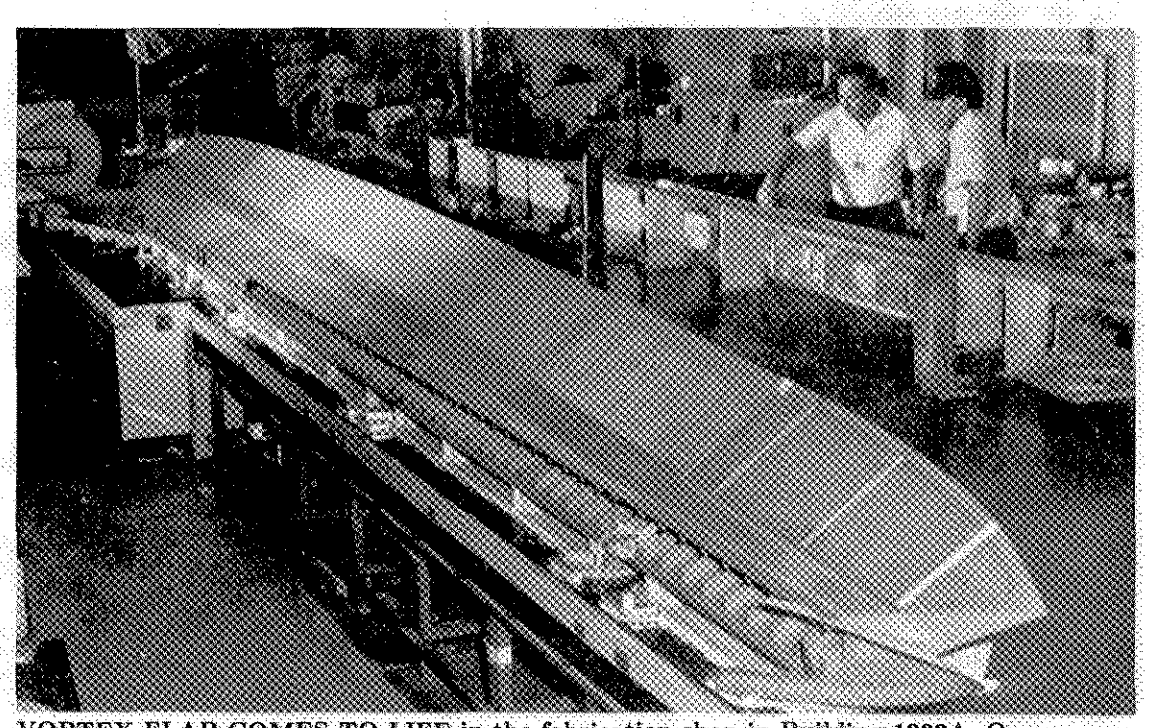
The F-106B has had a long history with NASA. First entering the inventory in the mid 1960s, it was used by Lewis Research Center to investigate supersonic transport propulsion systems. Then, at Langley, the F-106 was used in storm hazards research. Now the 30-year old airplane is matched with another new idea—to improve maneuverability of fighter aircraft.

Ron Smith looks ahead to further advantages of the vortex flap concept. "On any similar delta wing configuration, you could probably design the vortex flap to improve takeoff and landing characteristics. The implication is that on a supersonic transport, if you could improve the lift to drag ratio by 20 percent and take off with better aerodynamics—more lift, then you wouldn't have to light the afterburner and the noise would be significantly lower. That's another potential we see."

Roy Harris passes on a tip: "Watch the skies above Langley in the months ahead. You just may get a glimpse of the future."



GARLAND GOODWIN'S SOLUTION to attaching the vortex flap to the existing leading edge of the F-106B involves a hinged attachment, a link strip and a support structure. The vortex flap, which ideally will be moveable in flight, can be fixed to four different angles by pulling the hinge pins and inserting the appropriate link strip for the angle desired.



VORTEX FLAP COMES TO LIFE in the fabrication shop in Building 1232A. On an extremely long surface table lies the leading edges of an F-106B to which support structures have been mounted and the vortex flap attached. A wooden cradle was fashioned to maintain alignment of the existing leading edges while each segment of the vortex flap was custom built and then attached.

Employees Support Bloodmobile

A total of 322 Langley employees, retirees and contractors donated pints of blood at the July 27 visit of the American Red Cross Bloodmobile.

Achieving gallon status were:

12 gallons — Stanley L. Pearce and William G. Chapin;

10 gallons — Nelson L. Seabolt;

8 gallons — Sharon K. Crockett and Barr L. Price;

7 gallons — Richard G. Bouth, Jr. and Clyde Lane;

6 gallons — Robert L. Spruill, Joseph Price, F. Wayne Barfoot, J. Richard Rawls, Spencer C. Johnson and Walton Wade;

5 gallons — Howard W. Wilson and Ralph G. Angel, Jr.;

4 gallons — Ronald J. Logioco;

3 gallons — Richard E. Bloxow, Henry E. Freeman, Jr., Craig B. Kornegay, Preston I. Carraway, III, and Brenda M. Sullivan;

2 gallons — Patricia Watts, Anita Flowe, John R. Carlson, Diane C. Griffin, Daniels J. Carey, Ralph E. Hood and Cornelius J. O'Connor;

1 gallon — Stephen Geissinger, Ralph W. Will, Tammy L. Spellman, Ralph Buehrle, and John A. Wagner;

First timers — David R. Barnes, Catherine S. Gallaway, Robert C. Redman, Jr., Cheryl L. Allen, Daniel M. Pasko, John W. Lasley, Twanda L. Copling, Cindy Love, Shirley M. Jones, Edward L. Kirby and Edward E. Adcock.

NASA coordinator for the Bloodmobile visit was Annette L. Forrest; Red Cross coordinator was Rachael Fotner. Special thanks are extended to the Langley Credit Union for donating coffee and donuts.

Positions Open

The following Competitive Placement Positions are currently open:

88-55: Engineering Technician, GS-802-9 or 10, Systems Engineering Division, Systems Development Branch, Systems Development Support Section. Closes August 31.

Supervisory Electronics of Materials, AST, Electronics of Materials, GM-1310-13 or 14, Office of Director for Electronics, Instrument Research Division, Nondestructive Measurement Science Branch. Closes August 31.

MLB Enterprises, Inc., LaRC Groundskeeping and Pest Control Support Services Contractor, recently held Employee Appreciation Day. Recognized for outstanding contributions to the company's mission were (L to R) Ernest Todd, Safety Award winner; Jackie Trent, Employee of the Year; and Phillip Seymore, Most Impressive New Hire. Awards were presented by Michael Brittin, contractor manager.

Harvey's Janitorial Service, Inc. recognizes employee teams who have excelled on their Facility Evaluation Reports. The award committee convened on August 1 and selected Crew #3, Night Shift, for the Crew of the Month for July. This crew received a score of 94.5 out of a possible 95 points. Team members are (L to R) Alfred Hudgins, Monique Hummel and Linwood Byrd.

From Behind the Scenes

VAB Personnel All Fired Up About Safety

Lance Bush, Langley aerospace engineer, dons firefighting gear and tries his hand at extinguishing a gasoline fire intentionally set during a fire safety briefing. Organized by Jim Youngblood, the hands-on demonstration gave researchers in the Vehicle Analysis Branch (VAB) an opportunity to use a fire extinguisher in a non-threatening environment.

Firefighters Steve Cappendyck and Henery Estes III, who conducted the safety briefing, are part of the 28-man Langley team that advocates fire prevention through frequent inspection of facilities and equipment as well as fire safety training through evacuation drills and pre-fire planning. The on-Center fire station—manned 24 hours a day, 365 days a year—is a cooperative effort of NASA Langley and the City of Hampton.

'The Hardest Thing is to Say Goodbye'

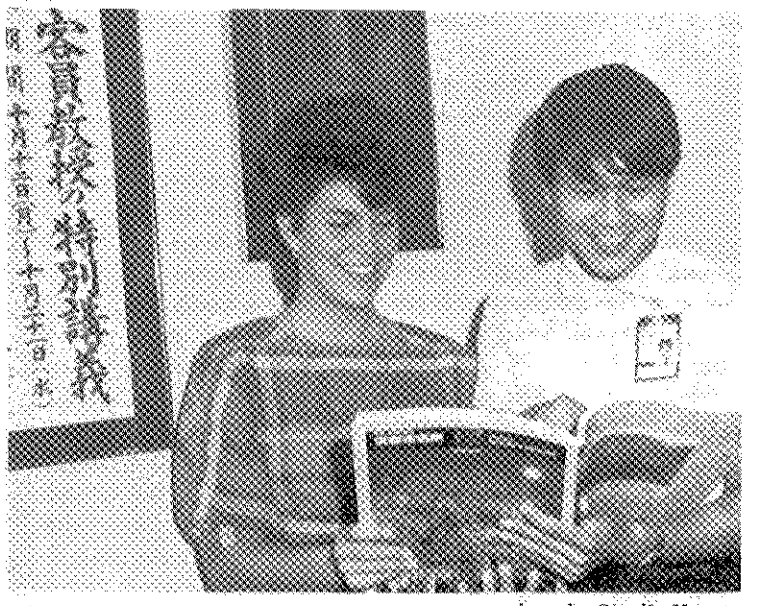
Susan Edwards, branch secretary for the Chemistry and Dynamics Branch, ends a seven-year career at Langley to follow a dream.

"I've always wanted to travel," Edwards explains. In pursuit of that desire she has accepted a job with the State Department Foreign Service Program. After a six-week extensive training program in Washington, D.C., Edwards will leave for Tokyo to join the staff of former Senator Mike Mansfield, American Ambassador to Japan.

During her six weeks in Washington, Edwards will study Japanese culture and begin a crash course in the language. Her command of Japanese is now limited to three words—hello, good afternoon and goodbye—but communication is not a problem for Edwards. Her warm personality and enthusiasm is sure to light up the American Embassy in Tokyo which she will call home for the next two years.

A 1981 graduate of Bethel High School in Hampton, Edwards came to NASA Langley as a secretary in the co-op program. She earned an associate's degree in secretarial science from Thomas Nelson Community College. While at Langley, she has worked in Personnel, the Analysis and Computation Division and, most recently, in the Atmospheric Sciences Division.

Enthusiastic about the opportunity before her, Edwards confesses the hardest part of her decision is having to say goodbye—to family, friends and co- workers. The Foreign Service application process involved rigorous medical and security checks and spanned a two-year time frame. "For two years now, I've looked forward to State Department acceptance. I'm so excited but, at the same time, it's so hard to say goodbye."



-photo by Sandie Horsey

Keisuke Asai (right) gives Susan Edwards a quick lesson in reading Japanese before she departs for the State Department Foreign Service appointment in Toyko. Asai, a resident of Toyko, is working for a year at Langley with Dr. Robert Kilgore.

Happenings

LAA SOCIAL will be held Friday, September 2, from 4 to 6:30 p.m. in the Activities Center.

CAR POOL MEMBER wanted from Gloucester. 7 a.m. shift. contact Parrish, ext. 4683 or Burner, ext. 3234.

WANTED: ROOMMATE, female to share new 3 BR/2 BA house off Saunders Rd. $250/mo. plus 1/2 utilities. Washer, dryer, dishwasher. Available Aug. 1. contact Cathy, ext. 2576.

FREE: PUPPIES. Two adorable puppies free to a good home. Call 693-0052 any time.

WANTED: ROOMMATE. Large furnished bedroom with private bath. Denbigh area near Newport News Park. $300/month plus toll calls. Immediate occupancy. Call 874-3247; leave message on recorder.

WANTED: ROOMMATE, male to share spacious townhouse in York County near Washington Square. $250/mo. plus 1/2 utilities. Washer/dryer, CA, FP in country kitchen. Immediate occupancy. Call 890-0520.

FOR SALE: AUTO. Chevy Impala S/W, 78, AT, PS, PB, V8, good condition, with new tires, carburetor (5 months). $500. Call Stefan at 865-4646.

Retirement Parties

Faith M. Allen will be honored at a retirement dinner on Friday, September 9, in the Activities Center. Cocktails (cash bar) will begin at 6:30 p.m.; prime rib dinner follows at 7:30. Cost is $13.50/person or $25/couple and includes gift. Please contact Bill Hollingsworth, ext. 4666,for reservations by September 2.

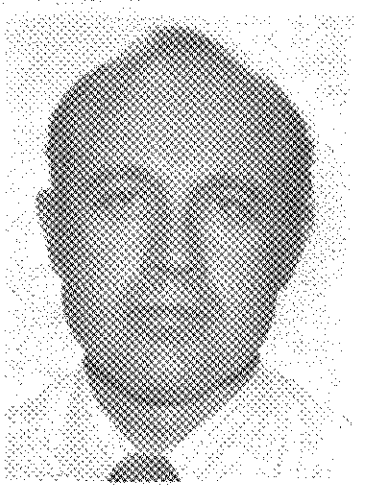
S. C. "Sid" Dixon will be honored at a retirement dinner on Wednesday, September 10 in the Activities Center. Social/cash bar will begin at 6 p.m.; dinner will be at 7. Cost, including gift, is $12.50/person. Donations to gift only will be graciously accepted. Contact Jim Gardner. ext. 3721, by September 2.

Kennedy Project Supports Life in Space

Dr. William Knott, who works with Life Sciences Research at Kennedy Space Center, will discuss present research designed to support life in space on Thursday, September 15, at 7:30 p.m. in the Visitor Center.

Knott will discuss Kennedy's Controlled Ecological Life Support System (CELSS) Breadboard Project. This project includes the production of oxygen, the preparation of food, the recycling of water and the processing of waste in a controlled recycling system. The project will include fabricating, testing and operating a breadboard facility to accomplish proof-of-concept evaluation.

Dr. Knott will describe the Biomass Production Chamber, the large atmospherically-sealed chamber that was developed to test crop production for the project. He will also discuss hydroponic growing techniques being used and give an update on the Breadboard Project.



William Knott

Ferebee: Space Stations of the Future

Melvin Ferebee will discuss "Advanced Technology Space Station System Studies" on Wednesday, September 7, at noon in the Visitor Center theater. This presentation is part of the Fall Guest Lecture Series sponsored by the Visitor Center and the AIAA-Hampton Roads Section Student Branch.

One of the goals of the U.S. space program is the establishment of permanent space stations. Studies are now underway for space stations using advanced technology and performing functions which support future space missions.

Ferebee points out, "As space flight matures, the requirements of the space station will change. The station's configuration must be able to accommodate these changes."

Ferebee, aerospace engineer in the Spacecraft Analysis Branch, Space Systems Division, will present an overview of the study as well as introduce enabling technologies with some examples for such a futuristic station.

Melvin Ferebee

Researcher News

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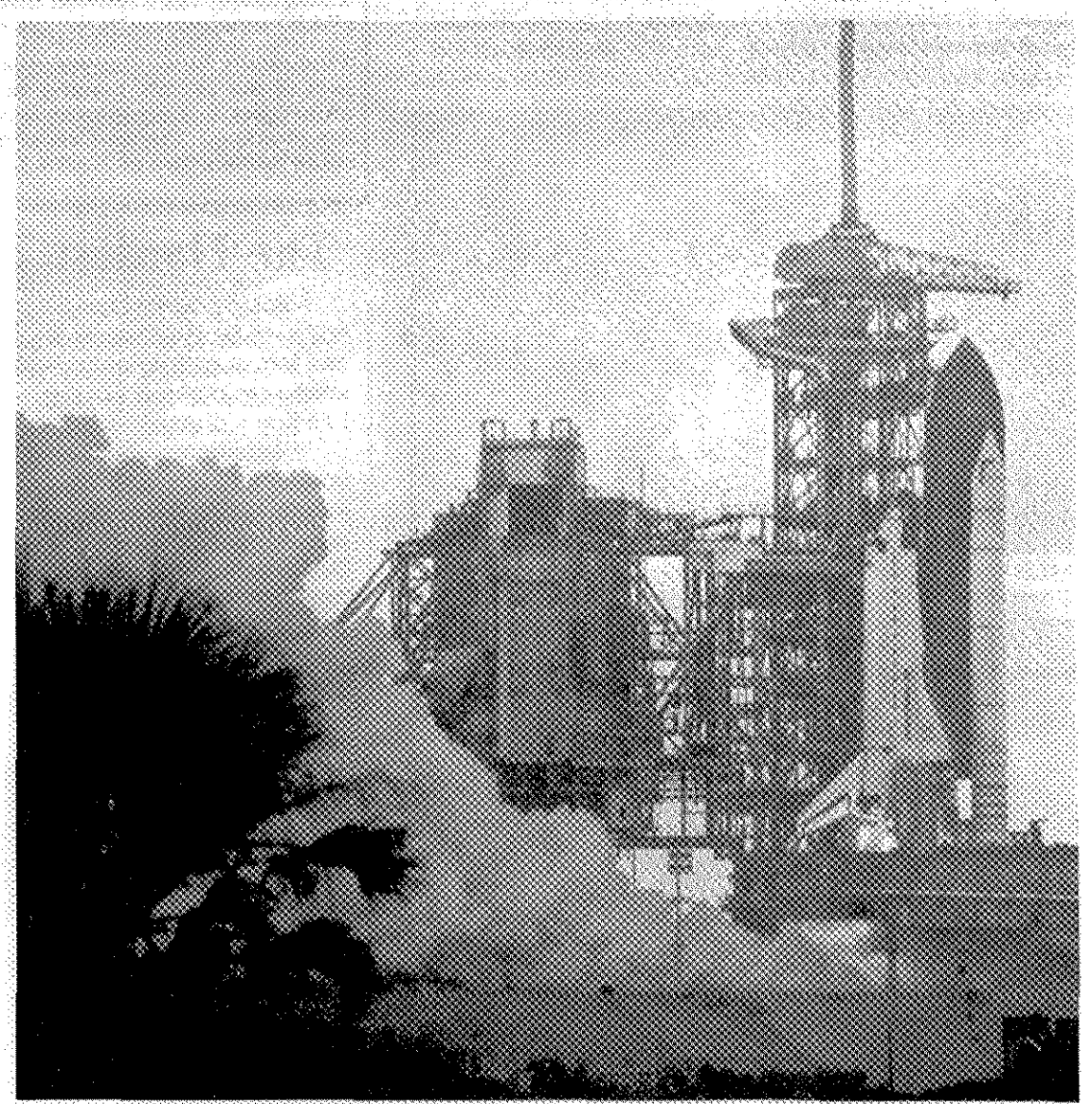


-photo courtesy of Kennedy Space Center

FLIGHT READINESS FIRING was accomplished at 7:30 a.m., Thursday, August 11, when Discovery's three engines ignited in rapid sequence and roared to full power with the combustion of liquid hydrogen and liquid oxygen fuels. Six days earlier the firing countdown was halted inside the T-10 second mark, due to a problem in the number 2 engine propellant bleed valve. The entire valve and sensor unit was replaced. After reviewing preliminary data, Thomas E. Utsman, director of shuttle management and operations at Kennedy Space Center, said, "The engines performed flawlessly. No surprises. We have a good set of engines."

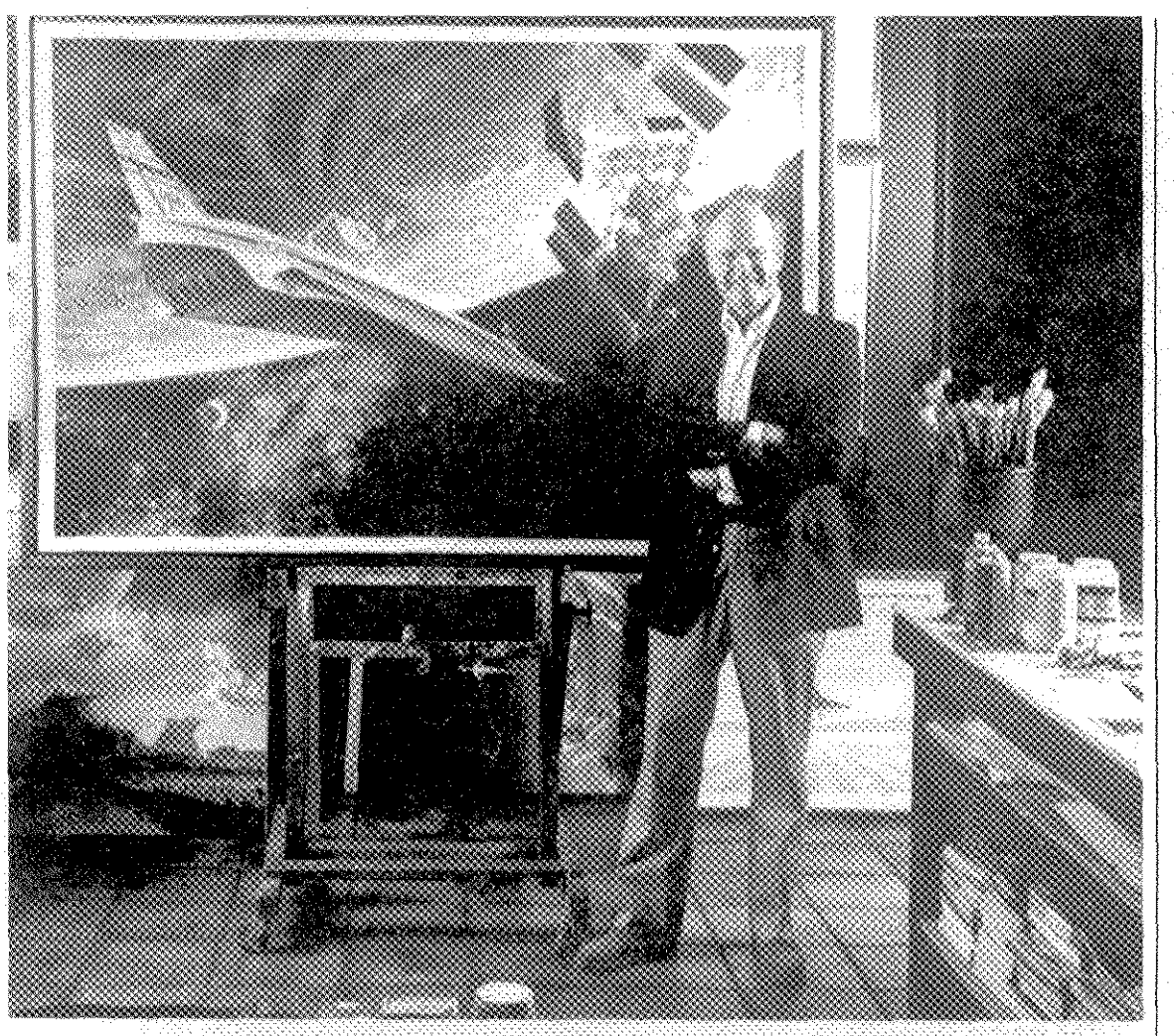
NASA
National Aeronautics and
Space Administration

Langley Research Center

Volume 2, Issue 18 September 9, 1988

News Researcher

Bi-weekly Employee and Contractor Publication



Once called "the nearest thing to an artist in residence from outer space," Robert McCall has chronicled American space flight from Project Mercury to the Space Shuttle. McCall's "Vision of the Future" exhibit, a collection of 25 paintings spanning the past 17 years of his career, will be on display at the Visitor Center from September 20 throught December 31.

Langley Colloquium and The Sigma Series

Space Artist, Robert McCall, to Lecture and Display Paintings in Hampton

Robert McCall has the technical knowledge, imagination and the artistic skill to present his vision of mankind's future, which encompasses developments on Earth, space stations in Earth orbit, manned activities on both the moon and Mars, and voyages to distant stars.

During two lectures on the Peninsula on Monday, September 19, McCall will present "A Vision of the Future," illustrated by artwork he prepared for the prestigious report of the National Commission on Space, which sought to predict mankind's direction in space for the next 50 years. McCall will speak to Langley employees during a colloquium in the Activities Center at 2 p.m., followed by a question and answer session and an informal discussion in the Langley Room. That evening, he will speak at the Hampton Holiday Inn—Coliseum at 7:30 as part of The Sigma Series. The Sigma Series is a series of free public lectures sponsored by Langley, the City of Hampton and the Daily Press.

McCall is known throughout the world for his murals and canvases, his classic U.S. postage stamps commemorating U.S. space achievements and his conceptual paintings for movies such at "2001: A Space Odyssey," "Star Trek," and "The Black Hole." These paintings are part of a collection of 25 known as "A Vision of the Future" that will be on display at the NASA Visitor Center September 20 through December 31.

For the past 25 years, McCall has chronicled for NASA American space flight from Project Mercury to the Space Shuttle. In 1981, he commemorated the first Space Shuttle flight with his painting "Hail Columbia," which in the wake of the January 1986 tragedy was renamed "Challenger's Last Flight." He has recently returned from the Soviet Union where he began work with his Soviet counterpart, artist Andrey Sokolov, to create a collaborative painting depicting a proposed U.S. and U.S.S.R. mission to Mars.

"I have always been interested in the future of man and space and my childhood drawings of aircraft eventually linked me with space," McCall said. "My first visit to NASA was in 1958, and ever since then I've documented the space flights, both manned and unmanned."

Born in Columbus, Ohio, in 1919, McCall received a scholarship to the Columbus Fine Arts School.

Chairman's Message

CFC Goal Set at $260,000

The Langley Research Center has always been a leader in aeronautics and space research. Examples are the NACA cowling, the area rule and the supercritical wing in aeronautics and the Lunar Orbiter, Viking and LDEF in space. These accomplishments as well as many others have enhanced the Center's reputation throughout the aerospace community and the world in general and have brought a great deal of pride and self satisfaction to Center employees.

Another area where the Langley Research Center is an established leader but perhaps does not receive as much recognition is in our support for the Combined Federal Campaign (CFC).

Even though we are the fourth largest government organization on the Peninsula, we are consistently first in the percentage of our employees who give to the CFC. In addition, though we are less than one fourth the size of the largest organization, we usually contribute the second largest amount to the campaign.

This record has gained the employees of LaRC the reputation of caring about the communities where we live and work. This is a reputation we can be as vastly proud of as our technical accomplishments.

Our contributions to the CFC are an investment in the future of the Peninsula. The many agencies that the CFC supports increases the quality of life around us. Without the CFC, children in our community may go hungry, researchers would lose significant help in their search for a cure for cancer and heart disease and victims of abuse would not be able to find help. There are many other similar examples of essential services provided by approved agencies. All of us benefit in some way from our contributions.

This year we have set a goal of $260,000 for the CFC campaign. This amount will go a long way in helping the Peninusla CFC meet its goal and, therefore, meet the needs of those less fortunate than we in our community.

When your "key person" contacts you during the one day solicitation on October 5, I encourage you to help Langley maintain a leadership role in this important community service endeavor by giving generously. With your help we will continue our tradition of exceeding the established goal.

H. Milton Holt
Chairman
1988-89 CFC Campaign

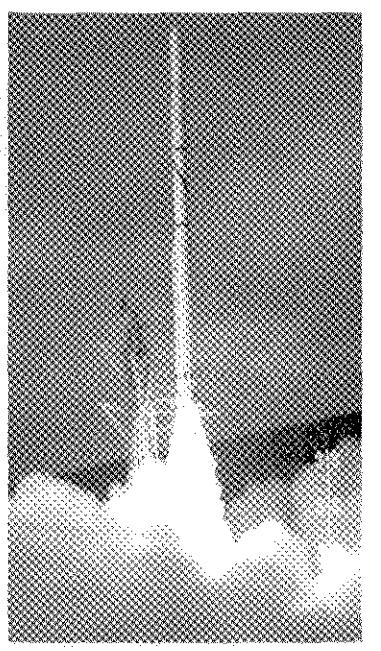
112th Scout Rocket Launched Perfectly

A NASA Langley Scout launch vehicle rocketed off the launch pad at Vandenberg Air Force Base, Calif., August 25 at approximately 12:05 a.m. PDT.

"This Scout launch had to be one of the most perfect launches in the history of the program," said William Mace, director for Electronics. "The only major unplanned event in the cycle came when the launch had to be delayed by about six minutes due to a train in the immediate vicinity of the launch site."

Scout carried a dual payload called SOOS for Stacked Oscars On Scout, which is part of the U.S. Navy's all-weather, global navigation system. Both 140-pound satellites were placed into 600-mile high, near-polar orbits. It was the fourth and final in a scheduled series of dual Navy satellite launches that began in 1985.

This marked the 112th launch of the highly reliable four-stage solid propellant booster rocket, which has earned a 98 percent operational success rate over the past 20 years. The Scout is built by the Missiles Division of LTV Missiles and Electronics Group.



News Briefs

HEADQUARTERS, Washington, D.C. — NASA has issued the newest update of its mixed-fleet manifest reflecting current planning for primary payloads for Space Shuttle missions and expendable launch vehicles (ELV's) through Fiscal Year 1993. In addition to supporting Department of Defense mission requirements, this mixed-fleet manifest continues to reflect the high priority assigned to civil space science and application payloads and the commercial space initiatives.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — NASA has issued a request for proposals inviting industry to compete for the design, development, test and evaluation of a Space Shuttle advanced solid rocket motor (ASRM) to replace, in the mid-1990s, the current redesigned solid rocket motor. The planned development of a new motor will provide substantial improvements in flight safety design margins and reliability, and achieve improved Shuttle payload weight capability.

HEADQUARTERS, Washington, D. C. — NASA and the National Science Foundation (NSF) have teamed together to make it easier and cheaper for U.S. astronomers to access and use a French astronomical database called the Set of Identifications, Measurements and Bibliography for Astronomical Data (SIMBAD). This database, maintained in France, makes it possible for an astronomer to look up an astronomical object, such as a star or the recent supernova, by its astronomical designation. The astronomer can get nearly all known information and a listing of papers about the object since 1950.

MARSHALL SPACE FLIGHT CENTER, Huntsville, Ala. — NASA has announced that TRW, Inc., has been selected for final negotiations leading to the award of contracts for extended definition and development of the space- based Advanced X-ray Astrophysics Facility (AXAF). The development contract will include a mirror development phase and a priced-option for spacecraft development and completion of the observatory. The proposed cost of the contracts is approximately $508 million.

Editor's note: Surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017.

Harris to be First Speaker

Videoconferences Available Via Satellite

Roy Harris, director for Aeronautics, will be the featured speaker for the first of a series of four video conferences for teachers planned by the Educational Affairs Division, NASA Headquarters, Washington, D.C. Harris will discuss NASA's role in aeronautics research on September 28.

The conferences, carried via satellite, will feature NASA project personnel and educational specialists and, in some cases, will highlight NASA field Centers.

These live, one-hour, interactive, video conferences are designed to update teachers on NASA programs, demonstrate aerospace activities for the classroom and announce new programs, products and activities available to classroom teachers. The nation's participating school districts will receive transmissions from 2:30 to 3:30 p.m. Eastern time.

The general theme for this year's series is advanced technology. The full schedule of 1988-89 video conferences follows:

September 28, 1988 — Aeronautics. Discusses NASA's role in aeronautics research including programs and research projects such as the National Aerospace Plane, vehicle technology, composite materials, noise reduction and wind tunnel testing.

November 15, 1988 — Living In Space. Investigates the human challenge of living and working in space for extended periods. Topics will include space suits, food preparation and human factors research.

January 24, 1989 — Future Exploration. Examines NASA's long-range plans for lunar and planetary exploration and the pathfinder technologies that will make them possible.

March 21, 1989 — Technology for Your Classroom. Explores NASA's aerospace developments for industry and the classroom. Special attention will be given to education technologies, computers, videodiscs, computer networks, simulations, and communication satellites.

NASA's education satellite, video-conference series, now in its third year, have been highly praised by educators throughout the nation.

The Sept. 28 conference will be transmitted on Westar IV, transponder 6D, channel 11. There is no charge for registration or participation in the video conference.

To register for the series, interested teachers should write: NASA Aerospace Education Services Project, Videoconference Site, 300 North Cordell, Oklahoma State University, Stillwater, OK, 74078-0422, or call 405/744-7015. Registrations ensures that announcements, publications and other materials for teacher-participants are received at the school.

Lankley

"NOT SO FAST, HARRY!"

Langley

Headquarters Forum

RECOUP—our Refuse-Fired Steam Generating Facility has now been in continuous operation since November 1980. Jointly funded ($10.5 M) by Langley Research Center, Langley Air Force Base, and the City of Hampton, it is currently being operated by the City of Hampton. This facility burns approximately 73,000 tons of government and municipal trash per year and provides Langley with approximately 300 million pounds of steam per year or 80 percent of our needs.

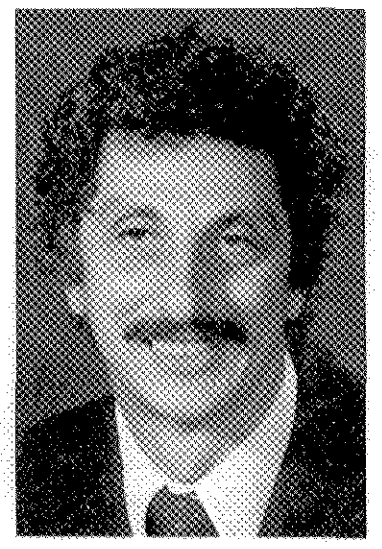
RECOUP was designed and built in the late 1970s based on the best technology that was available at that time. Since becoming operational, we have continually upgraded the plant to insure an operation that is as efficient and environmentally clean as possible.

Over the past two years, a major upgrade was accomplished at a cost of $2 million. This project included increasing the stack height from 90 feet to 248 feet, new economizers, additional emission control equipment and related control modifications. After the modifications were completed, air emission tests were conducted by Energy Systems Associates during April 18-24, 1988. The results of these air emission tests showed a very significant reduction in the emissions being produced by RECOUP and placed our plant as one of the cleanest in the nation.

In addition to environmental improvements, operational and efficiency improvements have also been realized. The plant has achieved an average on- line rate of approximately 81 percent (average of two boilers) compared to the original design rate of 70 percent. Moreover, both boilers were operated 100 percent of the time during separate months this year, a feat that is very difficult to achieve.

In summary, I believe RECOUP has been an outstanding investment for the Government and the City, significantly reducing the amount of trash that must be land-filled as well as reducing by 2.5 million gallons per year the amount of oil that must be purchased to produce steam for the Center.

Robert L. Swain
Director for Systems Engineering and Operations



Once again the Center is organizing the annual Combined Federal Camapign. The CFC committee has been named and a goal of $260,000 has been set for LaRC.

Contributions to the CFC benefit our regional United Way programs, National Health Agencies, National Service Agencies and International Service Agencies. These agencies, and the organizations they support, provide needed services and education to the underprivileged and less fortunate around the globe. However, keep in mind that the majority of the funds contributed to the local campaign remain here on the Peninsula and support the needs of our friends and neighbors.

We at Langley have never failed to accept and meet challenges. It's a part of our tradition that we can be proud of. This tradition extends to our support of the CFC. Langley has never failed to meet its goal, and I'm confident we'll continue this tradition in the upcoming campaign.

In this and future issues you will be reading more about specific programs benefiting from the contributions you and I make to the CFC. Keep these in mind when the time comes for you to make your pledge. A successful CFC campaign is a team effort. Be part of the team, maintain the tradition.

Dr. Ralph J. Muraca
1987-88 CFC Chairman

Q. What does a solar dosimeter have in common with a smooth ride and riblets?

A. Each is the result of "spinoffs" of aeronautics and space research.

By their challenging nature, NASA programs are particularly demanding of technological input. Meeting the aeronautical and space goals of the past three decades has necessitated advancements across a broad spectrum that embraces virtually every scientific and technological discipline.

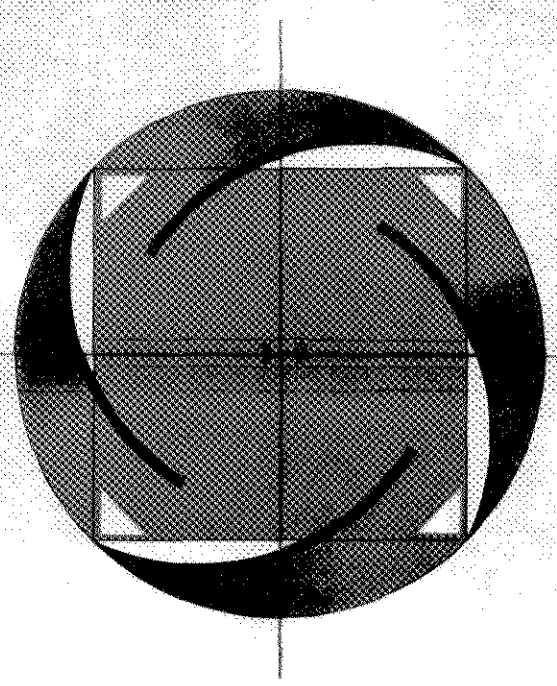
This technology is simply knowledge, or "know-how," and like other forms of knowledge it is transferable; once the technology is developed it can be reapplied to uses different—often remotely so—from the original application. thus, the great storehouse of technology NASA has acquired constitutes a valuable national resource, a bank of knowledge available for reapplication tonew products and processes of benefit to the national economy, industrial efficiency and human welfare.

By Congressional mandate, it is NASA's responsiblity to promote expansion of technology transfer in the public interest. The instrument of that purpose is the Technology Utilization Program, through which NASA seeks to encourage greater use of its knowledge bank by providing a link between the technology and those who might be able to put oit to advantageous use.

This year marks the 25th anniversary of the Technology Utilization Program. During the quarter centry span, NASA's own efforts to reapply the technology and those of imaginative entrepreneurs have generated tens of thousands of secondary applications or "spinoffs."

Some spinoffs offer only moderate increments of economic gain or lifestyle improvement; many others, however, have economic values running to millions of dollars. Collectively, they represent a substantial return on the national investment in aerospace research in terms of contribution to the U. S. economy, job production, industrial productivity, lifestyle innovations and solutions to problems of public concern.

James T. Rose
Assistant Administrator of
Commercial Programs



Spinoffs are Double Return on Aerospace Investment

NASA Celebrates Quarter Century of Technology Transfer

Spinoffs are technologies which have been applied to uses different than, and often remote from, their original application in the aerospace field. It is difficult to find a facet of everyday life into which spinoffs have not penetrated, even though sometimes their origins in aerospace research are not easily recognizable.

The more "newsworthy" stories are well known—some have even proven script material for popular movies. Many people will recall the Texas boy who had to live in a plastic bubble because he had no immunity to disease. Dozens of other biological systems and contamination controls have come from technologies developed to support manned-flight endeavors.

In fact, the medical "fallout" from aerospace research has been extraordinary. Artifical limbs, braces and crutches, an infrared scanner to diagnose breast cancer, fetal monitoring devices, automated blood pressure monitors, hearing-aid testers, vision-measuring equipment, surgical implements, and even a voice- controlled wheelchair are just some of the many advances that have resulted from NASA's decision to "shoot for the Moon."

Advances have spun-off in all directions. Sports, hobbies and recreation have benefitted as have the millions who take advantage of the new recreational materials and products. For instance, hang gliders originated from aerospace research. So did cordless power tools. A plastic foam, three times as shock absorbent as any other, has been used in football helmets and shoulder pads. Better tennis shoes, thermal insulation for boots, gloves, jackets and caps for hunters and skiers, and even improved shafts for golf clubs and frames for tennis rackets—all have come from aerospace research. And the experts say we have not yet begun to reap the full harvest of outer space.

Enormous strides have been made in varied industries—fishing, transportation, banking, agriculture, geology, mining, pollution control, energy conservation, even architecture and archeology—as a result of the U.S. space program.

But aerospace spinoffs rarely occur automatically. They are an outgrowth of dynamic interactions of people—from the aerospace technologists and inventors to the ultimate users in industry. Between these two, NASA's Technology Utilization Office is the vital link, the catalyst and broker who match the developer of technology with the potential users.

Established in 1962, the Technology Utilization (T.U.) Program has assisted industry and state and local governments in bridging the gap between aerospace research advances and their practical application on Earth.

The goal of the T.U. Office, headquartered in Washington, D.C., is simply to bring about the secondary use or new application of technology already developed and paid for by the taxpayer. Less obvious are the mechanisms and strategies employed by the office to transfer technology to both the public and private sectors.

Technology utilization officers located at each of the nine NASA field centers act as regional program managers and extend the catalyzing function of the T. U. offices by implementing policies and projects in the areas they serve. In addition, ten NASA-supported Industrial Application Centers at or near universities across the nation provide information retrieval services and assistance in applying technical information to user needs.

New technology is documented and reported in **NASA Tech Briefs**, the best known of all NASA publications. **Tech Briefs** are one- or two-page straightforward summaries of potentially transferreable aerospace technology. Interested readers can receive supporting documentation by contacting the applicable NASA field center's T. U. office.

This year marks the 25th anniversary of the Technology Utilization Program. Through spinoffs, the U.S. taxpayer gets a double return on every tax dollar invested in the country's aerospace program. A random sampling of Langley- initiated spinoffs follows. The diversity of applications illustrates the wide scope of aerospace benefits that have accrued. Some spinoffs affect only a select audience and some offer only moderate economic gain or lifestyle improvement; many others, however, offer economic savings in the millions of dollars.

Langley Contrib
Help Bring Aerospac
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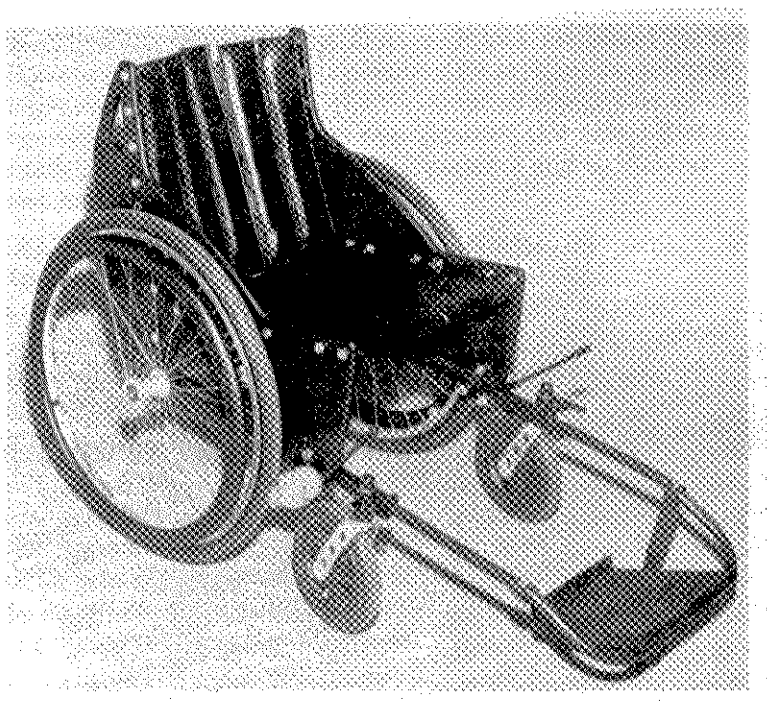
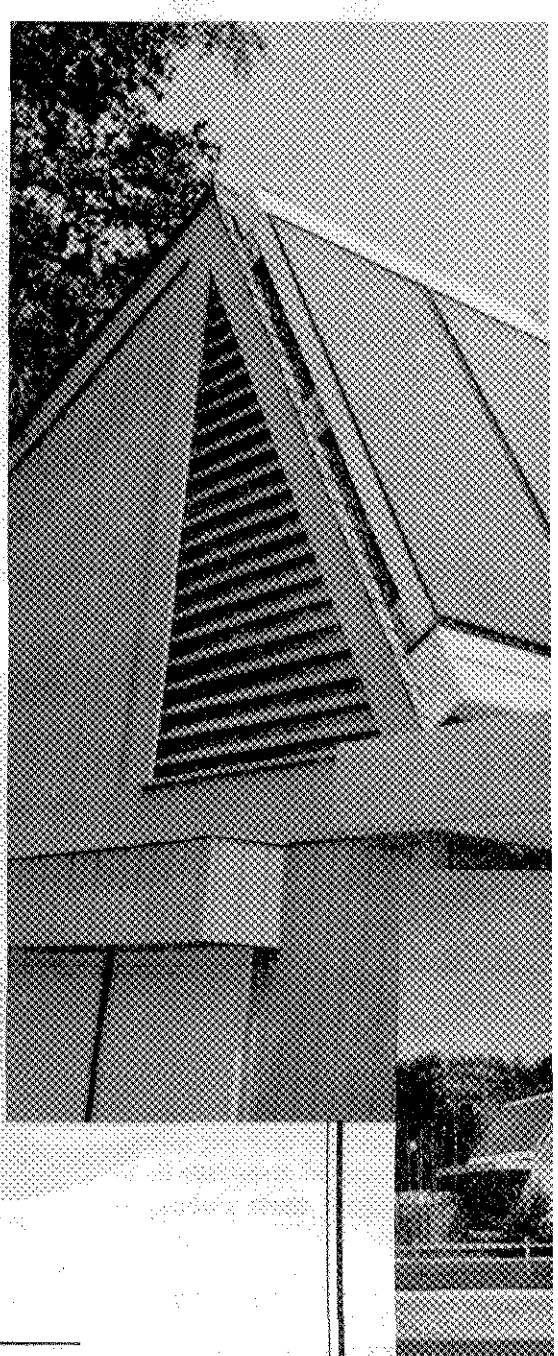


Taking the concept one step further, Baucom developed the "Stowaway," a 17-pound wheelchair able to support a 200-pound person but compact enough for commercial airliners allowing the handicapped to travel more easily by air. This wheelchair, capable of passage through narrow airliner aisles to move passengers to their seats, also gives them access to lavatories on board. The UVA/Langley chair was the first of the competing prototypes to be ordered by an airline; United Air Lines contracted for 15 units to be built by Accutron Tool and Instrument Co., Hampton.

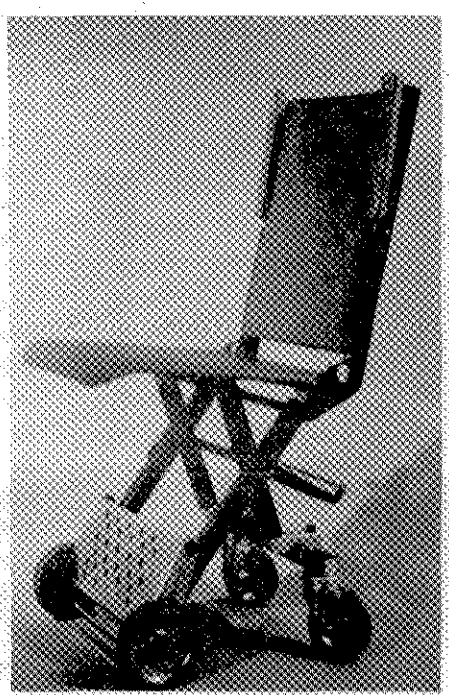


Medical

In aerospace design, every subsystem must be super-efficient and ultrareliable, yet as small and light as technology permits—requirements which are shared by many types of medical devices. That's one reason why the field of health and medicine has been a particular beneficiary of the aerospace spinoff.

More than one million people in the U.S. rely on wheelchairs for mobility. Langley's Bob Baucom teamed with the University of Virginia Rehabilitation Engineering Center to develop an advanced wheelchair that weighs only 25 pounds but has the same strength and weight-bearing capability as a conventional 50-pound stainless steel wheelchair.

Employing aerospace technology, Baucom applied computerized structural analysis techniques to arrive at the optimum design for the chair and used aerospace composite materials to keep the chair lightweight. It can be collapsed for auto stowage and it features a solid seat, wheel guards, dynamic brakes and shaped hand rims, and a footrest with smooth contours to aid in opening doors—a problem paramount to the mobilly handicapped.



Transportation

In designing any kind of transportation vehicle, a major consideration is assuring that passengers get a smooth, comfortable ride. What constitutes a good ride?

Langley's Jack Leatherwood came up with an answer to the problem—a generalized model, applicable to air, sea, road or track vehicles, for estimating passenger ride comfort in the presence of complex vibrations and interior noise. The meter, in essence, serves as a reliable and accurate passenger "jury."

Wyle Laboratories, Hampton, has introduced to the commercial market this instrument that eases the job of the ride quality engineer. Produced under NASA license, the portable Ride Quality Meter is based on a prototype meter and computer model developed by Leatherwood. Offering the first verifiable way of measuring ride quality, it is a design and diagnostic tool used in the development of passenger cars, trucks, buses, trains, aircraft, spacecraft and a wide range of special purpose transportation systems.

As the first known capability for summing the effects of noise and vibrations into a single ride quality index, the meter has attracted considerable attention among government and industrial transportation interests. Some of the nation's major manufacturers of transportation equipment—including Ford Motor Company, Firestone Tire and Rubber Company, and International Harvester—were among the initial customers.

The ride quality model and meter exemplify a special area of NASA effort: demonstrations to show how applications of advanced technology may help solve major problems or create better ways of meeting public needs.

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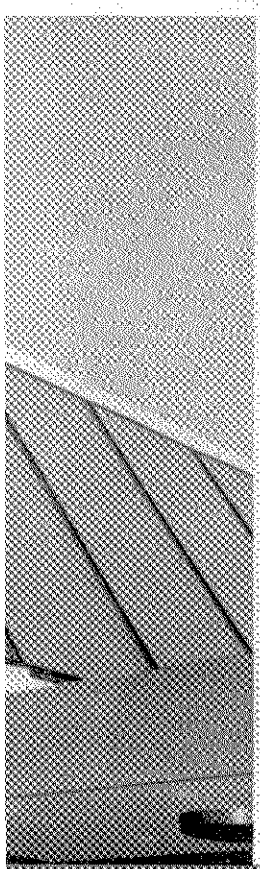
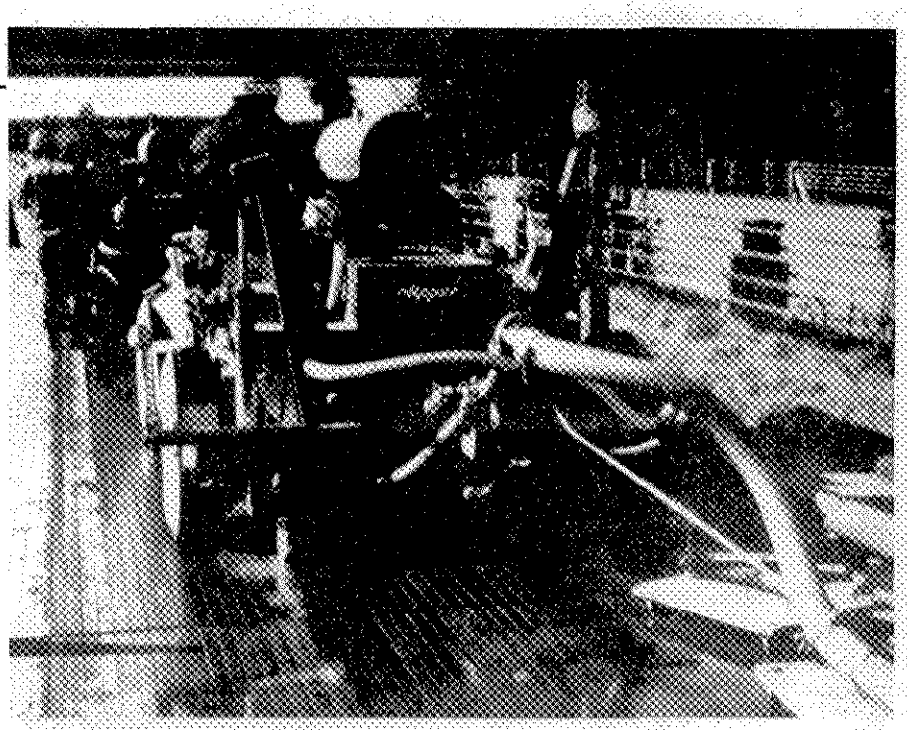




Safety grooving to improve human and even animal footing on slick or smooth surfaces represents a "spinoff from a spinoff." The technique was first developed to reduce aircraft accidents on wet runways and was subsequently widely adopted as a highway safety measure.

