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Langley Research Center

News Researcher

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Administrator Goldin Issues Statement on Challenger Observance

The following statement by NASA Administrator Daniel S. Goldin was released in observance of the 10th anniversary of the Challenger accident, January 28.

"The best way to honor the memories of the crew of the Challenger, and of all the men and women who have given their lives to explore the frontiers of air and space, is to continue their bold tradition of exploration and innovation. That's what the people of NASA do every day. They push the boundaries of knowledge and human endeavor to improve and enrich life on Earth today and secure a better future for all of us tomorrow.

"I've said many times that safety is the highest priority at today's NASA. We will not waver from that commitment. But human beings have always taken great risks to reap great rewards. Space flight is inherently dangerous and every member of the NASA team understands those risks.

"I'm proud of the women and men of NASA. They're blazing the trail to the future. They're building the components of the International Space Station. They're constructing spacecraft that will explore the farthest regions of the Solar System and the universe, and satellites that will monitor the health of our own blue planet for years to come. They're conducting cutting edge research that will make airplanes faster and safer, and they've made the Space Shuttle the most capable, reliable and versatile spacecraft in the world."

Note: Seven men and women aboard the shuttle Challenger died when their space vehicle broke apart 73 seconds after liftoff from the Kennedy Space Center on January 28, 1986. The explosion that caused the accident was traced to a flaw in the design of the shuttle's solid rocket boosters, made worse by cold weather. Shuttle flights were suspended until September 1988.

A Message from the Director

The Center's support of this year's Combined Federal Campaign far exceeded expectations and hopes, and resulted in our receiving special recognition for our generous contributions.

It was with pride that Irving Abel, Langley's CFC Chair, and I accepted an award from General Joseph Ralston, who headed the Peninsula CFC this year, at an awards ceremony at Langley Air Force Base. The plaque has the following inscription:

"Presented to the men and women of NASA Langley Research Center for phenomenal sharing for '95-96: Highest Per Capita Giving; Highest Participation Rate; Highest Average Giving; Largest Number of Keel Club and Eagle Givers of Major CFC Organizations on the Peninsula."

Our per capita giving was $118, an increase of $14 from last year; our participation rate was up to 73 percent, an increase of 2 percent; and our average gift was $162, an $18 increase. We had 110 employees who qualified for either the Keel, $500-$999 gifts, or Eagle status, at least a $1,000 donation.

The words on the plaque say it all. We are a great team! And, it was a team effort. We would not have exceeded our goals and set a standard for the Peninsula without each and every contributor's support.

The plaque hangs in the lobby of the H.J.E. Reid Conference Center. Please take a moment to see the tangible results of your concern for others and an example of our leadership in the community. Happy New Year to all of you. We have certainly helped to make it that way for others.

Paul

— Paul F. Holloway,
Center Director

Langley's Carbon Monoxide Catalyst Is An Award Winner

Photo by Fred Jones

LARSS student Meredith Payne holds the Langley-designed carbon monoxide catalyst, one of *Popular Science* magazine's 10 best technical achievements of 1995.

A Langley-developed device that helps change harmful carbon monoxide (CO) to harmless carbon dioxide (CO_2) has been designated by *Popular Science* magazine as one of 10 grand award winners among 100 technical achievements listed as The Best of What's New for 1995" in their December issue. The catalyst was also chosen as one of the seven finalists for the 1995 NASA Invention of the Year in the April 1995 issue of *NASA Tech Briefs*.

A research team led by Dr. Billy Upchurch, an analytical chemist, and physical chemist David Schryer, both of the Acoustic, Optical and Chemical Measurement Branch (of the Experimental Testing Technology Division) have created a catalytic device using a ceramic honeycomb covered with tin oxide and platinum. When carbon monoxide and oxygen pass through the honeycomb, they react on the catalyst surface to form harmless CO_2. The catalyst can also oxidize formaldehyde (CH_2O) to CO_2 and water at typical room temperatures.

Originally developed in 1990 for use with carbon dioxide lasers, the catalyst is finding its way into the marketplace for use in home furnaces, business heating systems, fire stations and mining operations. Potential commercial uses include the regeneration of CO_2 in closed-cycle CO_2 lasers; removal of CO and formaldehyde from houses and other buildings, and from the interiors of automobiles, aircraft and other vehicles; conversion of toxic CO to nontoxic CO_2 in protective face masks; and removal of CO from internal-combustion engine exhaust during cold-start conditions.

For home use, Langley is developing and testing the catalyst in collaboration with Rochester Gas and Electric Company in New York. Upcoming field experiments call for prototype catalysts to be placed in the company's truck bay, a pathology laboratory at Rochester General Hospital and, then, in a customer's house. The tests should reveal any difficulties in using the catalysts outside the laboratory environment, but Upchurch said, "We don't anticipate any problems in making the conversion from laboratory tests to home tests." Catalysts for home use could be available in early 1997.

The Mantic Corp., Salt Lake City, Utah, plans to use them in breathing apparatus, such as firefighter masks. The catalysts also have applications as trace-gas detectors and in cold-engine emission control.

To work, the catalysts are applied to a surface; air passing over the surface reacts with the catalysts, transforming the carbon monoxide and formaldehyde into harmless gases. The device requires no energy for operation, doesn't need to be plugged in, has no moving parts and lasts a long time. "Simplicity is the beauty of this technology. It just sits there and works on its own," said Upchurch.

The catalyst is also featured in the January 1996 issue of *Popular Mechanics* magazine.

Center Director Paul F. Holloway and Irving Abel, Langley's Combined Federal Campaign (CFC) chairman, accept a plaque recognizing Langley's outstanding response to this year's campaign from Gen. Joseph Ralston, USAF. Ralston headed this year's Peninsula CFC.

January 30 Colloquium features Lee Person

See Page 3 for details

News Briefs

Around the Agency

HUBBLE FINDS NEW BLACK HOLE AND UNEXPECTED MYSTERIES – Confirming the presence of yet another super-massive black hole in the universe, astronomers using the Hubble Space Telescope have also found unexpected new mysteries. The black hole and an 800 light-year-wide spiral-shaped disk of dust fueling it, are slightly offset from the center of their host galaxy, NGC 4261, located 100 million light-years away in the direction of the constellation Virgo. This discovery is giving astronomers a ringside seat to bizarre, dynamic processes that may involve a titanic collision and a runaway black hole. The relatively nearby galaxy could shed light on how more distant active galaxies and quasars produce their prodigious amounts of energy.

X-33 DRAFT COOPERATIVE AGREEMENT NOTICE ISSUED – NASA has issued a draft Cooperative Agreement Notice for the design, fabrication and flight test of the X-33 advanced technology demonstrator — the next step in development of a new generation of reusable launch vehicles that will dramatically reduce the cost of putting them into orbit. "We were seeking comments on the draft notice by Jan. 22 from industry and any other interested parties," said X-33 project manager Gene Austin. "We will consider these comments before issuing the actual Cooperative Agreement Notice in April 1996." The April notice will solicit proposals for a joint government and industry effort to demonstrate single-stage-to-orbit technologies by means of the X-33. Three aerospace companies — Lockheed Martin Skunk Works, McDonnell Douglas Aerospace and Rockwell International Corp. — have been working with NASA since March on concept definition and design of the X-33 in Phase I of the program. NASA will select an industry partner to work with in Phase II, in which the X-33 will demonstrate vehicle reusability and operability concepts that assure low cost operations and rapid processing for reflight. Phase II will culminate in flight testing of the X-33, beginning in early 1999.

Career Transition Center Has Moved

The Career Transition Assistance Program Center (CTAPC) has moved. The telephone number, ext. 45000 and fax number, ext. 45040 remain the same, as does the Mail Stop, 368.

CTAPC is now in Building 1312, the small building next to the Langley Federal Credit Union. Please stop by and visit — use the side entrance facing the credit union.

Lots of exciting training is scheduled for 1996. Due to the furlough, several seminars have been rescheduled. Seminars are planned as follows:

- Feb. 1, 9 to 11:30 a.m., *Body Language in the Job Search*, Building 1312.
- Feb. 8, 1 to 4 p.m., *Dress for Success*, Pearl I. Young Theater, 5A North Dryden St.
- Feb. 14-15, 9 a.m. to 4:30 p.m., *Career Transition* Seminar, Building 1216.
- Feb. 22, 9 a.m. to noon, Employer Panel "Trends in the Career Marketplace," Pearl I. Young Theater, 5A North Dryden St.
- Feb. 27, 9 a.m. to 4:30 p.m., *Integrating Covey's Seven Habits into the Job Search*, Building 1216.
- Feb. 29, 9 a.m. to 4:30 p.m., *Starting Your Own Business*, Building 1312.

Call Susan Costello at ext. 45000 for more information and to register.

Dr. Christine Darden Featured on Calendar

A calendar entitled "The Power of Discovery and the Challenge of History — African Americans in Science," the 1996 Aetna Life Insurance Calendar of African American History, features Dr. Christine Darden of the High Speed Research Program Office.

Aetna features Darden and 11 other prominent African Americans scientists and engineers. Calendars are available from Aetna for $3 each. Write to Aetna Calendar Corporate Communications RE6A, 151 Farmington Avenue, Hartford, CT 06156.

In Memoriam

Eric Scott Price

Eric Scott Price, age 49, died Tuesday, Dec. 12. He was a 1986 graduate of the Engineering Technician Apprentice Program and worked as an engineering technician in the Operations Support Division.

Jim Richardson writes of his co-worker, "Scott will be remembered for his contributions at the Impact Dynamics Research Facility, Landing Loads track, Advanced Technology Research Laboratory and the Structures and Materials Laboratory.

"Scott was awarded for these accomplishments in the area of solar-powered laser development, and was instrumental in creating the Space Materials Dimensional Stability Lab in Building 1148. He taught the machine operations portion of the division-sponsored Trade Fundamentals program."

William R. Ferguson

William Randolph Ferguson, age 77, died Sunday, Dec. 3. A native of Chattanooga, Tenn., he had been a Peninsula resident for 40 years.

Ferguson was an instrument designer at Langley, retiring in 1971 after 33 years of service.

George W. Johnson

George W. "Scobie" Johnson, age 64, died Wednesday, Dec. 6.

Johnson retired from Langley as a machinist in 1986 after 36 years of service.

William Sleeman Jr.

William C. Sleeman Jr., age 72, died Friday, Dec. 8. A native of Birmingham, Ala., he lived on the Peninsula for 44 years.

Sleeman retired from NACA/Langley as an aerospace engineer in 1981 after 37 years of service.

Donald Barthlome

Donald E. Barthlome, age 66, died Sunday, Dec. 31. He was an engineer at Langley, where he designed and patented the Equipotential Space Suit Design Concept in 1970. The space suit's data is in the Smithsonian Institute's archival collection.

Barthlome, along with fellow engineer Moses Long, is also credited with inventing a therapeutic hand device called the "Finger Joint Flexor," used on patients experiencing stiff joints and fingers. He left Langley in 1976 to found Bardon Enterprises in Hampton.

Francis Driesbach

Francis R. Driesbach, age 76, died Sunday, Jan. 7. He was born in Columbus Ohio.

Driesbach retired as an aerospace technician from Langley after 43 years of service.

Two from Langley Receive National Procurement Awards

BY MEGHAN WOODCOCK

Connie Stott

Tim Stubbs

In late fall, Center Director Paul Holloway presented Connie Stott and Tim Stubbs, both of the Acquisition Division, with employee-of-the-year awards given by NASA's Procurement Awards Program. Recipients of these awards are first nominated by their Center's procurement officer. Nominated employees are then rated by a panel of NASA contract specialists who choose a winner for each category. This is the first time Langley personnel have won individual awards in the competitive award program.