In the early 1960s Langley began an extensive research program that led to the type of remedial grooving currently employed on airport runways around the world. The technique was designed to curb skid-causing "tire hydroplaning," a condition that occurs during rainstorms when tires rolling or sliding along a water-covered pavement are lifted away from the surface by the action of water pressure. The grooves, cut transversely across the runway, create channels through which excess water is forced, thereby reducing the skid hazard and increasing an airplane's braking effectiveness.

Langley scientists were also instrumental in bringing the problem and its solution to the attention of highway safety engineers. Highway grooving— usually longitudinally, along the line of vehicle movement—reduces skidding, decreases stopping distances and increases a vehicle's cornering ability on curves.

Safety grooving has found a wide range of new applications: sidewalks, playgrounds, parking lots, service stations, car washes, railroad station platforms and swimming pool decks. Indoor applications include slippery-when- wet working areas in refineries, factories, warehouses, meat packing facilities and food processing plants.

Recreation

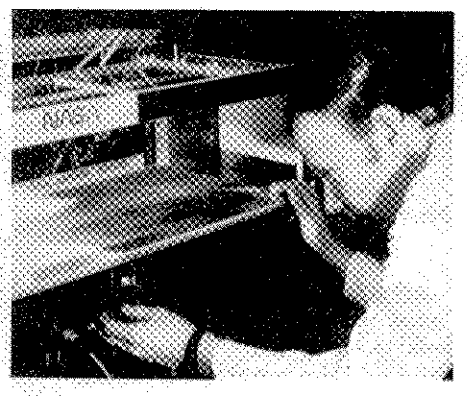
Sailing is a relaxing form of recreation—but in the America's Cup Race, sailing is big business. Big business is high tech. Technology transfer has affected not only recreation but also big business in the area of riblets.

Experiments at Langley showed that small, barely visible grooves on the surfaces of an airplane can favorably change turbulent airflow and reduce skin friction as much as ten percent. The grooves—dubbed "riblets" by their inventor Mike Walsh—are v-shaped with the angle pointing in the direction of the airflow; no deeper than a scratch, they have a profound beneficial influence on air turbulence.

First machined on flat aluminum sheets at Langley, engineers of 3M Company, St. Paul, Minnesota, suggested riblets be molded into a lightweight plastic film with adhesive backing that could be pressed into place. The technology, first seen to increase airplane speed or lower fuel consumption, also offers a means to reduce hull friction for vessels moving through water.

Riblet film was not the only aerospace technology employed by the America's Cup teams. Most yachts, including *Stars & Stripes* had winged keels, adaptations of aircraft winglets—a Dick Whitcomb technology developed at Langley to reduce air drag.

Langley's winglets are already in service on a number of operational aircraft; riblets may soon follow. Boeing, the world's largest producer of commercial airliners, has initiated it own research program investigating the application of riblets to jetliners. A drag reduction of 8 percent could mean cost savings in the hundreds of millions of dollars for U. S. commercial airlines.



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is was well insulated. In additions to insulation, Tech House boasted a variety of other design features and systems to reduce energy usage—skylights, innovative fireplace design, computer-directed heating and cooling systems, solar-heated domestic hot water and gray water recycling.

While the basic thrust was toward utility economies, Tech House also served as a proving ground for devices designed to provide greater home protection, many of them aerospace spinoffs. For fire safety, fire retardant materials were used throughout Tech House. Tech House even included a tornado detector and an advanced security system. In short, Langley's Tech House was a fascinating collection of innovations that offered exciting prospects for future conservation efforts.

An Opinion: Technology Can Be Refined to Serve Many Masters

An advocate of the Technology Utilization Program, Joe Heyman, head of the Nondestructive Measurement Science Branch, has a philosophy about the transfer of technology out of the aerospace community. He views it as positive, has coined the term "Spin On" and has concrete examples of benefits to NASA to prove his point.

Heyman feels developments that are shared not only occasionally, but invariably, **spin back**—as matured technology—to be utilized by NASA for additional applications. And Heyman speaks from experience, both personal and managerial.

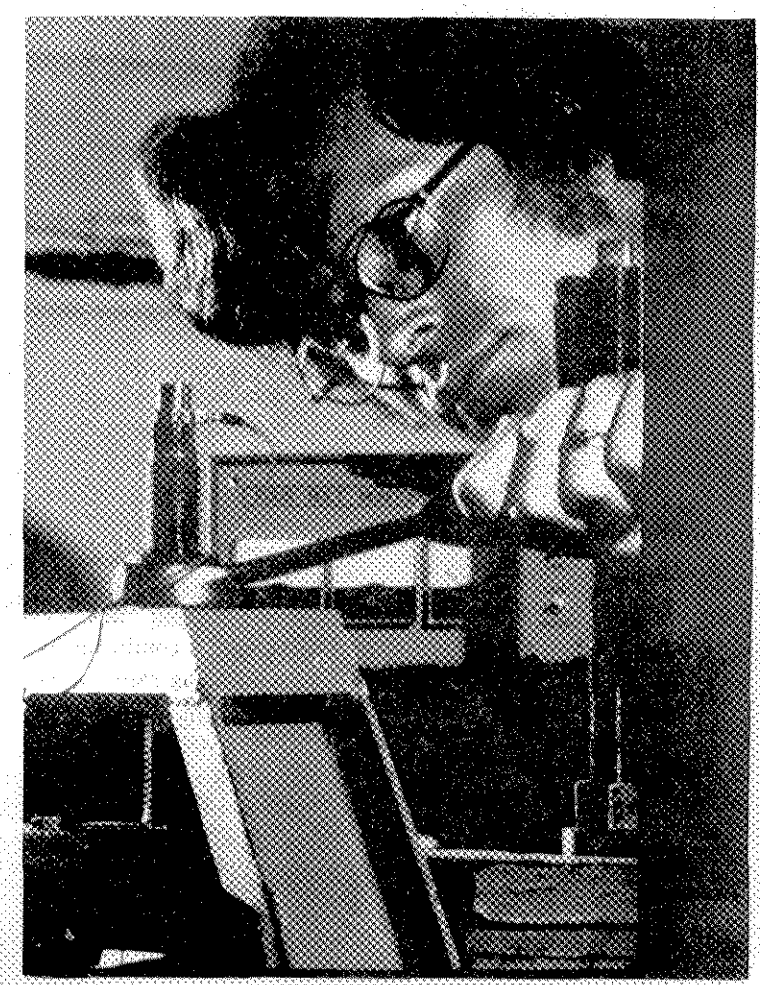
A chain is as strong as its weakest link—an axiom that proves true in various applications, the most obvious of which may be in construction. Heyman was looking in the direction of that weakest link when he developed a highly accurate device to monitor bolt stress. Consulted as a result of a wind tunnel accident at Ames in the early 1970s, Heyman devised a method to measure bolt stress by ultrasound. Heyman's system was more accurate and less expensive than traditional methods.

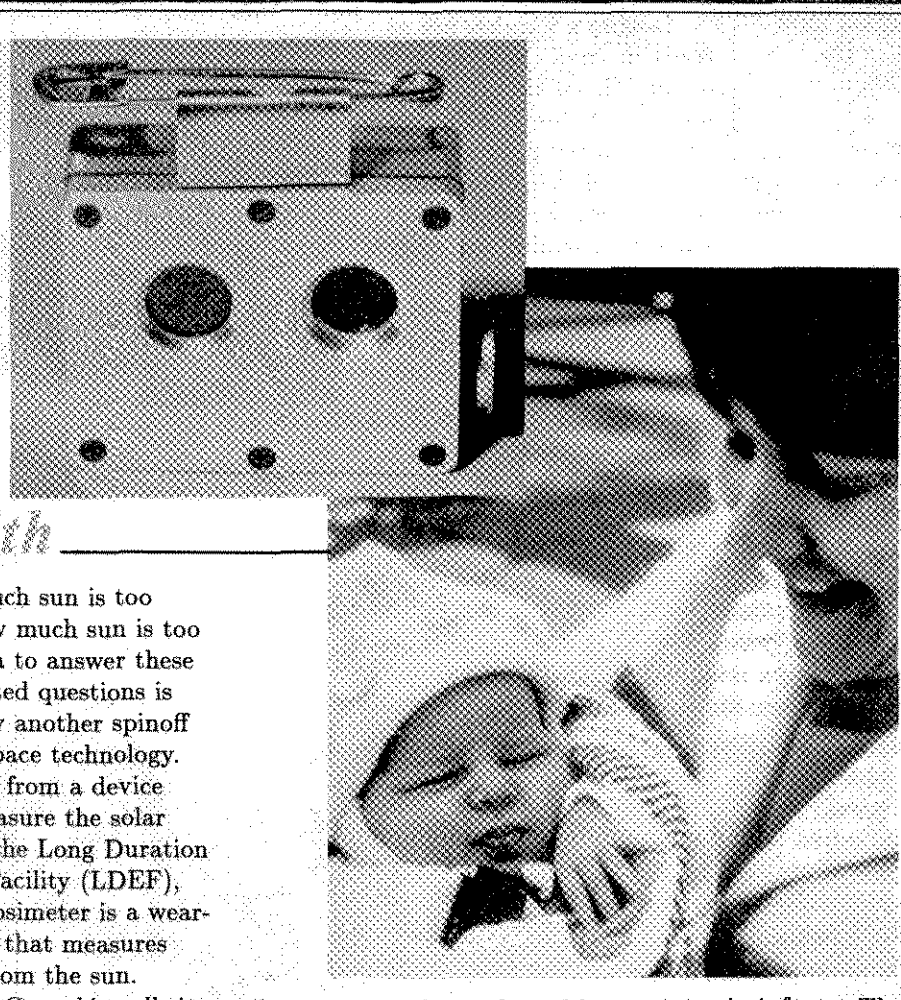
The instrument was further developed as a result of a request from the Bureau of Mines for help in measuring the integrity of bolts eight feet in length used in the roofs of mines. The Pulse Phase Locked Loop Bolt Stress Monitor (P^2L^2) provides highly precise stress measurement in industrial applications—such as pressure vessels, bridges and power plants—where overtightened or undertightened bolts can fail and cause accidents or costly equipment shutdowns. In further developments, the device is a refined microprocessor-controlled version of the P^2L^2 usable on bolts, plates, liquids and gases.

"Technology Utilization is part of our job. We are paid by the U.S. public and the expertise developed here belongs to the public," explains Heyman. "I see it as a definite positive rather than a negative; it's not time away from our job, but research that clearly benefits NASA in the long run."

That's exactly the situation in the case of the bolt stress monitor. In its final, mature form, the monitor has been used to measure stress in fasteners on the Space Shuttle's external tank and on wheel bolts in the Shuttle orbiter's landing gear—a Spin On or spin back to benefit the U.S. aerospace program. Heyman insists the refined instrument is vastly superior to the original concept; the "gross growth" in technology is a result of creative applications of shared technology. "The advances in the current instrument would never have existed to be utilized by NASA on the Space Shuttle" without the intervention of the Technology Utilization Program and the knowledge transfer system it encompasses, Heyman believes.

A second self-contained device, developed for a different T.U. project—which sends out a pulse, receives information, digitally stores the data, microprocesses and compares the information with a norm, and finally assigns an informed number to the process—is finding application in any number of areas. All this from a philosophy that advocates technology transfer and demonstrates evidence of a generous return of the time and expertise shared.





Health

How much sun is too much? How much sun is too little? Data to answer these health-related questions is provided by another spinoff from aerospace technology.

Derived from a device used to measure the solar dosage on the Long Duration Expsoure Facility (LDEF), the solar dosimeter is a wearable device that measures radiation from the sun.

Ian MacConochie calls it a "fallout from Langley's Instrument Research Division." The original device, developed by Dick Adams and Bordie Poole for space applications, was modified and repackaged for health- related applications.

MacConochie was spurred by an interest in the correlation between sunlight and the incidence of skin cancer, and then further by the connection between sunlight and all forms of cancer. In a long-term study conducted by biomedical researchers at the University of Virginia, the simple, personal-use dosimeter was worn by study participants throughout a day's activity to provide data on the amount of solar radiation to which the wearer was subjected.

The aparatus has also been used at the University of Cincinnati Medical Center in an investigation of the effect of sunlight exposure on maintaining vitamin D status in infants. The effect of sunshine on vitamin D is particularly important to breast-fed infants, because the vitamin D content of breast milk is low. The solar dosimeter correlated with another method of study to provide considerable valuable information on the sunshine exposure/vitamin D relationship. Spacecraft and infants, both precious packages, are now successfully monitored by aerospace technology.

Construction

Whitewater canoeing is a growing sport but the fun can end quickly if the plastic craft that rips through the rushing waters is gashed by sharp rocks. A versatile NASA spinoff device—an advanced welding tool—provides repair facilities on the spot.

The welder, originally developed by a team led by John Buckley to manufacture large structures in space, was then used to patch aircraft and repair damaged helicopter windshields. It is a low cost, low power, self-contained, portable tool designed for joining thermoplastic materials which become soft when heated and harden when cooled. The welder has a broad range of applications for joining both thermoplastic and, using adhesives, non-thermoplastic materials in the aerospace, automotive, appliance and construction industries.

The welder's portability and low power requirement allow its use on-site in any type of climate with power supplied by a variety of portable sources. Langley conducted extensive tests of the welder before making it available for commercial use. The Toroid Welder is produced under NASA license by Inductron Corporation of Grafton.

People & Places

Speakers Bureau

Members of the Langley Speakers Bureau present the NASA story to groups and organizations throughout the community and the five-state region Langley serves. Recent presentations include:

Allen Waters spoke on NASA Careers at Hines Middle School on May 18.

Bruce D. Fisher gave a presentation on Storm Hazards/Lightning Research at the Gulfstream Aerospace Annual Owners and Operators Conference, Savannah, Ga., on June 8.

Lenwood Clark spoke on the Space Station to the Governors School for Scientists and Technicians, Richlands, Va., on July 11; the 1988 Governors School, West Point, Va., on July 19; and to the First Flight Lions Club, Kill Devil Hills, N.C., on July 27.

Lance Bush gave a presentation on the Future of the Space Program to a 4-H Camp, Jamestown, Va., on July 18.

Lester J. Rose presented Spinoffs from Aerospace Technology to the 1988 NEWMAST participants on July 21.

James A. Martin spoke on Future Space Transportation at a meeting of the Mathews Ruritan Club on July 25.

David Shuster and **Richard Rawls** gave a presentation on Rocketry at Appalachian State University on July 29.

Many thanks to these NASA spokespersons who give freely of their time and talent.

NACA Reunion

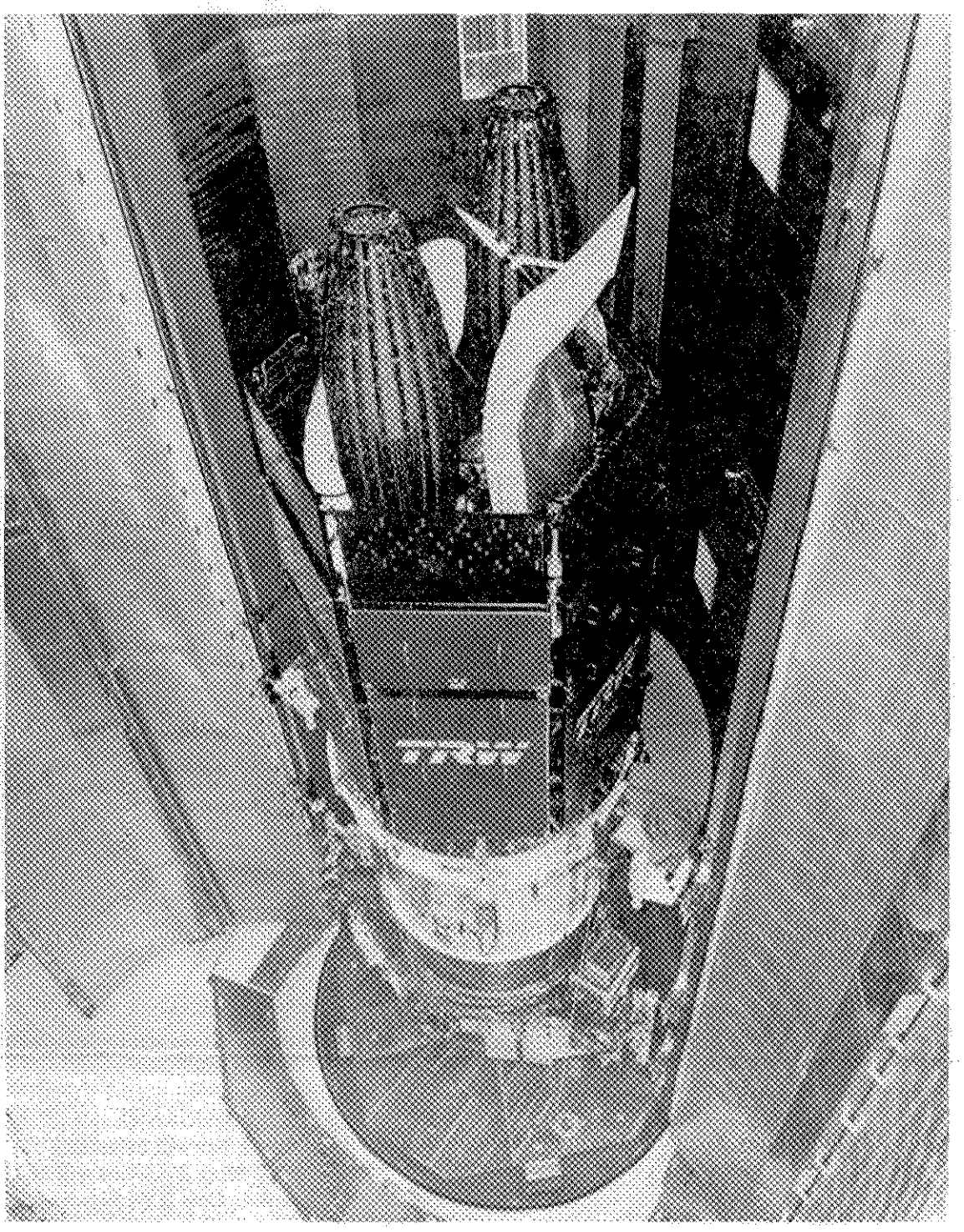
The following Langley Research Center retirees and spouses are representing the Center at the 4th National Advisory Committee for Aeronautics (NACA) Reunion later this month:

Mr. and Mrs. Melvin Butler, Mr. and Mrs. Abraham Leiss, Mr. and Mrs. Jack Reeder, Mr. and Mrs. Axel Mattson, Mr. and Mrs. Bart Geer, Mr. and Mrs. Paul Culotta, Mr. and Mrs. Guy Thibodaux, Mr. and Mrs. Max Faget, Mr. and Mrs. Cauldwell Johnson, Mr. and Mrs. Norman Richardson, Mr. and Mrs. Ralph Bielot and Mr. Bernard Morewitz.

Approximately 900 persons are expected to attend the reunion, which will be held in San Jose, Calif., from September 29 through October 2. The Red Lion in San Jose will have a hospitality suite reserved for Langley representatives.

Criteria for attending a NACA reunion is that an employee had to work for the agency prior to October 1, 1958, when the name was changed to the National Aeronautics and Space Administration (NASA). The three previous NACA reunions were held in Asheville, N.C., in 1979; Williamsburg, Va., in 1982; and Cleveland, Ohio, in 1985.

Abe Leiss is the local representative for reunion activities. Reservations can be made by calling him at 877-2939.



KENNEDY SPACE CENTER, Fla. Shown at Pad 39B, the Tracking and Data Relay Satellite (TDRS-C) and the Inertial Upper Stage (IUS) are prepared for integration from the payload transporter canister into the payload changeout room. Workers have now completed loading of TDRS-C into Discovery's payload bay. TDRS-C is the primary satellite payload to be flow aboard Discovery on STS-26. The IUS will boost the TRDS-C spacecraft into geosynchronous altitude from low Earth orbit. TDRS-C will relay data from low Earth obriting spacecraft and air-to-ground voice communications and television from Space Shuttle orbiters during missions.

Training Notice

If you will complete the requirements for your graduate degree during Fiscal Year 1988, and **have not** notified the Training Office, please call George D. Allison, ext. 2611.

Hawaiian Trip

This is the last call for the two-week, three island Hawaiian tour departing from Norfolk October 21 and returning November 3. For details, please call Ernie Greene, ext. 2312 or 838-0567, or Dan Crawford, ext. 3284 or 877-3053.

Klate Holt Co. has selected the Inspection Section as Crew of the Month for August. Shown left to right are John Ogburn, Cecil Case and Jim Price, inspectors assigned to the modification of the 8 Ft. High Temperature Tunnel, Building 1265. They have a combined total of 79 years of experience and their "can do" attitude reflects credit upon themselves and the Klate Holt Company.

Senior Management Research Review

The Senior Management Research Review will be held Monday, September 19, from 9 to 11 a.m., in Bulding 1219, Room 225. Following the Director's comments and program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:30	Reaction-Time Data Shows Effectiveness of Stereo and Pathway Cues in a 3-D Primary Flight Display	Mark Nataupsky (Flight Systems/AFSCLO)
9:45	Ground-Based Monitoring of Atmospheric Gases Using High-Resolution Infrared Spectroscopy	Curtis Rinsland (Space/ASD)
10:00	Experimental and Predicted Pressure and Heating Distributions for the AFE in Air at Mach 10	John Micol (Space/SSD)
10:15	High Mach Number Inlet Tests Ingesting a Thick Forebody Boundary Layer	Carl Trexler (Aeronautics/HSAD)
10:30	Concept and Demonstration of a New Synthetic Route to a Family of Non-Classical Addition-Type Thermoplastic (ATT) Polyimides	Ruth Pater (Structures/MD)
10:45	Spaceflight Optical Disk Recorder	Thomas Shull (Electronics/FED)

Temporary Leave Transfer Program

The Temporary 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 personal or medical emergency.

As a result of such an emergency, the following employees are approved leave recipients:

- Robert M. Connell, Jr.
- Antoinette L. Green
- Carol M. Olsen

If you wish to donate annual leave to these recipients, or wish more information concerning the Temporary Leave Transfer Program, please contact Linda Park of the Employee Relations Section, at ext. 2266.

Happenings

LAA SOCIAL will be held Friday, September 16, from 4 to 6:30 p.m. in the Activities Center.

LAA BOARD. The Langley Activities Association Executive Board will meet Tuesday, Spetember 13, at 7 a.m. in the Activities Center. Concerns to be brought before the board should be addressed to the proper committee member.

BLOODMOBILE. The American Red Cross will hold a Bloodmobile, Wednesday, September 28, in the Activities Center.

TOASTMASTERS. NASA Langley Toastmasters will meet Wednesday, Sept. 14, 11:30 a.m.—1 p.m., in the Hampton Room of the Activities Center. Guests are welcome. See how Toastmasters can be of benefit. Call Natalie Johnson, ext. 3483, for further information.

COUNTRY-WESTERN DANCE club will hold a dance at the Activities Center, Saturday, Sept. 17, 7:30—11:30 p.m. Dance to continuous music by D.J. Chuck Kessler. Y'all join in the fun.

AIAA OYSTER ROAST. Monday, Sept. 19, 4:30—8 p.m., Activities Center picnic grounds. Cost: Members and family/ $7 each; children under 10/ $3; student branch members/ $4; non-members/ $8. For reservations, contact Karen Credeur, ext. 7347, or Ferd Grosveld, ext. 3896, by 4 p.m. Sept. 15.

McCALL PRINTS on sale at the Visitor Center Souvenir Counter. "A Vision of the Future: The Art of Robert McCall" will be on exhibit at the Visitor Center, Sept. 20—December 31.

NAGS presents an evening of entertainment, Tuesday, Sept. 20, 6:30 p.m., Holiday Inn-Hampton, Jane Sprouse, flutist with Tidewater Flute Ensemble; Nancy Eggleston, vocalist; and VENDS, local whimsical dance group. All are invited. For registration/information, contact Reachie Hall, ext. 2159, or Shirley Davis, ext. 2759.

APICULTURE CLUB will meet Monday, September 19, at 7 p.m. in the NASA Cafeteria executive dining room. All interested in beekeeping are encouraged to attend. For more information, call Wilson, ext. 4615.

VISITOR CENTER SOUVENIR COUNTER will hold a book sale, September 12-16. Visit the Souvenir Counter and browse through the good selection of books on a wide range of themes. The perfect gift for aerospace buffs on your gift list.

LAST SPLASH of the Year at Water Country, September 18, 10 a.m. to 6 p.m. $6.25/person.

FREE: KITTENS. Five cute, playful kittens to a good home. Call 867-9645 after 4 p.m.

FOUND: SWEATER. Maroon cardigan found in Bldg. 1229, Room 146. Please contact Anne Cary, ext. 2601, to claim.

FOR SALE: PUPPIES. Beautiful Golden Retriever puppies, AKC show and field bloodlines. Males and females. Local sire. Available Oct. 15. Call 873-0701 or ext. 3979.

FOR SALE: HONEY. Mountain honey, $3.50/quart; $2/pint. Contact Ralph Caldwell, 723-5558, or Clarence Caldwell, 723-9116.

Retirement Party

Ng Ging will be honored with a retirement party Saturday, September 24, at the Activities Center. A cash bar will begin at 6 p.m.. Hors d'oeuvres will be served. Cost is $6.50/person. Contributions to gift only are welcome. Please send reservations to Bob Schwartz, Mail Stop 286, by September 16. For more information, call ext. 2709.

Carnival News

Carnival Monarch Crowned

Valinita Hicks, Fabrication Division, was crowned 1988 Carnival Monarch by Eugene Hicks, Chairman of the Langley Activities Association Social Committee, during carnival activities on Friday, August 19. Ms. Hicks sold 5,066 raffle tickets to win top honors; 18,849 raffle tickets were sold. As Carnival Monarch, Hicks received $300, a plaque and two tickets to Busch Gardens.

! ! Carnival Winners ! !

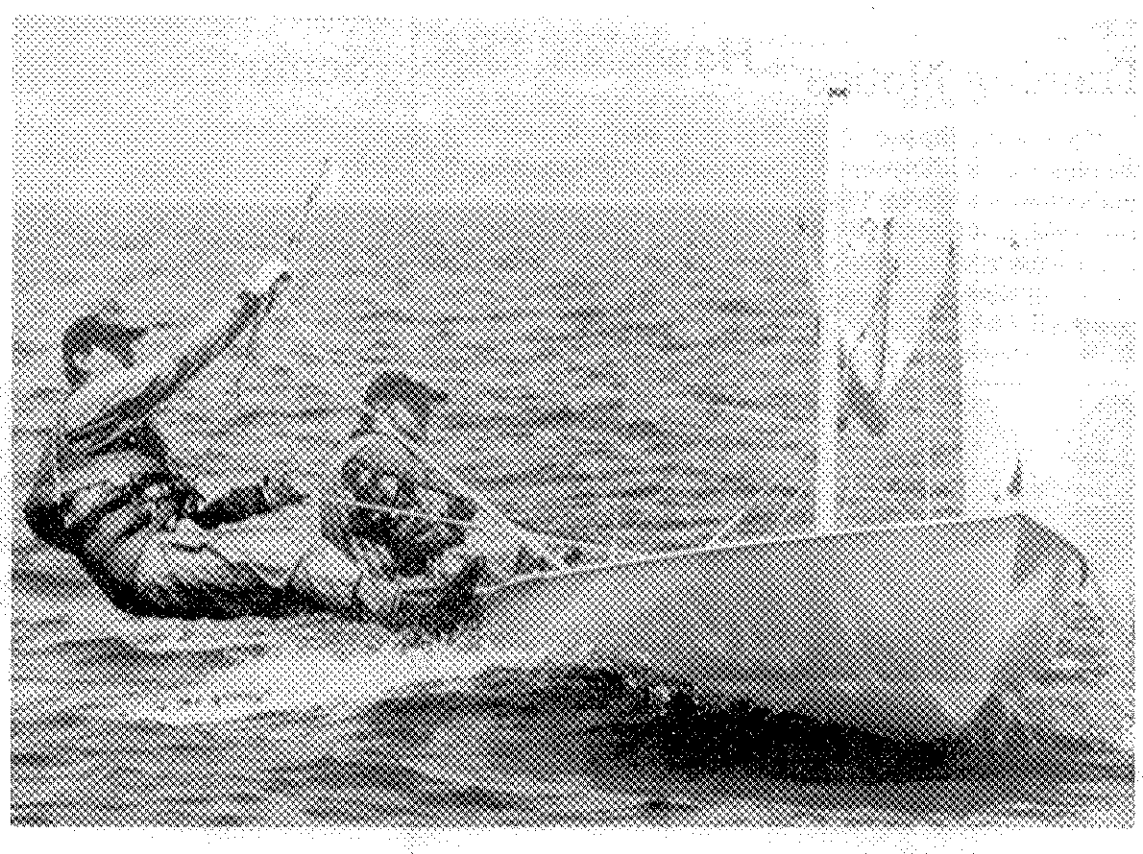
The following were grand prize winners at the LAA Carnival held August 19 and 20.

Friday	VCR	Anh Trinh
	$500	William G. Dudley
	$1200	Dennis M. Kindel
Saturday	TV	Richard B. Geissinger
	$500	Kevin Vipavetz
	$1500	Charlie Harris

Carnival Thank You

A party for Carnival workers has been scheduled and invitations have been issued through distribution.

Carnival workers who do not receive invitations should call the Activities Association office, ext. 3139.



ALLEN KILGORE SUPPORTS OLYMPIC SAILING TEAM IN KOREA. Kilgore, ODU student, official volunteer at NASA and son of Bob Kilgore, has been selected by the '88 U.S. Olympic Yachting Team as crew for the second team in the Flying Dutchman class. In this capacity he travels to Pusan Korea for the practice races prior to Olympic competition. Currently pursuing a master's degree in mechanical engineering, Kilgore has been working at Langley on the Magnetic Suspension Balance System. Shown above in the trapeze of the Flying Dutchman, Kilgore says the craft is the most highly technical boat in Olympic sailing.

Researcher News

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Langley Research Center

Volume 2, Issue 19 September 23, 1988

News Researcher

Bi-weekly Employee and Contractor Publication

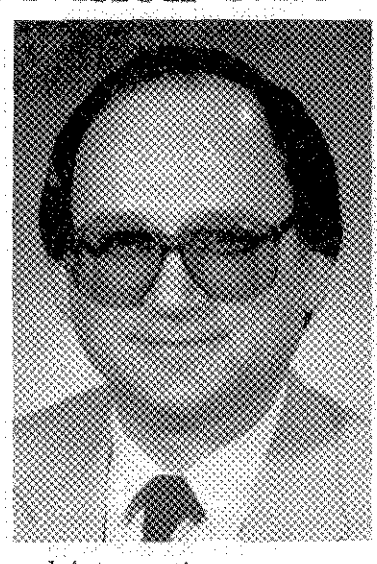
Abel, Structural Dynamics Division Chief

Irving Abel, assistant chief of the Structural Dynamics Division, has been selected chief of that division under the Senior Executive Service program. He replaces Dr. Sidney C. Dixon, who retired July 1 after more than 30 years of government service.

Pending approval by the Office of Personnel Management, Abel will head the organization responsible for research in aeroservoelasticity, spacecraft dynamics, unsteady aerodynamics, configuration aeroelasticity, and landing and impact dynamics.

Abel joined the Langley staff in 1963 as an aerospace engineer in the Aeroelasticity Branch. From 1977 to 1979, he served in the Dynamics Loads Branch. He was then named to the Aeroelastic Optimization Office, where he worked until being selected assistant head, Multidisciplinary Analysis and Optimization Branch in 1980. Abel served from 1983-84 at NASA Headquarters in Washington, D.C., as the program manager for structures and dynamics. Upon returning to Langley in 1984, he was the technical assistant to the Director for Structures and, in August, 1985, he was selected assistant division chief. In the latter position, Abel planned and directed experimental and analytical research on aeroelastic and unsteady aerodynamics problems relating to aircraft and space vehicles, and assisted the chief in the areas of thermal structures and aerothermal loads.

The author of 40 technical papers and presentations, Abel has received three special achievement awards and one NASA group achievement award for research in aeroelasticity and active controls. He is a member of the American Institute of Aeronautics and Astronautics.



He graduated from the University of Miami with a bachelor of science degree in engineering science in 1963 and from the University of Virginia with a master of science degree in applied mechanics in 1968.

Abel and his wife, the former Susan Lee Gordon, live in Grafton. They have two sons.

Moore, First Langley Manager to Complete Executive Master's Program

-by Anastasia Gonty

An assistant division chief at the Langley Research Center is the first NASA employee to complete the fast-track, highly concentrated fellowship program for executives at the College of William and Mary.

Frederick L. Moore, assistant chief of Business Data Systems Division, graduates tomorrow from William and Mary's Executive Master of Business Administration (EMBA) program.

The executive program is offered by many top business schools and designed for mid-career managers with at least five years in a management position. William and Mary initiated their program in 1986 and Moore, who was selected by Langley to attend the program, became a member of the second class.

The EMBA program objective is to provide the training to develop a broad foundation of knowledge and skill to recognize, analyze and solve problems within the business functional area. The courses offered in the program cover accounting, economics, finance, business policy, marketing, management information systems, management of operations and organizational behavior.

Malcolm P. Clark, assistant head, Employee Development and Services Branch, said that the EMBA program is the most demanding program available for Langley's managers. "It takes a lot of commitment and dedication to complete this particular program because of its intensity and the college's tough requirements," Clark said.

The executive program lasted 20 months, with classes meeting from 8:30 a.m. to 5 p.m. on alternate Fridays and Saturdays. "My workload was very intensive and the first semester was the toughest with the additional burden of trying to get back into a study routine," Moore explained. "My management was very understanding about my course load, particularly around finals."

When asked how his new skills would benefit Langley, Moore said that the program provided him with all the skills to be general manager. "Specifically, the training in organizational development will improve my performance in planning and making organizational changes," Moore said. "The training in marketing will allow me to develop better strategic packages to influence NASA Headquarters."

Moore believes that this is a great local resource and should be considered a long-term investment for enhancing Langley's management skills. Moore said the Newport News

Shipyard management is so sold on the program that it sends two people a year.

Moore began his Langley carreer in 1966 as a researcher in the Full-Scale Tunnel. He received his bachelor and master of science degrees in aerospace engineering from West Virginia University in 1966 and Virginia Polytechnic Institute in 1969 respectively.

Moore and his wife Rosemary, who teaches at Trinity Lutheran School, live in Newport News. They have two children; Amy is a sophomore at the University of Virginia and Fred is a freshman at VPI.

Anastasia Gonty is a senior at Christopher Newport College. Gonty is participating in an internship in the Office of Public Affairs.

Future of Hampton Roads VP to Speak

Langley Holds CFC Kickoff

NASA Langley Research Center will begin the 1988-89 Combined Federal Campaign with a special kickoff ceremony Tuesday, September 27.

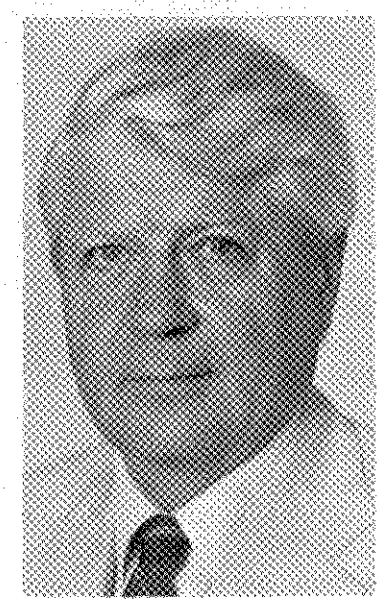
Admiral Harry D. Train II, U.S. Navy (retired), will speak on "Making a Difference" at 2 p.m. in the Activities Center, Building 1222.

As executive vice president of Future of Hampton Roads, Inc., Train is responsible for promoting regionalism in the Tidewater area. The committees within the organization are constantly seeking ways and ideas to better the communities in which we live.

In his talk, Train will discuss "community spirit and involvement" and how contributing to the Combined Federal Campaign can make a difference to the future of Hampton Roads and its citizens.

Train is also president of SRMS, Inc., a contractor for the Department of Defense.

He serves on the board of directors of Aydin Corporation, American Cancer Society Virginia Division, American Cancer Society Norfolk Unit and Norfolk Council of the Hampton Roads Chamber of Commerce. He is also on the board of trustees of the Institute for Defense Analysis, regional board of directors of the First American Bank of Virginia and aca-



demic advisory board of the NATO Defense College. He is chairman of the Virginia Division American Cancer Society Crusade Committee and serves on the board of governors of the Town Point Club of Norfolk and the board of advisors of the Cultural Alliance of Greater Hampton Roads.

Train is a 1949 graduate of the U.S. Naval Academy at Annapolis and a 1956 graduate of the Naval Postgraduate School in Monterey.

Langley division chairmen, key solicitors and new employees are invited to hear Train speak at the kickoff ceremony. The CFC film, "What a Difference," featuring Cliff Robertson, will be shown during the kickoff program.

ARTIST'S CONCEPT OF LDR. Proposed for launch in the late 1990s, the Large Diameter Reflector (LDR) will be about 20 meters across and require a surface accuracy of a few microns. Future space missions which require large optical or antenna systems present new and difficult challenges for spacecraft designers. Read about CSI, a new technology program at Langley, on page 3.

News Briefs

HEADQUARTERS, Washington, D.C. — Seven high school students will present proposals for space station experiments as national finalists of the 8th Annual Space Science Student Involvement Program (SSIP). The program, co-sponsored by NASA and the National Science Teachers Association (NSTA), gives high school students the opportunity to propose experiments which theoretically could be conducted in space. The students will be competing for scholarships and other awards.

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — A Center for Excellence for Space Data and Information Sciences (CESDIS) has been established at the NASA Goddard Space Flight Center. The Center is associated with the University of Maryland and the University Space Research Association (USRA), Columbia, Md., a consortium of more than 60 universities. A $4.8 million cost-plus-fixed-fee contract has been awarded to the USRA to manage and staff the center for the first three years with options for two or more years.

HEADQUARTERS, Washington, D.C. — NASA and the McDonnell Douglas Astronautics Company, St. Louis, have announced the signing of an agreement providing for the firm's use of facilities at the Kennedy Space Center, Fla., and technical support for the Goddard Space Flight Center, Greenbelt, Md., in support of commercial launches. Advancing the government's objectives to encourage and assist the growth of a robust U.S. commercial launch industry, the umbrella agreement enables McDonnell Douglas to gain access to NASA-managed launch support facilities when the firm begins conducting commercial launches of the Delta rocket.

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — NOAA-H, a meteorological weather satellite, is set for launch aboard a U.S. Air Force Atlas-E expendable launch vehicle from Vandenberg Air Force Base, Calif., no earlier than September 24. The Atlas-E is an Air Force ballistic missle, refurbished and modified to boost spacecraft into a variety of low-Earth orbits. After initial checkout by NASA, the satellite will be operated by the National Oceanic and Atmospheric Administration.

HEADQUARTERS, Washington, D.C. — NASA and the Air Force, which has responsibility for range safety, have mutually determined that the number of persons who will be permitted access to the Kennedy Space Center for the launch of the Space Shuttle Discovery, STS-26, will be greatly reduced for safety reasons. The risk of loss of the Shuttle and the crew have been substantially reduced through redesign of the solid rocket motor and other improvements. At the same time, studies of the Challenger accident in January 1986 and the loss of an Air Force Titan 34D the following April have shown that the danger to persons on the ground is much greater than was understood should an accident occur.

Editor's note: Surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017.

Recycle Your Computer Magazines

Before you relegate last month's computer/software magazines to the trash pile, consider recyling them to students enrolled in computer classes.

Two local organizations, Boys' Club of the Virginia Peninsula and Hampton Roads Boys' Club, are offering on-site basic computer classes to adolescent boys and girls. The classes are taught by local professionals who volunteer their time and expertise. Using Apple equipment, classes are set up on beginner, intermediate, and advanced levels and meet several times a week after school and on Saturdays.

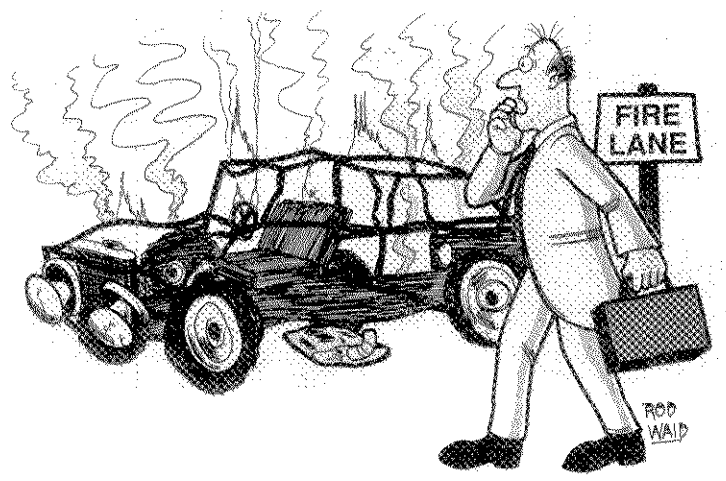
Jim Youngblood, senior aerospace engineer in the Vehicle Analysis Branch, has been involved with these clubs through his work with the United Way. In discussion with the clubs' directors, Youngblood learned that additonal computer/software publications are needed as teaching aids and resource material to broaden the students' horizons.

Here's where Langley staff members can play a role. Send your discard computer magazines to Youngblood so he can distribute them to the clubs. So as not to overwhelm him (and the students) with paper, do some preliminary screening of your material; i.e., consider the level of expertise involved and send only those publications which, in your opinion, are appropriate.

Send your contributions to Youngblood at Mail Stop 365 or call at ext. 4960.

Who knows—there may be some budding computer geniuses out there who will receive imspiration from your contributions!

Lankley



Sorry, No Car Passes for STS-26

Because of a change in range safety requirements at Kennedy Space Center, the Agency has had to reduce the number of guests for STS-26. Therefore, there will be no car passes issued at any Center for this mission.

Newsome to Head CSI

Jerry R. Newsom returns to Langley to head the recently formed Controls-Structures Interaction (CSI) Office. The CSI Program is developing new technology to benefit space systems design for the year 2000 and beyond.

Since December 1985, Newsom had been technical assistant to the NASA Administrator, Dr. James C. Fletcher. In Washington, he acted primarily as the interface between the Administrator and the White House.

"Our goal is to produce technology that will benefit future NASA missions. And there are plenty of missions planned that can benefit from controls-structures technology," states Newsom.

Newsom feels the CSI program will "help evolve a new discipline to aid space systems design. Not only will we have the traditional structures experts and controls experts, but a new breed of experts knowledgeable equally well in both structures and controls."

Prior to his appointment at NASA Headquarters, Newsom was head of the Aeroservoelasticity Branch, Loads and Aeroelasticity Division. He joined NASA in 1978 after working for Ling-Temco Vought at Langley.

Newsom earned a bachelor of science degree from Virginia Polytechnic Institute in 1973 and a master of science degree in aeronautical engineering from George Washington University in 1978.

He and his wife, Ellen, live in Hampton. They have four children.

Martin Selected PAO

J. Campbell "Cam" Martin has been named head of the Public Affairs Office at Langley Research Center. In this position he is responsible for the center's public information and public affairs programs, coordinating activities with NASA Headquarters, other NASA centers, the aerospace industry, other government agencies and academia; serves as an advisor to top management on public affairs related issues; is the chief speech writer and chief media spokesman for the center; works closely with national and international print and broadcast media regarding the center's research programs; and oversees preparation of news releases, press kits, fact sheets, brochures, scripts, the in-house newspaper, and video and audio productions, reviewing same for accurate technical content.

Martin comes to NASA from the Continuous Electron Beam Accelerator Facility (CEBAF) in Newport News, where he was the special assistant for public information. Before joining CEBAF, he served in the U.S. Navy as the Naval Air Force Atlantic deputy public affairs officer and surface warfare officer.

A native of Butler, Penn., Martin received a bachelor of science degree in business administration from Pennsylvania State University in 1976. He received a master of arts degree in administrative science (information systems) from George Washington University in 1988. He is a member of the Aviation Space Writers Association and the Public Relations Society of America.

He and his wife, the former Susan Jacob, live in Virginia Beach. They have a son, Scott.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

Controls-Structures Interaction (CSI): A New Approach to Spacecraft Design

A team of experts has been assembled to tackle a dilemma that has traditionally split the engineering disciplines of controls and structures for decades. In a new program directed from NASA Headquarters and combining the talents and resources of Langley, Marshall Space Flight Center and the Jet Propulsion Laboratory, the structures and the controls sides of the house will communicate, design in unison, test together and work side by side to advance an interdisciplinary technology for spacecraft of the year 2000 and beyond.

The National Commission on Space, charged by the Congress and the President to look into the future to propose civilian space goals for 21st-century America, has postulated an ambitious series of missions, including a base on the moon, a manned mission to Mars and global monitoring of the Earth's atmosphere, oceans and land.

Platforms are being bantered about in the current political arena, and it is essentially uncertain which goals will be embraced by a new administration. Regardless of the outcome in November, the nation must have the capability to execute whatever space options are chosen.

Key to that capability will be the research base that is available in the technologies critical to the chosen missions. Propulsion, power, materials, structures, life support, human factors, space medicine, automation and robotics, communication, instrumentation, guidance and controls, and operations are the technology building blocks that enable missions and will ensure America's leadership in space.

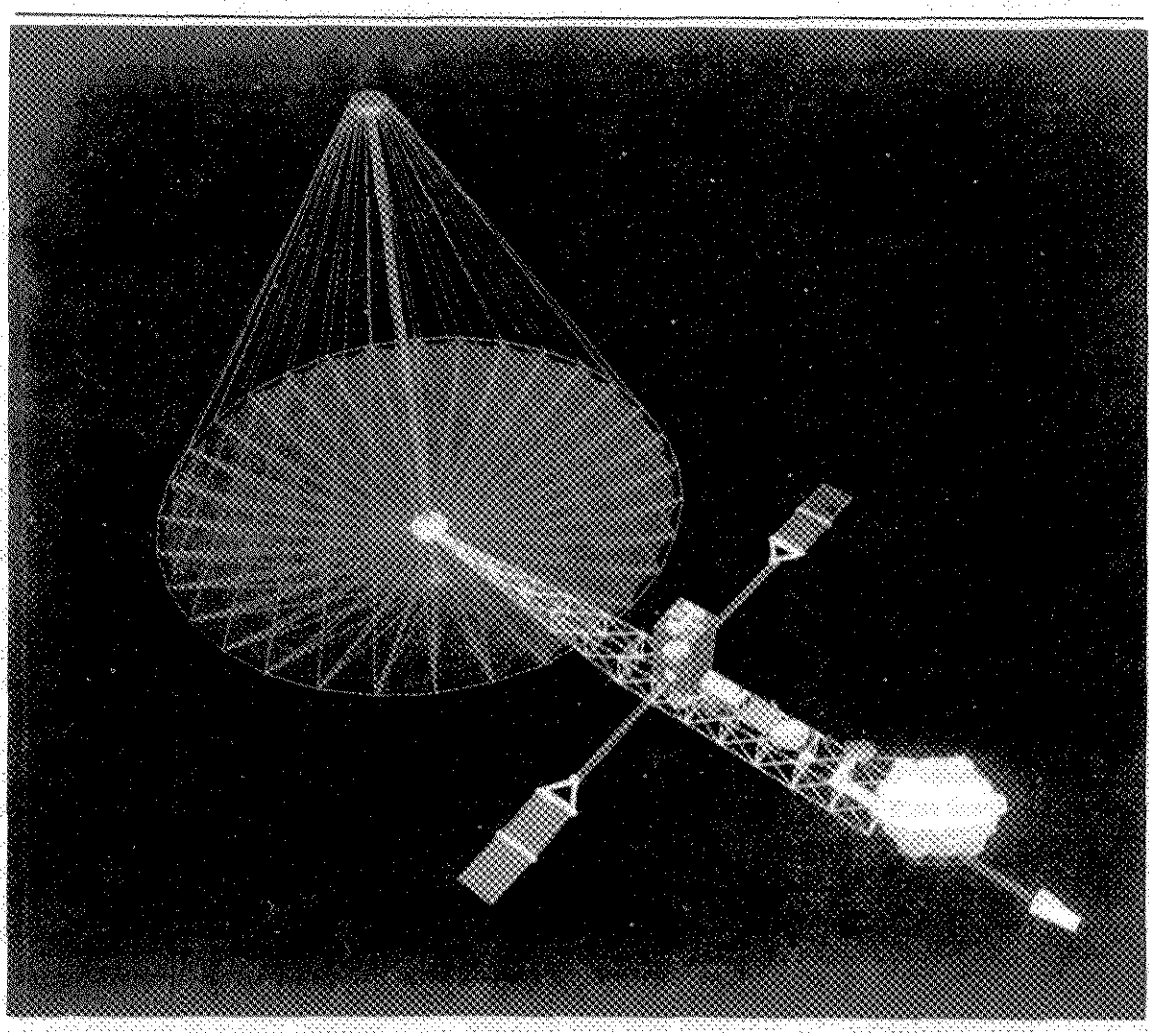
What is CSI?