Connie Stott received NASA's "Procurement Analyst of the Year" award. Stott served as the coordinator for Langley's Bankcard program which was recognized by Deidre Lee, associate administrator for Procurement, as "setting the Agency's standard for aggressive customer-focused micro-purchasing." Stott has worked at Langley since 1978, spending the last 10 years in the Acquisition Division. She was a part of an agency-wide small purchase reengineering team, which was awarded for its efforts by NASA Administrator Daniel Goldin last August. Stott says receiving the "Procurement Analyst of the Year" award was the highlight of her career since it recognizes her individual efforts in Langley's procurement office.

Tim Stubbs was the recipient of NASA's "Purchasing Agent of the Year" award. Stubbs was noted for his exceptional achievements in both placing and administering purchase orders and is the only Langley purchasing agent to earn a revised contracting officer's warrant for higher dollar, more complex procurements. Stubbs has worked at Langley since 1986. He has spent the last eight years in his present position during which time he received six outstanding performance awards. Stubbs said the "Purchasing Agent of the Year" award was an extraordinary honor because it was an Agency-wide consideration.

Results from Inter-Division Team Races

The Runners' Club Inter-Division 5-kilometer race, held Dec. 7, was won by the Computational Fluid Dynamics (CFD) Lab team from the Fluid Mechanics and Acoustics Division with 36 points. The team members were Jim Thomas, Chris Rumsey, Kyle Anderson, Jonay Campbell and Dianne DeTurris. The second place team was the Wyle Laboratories team with 54 points.

The fastest runner was Craig Eller of George Washington University with a time of 18:31. The first-place woman, with a time of 25:09, was Jonay Campbell of Mason & Hanger, Inc. running with the CFD Lab Team.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. **Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov)**, QuickMail (Ann Gaudreaux), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

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

NASA Flights Will Test Breakthrough Airplane Concept

BY KEITH HENRY

NASA has begun flight testing an experimental aircraft wing panel that may lead to a revolutionary way of improving the aerodynamics and fuel consumption on large future supersonic aircraft. The goal of the project is to achieve what is called laminar, or smooth, air flow over the surface of an aircraft's wing while flying at supersonic speeds. Laminar flow conditions can reduce aerodynamic drag, or friction, and contribute to reduced operating costs by improving fuel consumption and lowering aircraft weight.

If the NASA project is successful, a method of maintaining laminar flow control could be incorporated into the design of the High Speed Civil Transport (HSCT), a conceptual supersonic airliner of the future that would carry 300 passengers at 2.4 times the speed of sound.

"This is a very important event in the history of aerodynamics," said Jeffrey Lavell, project manager of the F-16XL Supersonic Laminar Flow Control (SLFC) flight experiment at Langley. "If we are successful, supersonic laminar flow control will revolutionize flight." Langley manages the project, which is part of the agency's High-Speed Research Program dedicated to producing technologies helpful to the development of a supersonic passenger jet.

Flights with the SLFC experiment are being carried out at Dryden Flight Research Center, Edwards, Calif., using an F-16XL, which has a large delta wing. The wing's shape is similar to the design that likely will be used on the HSCT, making the F-16XL an excellent testbed for the laminar flow research project.

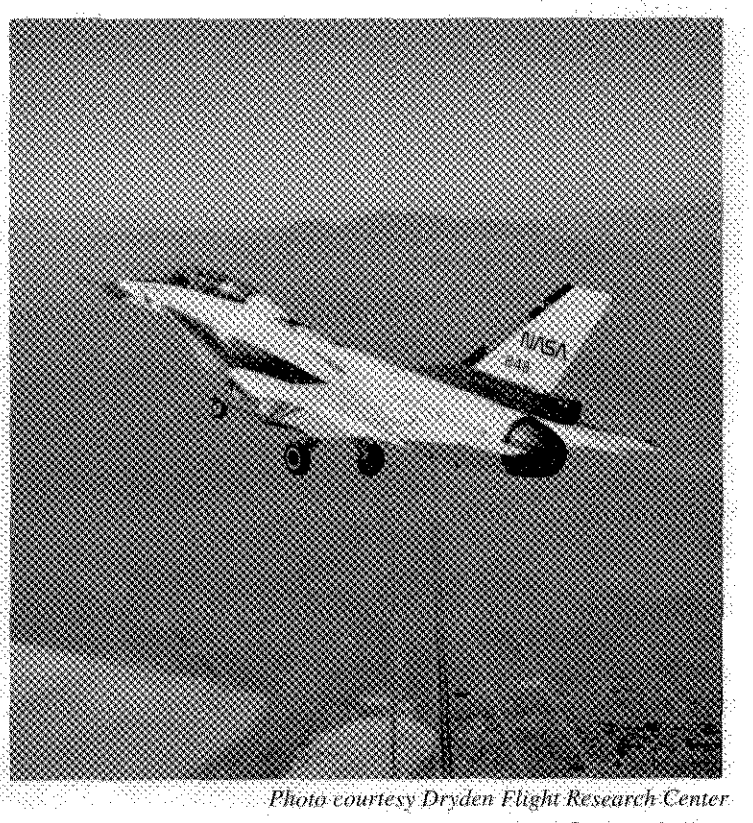


Photo courtesy Dryden Flight Research Center

The F-16XL maneuvers during recent testing in California displaying its large delta wing.

A large panel, called a glove, has been attached to the upper surface of the test aircraft's left wing. The titanium panel has been perforated with more than 10 million laser-cut holes, while below the panel is a suction system linked to a compressor. Natural aerodynamic drag on an aircraft wing is caused by the friction of a thin turbulent layer of air moving across the wing's surface. During coming research flights with the modified F-16XL, the suction system will pull that thin layer of turbulent air through the glove's porous surface to create a smooth laminar flow. The area below the glove has been divided into 20 sections, and the strength of the suction in each compartment can be controlled individually to attain specified conditions during the research flights.

The manager of the SLFC project at Dryden, Marta Bohn-Meyer, said that up to 70 flights are planned — as many as 30 were flown before the end of 1995. Most of the research flights will be at speeds of Mach 2 (1,400 mph) and altitudes of 35,000 to 50,000 feet, the proposed range for the HSCT.

NASA project officials hoped to have enough favorable data by December 1995 to give HSCT designers confidence to consider the use of SLFC when they meet to study possible technologies to incorporate into that aircraft.

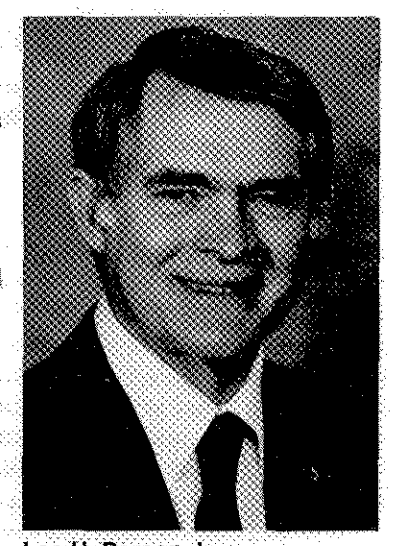
The SLFC experiment represents a collaborative effort between NASA and the aerospace industry. A team composed of Boeing, Rockwell and McDonnell Douglas designed the wing panel and suction system. The panel was assembled at a Boeing facility, Seattle, Wash., while the suction system was fabricated by McDonnell Douglas, Long Beach, Calif.

Three Receive Space Flight Awareness Awards

Three Langley employees were recently honored at Kennedy Space Center with NASA Space Flight Awareness Awards for their contributions to STS-74 which flew in November. They were Junilla Boatwright Applin, Engineering Design Branch, left, Chuck L. Carpenter, Aerospace Engineering Design Branch, right and O. Vernon Marshall, Engineering Design Branch, not pictured.

Lee Person Will Address January 30 Colloquium

The Colloquium lecture: "Earthbound 'Flying' Simulators for Weightless Rendezvous and Lunar Landings," has been rescheduled for Tuesday, Jan. 30 at 2 p.m. in the H.J.E. Reid Conference Center. The speaker will be Lee H. Person Jr. The talk was first scheduled for Nov. 14 but was interrupted by the first government furlough.



Lee H. Person Jr.

Person, a retired Langley research pilot, will talk about his participation in the prototype lunar landing research vehicle flight tests. He will also discuss his experiences with one-person vehicles such as Icarus and Pogo. Icarus and Pogo were vehicles of different designs that were both intended for travel on the lunar surface.

Person began his flying career with Naval Aviation training in 1954, received a degree in mechanical engineering from North Carolina State University in 1961, and began his research flying at Langley in 1962. The past 20 years on Center Person spent as lead pilot for NASA's Advanced Transport Operating Systems (ATOPS) program.

The Colloquium is open to all Langley employees. Civil service personnel should charge their time to Job Order B1010.

White House/NASA Affirm Role of Fathers in Families

The President's Letter

The following is an excerpt of a letter sent from President Clinton to the heads of all executive departments and agencies.

"I am firm in my belief that the future of our Republic depends on strong families and that committed fathers are essential to those families. I am also aware that strengthening fathers' involvement with their children cannot be accomplished by the Federal Government alone; the solutions lie in the hearts and consciences of individual fathers and the support of the families and communities in which they live. However, there are ways for a flexible, responsive government to help support men in their roles as fathers."

The President went on to direct all the executive departments and agencies to review every policy, program and initiative pertaining to families to ensure that they seek to include fathers and to modify, if appropriate, those designed to serve mothers and children to include the involvement of fathers. Included in that involvement would be to incorporate fathers in government-initiated research regarding children and their families.

NASA's Response

In support of that memorandum, NASA Administrator Daniel Goldin wrote to the White House. In the letter, he stated, "NASA has long been a proponent of family-friendly policies, and we recognize the importance that fathers play in the nurturing of their children. . . Fathers are considered a viable part of all NASA policies and programs and will be automatically included in any Government-initiated research regarding children and their families in which NASA participates."

Langley/Goddard Hold Joint Earth Science Workshop

In order to facilitate industry/government/university teaming for future Earth Science Missions (instrument, spacecraft, ground systems, launch vehicles) and related technologies, an Earth Science Missions and Technology workshop will cover future desired Earth Science measurement objectives, requirements and mission concepts and technology readiness.

The workshop will be held at the Hospitality House, Williamsburg, Va., March 5 through 7. All Langley Research Center, Goddard Space Flight Center, university, industry and other government agency scientists and engineers are invited to attend.

Questions pertaining to the workshop should be directed to Sonya L. Herrin, Science and Technology Corporation, by telephone, (804) 865-7604, fax, (804) 865-8721 or e-mail, herrin@stcnet.com. Technical questions should be directed to Dr. Roger Breckenridge at Langley, (804) 864-1933 or fax, (804) 864-1975.

A Call to Action: Preparing Girls and Women for Technological Workforce

The following is an excerpt from a recent report of the New York State Alliance for Girls and Women in Technology.

Equity of Outcome

All too often, young women think they will "have it all:" a partner, family and rewarding career—with no real understanding of how these goals are accomplished. This dreamy approach to their adult lives goes unchallenged by many parents and professionals who fail to guide girls toward serious academic and career planning. Differing career expectations for girls and boys, coupled with biased achievement/career aptitude testing procedures, reinforce basic assumptions that girls and young women are to be excluded from a broad field of choices, especially in mathematics, technology and the sciences.

Information about work and career options that require the study of mathematics, science and related fields can be developed in cooperation with employers, labor unions, higher educational institutions, community agencies and advocates. Early on, girls need to appreciate how these courses act as "gatekeepers" to future opportunities in higher technology and higher wage employment. Career days, science fairs and the growing national participation in the "Take Our Daughters to Work" program all help illustrate the connection between work in mathematics and science and wider job opportunities.

Supporting Girls as Student Decision-Makers

Decisions that will shape the course of personal and professional lives are sometimes made by girls and young women with an alarming lack of data about the realities they will face. Many girls believe that they can "opt out" of career preparation because they expect to be "stay-at-home" mothers who are supported by their husbands. A girl today can expect to spend more than 30 years in the paid workforce, regardless of whether or not she marries and has children.

The Startling Facts

The mental and physical readiness of students is directly related to their ability to succeed at school and to prepare for work. Yet, so many students manage to sidestep the relationship between healthy minds and healthy bodies. This is particularly true for girls:

- A 1990 study found that more girls than boys (in all ethnic groups except Asian) smoke cigarettes.
- Adolescent girls are four to five times more likely than boys to attempt suicide.
- Adolescent girls are at increasing risk for contracting AIDS.
- One in 10 teenage girls get pregnant each year. In 1992, more than one million American girls between the ages of 12 and 19 became pregnant. Since 1975 there has been a 10% increase in births among 15-17 year-olds, almost entirely of black and Latina teens.
- Only 25 percent of female high school seniors exercise vigorously on a regular basis — compared to 50 percent of boys of the same age.
- A 1994 study found that teenage girls are using more marijuana, cocaine and LSD than in 1990.

Eating disorders, alcoholism, drug abuse, sexual abuse, assault and homophobia are almost commonplace problems for many youngsters today. And yet, neither boys nor girls are likely to find a school or community environment that recognizes the presence of these issues in their lives, or helps them to construct useful solutions.

Involvement in these risky behaviors in teenage years, and the school difficulties and dropout rates often associated with them, is at odds with the realities of a future workforce that requires a higher level of training for the most basic, entry-level employment.

For a copy of the full report, send a $5 check payable to the Albany BOCES (Board of Cooperative Educational Services), and mail to: The Equity Center, 6 British American Boulevard, Suite G, Latham, New York 12110-1402. For more information, call Patsy Campbell, ext. 43291. To correct the problems, encourage your local schools and communities to strengthen and expand their health and family life education programs, and then, do the same things for them at home!

NASA Office of Legislative Affairs Available on WWW

NASA's Office of Legislative Affairs has made the NASA Legislative Affairs *Month in Review* available on the World Wide Web. The URL is http://www.hq.nasa.gov/office/legaff/month.html . Also available is a page that has updates to the appropriations process at http://www.hq.nasa.gov/office/legaff/current.html . The weekly Legislative Activities Report can be reached at http://www.hq.nasa.gov/office/legaff/lar.html .

Also available is a GIF spreadsheet of the Appropriations budget divided by Administrations request/House and Senate Mark and Conference Report amounts.

Suggestions for improvements and additions are welcomed. The URL is: http://www.hq.nasa.gov/office/legaff/ . For more information, contact Matt Peterson, mpeterso@legaff.hq.nasa.gov.

African-American History Program at Ft. Monroe

The first woman and the first African-American to lead Thomas Nelson Community College in its 26-year history will be the speaker for a program at Fort Monroe on Feb. 1. The program, that starts at 1 p.m. at the Post Theater, Building 42, will kickoff the installation's African-American History Month observance.

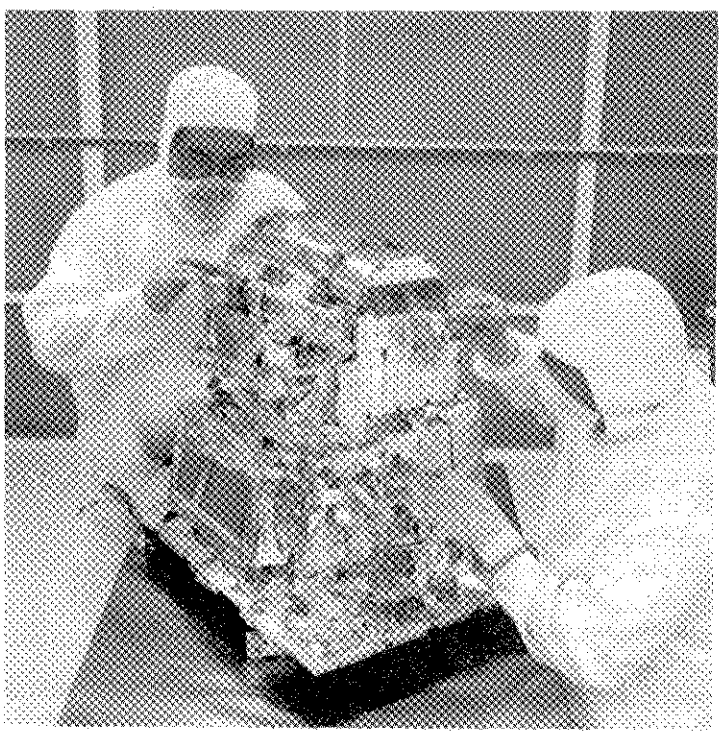
Dr. Shirley R. Pippins, the college's fifth president, will give remarks on the month's theme, "African-American Women: Yesterday, Today, Tomorrow."

Other events include a jazz set luncheon at the Fort Monroe Club, Feb. 7, from 11:30 a.m. to 12:30 p.m. The pay-as-you-go buffet will hear the music of the Hampton University Jazz Ensemble. A gospel program will be on Feb 20 from 6:30 to 8 p.m. in the Chapel of the Centurion at the fort. Admission is free.

The U.S. Continental Army Band will hold a free concert on Feb. 22 from 10 to 11 a.m. at the Post Theater. Finally, there will be a luncheon on Feb. 29 from 11:30 a.m. to 1 p.m. at the Fort Monroe Club, with speaker Dr. Roy Finkenbine, assistant professor of history at Hampton University. Tickets are required in advance.

Call 727-2122 for more information on all events.

Cloud Remote Sensing Instrument Delivered To Langley



Technicians at TRW, Inc. ready the Clouds and the Earth's Radiant Energy System (CERES) instrument prior to its delivery to Langley in October 1995. The CERES instrument is presently at the Goddard Space Flight Center, Greenbelt, Md., where it is being integrated and tested on the Tropical Rainfall Measuring Mission (TRMM) spacecraft. CERES/TRMM is scheduled for launch in August 1997.

CERES will measure reflected solar radiation and emitted thermal radiation from the Earth. The CERES data will help scientists better understand the role clouds play in determining the Earth's temperature. The CERES data is one of the highest priorities in NASA's Mission to Planet Earth Program and the U.S. Global Change Program.

CERES is a scanning broadband radiometer made up of three sensors, each with its own telescope mounted on a gimbaled platform that scans across the Earth below the satellite every 6.6 seconds. The CERES instrument is one of the most precisely calibrated radiometers ever to fly in space.

The Langley-managed CERES instrument is the follow-on to the Earth Radiation Budget Experiment (ERBE) instrument, which has been returning unprecedented data about the Earth's radiation budget since October 1984. For more information on the CERES project, please visit the CERES World Wide Web site at URL: http://asd-www.larc.nasa.gov/ceres/ASDcereshome.html.

Virginia Air and Space Center News

STAR TREK Federation Science®

STAR TREK Federation Science® will be featured at the center January 27 through April 30. Visitors will learn the way scientists do — by experimentation. The main focus is on scientific principles that are expected to challenge scientists in the future, including particle physics, practical astronomy and living and working in space. The principles behind propulsion systems, medical science and life support will be intertwined with basic research areas such as the structure of galaxies, orbits, relativity and planetology.

The center is open Monday through Thursday, 10 a.m. to 5 p.m.; and Friday through Sunday, 10 a.m. to 7 p.m.

Virginia Air and Space Center
Hampton Roads History Center

Antarctica

A new IMAX® film *Antarctica* is now playing at the center. The movie shows the history, science, ecology and awesome beauty of Antarctica, the world's southernmost continent. For the first time, the mysterious icy expanse of the highest, driest and coldest continent has been captured on the giant screen.

Call the center for times and fees at 727-0900.

Stevenson-Wydler Act Benefits Local Schools

BY PETER THOMAS

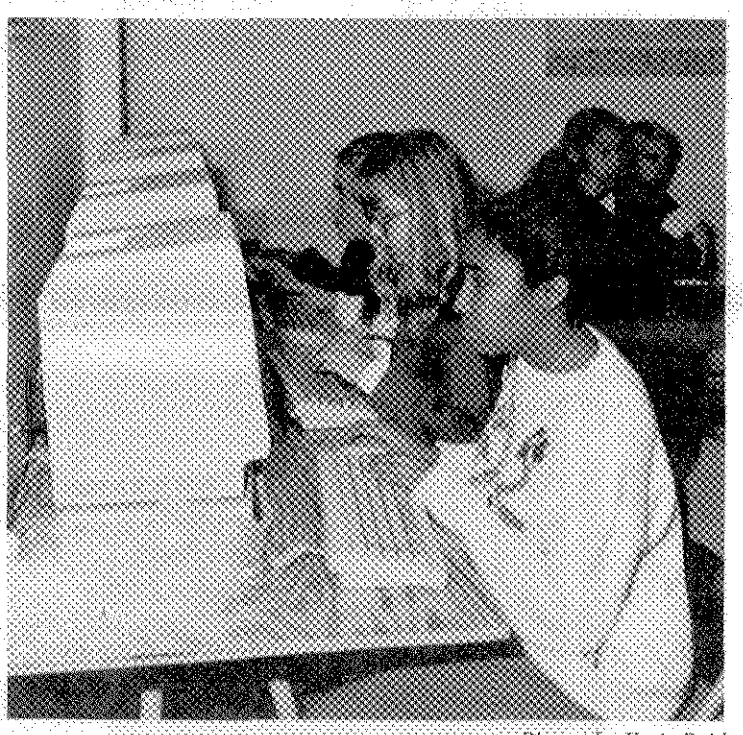
Langley's Office Of Education (OEd) and the Logistics Management Support Division's Property Disposal Office implemented the Stevenson-Wydler Technology Innovation Act (S-W Act) in March 1994. The Act had been amended in February 1992, and incorporated within this law is the direct transfer of education-related Federal equipment to elementary and secondary schools.

There are 51 school districts, counties or cities participating in the Langley Stevenson–Wydler (S-W) Act resulting in the distribution of more than 3,500 items with an acquisition cost of approximately $6.3 million. OEd has received some very positive feedback from the success of the S-W Act. One success story is from the Hampton Christian Schools (HCS). HCS schools are nondenominational schools in Hampton, established in 1935. These schools offer 535 students from grades K-12 a private school environment. Ken Hertzler, a science teacher in the high school, is one of the key proponents of the school's implementation of their program. More than 200 pieces of equipment have been received by HCS since the start of their participation in Langley's program in October 1994.

Hertzler said, "The ability to obtain quality computers and peripheral equipment to include multi-meters and overhead projectors from Langley's excess property has been a blessing."