Structures technology is one of the key pacing areas for the exploitation of space. Future flight vehicles, spacecraft, and platforms must be as lightweight as possible yet strong and durable enough to withstand long-term exposure to space, the harsh environment of extraterrestrial surfaces, and, for some missions, repeated atmospheric reentry.

The tradeoff in size, weight, structural flexibility and control requirements is a perennial aerospace problem. A solution to the basic difficulty— Controls-Structures-Interaction (CSI)—offers greatly improved spacecraft designs for the future.

The CSI initiative, a restructuring of the Control of Flexible Structures (COFS) program which met with unacceptable flight experiment cost overruns, is a joint effort of NASA Headquarters, Langley, the Marshall Space Flight Center and the Jet Propulsion Laboratory. The prime objective of the CSI program is to develop and validate the technology needed to design, verify and operate spacecraft in which the structure and the control system complement each other to meet the requirements of 21st century space missions. Emphasis will be on increased analysis and ground testing with a conservative flight experiment schedule to verify the analysis and ground test data.

Dr. Dan Mulville of the Structures and Materials Division, Office of Aeronautics and Space Technology, NASA Headquarters, is the overall CSI program manager. Langley has the lead role for technical program coordination. Brantley Hanks, head of the Spacecraft Dynamics Branch, has been the key individual for planning and organizing the CSI program and, for the past several weeks, has acted as head of the recently formed CSI office. Jerry Newsom, formerly assigned as technical assistant to NASA Administrator James C. Fletcher, returns to Langley to take over the CSI office.



ARTIST'S CONCEPT OF LSA. Mission-to-Planet-Earth geostationary platform is made up of a 40-meter mesh antenna and a 7.5-meter segmented reflector for high resolution remote sensing of the Earth.

Why CSI?

A significant number of space missions currently planned require lightweight structures which are extremely large and flexible but must maintain precise configurations and, at the same time, be moved and pointed. In order to implement these programs, significant technology development in the controls-structures areas must be realized.

Conventional spacecraft design procedure first estimates sizes and masses of mission-related components, next seeks to design a structure stiff enough to maintain the desired component relationships during operations, and finally designs a control system to orient, guide and/or move the stiff spacecraft to obtain required performance. Frequently, though, spacecraft components such as booms, solar arrays and antennas are so large that making them both stiff and packageable for launch is at best—costly, at worst—impossible. Consequently, these components are generally made lightweight and are flexible which can reduce performance and cause unexpected, undesirable or even catastrophic dynamic motions in spacecraft.

Future NASA missions are likely to need very large distributed-mass components, greater surface and pointing precision, increased use of moving components as well as increased use of multi-mission platforms with multiple control systems on board.

The CSI program objective is to advance controls-structures technology to a point where it can be used in spacecraft design for future missions. Because of the close interrelationships between the structure, the control hardware and software, the analyses and the design approach, a highly interdisciplinary activity is planned. Structures, dynamics, controls, computer and electronics engineers are working together on a daily basis and are co-located to a large extent.

Methods will be developed which allow the controls and structures analysis and design functions to use unified mathematical models. Verification of methods in hardware applications and tests is emphasized and will require development of hardware concepts and test methods for implementation.

This interactive program is in place at Langley and involves over 30 scientists and engineers. The cooperative venture is overseen by J. F. Creedon, director for Flight Systems, and C. P. Blankenship, director for Structures.

For What Purpose?

CSI focus mission categories include large optical systems, large space antennas and special missions—evolutionary space station, remote manipulator systems, humans to Mars.

An example of one of the Large Space Antenna (LSA) missions requiring CSI technology is the remote sensing geostationary satellites—one of the four "bold new initiatives" identified by the Sally Ride Task Group as Mission-to-Planet-Earth. This initiative is designed to obtain a comprehensive data set of global observations and a resultant understanding of the Earth's atmosphere, oceans and land systems, how they interact, and may be expected to evolve on all time scales.

The satellites required must carry not only currently available visible and infrared sensors, but a new generation of microwave sounders and imagers with large space antennas needed for improved spatial resolution.

LSA diameters up to 200 meters are necessary to meet the science requirements being advocated for this initiative. The largest antennas flown in space to date are smaller than 20 meters. CSI technology is necessary for even moderate increases in size.

An example of a large optical system that would require CSI technology is the Large Diameter Reflector (LDR). The LDR is an astronomical observatory. Roughly ten times the size of the Hubble Space Telescope in which the one-piece mirror fits within the Shuttle payload bay, the elements of the LDR are designed to be carried into space by the Shuttle and assembled at the Space Station. After assembly, it will be boosted into orbit where it will operate as a free-flyer.

The 20-meter diameter primary mirror of the LDR consists of 84 hexagonal panels; each panel is roughly 2 meters in diameter and made of lightweight composite materials.

Control systems technology is crucial to LDR. LDR requires absolute pointing accuracy, active alignment, figure and vibration control. The position and orientation of all 84 segments of the primary mirror must be actively controlled.

CFC...

A CFC Message from the Director

Langley Solves Problems in a Team Approach

Langley Research Center functions as a community within the surrounding communities from which we draw our most valuable resource—our people. Sharing the expertise amassed here to find innovative solutions to old problems and new challenges is what research is all about.

This cooperative approach has been heralded most recently in news of the first flights of the vortex flap experiment. The same integrated strategy is being employed in the Controls Strucures Interaction (CSI) program about which you can read in this issue.

Langley's team approach to providing solutions to seemingly insurmountable challenges doesn't stop at the gate. Our people are as actively involved in their home communities as they are at work. People helping people is what community is all about.

The Peninsula Combined Federal Campaign (CFC) is the vehicle through which our employees can help the people that help people. The community service agencies face challenges as delightful as providing recreation to children and senior citizens to challenges as serious as helping our brothers and sisters rebuild their lives. The CFC provides relief—food for the hungry, shelter for the homeless, help for the abused, counselling for the drug dependent, education for the illiterate—not only on the Virginia Peninsula but around the world.

In two weeks, Langley will hold our annual fund drive for the CFC. You will again be asked to join the Langley team . . . this time to help our local communities and those in need around the world.

The CFC committee and I have set our goal at $260,000. I am confident that we can attain this goal through the team effort that characterizes Langley. We have always

been a CFC leader on the Peninsula and a leading center within NASA.

I know I can count on each of you to say "yes" when the CFC key representative for your division contacts you on October 5.

Remember, this one day solicitation helps people—our families, friends, neighbors—all year long.

Richard H. Petersen
Director

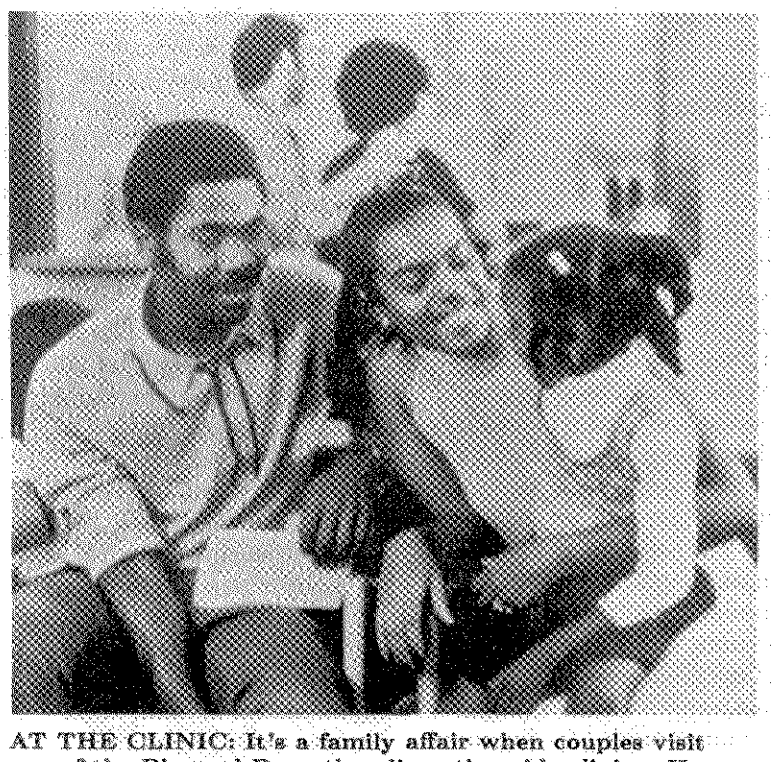
United Way: Giving, Caring and Helping Bring Out the Best in All of Us

Every day, thousands of people slip through the cracks in our society. Every day, thousands of people struggle—to change their lives, improve their lives and save their lives. Every day, thousands of people need protection from trouble, fear and themselves.

Luckily, thousands of people at dozens of United Way agencies are available to help those in need. You can help, too, by giving the United Way. It brings out the best in all of us. Forty-five agencies and 200 programs are depending on the funds collected from the community during this annual drive. Raising money gets tougher each year, but so do the demands. This is the time of year the United Way turns to the citizens of the community.

Whether you are a United Way volunteer or a contributor, several facts are certain. Every moment you spend helping those less fortunate and every penny you contribute to this worthy cause are important and do make a difference. For, when the need is there, someone has to be there to meet it. And when all is said and done, it all comes down to you, the members of the Langley family keeping the tradition of giving, caring and helping.

Join forces with the many people who work diligently to improve the way of life for Peninsula residents. Your first call for help: United Way of the Virginia Peninusla or Greater Williamsburg United Way.



AT THE CLINIC: It's a family affair when couples visit one of the Planned Parenthood's nationwide clinics. Here, women and men receive contraceptive counseling; testing for cancer, venereal disease, sickle cell anemia; and other health services often provided by this clinic. Planned Parenthood believes that all people have the right to good medical care, and no one is turned away for inability to pay. This organization is one of the 45 agencies covered by the United Way.

NSA Provides Special Needs

The National Service Agencies are national voluntary organizations that provide specialized help to assist citizens to achieve their basic human rights and/or human welfare needs. These needs include areas such as parks and recreation, medical, blind, black funds and seamen services.

You may designate your contribution to any organization listed in the brochure you will be provided during the one-day solicitation October 5.

America, Langley Strive to Me

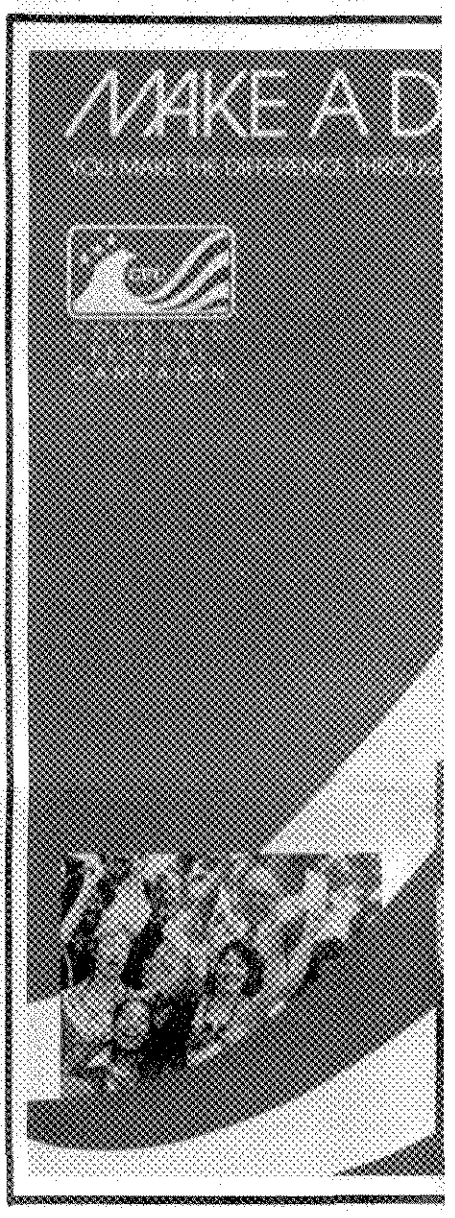
America—one nation indivisible—a nation where people are working together to make our country a better place in which to live; a nation striving to meet the needs of the people.

And here on the Peninsula, Langley is no exception. We, too, are working together to meet the needs of our people and to shape our community's future.

Once again, Langley has joined forces with other civilian and military employees to form the Peninsula Combined Federal Campaign. Through this campaign, we have an opportunity once a year to contribute to the many health, welfare and community service organizations. The funds we provide to these agencies permit them to relieve suffering, provide care for the young, aged, homeless and hungry, and bring hope to the depressed. It is the one campaign which helps people—our families, friends and neighbors—all year long.

The Langley Research Center, the second largest CFC contributor on the Peninsula, has a goal of $260,000. The money Langley contributes will be distributed among the Peninsula United Way, Greater Williamsburg United Way, National Service Agencies, National Health Agencies and International Service Agencies. Each of these organizations distributes its funds directly to subsidiary agencies.

The United Way, an organization devoted to making it easier to deal with the problems of being human, encourages and assists volunteer groups in providing the broad range of social services for the community. It is responsible for social planning for the community and budgeting and allocating funds to its member agencies. The United Way is divided into two en-



NHA: Another Little Miracle

If you have ever loved someone who is fighting a deadly disease, you know what fear and hope are. And you pray for a miracle—because miracles do happen.

The National Health Agencies make miracles happen with your Combined Federal Campaign gifts. Your CFC dollars make it possible for the health agencies to continue their vital medical research programs, provide community and patient services and materials to those suffering from illnesses and disease, and continue their public and professional education programs. Americans depend on the expertise and knowledge of those who continue to search for the treatments, cures and preventatives for some of the devastating and life threatening diseases.

Listed below are some statistics provided by a few of the health agencies that participate annually in the Combined Federal Campaign:

- The **Arthritis Foundation** estimates that one person in every th families will be affected by arthritis during their lifetime...or one new vict every 33 seconds.
- The **American Diabetes Ass ation** says diabetes, affecting more t 10 million Americans, is recognized, its complications, as one of the leadi causes of death in the United States.
- The **National Multiple Scler Society** estimates that over 500,000 Americans have MS which attacks th central nervous system and is uaually diagnosed between the ages of 20 and

With the help of individual memb of the armed forces and the many civilian federal employees in this area the NHA is better able to serve the Peninsula and Williamsburg. Althou all of the agencies conduct separate fund-raising campaigns among the general public, only federal workers h the privilege of contributing to all of them, or any one in particular, throu payroll deduction.

Your contribution will make a difference. Please remember the Nation Health Agencies through the CFC O ber 5.

to care, to help, to give

People's Needs

-by Jean Drummond Clough

ties for the campaign—the Penin-
la United Way and the Greater
'illiamsburg United Way.

The National Service Agencies
e national voluntary organiza-
ons that provide domestic welfare
rvices.

The National Health Agencies
e organized to implement nation-
ly recognized health programs
research, education and service

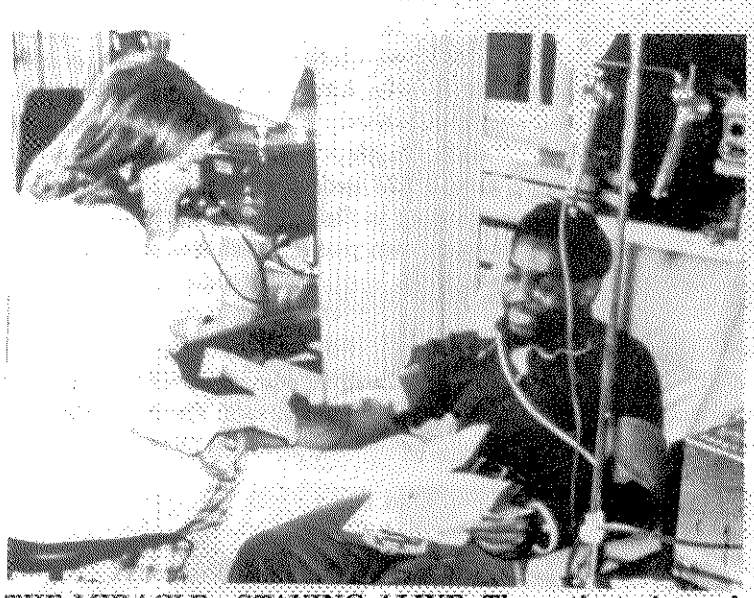
within the community.

The International Service Agencies are a group of organizations that give direct service programs of health, welfare and humanitarian assistance to people in poor areas of the world. These agencies provide the tools, knowledge and management to millions of needy people to help them build a future for themselves and their children.

The Langley Research Center will hold its one-day solicitation Wednesday, October 5. During the day, each employee will have an opportunity to contribute or pledge, through payroll deduction, their fair share. A brochure, listing the recipients of our gifts and describing their activities, will be distributed during the day. Please take the time to study the brochure before making your contribution. Each agency needs your support in helping the people in our community. "By helping to shape our community's future through the Combined Federal Campaign, we're more than just living our lives. We're fulfilling them," a volunteer worker said.

Langley, though a very small area of America, plays an extremely large part in shaping our community's future and meeting the needs of our people—quite a show of American citizenship.

Help fulfill the lives of others. Contribute to the Combined Federal Campaign.



THE MIRACLE—STAYING ALIVE: The patient pictured here is one of 36,000 Americans who must depend upon an artificial kidney machine to live. The average patient must dialyze three days a week for four to six hours a treatment. Although kidney transplantation is the answer for many, only two- thirds of the patients on dialysis are medically eligible for a transplant. The National Kidney Foundation is supporting research which researchers hope will help make dialysis treatments shorter and less frequent. The National Kidney Foundation is the only voluntary health agency seeking the total answer to kidney disease, through prevention, treatment and cure. Its many-faceted programs include research, patient services, professional education and public information. The gift you give may help doctors and researchers perform a miracle: finding a cure for kidney disease and giving someone a new lease on life.

CFC Co-Chairman's Message

Support Your Community Through CFC

In the last issues of the **Researcher News**, we have been reminded of the beginning of the 1988-89 Combined Federal Campaign (CFC). We all can take pride in that Langley has always been a leader on the Peninsula in the CFC campaigns. We have shown that we do care about the communities where we live and work, and that we can make a difference in someone's life.

As you know, the Langley CFC goal for this year is $260,000. This is higher than last year's results; however, we are confident that we can meet this challenge. Langley has always met its commitment, and I am sure we will continue the tradition in this campaign as well.

The committee gladly invites employees to the kickoff on September 27. We strongly encourage all division chairmen, key persons and new employees to participate in this informative hour. It is a time when all of us can get together to discuss meeting our goal and to hear Adm. Train speak to us on ways we can support our community.

Contributing to the CFC is one outstanding way of supporting the community in which we live. When your key person asks for your pledge October 5, please be generous with your gift. With your help, we can continue

the Langley tradition of meeting the needs of those less fortunate than we.

Jim Arrington
CFC Co-Chairman

ISA: Making a World of Difference

The International Service Agencies is a federation of distinguished American non-profit charitable organizations, assisting over 95 million impoverished people in 100 countries in Latin American, Africa, Asia and the Far East.

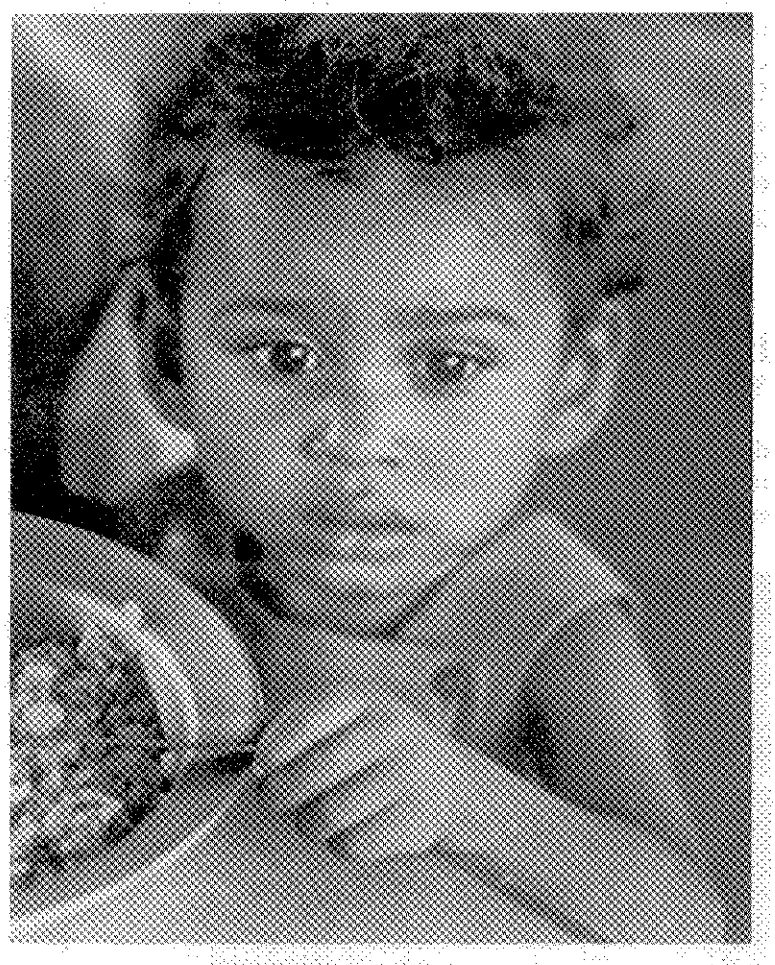
ISA agencies reach those who suffer from overwhelming hunger, poverty and disease. These agencies make a difference through self-help, "people- to-people" projects with special focus on health, food, medical education, farming, job training, schools, clean water systems, refugee resettlement and emergency aid.

The International Service Agencies—International Human Assistance Programs, International Rescue Committee, Planned Parenthood-World Population, Save the Children, CARE, Project HOPE and Helen Keller International—have developed expertise to direct our concern abroad. Each agency offers special skills in response to particular concerns in various countries. Together they embrace the world and its children.

Project HOPE, the world recognized education organization, has benefitted millions of people in 27 developing countries. **International Rescue Committee** is America's leading nonsectarian agency providing relief and resettlement services for refugees fleeing political, religious and racial persecution. **Helen Keller International** combats the staggering problems of blindness in developing countries. **Save the Children** works in more than 500 communities in 17 overseas countries with programs which focus on services to children in health, education and nutrition.

America has always been quick to respond to the critical needs of its world neighbors—whether in times of disaster, or in assisting with long-range programs that provide individuals with the skills to become independent and self-reliant. Many have been helped but many more await assistance.

As an American, you can make a world of difference. Your contribution to the Combined Federal Campaign is an investment providing individuals with an opportunity to change their lives and build a brighter future for themselves and their children. Your contribution will help provide a life of dignity for tens of millions of people in every corner of the earth.



THE FIGHT AGAINST HUNGER: This Latin American youngster is one of the millions of children who regularly receive CARE nourishing food through International Service Agencies. CARE's supplementary feeding programs around the world help combat malnutrition so children can grow into healthy, productive adults. In 38 countries of Asia, Africa, Latin America and the Middle East, CARE conducts a wide variety of aid programs including feeding, agricultural development, medical training and self-help projects. This vitally needed assistance helps destitute families now, and enables them to work towards becoming self-supporting. Your contribution to ISA throught the Combined Federal Campaign does make a world of difference.

Langley Papers Judged Best

Charles P. Blankenship, Robert J. Hayduk, Paul M. Hergenrother and Stephen J. Havens have recently been recognized by their respective professional societies as authors of "Best Papers."

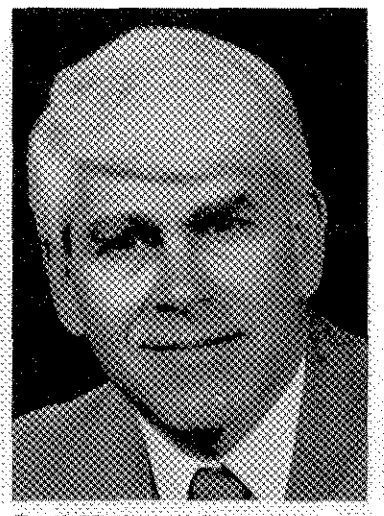
The Society of Automotive Engineers (SAE) have selected Blankenship and Hayduk winners of the 1987 Wright Brothers Award for their paper entitled "Large Space Structures—Structural Concepts and Materials."

The prestigious Wright Brothers Award is presented annually to the author or authors of the best paper relating to the invention, development, design, construction or operation of an aircraft and/or spacecraft. The award, established in 1927, will be presented October 5 at AEROTECH '88 in Anaheim, California.

Blankenship, director for Structures, manages all research work in materials, structural mechanics, structural dynamics, and acoustics and noise reduction. He began his NASA career in 1961 at Lewis Research Center in Cleveland, Ohio. Blankenship transferred to Langley in July 1980 as chief of the Materials Division. He was appointed to his present position in July 1983. He and his wife, Gayle, live in Poquoson. They have two sons.

C. P. Blankenship

Robert Hayduk



Paul Hergenrother

Stephen Havens

Hayduk, assistant head of the Spacecraft Dynamics Branch, began his NASA career in 1962. For most of his career, his principal research interest has been impact dynamics. In his present position, he manages and conducts research activities to determine, predict and control vibration behavior and dynamic response of advanced aerospace structures. Hayduk and his wife, Sally, live in Newport News. They have four children.

Hergenrother and Havens have been selected winners of the "Best Paper by a SAMPE Member Award" by the Society for the Advancement of Material and Process Engineering (SAMPE). Their paper is entitled "Adhesive Properties of LARC-CPI, A New Semi-Crystalline Polyimide."

The SAMPE is an international society providing continuing education in new materials technology and processing as well as technical forums in which engineers and scientists can exchange ideas. Hergenrother and Havens, members of the Old Dominion Chapter, will receive the award at the 20th International SAMPE Technical Conference to be held September 26-29 in Minneapolis, Minnesota.

Hergenrother, senior polymer scientist in the Polymeric Materials Branch, joined Langley in 1980. He is internationally known for his work in high performance organic polymers. In his present position he is responsible for the development of high performance/high temperature polymers for potential use as structural resins on aerospace vehicles. Hergenrother and his wife, Lani, live in York County.

Havens, research chemist in the Polymeric Materials Branch, joined Planning Research Corporation (PRC) in 1982 after two years with Jim Walter Research Corp. At PRC he works primarily with modified thermoplastics. Havens lives in Newport News.

Retirement Parties

Edward "Eddie" J. Roberts retired on June 3. He has requested no retirement ceremony. In recognition of his dedicated career and contributions to Langley, donations for a gift are being solicited. Please send donations to Charlene Gleaton, Mail Stop 424, ext. 2156, by October 21.

Robert R. "Skip" Nunamaker will be honored at a retirement party Saturday, October 1 in the Activities Center. Festivities will begin with a cash bar at 6 p.m.; steamship round buffet dinner at 7; program at 8. Cost is $12.50/person which includes gift. Contributions for gift only will be graciously accepted. Please respond to Barbara Clark, Mail Stop 107, by September 26.

In Memoriam

Sympathy is extended to the families of:

James R. Tyeryar, who died August 30. tyeryar had retired earlier this year as an engineering technician.

Sullivan C. Donadio, who died July 31. Donadio, an engineering technician, retired in 1971 after 30 years of government service.

HISPANIC HERITAGE SALUTED AT LANGLEY. Anthony M. Busquets, aerospace engineer, Flight Management Division, interfaces advanced cockpit displays and information transfer devices to simulation computers. Shown here at a cockpit simulator, Busquets was recently featured in a special issue of *Graduating Engineer* magazine. Langley is saluting our Hispanic workers during September.

Note of Thanks

Joe DeGinder writes: "My family and I would like to express our thanks to all who gave us a wonderful send off at my retirement party. We would especially like to thank those who worked so graciously to plan and provide such a memorable evening. Thanks, again, for all the gifts and mementos that mean so much to me."

Planning to Retire this Year?

Numerous articles have been published regarding the length of time it takes a retiree to get that first annuity check. Congress has put a great deal of pressure on the Office of Personnel Management (OPM) and all other federal agencies to speed up the process. **But**, we need your help!

As the prospective retiree, you can do your part by planning in advance. Therefore, if you are planning to retire this year and have not yet had your pre-retirement counseling session, please call Betty S. Burnes, ext. 2266, for an appointment as soon as possible.

We want to make your transition into retirement as pleasant and smooth as we possibly can. So, the sooner the paperwork process can be begun, the easier life will be for everyone involved.

Runners Club Race Results

Runners Club top finishers in the Carnival 5-Mile Race are as follows:

Men	1 Gale Harvey	32:14
	2 Joe Drozdowski	39:14
	3 Marion Martin	48:50
Women	1 Anne Drozdowski	36:31

Upcoming Events for Runners Club

NASA Intercenter Races will be held during the month of October, with 10 KM races on October 3, 13, and 27; and 2-Mile races on Oct. 6, 11, 20 and 24. All races start at 5 p.m. on Doolittle Road, except the 2-Mile race on Oct. 11 which will be on the Bethel High School track at 12 Noon.

All NASA employees, retirees, on-site contractors, and co-ops at work will earn points for Langley by participating. WALKERS are welcome in all races.

In the Spring 1988 races, Langley finished 5th among the NASA centers in both the 10 KM and the 2- Mile. Langley needs to make a better showing in October, so come out and run or walk the races at your own pace. For more information, call Richard Shearer, ext. 4508.

Bowling Stats

The NASA Tenpin Bowling League, comprised of 20 teams, bowl each Tuesday evening at Victory Lanes in Grafton. Results of the first session follow:

Team High Game	936	Odd Lot
Team High Series	2642	Odd Lot
Male High Game	240	Craig Neil
Male High Series	623	John Kovtun
Female High Game	222	Marilyn Aldrich
Female High Series	539	Marilyn Aldrich
Most Pins	+79	Craig Neal
over Average	+69	James Rishardson

The NASA Bowling League is always interested in people who would like to substitute-bowl. Call Pat Gates, ext. 2058.

Phone Note:

Please make the following pen and ink change to your June 1988 copy of the on- site telephone directory:

Wells, Carolyn.....Mail Stop 126.....Extension 3330

What's in a Name?

What do Voyager, Eagle, Mustang, Phantom, Goose and Jenny have in common? All are famous airplanes; more specifically, all are famous airplanes to which Langley Research Center has made significant design contributions. More recently, all have been selected to name computers in Langley's new supercomputer system.

The winning naming convention—famous airplanes—was submitted by Michael Holloway, Systems Architecture Branch, Information Systems Division, and jointly by O. J. Rose, PRC/Kentron Inc., and Chet Dominik, LARSS student, who worked together this summer in the Supersonic/Hypersonic Aerodynamics Branch, High-Speed Aeronautics Division.

Holloway cites Langley's preeminence in the field of aeronautics as his reason for chosing famous airplanes as one of his submissions. "I feel it's a great way to emphasize Langley's reputation."

Rose and Dominik were also interested in zeroing in on a convention specific to Langley accomplishments. "Langley has had a definite influence on nearly every fighter aircraft in history. And the list can be expanded without difficulty as more computers are added."

Voyager, the name chosen for the Cray-2 Supercomputer, lauds the first aircraft to fly around the world nonstop without refueling. Names chosen for the two Convex C210 processors are **Eagle**, the F-15 for which Langley engineers played a major design role, and **Mustang**, the first aircraft to employ the NACA laminar flow airfoil. **Phantom**, one of the first models to be tested in the 4-by-4 ft. Unitary Tunnel at Langley, will name the Convex C120 processor. The Sun Gateway will be called **Goose**, the amphibian aircraft used to shuttle workers between Langley and Wallops Island. Finally, the IBM mass storage processor will carry the name **Jenny**, the darling of barnstormers of the 1920s which was tested extensively by NACA engineers at Langley.

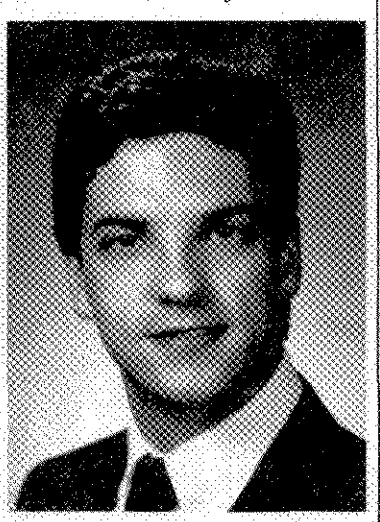
Mickey Rowe, assistant division chief, Analysis and Computation Division, was pleased with the enthusiasm generated by the contest. "It was a pleasure to notify the winners. The excitement in their voices was a reflection of the mood created by the contest." The prize: the satisfaction of naming Langley's supercomputer system.

The contest, open to all computer users, drew 90 submissions from over 50 individuals. Organized by Annette Holloway, ACD, the contest offered a pleasant change of pace for computer users and stimulated a variety of subject entries. Some were serious . . . important scientists/engineers, celestial bodies, fathers of aviation; others bore the mark of creativity . . . "super" heroes, yuppie-isms, mythological figures; still others were submitted 'tongue-in-cheek': famous pool balls—1, 2, 3, etc. Chris Rumsey, Analytical Methods Branch, suggested letters of the alphabet as the naming convention. "It's simple, easy to remember, and it's never been done before."

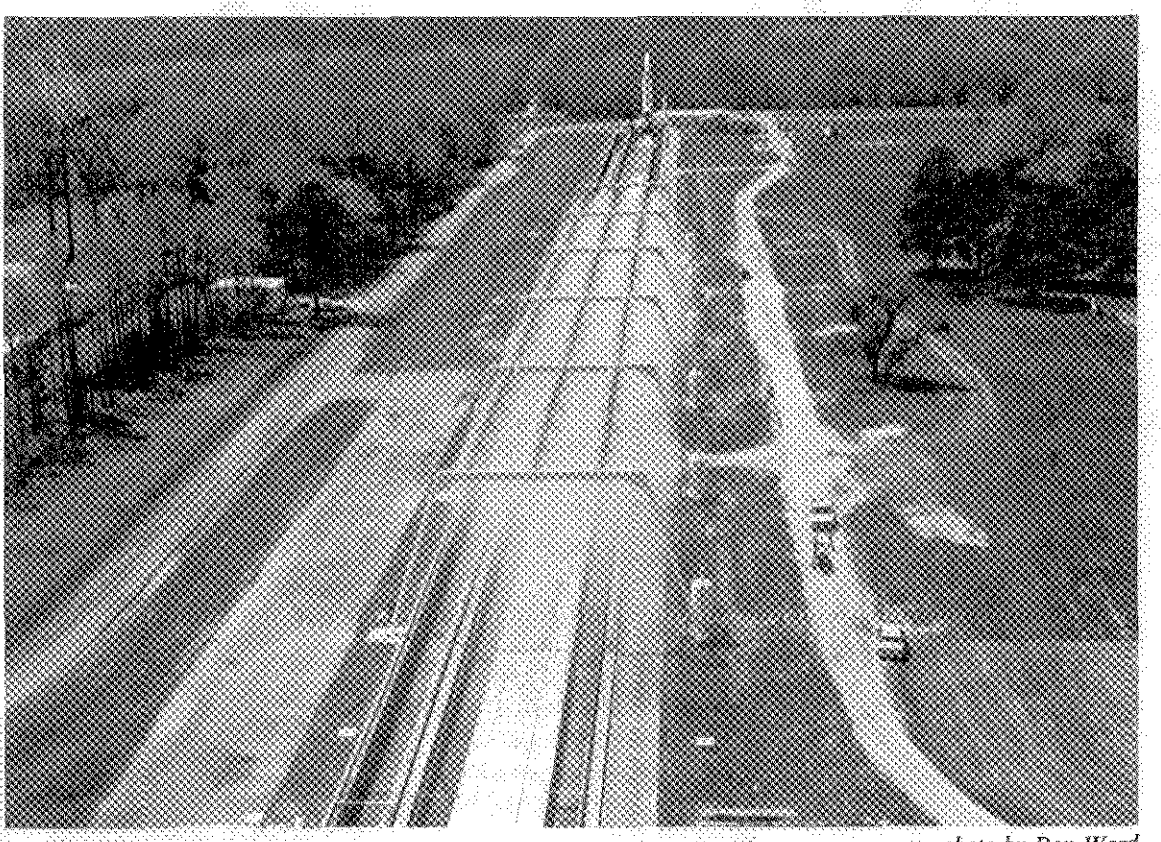
The supercomputer augmentation is a $53 million upgrade to computing capabilities at Langley. It will provide the critically needed increase in computer processing to support large-scale analytical simulations for basic and applied research.

Michael Holloway

O. J. Rose



Chet Dominik



-photo by Don Ward

From Behind the Scenes

Rain Can't Dampen Langley Cooperation

The Aircraft Landing Dynamics Facility (ALDF) has taken on a new application. The ALDF, designed to test full size aircraft landing gear systems at operational velocities, has recently been refitted for full-scale testing of airfoil performance in simulated rain. Heavy rain is often associated with a wind shear environment which is known to be a serious hazard to aircraft.

The rain study makes use of the varied expertise at Langley. The research focus is provided by the Low-Speed Aeronautics Division and tests involve a unique application of an existing facility—ALDF—primarily used by the Structural Dynamics Division and operated by the Operations Support Division. The development of the spray system and wing model/carriage interface was a cooperative effort of the Facilities Engineering Division, the Wallops Flight Facility, the Systems Engineering Division, the Operations Support Division, and the Fabrication Division.

DDF Progress Reports Due

The Director's Discretionary Fund (DDF) continues to be an effective mechanism to initiate, at any time during the year, innovative and high risk research that does not directly fit into any of our ongoing programs. In order to assure the continuance of this program, written and oral progress reports are required.

Research project summaries should be forwarded to Jan Edwards, Mail Stop 105A, by Wednesday, September 28.

Selected oral presentations will be on Tuesday, October 25, 1988, from 8:30 a.m. to 4:15 p.m. in Building 1219, Room 225. Results of discretionary-funded work will appear in a report to Headquarters.

Those who are already receiving discretionary funding or those interested in additional information about DDF, call Ed Prior, ext. 3316.

Langley Directives Distributed

DIRECTIVES NO.	TITLE	DATE	T.S.#	DATE DISTR.
Revised				
LMI 5320.6	"Implementation of NASA Standard Parts Program"	7-15-88	1607	8-3-88
LMI 2230.1	"Review and Approval of Publication or Dissemination of Information Derived from Contracts, Grants or Cooperative Agreements"	8-8-88	1608	8-19-88
LMI 2220.5	"Langley Scientific and Technical Publications Program"	8-8-88	1609	8-19-88
LMI 1700.4	"Reporting Accidents, Injuries, Illnesses, Compensation Claims, and Motor Vehicle Accidents"	8-8-88	1610	8-19-88
LMI 1100.31	Attachment, "Library Committee"	8-8-88	1611	8-19-88
LMI 1900.1	"Outside Employment and Statements of Employment and Financial Interests"	8-8-88	1612	8-19-88
LMD 1200.12	"Redelegation of Authority to Approve Absence and Leave"	8-8-88	1613	8-19-88
LMD 1200.13	"Redelegation of Authority to Approve Hours of Duty and Related Matters"	8-8-88	1614	8-19-88
LMI 1100.32	Attachment, "Langley Chapter, NASA Employees' Benefit Association"	8-8-88	1615	8-19-88

NOTE: Directives are available for review in each organizational office. Extra copies may be obtained from the Directives and Forms Management Office, ext. 3511.

Happenings

LAA SOCIAL will be held Friday, September 30, from 4 to 6:30 p.m. in the Activities Center.

HALLOWEEN SOCIAL. The LAA will sponsor a special Halloween social October 28 from 4:30 to 9:30 p.m. Watch for details in an upcoming issue.

TOASTMASTERS. The NASA Toastmasters will meet Wednesday, Sept. 28, 11:30 a.m.—1 p.m., in the Hampton Room of the Activities Center. Toastmasters can help improve speaking, listening and thinking-on-your-feet. All are welcome. Call Natalie Johnson, ext. 3483, for information.

MUSIC CLUB FORMING. Attention musically inclined, string instrument players, those interested in Blue Grass, 50s—60s, and folk music: interested in impromptu get-togethers? Call Tom Gabany, ext. 2592, and leave message.

LAFB O-CLUB. Back by popular demand, the officer's club will offer "Complete Breakfast Line Service" Monday through Friday during September.

JACK AND THE BEANSTALK will be presented live on Saturday, Oct.15, at Denbigh High School. Tickets are $2.50 in advance and $3 at the door. Call 244-4173 or 596-6917 for reservations and information.

VA. STAGE COMPANY, Hampton Arts Commission and the City of Hampton will present a four-part preview/discussion series on theatre-making. First lecture will be held Thursday, Sept. 29, 7:30–9 p.m., in the new Hampton Public Library, Victoria Blvd. Call 627-6988 for details.

NEEDED: RIDE from Portsmouth or Norfolk to LAFB TAC HQ 7:30—4:30 shift. Payment negotiable. Call Jessie at 764-3673 (w) or 397-1491 (h).

FOR RENT: TOWNHOUSE. 3 BR, 2 1/2 BA, LR, DR, eat-in Kit. New paint and carpet, washer/dryer, dishwasher, C.A. and heat. Screened patio, storage shed. Near LAFB and I-64. Rent to family or three individuals. Call 898-3419 and leave message.

FOR SALE: BIKE. 10-speed, Azuki 25-inch frame, Alpine gearing, Brooks saddle, rack bag, pump, toe clips, generator/lights set. GC. $165. Call 1- 588-8617 after 7 p.m. or leave message.

FOR SALE: GREAT BOOKS of the Western World. Cloth binding. Pristine condition. $900 OBRO. Call 1-588-8617 after 7 p.m. or leave message.

FOR SALE: AUTO, 1986 Fiero, 5-speed, AC, AM-FM cassette, 20,000 miles. $7,100 OBRO, Call ext. 3011 or 827-0284 after 5 p.m. or leave a message.

FOR SALE: ITEMS. Queen/double headboard, $40; large table lamp, $30; desk chair, $50. Excellent condition. Call 898-8463.

FOR SALE: 35MM CAMERA. Sears (Ricoti) w/built-in light meter, fl.7 lens plus 3X teleconverter, 28mm wide-angle and 135mm telephoto lenses, electronic flash, assorted filters. $175. Call 1-588-8617 after 7 p.m. or leave message.

FOR SALE: LOT. Wooded lot in Ford's Colony, .4+ acre on cul- de-sac. Golf course view. $69,900. Call 1-588-8617 after 7 p.m. or leave message.

Video Conference Briefing Planned

The agencywide Video Teleconference System is a state-of-the-art audio and video conference system which is part of the new Program Support Communication Network (PSCN). It consists of full conference facilities, including multiple remote control positioned cameras, dual large screen monitors, coder/decoder, video recorders, audio teleconference system, electronic medium presentation with PC/terminal interface, color printer and facsimile machine.

A series of briefings explaining the new video conferencing system will be held from September 27 through October 3 in Building 1201, Room 115A. The approximate 1 1/2-hour presentation will take place at 8:30 a.m., 10 a.m., 1 p.m. and 3 p.m. each day.

It is very important that each Langley organization become familiar with this facility and use this resource to improve communication and productivity.

Please call the Video Communications Group, ext. 4255, to schedule a briefing time or for additional information.

Notice to Employees:

TV coverage of the entire STS-26 mission will be available for viewing by Langley employees in the following locations:

- Visitor Center—Building 1202
- Cafeteria—Building 1213
- H.J.E. Reid Conference Center*—Building 1222*

*The H.J.E. Ried Conference Center, Building 1222, will be available for viewing of Space Shuttle Mission STS-26 providing there is no major conference scheduled in that facility. Watch the marquee in front of the building for up-to-the-minute information.

National Aeronautics and Space Administration

Langley Research Center
Hampton, Virginia 23665-5225

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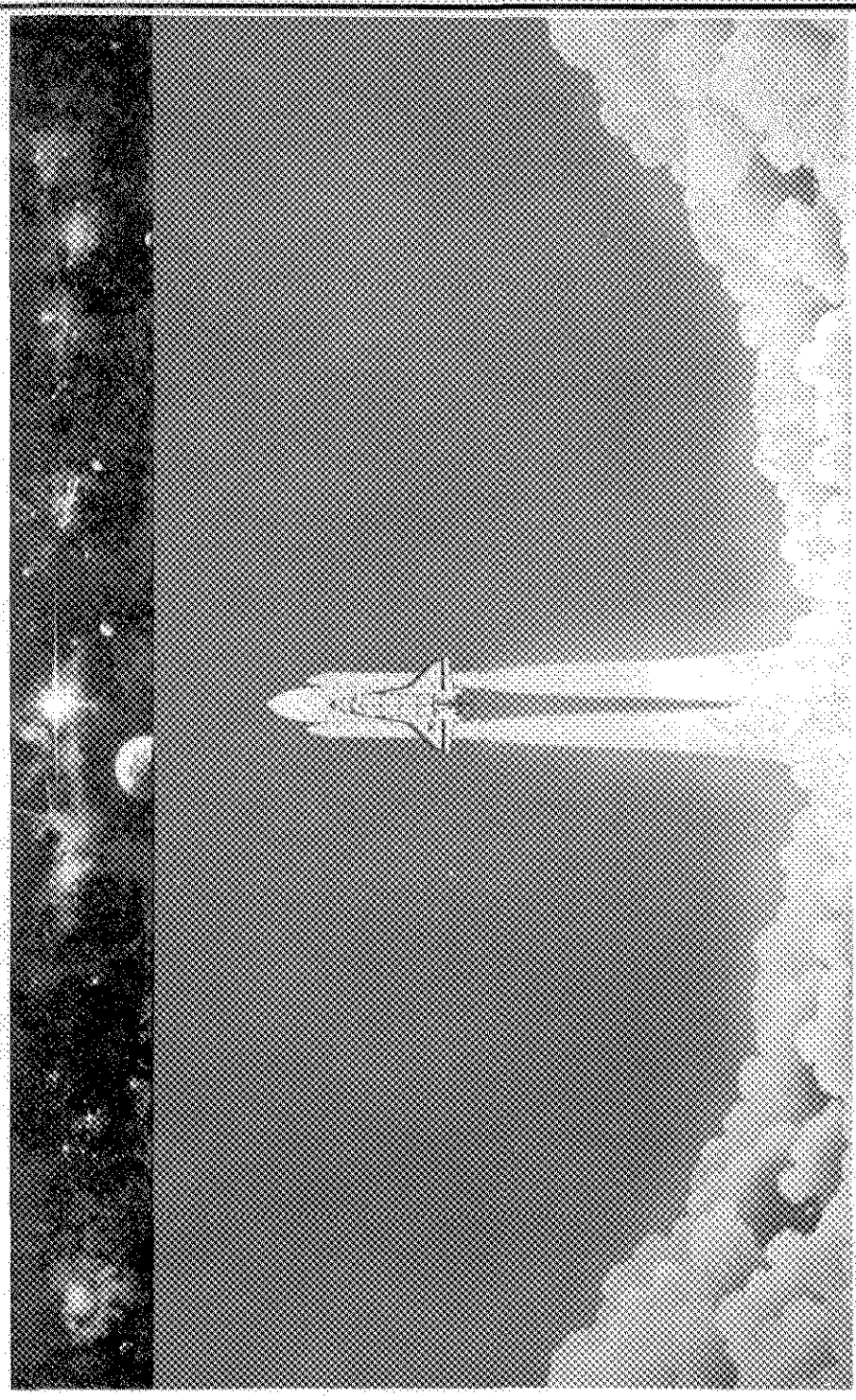
News Researcher

Return to Flight: Saluting Discovery Past and Present



THE DREAM IS ALIVE, by artist Nick Gonzalez-Goad, depicts the April 1985 launch of the Space Shuttle Discovery. More than that single event, the painting embodies the spirit of NASA's "return to flight." Gonzalez-Goad has captured the hopes and dreams of the entire space program— past, present and future. The mysteries of the universe and mankind's eternal quest for knowledge are symbolically portrayed in this painting commissioned by NASA and included in the NASA's permanent collection. Prints of *The Dream is Alive* are available for sale at the Visitor Center Souvenir Counter.

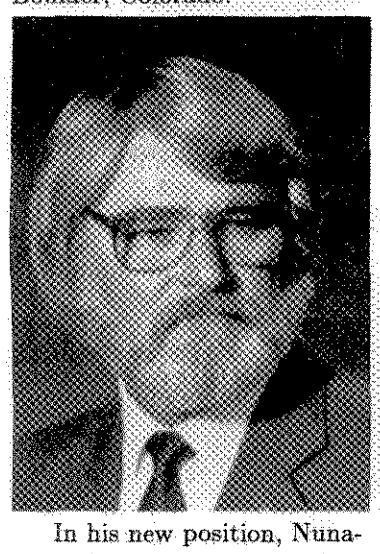
NASA
National Aeronautics and Space Administration
Langley Research Center

News Researcher

Volume 2, Issue 20 October 7, 1988
Bi-weekly Employee and Contractor Publication

Nunamaker Retires From Government Service

Robert R. "Skip" Nunamaker, Langley's director for Space, has announced his retirement from government service. He has been named Director for Program Integration at Ball Space Systems Division, Ball Corporation, in Boulder, Colorado.



In his new position, Nunamaker will be responsible for upgrading and reorganizing the aerospace programs in the corporate office. He will be working for Jesse Moore, former director of Johnson Space Center and now president of Ball Space Systems Division.

As Director for Space since 1985, Nunamaker directed the organization responsible for research in the atmospheric and earth sciences, the development of technology for advanced spacecraft and transportation systems, research in energy conversion techniques for space applications, and the development of activities for technology utilization and evolutionary growth of the Space Station.

Nunamaker has been with NASA since its inception in 1958, when he joined the staff of the Lewis Research Center as a design engineer.

Nunamaker has been recognized by Who's Who in America, American Men and Women of Science, Who's Who in Aviation, Jane's Who's Who in Aviation and Aerospace, Men of Achievement, and the Directory of Distinguished Americans.

Hook Named Director for Space

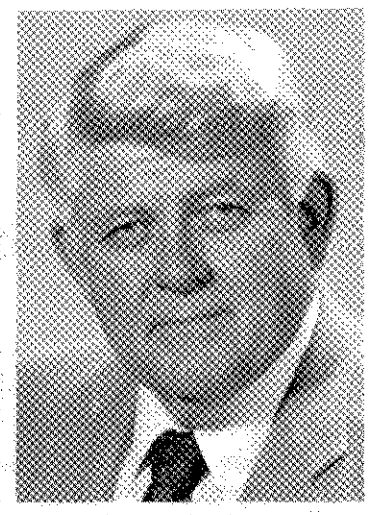
W. Ray Hook, manager of Langley's Space Station Office, has been named the Director for Space at Langley Research Center.

Hook replaces Robert R. "Skip" Nunamaker, who retired after 32 years of federal service. Nunamaker has accepted a position with Ball Space Systems Division, Ball Corporation, in Boulder, Colorado.

As Director for Space, Hook oversees Langley's space research efforts. He is responsible for advanced space transportation, planetary entry, Space Station Freedom, large space antenna research, and Langley's atmospheric sciences programs. "I foresee no major changes in the organization," Hook explains, "and we will continue to produce an excellent technical product."

"We're going to have a lot more access to space," Hook says. "Atmospheric sciences experiments that are proposed for the Earth Observing Satellite (EOS) system, structural characterization experiments for Space Station Freedom, and the Aeroassist Flight Experiment (AFE) will begin in the next several years. The years ahead will be exciting ones."

Hook began his federal career at Langley in 1955 as an aeronautical research intern. After serving as an aircraft maintenance officer



in the U.S. Air Force from November 1955 to April 1958, he returned to Langley as an aerospace engineer, and served as the co-project engineer on the Trailblazer II Program.

Hook's other positions included an assignment at NASA Headquarters, Washington D.C., as acting director for Space Shuttle Technology Payloads. He was also head of Langley's Shuttle Experiments Office, where he helped develop technology payloads and atmospheric science payloads that have since flown on Shuttle and Skylab, and head of the Systems and Experiments Branch.

Go, Discovery! STS-26 Launched

The Space Shuttle Discovery was launched at 11:37 a.m., Thursday, September 29 returning America to space flight. Paul Holloway, deputy director, spoke for all Langley employees when he commented, "The dream is alive!"

Piland Returns as Chief, SSD

William M. Piland returns to Langley to assume duties of chief of the Space Systems Division.

He was formerly National Aero-Space Plane (NASP) director for NASA in the NASP Program Management

Office, Washington, D.C. As Director for NASP, Piland participated in the planning, formulation, and direction for the NASP Program with particular emphasis in those areas where NASA had lead responsibility, such as technology maturation and civil applications.

In his new position, Piland heads the organization responsible for aerothermodynamics of advanced space vehicles, research on advanced space energy concepts, and systems analysis of integrated spacecraft and space transportation concepts for future NASA missions.

Piland began his NASA career at Langley in 1962 as a commissioned officer with the U.S. Army.

Walberg Named Deputy Director for Space

Dr. Gerald D. Walberg, chief of the Space Systems Division, has been named deputy director for Space at Langley Research Center.

In his former position since 1980, Walberg directed the organization responsible for aerothermodynamics of advanced space vehicles, research on advanced space energy concepts, and systems analysis of integrated spacecraft and space transportation concepts for future NASA missions.

Walberg began his NASA career in 1957 as an aerospace engineer in the 8-Foot Transonic Tunnel Branch, conducting research on the problems of supersonic aircraft in the transonic speed range. He became a specialist on aerodynamic flutter.

In 1961, Walberg transferred to the High-Temperature Materials Branch of the Applied Materials and Physics Division to study ablation materials for re-entry vehicle heat shields.

Walberg has served as head of the Thermodynamics and Combustion Section, the Gas Radiation Section, the Aerothermal Branch, and the Aerothermodynamics Branch, specializing in aerothermodynamics, planetary entry vehicles and advanced space transportation systems.

From January to November 1979, he participated in the Executive Development Program at NASA Headquarters, Washington, D.C. The author or co-author of 27 technical publications, Walberg is a past chairman of the Hampton Roads Section, American Institute of Aeronautics and Astronautics (AIAA), and the associate editor of the Journal of Spacecraft and Rockets.

News Briefs

HEADQUARTERS, Washington, D.C. — NASA and the National Science Teachers Association announce winners of the 8th annual Space Science Student Involvement Program (SSIP) competition. National SSIP winners were in three competition categories: Space Station proposal; student newspaper promotion; and aerospace internship. The objective of the SSIP competition is to stimulate interest in science and technology by directly involving students in a space or aeronautics research program. Since 1980, approximately 2.5 million students have used the space science program materials in classroom and over 15,000 students have submitted proposals.

HEADQUARTERS, Washington D.C. — NASA has concluded contract negotiations for full-scale development of the permanently manned space station Freedom, scheduled to be deployed in orbit in the mid-1990s. In December 1987, NASA selected Boeing Aerospace Co., Huntsville, Ala., McDonnell Douglas Astronautics Co., Huntington Beach, Calif., GE Astro-Space Division, Valley Forge, Penn. and East Windsor, N.J., and Rocketdyne Division of Rockwell International, Canoga Park, Calif., for negotiation of cost-plus-award-fee contracts to design, develop, test and evaluate, and deliver the components and systems comprising the space station Freedom. This newest action marks the successful settlement of those contracts. The 10-year contracts with these four aerospace firms have a total value of approximately $6.7 billion.

Editor's Note: Surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017. Request information by headline and release number. See Current News Release information box below.

Composer/Musician Covers STS-26

For more than 25 years, American artists have chronicled the nation's space and aeronautics programs with works of art under the NASA Art Program. The program takes on a new dimension as the Space Shuttle returns to flight. For the first time, a musician will be using the musical medium to convey artistic impressions of the space program.

Jane Ira Bloom, a soprano saxophonist and a jazz improviser and composer, experienced the activities involved in the launch and landing of the 26th Shuttle mission. Based on her impressions, she will provide a suite of musical compositions.

Other artists covering the STS-26 launch were Angela Manno, West Palm Beach, Fla.; Wendell Minor, New York City; Michael Knigin, Long Island, N.Y.; Alan Chinchar, Houston, Texas; and John Solie, Santa Monica, Calif. In addition, Solie and Dan Namingha of Santa Fe, N.M., covered the landing at Edwards Air Force Base, Calif.

An avid follower of the space program, Bloom wrote to NASA in 1985 suggesting that the agency commission a musical composition as a part of its fine arts documentary. She stated that "composers can't document historical events quite as literally as painters, but we can capture emotional history in a way that other art forms cannot." Robert Schulman, director of the NASA Art Program, found her viewpoint and her talent worthy.

Space, in both the phsyical and astrophysical senses, is not new as a theme in Bloom's compositions. Her suite, "Music for Amazing Space," was inspired by her deep interest in the space program. The inspiration for another composition, "Doppler's Revenge," came from NASA experiments on spatial reorientation in weightlessness—a concept that Bloom finds intriguing.

Bloom is noted for her music's unusual use of movement and technology. While playing, she swings her saxophone around in an arc to get certain doppler-type sounds. She likes to accentuate how sound can change with movement. Bloom has five record albums to her credit, with a sixth to be released this fall.

The musician describes herself as being "as passionate in the detail of my work writing music as technicans and engineers must be in their work."

The artists arrive at Kennedy Space Center three days before launch and stay until the day after launch. Activities include sketch sessions near the pad and at astronaut suit up, along with other pre-launch activities.

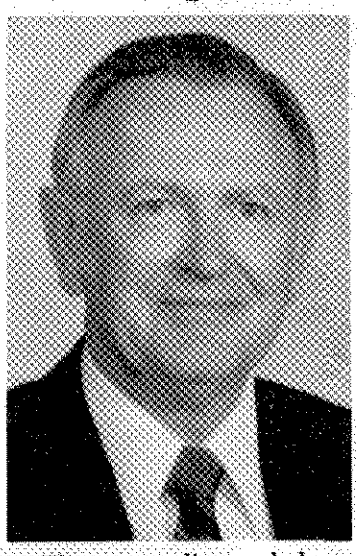
Artists invited to participate in the program are paid an honorarium. Each is asked to donate at least one piece of art to NASA.

Lankley

"I don't care how many years experience your friend Ben has, we don't have any openings in the Storm Hazards Program!"

Editorials

NASA, 1958-1988: A Perspective



The formation of NASA gave the NACA a new set of opportunities to contribute to the technological advancement of the U.S. In particular, a number of NACA engineers were presented with the new and rigorous challenges of space that eventually ignited the imagination of the country and the world.

The triumphs and tragedies that have followed and produced the headlines of the past 30 years attest to the impact of NASA on our lives. There is no field of science or engineering that hasn't seen a significant change in its state of the art as a result of NASA's efforts over these exciting years. From Project Mercury to the Sea of Tranquility, from the Scout to the Space Shuttle, NASA has totally changed our view of the world and the solar system in which we reside.

Anyone who has participated in these last 30 years has certainly lived in one of the most rewarding periods of our country's history and should be justly proud. However, an immortal Brooklyn Dodger fan coined a phrase, "yesterday's hero's are tomorrow's bums" and, similarly, NASA today is faced with a tarnished reputation as a result of the Challenger accident and its apparent malaise in dealing with the future.

The extraordinary challenges of today are no different in scope than they were 30 years ago. NASA is still composed of some of the best young people in the U.S. and is equipped to solve the most demanding problems. The return to flight of the Space Transportation System, the Hubble telescope, the coming trips to Venus and the outer planets, the Aero-Space plane, and the Space Station Freedom will certainly help to restore NASA's image.

What is needed is a NASA willing to overcome the bonds of bureaucracy, to deal with the issues in a straightforward and eloquent fashion, and to recognize that they, too, have to make some sacrifices in order to live up to the expectations that the country has come to look for.

Christopher C. Kraft, Jr.

Christopher C. Kraft, Jr., is the former director of the Johnson Space Center, Houston, Texas. Since his retirement from federal service in August 1982, Dr. Kraft serves as an aerospace consultant to Rockwell International, IBM and a number of other companies.

Kraft joined the Langley Aeronautical Laboratory of the National Advisory committee for Aeronautics (NACA) in January 1945. In October 1958, he was selected as one of the original members of the Space Task Group at Langley.

Kraft, a graduate of Virginia Polytechnic Institute, was born in Phoebus, Va.

NOAA-H/Atlas Launch Successful

Reports from the NASA facility at Vandenberg Air Force Base indicate that the Atlas 63E launch of a NOAA-H weather satellite from the Western Space and Missile Center was completely successful.

Launch of the Atlas was precisely at 6:02 a.m. EDT as planned and all Atlas staging operations occurred nominally on time. The Apogee Kick Motor on the NOAA-H spacecraft fired on time and worked properly.

Position Open

88-66: Supervisory Contract Specialist, GM-1102-13 or 14, Management Operations Directorate, Acquisition Division, Research and Services Contracts Branch. Closes October 17.

Current News Releases

88-127.....NASA Sets Target Date for STS-26 Launch
88-128.....Composer/Musician to Cover Shuttle Mission Under Art Program
88-129.....NASA Marks 30th Anniversary on October 1
88-130.....Telephone Service Available for Shuttle Missions
88-131.....NASA Announces Student Space Station Proposal Winners
88-132.....Space Station Freedom Contract Negotiation Concluded

CFC

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865-3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

NASA Marks Thirtieth Anniversary in October

This month, NASA marks three decades of achievements in aeronautics and space. In retrospect, it has been a period of remarkable scientific and technological accomplishment that pioneered the space frontier, made quantum leaps in man's understanding of his planet and his universe and saw revolutionary advances in the aeronautics field.

The Tidewater area has been home to NASA and its predecessor agency, the National Advisory Council for Aeronautics (NACA), since 1917. When NACA became NASA in 1958, the Langley Research Center had been involved in basic and applied aeronautics research for more than 40 years. Many of the aeronautics advances in performance, speed, safety and efficiency from NACA/NASA research are considered so fundamental today that they are taken for granted.

Langley, because of its experience in early rocket research for pilotless aircraft, became the birthplace of America's first manned space program. The Space Task Group was formed here to manage Project Mercury. Langley contributed to the design and testing of the Mercury, Gemini and Apollo spacecraft and was the original training site for the first seven astronauts.

Now, thirty years later, as NASA returns to space flight, the Langley Research Center is proud to have played a significant role in the Shuttle recovery process. Langley researchers have analyzed structures, tested materials, modified designs, fabricated test articles, and conducted countless tests to provide answers to some of the key technical questions of the Shuttle recovery.

As we celebrate the establishment of NASA 30 years ago and take account of our agency's accomplishments since then, I hope we will also take a moment to reflect on how privileged we are, as public servants, to have been entrusted by the American people with such exciting and challenging missions—missions of critical importance to the scientific, technological, and economic strength and well being of this country.

Our record over the 30 years testifies to how well we have met the goals and challenges of these missions. It includes many exciting high points such as the early manned space flights, the fly-bys of the planets, the unmatched success of the Apollo landings on the Moon and the flights of the Space Shuttle. And the record includes countless other accomplishments in space science and applications, advanced technology, aeronautics, and practical spinoffs of space technology.

After 30 years, NASA has achieved a vigorous maturity. Now, we have the ability, the unending challenge, and, I believe, the support of the American people to make the next 30 years just as memorable as those we celebrate today.

James C. Fletcher
NASA Administrator

NASA's Beginnings . . .

On April 2, 1958, the Eisenhower Administration submitted a bill establishing a national aeronautics and space agency. After refinements, President Eisenhower signed into law the National Aeronautics and Space Act of 1958. NASA came into being on October 1, 1958.

The act established a broad charter for civilian aeronautical and space research. It absorbed the existing National Advisory Committee for Aeronautics (NACA) and made broad transfers from other government programs. NASA received Project Vanguard from the Naval Research Laboratory; lunar probes from the Army; lunar probes and rocket engine programs, including the F- 1, from the Air Force; and over $100 million of unexpended funds. T. Keith Glennan was named administrator. The broadest possible dissemination of information to the public was a unique part of the act.

The agency's resources included 8,000 people, three laboratories (Langley; the Lewis Research Center, Cleveland, Ohio; and Ames Research Center, Mountain View, Calif.) and two stations, with a facilities value of $300 million and annual budget of $100 million. The Jet Propulsion Laboratory (JPL), Pasadena, Calif., and the Army Ballistic Missile Agency, Huntsville, Ala., were soon added to the list of facilities. Today, NASA has 18 facilities located nationwide.

Aeronautics

U.S. aeronautical products provide the largest positive contribution of any industry to the nation's trade balance. Maintaining a world position of aeronautical leadership among fierce international competition is important to the U.S. economy.

NASA continues to expand U.S. capabilities in civil and military aviation and to contribute significantly to the nation's aviation leadership and national security. Aeronautical programs run the gamut from fundamental disciplinary research to flight testing, with primary research subjects being the vehicles and power plants that use the Earth's atmosphere for flight. Aeronautic research also focuses on the aerodynamics of space vehicles.

NASA's research programs continue to reshape future aircraft for enhanced efficiency and maneuverability and expand the range of composite materials available for aircraft construction.

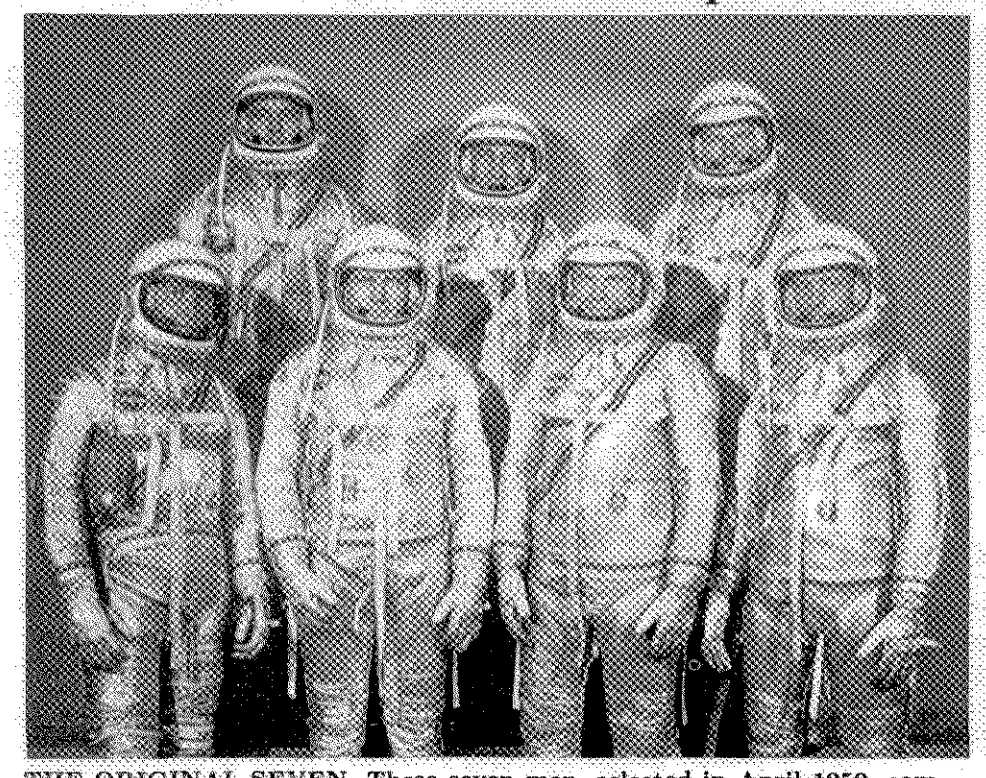
Manned Space Flight

The Soviets achieved the first successful manned space mission when Cosmonaut Yuri Gagarin was launched into space in 1961. The Mercury program, which began just after NACA became NASA, was America's pioneering manned space flight program. On May 5, 1961, Alan B. Shepard, Jr., in the Freedom 7 Mercury spacecraft, was the first American to fly in space.

When the program began, there were serious questions as to man's ability to function or even survive in the space environment. The Mercury program of one-man spacecraft proved that man could live, eat, work and sleep in space. The space flights in the two-man Gemini spacecraft provided mastery of technology and skills that were crucial to Apollo: maneuvering in space, rendezvous and docking with another vehicle in space, extravehicular activities and demonstrating that man could function effectively in space for as long as 2 weeks with no lasting harmful aftereffects.

Continued on page 4.

National Aeronautics and Space Administration: 1958-1988



THE ORIGINAL SEVEN. These seven men, selected in April 1959, composed the first group of astronauts announced by NASA. Shown are (front row, L to R) Walter M. Schirra Jr., Donald K. Slayton, John H. Glenn Jr. and M. Scott Carpenter; (back row, L to R) Alan B. Shepard Jr., Virgil I. Grissom and L. Gordon Cooper Jr.

THE STS-26 CREW. Leading NASA's return to flight are astronauts (front row, L to R) Richard O. Covey, pilot, and Frederick H. "Rick" Hauck, mission commander; (back row, L to R) David C. Hilmers, George D. "Pinky" Nelson and John M. "Mike" Lounge, mission specialists.

Boyer Urges Alumni CFC Support

Once again it's time for the many government agencies and industries large and small on the Peninsula to join together to provide funds for many worthy health, welfare, and community service organizations through the Combined Federal and United Way Campaigns.

This year, as in the past, Langley retirees will be contacted by mail and invited to contribute with the active Langley staff members to the Combined Federal Campaign. By the time this message appears in print you should have received your packages. The retirees' goal for the campaign is $20,180. I'm confident that if we are all just a bit more generous, we can reach this year's goal.

This will be the last time the Center will be permitted to solicit retirees due to government-wide regulatory changes issued recently. In the future, we will not have an established goal against which to measure our support of the worthwhile organizations the CFC supports; nor will NASA retirees' contributions be identifiable. Future contributions must be made directly by individuals to the local United Way.

I encourage my fellow retirees and alumni members to join me in "digging deep" into our pockets for the maximum we can afford to help our neighbors who are less fortunate.

William J. Boyer
President
LaRC Alumni Association

CFC Suggests an Alternative to Substance Abuse

Langley staff members recently visited Alternatives, an organization dedicated to the prevention of substance abuse in children. Richard Gall is founder and director of Alternatives.

Partially funded by your contribution to the Combined Federal Campaign, Alternatives helped 36,000 children last year. Over 50 percent of those served voluntarily admitted they had a substance abuse problem. Others were recognized by family members or teachers.

The organization has student counsellors in all public schools in the city of Hampton who work with the children and are available during school hours. In the elementary schools, the organization is known as "Just Say No," the middle school level is called "Friends Who Care," and at the high school level, "Natural Helpers."

Gall says of the many substances available to students, alcohol is used most often, followed by marajuana and cocaine. Cocaine is on the rise and Gall says recent national statistics reveal that 17 percent of all high school students have tried it.

Langley can contribute to a possible reduction in substance abuse by supporting Alternatives through the CFC. You could make the difference—**just say yes**!.

-photo by Sandie Horsey

Richard Gall, (second from right) founder and director of Alternatives, briefs Langley CFC representatives (L to R) Roscoe Edge, H. Milton Holt, and B. J. Schlichenmayer on their recent visit. Alternatives is a organization formed to prevent substance abuse in children.

NASA Marks Three Decades

Continued from page 3.

On May 25, 1961, President Kennedy addressed a joint session of Congress embracing a national goal of "landing a man on the moon and returning him safely to Earth" within a decade. Apollo vastly expanded knowledge about the moon and Earth.

With the launch of the Space Shuttle Columbia on April 12, 1981, the United States entered a new era in transportation between Earth and space. The National Space Transportation System opened space for regularly schedulted transportation of people and cargo between Earth and Earth-orbit.

Toward the Future

The presidentially appointed National Commission on Space was charged with proposing a national program that would "carry America's civilian space enterprise into the 21st century." The commission projected the next 50 years of America's future in space and proposed goals which assure America's continued leadership in space.

On June 1, 1987, the NASA administrator announced the creation of the Office of Exploration to coordinate agency activities that would "expand the human presence beyond Earth," particularly to the moon and Mars. A key role of this office is to focus lunar and Mars initiatives, identifying the prerequisite investments that the nation must make in the near term to achieve them.

The National Commission on Space paid tribute to NASA as "...a national resource that plays a critical role in space exploration and development. It also provides a symbol of national pride and technological leadership. The Commission applauds NASA's spectacular achievements of the past and anticipates impressive achievements to come."

Senior Management Research Review

The Senior Management Research Review will be held Monday, October 17, from 9 to 11 a.m., in Building 1219, Room 225. Following the Director's comments and the program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENTS	SPEAKER
9:30	Space Station Truss Assembly with Mobile Transporter Demonstrated in Simulated 0-G Tests	Judith Watson (Structures/SDD)
9:45	Enhanced Diffusion Bonded $Ti_3Al - Ti$ Honeycomb Core Sandwich Panels	Eric Hoffman (Structures/MD)
10:00	Low-Frequency Absorption of Sound in Air	Allan Zuckerwar (Electronics/IRD)
10:15	Navier-Stokes Solutions for the F-18 Forebody-Lex	Farhad Ghaffari (Aeronautics/Vigyan)
10:30	Viscous Shock-Layer Solutions with Nonequilibrium Chemistry for Hypersonic Flows Past Slender Bodies	Vincent Zoby (Space/SSD)
10:45	Takeoff Performance Monitoring System (TOPMS)	David Middleton (Flight Systems/GCD)

Management Video Conference

The Management Vision Video Conference entitled "Making Conflict Work for You: Managing Differences and Agreements" will be broadcast on Wednesday, October 12, from 3 to 5 p.m. The telecast will be received in Building 1194- A, Room 203/204.

This program, featuring Jim Maselko, will examine how to diagnose the causes of conflict, decide if the differences are manageable, engage an opponent in dialogue, use confrontation and support on the same issue, and, finally, understand the role that anger plays in managing conflict.

Please notify your training coordinator if you would like to attend.

Return to Space

A NASA Aeronautics and Space Report video entitled "Return to Space" is available for loan by calling Edith Watts, ext. 3017, Mail Stop 146.

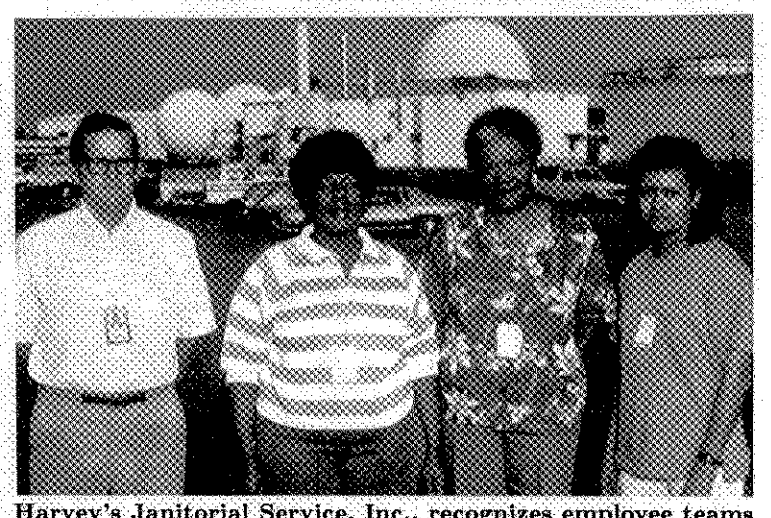
"Return to Space" outlines what NASA has done to get the Shuttle ready to fly again.

Note of Thanks

Jane C. Kirby writes: "We were genuinely surprised and touched by the response of Cecil's co-workers who gave so generously to the leave-sharing program on his behalf. We are grateful for the love and support of everyone at Langley over the years, and especially for this most recent expression of tribute to his memory."

Retirement Party

George Ware will be honored with a retirement party Saturday, October 29, at the Activities Center. A steamship round dinner will begin at 7 p.m. Cost is $12.50/person. Contributions to gift only are welcomed. Please send reservations to Aubrey Fitzgerald or Gloria Ragsdale, Mail Stop 439, by October 15. For more information, call ext. 4656.



Harvey's Janitorial Service, Inc., recognizes employee teams who have excelled on their Facility Evaluation Reports. The award committee convened on September 1 and selected Crew #5 as the Crew of the Month for August. This crew obtained a score of 93.75 out of a possible 95 points. In addition, they received a letter of commendation for the excellent manner in which they maintain all areas of Building 1268 complex, the largest complex on the field. Team members are (L to R) Zane Burns, Sandra Garrett, Julia West and Patricia Morton. Not shown is Mary Jackson.

People & Places

At the VC during October

CSI: A Key to Future Space System Design

Brantley Hanks will discuss "Controls-Structures Interaction: An Interdisciplinary Challenge" on Wednesday, October 19, at noon in the Visitor Center theater. This presentation is part of the Fall Guest Lecture Series sponsored by the Visitor Center and the AIAA-Hampton Roads Section Student Branch.

Hanks, head of the Spacecraft Dynamics Branch, explains, "There are many needs for future spacecraft with combinations of size, precision and agility which are beyond current state of the art. The Langley Research Center is leading a major new research project to develop the required controls-structures interaction (CSI) technology."

Large spacecraft need to be packageable for launch and they need to have low mass for easy maneuvering.

These requirements tend to drive toward flimsy structures with an interplay between structural flexing and control forces. The control system must "understand" the behavior of the structure and these two subsystems must combine to produce the desired performance goals.

Hanks points out, "This task defies conventional design and verification test technology because the two disciplines cannot be applies separately. A significant challenge exists in merging the disciplines and in developing and verifying experimental methods to assure that the theoretical approaches are valid for on-orbit applications."

Bluth Discusses Lessons Learned from Soviet Long-Duration Space Flight

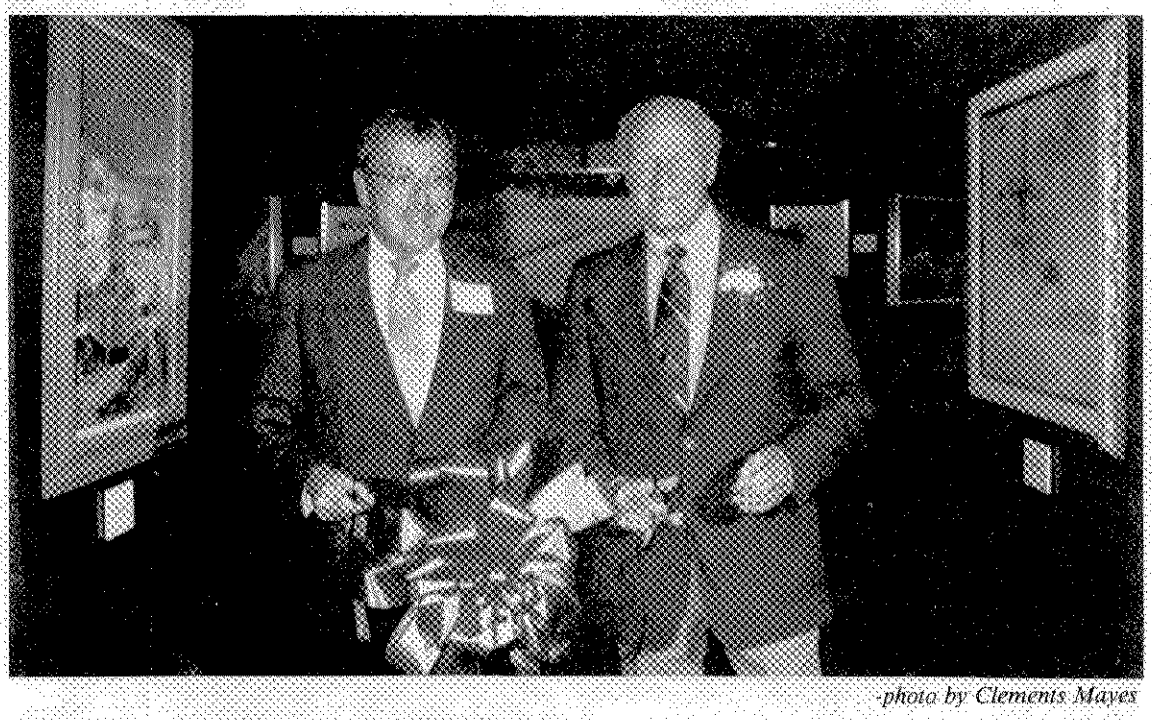
Dr. B. J. Bluth, from the NASA Space Station Program Office in Reston, Va., will discuss lessons learned from Soviet long-duration space flights on Thursday, October 13, at 7:30 p.m. in the Visitor Center.

For Soviet cosmonauts, space missions are not something to endure and complete—the space environment is seen as a continuing environment. The Soviet's longest mission is 326 days, compared to the U.S. Skylab mission in 1973 of 84 days duration.

Bluth's research involves designing spacecraft to meet the psychological, social, cultural and aesthetic needs of the crew on long-duration missions in order to maximize productivity.

Bluth points out that the space environment is characterized by isolation, confinement, deprivation and risk. With the advent of the Space Station Freedom, U.S. astronauts will deal with these factors compounded over long periods of time.

B. J. Bluth has researched sociological factors involved in space flight for more than a decade. She has won numerous awards and published more than twenty papers. Bluth earned a doctorate in analysis and design from UCLA in 1970.



-photo by Clements Mayes

A VISION OF THE FUTURE, a collection of space art by Robert McCall, is on display at the Visitor Center through December 31. The artist (right) is shown with A. G. Price, head of the Office of External Affairs, as they cut the ribbon opening the exhibit. The McCall exhibit includes three paintings from his "Star Wars" series, a painting from the movie "Star Trek" showing the spaceship Enterprise, and several paintings used in the Report of the National Commission on Space, a bold vision of the next 50 years in space.

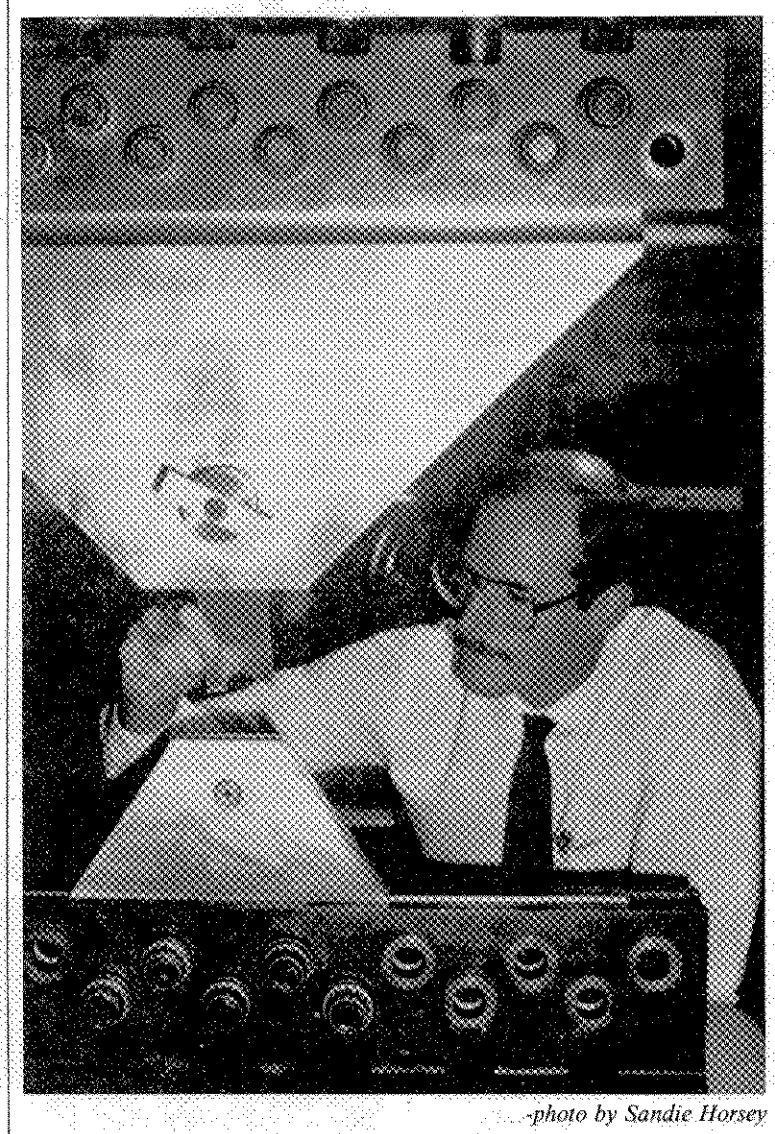
Temporary Leave Transfer Program

The Temporary 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 personal or medical emergency.

As a result of such an emergency, the following employees are approved leave recipients:

- Penny L. Murphy
- Catherine B. Worth
- Robert M. Connell, Jr.
- Carol M. Olsen

If you wish to donate annual leave to these recipients, or wish more information concerning the Temporary Leave Transfer Program, please contact Linda Park of the Employee Relations Section, ext. 2266.



-photo by Sandie Horsey

Jeff Bland, a Marshall Space Flight Center structural anaylst, examines a test specimin made from the steel case of a Shuttle solid rocket motor. The specimin was intentionally failed in the 400,000-pound fatigue test machine in Building 1205. Bland spent the past eight months at Langley conducting fracture mechanics tests for the redesign of the Space Shuttle.

Exchange Encourages Teamwork Between Centers

A Marshall Space Flight Center structural analyst has spent the past eight months at Langley conducting a series of fracture mechanics tests for the Space Shuttle solid rocket motor (SRM). Among the issues Jeff Bland investigated were two tests required for the Shuttle's return to flight.

The SRM has been the focus of Bland's work following STS-25. Since Fall 1986, Bland has worked on the redesign of the solid rocket motors at Marshall. In early 1987 he was assigned to Morton Thiokol, NASA's primary SRB contractor. Bland was one of a team of 20 NASA engineers stationed at Thiokol and tasked to work with the contractors on the redesign of the solids.

SRM testing then brought Bland to Langley. At the suggestion of Dr. Michael Card, head of the Structures and Dynamics Division who for the past year has been working at Marshall, Bland accepted an invitation to conduct his tests here. "It's been a very unofficial exchange of expertise and the networking opportunities have been very beneficial for me. I think this kind of exchange leads to real teamwork between the NASA field centers," says Bland.

Bland has worked at Langley under the direction of Dr. Jim Newman. He feels his stay has been a wonderful learning experience. "I've had the opportunity to work with Newman, an internationally known expert in the area of fracture mechanics. My work has been most rewarding. The testing has been convenient and accomplished within a much faster time span than would have been possible at Marshall. Langley has the facilities, the machines and the experts necessary to support SRM testing."

Asked about his feelings at the launch of Discovery, Bland says he is very confident. "A lot of people put a lot of effort into the redesign of the solid rocket motors. I'm convinced this will be the safest launch ever."

Bland returned to Marshall October 1. Rather than the SRB work that has consumed his energy prior to return to flight and brought him to Langley, Bland is now working for the Chief Engineer at Marshall on the Space Shuttle main engine project.

Happenings

LAA SOCIAL will be held Friday, October 14, from 4 to 6:30 p.m. in the Activities Center.

TOASTMASTERS. NASA Langley Toastmasters will meet Wednesday, October 12, 11:30 a.m. to 1 p.m. Call Natalie Johnson, ext 3483, for location. Visitors welcome. Civil service employees charge one hour to Job Order A1619.

VPI/UVA BUS TRIP. Va. Tech Alumni Assoc. is planning an overnight bus trip to the UVA game. Bus departs promptly at 6 a.m. Saturday, October 29, from Patrick Henry Mall. Cost is $63/person, double occupancy, and includes Sunday breakfast. You must provide your own game ticket. For details/reservations, contact Heidi Derby, 595-3436 by October 10.

VA STAGE COMPANY "Les Liaisons Dangereuses," an award- winning drama of sexual decadence in 19th century Paris, opens the Virginia Stage Company's tenth season at the Wells Theater. Call 627-6988 for details.

HALLOWEEN SOCIAL. The LAA will sponsor a special Halloween social October 28 from 4:30 to 9:30 p.m. Watch for details in the next issue.

MOTORCYCLE RIDER TRAINING programs available at Thomas Nelson and Tidewater Community Colleges. Completion of program prepares student for state licensing exam and 10 percent discount with many insurance companies. Call Dennis McMillan, ext. 3421, for details.

WANTED: SECRETARIES. Peninsula chapter of Professional Secretaries International is holding a membership drive. For information, contact Linda Budd, Mail Stop 910. Come to "Executive Night," October 11, 6 p.m., Sheraton Inn, Hampton.

LOST: GLASSES. Men's glasses, without case, lost in one of LaRC's conference rooms sometime within the past three months. If you have a candidate pair of glasses, call Larry Rowell, ext. 3887 or 898-4010.

swap and shop

FOR SALE: HONEY. Mountain honey, $3.50/quart; $2/pint. Contact Ralph Caldwell, 723-5558, or Clarence Caldwell, 723-9116.

FOR SALE: SOFA BED, queensize. Excellent condition. $125. Call 898-5702 after 5 p.m.

FOR SALE: MOTORCYCLE. 1974 Yamaha TX650A. Classic, low miles, many accessories. VGC. $450. Call 1-588-8617 and leave message.

FOR SALE: MOTORCYCLE. 1982 Gold Wing Aspencade. Much chrome and accessories. $3250 neg. Call 595-3739 after 4 p.m. or weekends.

Change in Physical Examination Procedures

Effective October 17, the procedure for scheduling physical examinations will change. The change is designed to serve employees better and reduce the number of "no-shows."

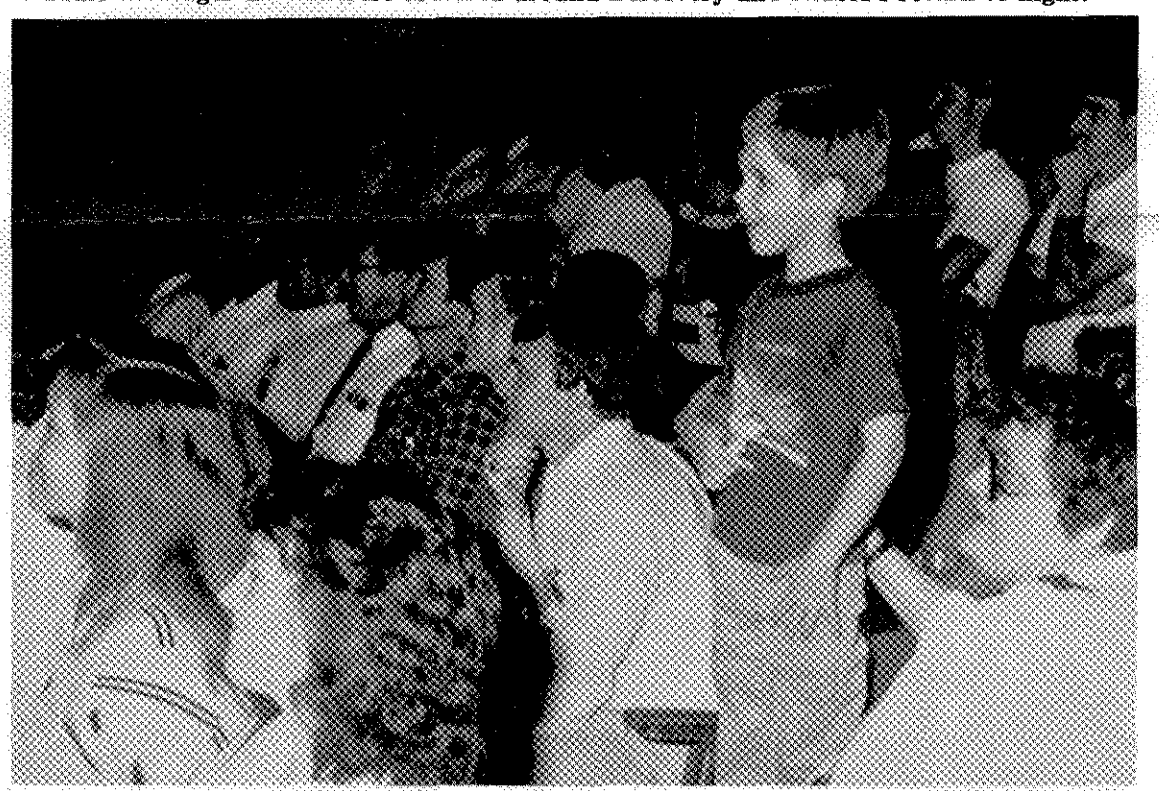
Each employee scheduled for a physical examination will receive written notification of the date and time of the physical. **Employees will now be asked to confirm by telephone their appointments no later than seven days prior to the examination date.** The new appointment letter fully explains the physical examination procedures and indicates phone numbers to call.

Employees may, due to travel requirements, etc., request an alternate date. The new method, confirming appointments by telephone, will hopefully reduce the number of "no-shows" and enable the clinic staff to effectively use all physical examination slots.

The employee benefit of this change will be greater flexibility in scheduling and individual input in the physical examination process. If additional information is required, please call Occupational Health Services, ext. 2246.

Launch Lifts Space Spirits

Langley employees, family members and visitors packed the three main viewing locations for the launch of STS-26. Still others huddled around monitors in Langley labs or were tuned to audio coverage. The interest centered around Discovery and NASA's return to flight.



THURSDAY, SEPTEMBER 29, 11:37 A.M. The crowds hold their breath as the Space Shuttle Discovery is launched and clears the tower.

-photos by Clements Mayes

THURSDAY, SEPTEMBER 29, 11:39 A.M. The solid rocket boosters have separated and the reaction is unanimous. NASA and America have returned to space flight!

Researcher News

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Langley Research Center

Volume 2, Issue 21 October 21, 1988

Researcher News

Bi-weekly Employee and Contractor Publication

Heyman Named IEEE Distinguished Speaker

Joseph S. Heyman, head of the Materials Characterization Instrumentation Section,

has been named distinguished lecturer for the Institute of Electrical and Electronics Engineers (IEEE) Ultrasonics, Ferroelectrics and Frequency Control Society.

The IEEE is the largest professional engineering society in the world. The Institute boasts over 290,000 active members.

Heyman began his NASA career at Langley in 1964. His first research area, radiation interactions with solids, resulted in a low energy ion accelerator for solar wind simulation. He developed the model and analysis the for Apollo Solar Wind Experiment and performed heavy ion implants to ion calibrate material for moon rock studies.

In 1971, he started the NASA Laboratory for Ultrasonics which has grown to a major Nondestructive Evaluation (NDE) research center. He has over 15 patents primarily in the field of ultrasonics NDE and has authored over 120 papers covering a broad area of measurement science. In 1979, he was made an adjunct professor of physics with The College of William and Mary and, in 1985, was appointed by Governor Robb to the Hampton Roads Sanitation District Commission.

Heyman has received numerous awards including four IR-100 awards for his technlology developments, the NASA Exceptional Service Award, the Arthur S. Fleming Award for Outstanding Federal Employee in Science, NASA Inventor of the Year Award, and two NASA Technology Utilization Annual Awards.

AIAA-Hampton Roads Marks Quarter Century

Members and other interested parties are invited to attend a banquet celebrating the 25th anniversary of the AIAA-Hampton Roads Section, Tuesday, November 1, at the Radisson Hotel in Old Hampton.

Former Astronaut Charles Walker will be the featured speaker. Walker, President and Chairman of the Board of SpaceCause, will give SpaceCause's nonpartisan assessments of the aerospace issues facing the presidential candidates in the November election. Of special interest locally are the Shuttle, Space Station Freedom, National Aerospace Plane, Missions to Planet Earth, Moon and Mars; civilian aviation; atmospheric sciences including the greenhouse/ozone/acid- rain effects; science education; aerospace impacts on the nation's economy and policies on balance of trade, international exchange of technology and foreign competition.

SpaceCause is a nonprofit, nonpartisan organization formed in 1987 to build an effective national lobbying network for the civilian space movement. The organization provides a grassroots message of broad and deep public support to Congress and the Administration.

Walker served as payload specialist for a biotechnology program on three Shuttle missions. He is currently special assistant to the president of McDonnell Douglas Astronautics Company.

Special invited guests include Dr. William Ballhaus, president of AIAA; James Harford, director of Region I; Dr. John Whitesides; and James L. Eason, mayor of Hampton.

For additional information or reservations, call Karen Credeur, ext. 3467, or Ferd Grosveld, ext. 3561, by Thursday, October 27.

A Perfect Touchdown! Welcome Home!

-photo courtesy of NASA Ames-Dryden Flight Research Facility

The Space Shuttle Discovery completed a near-perfect four-day mission with a flawless landing on the dry lake bed runway 17 at Edwards Air Force Base, California, at 12:37:08 p.m. Eastern time, Monday, October 3. "Welcome back," said astronaut Blaine Hammond, who was manning the microphone at mission control as Discovery touched down. "A great end to a new beginning."

CFC Update

At **Researcher News** press time, Langley personnel and NASA affiliated organizations had donated $120,836.04 to the 1988 Combined Federal Campaign. This represents 46.48 percent of Langley's $260,000 goal.

The CFC is the one time each year when the Langley family is called upon to help other families in the community. Please help us continue the long tradition of outstanding participation in community activities and helping in a time of community need.

There is still time to make a pledge to the CFC. When a key person approaches you, please consider the needs of the less fortunate. Your gift will make a difference.

NASA Joins President in Advocating Quality

October has been designated National Quality Month by President Ronald Regan. In keeping with the presidential proclamation, NASA Administrator James C. Fletcher has declared October 25 "NASA Quality Day." Various activities and events have been scheduled locally and within the agency throughout the month of October to focus on the recently adopted NASA slogan: Quality—A Commitment to the Future.

"The occasion of NASA's 30th anniversary provides the opportunity to reflect on our past achievements and to rededicate ourselves to excellence for the future. NASA's greatest strength has always been its people. Our enthusiasm to accept complex challenges and our ability to work together to overcome difficult obstacles will fuel our ongoing quest for excellence.

"The purpose of NASA Quality Day, October 25," Fletcher explains, "is to reaffirm our dedication to excellence and to recognize our reliance on the creative and imaginative contributions of our entire workforce."

William L. Williams, Langley's Productivity Officer, points to the very successful flight of Discovery as a great way to highlight NASA quality. Williams also outlined some of the "quality" events planned during the month.

For NASA Quality Day, October 25, an all-day program will originate from NASA Headquarters and will be aired over the NASA select TV channel. This program will feature participating Center representatives, key agency officials and the NASA Excellence Award finalists. A copy of the agenda will be sent to each employee.

Sid Pauls, associate director, will team up with Paul J. Weitz, deputy director of the Johnson Space Center, to highlight the benefits of strategic planning from the perspective of a research center and a development center. "The necessity of seeing the big picture is the fundamental reason why, in 1985, the Center Director and the Senior Staff at Langley began a formal process of strategic planning," states Pauls. NASA strategic planning is designed to improve the quality of decision-making.

Also on October 25, Clarence M. "Skippy" Cole, Langley's Quality Circle coordinator, will present some of the success stories resulting from these problem-solving teams as well as the activities of our employee involvement teams. In a subsequent issue of the **Researcher News** interviews with selected quality circle and employee involvement team members will be presented and the new committee structure for the Center's Productivity Program will be examined.

The success of the NASA goal, "Quality—A Commitment to the Future," is dependent on the commitment to excellence of each employee. During October, each NASA employee will receive a lapel pin advocating quality, as well as a poster and a copy of the proclamation signed by the Administrator.

News Briefs

HEADQUARTERS, Washington, D.C. — NASA has extended its contract with the California Institute of Technology (Caltech), Pasadena, for the performance of research and development at NASA's Jet Propulsion Laboratory for five years, from October 1, 1988 through September 30, 1993. The cost-type contract is valued at approximately $5 billion over the five-year period.

HEADQUARTERS, Washington, D.C. — The NASA Office of Small and Disadvantaged Business Utilization, Washington, D.C., has selected Communications Electronics International (CEI), Orlando, Fla., and New Technology, Inc. (NTI), Huntsville, Ala., as its minority contractors of the year. Because of the quality of work both companies exhibited, this is the first time two contractors have been selected.

Editor's note: Surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017.

LAA Halloween Social

October 28 **4:30 to 9:30** **Activities Center Grounds**
Bring a blanket

Music by "Fox Fire"

Games and Prizes:
Bobbing for Apples
Jack-O-Lantern Carving Contest

Costumes welcome; prizes awarded for prettiest, ugliest and most original!

Hot Dogs $.25 **Hamburgers $.50** **Draft $.25** **Free Popcorn**

1989 Calendars Available from Stock

Requests for 1989 calendars can now be submitted to the Stockroom, Mail Stop 382, on NASA Langley Form 55. Stock numbers are listed below:

NSN	DESCRIPTION
7510-01-225-9802	Calendar Pad, flipover; size 3" x 3-5/8" (ea)
7510-01-225-9214	Calendar Pad, executive flipover; 3-5/8" x 5-7/8" (ea)
7510-01-172-9693	Wall Calendar, displays 3 months at a time, 11-5/8" x 8-7/8" (ea)
7530-01-228-9703	Looseleaf Appointment Book Refill, daily and monthly calendar sheets, 6-1/2" x 5-1/2" (ea)
7530-01-173-7095	Weekly Appointment book, features two pages per week, columns for appointments and reminders are marked in 15-minute intervals, 8-1/2" x 11" (ea)
7530-01-173-1434	Desk Blotter, 17" x 22", monthly sheets ruled and squared for each day (ea)

Requests for other types of calendars available from GSA should be submitted on a Purchase Request, Langley Form 125. Each branch secretary should submit branch and section requirements to reduce the number of requests. Other stock supplies **should not** be ordered on the same request.