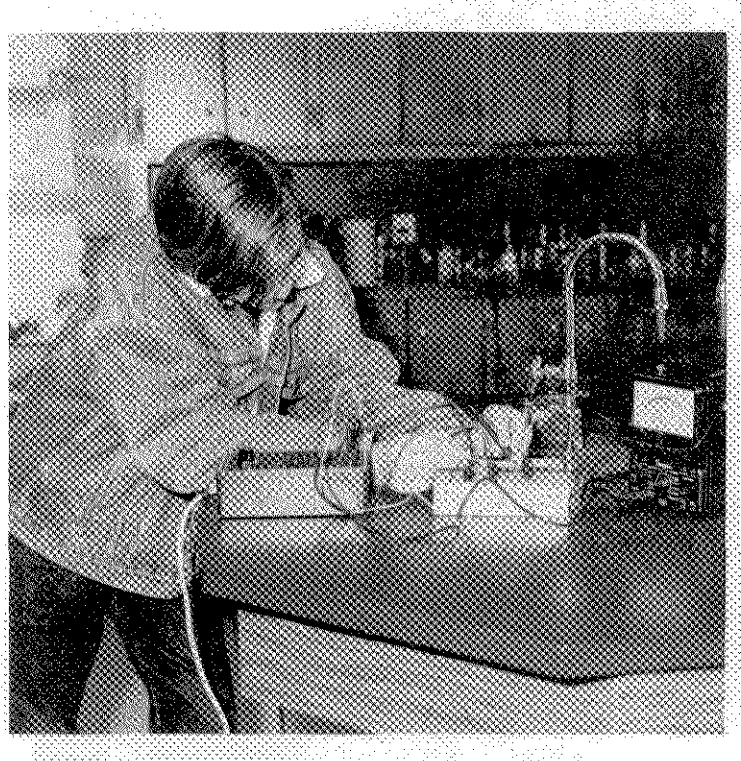
The school has been able to enlist the assistance of parents to tune up and/or recondition the equipment and to use it in three different settings in the school. "Four Macintosh Plus computers with hard disks are used in a remedial algebra class to help those students in need of extra practice catch up, while the regular class is in session. The chemistry and physics laboratories are enhanced by using a large screen monitor to demonstrate experiments and procedures that would otherwise be very difficult to include all the students." He also said that "hands-on use of computers in the IBM computer laboratory has provided flexibility and reliability that was previously not available."

Ms. G. Motoanga, a teacher at Hampton Christian Schools makes presentation with an overhead projector from Langley.



Photos by Katie Reid

A Macintosh lab was installed in the Algebra classroom to help students who needed some remedial work.



Student Dan Miles performs tests using Langley equipment. Two computer labs, one with IBM-compatible and one with Mac computers and printers, are also available to students thanks to the Center's distribution policy.

Property Disposal Office personnel have been highly commended by school officials for their people skills and professionalism. Screeners from the schools have been praised for the smooth and efficient procedures that were established to minimize their viewing efforts and ensure speedy receipt of equipment.

Langley has implemented the S-W Act in three phases. Phase I (March 1994 to February 1995) encompassed a 50-mile radius of Langley. Phase II (March 1995 to February 1996) includes schools within a 200-mile radius of the Center. Phase III, full implementation, will begin in March 1996 and will include the five-state area that includes Kentucky, North and South Carolina, Virginia and West Virginia.

Budget Process Part VII: Outlook for the New Year

BY LEE RICH, CONGRESSIONAL LIAISON OFFICER, EXT. 46529

Here is a review of the current budget situation.

• The U.S. government will not shutdown again this fiscal year, according to Rep. John Kasich (R-OH), chairman of the House Budget Committee, speaking for the Majority at a Jan. 14 "Meet the Press" appearance.

• With "shutdown strategy" abandoned, the focus, according to Kasich, will shift to "defunding" unwanted programs with the result that unfavored departments or programs will remain authorized but will have no operating funds. This approach is called "targeted appropriations." Another approach is to fund the government through a continuing resolution during FY 1996 at reduced levels.

• Six of the 13 appropriations bills for fiscal year 1996 which were supposed to have been passed by Congress and signed by the President by Oct. 1 have either not made it through Congress or have been vetoed by the President. Among those vetoed is the Veteran Administration (VA), Housing and Urban Development (HUD) and Independent Agencies appropriations bill which funds NASA. Should no agreement be reached with the White House, there are several agencies that would be "targeted" but NASA is apparently not one of them.

• In a front-page article "Budget Favorites," from the Jan. 16 *Washington Post*, the first sentence reads, "The National Aeronautics and Space Administration, which has friends in the right places, would get its money."

The budget: For NASA's FY 1996 budget, the President has requested $14.26 billion; the House of Representatives Appropriations bill requests $13.672 billion while the Senate bill wants $13.799. Finally, the Appropriations Conference is looking for $13.821 billion for NASA.

Two Programs Critical To Langley

• Aeronautics

Until the 1996 budget hearings, support for NASA's aeronautical research program was unchallenged. The aero budget hovered around $800-$900 million.

Government involvement in aero research was considered vital to national interests. This past year, with the focus on balancing the annual federal budget by the year 2002, with major cuts in discretionary spending; with allocations to the Appropriations Subcommittees on VA, HUD and Independent Agencies $9 billion less than for FY 1995; with the Congressional Budget Office recommending cancellation of Advanced Subsonics and High-Speed Research programs; and critics of Langley in Congress, suggesting its closure, challenges to 80 years of federally-sponsored aero research seemed to abound.

However, Boeing, McDonnell-Douglas, Lockheed Martin and other aerospace companies rallied to NASA's cause, and they made a difference. Realizing the corporate need for long-range government-sponsored research, CEOs from a dozen aerospace companies wrote to Rep. James Sensenbrenner (R-Wisc.), chairman of the Space and Aeronautics Subcommittee. They helped swing support for NASA programs from several senators and representatives. Robert Spitzer, a Boeing vice president and the first to begin aeronautical research advocacy, has testified on Capitol Hill in staunch defense of NASA's aero budget.

• Mission to Planet Earth (MTPE)

The national debate on the environment has shown that Americans care about clean air and water and conservation. Attempts to dismantle the Environmental Protection Agency (EPA) or curb its enforcement power have met with more resistance than Congress anticipated. MTPE has benefited from current voter efforts not to savage the EPA budget. Much of the MTPE budget previously cut has been restored with the help of Sen. Christopher "Kit" Bond (R-Mo.).

The most vocal critic of MTPE has been Walker, Rep. Robert Walker (R-Pa.), chair of the Science Committee, who is not seeking reelection in 1996. Sensenbrenner, a likely replacement to chair the committee, may be more supportive of MTPE.

All-in-all, there is a hopeful outlook for Langley.

Happenings

Start the New Year Off Right

There is no better way to begin a new year than by helping others. The blood drives are one way to accomplish this. The 1996 schedule for Langley blood drives is March 20, May 22, July 24, Sept. 25 and Nov. 27, 1996, in the H.J.E. Reid Conference Center, from 9 a.m. to 3 p.m. The continued support of donors is greatly appreciated by those who are helped by blood donations, and by the Office of Occupational Health Services and the American Red Cross. For more information, please contact Karen Ridlon at ext. 43194.

FOR RENT: Poquoson Towne Villas townhouse, 3 BR, 2-1/2 baths, living/dining room, family room w/ fireplace, eat-in kitchen, deck and storage building. Available 2/6, $750/mo. Call 838-6000.

LOST: Pair of red insulated gloves. Call Susan at ext. 47149.

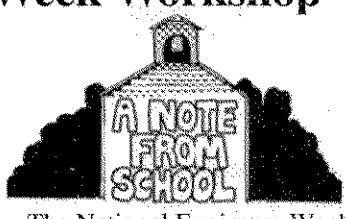
FOR SALE: Hampton/ Back River, beautiful colonial brick home on picturesque inlet, 4 BR, 2-1/2 baths, formal living and dining rooms and foyer, 5 min. from Langley. Asking $199,000. Call 723-7296 for details.

INCOME TAX PREP: At your place, call Nancy Taylor for an appointment at 723-5227.

INCOME TAX PREPARATION: Member of National Association of Tax Practitioners. Electronic filing and direct deposit offered at no extra charge. We also do small business bookkeeping, and we travel to you. By appointment, 874-3121.

TAX PREPARATION: I'll "Take the Tax out of your Return" this year. Specializing in personal and small business income tax returns, offering accurate computerized tax preparation, very reasonable rates with referral discounts. Will give you valuable information to reduce your 1996 tax liability. B.A. in Accounting and obtain annual VITA certification. Call Wanda at 838-6546 for quote and appointment.

National Engineers Week Workshop



The National Engineers Week Workshop for volunteers will be held from 1 to 3 p.m., on Monday, Jan. 29 at the H.J.E. Reid Conference Center.

A general session will give you tips and advice on what to do after you get your assignment, and what materials are available to support your classroom lesson.

Former volunteers will share ideas about how to get students involved in the presentation early and keep their interest. Come gather tips on how to develop class presentations to teach and transform!

Civil service employees may charge their time to K-12 Math-Science Outreach, Job Order #A-5423.

VIRGINIA SYMPHONY

Tickets are 20 percent off for NASA and contractors all season to Masterworks, Pops, and Mozart concerts. Call the Virginia Symphony ticket store at 623-2310 or visit the Langley Exchange Shop.

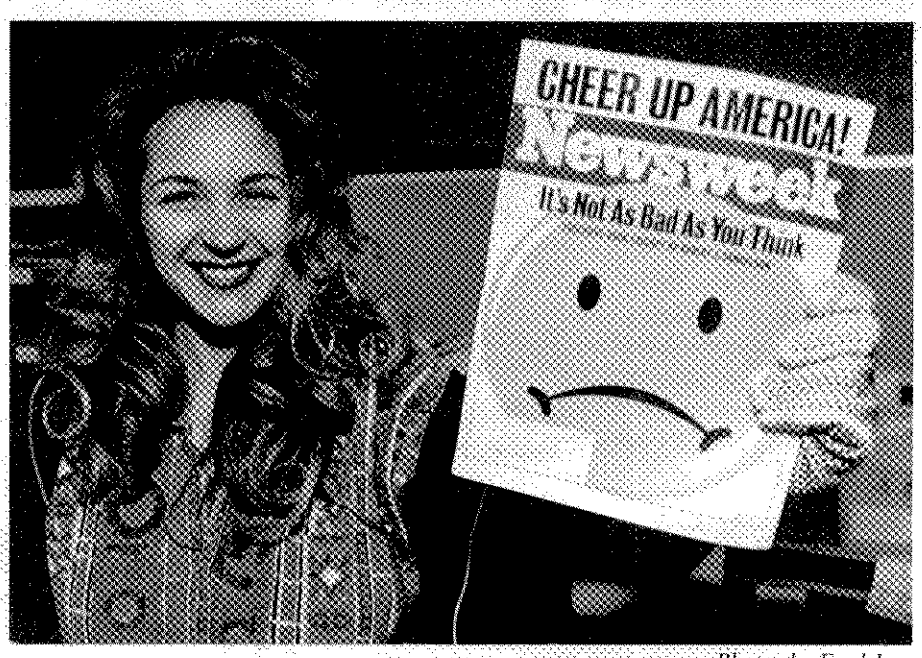
Researcher News Schedule for 1996

Deadline	Distribution
January 29	February 9
February 13	February 23
February 26	March 8
March 11	March 22
March 25	April 5
April 8	April 19
April 22	May 3
May 6	May 17
May 20	May 31
June 3	June 14
June 17	June 28
July 1	July 12
July 15	July 26
July 29	August 9
August 12	August 23
August 26	September 6
September 9	September 20
September 23	October 4
October 7	October 18
October 21	November 1
November 4	November 15
November 18	November 29
December 2	December 13

The Coleman Connection: Traffic Shift

A traffic shift on the Yorktown end began on Monday, Jan. 15. The shift is similar to what happened on the Gloucester end of the bridge on Dec. 20. The northbound lane will be shifted first, followed by the southbound lane. The speed limit at both ends of the bridge is 25 m.p.h.

The new traffic pattern will remain in effect until the new bridge spans are floated into place in April/May 1996.



Photos by Fred Jones

Let it snow, let it snow . . . The blizzard of '96 brought more than just snow to Langley. The recent furlough, that lasted from Dec. 15 through Jan. 6 plus the snow that followed it, left a backlog of mail. Elaine Heitman, above, shows an appropriate headline from a late-arriving magazine. Daniel Barrett and Becky Johnson sort through the more than 23 carts of mail that were delivered to the Center Jan. 9.

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Researcher News

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National Aeronautics and Space Administration
Langley Research Center

Researcher News

Bi-weekly Employee and Contractor Publication

Volume 10 ❖ Issue 3 ❖ February 9, 1996

"Microelectronics for New Millennium Space Missions" Is Colloquium Topic

Dr. Carl A. Kukkonen will present a Colloquium entitled "Microelectronics for New Millennium Space Missions" on Friday, Feb. 23 at 2 p.m. in the H.J.E. Reid Conference Center. Kukkonen is director of the Center for Space Microelectronics Technology and manager of supercomputing at the Jet Propulsion Laboratory (JPL), California Institute of Technology in Pasadena, Calif.

Microsensors, microinstruments and advanced microelectronics are key technologies for the faster, better, cheaper science missions envisioned by NASA for the 21st century.

Kukkonen will provide an overview of JPL's research and development programs in microelectronics and microinstruments, and describe their application in the space and earth sciences.

The Center for Space Microelectronics Technology conducts research and development in microsensors and microinstruments, detectors and high performance computing. The center is sponsored by NASA and the Department of Defense to develop advanced technology for space mission applications.

Dr. Carl A. Kukkonen

Prior to joining JPL in 1984, Kukkonen was at Ford Motor Company where he assessed the prospects for hydrogen as an alternative automotive fuel, and designed and developed a direct injection diesel engine. Kukkonen earned his doctorate in theoretical physics from Cornell University in 1975.

A Message from the Director

Government shutdowns, snow storms, zero base reviews and political posturing . . . It's been a confusing and frustrating period. I am sorry to say that I'm not sure it is going to get better anytime soon!

Yet, I want to congratulate and thank everyone on the Langley team for the way you are handling or trying to handle the situation. From my personal observations, I think we are weathering the storm as well as could be expected.

Most of us in the government today have come to realize that we no longer are immune to the changes that have been affecting the private sector for many years. Furloughs, shutdowns and ideological debates are part of the new way of doing business, and we are all having to adjust.

These difficult times are obviously quite a challenge to our morale and psyche.

I want to thank everyone for sticking together and handling the situation as well as you have. I know it is a challenge.

Paul

— Paul F. Holloway, Center Director

Langley Engineers Week Volunteers Set to Go

BY CATHARINE G. SCHAUER

Anyone looking for samples of rocks from Mars, Jupiter, Venus and Earth came to the right place when they attended this year's Engineers Week workshop.

Co-sponsored by Women in Aerospace and the Office of Public Services, attendees left with a new respect for the importance of involving young audiences in their presentations. They also got some edible "samples" of rocks from the planets.

Dr. Shelley Canright of the Office of Education who presented a program on "How to Make Presentations that Teach and Transform," used the edible rocks to get and hold her audience's attention. Using scientific methods, she also had them solve the mystery of what rock came from what planet.

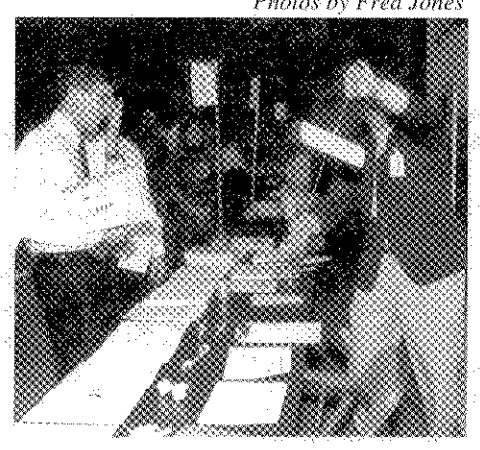
"I don't recall doing things like this when I went to school," one volunteer remarked. "This is what I call active learning!"

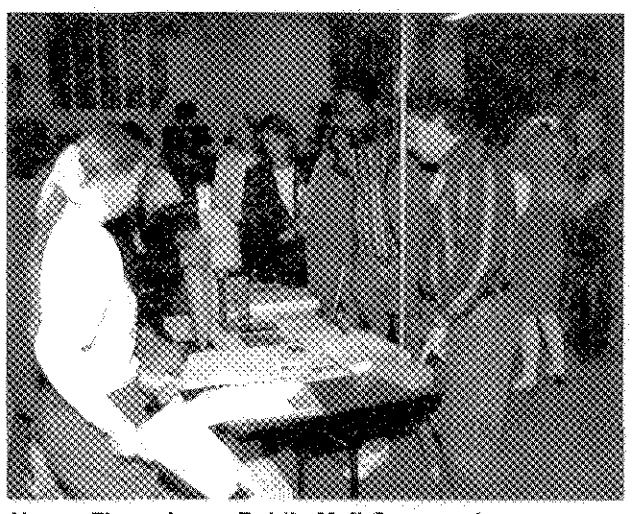
A second presentation by Joyce Weeks, science supervisor for the Hampton City Schools, reinforced involving students in the learning process. Weeks stressed always asking students the who, what, when, where and why of an experiment.

Special appreciation goes to the following for supporting the workshop by making their presentations available to all volunteers: Women in Aerospace, American Association of Aeronautics and Astronautics, Cheri Tanner, Audrey Coppedge, Jeane Shanks, Pete Thomas, Kathy Powell, Dave McInnes, Elka Ertur, Greg Daughton, Dr. Joe Posey, Anna-Maria McGowan, Marilou Philips and Nancy Kruse.

Joyce Weeks, science supervisor for Hampton City Schools, conducted a "bouncing ball" experiment with 13 volunteers, some pictured here with her. They were all part of a January workshop given for 133 Engineers Week volunteer speakers who will go to about 180 schools in February.

Photos by Fred Jones





Nancy Finn, above, Public Mail Center, gives out Engineers Week assignments to Langley volunteers from all divisions. At left, Pete Thomas of the Office of Education gives an aeronautical demonstration to volunteer Tom Moul of the Systems Analysis Branch.

Volunteers are still needed for National Engineers Week. Send completed forms to Cathy Schauer at Mail Stop 154 or fax to ext. 47732. To receive a form, call ext. 43293, or stop by the Public Mail Center in Building 1153, room 115.

A *Researcher News* Survey is on Page 3. Please complete it and return it quickly. We are looking for ways to serve you better!

News Briefs

Around the Agency

ABBEY NAMED DIRECTOR OF JOHNSON SPACE CENTER – George W. S. Abbey has been named the new Director of the Lyndon B. Johnson Space Center (JSC), Houston, Texas, effective immediately, NASA Administrator Daniel S. Goldin announced recently. "George Abbey is uniquely qualified to lead the Johnson team into the future," Goldin said. "Over the course of his eminent career with NASA, he has distinguished himself as an innovator and pioneer at all levels of Agency management." Abbey had been serving as acting Director at JSC since August 1995. His career in federal service spans over 40 years. His career with NASA began in 1967.

WEST NAMED NASA CHIEF INFORMATION OFFICER – Ronald S. West has been named Chief Information Officer (CIO) at NASA Headquarters, Washington, D.C., effective March 3. West will succeed John C. Lynn, who has announced his intention to retire after 40 years of government service. The CIO reports directly to the NASA Administrator and is responsible as an integrated Agency focus for the development of information resource management strategies, policies and practices. These encompass strategic planning; standards in computing, networking and security; establishment of system and information architectures; and incorporation of life-cycle management concepts into information technology acquisitions and management. In addition, the CIO serves as the NASA-designated senior official for Information Resource Management.

Good Wishes, Well Received at Director's Reception

Photos by Fred Jones

Center Director Paul F. Holloway and Mrs. Holloway, above left, and Deputy Director Dr. H. Lee Beach and Mrs. Beach greeted hundreds of guests during the Dec. 15 Holiday Reception for Langley employees and retirees. At right, Chief Financial Officer Joseph Struhar pours punch for Pat Link, Office of Education, at the reception with the help of Vivian Merritt, Office of Equal Opportunity Programs.

In Memoriam

Robert D. Ross

Robert D. Ross, 90, died on Tuesday, Jan. 16. He retired from Langley after 25 years as an electrical aeronautical engineer who worked on the Apollo Space Program.

Kyle T. Bullock

Kyle T. Bullock, 28, died Monday, Jan. 15. A native of Hampton, he was a lifelong Peninsula resident.

Bullock was a student in Langley's engineering co-op program for the past three years.

In a letter to Bullock's parents, Center Director Paul F. Holloway wrote, "Kyle was highly regarded by those he worked with in the engineering community. Throughout his co-op assignments, he consistently received outstanding ratings . . . To many, he was not only a co-worker, but also a trusted friend. He will be missed at NASA Langley Research Center."

Speakers Bureau Report

Karen Freidt spoke at Pulaski County High School, Somerset, Ky. about "Computer-based Graphics."

Michael Uenking spoke at Great Neck Middle School about "Careers in Engineering."

Veloria Martinson spoke at the Portsmouth Public Schools Science Scholars, Superintendent's Scholars Luncheon about "NASA Langley History and the Aircraft Landing Dynamics Facility."

George Sydnor spoke to the IEEE Old Dominion University Student Chapter about the "State-of-the-Art Fan Drive System on the National Transonic Facility."

David Shannon spoke at Boushall Middle School about the "Solar System and Space Station."

Alisa Buchman spoke to students at Old Dominion University's Department of Mechanical Engineering about "Preadaesion Laser Surface Treatment of Carbon Reinforced Peek Composite."

Debra Carraway spoke to an Old Dominion University psychology class about "The Glass Ceiling: Experiences of a NASA Engineer."

Robert Baals spoke to the Poquoson Lions Club about "Lift, Drag and Wind Tunnels."

Roland Bowles spoke at Collegiate School, Richmond, Va. about the "The First 'A' in NASA."

Richard E. Davis spoke at Palmer Elementary School's CHROME Club about "Airplanes."

Byron Meadows spoke to members of Girls, Inc. about "Measuring Earth's Atmosphere."

Salas Named Director of ICASE

BY MEGHAN WOODCOCK

Manuel D. Salas

In February, Manuel D. Salas, leader of Langley's Computational AeroSciences Team, retired from NASA and took over as director of the Institute for Computer Applications in Science and Engineering (ICASE). ICASE is part of a consortium of major colleges and universities whose researchers and consultants meet on Center. The Institute helps promote cooperative research activities among academic and industrial scientists and NASA scientists and engineers. The Institute conducts a broad unclassified basic research program focused on Langley's areas of excellence.

Salas began working at Langley in 1974—the same year ICASE was established. His appointment as director is for an indefinite period, and Salas says he is looking forward to the new opportunities the position will afford. He said, "I am pleased with the current research direction at ICASE but would also like to broaden the base of research to include materials and structures."

Retiree Harrison Receives 1996 AIAA Atmospheric Sciences Award

Edwin F. Harrison, former head of the Radiation Sciences Branch, was presented the 1996 American Institute of Aeronautics and Astronautics (AIAA) Losey Atmospheric Sciences Award Jan. 16. The award is given annually for outstanding contributions to atmospheric sciences.

Harrison was given the award "For his outstanding leadership, vision, and scientific contributions in advancing the understanding of clouds, atmospheric radiation, and climate through innovative analysis of satellite missions and observations."

Harrison retired from Langley in April 1995 after more than 38 years of service. During his service, Harrison made major contributions in fields ranging from aerodynamics and astrodynamics to meteorology and climatology. He served as head of the Mission Analysis Section from 1970 to 1976 and head of the Missions and Operations Branch from 1976 to 1982. He was made head of the Radiation Sciences Branch in 1982. Harrison was also a principal investigator on the Earth Radiation Budget Experiment (ERBE) science team and co-investigator on the Clouds and the Earth's Radiant Energy System (CERES) science team.