Lankley

In Memoriam

Sympathy is extended to the family of Jean G. Thompson, widow of former director Floyd L. Thompson, who died September 29.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865-3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

Editorials

Langley

Headquarters Forum

It's been said many times that one of the things that makes Langley great is its people. For me, this has been illustrated in many different ways since I came here over forty years ago, but never more meaningfully than in the following experience.

One of my assignments has been as a member of the committee on Programs for People with Disabilities. Two years ago this committee undertook a survey of all employees to get a relative measure of the attitude of the staff towards people with disabilities. The survey tool used had been in general use for over 25 years, and is generally accepted as being the standard. A rather large data base has been assembled.

An analysis of your responses revealed that the Langley family is considerably more accepting and supportive of people with disabilities than the average of the organizations surveyed.

Our committee has found this conclusion to be supported by many examples of voluntary and spontaneous actions taken by individuals, government as well as contractor employees, to remove impediments of all sorts that have been found in the workplace. We have also found instances in which supervisors, and here again, both government and contractor, have instituted programs designed to increase the pool of people which can be employed here, as well as improve the career opportunities of those who have already been employed.

I have always considered myself lucky to have been associated with Langley's programs. More importantly, the attitude of the people around here has always made Langley a nice place to be, and I believe you agree with that.

This is National Disability Employment Awareness Month. I thought you might like to know that Langley, in general, is very aware of the **abilities** of those with disabilities and we are constantly striving to create a workplace where those abilities can prosper for the mutual benefit of all. I invite all of you to help our committee find ways to make this an even better place to work, especially for those with disabilities.

W. D. Mace
Director for Electronics

Baucom Honored by Presidential Committee

Robert M. Baucom, group leader in the Polymeric Materials Branch, has been presented the John F. Fogarty Public Personnel Award sponsored by the President's Committee on Employment of the Handicapped.

"Baucom's leadership in creating awareness and his unselfish efforts to promote employment and placement of workers with disabilities are commendable and an inspiration for all of us," says Harold Russell, chairman of the President's Committee on Employment of the Handicapped.

Baucom was honored at the International Association of Personnel in Employment Security Convention held recently in Chicago, Illinois.

Baucom has designed a number of lightweight ambulation and protective devices which have been successfully utilized by handicapped persons in the Tidewater area. Notable among these devices are shoe extensions, protective face guards, long arm crutches and an artificial foot.

Baucom directed a project to design and fabricate a lightweight, general use wheelchair which was highlighted on the **Good Morning America** television show and is currently being produced by a privately-funded group in Virginia.

Apprentice Graduation

Clark, Keynote Speaker at Graduation

Malcolm P. Clark, head, Training and Education Section, Personnel Division, will be the guest speaker for the apprentice graduation ceremony today.

In his commencement address, Clark will expand on the theme "Be All That You Can Be," directing the statement to the apprentices' career development within the government. Clark's theme will stress the opportunities for growth, achievement, responsibility and recognition in jobs with the government.

Clark began his NASA career in 1962 as an employee development specialist. He has specialized in personnel administration, teaching and training administration.

A native of Murray, Ky., Clark received a bachelor of science degree in education from Murray State College. He earned a master of science degree in personnel administration from George Washington University in 1968.

Clark is a member of the Cooperative Education Association. He has served on the Exectuvie Board of the Cooperative Division of the American Society of Engineering Education, the Thomas Nelson Community College Vocational Education Board, and the Virginia Peninsula Vocational Training Council.

Clark received a NASA Exceptional Service Medal in 1983 "for establishing and conducting superior service and educational programs which are pivotal to the continuing development of Langley's human resources."

Clark will retire in December and is planning to teach personnel administration at George Washington University. Retirement will also allow Clark to spend more time with his grandchildren, his three children and his wife, Joan.

Apprentice Graduation Today; School Programs Revised

The Langley Research Center Apprentice School graduates six engineering technicians today. The Forty-fourth Annual Completion Exercises for Engineering Technicians will be held in the Activities Center. Center Director Richard H. Petersen will present the certificates.

Two apprentices are graduating with honors from the Apprentice Program. The accomplishments of the graduates are many. One has earned a bachelor of science degree in chemistry from Christopher Newport College, two have associate of applied science (A.A.S.) degrees in mechanical technology and three have A.A.S. degrees in electronics technology.

Today's graduation ceremony is the last under the five-year apprentice program. "The Apprentice School curriculum has been extended to a six-year program to allow for additional on-the-job training," said Frederick M. Thompson, program coordinator. "The Apprentice School normally graduates over 20 technicians each year. Today's graduates are the last to complete requirements prior to the program's change."

In the future upon graduation, program participants will receive the grade of GS-8; under the old program, graduates received a GS-7 rating.

Also revised is the Technician Co-op Program, a principle feeder to the Apprentice School. Under the new co-op program, participants will work one- half day every day, tuition will be paid by NASA and participants will be hired after one semester of successful academic course work. Previously sons and dughters of employees could not be accepted into the co-op program; this nepotism ruling has been set aside under the revised co-op program.

Langley Apprentice Class of 1988

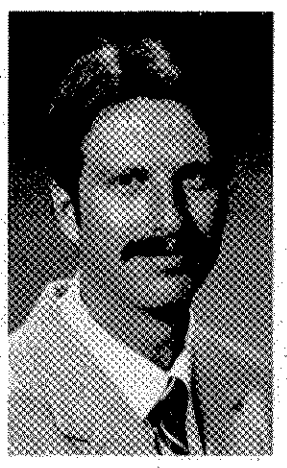
Ronald E. Bush, Sr., is an electronics technician in the Electro-Mechanical Instrumentation Branch, Instrument Research Division. He entered the apprentice program through Thomas Nelson Community College. Bush has an associate in applied science degree in electronics technology from Thomas Nelson Community College. He is presently working on the Magnetic Suspension System project.

Bush is a retired Chief Warrant Officer from the U.S Army and a Viet Nam veteran. He resides in Grafton with his wife, Janet.

Tammy Jo Harris, a Newport News native, is an engineering technician in the Tunnel Operations Branch, Operations Support Division. Harris graduated from Thomas Nelson Community College with an associate in applied science degree in mechanical technology. She entered the program through Thomas Nelson Community College. Harris is interested in testing models in the spin tunnel; she enjoys launching and tracking the models. She also has a special interest in the twelve foot tunnel.

***Douglas M. Smith, Jr.**, a native of Newport News, is an engineering technician in the Electrical Support Branch, Operations Support Division. A master electrician since 1984, Smith is working to complete his electrical engineering undergraduate degree at Old Dominion University. Current projects include work with high temperature materials testing and control systems for RF plasma equipment. Smith has also worked on the Space Shuttle O-rings and tested metals and composite materials in the fatigue lab.

Smith resides in Newport News with his wife, Diana.



***Mark T. Fletcher** is an electronics technician, Measurement Physics Branch, Instrument Research Division. Fletcher graduated cum laude from Thomas Nelson Community College with an associate in applied science degree in electronics technology. He entered the apprentice program through Thomas Nelson Community College. Fletcher has received an achievement award for special contributions to the Laser Velocimeter Development program.

Fletcher resides in Newport News with his wife, Christine.

Dennis C. Working is an engineering technician in the Laboratories Operations Branch, Operations Support Division. Working graduated with honors from Christopher Newport College with a bachelor of science degree in chemistry. He has received a Special Achievement Award for excellent technical support to research conducted in the polymer materials laboratories. He has also received a certificate of outstanding performance while assigned to the Polymer Materials Branch. Working has applied for a patent with Robert Baucom for the Fluidized Bed Coating of Carbon Fibers.

Working resides in Norfolk with his wife, Vicky, and daughters, Nichol and Amanda.

Timothy Harris, a Hampton native, is an engineering technician, Laboratory Operations Branch, Operations Support Division. Harris attended Virginia Military Institute for three years. He entered the apprentice program through Norfolk's Office of Personnel Management. Harris has worked with the LIDAR (Light Detection and Ranging) system. He was also assigned to the Aircraft Landing Dynamics Facility. He is presently working in the Scramjet Test Facility on development of the aerospace plane.

Harris resides in Hampton with his wife, Lori, and his two-year-old son, Jason.

* Denotes Honors Graduate

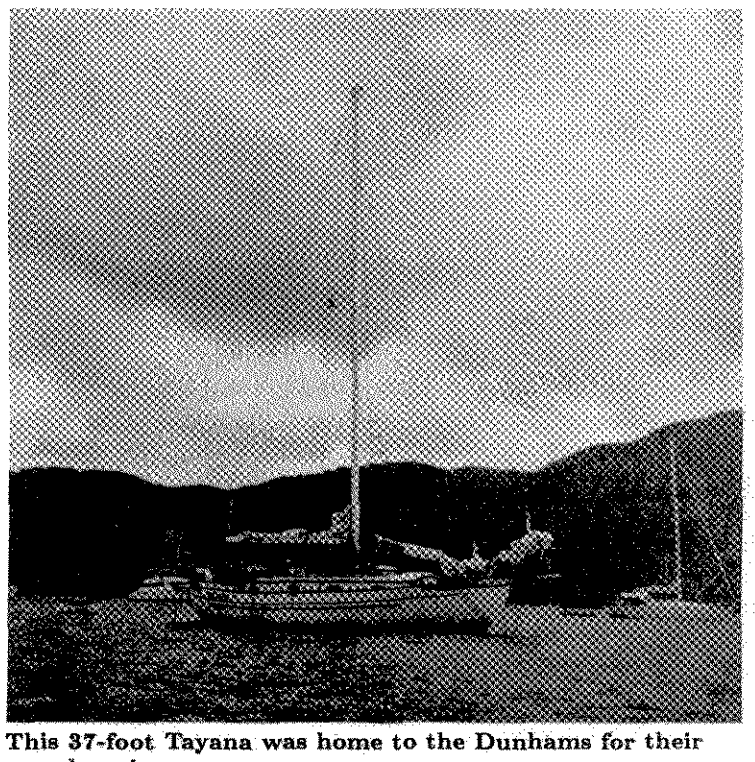
-photos by Sandie Horsey

-stories and layout by Anastasia Gonty

Shaping a Dream

Langley Couple Completes Year-Long Journey

-by Anastasia Gonty



This 37-foot Tayana was home to the Dunhams for their year-long journey.

Have you ever wished you could get away from it all—take a year off work—and travel to some tropical island to sightsee, read, relax and just get in touch with yourself again? A couple at Langley has done just that.

Dana and Earl Dunham, aerospace technologists in the Subsonic Aerodynamics Branch, took off a whole year to sail down the east coast to the Virgin Islands with their fourteen-year-old daughter, Katie.

The couple purchased their boat, a 37-foot Tayana, two years ago specifically for the trip.

"The actual sailing was the easy part. The most difficult part was planning the trip and preparing the boat," Dunham said.

The Dunhams installed a refrigeration system, overhauled the engine and added a new exhaust system. They also bought a ham radio system for communications and added self steering capability to the boat.

The couple took a year's leave of absense for the trip which they financed with their savings. They were totally committed to this adventure . . . they sold their home and most of their belongings and moved on to the boat about two months before their planned departure.

"We were initially planning a two-year trip. We wanted to do this while we were young enough in our careers to come back and find work. Langley management allowed us a one year's leave without pay, which was the determining factor for the trip's length," Dunham said.

"This allowed us to complete the trip in a more luxurious fashion because we knew we would come back to a specific job and salary. We were able to take tours and eat in the nice restaurants without worrying we'd need that money to live on while we looked for jobs," Dana added.

The quality of family life on the boat was great for the adventuresome trio—(L to R) Earl, fourteen-year-old Katie and Dana—who really "had an opportunity to get to know each other."

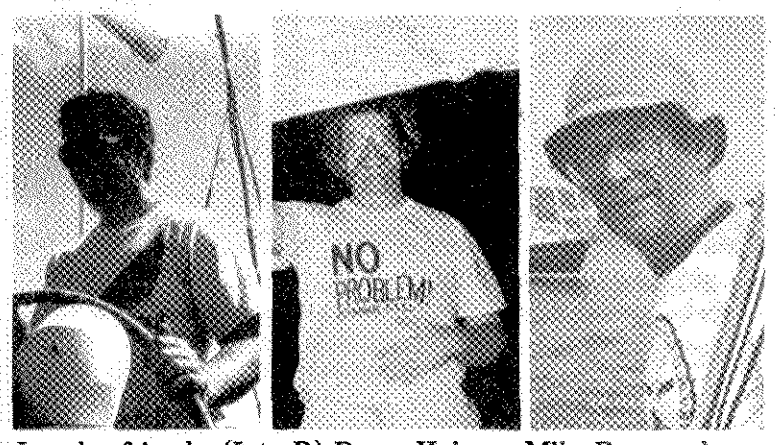
The trio sets sail . . .

The Dunhams left the Hampton Roads area in mid-September 1987 and sailed south on the inter-coastal waterway to avoid the danger of hurricanes. They visited towns along the coast, such as Charleston, Beaufort and Georgetown, S.C. Highlights of their stop in Florida were visits to the Kennedy Space Center and Disney World. After Thanksgiving and the hurricane season, they sailed from Florida to the Bahamas.

After Christmas, the Dunhams sailed for nine days to the U.S. and British Virgin Islands and spent the entire winter in the area.

"The natural beauty of the islands is hard to describe," Dana reminisced. "Towering mountains rise from crystal clear water. We saw a lot of wildlife, including a whale, while we were sailing in Sir Francis Drake Channel."

While the family was in the islands, several friends and co-workers visited them. Among the Langley employees who visited were Bruce Holmes, Mike Bray and Norm Crabill. Ed Brummer and Clint Lee were ham radio contacts and radioed weekly messages to the Dunhams from Langley for the entire year.



Langley friends, (L to R) Bruce Holmes, Mike Bray and Norm Crabill, were among the visitors who joined the Dunhams. "No problem," the phrase used to describe carefree living in the Islands, became the slogan for the Dunham trip.

An unexpected benefit . . .

The most important thing that came out of the trip, however, was not the sailing experience. It was a less tangible but very positive influence that has affected the lives of the Dunham family.

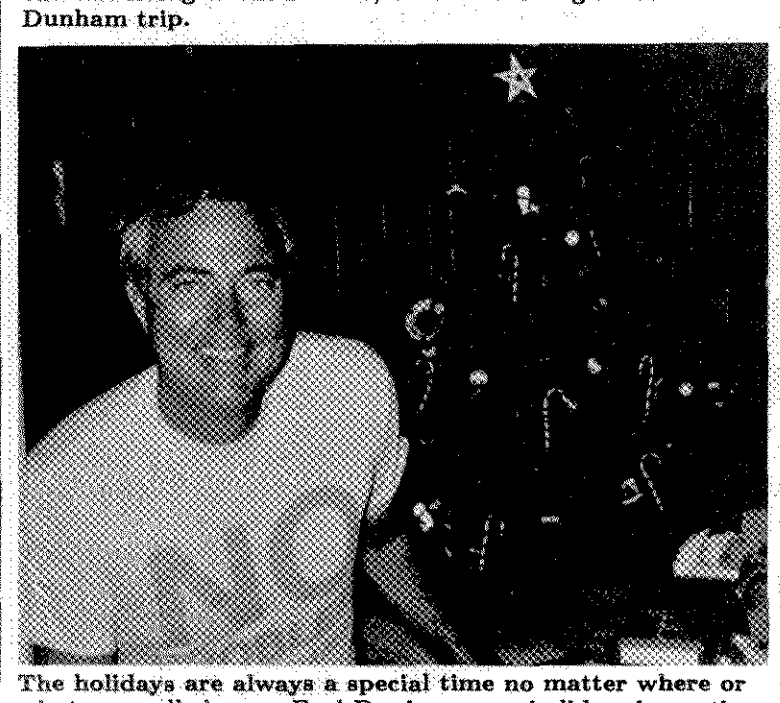
"The work-day world makes serious demands on family life," noted Dunham. "On the contrary, we noticed that the quality of our family life on the boat was really great. We spent so much time together. We ate three meals a day together, we studied and worked together, and we all faced the same problems together," Dunham said.

"This trip really gave us an opportunity most people don't have in the every day world . . . an opportunity to get to know each other as individuals. That's what the whole trip was really about," Dana added.

The couple admitted that it was a bit difficult for their daughter, Katie, to get used to the change of pace. Once they had gone to sea, however, Katie loved it.

"The turning point for Katie came when we sailed from Florida to the Bahamas," Dana said. "Katie slept during the entire ocean-going trip and when we arrived in Bahamas the next day, she loved it. She loved to snorkle and had a great time in the islands," Dana added.

On May 24, the Dunhams sailed from the Virgin Islands to Bermuda. After a few weeks there, they headed for the Chesapeake Bay.



The holidays are always a special time no matter where or what one calls home. Earl Dunham says holiday decorating on board was "no problem."

One frightening experience and an assessment . . .

Katie, a freshman at Poquoson High School, celebrated her fourteenth birthday on the trip. That very day the Dunham family experienced their firtst "true sailing" adventure.

It was a rainy evening and Dana was cooking dinner below deck. Unbeknownest to them, a freighter had come within a few yards of their boat. Neither the freighter nor the Dunhams had seen the other coming.

"I happened to open the hatch for some reason and my whole view was obscured by it (the freighter). It was a very scary experience!" Dunham said.

All the Dunhams have come back much more aware and appreciative of what's available for all of us in this country. For example, the selection of food on the islands was limited, expensive and of poor quality. Medical care was available on just a few of the islands and newspapers were items not readily available.

When asked if they'd do it all again, the couple responded they are already thinking about another trip several years from now.

"What Earl would really like to do is sail to Europe," Dana said.

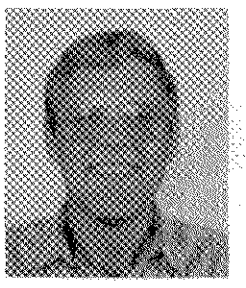
How does it feel to be back to work after this wonderful adventure?

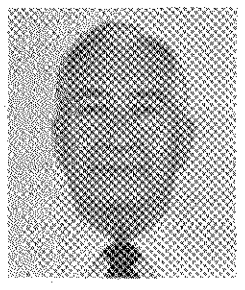
"Working is more fun now for some reason I think it's because we've had the opportunity to step away from it all and put things in better perspective. We both came back with a better attitude. For example, we seem to be able to face problems much better now. The trip was a wonderful experience for our family," Dana said.

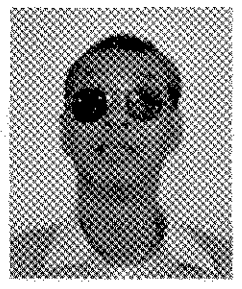
People & Places

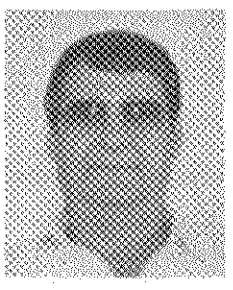
Recent Retirees

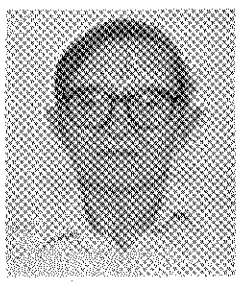
R. K. Lupton

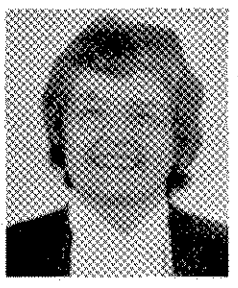

D. M. Foster


W. A. Byars, Jr.


N. O. Ging


N. W. Jalufka


G. D. Ware


F. M. Allen

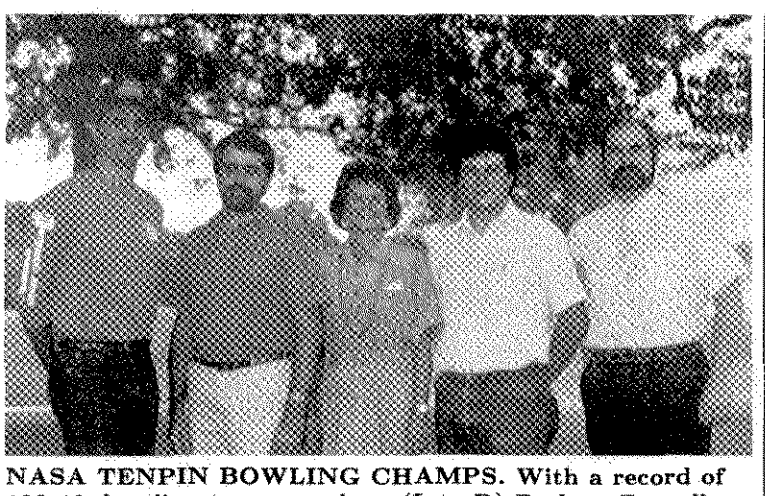
Carol M. Olsen, Loads and Aeroelasticity Division, retired July 28.

Roman K. Lupton, Operations Support Division, retired August 3.

Durward M. Foster, Projects Division, retired September 1.

William A. Byars, Jr., Facilities Engineering Division, **Ny O. Ging**, Operations Support Division, **Nelson W. Jalufka**, Space Systems Division, and **George D. Ware**, Facilities Engineering Division, retired September 2.

Faith M. Allen, Systems Engineering Division, retired September 30.


NASA TENPIN BOWLING CHAMPS. With a record of 100-40, bowling team members (L to R) Rodney Russell, Alan Frizzell, Ruth Frizzell, Mark Frye, Larry Harvey and (not pictured) Ronnie Weber are the 1987-88 Tenpin Bowling League champions.

Bowling Stats

	September 13	September 20
Team High Game	941 Ballers	1072 Odd Lot
Team High Series	2625 Ballers	2715 Odd Lot
Male High Game	222 S. Kjelgaard	254 J. Kovtun
Male High Series	597 S. Kjelgaard	618 G. Andrews
Female High Game	215 R. Frizzell	242 M. Aldrich
Female High Series	503 R. Frizzell	591 M. Aldrich
Most Pins	+64 D. Gates	+73 A. Lewis
over Average	+63 W. Bowser	+67 A. Frizzell

	September 27	October 4
Team High Game	954 Ballers	946 Strikers
Team High Series	2692 Thunderbolts	2628 Spare Change
Male High Game	225 M. Frye	238 L. Mayo
Male High Series	649 B. Huffman	634 L. Mayo
Female High Game	200 S. Moran	195 A. Lusk
Female High Series	530 P. Gates	492 B. Williams
Most pins	+81 R. Stapler	+63 M. Nortness
over Average	+73 L. Marks	+60 M. Fitzgerald

John W. Lee has been selected AST, Technical Management, Safety Engineering Branch, Systems Safety, Quality and Reliability Division, under CPP 88-24.

Kay Black has been selected Personnel Clerk (Typing), Placement and Position Management Branch, Personnel Division, under CPP 88-25.

Donna Barker has been selected Secretary (Stenography), Program and Resources Division, under CPP M88-47.

Bruce M. Kendall has been selected Supervisory Electronics Engineer AST, Electromagnetics, Antenna and Microwave Research Branch, Guidance and Control Division, under CPP 88-33.

Lisa J. Massie has been selected Engineering Technician, Tunnel Support Section C, Tunnel Operations Branch, Operation Support Division, under G88-3.

Cerie Wood has been selected Accounting Technician, Travel Section, Financial Services Branch, Financial Management Division, under CPP 88-30.

Yvonne W. Beyer has been selected Secretary (Stenography), Office of the Director for Management Operations, under CPP 88-37.

Ronald L. Baker has been selected Supervisory Aerospace Engineer, AST, Aerospace Flight Systems, Systems Development Branch, Systems Engineering Division, under CPP 88-39.

Joseph C. Hickman and **Frank L. Boyer** have been selected Engineering Technicians, Systems Development Support Section, Systems Development Branch, Systems Engineering Division, under CPP 88-40.

William C. Phaup has been selected Supervisory Engineering Technician, Tunnel Support Section D, Tunnel Operations Branch, Operations Support Division, under CPP 88-41.

Howard C. Jones has been selected Engineering Technician, Systems Development Support Section, Systems Development Branch, Systems Engineering Division, under CPP 88-42.

Thomas Grepiotis has been selected Engineering Technician, Systems Development Support Section, Systems Development Branch, Systems Engineering Division, under CPP 88-43.

Charles E. Jenkins has been selected Aerospace Engineer, AST, Aerospace Flight Systems, Mechanical Systems Section, Systems Development Branch, Systems Engineering Division, under CPP 88-46.

-photo by Clements Mayes

BLOODMOBILE SUPPORTERS EXTRAORDINAIRE, Merle Ott (left) and Dot Kubalak display earrings they made from blood donor pins given contributors by the American Red Cross. Ott, a math technician in the Flight Applications Branch, has donated over nine gallons of blood at NASA Bloodmobiles. Red Cross worker and blood donor Dot Kubalak has passed the 19 galloon mark and has been assisting the Red Cross at bloodmobiles for fourteen years.

Employees Support Bloodmobile

A total of 291 Langley employees, retirees and contractors donated pints of blood at the September 28 visit of the American Red Cross Bloodmobile.

Achieving gallon status were:

14 gallons — C. M. Hudson;

12 gallons — Davis B. Wright Jr. and Ray E. Haynes;

11 gallons — William T. Debnam;

10 gallons — Robert A. Bruce and John B. Kovtun;

8 gallons — James A. Dorst;

6 gallons — Virgil Laney, Robin Rubrecht and Tyrone O. Ellis;

5 gallons — Wayne S. Milton and Martin Leatherman;

4 gallons — Robert Myers, James Fields Jr., Mark W. Frye, Willis H. Ward Jr., and Greg J. Brauckman;

3 gallons — William R. Tate, Christopher M. Cagle, Robert Huffman, Todd B. Beyer;

2 gallons — William K. Abeyounis, Russel A. Winker Jr., Mark O. Moore, James R. Bronson and Jon E. Thompson;

one gallon — Daniel G. Murri, Michael T. Harrell, Gloria Evans, Robert F. Hill and Susan Hurd;

First timers — Patricia I. VonHatten, William J. Lindsay, Sandra M. Horsey, Pamela P. Holmes, Colleen D. Dore, Tammy Hopkins, Kristine K. Davis, Robert Harris and Gary Hoffman.

NASA coordinator for the Bloodmobile visit was Annette L. Forrest; Red Cross coordinators were Marilyn Asby and Nina Hughes.

Retirement Party

Robert E. Nye, Photographics Section, will retire October 31 with over 37 years of federal service. Nye will be honored with a cash bar retirement social Wednesday, November 2, at 5 p.m. in the Activities Center. (Note: the location of the celebration was inadvertently omitted from the retirement flyer.) Cost including gift is $8/person. Contribution to gift only is $2. For reservations, call Ann Wilson, ext. 3521, by October 26.

Note of Thanks

Antoinette Green writes: "I would like to extend a special thanks and my appreciation to the generous LaRC personnel who recently donated leave to me."

NASA Honored at Local Church

NASA Appreciation Sunday will be held October 23 at 11 a.m. at First United Methodist Church of Hampton, 100 East Queen's Way.

Ed Kilgore, former Director for Management Operations at Langley and Associate Aministrator at NASA Headquarters, will speak on the topic "Does God Still Matter in the Space Age?"

All present and former NASA employees will be honored. There will also be a special presentation for children.

Happenings

HALLOWEEN SOCIAL. The Langley Activities Association will sponsor a special Halloween social, Friday, October 28, from 4:30 to 9:30 p.m. This will be the last LAA Social for the year. Come, join in the fun!

TURKEY SHOOT AND FALL BAZAAR. The LAA will sponsor these events at the same time this year, Saturday, November 5, in the Activities Center, from 9 a.m. to dusk. Participate in the turkey shoot and do your Christmas shopping early. A wide variety of merchandise will be on sale. Free door prizes. Food for sale throughout the day.

ALUMNI ASSOC. BOARD OF DIRECTORS will meet Thursday, October 27, at 10 a.m. in the Activities Center.

CHILD DEVELOPMENT CENTER. All civil servant employees and on- site contractors are eligible to enroll their children in the employer- sponsored child care center located in Bldg. 1231. Applications for children 6 weeks to five years of age may be obtained by calling 865-2191.

BASKETBALL BLAST. See the L.A. Lakers take on the Washington Bullets at the Capital Centre, Sunday, December 18. Leave Hampton about noon, game is at 7:30 p.m., and return about 2 a.m. Cost for transportation and court-side game ticket is $50/person. Contact Donna Speller, ext. 4002, for further information.

RUNNERS AND WALKERS are needed for the Fall NASA Intercenter Races. The final 2-Mile race will be held October 24, and the final 10-KM race will be on October 27. 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. For more information, call Richard Shearer, ext. 4508.

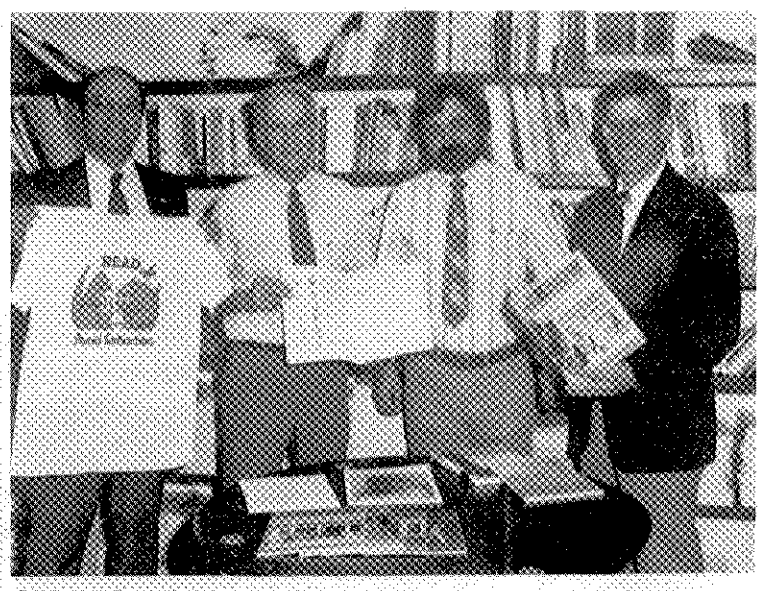
TOASTMASTERS. NASA Langley Toastmasters will meet Wednesday, October 26, 11:30 a.m. to 1 p.m. in the Activities Center, Building 1222. Visitors are welcome. Civil service employees charge one hour to A1619. For further information, call Rich Booth, ext 3446.

SWEET ADELINES. Publick Times Chorus presents "A '50s Flashback" Saturday, Oct. 22, 8 p.m., at the Williamsburg Lodge auditorium and Sunday, October 23, 3 p.m., at Thomas Eaton Middle School, Hampton. For tickets and information, contact Linda Hunt, ext 4932, or call 565-0888 or 723- 4458.

SEASONAL SENSATIONS, a holiday fashion show and luncheon, sponsored by the Junior Woman's Club of Hilton Village on Saturday, November 5, at the Radisson Hotel. For ticket information or reservations, call 877- 7363. Proceeds to benefit local charities.

OVERSEAS JOB FAIR, sponsored by the Department of the Navy, will be held October 26-27, from 11 a.m. to 8 p.m., in the Red Cross Room, Building A-67, at the Naval Station, Norfolk.

NEEDED: ROOMMATE. Male seeks to share luxury 3 BR Denbigh Condo. Private bath, all appliances. $262.50/mo. + 1/2 utilities. Non- smoker. Call 874-1752 after 5 p.m.



CAN YOU READ? If so, why not give yourself enormous personal satisfaction—help someone who can't. Robert Bower (second from left), retired Langley Associate Director, does just that. As a volunteer tutor with The Peninsula Literacy Council, Bower works with the illiterate teaching foreign born adults or children how to hear, speak, read and write English; and assisting children with reading problems in public schools. During a recent visit to the council office, Langley staff members Jim Arrington, Tom Vranas and Bob Wingate found that one out of five adults can't read. Bower explained that contributions to the Combined Federal Campaign can advance literacy and the quality of life for many Peninsula residents, help reduce the rising unemployment rate in Virginia and change the future by offering hope to those who can someday benefit the community. You, as a member of the Langley family, can make a difference. Contribute to the Peninsula Literacy Council through the CFC—and become certified through the council's workshops as a volunteer tutor.

The Senior Management Research Review, originally scheduled for October 17 has been rescheduled to **Monday, October 31**, from 9 to 11 a.m. in Building 1219, Room 225.

Researcher News

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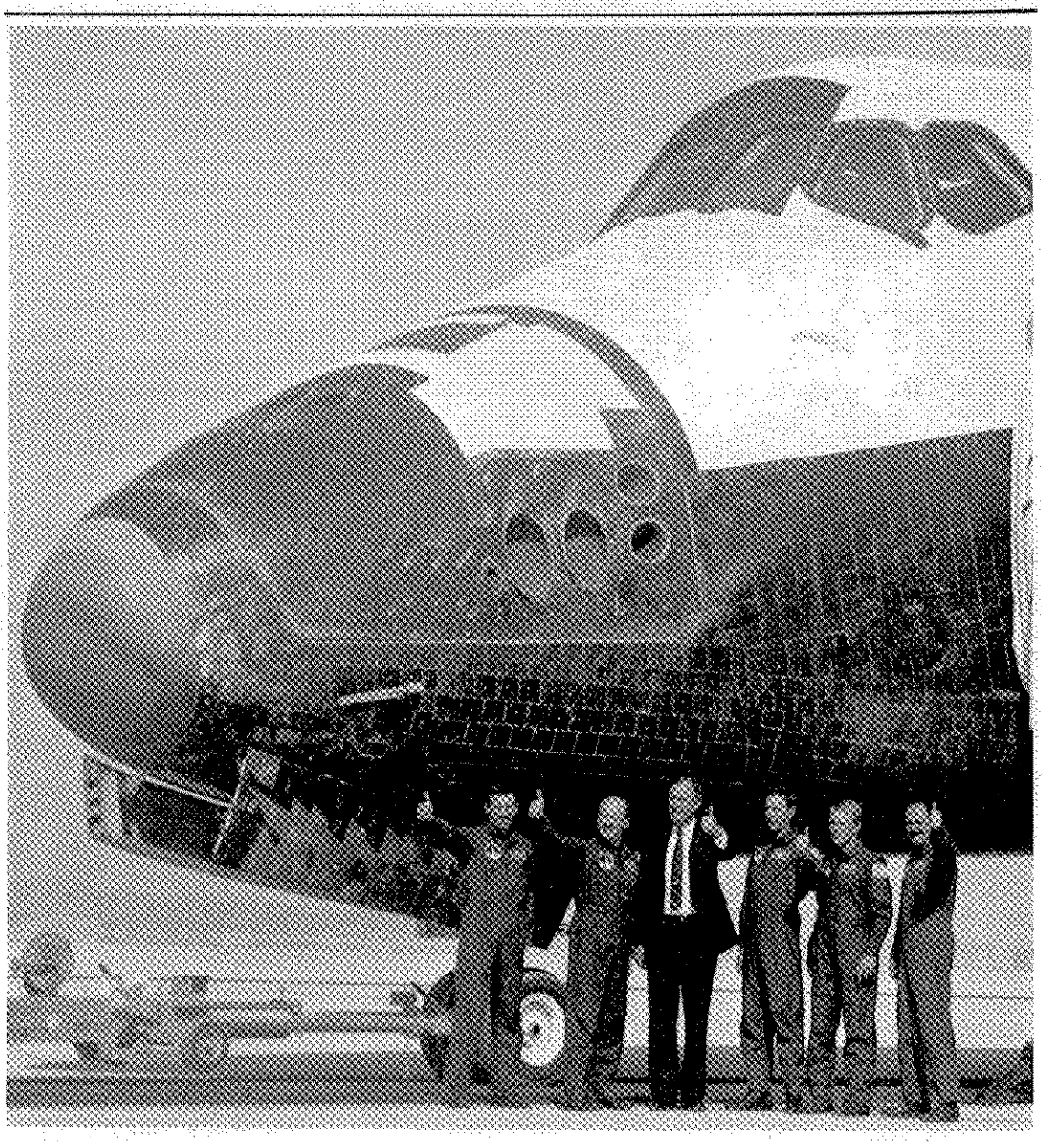


-photo courtesy of NASA Ames-Dryden Flight Research Facility

IT'S THUMBS UP FOR THE SHUTTLE as the STS-26 crew celebrate their return to Earth with Vice President George Bush. A cheering crowd of more than 300,000 people greeted the return of the Space Shuttle Discovery and her five-man crew. Shown are (L to R) Mission Specialist David C. Hilmers, Commander Fredrick H. "Rick" Hauck, Vice President Bush, Pilot Richard O. Covey, Mission Specialists George D. "Pinky" Nelson and John M. "Mike" Lounge. Discovery orbited the Earth 64 times during her four-day mission and deployed the Tracking and Data Relay Satellite, her primary payload.

NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 2, Issue 22 November 4, 1988

News Researcher

Bi-weekly Employee and Contractor Publication

Fletcher Awarded Medal; Elected to Hall of Fame

Dr. James C. Fletcher, administrator of NASA, received the International Technology Institute's (ITI) highest award, the Willard F. Rockwell, Jr., Medal at the International Congress on Technology and Technology Exchange banquet in Pittsburgh. In addition to the award, Dr. Fletcher was elected to the World Level Hall of Fame for Engineering, Science and Technology.

Established in 1982, the Williard F. Rockwell, Jr. Medal is awarded to recognize contributions toward the generation, transfer and application of technology for the betterment of mankind. According to ITI, "recipients are persons of high stature in the international technology community."

Fletcher, who has worked on the frontiers of technology as a scientist most of his professional life, said during his acceptance speech that, "technology will help to lay the groundwork so that future generations will harness riches from space for all mankind. I'm a strong believer in technology and all its promise as a tool for the betterment of humanity." Fletcher also cited NASA's most recent Space Shuttle Discovery mission as an "engineering marvel."

Each year the medal is awarded to a maximum of three individuals, no more than one from any continent, for excellence in technology. This year's recipients are Dr. Fletcher and Dr. Chauncey Starr, founder of the Electric Power Research Institute.

STS-26 Commander To Give Postmission Briefing to Employees

The nation rejoiced September 29 when the Space Shuttle Discovery soared into the sky over Florida. It carried the hopes of the American people as the U.S. returned to space after the Challenger accident in January 1986 and it also marked the beginning of a renewed commitment to lead the world in space exploration.

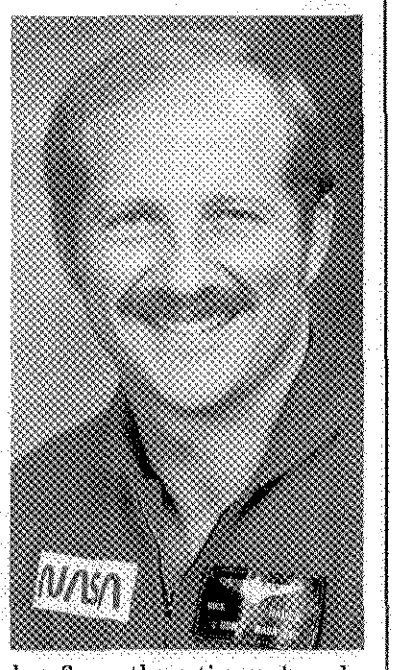
The mission of the Space Shuttle Discovery will be relived by the commander of the five-man crew, Frederick "Rick" Hauck, captain USN, when he speaks to Langley employees on Thursday, November 10. During his postmission briefing, Hauck will show a video tape highlighting the mission. The lecture will be held at 2 p.m. in the H.J.E. Reid Conference Center, Building 1222.

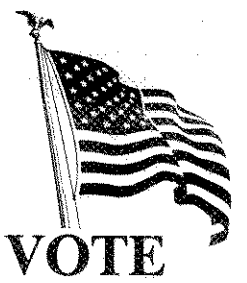
Hauck was accompanied on STS-26 by pilot Richard O. "Dick" Covey, a colonel in the USAF; and mission specialists John M. "Mike" Lounge; David C. Hilmers, lt. colonel, USMC; and George D. "Pinky" Nelson.

The crew's main task was to deploy a large tracking and data relay satellite called TDRS-C. Now that TDRS-C is in place, Earth to space contact will be almost continuous. TDRS-A, deployed by the STS-6 astronauts, is in geosynchronous orbit over the Atlantic Ocean east of Brazil and has reduced the number of communicaion blackouts between shuttles and the ground. TRDS-B was destroyed during the Challenger explosion and TDRS-D, manifested for STS- 29, is scheduled for launch in February 1989.

STS-26 astronauts also managed 11 in-cabin experiments, some commercial and two designed by students, before landing at Dryden on Monday, October 3.

Hauck, a member of the astronaut corps since January 1978, recently announced that the STS-26 mission was his last. He said other astronauts are waiting in line to fly and now it is time for him to consider a management position with NASA or the Navy. Hauck has flown three times aboard the Shuttle, including a mission which deployed two satellites and retrieved two others—the first ever space salvage effort.





VOTE November 8

Three Selected as Manned Flight Awareness Honorees

Three Langley employees have been selected Manned Flight Awareness (MFA) honorees and will participate in an honoree event at the Kennedy Space Center, Florida, during the week of November 14. The honorees are James C. Young, Space Systems Division; Cynthia L. Lach, Materials Division; and Laurence J. Bement, Systems Engineering Division.

The MFA program honors employees who have performed exemplary work in support of the Space Shuttle program and other manned space flight-related assignments. Richard H. Truly, Associate Administrator for Space Flight, regards the MFA honoree award "as one of the highest and most prestigious awards available to employees of the NASA/industry Shuttle/payloads team."

James Young, senior aerospace research engineer, Experimental Aerodynamics Branch, was selected "for outstanding contributions to the aerodynamic design, development and operation of the Space Shuttle" and was nominated by W. Ray Hook, director for Space. "Young has made many outstanding contributions to the nation's manned space flight program from 1961 to the present and is indeed worthy of being recognized for his accomplishments," Hook said.

Young began his NASA career at the Marshall Space Flight Center where he made significant contributions to the aeronautic development of the Saturn launch vehicles. He was a member of the Johnson Space Center in-house preliminary design team and was the NASA focal point for coordinating the wind tunnel test program during Shuttle conceptual design. From 1972 to 1982, he was Shuttle program manager for aerodynamics. At Langley, Young served as team leader for an in-house study to define and alleviate excessive wing loading during Shuttle ascent. He also made significant contributions to a Langley Shuttle crew escape study and a Langley Shuttle Orbiter ascent separation study.

Cynthia Lach, aerospace engineer, Mechanics of Materials Branch, was selected "for investigating the sealing characteristics of the Space Shuttle Solid Rocket Booster field joint O-rings" and was nominated by Charles P. Blankenship, director for Structures. "Lach has made substantial contributions to the Shuttle SRB field joint redesign project by establishing critical O-ring sealing parameters," said Blankenship.

Lach began her career with NASA in September 1986 and was promoted to her present position in January 1988. Her research has focused on identifying the gap opening rates and temperatures under which candidate O-ring materials will maintain a seal during simulated Shuttle launch conditions. Due to the rougher surface finishes of the redesigned O-ring glands, Lach examined the effects of temperature and structural vibrations on the sealing performance of the O-rings. During the latter stages of the redesign project, contaminated seal tests were conducted on a unique 1/4-scale bore seal fixture, designed at Langley by Dr. Wolf Elber and Mickey Gardner. These tests verified that the redesigned leak check procedure, used after the field joint assembly, can detect contaminants as small as 0.001 inch. Her tests determined that cleanliness is critical for sealing performance. The O-rings are now installed in a "clean room" environment to ensure that threads from clothing or human hairs will not result in a localized leak during launch.

Laurence J. Bement, aerospace technologist, Systems Development Branch, was selected "for contributions in the field of pyrotechnic technology on Shuttle payloads and in-flight escape" and was nominated by Robert L. Swain, director for Systems Engineering and Operations. "Bement has contributed significantly to the pyrotechnic technology base

(Continued on page 6.)

James C. Young

Cynthia L. Lach

Laurence J. Bement

News Briefs

GODDARD SPACE FLIGHT CENTER, Greenbelt Md. — Scientists at the NASA GSFC have noted the emergence of an unusually weak Antarctic ozone hole in 1988. The scientists have been closely monitoring the total ozone levels over the southern hemisphere with the Total Ozone Mapping Spectrometer (TOMS), an instrument on board NASA's NIMBUS-7 satellite.

HEADQUARTERS, Washington, D.C. — The Rocketdyne Division of Rockwell International Corp., Canoga Park, Calif., has been named the recipient of the 1987 NASA Excellence Award for Quality and Productivity. Rocketdyne, primarily responsible for design, development and production of the Space Shuttle main engines, was one of eight finalists in NASA's third annual awards program, which recognized the agency's aerospace industry contractors.

HEADQUARTERS, Washington, D.C. — NASA and Martin Marietta commercial Titan, Inc., Denver, Colo., have announced the signing of an agreement providing for the firm's use of facilities at the Kennedy Space Center, Fla., in support of commercial launches of the Titan III rocket. Advancing the government's objectives to encourage and assist the growth of a robust U.S. commercial launch industry, the umbrella agreement allows Martin Marietta access to NASA-managed support facilities when the firm begins conducting commercial launches of the Titan III in the third quarter of 1989.

HEADQUARTERS, Washington, D.C. — NASA Administrator James C. Fletcher has announced the appointment of Dr. Noel W. Hinners as Associate Deputy Administrator, effective October 24. Hinners, formerly Associate Deputy Administrator (Institution), succeeds Willis H. Shapley who is retiring but will continue to serve as a consultant to the Amininistrator. Hinners will continue as NASA chief scientist and will exercise his present functions of supervising NASA institutional management.

HEADQUARTERS, Washington, D.C. — Jon R. Busse, director of engineering at the NASA Goddard Space Flight Center, Greenbelt, Md., will head the investigative review board appointed to analyze damages to the Magellan spacecraft during a power systems check at Kennedy Space Center on October 17. The board will determine what caused a localized electrical fire in a test battery, why this occurred and how to prevent such a mishap in the future. The launch date for Magellan, set for April 1989, is not expected to change.

HEADQUARTERS, Washington, D.C. — NASA and Corabi International Telemetrics, Inc., a Maryland-based telemedicine system company, have announced the signing of a cooperative agreement supporting the commercial development of telemedicine services for the Space Station Freedom. Corabi is interested in commercially providing a telerobotic workstation that transmits a high-resolution video image of a patient or sample specimen to a ground workstation anywhere in the world.

Editor's note: Surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017.

Langford To Describe Flight of Daedalus

"From Myth to Reality: The Triumph of Daedalus" will be the topic of two lectures presented on the Peninsula Monday, November 14, by Dr. John S. Langford III of the Institute for Defense Analysis.

At 2 p.m. Langford will give his talk to Langley employees during a colloquium in the H.J.E. Reid Conference Center, Building 1222. Following his lecture, Langford will hold a question and answer session and an informal discussion.

At 7:30 p.m. Langford will present the same lecture at the Sheraton Inn- Coliseum as part of The Sigma Series. The Sigma Series is a series of public lectures sponsored by the Daily Press, the City of Hampton and NASA.

In his lecture, Langford will describe the design, testing and successful 75-mile flight of the man-powered airplane Daedalus II from the Island of Crete to the Island of Santorini, thereby duplicating the mythical flight of Daedalus. Langford's lecture will be illustrated by movies of the flight.

Langford has been associated with the development of man-powered airplanes at the Massachusetts Institute of Technology since the early attempts to win the Kramer prize for the first man-powered flight around a one-mile course. This program has resulted in notable advances in the application of composite structures to light-weight aircraft and in developments in airfoil theory applicable to the low-speed flight regime.

Lankley

"Lankley helps to protect NASA's endangered wildlife."

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

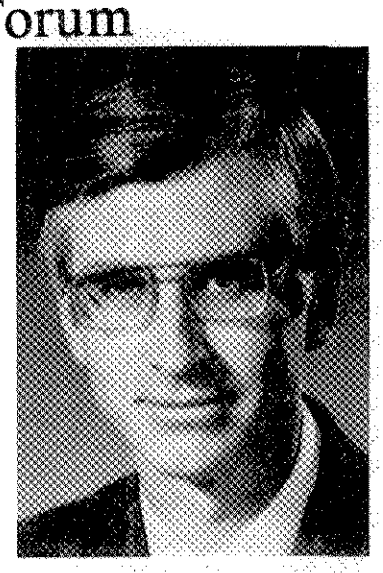
Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

Editorials

Langley

Headquarters Forum



This opportunity to address the Center from the Headquarters Forum is timely in that I recently completed a three-month assignment as acting director for Institutions in the Office of Aeronautics and Space Technology (OAST) at NASA Headquarters. I wish to share some of my impressions from that assignment.

As we have all heard, the Headquarters environment is a difficult one. Much of this is driven by external requirements for which no one can plan. Requests from Congress, the Office of Management and Budget (OMB), the Office of Personnel Management (OPM) and other regulatory agencies drive much of Headquarters on a daily basis. While management works to minimize these surprises, many demands for information simply cannot be predicted. This contributes to the crisis environment that pervades much of Headquarters. This, in turn, results in a reactive rather than proactive mode of operation, since no matter how much planning you do, you will get jerked around beyond your control. Add to this the poor logistics support and poor general housing conditions, and you have a very challenging task to maintain morale and productivity in this environment.

The good news is that the employees at Headquarters are exceptionally hard working and dedicated. I was most impressed with the long hours and willingness to fight the challenge of the environment to get the job done. This is typical of what I found not only in OAST but also in the other organizations.

The second area I wish to address is teamwork. While I believe, particularly since the Challenger accident, strong efforts have been made towards teamwork throughout Headquarters and between Headquarters and the centers, we still have a long way to go. A concern is the absence of center input on major decisions. In some cases, this is driven by the lack of time and effective mechanisms to get communications from the center in the short timeframe the actions require. This is exacerbated by the fact that a growing number of Headquarters employees do not have center experience, yet they are in key decision-making positions, which affect the future of this Center from a functional, institutional or programmatic standpoint.

There are some things we at Langley can do to alleviate this problem. We need to put more time and energy into working on relationships at Headquarters by frequent communications and visits to Headquarters as well as encouraging —almost to the point of insisting—that our functional and program counterparts from Headquarters spend time at Langley. This will develop better and more open communications. Understanding of the other guy's problems is best obtained through personal relationships rather than passing pieces of paper back and forth.

Secondly, we can continue to encourage Headquarters developmental assignments. Langley has always been a supporter of the formal Professional Development Program, but I also believe that targeted six-month assignments—plus or minus three-months—can be of great benefit in developing working relationships.

In closing, I was pleased to find —as I have often heard—that Langley is highly respected at Headquarters for both its technical competence and its management integrity. This is very important to the Center and to me as an individual.

Finally, I would like to sum up my three months in Washington in the words of a senior Headquarters official when he reflected upon working at Headquarters, "at the same time, it is both exhilarating and frustrating."

J. F. Stokes
Director for Management Operations

Note Deadline Change

Due to the Thanksgiving holiday, the deadline for the December 2 issue of the **Researcher News** will be Friday, November 18. Items to be published December 2 must be submitted to the editor, Mail Stop 115, by noon on November 18.

NASA Participates in Career Assessment Program for Local Students

What are you going to be when you grow up? Everyone has, at some time, been asked that very question. Viewed in its propoer perspective, the answer to this universal query shapes an entire life.

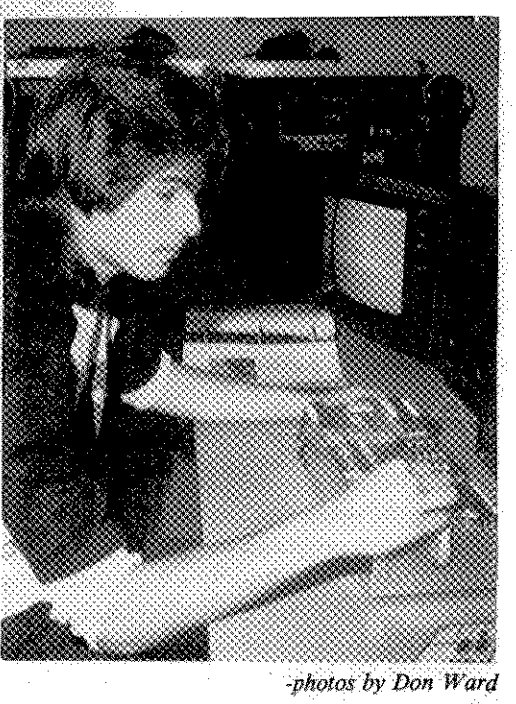
NASA Langley has teamed up with the Peninsula Area Cooperative Educational Services (PACES) to help local students explore the fields of electronical and aeronautical engineering.

'What do you want to be when you grow up?'

During the past year, three Langley employees have worked with the evaluation team at PACES Career Assessment Center to develop work samples in the areas of electronics/electronical engineering and physics/aeronautical engineering. The NASA team outlined job tasks related to their respective fields and illustrated typical work scenarios that could be explored and completed by interested high school students. The PACES evaluator team actually built the hardware for the work stations. The combined effort has yielded two work samples that will help assess student interests in and qualifications for careers in engineering.

LANGLEY, PACES TEAMS CRITIQUE THE FINAL PRODUCT. Langley engineer Preston Carraway (left) and engineering technican Peggy Harmon (second from left) watch as Will Scott (seated) and Nancy Scott (right) demonstrate the Electronics/Electrical Engineering work sample. Carraway and Harmon provided the plans for an electrical circuit board and designed an electrical engineering work scenario. The Wilsons built the hardware.

A CLOSE-UP VIEW OF AN ELECTRICAL ENGINEERING PROBLEM. Mark Milleo (below), a senior at Poquoson High School, examines the work sample to see how an electrical circuit is designed and built.



-photos by Don Ward

The joint NASA/PACES effort was coordinated by Dr. Arlene Levine, Langley education and information specialist.

Robert Baals, engineering technician in Langley's Operations Support Division, supplied plans for and monitored the construction of a wind tunnel. PACES staff members Thomas Raykovich and Annamaria Kelley built the tunnel with assistance from machine shop instructor Kurt Strovink and student Brandon Wade. Wade, a senior at Poquoson High School, machined the two-axis beam balance for the wind tunnel.

The Aeronautical/Physics work sample utilizes the wind tunnel to test the lift and drag of scale model aircraft. Students are introduced to the mathematical equations used to calculate lift and drag coefficients. They also see how this information is used to design and test full scale aircraft.

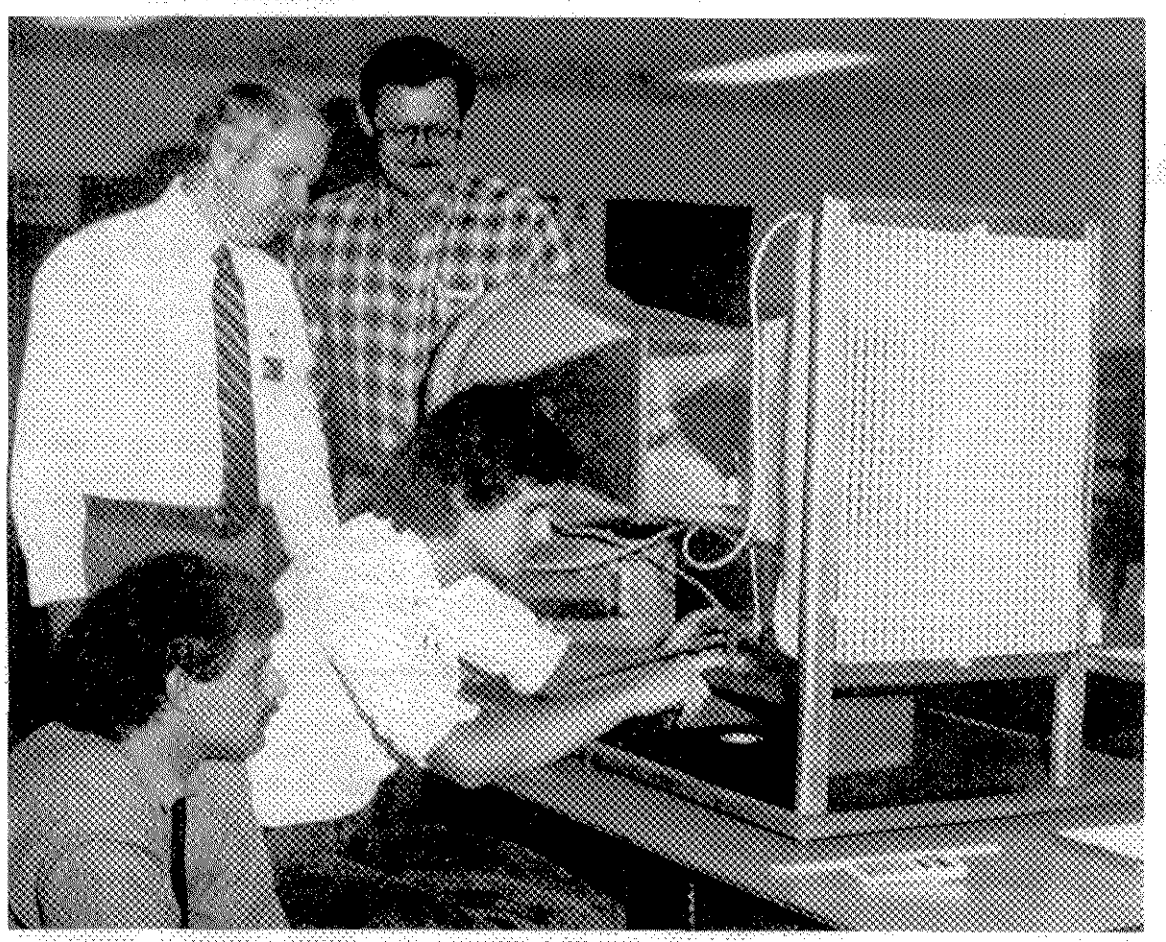
Langley engineer Preston Carraway, Flight Electronics Division, and engineering technician Peggy Harmon, Fabrication Division, provided the plans for an electrical curcuit board and designed an electrical engineering work scneario. The hardware was built by PACES evaluator Nancy Scott and her husband Will Scott, an electrical engineering student at Old Dominion University.

The Electronics/Electrical Engineering work sample allows interested students to learn how an electrical circuit is designed and built as well as the mathematics involved in solving an electrical engineering problem. A switch operating a seven-segment LED is broken down into different components. The students wire the components and see how small scale integration can be developed into medium scale integration. They are also introduced to binary code digits and see how they are used in circuitry.

The work samples created with the help of NASA have increased the opportunity for students in the Hampton Roads area to examine careers closely associated with the U.S. aerospace program. The NASA work samples bring to 30 the number of career areas that can be explored at the PACES Career Assessment Center housed at the New Horizons Technical Center on Butler Farm Road in Hampton.

PACES Coordinator of Vocational Services Nancy Scott explains the objective of the program which has been in operation since Febvruary 1987. "Local high school students have the opportunity to perform simulated work tasks that relate to career opportunities in our own community. Performance on the work samples, plus the students' interest and ability are compared with their high school performance and aptitude test scores. This information then is used to develop career plans for the students. Plans may include recommendations for college or vocational training."

Over 300 students from six area divisions—Gloucester, Hampton, Newport News, Poquoson, Williamsburg-James City County and York County—will participate in the Career Assessment program beginning in late October.



DESIGNER AND BUILDERS FINE TUNE WIND TUNNEL. Langley engineering technician Robert Baals (standing, left) supplied plans and monitored the construction of this table-top wind tunnel. Built by PACES evaluator Thomas Raykovich (kneeling) with help from New Horizons machine shop instructor Kurt Strovinck (standing, right) and student Brandon Wade (seated), the wind tunnel is utilized to test aerodynamic lift and drag of scale model aircraft.

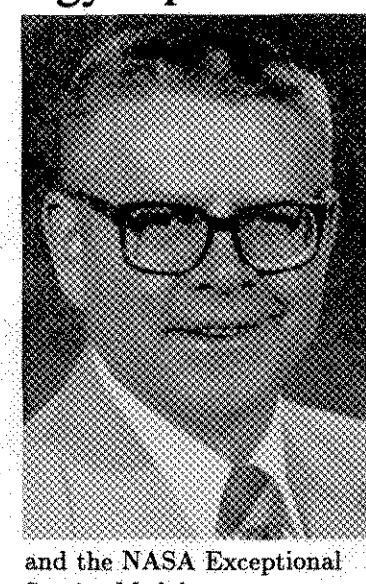
At the VC during November

Huston Presents Rotorcraft Technology Update

Robert J. Huston will discuss "Rotorcraft, Past, Present and Future" on Wednesday, November 9, at noon in the Visitor Center theater. This presentation is part of the Fall Guest Lecture Series sponsored by the Visitor Center and the AIAA-Hampton Roads Section Student Branch.

The focus of this lecture will be on the technology changes that have resulted in increased helicopter capabilities and utilization. Huston will present a selected review of the history of rotory wing developments leading to the helicopter and tiltrotor vehicles of today. He will also speculate on what the rotorcraft configuration of the future will look like.

Huston, manager, Rotorcraft Research and Technology, joined Langley as an aeronautical research engineer in 1958. He is the author or co-author of 35 technical papers on the various areas of research and development in which he has been involved. He has received four Langley Special Achievement Awards, two Langley Group Achievement Awards, two NASA Group Achievement Awards and the NASA Exceptional Service Medal.



NASA Expert Discusses the Smallest Spaceship

Once an astronaut leaves the confines of a spaceship, the space suit must supply all of the functions of the spacecraft. "It is the smallest spaceship of all," says NASA expert Dr. Bruce Webbon.

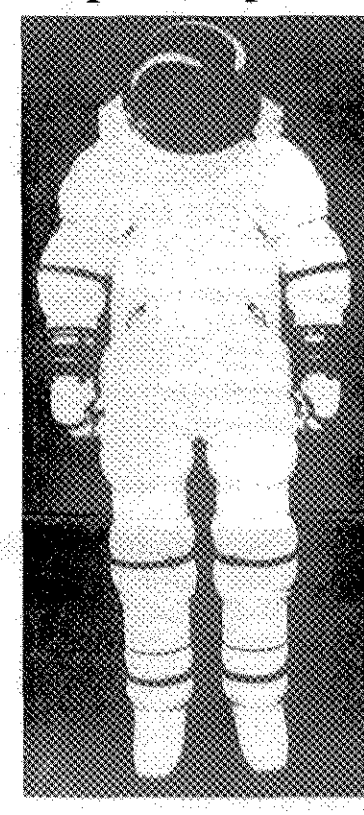
Webbon, from Ames Research Center, California, will discuss space suit designs for advanced programs such as lunar or Mars colonies. His presentation will be at 7:30 p.m., Thursday, November 10, in the Visitor Center.

"The Space Shuttle provides the astronauts with a pressurized vessel, oxygen supply, carbon dioxide removal, humidity control, air circulation, communication systems, maneuverability, temperature and waste control," explains Webbon. All these functions must be considered in designing space suits.

By the late 1990s, NASA astronauts could log 1,000-2,000 hours a year in extravehicular activity (EVA) working outside the Space Station Freedom. To accommodate future missions, the ideal space suit should fit both male and female astronauts, be comfortable to wear and allow adequate mobility and range of motion for the tasks performed. It must provide protection from radiation, micrometeoroids and man-made debris, which are potential hazards on extensive EVAs.

"Astronauts on Freedom or lunar and Mars colonies could use EVA space suits daily," Webbon points out. "The space suit for this "blue collar' EVA system must be durable and reliable enough for months of daily use with only routine maintenance."

Webbon, who received his doctorate in mechanical and aerospace engineering in 1978, has more than 20 years of experience with EVA space suit design. He has won nine NASA awards and holds five patents for his inventions. He has published 37 papers in the last 20 years.



Personnel News

Extension of Temporary Leave Transfer Program

The Temporary 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 personal or medical emergency.

As a result of such an emergency, the following employees are approved leave recipients:

- o Robert M. Connell, Jr.
- o Kenneth M. Jones
- o Penny L. Murphy
- o Carol M. Olsen*
- o Catherine B. Worth

*Donations will be accepted until the close of business November 14.

The Temporary Leave Transfer Program was scheduled to terminate on September 30, 1988. However, on September 22, the President signed the Treasury Appropriations Bill, P.L. 100-440, which extended the authority for the leave transfer program until September 30, 1989. The only change to NASA's policy will be that of allowing transfer of annual leave between agencies.

If you would like more information concerning the Temporary Leave Transfer Program, please contact Linda Park of the Employee Relations Section at ext. 2266.

Leave Scheduling

Supervisors and employees are reminded of their responsibility to effectively plan and schedule annual leave for use throughout the leave year. Except in unforeseen circumstances, employees are responsible for requesting annual leave far enough in advance to permit careful scheduling of leave for all employees in the organizational unit and also enable efficient conduct of work.

Supervisors must approve a formal and timely request for annual leave (scheduled on a Standard Form 71), provided the work load permits. However, if the request must be denied because of work load requirements, the annual leave should be rescheduled to the satisfaction of the employee.

If the requested leave in in the "use or lose" category and must be denied or cancelled because of an urgent need, the supervisor must obtain approval of the exigency prior to cancellation or denial.

Annual leave must be scheduled by **November 18** in order for it to be considered for restoration.

Health Corner

Ho, Ho, Ho---Hack, Hack, Hack!

Sometime between Halloween and Thanksgiving, Christmas decorations begin to appear, indicating the start of the festive season and, unfortunately, the start of the influenza season too.

"Flu," as everyone knows, occurs in epidemics in the winter months. It puts people to bed plagued with high fever, aching bones, sore throat, cough and extreme fatigue and malaise. Millions of work and play hours are lost each year to this annual scourge.

As if that weren't bad enough, over 10,000 excess deaths are recorded with each flu epidemic. Most of these deaths are in the very young, very old and chronically ill, but 10 to 20 percent are in young, vigorous working-age people like you.

The specific ingredient of the flu vaccine must be changed every year because of something called "antigenic drift." This simply means that the virus changes its specific characteristics and "disguises" itself so it is immunologically unrecognizable to the previous year's vaccine. For this reason, we must get the **new** flu shot each year if we want to be protected.

This protection does three important things: minimizes or completely prevents the flu in the protected individual; decreases the spread of the disease among the work force at LaRC; and prevents carrying the virus home, where those at high risk of death from flu are more likely to be.

The side effects of the modern flu vaccines are insignificant—a day or two of redness at the injection site occurs in about 30 percent of those getting the shot. If you believe the common misconception that one can catch the flu from the flu shot, you will also believe that those holiday decorations were sent by Sants and his elves from the North Pole! The flu vaccine is made of *killed* virus and can't transmit the flu. If, in the past, the *dead* virus in the vaccine made you sick, guess what the *live* virus can do to you if you catch the flu!

The only people for whom the flu shot is not recommended are those few people who are truly allergic to chicken eggs in which the virus vaccine is grown. These people get hives when they eat anything that has eggs in it. The immunization is even safe for pregnant women.

The Occupational Health Clinic will offer the flu shot to civil service and contractor employees, Monday through Friday, from 7 a.m. to 4 p.m. To save you work time, we will also come to your building by invitation to give the shot to groups of ten or more people. For this "house call" service, have your building coordinator call ext. 2246 to arrange a mutually agreeable time.

Get your flu shot this year for your own, your co-workers' and your loved ones' sake. Let's make this a flu-free, festive season.

GREAT AMERICAN SMOKEOUT

AMERICAN CANCER SOCIETY

TAKE A BREATHER

The NASA Health Clinic will sponsor a **Smoking Cessation** display in the cafeteria during the week of November 14. Join the Great American Smokeout on Thursday, November 17. Millions of smokers across the country will take a break and try not to smoke for 24 hours. If you don't smoke, adopt a smoker for the day and promise to help that friend get through the day without a cigarette.

Notes of Thanks

Faith M. Allen writes: "I want to thank all my friends at NASA for making my retirement party such a memorable day for me. The gifts will be a constant reminder of my many friends. The kind words and pleasure of your company were greatly appreciated and will always be remembered."

Roger Phelps writes: "My wife Arvis and I would like to thank our many friends and my co-workers for the memorable retirement dinner and party. We greatly appreciate the most generous gifts and your friendship. God bless each of you."

People & Places

NRC Announces Associateship Programs

The National Research Council announces the 1989 Resident, Cooperative and Postdoctoral Research Associateship Programs for research in the sciences and engineering to be conducted on behalf of 30 federal agencies or research institutions, including Langley Research Center.

The programs provide for Ph.D. scientists and engineers of unusual promise and ability to perform research on problems largely of their own choosing yet compatible with the research interests of the supporting laboratory. Initiated in 1954, the associateship programs have contributed to the career development of over 5,500 scientists ranging from recent Ph.D. recipients to distinguished senior scientists.

Approximately 450 new full-time associateships will be awarded on a competitive basis in 1989 for research in chemistry; earth and atmospheric sciences; engineering and applied sciences; biological, health, behavioral sciences and biotechnology; mathematics; space and planetary sciences; and physics. Eight associateships will be awarded for research at Langley.

Applications to the National Research Council must be postmarked no later than December 15, 1988, April 15 and August 15, 1989. Initial awards will be announced in March and April (July and November for the two later competitions) followed by awards to alternates later.

Information on specific research opportunities and federal laboratories, as well as application materials, may be obtained by writing Associateship Programs (GR430A-D2), Office of Scientific and Engineering Personnel, National Research Council, 2101 Constitution Avenue, N.W., Washington, D.C. 20418 or by calling (202) 334-2760.

As of press time, Langley is slightly short of its CFC goal. Thus far, $256,066.88 (98.49 percent) has been contributed. Please give to this worthwhile cause.

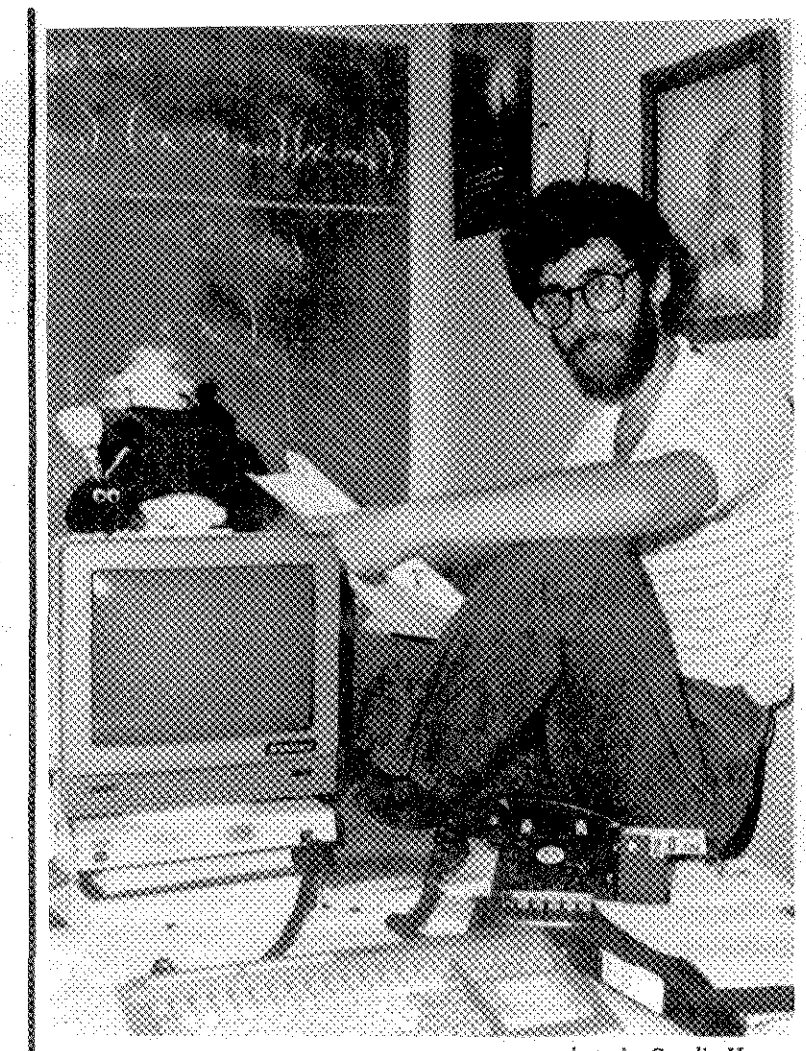
PLANNED PARENTHOOD CAN HELP! This organization, partially funded by the United Way of the Virginia Peninsula, provides professional educational programs in human sexuality, family planning and parent-child communication. Planned Parenthood staff members Sherry Norfleet (left) and Daniel Brown (center) recently briefed Langley employees Jim Arrington, co-chairman of the Combined Federal Campaign; Milt Holt, chairman CFC; and Bob Wingate, deputy director for Systems Engineering and Operations, on the educational services provided on the Peninsula. Programs available include family planning, sexually transmitted diseases, AIDS, teenage pregnancy, sexual decision- making, parent-child communication and prevention of sexual abuse. Through contributions to the CFC, the Langley family can help Planned Parenthood train educators and speakers to conduct workshops for clubs, churches, schools and companies. The programs are tailored to suit the group's needs and are offered free of charge to the community. "Our young people today have lots of questions about their sexuality....Adults are looking for ways to provide answers...." Planned Parenthood can help find those answers.

Cafeteria Prices Increase

For the first time since December 1985, there has been a price increase on dinners, vegetable and other selected entrees, such as deli sandwiches.

This action is necessary in light of the recent dramatic increase in the wholesale price of food, a result of this summer's drought. As an example, the price of turkey breast, used in dinners and deli sandwiches, has gone from $2.14 to $2.98 per pound; lima beans have recently increased from 60 cents to 90 cents per pound. Wholesalers indicate that the price of corn, wheat and soy-related products can be expected to rise through next spring.

To you, the customer, this means that the price of a dinner has increased to $2.20, the price of a vegetable entree is now 60 cents, and deli sandwiches have increased slightly in price. The new prices went into effect on Monday, October 31.



-photo by Sandie Horsey

With computers I wrestle and play,
Deciphering output earns me my pay.
I test out my notions
About fluid motions,
And learn something new every day.

Oh, I get nervous and itchy when things don't work
Debugging programs can make one berserk.
There're deadlines to meet and papers to write,
And arguments brew over which theory's right.

But how can I beat a job with flex time.
With colleagues whose work is A No. 1 print?
I love solving problems and getting things done.
I really like my job; it is so much fun!

Singer 'Loves' His NASA Job

Bart Singer, research scientist in the Computational Methods Branch, was recently recognized in the **Daily Press/Times-Herald** for his contribution to the "Take This Job and Love It" contest. He was chosen a semi- finalist.

Chosen from a field of 250 entries, Singer's expressed his views on his job at NASA Langley in rhyme. "I thought it would be a novel technique. I often compose ryhmes to pass time and ease tension," said Singer. "Besides, I really do enjoy what I do here."

An employee of High Tech Corporation, Singer began work at Langley in May 1988. He has a bachelor's degree in mechanical engineering from the University of Rochester and a masters and doctoral degree from Stanford University. He has done postdoctoral work at the Naval Post Graduate School, Monterey, Calif.

Employee-Built Submarine Launched

The **Pacita I**, the one-man submersible built by Pacita Tiemsin, an Army employee assigned to NASA, and former NASA employee Jeffrey Knutson was launched on September 14 in Owl's Creek at Rudee's Inlet, Virginia Beach. (Feature story on the construction of the submarine appeared in the July 29 issue of the **Researcher News**.)

By a toss of the coin Knutson was chosen to board the craft for the initial submersion. He was struck by the slow motion response of the steering controls and by the near total silence of the propulsion and steering systems. Both builders regarded the launch as a success. Several areas, though, needed improvement, specifically to install additional lighting in the cockpit, make steering apparatus less sluggish and develop a means to protect joysticks from accidential actuation.

The second open water test occurred on October 12, again at Owl's Creek. This time a main objective was to select and maintain a particular heading. The sub performed extremely well and there were no failures in any system.

Tiemsin and Knutson are conviced that "we have one of the highest performance, most sophisticated, small manned research submersibles in existence."

The story of the **Pacita I** will be featured on "Our Place, Our Time," on WHRO television, channel 15, November 17 at 10 p.m. Tune in and see Tiesmin and Knutson expain how they shaped their dream.

Employees, Take Note:

- The new version of NASA Langley Form 165, Work Order and Shipping Memorandum, Version July 1988, is now in stock. This form is used to have instruments serviced through the Instrument Control Unit (ICU), Instrument Research Division, Building 1230. Please dispose of all previous versions of this form and use only the latest version. Any questions regarding the use of this form may be addressed to the ICU, ext. 2801.

- Extra copies of the NASA "Quality" poster, distributed earlier to civil service employees, are available from Edith Watts, Mail Stop 146, ext. 3017.

- **Instructions have been written for using LARCMACS, the TEX macro set used in the Technical Editing Branch. Those interested in receiving a copy should send their name and mail stop to Mary McCaskill at Mail Stop 149 or at mary@teb.larc.nasa.gov.**

Happenings

FALL BAZAAR AND TURKEY SHOOT, sponsored by the Langley Activities Association, will be held tomorrow, Nov. 5, from 9 a.m. to sunset in the Activities Center, Building 1222.

LAA BOARD MEETING. The Langley Activities Association Board of Directors will meet on Tuesday, November 8, at 7 a.m. in the Activities Center. Concerns to be brought before the Board should be addressed to the appropriate chairperson.

CHILDREN'S CHRISTMAS PARTY, sponsored annually by the LAA, will be held Sunday, Dec. 18. Mark this date on your calendars and bring the little ones to see Santa when he visits the Activities Center.

NASA BASKETBALL LEAGUE. The NASA Basketball Association is now organizing for the 1988-89 season. If you are interested in forming a team, or you have a returning team that has not yet registered, please contact Tom Brinkley, ext. 3325, before November 18. Scrimmage games will begin on or about November 28, so don't delay.

TOASTMASTERS. NASA Langley Toastmasters will meet Wednesday, Nov. 9, in the Activities Center from 11:30 a.m. to 1 p.m. Visitors are welcome. For additional information, call Natalie Shrader, ext. 3483.

MOBILE MAMMOGRAPHY UNIT will be on Center November 29 and 30, from 7 a.m. to 5 p.m. Special NASA price for breast cancer screening is $39. Call ext. 2605 for an appointment.

SCI-CON, the oldest and largest science fiction convention, will be held Nov. 10–13 at the Holiday Inn Executive Center, Virginia Beach. Guest of honor will be David Brin, the leading expert on SETI research. Memberships are $20/weekend; one-day memberships are $10/$15/$10 for Fri./Sat./Sun. For more information, contact John Kaiser, ext. 2146.

BUSINESS CARDS. Telephone numbers on center will be changing in the next few months. For up-to-date business cards, contact the Visitor Center Souvenir Counter, ext 2198. Cards are $17/500 and $19/1000 and take 4-6 weeks for processing.

FOUND: WATCH. A man's watch has been found in Building 643. Call Bob Bryant, ext. 2184, to identify and claim.

FOR RENT: HOME. Degreed professional seeks same to share house and expenses. 3 BR, 2 BA home in Hampton with garage, deck, great room and fireplace. Close to NASA/LAFB. $300 plus utilities. Call Jay at 851-3339 (evenings) or 688-8811 (days).

FOR RENT: TOWNHOUSE in York Co. 2BR, 1 1/2BA, country kit/fpl. All appliances, $550/mo. neg. Available now. Call 898-5113.

FOR SALE: ITEMS. 27"man's ten-speed bicycle, like new. $30. Smokey camping trailer, 18', like new. $1,000. Call 723-1250.

In Memoriam

Sympathy is extended to the family of **Thomas Carmines** who dies November 10. Carmines retired in 1986 after 33 years of service to NASA.

MFA Honorees

(Continued from page 1.)

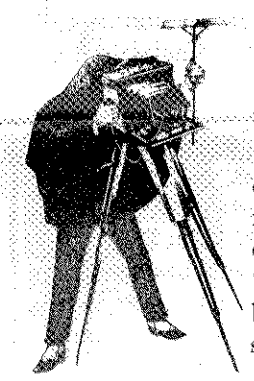
and safety for both Shuttle payloads and in-flight escape mechanisms," said Swain.

Bement has been with NASA for 24 years and has been Langley's pyrotechnic support engineer for ten years. In this position he is responsible for Langley's explosive and pyrotechnic safety and research and development. Bement managed a failure investigation on the spacecraft separation joint planned for use on the Shuttle/Centaur, Inertial Upper Stage (IUS), and Galileo spacecraft. The results of the investigation were accepted and immediately incorporated into flight hardware. Following the Challenger accident, Bement co-managed a Shuttle seated extraction feasibility study with astronaut Steve Nagel. This system significantly expands the existing manual bailout escape opportunity at liftoff to 6,000 feet, following reentry, loss of control and even vehicle breakup. The system, as conceived but not yet incorporated into the Shuttle, can extract seven crewmen in less than two seconds.

The MFA award and honoree activities are sponsored by the Office of Space Flight and the NASA/Industry Motivation Panel. This NASA-wide program includes honorees from all the NASA installations, including civil service, contractor and military personnel.

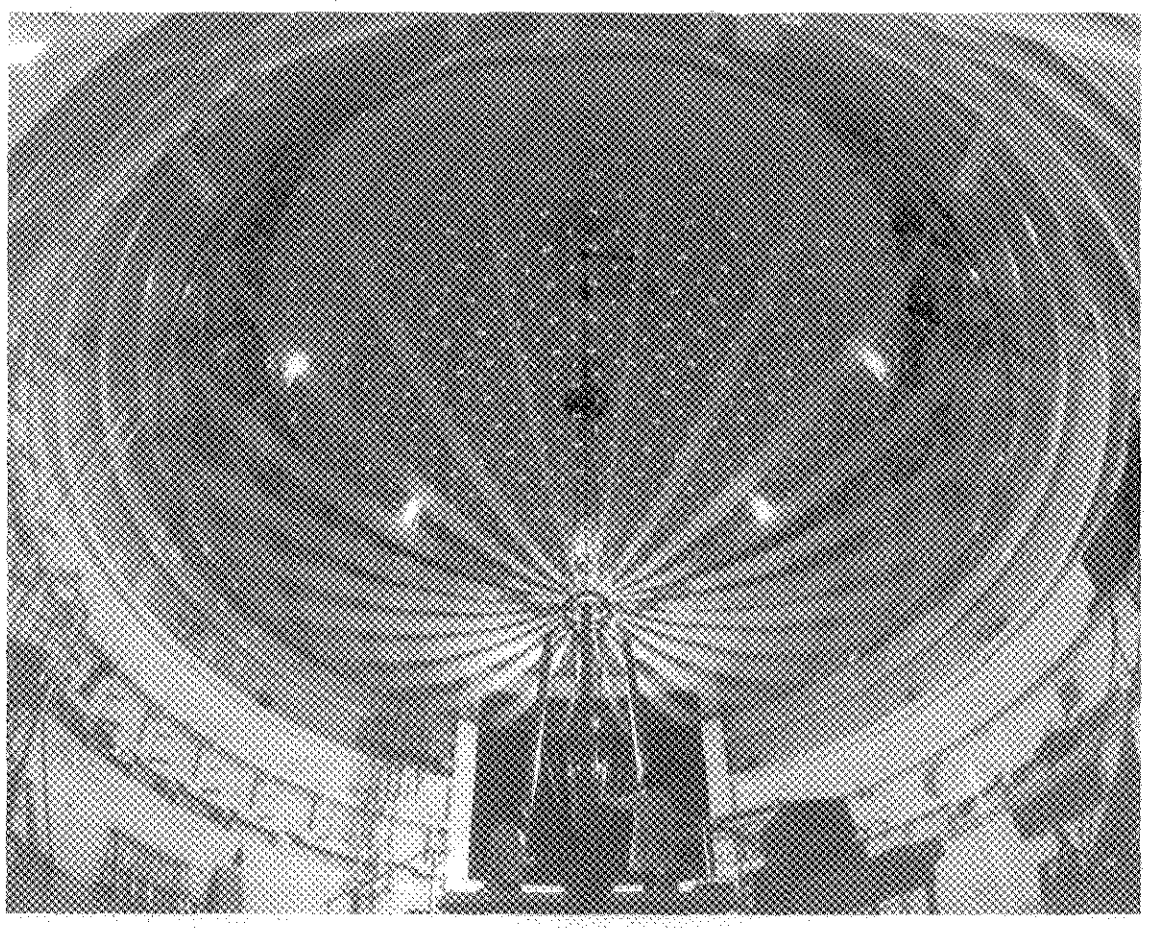
To Set the Record Straight:

Kitty Brand writes: "To all my friends, Viking mates and even strangers who watched Channel 13 news the evening of our great Discovery launch, please let it be known that Kitty Brand does know that the Viking Lander did not land on the Moon; Viking landed on Mars and I watched that landing in July 1976."



Attention: Shutterbugs

Help us capture the spirit of the holiday season. Traditionally, the year-end issue of the **Researcher News** carries a holiday message from senior management and a photograph conveying to our readers a holiday greeting or best wishes for a joyful New Year. Submit a candidate photo, ideally a 5 x 7 or 8 x 10-inch black and white or good quality color photo, and fill the space below for the December 16 issue of the **Researcher News**. Please direct your submissions to the Editor, Mail Stop 115, by December 5.



-photo by Roger Ressmeyer, (c) National Geographic Society

LANGLEY FEATURED IN NATIONAL GEOGRAPHIC. This photograph of Langley's Hoop Column Antenna is one of four Langley photographs featured in the November issue of *National Geographic* magazine. The antenna, pictured on page 739, helps illustrate the article entitled "Mission to Mars," written by former astronaut Michael Collins. In his story, Collins, now a trustee of the National Geographic Society and author of the recently published book *Liftoff: The Story of America's Adventure in Space*, describes a flight scenario for a U.S.-Soviet manned voyage to Mars, which could take place in the year 2004. Photographer Roger Ressmeyer visited Langley on several occasions to take candidate photographs to accompany the Collins' story. Permission was granted by National Geographic Society to publish the antenna photograph to announce the special Mars feature.

Researcher News

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Langley Research Center
Hampton, Virginia 23665-5225

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NASA
National Aeronautics and Space Administration
Langley Research Center

Volume 2, Issue 23 November 18, 1988

Researcher News

Bi-weekly Employee and Contractor Publication

CFC Goes Over The Top

As another successful Combined Federal Campaign (CFC) comes to a close, the Langley Research Center has again maintained its tradition of always meeting or exceeding its goal.

As of **Researcher News** press time, Langley personnel and affiliated organizations had donated $260,266 to the 1988/89 campaign. This figure is more than $4,000 over what was donated last year and is slightly over 100 percent of this year's goal of $260,000.

This support continues to show that LaRC is a leader on the Peninsula in caring about the community in which we live.

The combined efforts of many people made this a successful campaign. On behalf of the Langley CFC committee, I would like to thank all of those who volunteered their time to this cause. As a result of your efforts and all who so generously contributed, the Langley Research Center will "make a difference" in the lives of many people within our community.

Thank you for your support.

H. Milton Holt
Chairman, CFC

Virus Halts Communications

Cold weather generally initiates the flu season. This November 3 it was the Langley computer system that was at risk.

Thousands of computers at university and government research centers across the U.S. were shut down and their links with other computers temporarily severed when they were hit by what appeared to be the worst attack to date of a computer "virus."

The virus did not seriously affect the agency's computers because of preventative measures NASA took after a similar incident last March, said NASA spokesman Charles Redmond. A protective "software patch" has been developed to immunize against this type of virus. Reconnection to the networks occurred only after the patch had been installed and tested.

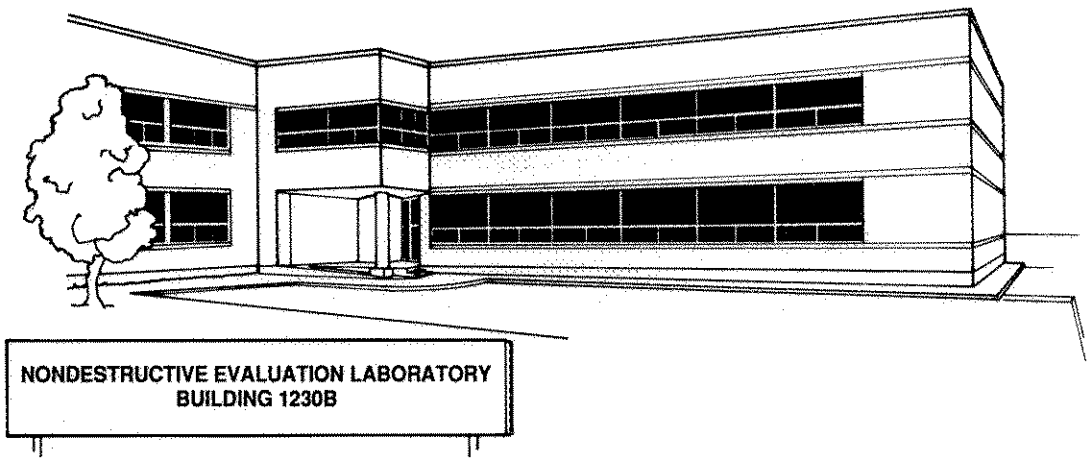
The NASA Science Internet was vulnerable to the attack. The virus was discovered at the Ames Research Center (ARC) at 7 p.m. on November 2; by 9 p.m. the Network Project Office at ARC confirmed the virus and directed all associated centers to implement the first level of crisis management by closing down external connections until further notice. By Thursday, November 3, system managers were using procedures to verify the presence of the virus and proceeding to eradicate it. A check-point was set for 12 noon Friday, November 4, to determine status and begin to systematically re-connect computers to the Internet. These procedures have protected the supercomputers and data bases and prevented further contamination.

Excellent coordination and cooperation throughout NASA enabled the virus to be isolated and contained within hours of discovery to prevent any significant damage. At this time the incident is regarded as a "benign attack."

At Langley, the virus was diagnosed after one small computer system began to slow down for no apparent reason. Langley computer managers had just gone on the alert for signs of the virus.

The system, a file server and 21 workstations, is used by ICASE (Institute for Computer Applications in Science and Engineering). The system was immediately isolated. Most on-center computing continued, but all external off-center network communications were disconnected and some local computing ground to a halt.

As was the case agency-wide, the impact was felt not in lost or altered data but in the loss of computer capacity. The virus at Langley was labeled "a nuisance" and, like a mild version of the real thing, was cured and gone in approximately 24 hours.



Langley Dedicates Unique Research Lab

NASA Langley Research Center is a premier research center, internationally known for its achievement in aeronautics and space sciences and its unique facilities. The center strives to maintain advanced experimental, computational and institutional facilities to accomplish its current and future research programs.

Today Langley will add another research laboratory to its list of unique facilities when the center dedicates its Nondestructive Evaluation (NDE) Laboratory.

"The new laboratory for testing materials represents a continuing commitment by NASA for vitally needed improvements in the measurement sciences for safety, reliability and maintainability," said Dr. Joseph S. Heyman, head of the Materials Characterization Instrumentation Section. "Research in this building, with an energetic tradition of technology transfer to industry, will provide an improved understanding and the instrumentation to measure and predict the state of life of materials and structures."

Heyman said that new concepts developed in the NDE laboratory will result in a class of materials that can monitor their own health. "With these facilities," Heyman explained, "NASA will provide a national focus in a critical science and technology having significant impact not only in aerospace, but also in industry and medicine. As such, this laboratory has a direct bearing on the future competitiveness of U.S. products and services at a time when foreign technology trends present a major challenge."

The dedication ceremony will be held in Building 1230B at 10:30 a.m. George Rodney, associate administrator for Safety, Reliability, Maintainability and Quality Assurance at NASA Headquarters, Richard H. Petersen, Langley director, William D. Mace, director for Electronics, and Heyman will officiate.

Following the dedication ceremony, attendees will be invited inside the building to see a demonstration of nondestructive evaluation technology. Microchips will be inserted into a socket on a circuit board to complete a circuit, lighting a lamp. At this point, a computer program will be triggered to display on several large monitors a sequence of pictures relevant to NDE research at Langley. The program will use synthesized speech to commemorate the opening of the new building.

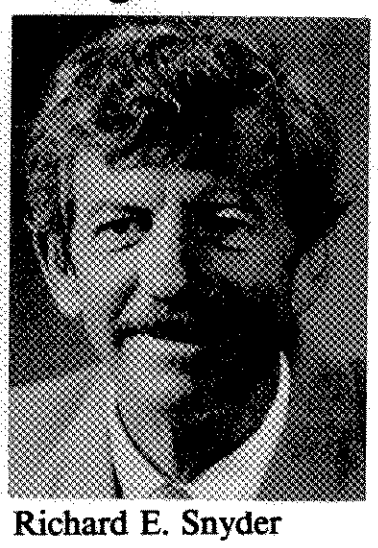
Huckins, Synder Transfer to Space Station Freedom Program Office in Washington

Two NASA Langley Research Center managers have transferred to the Space Station Freedom Program Office in the Washington, D.C. area.

Dr. Earle K. Huckins III, deputy manager of the Space Station Evolutionary Definition Office at Langley, has been selected as director of the Strategic Plans and Programs Division within the Office of Space Station Freedom at NASA Headquarters. Dr. Richard E. Synder, deputy manager of the Langley Space Station Freedom Office, has been named director of the System Engineering Division, Space Station Freedom Program Office, Reston, Va.

Huckins has the responsibility for all planning and advanced development associated with evolution of Space Station Freedom beyond the baseline configuration. The Langley office has the technical lead for Freedom evolution and works closely with Huckins' division.

Earle K. Huckins III



Richard E. Snyder

Snyder's responsibilities at the Reston office include ensuring that the Space Station Freedom is developed within budget and schedule constraints according to safety requirements; that it functions as a permanent facility meeting the programmatic goals and supporting the requirements of all user groups; and it meets effective and efficient crew productivity guidelines for long duration flights and the maintenance of a permanent human presence in space.

News Briefs

HEADQUARTERS, Washington, D.C. — NASA has announced that it is rescheduling the launch of the Hubble Space Telescope from February 1990 to an earlier date of December 1989. The earlier date was made possible following reassessment of a variety of factors including payload requirements and Space Shuttle orbiter assignments during the period. The Hubble Space Telescope is a cooperative project with the European Space Agency.

JET PROPULSION LABORATORY, Pasadena, Calif. — An infrared remote sensing system employing specialized data-processing techniques is being developed at JPL to provide forest fire mapping for fire fighters. The work is being accomplished in conjunction with the Forest Service. Called Firefly, the new project calls for a compact, computerized flight system mounted in a Forest Service aircraft. It will integrate multichannel infrared images from its sensor with location data from the aircraft's navigation system, producing simple, precise map information on the fire's perimeters and associated hot spots.

HEADQUARTERS, Washington, D.C. — NASA has published a draft of its revised policy guidelines for proposals from commercial entities to provide infrastructure for the Freedom space station. The guidelines, published in Commerce Business Daily, were revised in response to the President's Commercial Space Initiatives, issued in February, which directed NASA to "clarify and strengthen the federal commitment to private sector investment in this program."

LEWIS RESEARCH CENTER, Cleveland, Ohio — NASA Lewis and the Argonne National Laboratory, Chicago, have signed an agreement to begin joint research in the development of high-temperature superconductivity (HTS) materials and technology. The program is regarded by both parties as having the potential to provide significant economic benefits and a world leadership role for the United States. The objective of this major research effort is to exploit recent rapid advances in HTS technology for significant space and aeronautical applications.

HEADQUARTERS, Washington, D.C. — NASA and the Consortium for Materials Development in Space (CMDS) have awarded a $1 million commercial launch services contract to Space Services, Inc., Houston. CMDS is a NASA- sponsored Center for Commercial Development of Space at the University of Alabama—Huntsville. Under the contract Space Services will launch a materials science experiment payload aboard their Starfire rocket from White Sands Missile Range, N.M., in March 1989.

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md. — NASA Goddard has issued a request for proposal which will lead to the award of a prime contract for the design, development, testing and fabrication of Space Station Freedom's flight telerobotic servicer (FTS). The FTS will be a space robot with automated features that will assist crews in the assembly, maintenance and servicing of the Freedom station and visiting spacecraft.

HEADQUARTERS, Washington, D.C. — NASA has announced the selection of 202 research proposals for immediate negotiation of phase I contracts in NASA's 1988 Small Business Innovation Research Program (SBIR). Proposals were selected from 166 small, high technology firms located in 28 states. It is anticipated that more than 20 additional phase I awards will be chosen at a later date. SBIR objectives are to stimulate technological innovation in the U.S., use small business (including minority and disadvantaged firms) to help meet federal research and and development needs and to encourage commercial applications of federally supported research innovations.

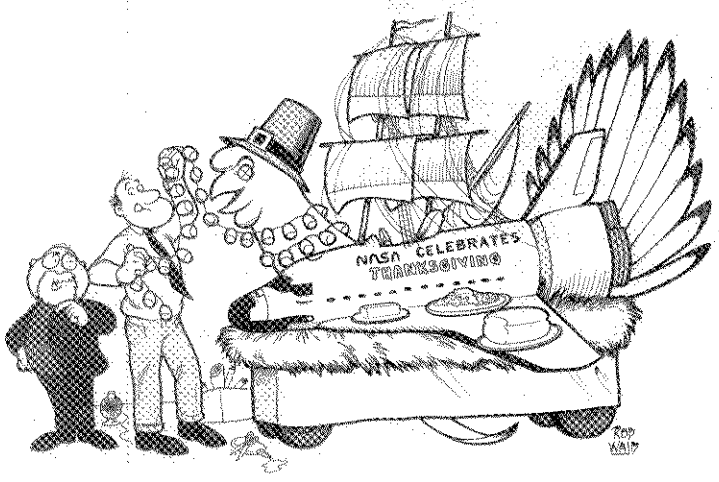
AMES RESEARCH CENTER, Mountain View, Calif. — A Cray Y-MP, the fastest supercomputer in the world, is currently undergoing acceptance tests in the Numerical Aerodynamic Simulation Facility at NASA Ames. Ames is the first organization to have the new supercomputer which is expected to be fully operational by January 1989. The Cray Y-MP can exceed one billion computations per second in sustained operation and has achieved peak speeds of 2.37 billion computations per second by concentrating all of its eight processors on a single scientific simulation.

Editor's note: Surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext. 3017.

Upcoming Conference

The Third Annual NASA/DOD CSI Technology Conference will be held January 30—February 2, 1989, in San Diego, California. Advance registration is required no later than December 23, 1988. Contact Gin Marks, ext. 2077, for registration information.

Lankley



"Say Lankley, don't you have to let Macy's know you're joining their parade?"

Editorials

Langley

Headquarters Forum

All of us who use or depend on computers were concerned about possible damage as the latest computer virus spectacle unfolded. I was and still am equally concerned about the public reaction of some of the computer specialists quoted by the media during and after the event. While all acknowledged the potential danger these viruses pose, some also expressed admiration for the technical accomplishment involved. I submit that this is comparable to praising an arsonist for developing a new way to start fires.

I fear that the grudging admiration displayed in the media may be representative of a fairly large segment of the computational community. There seems to be an atmosphere of gamesmanship associated with computer vandalism which encourages "clever" acts that defeat the acknowledged rules of usage.

The fact is that most computing systems have been designed not for optimum security but for optimum usability. There is an implicit assumption that computer users are basically trustworthy. Passwords protect computing systems in the same way that locks protect houses with glass windows; moral outrage is supposed to be part of the process. The sufficient human characteristic for defeating such systems may be cleverness; the necessary characteristic is contempt.

Toleration of vandalism by computer network users is self destructive; each incident strengthens the argument for network closure. It behooves all with a vested interest in these networks to oppose intentional abuse, both intellectually and morally.

Richard W. Barnwell
Chief Scientist

Contributions are Priceless

November 13-19 has been designated American Education Week. During this week, schools, education associations and Parent-Teacher-Associations have conducted activities promoting the theme, America's Schools: Investing in Your Future.

This seems a fitting time to give recognition to both NASA Langley and its employees for contributions given to schools and youth. The type of contribution, the level of support, and the number of contributors are too numerous to list. However, in identifying the programs, tribute is paid to the Langley participants.

NASA Langley and its employees have given continuous support to the Office of Public Services' educational programs. These programs include: Speakers Bureau, tours, New Horizons Technical Center, Governor's School for the Gifted, Summer High School Apprenticeship Research Program, Technical Opportunities for Peninsula Students, Cooperating Hampton Roads Organization for Minorities in Engineering, PACES Career Assessment Center, NASA Education Workshop for Math and Science Teachers, and NASA Education Workshop for Elementary School Teachers.

The investment of employee time and talent has ensured the success of these programs. In addition, these contributions ensure a talent pool of future workers and an informed citizenry. The payoff is priceless.