Harrison has also been the recipient of the 1985 H.J.E. Reid Award, the NASA Exceptional Service Award, the NASA Exceptional Scientific Achievement Medal and the NASA Outstanding Leadership Medal. He is a member of the American Geophysical Union and an Associate Fellow of the AIAA.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following Langley employees are approved leave recipients: Marilyn K. Aldrich, Janet L. Edmondson, Sally C. Johnson, Geraldine N. Pardue, Tammy J. Price, Cassandra Stevens and Charles S. Washington

Potential leave donors wanting to donate annual leave to recipients currently in the Voluntary Leave Transfer Program, send your donations on the "Request to Donate Annual Leave to Leave Recipient Under the Leave Transfer Program" form. The form can be found via your computer in Informed Manager. Send completed forms to Mail Stop 293, Office of Occupational Health Services, or fax them to 864-9114. Your annual leave donations are greatly appreciated. For more information, call Karen Ridlon at ext. 43194.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Ann Gaudreaux), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor. . . . . Catherine Watson

Editor. . . . . Ann C. Gaudreaux
Science and Technology Corp.

Assistant Editor. . . . . Jeane Shanks
Science and Technology Corp.

Photojournalist . . . Carole Petrachenko Chapman
Science and Technology Corp.

Photographer . . . . . Fred Jones

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

Researcher News Survey:

To better serve you, and meet your informational needs, the staff of the ***Researcher News*** *is conducting this survey. Please take a few minutes out of your already hectic day to complete this survey and return it to Ann Gaudreaux at Mail Stop 146 by March 15. Comments or questions about this survey can be sent via e-mail to: researcher-news@larc.nasa.gov. Thanks in advance!*

— Catherine Watson
Managing Editor

How would you rate the *Researcher News* as a source of information...

I . . . from NASA Langley senior staff:

6 - information not important to me
5 - excellent
4 - good
3 - fair
2 - poor
1 - no opinion

II . . . to help plan your NASA career:

6 - information not important to me
5 - excellent
4 - good
3 - fair
2 - poor
1 - no opinion

III . . . about individual researchers and/or projects at NASA Langley:

6 - information not important to me
5 - excellent
4 - good
3 - fair
2 - poor
1 - no opinion

IV . . . about individual researchers and/or projects at other NASA centers:

6 - information not important to me
5 - excellent
4 - good
3 - fair
2 - poor
1 - no opinion

V . . . about NASA Langley as a whole:

6 - information not important to me
5 - excellent
4 - good
3 - fair
2 - poor
1 - no opinion

VI . . . about NASA as a whole:

6 - information not important to me
5 - excellent
4 - good
3 - fair
2 - poor
1 - no opinion

VII What percentage of your information about NASA Langley do you currently get from the *Researcher News*?

6 - 100%
5 - 75-99%
4 - 50-74%
3 - 25-49%
2 - less than 25%
1 - no opinion

VIII What percentage of your information about NASA as a whole do you currently get from the *Researcher News*?

6 - 100%
5 - 75-99%
4 - 50-74%
3 - 25-49%
2 - less than 25%
1 - no opinion

IX Does the *Researcher News* provide you with information in a timely manner?

yes ____

no ____

X If the *Researcher News* were available only via the Internet, would you read it?

yes ____

no ____

If no, why:

XI What are your favorite features in the *Researcher News*?

XII What are your least favorite features in the *Researcher News*?

XIII What type of stories would you like to see get increased coverage in the *Researcher News*?

NASA Langley Affiliation:

Retiree _____
Contractor _____
Civil Servant _____
Other _____

Thank you!

Additional Comments:

Return to: Ann Gaudreaux, editor, Mail Stop 146 by March 15.

Langley Cyclists Help Restore Bike Access on King Street Bridge

Cyclists, including those who ride through Langley Air Force Base (LAFB), had both roadway and bicycle access on the King Street Bridge for many decades. That changed in October 1993 when bike riding was prohibited on the bridge. Bicycles were permitted only to be walked across the bridge using the sidewalk.

The closing of the bridge to Hampton cyclists required them to reroute, riding on Mercury Boulevard and using the LaSalle gate, coping with motorists driving 55 mph.

Langley and LAFB cyclists discussed the aspects of bicycle safety and access on the King Street Bridge with LAFB traffic management officials through meetings, teleconferences and letters. Hampton city officials, the Peninsula Bicycle Association, the Hampton Roads Bicycle Advocacy League, Congressman Herb Bateman, the Virginia Bicycle Federation, the U.S. Department of Transportation and *Bicycle* magazine were all kept informed of the discussions and all were supportive of restoring normal and safe bicycle access onto LAFB.

Access to the King Street Bridge roadway was restored to vehicles in October 1994. Bicycle access on the bridge's sidewalk was restored in May 1995. Finally, NASA Langley cyclists, with support from their LAFB counterparts, began to push for full and safe access for bikes on the bridge.

Some of the Langley cyclists involved in restoring safe bicycle access on the King Street Bridge have formed the Langley Bicycle and Pedestrian Safety and Advocacy Club. The purpose of the club is to foster bicycle and pedestrian safety through promotion of signage, lane markings, helmet use and dissemination of bicycle and pedestrian safety information; and to inform Langley employees of the health, ecological and economic benefits of cycling, running and walking.

The club has requested crossing signs between Langley buildings 1209 and 1250 on the recently-widened Langley Boulevard.

Members are now working on the issues of replacing newly-posted "Bicycles Not Allowed" signs with "Slow for Pedestrians and Cyclists" signs at Langley gates, and the removal of "No joggers, No walkers, No bicycling anytime" signs on Landing Loads Loop. Promotion of bike lanes on sections of Langley Boulevard; use of bike helmets and rear view mirrors; and "Bike to Work" activities in May, Bike Month, are planned. Club meetings are held on the last Friday of the month at 11:30 a.m. in the executive dining room of the cafeteria. For more information, call Gale Harvey, ext. 46742, "Bird" Taylor, ext. 43768, or Olaf Storaasli, ext. 42927.

Cyclists travelling along the King Street Bridge at Langley Air Force Base.

New "Monograph in Aerospace History" Available

Free for the asking, the most recent Monograph in Aerospace History is available. *Enchanted Rendezvous: John C. Houbolt and the Genesis of the Lunar-Orbit Rendezvous Concept*, written by James R. Hansen, tells the important story of NASA's effort to decide upon the method of carrying out the mandate to land an American on the Moon before the end of the 1960s.

Copies of this monograph are available free of charge from the NASA History Office, Code ZH, NASA Headquarters, Washington, D.C. 20546. To speed response, please include a 9- by 12-inch self-addressed, stamped (for one pound) envelope.

Life after Langley

Marge Gieseking Honing Old Skills, Learning New Ones in Retirement

BY RON HARVEY

Working at Langley has been a "neat" experience for Marge Gieseking, a 1994 retiree who was a program analyst in the Controls Structures Interaction Office of the Guidance and Control Division.

After her graduation from the University of Wisconsin at Whitewater, Gieseking's first tenure at Langley began in 1959. Leaving in 1964 to raise her family, she returned to the Center in 1973.

Life at Langley during those early days of NASA were fast-paced and exciting for Gieseking. Early assignments included Project Mercury where she met the original seven astronauts, and the Dyna-Soar Project where she was the project's Langley representative at Wright Patterson Air Force Base during the absence of the project manager.

In later years, Gieseking's projects included working in the Scout Office and the Manned Orbital Research Laboratory Studies Office, NASA's predecessor to the space lab.

When asked what she enjoyed most about working at Langley, Gieseking said "The people – they were brilliant people during neat and exciting times." Early NASA pioneers such as John Stack, Sid Pauls, Harvey Soule, Ray Hook and Bill Gardner were some of those people.

"Busy" is how Gieseking summed up her life after retirement. Her husband, Hal, is a travel writer, and they just returned from a White House conference on travel and tourism. They are now planning a trip to Malaysia to visit their daughter, Peggy, and son-in-law, Craig, who is working in Penang.

Marge Gieseking

The Giesekings are involved in several community activities including the Muscerelle Museum, Historic River Land Conservancy, the Child Development Resources and the Kingsmill Choraliers.

On the home front, last March Gieseking became a grandparent for the first time when her daughter, Beth, had identical twins, Rebecca and Kaityln.

A devoted Virginia Tech fan (all of her three children are graduates of Tech), Gieseking clips Tech sports write-ups and mails them to her son John who lives outside the local area.

Gieseking has just refinished a primitive cupboard, some chairs and rockers she has been "lugging around for more than 30 years." Additionally, she has been doing picture framing for Hal's travel photos and for some friends.

Gieseking has attended cooking demonstrations and has been growing herbs in her deck garden. She has also canned applesauce, tomatoes and peaches. Her new cooking skills, honed by cooking for guests, have gotten special note from her children. "Where was all the good food when we were growing up?" they complained. Gieseking laughs and responds that since her retirement she has had "more time to enjoy more of life's pleasures."

Anyone who knows or meets Marge Gieseking can easily imagine that this warm and energetic Langley retiree is enjoying "life's pleasures."

Joint Earth Science Workshop

An Earth Science Missions and Technology workshop will be held at the Hospitality House, Williamsburg, Va., Mar. 5 through 7. The workshop's purpose is to further the teaming concept for future Earth Science Missions (instrument, spacecraft, ground systems and launch vehicles) and related technologies. All Langley Research Center, Goddard Space Flight Center, university, industry and other government agency scientists and engineers are invited to attend.

Questions pertaining to the workshop should be directed to Sonya L. Herrin, Science and Technology Corporation, by telephone, (804) 865-7604, fax, (804) 865-8721 or e-mail, herrin@stcnet.com. Technical questions should be directed to Dr. Roger Breckenridge at Langley, (804) 864-1933 or fax, (804) 864-1975.

WebCat Is Loose in LaRC's Technical Library

BY MANJULA AMBUR

Langley's Technical Library debuted WebCat on Jan. 24. WebCat is the World Wide Web interface to STILAS, the Library's on-line information system. This is part of the library's ongoing efforts in realizing the goal of an 'Electronic Library' by expanding the databases accessible from employees' desktops and improving the user interfaces.

WebCat provides a more user-friendly interface for searching STILAS. This is not a new system or database, but is only a new interface to the standard STILAS. All the current search options (keyword, author, title, publication year and conferences) are available and results can be downloaded and/or e-mailed to oneself. They can also be e-mailed to the library as requests.

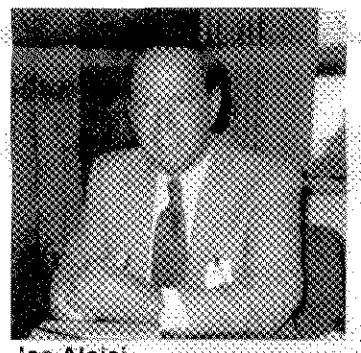
The URL is **http://stilas.larc.nasa.gov** and the login is 'library'. Online user guides are available for using WebCat and searching STILAS. Users can access these guides by clicking on "Help" from the WebCat homepage. A detailed paper "STILAS Users Guide" is available and can be requested by calling the Reference Desk at ext. 42356, or via e-mail to tech-library@larc.nasa.gov.

Do not hesitate to call the Reference Desk for more information and assistance. Try WebCat. Your feedback, which will help us serve you better, is welcomed.

Three Stars for CTAPC

Resource Consultants, Inc., the organization that provides Langley and all NASA centers with career transition services, has given their highest award for distinguished client service to Joe Aloisi, manager, and Marty Brown, counselor, of the Career Transition Assistance Program Center (CTAPC). Three CTAP Stars have been awarded in recognition their sustained exemplary service in assisting Langley personnel. The third star recognizes the center's overall excellent service to clients.

CTAPC offers a variety of career management services including career consulting sessions, workshops/seminars, interview training, books/publications, telephone joblines, several position databases and resume design/preparation. Their services are available to all Langley civil service employees and their spouses. Their offices are located at 4 Lindbergh Way, adjacent to the Langley Federal Credit Union.