Positions Open

The following Competitive Placement Positions are currently open:

88-72: AST, Technology Utilization (Temp/NTE: 1 yr.), GS-0301- 14, Office of Director for Space, Space Station Office. Closes November 21.

88-73: AST, Flight Systems Program Management, Aerospace Engineer (Temp/NTE: 1 yr.), GS-861-14 or 15, Office of Director for Space, Space Station Office. Closes November 21.

88-74: Contract Specialist, GS-1102-12 or 13, Office of Director for Management Operations, Acquisition Division, Research and Services Contracts Branch. Closes December 5.

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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-27 CREW. Aboard the orbiter Atlantis for Space Shuttle mission 27 will be (seated, L to R) Astronauts Guy S. Gardner, Robert L. "Hoot" Gibson and Jerry L. Ross; and (standing, L to R) William M. Shepherd and Richard M. "Mike" Mullane. Gibson is commander; Gardner, pilot; and the other three will serve as mission specialists.

Attention Turns to Atlantis

The Space Shuttle orbiter Atlantis was rolled out to Launch Pad 39-B on Wednesday, November 2.

Since March of 1987, Kennedy Space Center workers have been modifying and preparing Atlantis for its upcoming launch. Nearly 200 modifications were implemented—primarily the modifications previously made to Discovery.

Atlantis was transferred from its processing hangar to the Vehicle Assembly Building on October 22 and was bolted to the huge rust-colored external tank and white solid rocket boosters.

Space center workers completed the Shuttle Interface Test which verifies the connections between the orbiter Atlantis, the external tank, the solid rocket boosters and mobile launcher platform. This test also verifies the various components of the SRBs including the new joint heaters, the hydraulic power units and flight instrumentation.

While Atlantis was being prepared for flight in the Orbiter Processing Facility, the redesigned solid rocket boosters were being stacked in the Vehicle Assembly Building. The stacking operation began July 30 with the left aft booster and was completed on September 20. The next processing step, mating the external tank to the boosters, was accomplished September 20.

Once at the pad, workers began validating connections between the launch pad and the shuttle vehicle elements. A "hot fire" of the orbiter's auxiliary power units and the solid rocket boosters hydraulic power units is planned.

NASA will not conduct a Flight Readiness Firing (FRF) or a Wet Countdown Demonstration Test during Atlantis' stay at the pad. These tests were performed on Shuttle Discovery and included a 22-second test firing of Discovery's main engines confirming the integrity of the overall Shuttle system and launch pad facilities.

One of the major activities planned at the pad is the Terminal Countdown Demonstration Test (TCDT). This is a "dress rehearsal" of launch day for the STS-27 flight crew and for members of the KSC launch team. The actual launch countdown will pick up about three days prior to liftoff.

NASA plans to launch the Space Shuttle Atlantis in late November on mission STS-27. An official target launch date will be set at the Flight Readiness Review in mid-November. Launch will occur during the period from 6:32 to 9:32 a.m. EST. The STS-27 commander is Richard "Hoot" Gibson, the pilot is Guy Gardner, and the three mission specialists are Richard "Mike" Mullane, Jerry Ross and William Shepard. STS-27 is a dedicated Department of Defense mission.

Mixed Fleet MANIFEST Through 1990

Space Shuttle

Date	Mission and Vehicle	Primary Payload
November 1988	**STS-27** Atlantis	DOD
February 18, 1989	**STS-29** Discovery	TRDS-D
April 28, 1989	**STS-30** Atlantis	Magellan
July 1, 1989	**STS-28** Columbia	DOD
August 10, 1989	**STS-33** Discovery	DOD
October 12, 1989	**STS-34** Atlantis	Galileo
November 13, 1989	**STS-32** Columbia	DOD/NASA; LDEF-1R and SYNCOM IV-5
December 11, 1989	**STS-36** Discovery	HST
February 1, 1990	**STS-31** Atlantis	DOD
March 1, 1990	**STS-35** Columbia	ASTRO-1 and BBXRT
April 5, 1990	**STS-37** Discovery	GRO
May 10, 1990	**STS-38** Atlantis	DOD
June 7, 1990	**STS-40** Columbia	SLS-1
July 19, 1990	**STS-39** Discovery	DOD: CIRRIS, IBSS and Teal Ruby
September 10, 1990	**STS-41** Columbia	DOD: Starlab
October 5, 1990	**STS-42** Atlantis	Ulysses
November 8, 1990	**STS-43** Discovery	TRDS-E
December 20, 1990	**STS-44** Columbia	Atlas-1

Expendable Launch Vehicles

Date	Launch Vehicle	Payload
May 1989	Delta 184	COBE
May 1989	Atlas 50E	NOAA-D
September 1989	Atlas Centaur 68	FLTSATCOM-F8
February 1990	Delta	ROSAT
February 1990	Scout S-218C	TRANSIT-27
June 1990	Atlas Centaur	CRRES
July 1990	Atlas Centaur	GOES-1
August 1990	Scout S-210C	TRANSIT-28
September 1990	Atlas 34E	NOAA-I

*Manifest is for planning purposes only; dates are subject to change.

Glossary

ASTRO	Astronomy
ATLAS	Atmospheric Laboratory for Applications and Science
CIRRIS	Cryogenic Infrared Radiance Instrument for Shuttle
COBE	Cosmic Background Explorer
CRRES	Combined Release and Radiation Effects Satellite
DOD	Department of Defense
FLTSATCOM	Fleet Communication Satellite
GOES	Geostationary Operational Environmental Satellite
GRO	Gamma Ray Observatory
HST	Hubble Space Telescope
IBSS	Infrared Background Signature Satellite
LDEF	Long DurationExposure Facility
NOAA	National Oceanic and Atmospheric Administration
SLS	Space Life Sciences Laboratory
SYNCOM	Hughes Geosynchronous Communication Satellite
TDRS	Tracking and Data Relay Satellite

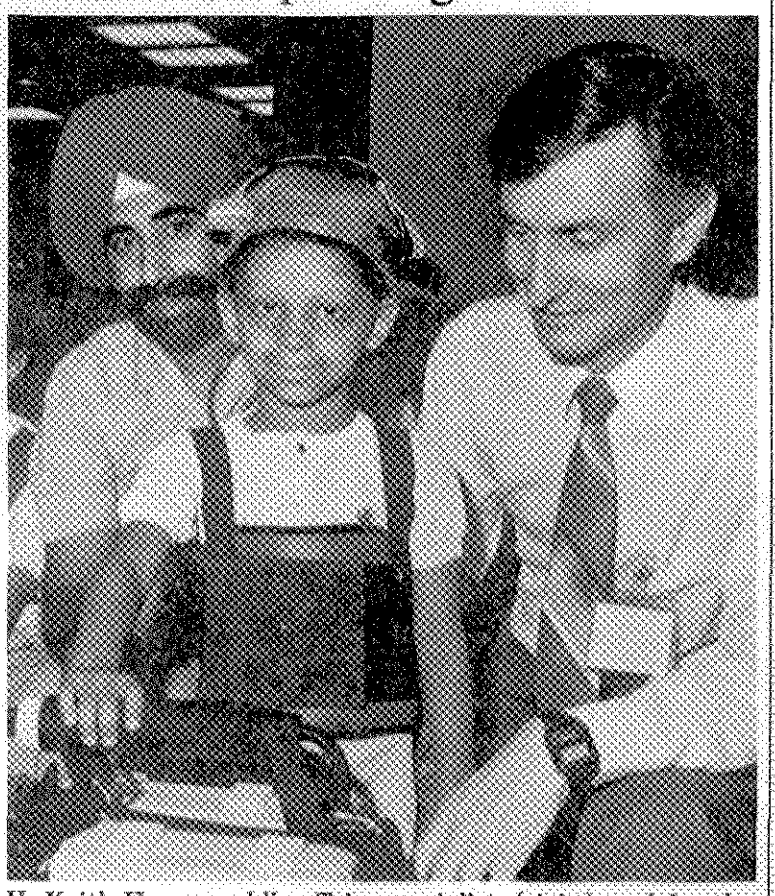
Employee Is Ambassador of Space Age Solution

Suits designed to keep astronauts cool are now giving new freedom to youngsters whose bodies lack a cooling system of their own. H. Keith Henry, Langley public affairs specialist, presented a "cooling suit" to an Indian child on a recent trip to the Near East.

Four-year-old Tanu Arora suffers from hypohidrotic ectodermal dysplasia (HED); he was born without sweat glands. Without perspiration to cool him, Tanu risks heat exhaustion in hot weather or during any type of vigorous activity. When ill, a fever could be fatal. The child's father, who had heard about the space-age suit, called NASA and was, in turn, put into contact with the HED Foundation.

Henry was in India to attend the International Astrophysical Federation conference in Bangalore. A HED Foundation board member, Henry made arrangements to travel to New Delhi, meet the Arora family and make the presentation before returning to Langley.

"The suit originated in a NASA program that produced a channeled cooling suit for astronauts, Henry said. "The key to the garment is a cooling hat and vest, which absorb heat from the torso and head, where most body heat is given off." The system is designed to eliminate 40-60 percent of a person's stored body heat while lowering the heart rate by 50-80 beats per minute.



H. Keith Henry, public affairs specialist, (right) explains the workings of the "cooling suit" to J.P.S. Arora (left) and his four-year- old son Tanu. The outfit, a helmet liner and vest, is cooled by a portable battery-powered refrigeration unit and will allow the child, afflicted with HED, to live a more normal life.

The HED Foundation was established last year in Hampton by Sara Moody who was successful in obtaining such a suit for her nephew, after calling John Samos and Thayer Sheets of Langley's Technology Utilization Office. Henry said the HED Foundation's work is a good example of how space technology can be applied on earth to help people live happier, healthier lives.

The suit, manufactured by Life Support Systems, Inc., Mountain View, California, was the fifth to be presented by the Foundation. "The invention of the cooling suit has boosted our morale," said Tanu's father. "We are confident that Tanu's life will now be more normal."

DIRECTIVES NO.	TITLE	DATE	T.S.#	DATE DISTR.
Revised				
LMI 5000.4	"Unsolicited Proposals for Scientific and Technological Research—Grants, Cooperative Agreements and Contracts"	9-6-88	1616	9-19-88
LMI 5300.1	"Systems Safety, Quality and Reliability Program"	9-6-88	1617	9-19-88
LMI 3792.1	"NASA Employees Assistance Program"	9-6-88	1618	9-19-88
LMI 1815.1	"Handling of Narcotics and Other Drugs"	9-6-88	1619	9-19-88
LMI 1700.2	Attachment D, "Safety Assignments"	9-6-88	1620	9-19-88
LMI 2700.2	"Historical and Artifacts Program"	9-6-88	1621	9-19-88
New				
LMI 1700.8	"Parking Regulations"	10-5-88	1622	10-19-88

A TWO-YEAR PRE-SUPERVISORY/MANAGEMENT TRAINING PROGRAM is offered by Thomas Nelson Community College at Langley after hours. This series of courses is of interest primarily to employees who aspire to become supervisors or who wish to acquire supervisory skills while earning college credit. Those recognized at the completion ceremony held September 7 are (L to R) Effie L. Nicosia, Alberta W. Reid, Phyllis E. Jones, Peggy H. Langford, Jospeh R. Phillips, Patricia L. Hosey, Donna M. Speller, and Angela M. Davis. Not pictured is Denna B. Zacharias. For further information about the program contact Louise Hamilton, ext. 2611.

Health Corner

Breast Cancer Screening Offered

Breast cancer will strike one in ten women during their lifetime. It is one of the leading causes of death in women.

The best way to detect breast cancer early is through a procedure called screening mammography. The American Cancer Society recommends that every woman have a mammogram at least once after age 35, every one to two years between the ages of 40 and 50, and annually after 50.

A mobile mammography unit will be on Center, in the Langley clinic parking lot, from 7 a.m. to 5 p.m., November 29 and 30 and December 1 and 2. The mammogram and breast self-exam training take approximately 15 minutes and are open to NASA employees, contractors and families. Cost is $39 and payment may be made by cash, check or VISA/MasterCard.

Call 865-2605 to make an appointment.

Contractor News

J.L. Associates, Inc., has recognized Bernard "Ski" Rutkoski as employee of the month for September. Rutkoski was nominated by Patricia Gates, manager of the H.J.E. Reid Conference Center, for "his enthusiastic 'can do' attitude and conscientious devotion to conference activities." Karen A. Hall, J. L. Associates Vice President of Administration, (center left) presents the award to Rutkoski (center, right) as Gates (right) and Richard E. Mackin, contract manager, look on.

Harvey's Janitorial Service, Inc., recognizes employee teams who have excelled on their Facility Evaluation Reports. The award committee convened on October 4 and selected Crew #7 for the Crew of the Month for September. This crew obtained a perfect score of 95 points. Crew members are (L to R) Barbara Herbert, Walter Briscoe, Josie Knight, Selina Lynch and Christine Redcross.

Call for Nominations

Nominations are being sought for the NASA Professional Development Program (PDP).

This program gives individuals an opportunity to have a 12-month work assignment at NASA Headquarters or other NASA installations.

The PDP has two levels within the program. Level 1 is for employees at GS/GM-15 and Senior Executive Status (SES) levels. Level 2 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 have demonstrated the potential to manage and lead the agency in the future.

The Langley Executive Resources Panel, chaired by Paul F. Holloway, will select Langley's nominees in early January. If you are interested, call the Training and Education Section, ext. 2611, for a nomination form. Inform your directorate-level training coordinator as soon as you decide to complete the form. The nomination deadline for directorate offices is mid-December.

People & Places

Speakers Bureau

Members of the Langley Speakers Bureau present the NASA story to groups and organizations throughout the community and the five-state region Langley serves. Recent presentations include:

Robert A. Kilgore spoke on The Humanities in an Age of Technology at Virginia Wesleyan College, September 13.

R. R. "Skip" Nunamaker and **Joseph Talbot** spoke on the Cultural Impact of the Space Program at Randolph Macon College, September 15.

Lenwood Clark gave presentations on Space Station to three astronomy clubs at Guilford Technical Community College, Jamestown, NC, September 16; to the American Society of Heating, Refrigerating and Air Conditioning Engineers, September 30; for the Roanoke College Convocation Series, October 13; and to the Peninsula Chapter, Society of Logistics Engineering, LAFB, October 20.

Delma Freeman spoke on Future Space Transportation to the National Defense Transportation Association, September 20.

Irwin Schauer gave presentations on NASA Careers at the Eighth Annual Hispanic Engineering Organization Science and Engineering Career Fair, September 28, and at the University of New Mexico, September 29.

Joel Levine discussed Ozone, Climate and Global Atmospheric Change at the Science Museum of Virginia, September 30.

Vickie Connors gave a presentation on Weather Instruments on the Ground, in the Air and from Space at Achilles Elementary School, October 7, and spoke on Satellite Meteorology at Poquoson Elementary School on October 12.

Tom Bastian and **Lindy Perkes** gave a presentation on NASA Educational Programs at the Virginia Beach Friends School, October 7, and **Perkes** spoke on NASA Educational Programs and Future Directions at Christopher Newport College, October 10.

Peter Coen presented a Transport Overview to the Delta Nu Alpha Transportation Fraternity, October 11.

Lester Rose spoke on Spinoffs from Aerospace Technology to the Central Virginia Section of the American Society of Mechanical Engineers, October 11.

Roger Breckenridge gave presentations on Space Station to the Methodist Men's Club, Morrison Methodist Church, October 12, and to the Armed Forces Communications and Electronics Association, October 28.

Cynthia Lach gave a presentation on the Shuttle O-Ring Project to the Hampton Roads Chapter of the American Society for Mechanical Engineers, October 13.

Bruce Fisher spoke on NASA Storm Hazards and Lightning Research to the Richmond Section, IEEE, October 13, and to the Samual Langley Flight of the Order of Daedalians, October 20.

Frank Quinto gave a presentation on NASA and Space Camp for Crossroads Recreation, Norfolk.

Lance Bush spoke on the NASA Space Program to the Chesapeake Kiwanis Club, October 26.

Many thanks to these Langley employees who give so generously of their time and talents.

NASA Researcher Dies

Ira H. Abbott, a renowned NASA Langley employee who rose from junior engineer to become assistant division chief in 1945, died Thursday, November 3, in James River Convalescent Center.

Abbott retired from NASA in 1962 as director of advanced research and technology, ending a 32-year career with the agency. He had worked at Langley from 1929 to 1947.

During his years at Langley, he was known for his work in aerodynamics research.

In 1947, Abbott was transferred to the National Advisory Committee for Aeronautics headquarters in Washington, D.C., as assistant director of research for aerodynamics. He was internationally known for his aerodynamic research, and he supervised projects such as the X-15 research plane, the nuclear rocket and advanced re-entry programs.

From Behind the Scenes

Advanced Technology to Fly With Pilots of the Future

New concepts for aircraft controls and displays are tested in the NASA transport systems research vehicle (TRSV) simulator. Information displayed on the bottom screen (left of pilot's hand) and projected onto a simulated out-the-window runway scene as a heads-up display are part of a new invention called the takeoff performance monitoring system (TOPMS). This award-winning invention may one day help airline pilots take off and land more safely.

The TRSV simulator is one of several facilities that are used at Langley for the development of automated piloting aids. The aids complement evolving ground-based air traffic control (ATC) concepts for improved safety, communications and traffic flow.

Senior Management Research Review

The Senior Management Research Review will be held Monday, November 21, from 9 to 11 a.m., in Building 1219, Room 225. Following the Director's comments and program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENTS	SPEAKER
9:30	Hypersonic Flow-Field Technology Enhancement	Vincent Zoby (Space/SSD)
9:45	Requirements Determined for Flying Complex Paths with the Microwave Landing System Using Electronic Flight Displays and an Advanced Flight Control System	Charles Knox (Flight Systems/FLMD)
10:00	Control Mode Panel Logic	Richard Hueschen (Flight Systems/GCD)
10:15	A Thermal Analysis Method for Preliminary Design of High-Speed Aircraft	Christopher Domack (Aeronautics/Kentron)
10:30	Wind Tunnel and Radio-Controlled Flight-Test Investigation of the U.S. Marine Corps Exdrone Remotely Piloted Vehicle (RPV) Configuration	Long Yip (Aeronautics/LSAD)
10:45	Passive Blade Twist Control Improves Performance of Tilt-Rotor Vehicle	Mark Nixon (Structures/LAD)

Happenings

LAA ANNUAL CHILDREN'S CHRISTMAS PARTY will be held December 18, from 2 to 4 p.m. in the Activities Center. A short Christmas tape will be shown, refreshments will be available and Santa will have gift stockings for all children. Admission is $2 for children only. Mark your calendar.

BLOODMOBILE. The American Red Cross will sponsor a Bloodmobile Wednesday, November 23, from 9 a.m. to 3 p.m. in the Activities Center. Blood is the gift of life. Please give this gift of self during the holiday season.

YOGA CLASS. Interested in joining a beginning level yoga class for improving relaxation, flexibility and strength? Attend an organizational meeting at 4:45 p.m., Wednesday, December 7, in Building 1202, Room 215. Call Karen Looney, ext. 3777, for additional details.

CLUB MEMBERSHIP. Those interested in renewing their Breezy Point Officers' Club cards, contact Al Shearin, Mail Stop 222B, ext. 3701 by close of business December 5.

FEDERAL ALMANAC. Orders are now being taken for Federal Almanacs. Cost is $4.15. Call Frankie Ward, ext. 3139, before December 31.

COIN COLLECTORS: Virginia Peninsula Coin Club will meet Monday, November 21, 7:30 p.m., War Memorial Museum, Warwick Boulevard, Newport News. Coin auction. Call 865-0595 after 5 p.m. for more information.

VA CHORAL SOCIETY opens the season with "Masterpieces in Miniature." Performances will be this evening at Ogden Hall, Hampton University, and Saturday, Nov. 19, at Warwick High School, Newport News. Performances begin at 8 p.m. Admission is $4; senior citizen, student and military admission is $2. For details, call 591-0439 or 423-1701.

TOASTMASTERS. NASA Langley Toastmasters will meet Wednesday, November 23, 11:30 a.m.—1 p.m. in the Activities Center, Building 1222. Co- ops, contractors, military, retirees are welcome. Call Natalie Shrader, ext. 3483, for further information.

CHRISTMAS CONCERT presented by the Tactical Air Command Band will be held at 7 p.m., Tuesday, December 6, in Chapel One LAFB. Free admission by ticket. For tickets, send stamped, self-addressed envelope to TAC Band, Publicity, Langley AFB, VA.

GRAND ILLUMINATION. Colonial Williamsburg's annual celebration of the opening of the holiday season will take place at 5:30 p.m., December 4, at the Capitol, Magazine and Governor's Palace. A military tattoo at 5:15 precedes the illumination.

COLONIAL WILLIAMSBURG has declared November Military Month and are saluting members of the Armed Forces, civil service employees, their families and supporting personnel. Military Month coupons, reflecting a 25 percent savings, are available at the LAA Office, Building 12222, ext. 3139.

HELP. Anyone who has a projection screen signed out, please call Ken Dreyer, ext. 2058.

BASKETBALL GAME. See VPI/ODU play at Scope on Saturday, December 10. Tickets are $7 from Peninsula Chapter, VPI Alumni. Proceeds benefit the Peninsula Chapter Academic Scholarship fund. Order from Joe Drewery, ext. 4933.

REMINDER. The H.J.E. Reid Auditorium will be closed from November 25 to December 11 for rennovations. Other rooms in the Activities Center will be available as usual.

Correction

The following obituary notice was incorrectly printed in the last issue. Apologies to the Carmines family.

In Memoriam

Sympathy is extended to the family of **Thomas Carmines**, who died October 10. Carmines retired in 1986 after 33 years of service to NASA.

WANTED: CARPOOL. Would like to join or start a carpool to and from Smithfield. Call Mark Hutchinson, ext. 3234.

NEEDED: ROOMMATE. Couple seeks to share 2 BR Condo at Mariner's Pt. in Hampton. Private bath, all appliances and furniture except BR. $325/mo. + 1/3 utilities. Call Scott at 865-3116 (days) or 827-0205 (evenings).

WANTED ROOMMATE to share large 3 BR, 2-story brick home in Hampton. Convenient to NASA/LAFB. $250/mo. + 1/2 utilities. Call 728-9343 after 6 p.m.

FOR SALE: WHEELCHAIRS. Two wheelchairs, excellent condition. $100 each, price negotiable. Call 898-5113 after 5 p.m.

FOR RENT: TOWNHOUSE in York Co. 2 BR, 1 1/2 BA, country kit/fpl. All appliances, $550/mo. neg. Available now. Call 898-5113.

Note Deadline Change

Due to the Thanksgiving holiday, the deadline for the December 2 issue of the **Researcher News** will be Friday, November 18. Items to be published December 2 must be submitted to the editor, Mail Stop 115, by noon on November 18.

BULK RATE
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Langley Research Center
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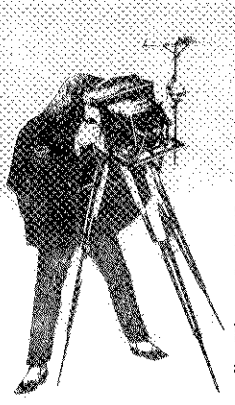
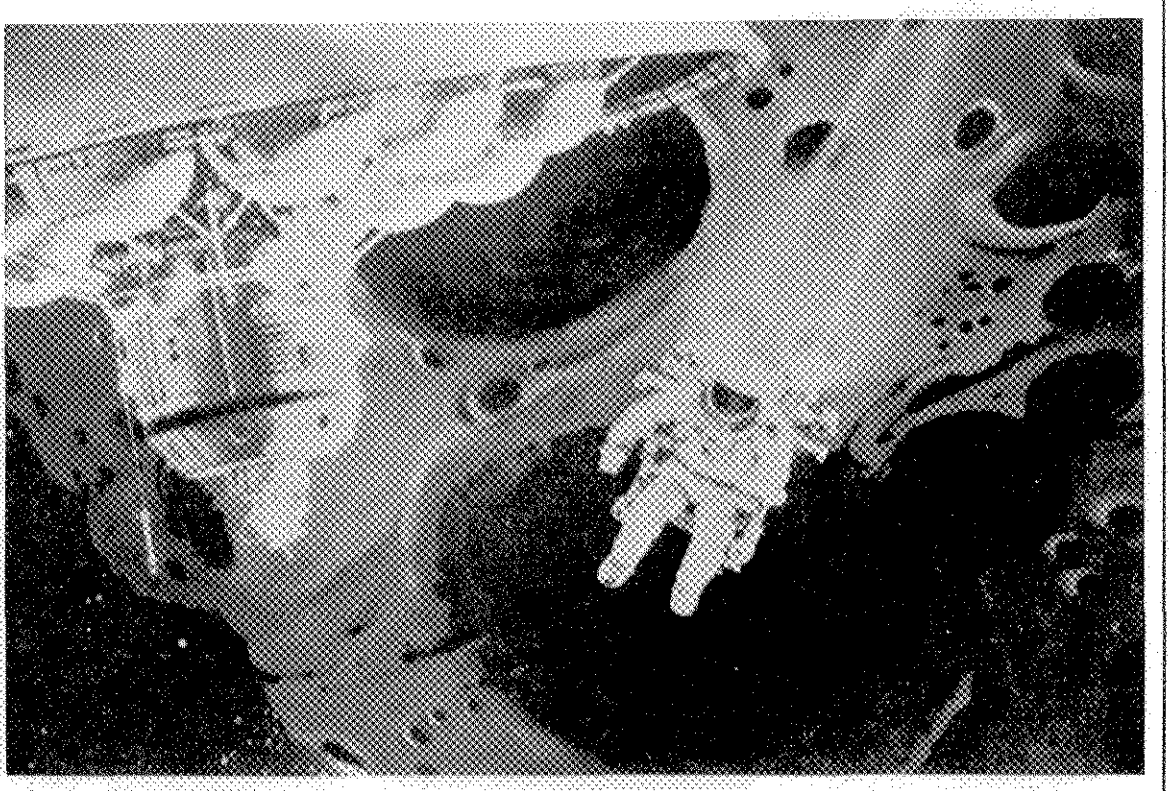
Researcher News



Attention: Shutterbugs

Help us capture the spirit of the holiday season. Traditionally, the year-end issue of the **Researcher News** carries a holiday message from senior management and a photograph conveying to our readers a holiday greeting or best wishes for a joyful New Year. Submit a candidate photo, ideally a 5 x 7 or 8 x 10-inch black and white or good quality color photo, and fill the space below for the December 16 issue of the **Researcher News**. Please direct your submissions to the Editor, Mail Stop 115, by December 5.



EXPLORING THE ASTEROIDS, by space artist Robert McCall, is one of the over 25 paintings on display at the Visitor Center through December 31. The exhibit, "A Vision of the Future," spans the past 17 years of McCall's career. Referred to by science writer Isaac Asimov as "the nearest thing to an artist in residence from outer space," McCall has chronicled American space flight from Project Mercury to the Space Shuttle. Admission to the Visitor Center and the McCall exhibit is free of charge. The Center is open Monday through Saturday, from 8 a.m. to 4:30 p.m., and Sunday, noon to 4:30 p.m., except Thanksgiving and Christmas.

NASA
National Aeronautics and Space Administration
Langley Research Center

Researcher News

Volume 2, Issue 24 December 2, 1988
Bi-weekly Employee and Contractor Publication

Yu Appointed Assistant Chief, Acoustics Division

Dr. James C. Yu of Williamsburg has been appointed assistant chief of the Acoustics Division.

In this position, Yu is responsible for assisting and supporting the division chief in managing the division in order to achieve its 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 rotor aircraft; quantifying subjective response to aircraft noise; and reducing and controlling the noise received by passengers and crew inside flight vehicles.

Yu began his NASA career in 1977 as an aerospace technologist in the Acoustics Division. He was promoted within the division, first serving as a group leader and then assistant branch head. From 1986 to 1987, he was the program manager, Materials and Structures Division at NASA Headquarters, Washington, D.C. Upon his return to Langley, he served as the technical assistant to the director for Structures, where he assisted in planning, implementing, coordinating, directing and managing all materials and structures research programs at the center. He has specialized in aeroacoustics, turbulence flow, measurement techniques, fluid dynamics and gas dynamics.

A native of China, Yu received a bachelor of science degree in mechanical engineering from National Taiwan University in 1962. He received a master of science degree in aerospace engineering and a doctorate in mechanical engineering from Syracuse University in 1986 and 1971, respectively.

The author or co-author of 65 technical publications and presentations, Yu has received two achievement awards for his research in materials and structures. He is an associate fellow of the American Institute of Aeronautics and Astronautics and a member of the Acoustical Society of America.

He and his wife, Lisa, have two daughters.

Hubbard is President-Elect of Acoustical Society

Harvey H. Hubbard has been elected president of the Acoustical Society of America and will succeed the current president, W. Dixon Ward of the University of Minnesota, in 1989.

The Acoustical Society of America was founded in 1929 to increase and diffuse the knowledge of acoustics and promote its practical applications. The Society also participates in the production of acoustical standards with the American National Standards Institute.

Hubbard has been involved throughout his career in research on the generation, propagation and control of aircraft noise and sonic booms, and their effects on structures and people. He also has shared responsibility for the conceptual design of a number of research facilities, including Langley's Aircraft Noise Reduction Laboratory.

Hubbard was head of Langley's basic research in atmospheric acoustics for the National Advisory Committee for Aeronautics (NACA) from 1945 to 1959 and head of basic research in acoustics for NASA from 1959 to 1973. From 1973 to 1980 he was assistant chief of the Acoustics and Noise Reduction Division. He currently works as a consultant for Planning Research Corporation in Hampton.

-photo by Paul Bagby

ASTRONAUTS PAY SPECIAL TRIBUTE TO MANNED SPACE FLIGHT EFFORTS Posed with STS-26 Commander Frederick Hauck are Silver Snoopy Award winners (L to R) Laurence J. Bement, Helen Scallion accepting for her husband William I. Scallion; Mary Jo Dorsey accepting for her brother John T. Dorsey, Mickey R. Gardner, Hauck, David H. Butler, Joseph S. Heyman, Bernard Spencer Jr. and George M. Ware. The silver pins were flown aboard Discovery, STS-26.

STS-26 Commander Hauck Presents Silver Snoopy Awards to Langley Employees

Eight Langley employees received the coveted Silver Snoopy Award from Astronaut Frederick "Rick" Hauck, commander of STS-26. Hauck visited Langley November 10 to brief employees on the flight of Discovery, the near-perfect mission that launched NASA's return to space flight.

Those honored were Laurence J. Bement, David H. Butler and Mickey R. Gardner, Systems Engineering and Operations; William I. Scallion, Bernard Spencer, Jr. and George M. Ware, Space; John T. Dorsey, Structures; and Joseph S. Heyman, Electronics Directorate.

The Silver Snoopy Award is a replica of Snoopy in space garb; the silver pin and certificate are presented personally by an astronaut for outstanding performance in support of manned space flight activities. The Snoopy Award is the astronaut's personal award to members of the NASA government/industry team.

Laurence J. Bement, aerospace technologist in the Systems Development Branch, was selected "for contributions in the field of pyrotechnic technology on Shuttle payloads and inflight escape systems."

Bement, Langley's pyrotechnic support engineer, is responsible for explosive safety in all Langley applications. Following the Challenger accident, Bement co-managed a Shuttle seated extraction feasibility study with astronaut Steve Nagel. He has also managed a failure investigation on the spacecraft separation joint planned for use on the Shuttle/Centaur, Inertial Upper Stage and Galileo spacecraft. The results of the investigation were accepted and immediately incorporated into flight hardware.

David H. Butler, aerospace engineering technician, Spacecraft Systems Section, was cited "for exceptional service in the engineering management of the Shuttle SRB-ETA partial ring redesign activity resulting in an improved design for the Shuttle SRB-ETA ring."

A Langley employee for the past 33 years, Butler has provided leadership in organizing and directing a LaRC team of engineers and technicians working closely with Marshall Space Flight Center to solve a major design problem involving bolt failures evident in the existing solid rocket booster-external tank attachment ring. Under Butler's leadership, the problem was solved by developing a tapered ring that provided a uniform bolt loading.

Mickey R. Gardner, engineering technician, Technical Support Section B, was honored "for exemplary dedication and performance in the development of test fixtures and accumulation of data pertinent to the solution of SRB "O" ring seal anomalies."

Immediately following the Challenger tragedy, Gardner was tasked with developing a capability to test O-ring sealing characteristics under varying conditions and in a controlled environment. Gardner designed a quarter-scale model of the 12-foot diameter SRB O-ring configuration which incorporated extensive test parameters. Subsequent test results provided certification data for Marshall Space Flight Center decisions on the SRB redesign. This two-year effort contributed significantly to the improved design and mission success of the Shuttle vehicle.

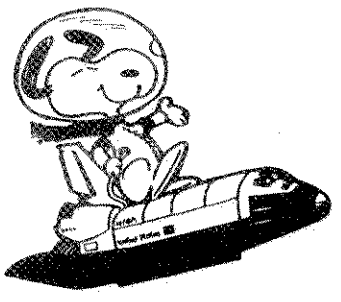
William I. Scallion, senior aerospace research engineer, Experimental Aerodynamics Branch, was selected "for outstanding contribution to the aerodynamic design and development of Space Shuttle and analysis of its flight data."

A NASA employee since 1949, Scallion, as a member of the mission simulation team, contributed significantly to Project Mercury, followed by contributions to Project Fire and Project Voyager. As head of the Applied Aerodynamics Section, he led a variety of studies directed at the aerodynamic design and development of the Space Shuttle. He was the center's representative to the Space Shuttle Engineering Coordination Panel for aerothermal test, aerodynamic performance and integrated entry.

Bernard Spencer Jr., senior aerospace research engineer, Experimental Aerodynamics Branch, was honored "for sustained superior performance in the development and assessment of aerodynamic characteristics for Space Shuttle concepts, leading to the selected configuration."

A NASA employee since 1956, Spencer was at the forefront of the development of the aerodynamic lines for the Space Shuttle vehicle. He performed a study that

(Continued on page 3.)



News Briefs

KENNEDY SPACE CENTER, Fla. — The Magellan Electrical Mishap Investigation Board appointed by the associate administrator for Space Science and Applications, NASA Headquarters, has released its findings, recommendations and observations. The board was convened to determine the cause of a localized electrical fire in a test battery aboard the Magellan spacecraft the night of October 17 and to make recommendations to preclude a recurrence on this and future spacecraft.

WALLOPS FLIGHT FACILITY, Wallops Island, Va. — Two NASA heavy-lift balloons are scheduled to be launched from Australia this month to continue scientific studies of Supernova 1987A, marking the fifth Supernova campaign conducted in the past two years. A 28.4 million cubic foot balloon is scheduled to carry a scientific experiment, weighing 1,100 pounds, to measure gamma-ray and hard X-ray emissions. A 29.47 million cubic foot balloon is also scheduled to carry a scientific experiment, weighing 3,700 pounds, that will measure gamma-ray emissions, but over a different energy band.

JOHNSON SPACE CENTER, Houston, Texas — Col. Karol J. "Bo" Bobko, USAF, has announced plans to retire from NASA and the U.S. Air Force on January 1, 1989 after a career which includes three Space Shuttle missions. Bobko will be joining the Space Systems Division of Booz, Allen & Hamilton, Inc., and will direct their activities in the Houston area with initial emphasis on Space Station program support.

KENNEDY SPACE CENTER, Fla. — An agreement, designed to enhance the efficiency of Space Shuttle logistics operations by consolidating them at the Florida launch site, has been negotiated with Rockwell International Corporation's Space Transportation Systems Division. KSC has awarded a cost-plus-fixed-fee/award fee contract extension for $419,187,597 to the Rockwell division. The contract covers the 3-year period beginning Oct. 1, 1988.

HEADQUARTERS, Washington, D.C. — NASA Administrator James C. Fletcher has announced that Dr. Franklin D. Martin has been named assistant administrator for the Office of Exploration. John Aaron, who has been acting in that capacity since the office was created in August 1987, is returning to the Johnson Space Center as a special assistant to the center director. The Office of Exploration is responsible for coordinating agency planning activities that expand exploration and the human presence beyond Earth, particularly the Moon and Mars.

GODDARD SPACE FLIGHT CENTER, Greenbelt, Md — The Tracking and Data Relay Satellite (TDRS), launched by the Space Shuttle Discovery on Sept. 29, has performed flawlessly on all tests to date and may support the next Space Shuttle mission. Since its launch, TRDS-3 has been moved for testing to 150 degrees west longitude over the Equator. This location is best for communications with the White Sands Ground Terminal in New Mexico, for spacecraft antenna testing, for pre-mission tests and mission support for STS- 27.

HEADQUARTERS, Washington, D.C. — H. Hollister Cantus, associate administrator for external relations, resigned from NASA effective November 19 to return to private industry. Cantus has accepted a position as vice president for government requirements with Lockheed's Missile and Space Systems Group. He will be located in Washington, D.C.

Langley Colloquium

Forbus to Address Automating Human Reasoning

The goal of qualitative physics is to capture the common sense knowledge and techniques people use to reason about the physical world.

At a colloquium Monday, December 12, Professor Ken Forbus of the University of Illinois will address "Qualitative Physics: Automating Human Reasoning About the Physical World." The talk will be held in the H.J.E. Reid Conference Center at 2 p.m., followed by a question and answer session and an informal discussion.

According to Forbus, qualitative physics has important potential applications in robots that work in unconstrained environments and in intelligent computer-aided engineering systems which incorporate the implied knowledge of engineers and scientists as well as quantitative knowledge. In his lecture, Forbus will provide an overview of qualitative physics, and describe how qualitative physics can be used in simulation, measurement interpretation, planning, spatial reasoning and learning.

Forbus is the founder and head of the Qualitative Reasoning Group at the University of Illinois and the creator of the qualitative process theory, a major contribution to qualitative physics. He received a Presidential Young Investigator Award in honor of his research and was chosen to give a Survey of Qualitative Physics at the 1986 National Conference on Artificial Intelligence.

Lankley

Attention, please

Address/Telephone Number Change Notice, NASA Langley Form 39, has been revised to assist employees in advising off-center business associates of your new telephone number, assigned because of the telephone system conversion.

The revised form is avaiable from **Stock**. Secretaries are requested to order these forms for members of their organizations to reduce the number of individual requests.

Editorials

Langley

Headquarters Forum

The FAA has asked NASA to help in the development of advanced technologies needed for commercial introduction. A few small challenges remain: acceptable noise levels from the huge, 40-45 feet diameter propellers located on each wing tip; a lightweight, pressurized composite fuselage; and aeroelastically stable and aerodynamically efficient forward-swept wings.

Tilt-rotors are not new to Langley. Aeroelastic analysis and scale-model tests in Langley's Transonic Dynamics Tunnel were performed in 1984-85 for the V-22. Langley's aeroelastic analysis for tilt-rotors, PASTA, came from an idea in earlier tilt-rotor work of 1969-73. Langley's acousticians have completed flight noise measurements with the XV-15. A Langley team is planning our part of the Tilt-Rotor Technology program with the FAA. Most of the research is expected to start in 1990.

C. P. Blankenship
Director for Structures

An idea originating in the late 1930s may find broad application in the 1990s. This idea, an aeroplane with the vertical lift of a helicopter and forward flight like a normal aircraft, has patiently awaited the evolution of technology and a mission.

Early prototype aircraft, such as the XV-3, provided encouraging results in 1955 flight tests. Research on this unusual concept continued with an abundance of new ideas. Interest and research support has had an up and down profile characteristic of the Allegheny area of western Virginia.

Conversion from vertical-to-forward flight and dynamic stability to speeds of 300 kn was finally demonstrated in 1979 with the NASA-Ames/Army XV- 15. Testing and tinkering continued and resolved many technical barriers.

Either the timing was right or serendipity was at work. In 1981, the Navy defined a mission need for such an aircraft—designated a Tilt-Rotor. History was made with the initiation of the V-22 or "Osprey" program. Roll-out of the first V-22 occurred in May 1988. Flight tests are planned to start later this year.

Many of us are too familiar with the congested air space of commercial flight. A commuter/transport version of the V-22 could help unclog this system. Congress has directed the FAA to develop a plan to introduce a commercial tilt-rotor—a new transportation system with Verti-Ports, targeted for 1995.

Launch Advisory

STS-27 Set for December Launch

Following completion of the two-day STS-27 flight readiness review at Kennedy Space Center, NASA officials set December 1 as the launch date for the next Space Shuttle flight.

Rear Admiral Richard H. Truly, NASA associate administrator for space flight, said, "I've just finished hearing comprehensive assessments of flight readiness from both government and contractor representatives of all Shuttle elements and systems. I am pleased to report that the Space Shuttle Atlantis is as ready to fly as Discovery was at this same point before the STS-26 mission last September."

STS-27 crew members are Robert L. Gibson (Cdr., USN), commander; Guy S. Gardner (Lt. Col., USAF), pilot; and mission specialists Richard M. Mullane (Col., USAF), Jerry L. Ross (Lt. Col., USAF) and William M. Shepherd, (Cdr., USN).

News Researcher

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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

Snoopy Awardees

(Continued from page 1.)

demonstrated proper tailoring of wing planforms that linearized subsonic lift and provided the trim at hypersonic speeds. Results of these studies provided the concept which was incorporated into the Shuttle orbiter design. Spencer is recognized as one of the leading aerodynamic stability and control experts in the country.

George M. Ware, senior aerospace research engineer, Experimental Aerodynamics Branch, was cited "for exceptional performance in planning, implementing and executing research programs to evaluate and improve Space Shuttle aerodynamic characteristics."

Ware has been active in the development of the Shuttle from its beginning in 1970. He has served on aerodynamic advisory panels and has conducted wind tunnel tests across the speed range, testing in every major wind tunnel at Langley and many across the nation. He was on the committee to verify and confirm the Shuttle Aerodynamic Design Data Book before first flight. Since then, he has continued investigations to improve the Shuttle system. His studies include the examination and resolution of discrepancies between flight and wind tunnel tests and the feasibility of crew bailout. Ware is currently assessing the characteristics of potential configurations for advanced space transportation systems.

John T. Dorsey, aerospace engineer, Structural Concepts Branch, was honored "for analysis and design efforts in support of an alternate field joint for the Shuttle solid rocket motors."

Dorsey was a major contributor to the development of a new bolted field joint for the Shuttle solid rocket motors. This concept provided a viable option to the field joint which leaked and caused the Challenger accident. Dorsey also contributed to the development of the tapered end joint for the external tank attachment ring which had experienced failures. This modified attachment ring is currently undergoing certification as part of a weight reduction program to improve Shuttle performance.

Dr. Joseph S. Heyman, head of the Nondestructive Measurement Science Branch, was cited "for innovative advances in NDE (nondestructive evaluation) that permitted informed return-to- flight decisions for STS-26 with improved system reliability and safety through NDE science modeling, instrumentation development/verification, and technology transfer to Morton Thiokol, Inc., for tests on solid rocket motor propellant/liner/insulation bonds, clevis insulation bonds and nozzle bolt tension."

Heyman, responding to requests from Marshall Space Flight Center and NASA Headquarters, assembled a scientific team to develop computational models for both acoustic and thermal energy inspection of the Shuttle solid rocket motors. His work resulted in new instrumentation and analysis that is now being used on Shuttle, providing more quantitative, higher resolution NDE data for critical flight decisions.

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.

Harvey's Janitorial Service, Inc., recognizes employee teams who have excelled on their Facility Evaluation Reports. The award committee convened on November 1 and selected Crew #6 for the Crew of the Month for October. This crew obtained a score of 94.4 out of a possible 95 points. They also received a letter of commendation for the excellent manner in which they maintain all areas of Building 1201. Crew members are (L to R) Alberta Austin, Sun Kitrel, William Clinton, Lula McClinton and Allie James.

Acquisition Holds 50th Anniversary Reunion

The Acquisition Division held a 50th anniversary reunion August 26 at the Activities Association picnic grounds. The division, formerly the Procurement Division, had invited all known retirees and other former members to attend.

Approximately 120 current and former members attended. This number included the three former Procurement chiefs and division heads—Sherwood L. Bulter, Frank V. Moore, and Robert R. Moore—and current procurement officer and Acquisition chief William R. Kivett. Other former managers attending were John Munick, associate procurement officer; Ronald Krodel, assistant to the chief, and William Hutcheson, head, Purchase Branch.

In addition, the following former members attended: Brenda Spencer, Charlie Crowder, Howard Puckett, Don Avery, Don Carson, Parri Engelsen, Joe Donahue, Willie Taylor, Jack Campbell, Ed Hodges, Frank Kawalkiewicz and Leon Blount.

Also, Walter Laughan, Betty Brendel, Hugh Mahanes, Fabiola Martin, Jack Gaines, Stan Rau, Gordon Degear, Terry White, Chuck Lord, Claude Burge, Sue Woolridge, Wilbur Gaskins, Tom Craigs, Charlie Lane, Martin Trusty, Rosemary Swindell, Carol DeRouren and Merci Hobbs.

A highlight of the event was the crowning of the king and Queen of Acquisition. These honors went to Pat Turgeon, currently of the Acquisition Division, who was crowned Queen and retiree Charlie Crowder, King.

ACQUISITION KING AND QUEEN. Pat Turgeon (left) and retiree Charlie Crowder were crowned King and Queen at the 50th Anniversary reunion of the Acquisition Division held recently.

DECISION MAKING

The Management Video Conference entitled "Decision Making" will be broadcast on Wednesday, Dec. 14, from 3 to 5 p.m. The telecast will be received in Building 1194-A, Room 203/204.

This program, featuring Peter Tobia of Kepner-Tregoe Inc., will distinguish between problem solving, decision making, and planning; present a rational decision-making process; identify uses of the process; and identify common pitfalls. A short case study, which will be used in the program, will be available upon registration and should be read prior to the program.

Please notify your training coordinator if you would like to attend.

Graphics Section Policy Change

In order to provide the best quality visuals, Graphics has had to eliminate some of the personal services provided in the past.

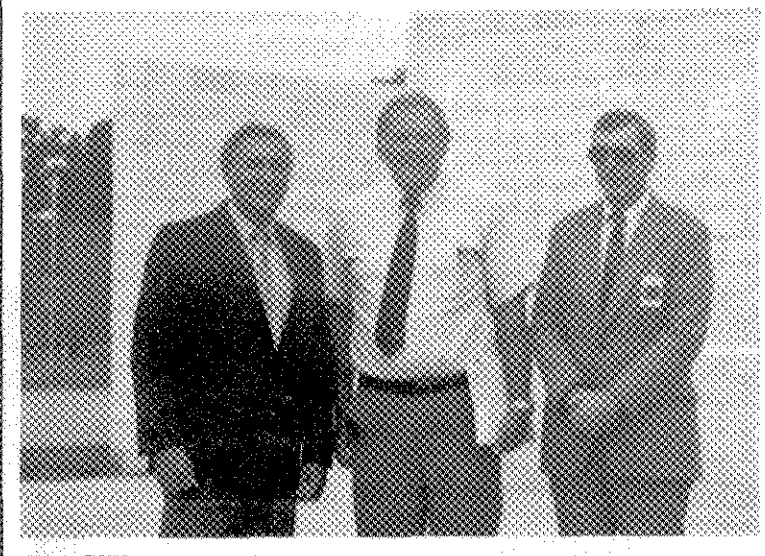
For information on new Graphics Section policies, please contact Charles "Skip" Watson, ext. 3344.

Club News

Runners Club Races

Langley Runners Club will hold the Interdirectorate 5 km road race Thursday, Dec. 8, starting at 4:45 p.m. on Doolittle Road. Teams shall consist of four or more runners from each directorate or contractor. Team scores will be the sum of the top four finish positions of each team with the low score winning.

There will also be a women's division, with each team consisting of two or more women. Contractors without a team may run with the directorate to which they are assigned. For more information, call Richard Shearer, ext 4508.



TENNIS BACKBOARD FACILITY READY. Inspecting the tennis backboard are (L to R) George Palko, Activities Association Building, Grounds, and Safety Committee chairman; Tom Yager, LaRC Tennis Club president; and Dick Layman, Langley Exchange Council treasurer. With funding from the Exchange Council, help from Dick Rountree and John Wilson, FENGD, and approval from the Activities Association, the facility, underway for two years, became playable in September. Plans to complete the concrete pad on the other side of the cinderblock wall await available funds.

Souvenir Counter Christmas Shop in Cafeteria December 5-16.

Happenings

CHRISTMAS IS FOR KIDS. The LAA Annual Children's Christmas Party will be held December 18, from 2 to 4 p.m. in the Activities Center. Santa will have a gift stocking for all children. Admission is $2, for children only.

LAA OPEN HOUSE. Share snacks and a cup of punch, December 22, 1 to 3 p.m. in the Activities Center. No charge, just a lot of camaraderie.

NEW YEAR'S EVE Dance and breakfast sponsored by the LAA. Set-ups, party favors provided. BYOB. 9p.m. to 1 a.m. $35/couple.

LAA BOARD. The Langley Activities Association Board of Directors will meet on Tuesday, December 13, at 7:30 a.m. in the Activities Center.

ALUMNI ASSN. LUNCHEON for members, prospective members and spouses, December 15, at Sammy and Nick's, West Mercury Blvd. Call Don Ward, 838-1063, Howard Evans, 868-6858, or Bill Boyer, 722-0443, by December 11 for reservations.

FEDERAL ALMANAC. Orders are now being taken for Federal Almanacs. Cost is $4.15. Call Frankie Ward, ext. 3139, before Dec. 31.

TOASTMASTERS. The NASA Langley Toastmasters will meet Wednesday, Dec. 14, 11:30 a.m. to 1 p.m., in the Hampton Room, Activities Center. All those seeking to improve their communications skills are welcome. Call Natalie Shrader, ext. 3483, for information.

BASKETBALL GAME. See VPI/ODU play at Scope on Saturday, December 10. Tickets are $7 from Peninsula Chapter, VPI Alumni. Proceeds benefit the Peninsula Chapter Academic Scholarship fund. Order from Joe Drewery, ext. 4933.

HELP: If anyone knows the whereabouts of a Konica 35 mm camera, model number FS-1, ICN 472512, please call Sal at the Photo Lab, ext 3521.

REMINDER: The H.J.E.Reid Conference Center will be closed from November 25 through December 11 for rennovations. Other rooms in the Activities Center will be available as usual.

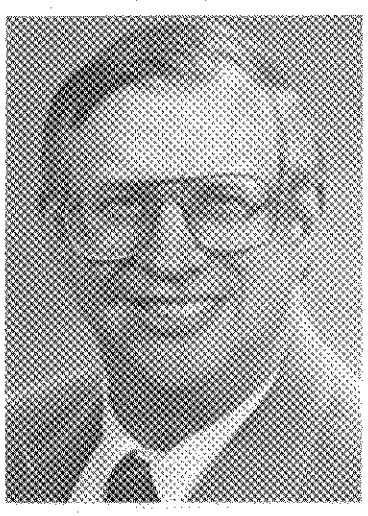
At the VC During December

Tanner Tells Langley Contributions to Shuttle Landing Dynamics

NASA researcher John Tanner will discuss "Space Shuttle: Landing in Safety" on Thursday, December 8, at 7:30 p.m. in the Visitor Center. Tanner will give an in-depth look at Space Shuttle testing done at Langley's Aircraft Landing Dynamics Facility over the past twelve years.

Shuttle tires, which cost about $3,000 each, are tested on a carriage which accelerates from 0 to 250 mph in less than two seconds, using over two million pounds of thrust. Tests conducted at Langley have included defining tire friction and wear characteristics, identifying surface modifications to the runway at the Kennedy Space Center Shuttle Landing Facility, and investigating the dynamics associated with the emergency Shuttle Orbiter Arrestment System.

Tanner, who has 22 years of aircraft landing dynamics experience, is head of the Landing and Impact Dynamics Branch. He has received numerous



NASA awards for his research activities and his support of the Shuttle program.

Robots, Futuristic Workers in Space

Ian MacConochie will discuss "The Space Spider Robot" on Wednesday, December 7, at noon in the Visitor Center theater. This presentation is part of the Winter Guest Lecture Series sponsored by the Visitor Center and the AIAA-Hampton Roads Section Student Branch.

MacConochie will discuss a futuristic space robot that looks like a spider and would be used for the assembly of space stations, space platforms and antennas. The robot could also be used for the transportation of cargo around a space station.

A ten-minute video will show the animations of the spider robot in motion. Animations were done using a scale model. Motions of the robot are also shown using the computer and solid modeling techniques.

MacConochie, an aerospace technologist in the Vehicle Analysis Branch, is principally engaged in the study of space transportation systems including space tugs, space rescue vehicles and advanced shuttles.

-photo by Fred Jones

ENTHUSIASM ABOUNDS IN THIS UNCHARACTERISTICLY DESTRUCTIVE ACT OFFICIALLY OPENING THE NDE LAB. Joining to cut the ribbon at the dedication ceremony of the Nondestructive Evaluation (NDE) facility November 18 were Richard H. Peterson, Langley director; Joseph S. Heyman, head of the Nondestructive Measurement Science Branch; James Ehl, deputy associate administrator, Safety, Reliability, Maintainability, and Quality Assurance, NASA Headquarters; and William D. Mace, director for Electronics. Langley is the lead center for basic research in NDE technology. The new facility enlarges the scope of the work and adds specialized capabilities that make the Langley NDE lab a unique national resource.

Researcher News

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Langley Research Center

Volume 2, Issue 25 December 16, 1988

Bi-weekly Employee and Contractor Publication

News Researcher

"They who wait for the Lord shall renew their strength, they shall mount up with wings like eagles."

It has been a good year for NASA, and 1989 should be even better. Happy holidays and best wishes for the new year to all of the Langley family.

Pete Petersen
Paul Holloway
Sid Pauls

On behalf of the Flight Systems Directorate, I hope each of you has a happy holiday season and a healthy and rewarding new year.

Jerry Creedon

Holiday Greetings to the Langley family from our LaRC Senior management

I want to take this opportunity to send holiday greetings to the families of all of us who work at the NASA Langley Research Center. The practice and support of research are demanding occupations, and we all appreciate the understanding and encouragement we receive from our families. I hope you all have a happy and fulfilling new year.

Dick Barnwell

Seasons greetings! The flight of the Shuttle Atlantis provides a fitting conclusion to a successful year. We look forward to the many research opportunities that make future space vehicles possible, and to the selection of Langley payloads for flights aboard Shuttle, Space Station Freedom and the Earth Observing System. Happy new year.

Ray Hook

I would like to wish all at Langley a joyous holiday season. I hope that each of us takes a few minutes at this busy time of year to think about our blessings and what is really important in our lives.

John Stokes

We have experienced an outstanding year in 1988. The Langley staff can be very proud of their special role in the safe return to flight of the Space Shuttle. Best wishes for a most enjoyable holiday season and a rewarding year in 1989.

Charlie Blankenship

On behalf of the entire external affairs staff, I would like to thank everyone at Langley for your support during the past year. It is impossible for our office to do its job without the full cooperation of the rest of the Center. There is no doubt that the Langley team is the most enthusiastic and supportive in the Agency. Best wishes and Merry Christmas. We look forward to working with you during the new year.

Gary Price

At this time of year it's good to look at what we have accomplished with pride, remember the friends we have with joy, and contemplate the opportunities ahead with thanksgiving. May each one of you know the added blessings of peace and good will throughout the coming year.

Bill Mace

At this Christmas season of 1988, we are truly blessed in so many ways! It has been a great year for NASA and for Langley with many notable achievements, including the return to space of Shuttle. Exciting challenges continue to stimulate our research across a broad array of both aeronautics and space disciplines. And, we have a world basically at peace. But this world will never know true peace until we apply in our hearts and lives the true meaning of Christmas and the principles of "peace on earth, good will toward men." Let's not get so swept up in the holiday that we forget the spirit of the holy day! A very Merry Christmas.

Bob Swain

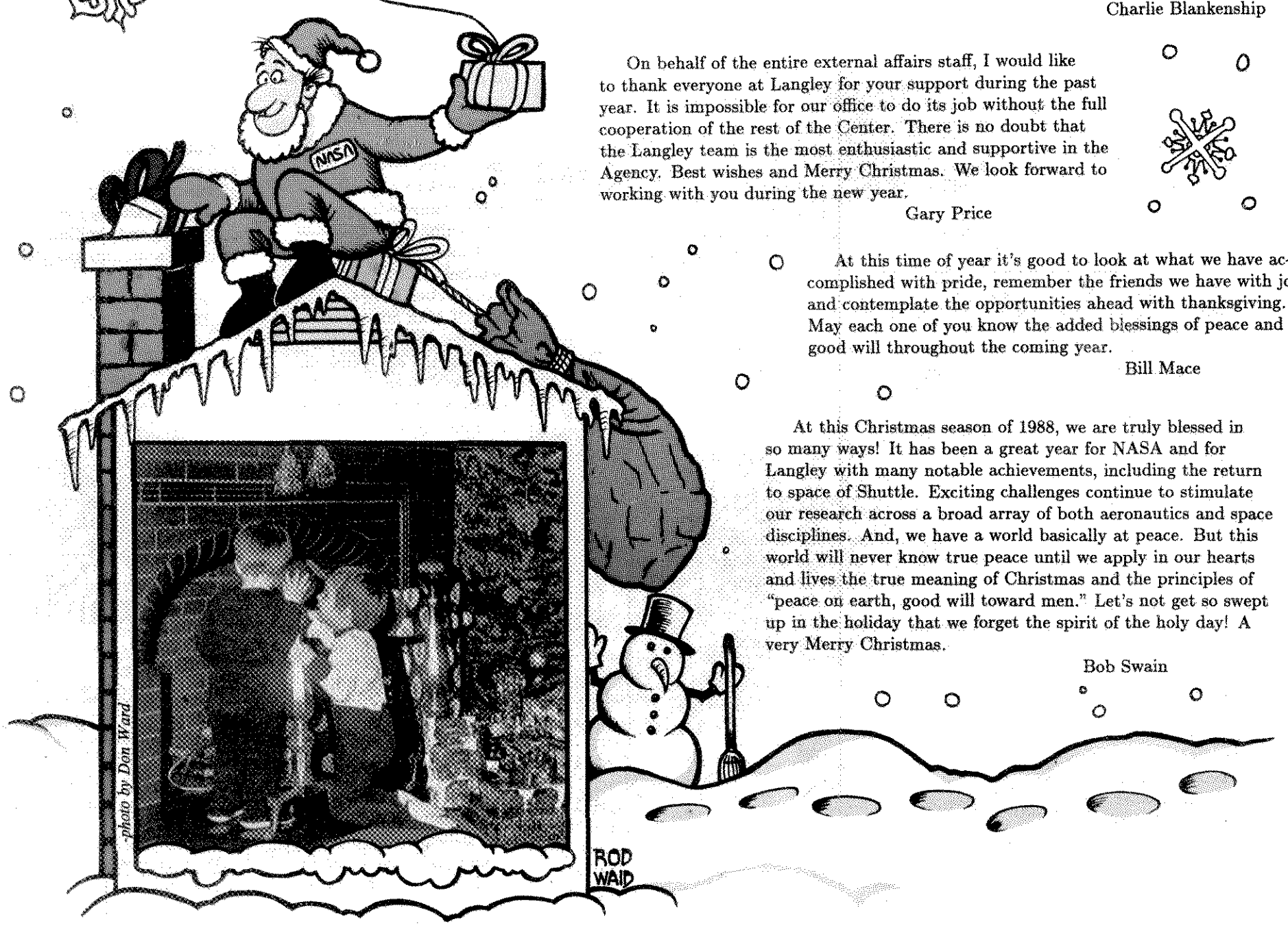


photo by Don Ward

News Briefs

HEADQUARTERS, Washington, D.C. — NASA Administrator Dr. James C. Fletcher has announced the appointment of Kenneth S. Pedersen as associate administrator for external relations. In his new position, Pedersen will be responsible for the agency's congressional, intergovernmental, international and industry relations; educational activities and relations with educational institutions and the NASA History Office. Pedersen succeeds H. Hollister Cantus, who resigned to return to the private sector.

HEADQUARTERS, Washington, D.C. — Dr. James C. Fletcher has announced two major executive appointments. Jerry Hlass, currently director, John C. Stennis Space Center, Miss., will assume the post of assistant for engineering and technology to the deputy administrator, NASA Headquarters. Roy S. Estess, currently deputy director of the Stennis Space Center will succeed Hlass as director. These assignments will be effective January 23, 1989.

JOHNSON SPACE CENTER, Houston, Texas — Astronaut flight crews have been named to four Space Shuttle missions which are scheduled to fly in late 1989 and early 1990, bringing the total number of crews in training to nine. Crews selected are for missions STS-33, DOD mission aboard Discovery; STS-34, Galileo mission aboard Atlantis; STS-32, deployment of SYNCOM IV-5 and retrieval of LDEF aboard Columbia; and STS-35, ASTRO-1 aboard Columbia.

HEADQUARTERS, Washington, D.C. — The selection of Thomas L. Moser as deputy associate administrator for Space Station has been announced by James B. Odom, head of the Space Station Office, NASA Headquarters. Moser succeeds Dr. Franklin D. Martin, who was recently appointed assistant administrator for exploration.

AMES RESEARCH CENTER, Mountain View, Calif. — December 5 marked ten years that the Pioneer orbiter spacecraft has been circling Earth's cloud-draped twin planet, Venus. December 9 was the ten year anniversary of a companion spacecraft, Pioneer Venus 2, which entered Venus' atmosphere with four hard-impact probes it released. Though other spacecraft have visited Venus, Pioneer's imminent completion of 3,652 24-hour-long orbits of Venus represents the first and most thorough survey of the planet yet made.

Editor's Note: Surveys locally and at the Headquarters level indicate that our readers are interested in NASA News Releases summarized here. Copies are available by contacting Edith Watts, Mail Stop 146, ext 3017.

Senior Management Research Review

The Senior Management Research Review will be held Monday, December 19, from 9 to 11 a.m., in Building 1219, Room 225. Following the Director's comments and program directors' reports, program accomplishments will be given by Langley scientists.

TIME	PROGRAM ACCOMPLISHMENT	SPEAKER
9:30	A Micromechanics Treatment of the Effects of Curvature in the Main Load-Carrying Layers on Composite Stiffness	Charles Harris (Structures/MD)
9:45	High Temperature, Low Dielectric Polyimides	Anne St. Clair (Structures/MD)
10:00	Thermographic Technique for NDE of Shuttle SRM	William Winfree (Electronics/IRD)
10:15	Aircraft System Identification Technology—Quantifying Icing Effects on Aircraft Stability and Control Through Flight Test Data	James Batterson (Flight Systems/GCD)
10:30	Local Intensity Adaptive Image Coding	Friedrich Huck (Flight Systems/ISD)
10:45	Mixing and Combustion Enhancement in Supersonic Flows	Philip Drummond (Aeronautics/HSAD)

Special Thanks

The staff of the **Researcher News** extends special thanks to the Photographics, Publications and Graphics Sections and the Technical Editing Branch for their continued support and generous cooperation throughout 1988.

About the Cover

Today's cover photograph was submitted by Langley photographer Don Ward. Although taken 18 years ago, the subject matter is—and always will be—current. Thanks, Don, for sharing a special photo.

The holiday cover page was designed by **Researcher News** cartoonist Rod Waid, a Hew-Es-Co employee attached to the Graphics Section. Many thanks to Rod for bringing us *Lankley* and his friends each issue.

AV Week Video Available

Aviation Week's newest video, "Future Flight," relives the earliest days of flight and explores the airliners of tomorrow.

This video is available for loan on a first come-first served basis. It is copyrighted and may not be duplicated. To reserve the film, call Edith Watts, ext. 3017.

Publication Dates Announced

This is the last issue of the **Researcher News** for 1988. For your convenience, deadline and distribution dates for the first half of 1989 are listed below. Clip and save.

Distribution Dates	Deadline
January 13	January 3
January 27	January 17
February 10	January 31
February 24	February 14
March 10	February 28
March 24	March 14
April 7	March 28
April 21	April 11
May 5	April 25
May 19	May 9
June 2	May 23
June 16	June 6
June 30	June 20

Editorials

Langley

Headquarters Forum

With the ever increasing emphasis on system performance, both in aeronautical and space systems, the interdisciplinary aspects of systems are becoming increasingly important and can, many times, dominate design more than traditional disciplinary aspects. There are many examples in recent years, such as the X—29A, that have illustrated this importance. Research and technology development is beginning to recognize the importance of these interdisciplinary aspects.

At Langley we have the opportunity to play a lead role in the evolving area of interdisciplinary research. Langley has both the breadth and depth, in almost all of the disciplines required, to be leaders in interdisciplinary research.

There are many disciplinary and organizational challenges that must be overcome in order to make significant advances in interdisciplinary research. Language, terminology, and associated computer software are among those challenges. In addition, organizational constraints and loyalties can often be barriers.

I believe that all of these barriers can be overcome by taking actions such as multi-discipline training, collocation of personnel, cross-discipline transfers and the development of common applications. A good example of an interdisciplinary program where these actions are being taken is the Controls-Structures-Interaction (CSI) program that was described in the September 23rd issue of the **Researcher News**.

CSI is an interdisciplinary research program that is merging the disciplines of structural dynamics and controls with applications to improved spacecraft. The program involves two teams of researchers—one team, in the Structures Directorate, focusing on ground test methods and one team, in the Flight Systems Directorate, focusing on development of analytical design methods. Each of these teams is composed of researchers from **both** the Structures and Flight Systems Directorates. Both teams are working toward a common set of long-range goals and are addressing common applications.

In addition to the technical challenges offered, there is an equally important set of challenges in managing interdisciplinary research. This approach usually involves a team or teams of researchers rather than an individual researcher. Langley has historically rewarded scientists/engineers/technicians based on individual research accomplishments. We must develop new management approaches where individuals can be rewarded based on team accomplishments, with consideration given to each individual's contribution to the team. Langley senior staff recognizes this and is committed to find ways to manage interdisciplinary research that will encourage this team approach to research.

I believe that Langley has the potential to make significant contributions in the area of interdisciplinary research. The technology developed will allow tremendous performance improvements in both aeronautical and space systems. With the combined effort of our researchers, middle and senior management, Langley can become the world's leading research organization in the new and exciting area of interdisciplinary research.

Paul F. Holloway
Deputy Director

Researcher News

The **Researcher News**, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia, 23665-5225, is published every other Friday in the interest of all Langley staff and retirees. Address contributions to the Editor, Mail Stop 115, telephone 865- 3707. Articles are due at noon on the Tuesday following the date of this issue.

Managing Editor . . Jean Drummond Clough

Editor . . . . . Marny S. Skora

Photographs . . . . . Photo Lab

The privilege of advertising articles in this publication is restricted to the staff 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.

Spitzer Honored by Airline Avionics Institute

Cary R. Spitzer, manager of Program Plans and Contracts, Advanced Transport Operating Systems Program Office, has been awarded the Airline Avionics Institute (AAI) Volare Award. Spitzer was cited "in honor and deep appreciation for his contributions and for guiding NASA and other researchers in developing new technology responsive to airline avionics needs."

This AAI Volare, the Chairman's Special Award, is a prestigious and coveted honor, not awarded each year. Candidates for the award usually come from airline companies, aircraft manufacturers and avionics manufacturers worldwide. On rare occasions, the special award is given to a particularly worthy recipient from an organization outside of these three primary categories.

AAI Chairman Robert A. Hollingsead said, "NASA's avionics systems and new technology applications research programs are of tremendous importance to the future of civil aviation. Cary Spitzer is recognized for guiding these programs to maximize their responsiveness to industry needs." He is the second federal government recipient in the 21-year history of the award.

Spitzer began his NASA career in October 1962 conducting research on thermal sensors for models being tested in various wind tunnels at Langley. He joined the Viking Project Office in February 1969 as manager of the Molecular Analysis Investigation for the unmanned Mars Lander. Later he served as deputy director for Operations in the Science Analysis and Mission Planning Directorate of the Viking Flight Team and, finally, as deputy Viking Project manager for Langley Research Center operations.

From 1978 to 1985 he was assigned to the Systems Application Office where he formulated research programs in avionics–aviation electronics—for advanced aircraft and spacecraft. In his present position, Spitzer maintains industry liaison with airline and aircraft manufacturers and provides definition for future research programs for transport aircraft operations.

The author of over 35 technical papers, Spitzer holds two patents and was editor of the book "Viking Orbiter Views of Mars." He is the author of "Digital Avionics Systems," published by Prentice-Hall.

NASA Historian Speaks Today for Federal Women's Program

Dr. Sylvia D. Fries, NASA's chief historian, will present "The History of Women in NASA" for the fall Federal Women's Program . The seminar will be held today beginning with a luncheon at 11:30 a.m. in the H.J.E. Reid Conference Center, Building 1222.

Dr. Fries received her doctorate in intellectual history from the Johns Hopkins University in 1969 and, for the next ten years, pursued a career in university teaching and historical research and writing.

In 1976, she was appointed to the NASA History Advisory Committee which provides program and policy guidance to NASA's history program. The following year she served as project director for a team study, sponsored by the National Science Foundation and the state government of Maine, to examine the ways in which the state of Maine did and could benefit from scientific and engineering expertise.

In 1981, she was asked to serve as chairperson of NASA's History Advisory Committee, an appointment which also placed her on the NASA Advisory Council. In 1983, she joined NASA as chief historian and director of NASA's agency-wide history program.

Employees should charge their time to job order A-1980.

Reverse Flow in Shuttle Plume is Old Hat to MSFC Group

-by Jerry Berg, MSFC

As tracking cameras followed the Space Shuttle Discovery downrange during its September 29 ascent into orbit, many spectators experienced a wave of apprehension. Beginning approximately a minute and a half into the flight, they noticed that the plume of flames and exhaust behind the Shuttle seemed to have spawned an additional flame slightly above the base of one solid rocket booster.

Lee Foster, an aerospace engineer in one of the Marshall Space Flight Center's specialized laboratories in Huntsville, was also watching Discovery's flight on a TV monitor in the Huntsville Operations Support Center. He noticed the small outgrowth from the main plume, too. Instead of being alarmed, though, Foster watched with high interest. He had expected to see the flames. Now, based on previous experience, he expected their appearance would bring a flood of questions.

To Foster and his coworkers in the Aerophysics Division of the Structures and Dynamics Laboratory, the effect captured by tracking cameras is a familiar one. In fact, their studies of it long ago resulted in giving the phenomenon a name—"plume recirculation"—and establishing it as the subject of a unique engineering discipline.

"The effect is visible—if weather conditions and camera angles permit—from around 92 seconds into flight until just before jettison of the boosters," Foster said. "Even if it's not visible, we've used instrumentation to determine that the effect does indeed occur on every flight."

Plume recirculation, Foster explained, is due to the relative location of the booster and main engine nozzles, the expansion of the rocket jets at high altitudes, and the airflow around the Shuttle vehicle and its plumes.

"As the Shuttle ascends, atmospheric pressure becomes lower," Foster said. "As a result, the exhaust plumes grow wider, as the Shuttle gains altitude. Then, as they get wider, they begin to intersect with each other and this intersection region gets closer and closer to the base region of the vehicle.

"Usually around 92 seconds," Foster said, "the pressure in this intersection becomes higher than the pressure in the base region and some of the exhaust plume gases from this intersection are reversed, or recirculated, into the base region. The high-temperature gases heat the aft dome of the external tank and the aft sections of the boosters."

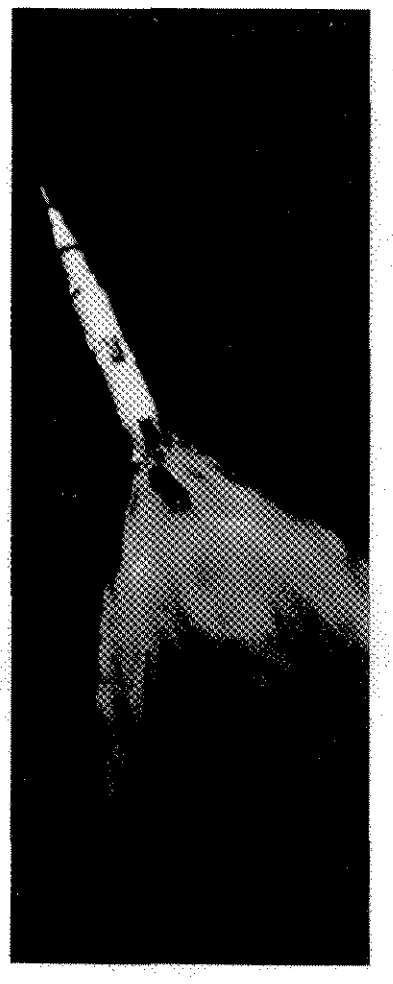
By itself, that effect wouldn't result in anything visible. However, another ingredient—oxygen—is added to the picture at this point.

"Around the outer boundary of the recirculation region, oxygen from the airflow around the Shuttle mixes with some of the recirculated exhaust gases, allowing residual fuel in the plume to burn. That's what results in the flames seen in the flight videotapes," said Foster.

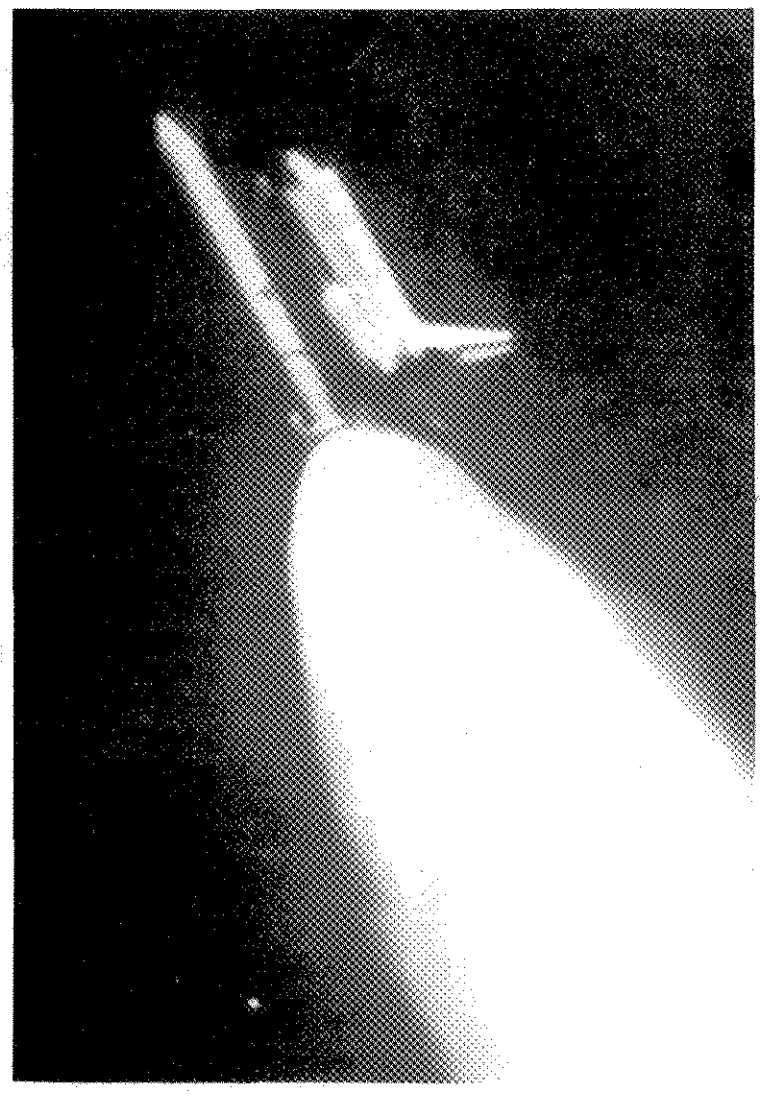
But is it a safety issue?

No, Foster declared, because the heating effect from plume recirculation was calculated even before the first Shuttle flight and appropriate thermal protection has always been used to protect the flight hardware.

Continued on page 5.

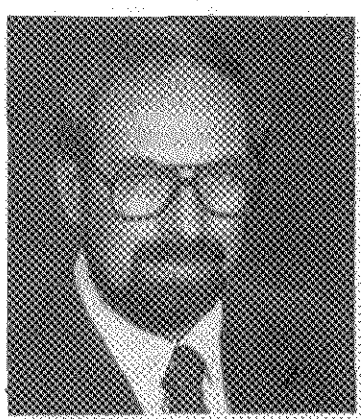


APOLLO 4. A photo from the first Saturn V flight in November 1967 captured an example of how flames would envelope the base of the Saturn vehicle shortly before jettison of the first stage. This phenomenon is one example of plume-induced flow effects.

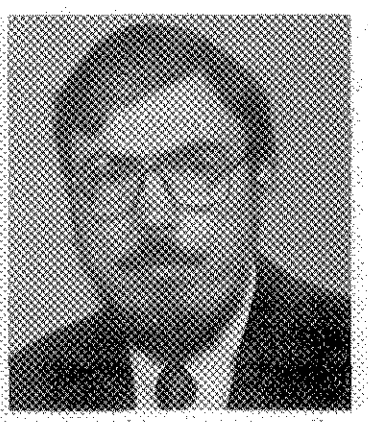


-photos courtesy of Marshall Space Flight Center

PLUME RECIRCULATION. In the November 1982 Space Shuttle flight designated STS-5, the phenomenon known as plume recirculation was easily discernbile in Columbia's base region. This photo was taken 96 seconds into flight.

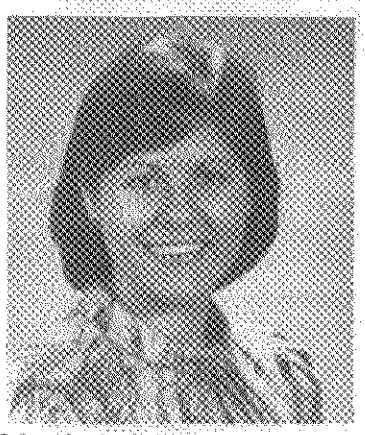

Lawrence L. Green

John D. Whitcomb


David R. Brooks

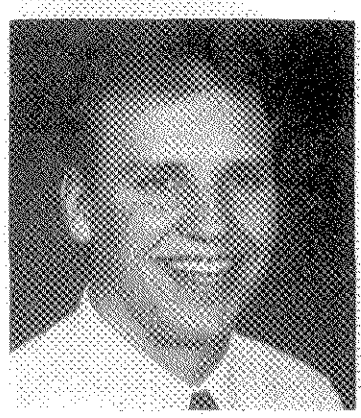
Joel L. Everhart, Jr.

Gregory M. Gatlin


Marcia S. Domack

Clyde R. Gumbert

Gloria Hernandez


Ralph D. Buehrle

Employees Earn Advanced Degrees

Seventeen Langley Research Center staff members have received advanced degrees through the Center's Graduate Study Program during fiscal year 1988.

The program, established in the 1940s, provides Langley scientists, engineers and administrators an opportunity to improve their proficiency in aeronautical and space research and earn advanced degrees while working at Langley. Approximately 1,300 employees have been awarded Master of Science or Doctoral degrees through the program.

Three employees received Doctoral degrees through various universities: **David R. Brooks**, Atmospheric Sciences Division, received the Doctor of Philosophy in Atmospheric Science from Imperial College of Science and Technology, University of London; **John D. Whitcomb**, Materials Division, received the Doctor of Philosophy in Materials Engineering Science from Virginia Polytechnic Institute and State University; **Joel L. Everhart, Jr.**, Space Systems Division, received the Doctor of Science in Fluid Mechanics and Thermal Sciences from George Washington University.

Master of Science degrees were awarded to the following fourteen employees: **James N. Moss**, Space Systems Division, received the Master of Science in Engineering Administration from George Washington University; **Catherine B. McGinley**, High-Speed Aerodynamics Division, received the Master of Science in Fluid Mechanics and Thermal Sciences from George Washington University; **David A. Dress**, Transonic Aerodynamics Division, received the Master of Science in Fluid Mechanics and Thermal Science from George Washington University;

Marcia S. Domack, Materials Division, received the Master of Science in Materials Science from the University of Virginia; **Gregory M. Gatlin**, Low-Speed Aerodynamics Division, received the Master of Science in Aeronautics from George Washington University; **Noah S. Higdon**, Atmospheric Science Division, received the Master of Science in Optical Sciences from the University of Arizona; **Gregory J. Brauckman**, Space Systems Division, received the Master of Science in Fluid Mechanics and Thermal Science from George Washington University;

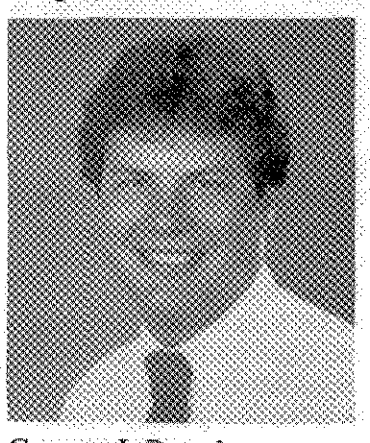
Jeffrey D. Singleton, an Army employee in the Structural Dynamics Division, received the Master of Science in Aerospace Engineering from Georgia Institute of Technology; **Gloria Hernandez**, High-Speed Aerodynamics Division, received the Master of Science in Applied Science from the College of William and Mary; **Lawrence L. Green**, Transonic Aerodynamics Division, received the Master of Science in Fluid Mechanics and Thermal Sciences from George Washington University; **Clyde R. Gumbert**, Transonic Aerodynamics Division, received the Master of Science in Fluid Mechanics and Thermal Sciences from George Washington University;

Max L. Blosser, Structural Mechanics Division, received the Master of Science in Fluid Mechanics and Thermal Sciences from George Washington University; **Ralph D. Buehrle**, Systems Engineering Division, received the Master of Science in Mechanical Engineering from the University of Cincinnati; **John Stadler**, Systems Engineering Division, received the Master of Science in Aerospace Engineering from Virginia Polytechnic Institute and State University.

Leonard T. Twigg, Systems Engineering Division, received the Master of Science in Engineering Administration from George Washington University; and **Joan G. Funk**, Materials Division, received the Master of Science in Materials Science from the University of Virginia Both of these degrees were awarded in 1987.

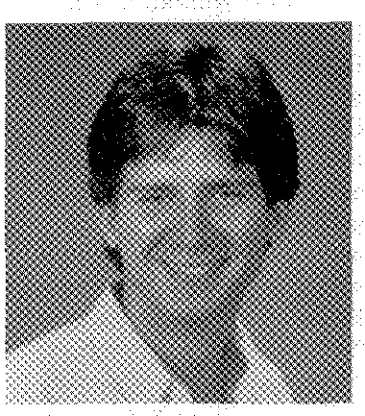
The Training and Education Section congratulates these individuals on the long hours and hard work necessary for their academic accomplishment. Such work not only brings additional expertise to Langley, but also enhances the individual's professional growth and career development.

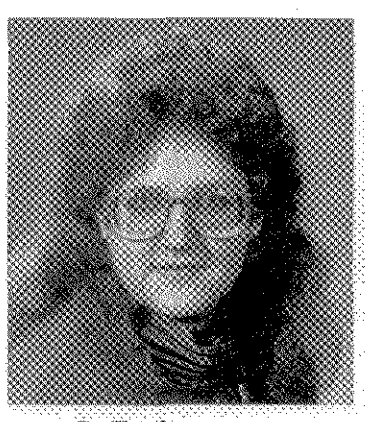
For information on the Center's Graduate Study Program, call the Training and Education Section, ext. 2611.


Gregory J. Brauckman

James N. Moss

Noah S. Higdon


Jeffrey D. Singleton


Joan G. Funk

Max L. Blosser

Leonard T. Twigg

John Stadler

David A. Dress

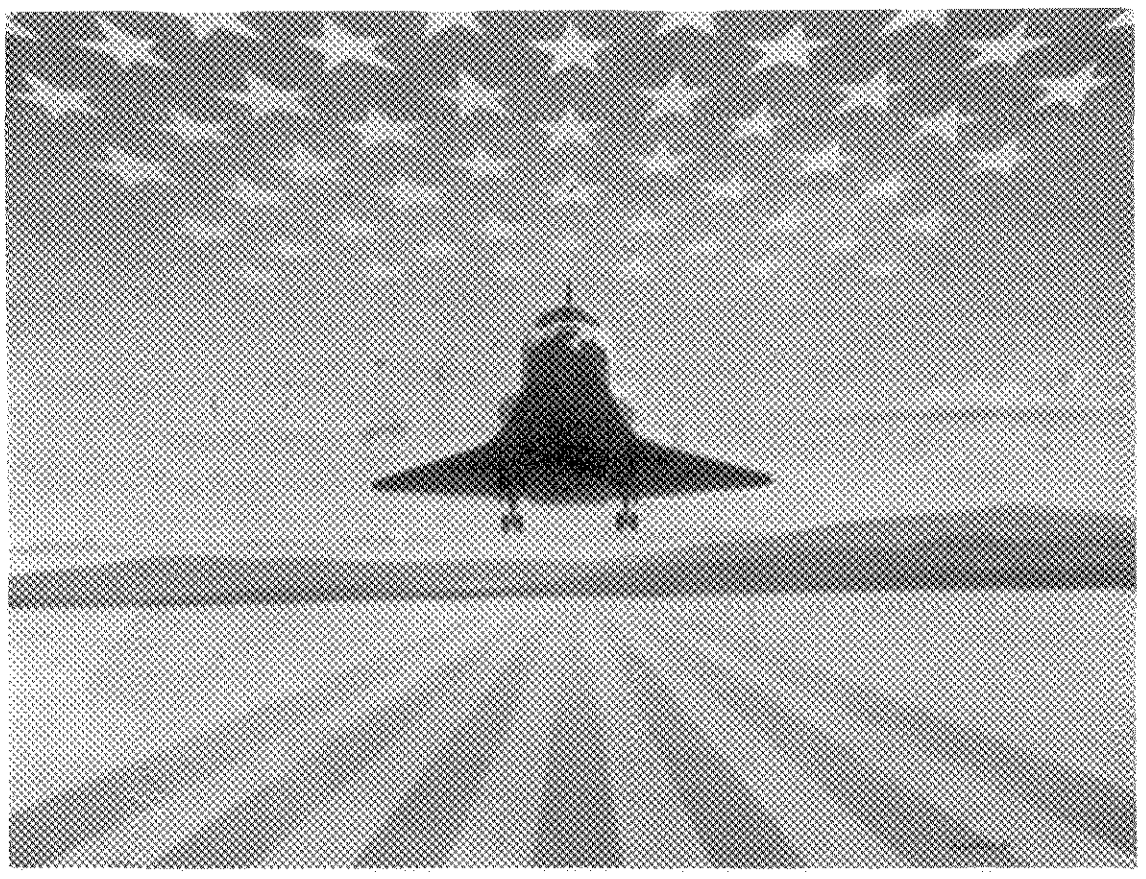
Reverse Flow in Shuttle Plume

Continued from page 1.

"We've been building our data base on this subject ever since the mid- 1950s. In fact, plume recirculation occurred from the very beginning, even with the German V-2 rockets.

"During the first six flights of the Shuttle, we put a variety of gauges on the external tank and boosters to measure the heating from plume recirculation," said Foster. "These measurements showed that the heating was basically the same on each flight and that the vehicle is well protected from the heating."

So, when Atlantis streaked through the upper reaches of the atmosphere, high powered tracking cameras again followed it into the distance. And, at least one viewer kept an eye out for a familiar phenomenon and yet another opportunity to expand his unique collection of data.



LANDING OF COLUMBIA is one of over 25 paintings by space artist Robert McCall comprising his "A Vision of the Future" exhibit, which is on display through December 31 at the Visitor Center. Signed posters of this painting are available for sale at the Visitor Center Souvenir Counter. McCall has chronicled American space flight from Project Mercury to the Space Shuttle.

Use of Langley Fitness Center

Employees are not entitled to official time to use the Fitness Center but, with supervisory approval, the following options are available:

- Annual leave
- Compensatory leave
- Change to another standard shift
- *Change to a nonstandard shift
- *Extended lunch period

During past holiday periods, the Langley Fitness Center has experienced reduced participation. In an effort to provide service, while allowing the staff holiday time, the Fitness Center will be open from 7 a.m. to 4 p.m., Tuesdays through Thursdays, December 20—22 and December 27—39, and from 7 a.m. to 12 noon, Fridays, December 23 and 30.

Seminar

A retirement seminar will be held January 10, 12, 17 and 19 at the H.J.E. Reid Conference Center, Building 1222. Topics to be covered during these four half-day sessions include information on retirement benefits, financial planning, physical and mental health, and uses of leisure time.

Retirement Party

Sue Seward will be honored at a retirement party January 5, 1989, from 5 to 7 p.m., at the Langley Officers' Club. Cost including gift is $10. Please respond by December 21 to Willaree R. Curtis, Mail Stop 185, ext. 2637.

Positions Open

88-82: AST, Atmospheric Chemistry and Dynamics, GS-1301-14 or 15, Office of Director for Space, Space Station Office, Technology Office. Closes December 23.

88-83: Security Specialist, GS-0081-11 or 12, Office of Director for Management Operations, Management Support Division, Security Branch. Closes December 30.

88-84: AST, Experimental Facilities Techniques, GM-801-15, Office of Director for Systems Engineering and Operations, Facilities Engineering Division, 8- Foot High Temperature Tunnel Modifications Project Office. Closes December 22.

88-85: Payroll Technician, GS-544-05 or 06, Office of Director for Management Operations, Financial Management Division, Financial Services Branch, Payroll Section. Closes December 21.

NASA/New Horizons Partnership Wins National Recognition

The NASA/New Horizons Technical Center Adopt-a-School Project has been named a first place winner in the National Partnership Awards competition sponsored by Partners America, publishers of the *Partnerships in Education Journal*. The NASA/New Horizons venture was honored in the Corporate Mentor category.

The awards program was open to schools and corporations involved in an elementary or secondary school partnership program during the 1987-88 school year.

The partnership provides New Horizons students with challenging state-of-the- art experiences through association with NASA scientists, engineers and technicians. These experiences span the educational spectrum, including both gifted science and vocational technical programs.

New Horizons serves students from six area school districts and fourteen high schools. Since implementation of the project in September 1985, approximately 86 vocational and science students have interacted in mentorships with 69 NASA engineers and technicians.

DISPLAYING THE PARTNERSHIP AWARD are (L to R) Dr. Patrick Konopnicki, principal, New Horizons; Don Adams, Editor, *Partnerships in Education* journal; Shelley Canright, NASA Langley project coordinator; and Dr. Ralph Johnson, director, New Horizons Technical Center.

Dr. Patrick Konopnicki, New Horizons principal, regards the Adopt-a-School project as "an exemplary partnership truly worthy of national recognition. The program offers experiential learning in a national laboratory setting unavailable in the traditional classroom. We have been expanding our directions each year. Both faculty and students are excited about the partnership opportunities that lie ahead."

Leonard Weinstein, group leader in the Turbulent Structures and Modeling Group and project mentor, views the partnership as incredibly useful on both the corporate and the student side. Weinstein and Dennis Bushnell, head of the Viscous Flow Branch, were teamed with Jason Reed, now a student at the University of Southern California.

Weinstein calls the pairing "a perfect fit. Reed's work in the area of skin friction reduction in turbulent water flow has produced interesting results which look very promising in reducing hydrodynamic drag." Factions at and outside of NASA are interested in pursuing further experimentation for a variety of applications.

Langley project coordinator Shelley Canright, education and information specialist, also views the partnership as mutually beneficial. "Students are given the opportunity to contribute to and work on research projects for the future. Mentors are given the opportunity to contribute to and work with our future work force."

Don Soloway, aerospace technician in the Automation Technology Branch, echoes Canright's sentiments. He regards his mentorship experience as highly beneficial to NASA as well as a learning experience for the student.

The New Horizons partnership paired Soloway with a student who developed a mechanism to collect data from the very complex computers that operate robotic systems. Bryan Pelham, now a student at the University of Santa Clara, California, was such an exceptional worker, Soloway investigated and succeeded in making it possible for him to return for two additional summers to continue the project. "Pelham's innovations and subsequent upgrades have allowed me to collect data from complicated robotic systems to accomplish my job more efficiently," said Soloway. "He has been a definite asset to us."

The Adopt-a-School program is "an investment whereby all participants—students, mentors, school and NASA—stand to gain," says Canright. "The NASA/New Horizons mentorship has opened and will continue to open partnership opportunities of mutual benefit."

Happenings

CHILDREN'S CHRISTMAS PARTY, sponsored by the Langley Activities Association, will be held December 18, from 2 to 4 p.m. in the Activities Center. A short Christmas tape will be shown, refreshments will be available, and Santa will have gift stockings for all children. Admission is $2 for children only.

LAA OPEN HOUSE. Share snacks and a cup of punch, December 22, 1 to 3 p.m. in the Activities Center. No charge, just a lot of camaraderie.

NEW YEAR'S EVE. Dance and breakfast sponsored by the LAA. Setups, party favors provided. BYOB. 9 p.m. to 1 a.m. $35/couple.

ALUMNI ASSOC. Annual Meeting and Election of Board Members. A dinner meeting will be held at 6 p.m., January 18, in the H.J.E. Reid Conference Center, Building 1222. Mark your calendar and watch for a mailing with complete information.

VA CHORAL SOCIETY presents Christmas carol concerts tonight at First Presbyterian Church, Hampton; December 17 at Trinity Lutheran Church, Newport News; and December 19 at Williamsburg Baptist Church. All concerts begin at 8 p.m. Admission is free. Also, a Holiday Concert, sponsored by the Daily Press/Times-Herald, will be held December 22 at 7:30 p.m. at the Hampton Coliseum. Free admission. For additional information, call 591-0439.

NELSON HOUSE HOLIDAY, in Yorktown, December 17 through January 1, 11 a.m. to 4 p.m daily, except Christmas Day. Admission is free.

CHRISTMAS CANTATA, December 18, 7 p.m., Regimental Memorial Chapel, Ft. Eustis. No admission, free child care.

VA STAGE COMPANY presents "Holiday Festival in the Wells Theatre." Four events, December 19—22. Call 627-6988 for details.

Cancer Screening an Overwhelming Success

A total of 316 NASA employees, retirees, contractors and their family members received breast self-exam training and mammographic exams at LaRC during the week of November 28. This vital service was co-sponsored by the Office of Occupational Health Services and the LaRC Federal Women's Program.

Mammography screening was selected as a project of the Federal Women's Program for fiscal year 1988. The Office of Occupational Health Services arranged for two mobile imaging vans to provide this service on Center.

-photo by Terry Shepard

JOINT EFFORT BRINGS EARLY DETECTION CANCER SCREENING TO LANGLEY. Gloria Champine, Federal Women's Program chairperson, and Peter Edgette, head of Occupational Health Services, meet to check on the progress of mammography screening available to Langley employees, contractors, retirees and their family members.

SKI

The first NASA ski trip for the '89 season is scheduled for January 12 to Wintergreen. Cost is $41. Contact Richard Bennett, 599-5585, for details.

Space Shuttle Update

The Inertial Upper Stage first stage motor for the NASA mission STS-29 was damaged December 1 during pre-launch processing at the Air Force's Eastern Launch Site, Cape Canaveral, Florida. A technician working on the vehicle bumped the first stage solid rocket motor nozzle exit cone, cracking it.

The Air Force and NASA have decided to replace the first stage motor with a spare motor already available at the launch site.

The Air Force and NASA, in discussion with support contractors, have determined that the incident should not impact the next Space shuttle mission slated for a February 18, 1989, launch date.

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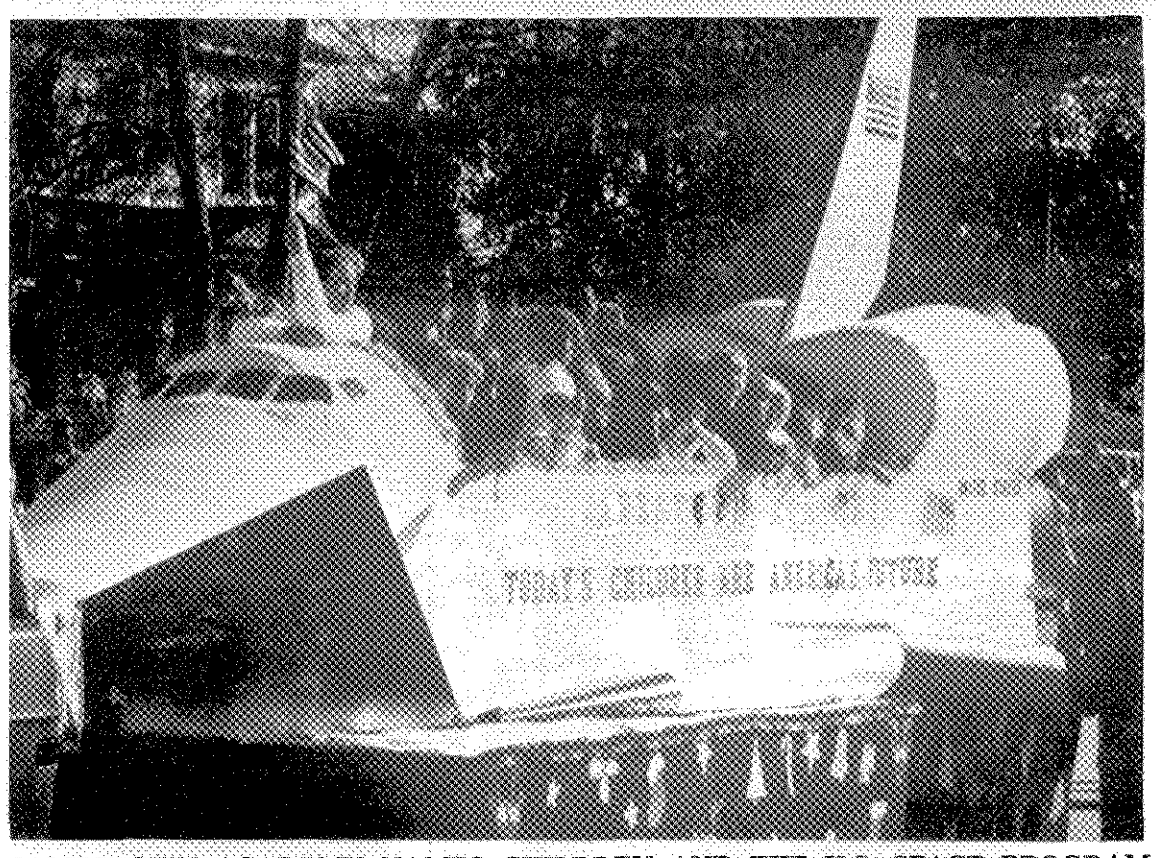
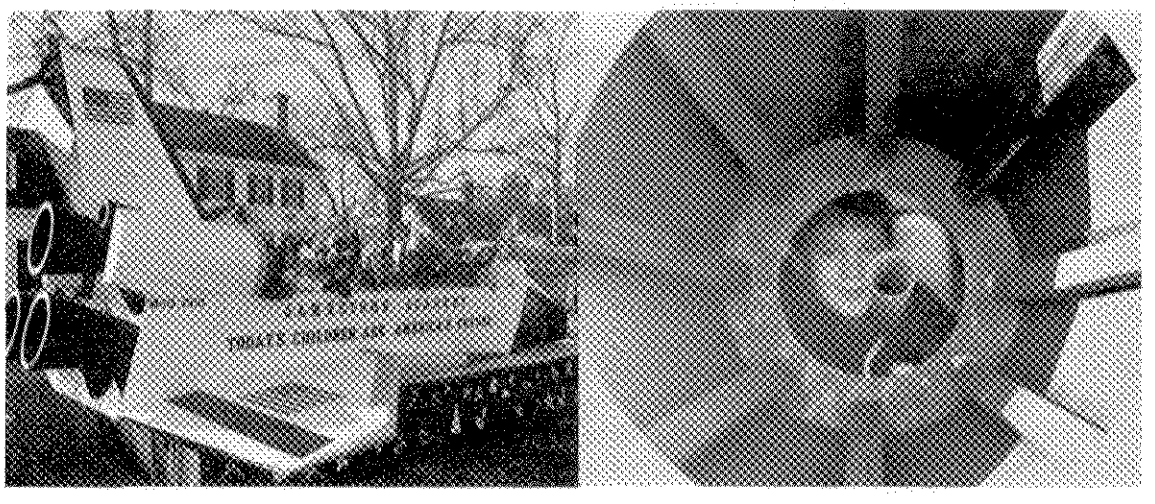
Researcher News



JAMESTOWN ACADEMY NAMES CHILDREN AND THE U.S. SPACE PROGRAM PRIORITIES FOR THE FUTURE. This award-winning float, entered in the Williamsburg Christmas Parade, was a PTA function of the Jamestown Adademy. Coming and going, the one-quarter scale model of the Shuttle is a noble effort. Academy sixth grader Jamie Faubert (lower right) peers through a main engine to check the reaction of the crowd.