Joe Aloisi

Marty Brown

CTAPC Schedule

- Feb. 14-15, 9 a.m. to 4:30 p.m., Career Transition Seminar, Building 1216.
- Feb. 22, 9 a.m. to noon, employer panel "Trends in the Career Marketplace" Pearl Young Theater, 5 N. Dryden.
- Feb. 27, 9 a.m. to 4:30 p.m., "Integrating Covey's Seven Habits into the Job Search"
- Feb. 29, 9 a.m. to 4:30 p.m. "Starting Your Own Business," Building 1312.
- March 5, 9 a.m. to noon, "So You Want to be a Consultant?"
- March 12-13, 9 a.m. to 4:30 p.m., Career Transition Seminar, Building 1216.

Call Susan Costello, ext. 45000, for more information and to register.

Despite Furlough Threat, Employees Help Those in Need

BY MARNY SKORA

December 1995 was especially warm, but that phenomenon had nothing to do with the outside temperature, the jet stream or a technology breakthrough in the heating industry. The added warmth was the result of a concern by Langley employees for those in need.

Civil service employees, contractors and retirees joined together to make Langley's holiday community service projects a grand success. The common factor in the varied activities was a desire to help those who needed help — those most Langley workers would never even meet.

Earn Wings

The Acquisition Division spearheaded an Angel Tree effort, an initiative that has become their holiday tradition. For the second year, this project — originated by Stan Ward eight years ago — was opened up to the entire Center. Angel tags distributed by the Salvation Army outlining ages and appropriate sizes for needy kids appeared on trees in area malls and churches. Many of these tags were pulled by Center employees who gleefully shopped for kids known only in the shopper's imagination.

Bags and boxes began appearing under a tree in the cafeteria decorated with angels. Clothing for 26 kids adopted by the Acquisition Division were piling up in closets and conference rooms across the Center. Warm clothes, socks, underwear, hats, gloves, shoes and boots were among the items chosen for nearly 50 children.

And there was a toy, a cuddly stuffed animal or candy in many of the packages as well.

Laurie Cole who had participated in the past wanted to do more than donate this year. "I wanted to give of my time as well," she said. "I had no idea it would be so much fun." More than any other time in her life, Cole had a very real feeling of what it is like to be Santa. "You know," she added, "I find myself looking for those kids who might have gotten outfits that I picked out." The question 'would she do it again?' got a resounding "Yes!"

Again this year, Linda Urquhart helped deliver the items to the Salvation Army's Hampton facility. "The gym was stacked to the ceiling with packages, toys and games. The whole room was full except for walking paths," reported Urquhart who was obviously proud that Langley had a role in the area's generosity.

In a related effort, the Projects Division provided bags of groceries as well as Food Lion gift certificates to several families. "I cannot express enough how much your contributions mean for these people," said Angie Davis who spearheaded the effort that has become a Space Projects Office tradition.

Cookie Power

And the holidays wouldn't be complete without sweets — and cookies seemed to be the dessert of choice. With the support of the Cafeteria, Langley launched *Cookie Power 1995*. Again this year, employees were encouraged to bake an "extra batch" of their favorite holiday treat to share with those less fortunate.

Photo by Katie Reid

Dozens of homemade cookies were donated by Langley "bakers." Cafeteria manager Donis Anders packs cookies for delivery to the Salvation Army in Hampton.

"The response was overwhelming and the treats looked scrumptious," reported Donis Anders, cafeteria manager. "The effort was infectious. Even a fellow who was doing some road work just before the holidays caught the spirit and asked if he could join in the effort."

More than 170 dozen cookies, brownies, fudge and other treats were collected during December, stored in the cafeteria deep freeze and delivered to the Salvation Army. These and the fruit that decorated the tables for the Director's Holiday Reception were donated to the mobile soup kitchen to provide a little extra cheer for the homeless.

The Impact

The Salvation Army thanks Langley employees for their generosity again this year. "Need, however, has no season," Captain Steve Long reminded all those who delivered holiday items. "The local community has a continuing need for food and clothing."

Long reports that the Salvation Army is in special need of nonperishable food and warm coats for children and adults. He and his staff operate an emergency canteen for the hungry and a shelter for the homeless. They give out bags of food daily to families in need and, especially at this time of year, help those on a tight budget with utility assistance.

"The greatest need is time," Long concluded, "time spent with others." Langley's Community Service Program will continue to pass along information on opportunities to help those who need help desperately.

Photo by Katie Reid

Bags of warm clothing were collected for area "angels." Acquisition Division employees, left to right, Stan Ward, Laurie Cole, Linda Urquhart and Nikki Tingen load Urquhart's car for delivery to the Salvation Army.

Photo by Olin Jarrett

An Angel Tree in the cafeteria became the repository for anonymous "Santas" to drop off packages for needy children.

Happenings

FOUND: A set of wedding photos. Please call security at ext. 43420 to identify and claim.

FOR SALE: Hampton Club 2BR condo, one bath, extra appliances, blinds, wall-to-wall carpet, security system, pool, near Langley. Asking $47,000. Call Marion 873-6900.

TAX PREPARATION: "Take the Tax out of the Return" this year. Specializing in personal and small business income tax returns, offering accurate computerized tax preparation, very reasonable rates with referral discounts and valuable information to reduce your 1996 tax liability. I have a bachelor of arts degree in accounting and obtain annual VITA certification. Call Wanda at 838-6546 for quote and appointment.

FOR RENT: Denbigh, 3 BR, 2 baths, living room, dining room, fireplace, eat-in-kitchen, fenced yard. $685/mo. Call 898-5710.

RECYCLING: The next increment of large, 44-gallon blue and green containers has arrived on Center and distribution of these containers has begun. Once the containers are in place, nearly all facilities will be on-line for the streamlined, user-friendly paper recycling program. Due to the furlough and funding constraints, the small blue, individual containers were just ordered. Those without the small containers can use any other type of container in the interim, and emptied into the large, central containers which will be emptied on a routine basis. This should preclude any further need for boxed paper for recycling. Individual containers will be distributed as soon as they arrive. For pick-up information or scheduling, call Dave Steigerwald at ext. 48058.

INCOME TAX PREP: At your place, by appointment. Call Nancy Taylor at 723-5227.

VOLUNTEERS NEEDED for rocket project with Gloucester and Virginia Beach high schools. Volunteers should contact Lee Rich at 864-6529.

CALL FOR ABSTRACTS: The Aerospace Sciences Section of the Virginia Academy of Science is now soliciting abstracts for the 74th meeting at the Virginia Commonwealth University. The author will make a 15 minute presentation at the meeting and deliver a one paragraph abstract to be included in the proceedings. Titles of proposed presentations should be submitted by Feb. 22. Abstracts will be due at the meeting. Send titles to: Henri D. Fuhrmann, NASA Langley Research Center, Mail Stop 248, Hampton, VA 23681-0001, phone, (804) 864-5254, fax., (804) 864-43553 or e-mail h.d.fuhrmann@larc.nasa.gov

VIRGINIA SYMPHONY: *Giselle* with the Rich-mond Ballet Feb. 10; Pops with Bernadette Peters, Feb. 16 and 17; Masterworks concert Feb. 23 and 24 includes Stravinsky, Prokofiev and Tchaikovsky. NASA and contractors get 20 percent off tickets to Master-works, Pops and Mozart concerts all season. Call the Virginia Symphony ticket store at 623-2310.

National Engineers Week
Peninsula Engineer of the Year Awards Banquet

The Peninsula Engineers Council will sponsor the National Engineers Week Peninsula Engineer of the Year awards banquet on Feb. 24 at the Radisson Hotel in Hampton. A cash bar opens at 6 p.m. with dinner at 7 p.m. and the program at 8 p.m. The cost is $18 per person. The engineer to be honored is Leonard P. Waltz, P.E. A representative from the Ford Motor Company will speak about new technologies in Ford trucks. For information, call Brian Beaton at ext. 47210.

INCOME TAX PREPARATION: Member of National Association of Tax Practitioners. Electronic filing and direct deposit offered at no extra charge. Also do small business bookkeeping. We travel to you, by appointment. Call 874-3121.

WILLIAMSBURG SYMPHONIA will present a symphonic fairy tale for young people, *Drakestail* and other works, March 5 at 10 and 11:15 a.m. and 12:45 p.m., and March 6 at 10 and 11:15 a.m. All concerts are at Phi Beta Kappa Memorial Hall, College of William and Mary. The cost is $2 per person. For information, or to make reservations, call the Symphonia at 229-9857.

SEEKING Langley employees interested in renting a room, house, garage apartment, etc. to one or more of the Center's program participants (ASEE college professors or LARSS students) for about 10 weeks this summer. If interested, please call Debbie Young at ext. 45215 as soon as possible.

DOCENTS WANTED: Do you have three or more hours a week that you would like to donate at Langley? As a docent for the Public Mail Center you would disseminate preprinted NASA information to people around the world. Your contributions would be widely recognized. Call Jeane at 864-3293 for details.

Photo by Fred Jones

Cheri Tanner of the Structural Acoustics Branch uses motorized Legos ® to show Engineers Week volunteers a "participatory" activity to interest and involve students. After presenting introductory materials on gears, levers and motors, students can then follow step-by-step written and illustrated instructions to build structures of varying complexity, from teeter-totters to ferris wheels.

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Researcher News

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National Aeronautics and Space Administration
Langley Research Center

News Researcher

Bi-weekly Employee and Contractor Publication

Volume 10 ❖ Issue 3 ❖ February 23, 1996

Langley Researchers Making Space Station Safer and More Durable

BY CATHERINE WATSON

In late March, astronauts aboard the Space Shuttle Atlantis (STS-76) will perform a space walk to attach a Langley-managed experiment to the Mir space station.

The Mir Environmental Effects Payload (MEEP) will be attached to the outside of the Russian space station to study the frequency and effects of debris striking the facility. MEEP will study both human-made and natural debris.

MEEP will also expose baseline and candidate materials for the International Space Station to the effects of space and orbital debris. According to Greg Stover, MEEP project manager in Langley's Space Projects Office, flying MEEP aboard Mir is the best way to test materials for the International Space Station because the new space station will be placed in about the same orbit as Mir.

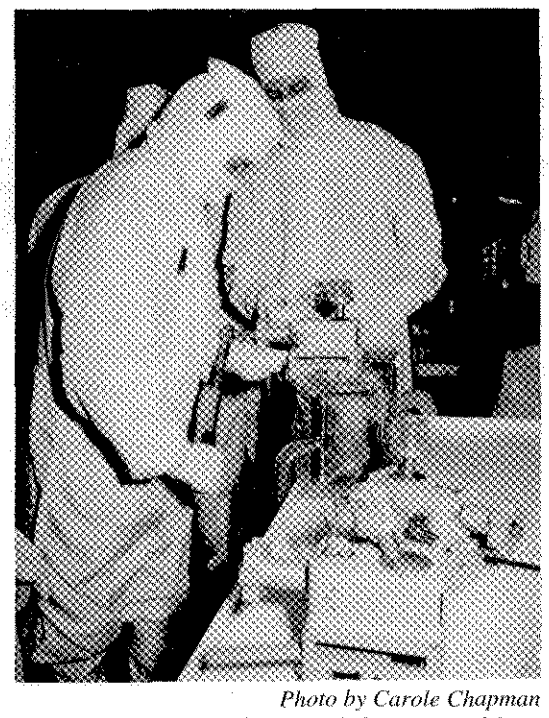


Photo by Carole Chapman

Astronaut Linda M. Godwin, left, trains with the Mir Environmental Effects Payload (MEEP) in a Langley clean room. During a space walk in late March, STS-76 astronauts Godwin and Michael R. Clifford will attach the MEEP hardware to handrails on the shuttle docking module of the Russian space station Mir.

The Four MEEP Experiments

MEEP is made up of four separate experiments from three NASA centers and the Boeing Defense and Space Group in Seattle.

The NASA Langley Polished Plate Micrometeoroid and Debris (PPMD) experiment is designed to study how often space debris hit the station, the sizes of these debris, the source of the debris, and the damage the debris would do if it hit the station. The PPMD is made up of gold, zinc and aluminum plates.

The Johnson Space Center Orbital Debris Collector (ODC) experiment is designed to capture orbital debris and return them to Earth to determine what the debris are made of and their possible origins. The ODC uses a material called aerogel, developed by the Jet Propulsion Laboratory, which is a silicon dioxide compound that Stover likened to solid smoke. The aerogel will capture debris and hold it in place until the experiment is recovered.

The Passive Optical Sample Assembly (POSA) I and II experiments, from the Marshall Space Flight Center and Boeing, respectively, consist of various materials that are intended for use on the International Space Station. These materials include paint samples, glass coatings, multi-layer insulation and a variety of metallic samples.

The four MEEP experiment containers and their attaching hardware were designed and built at Langley. Langley also was responsible for ensuring that the materials were properly integrated aboard the Space Shuttle Atlantis and Mir.

Continued on Page 3

Langley Has Lead for Three NASA Programs

NASA Headquarters has designated Langley the agency's lead center for three programs: High-Speed Research, Advanced Subsonics Technology and Airframe Systems.

"We now have a larger role to play in aeronautics within the agency than we did before," said Center Director Paul Holloway, who outlined the changes at an all-hands meeting Feb. 12. "That's good for Langley, and we're pleased with these changes."

Dr. Jeremiah Creedon has been named director of Airframe Systems, a long-term program in the Research and Technology Base Program. Charles Blankenship is director of Advanced Subsonics Technology and Wallace Sawyer is director of High-Speed Research, both "focused programs" within the Aeronautics Enterprise.

The changes move program management from Headquarters to centers and give the centers more direct control of program implementation.

The changes are consistent with the recently announced Administrator's guidance. The new responsibilities are in line with Langley's missions in Airframe Systems, Aerodynamics, and Atmospheric Science and center of excellence in Structures and Materials.

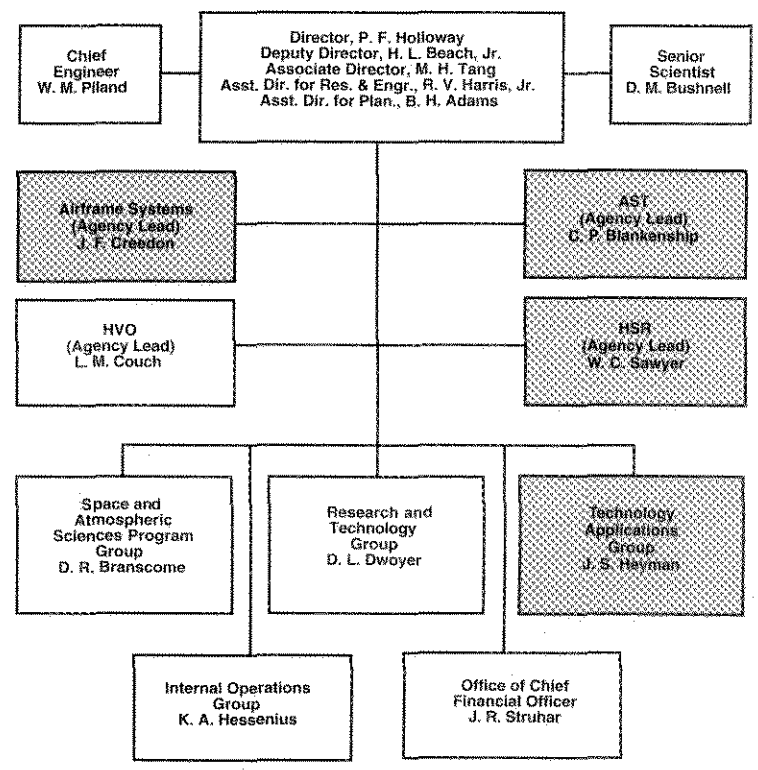
Here is a summary of changes at the other aeronautics centers:

Focused Programs –

- High-Performance Computing, Ames Research Center.
- Numerical Aerodynamic Simulator, Ames.

Base Programs –

- Aeronautical Propulsion, Lewis Research Center.
- Flight Research, Dryden Flight Research Center.
- Airspace Operations Systems, Ames.
- Information Systems, Ames.
- Rotorcraft, Ames.



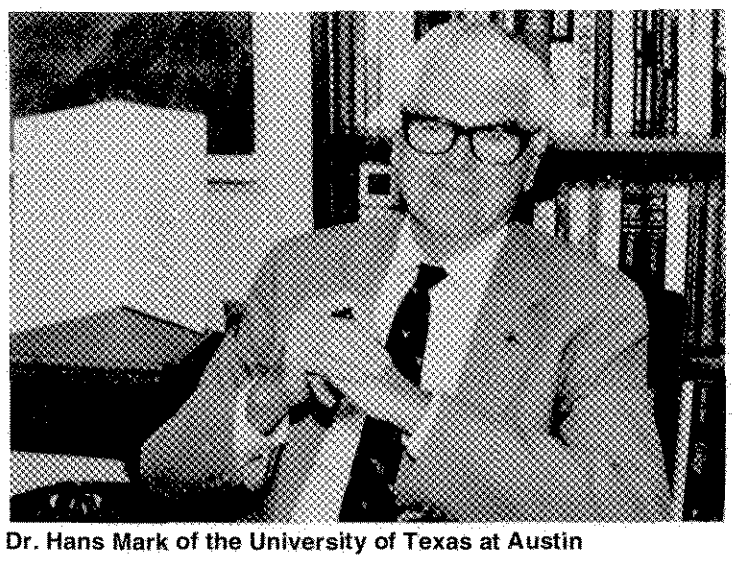
The Langley organizational chart, as of Feb. 12, 1996.

Dr. Hans Mark to Speak at March 4 and 5 Colloquia

On Monday, March 4, Dr. Hans Mark will present an ICASE (Institute for Computer Applications in Science and Engineering) lecture entitled "The Atomic Bomb: Fifty Years Later." The event will be held at 1:30 p.m. at the H.J.E. Reid Conference Center.

The controversy generated by the exhibit in the Smithsonian Institution of the Enola Gay has spilled over into a vigorous public debate on the propriety of the use of nuclear weapons by the United States on Hiroshima and Nagasaki in 1945.

The fiftieth anniversary retrospective on the development of and the decision to deploy the first nuclear weapons seeks to establish that it was their very deployment and not merely a summation of other geopolitical and military factors, that brought about the Japanese surrender.



Dr. Hans Mark of the University of Texas at Austin

The silent role of nuclear weapons in deterring major wars since 1945, as well as the propriety of continuing to develop defenses against them, also will be briefly considered.

On Tuesday, March 5, 1996, Mark will present another ICASE and Colloquium lecture entitled "The Apollo 13 Accident: A Personal History" at 2 p.m. in the H.J.E. Reid Conference Center. He will present the same lecture for the Sigma Series that evening at 7:30 p.m. at the Virginia Air and Space Center.

The Apollo 13 mission to the moon was launched from Kennedy Space Center at 2:13 p.m. EST on April 11, 1970. Although the crew, consisting of James Lovell, Fred Haise, and Jack Swigert, never got the chance to achieve their original scientific objective of exploring the geology of the moon, they and their colleagues on the

Continued on Page 3

News Briefs

Around the Agency

MCDONALD NAMED AMES CENTER DIRECTOR – Stressing the urgency for Ames Research Center to quickly become proficient in information systems technology, NASA Administrator Daniel S. Goldin named Pennsylvania State University professor Dr. Henry McDonald as the center's new director, effective March 4. "Dr. McDonald brings to Ames strong research experience in information systems applications, computational physics and aerodynamics, combined with technical and managerial skills that will reinforce NASA's commitment to aeronautical and space research for a stronger America," Goldin said.

LITTLES NAMED DIRECTOR AT MARSHALL – Dr. J. Wayne Littles was named the new director of the Marshall Space Flight Center, effective Feb. 3. Littles served as the associate administrator for the Office of Space Flight at NASA Headquarters. He replaced G. Porter Bridwell, who retired from NASA after 34 years of service. Littles returned as director for the same NASA center where he began his federal career in 1967.

THAGARD LEAVES AGENCY – Astronaut Dr. Norman Thagard has retired from NASA, and returned to his alma mater, Florida State University. He leaves the agency following five space missions, including a four-month stay aboard Russia's space station Mir. Thagard accepted the position of visiting professor and director of external relations for the university. His initial assignment is teaching electronics, an area that has been his longtime hobby. Becoming an astronaut was one of Thagard's dreams. Another was to return to his alma mater, where he received bachelor and master of science degrees in engineering.

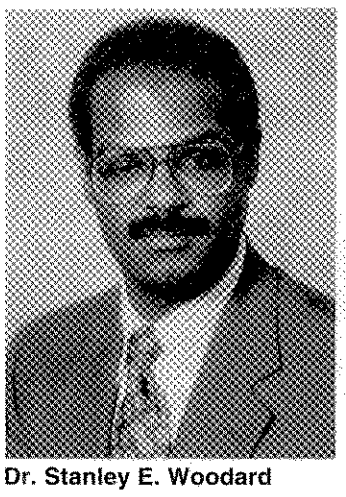
Woodard Named Black Engineer of the Year

BY MEGHAN WOODCOCK

Dr. Stanley E. Woodard, an aerospace engineer in the Structural Dynamics Branch, received the 1996 Black Engineer of the Year Award for Outstanding Technical Contributions on Feb. 24 from Career Communications Group, Inc. More than 250 of the nation's top scientists, engineers and technology leaders were nominated for this 10th anniversary celebration. Woodard, who started working at Langley in 1987, said "I felt very honored to have been chosen from such a distinguished group of researchers."

His work includes researching spacecraft dynamics and control. Specifically, he has been the principal investigator of a study of the in-flight dynamics of the Upper Atmosphere Research Satellite (UARS). The study included two successful in-flight experiments (approximately three orbits each) on UARS that were designed to better understand how disturbances affect spacecraft dynamic response and to examine payload-payload interaction. Results of the study have demonstrated the influence of spacecraft vibration on science measurements and provided a detailed analysis of instrument-instrument interaction, as well as analysis of excessive mass expenditure on spacecraft dynamic response.

Woodard received his doctorate in mechanical engineering from Duke University. His undergraduate and master engineering degrees were earned from Purdue and Howard University, respectively.



Dr. Stanley E. Woodard

The Black Engineer of the Year awards were created to recognize and reward America's successful black engineers, scientists and technology leaders. The awards, presented annually in Baltimore, Md., are sponsored by the Engineering Deans of Historically Black Colleges and Universities, Mobil Corp. and U.S. Black Engineer.

In Memoriam

Rudolph S. Olive

Rudolph S. Olive, 75, died Monday, Dec. 11, 1995.

Olive retired from Langley as an engineering technician in 1975 after 26 years of service.

Edwin W. Hinson

Edwin Ward Hinson, 60, a native of Peachland, N.C., and a Peninsula resident for 26 years, died Thursday, Jan. 18.

Hinson retired as an engineer with Hughes/STX in 1992, and worked at NASA on the space program, including the Viking, Space Shuttle and Apollo programs.

Dr. Joseph A. Stern

Dr. Joseph Aaron Stern, 68, died Wednesday, Jan. 31.

Stern, founder of The Bionetics Corp., Hampton, devised biological sterilization for NASA for the Viking's first landing on Mars. An expert in the field of microbiology and contamination, his company provides technical support to NASA in environmental and life sciences as well as services in aviation, engineering meteorology, computers and laboratories. He earned a NASA Certificate of Outstanding Achievement for the Viking Team, a NASA Certificate of Appreciation and Recognition for the Planetary Quarantine Program and a NASA Public Service Award.

Margaret Ridenhour

Margaret A. Ridenhour died Wed., Dec. 20, 1995 in Fairfax, Va. Ridenhour retired from Langley as a mathematician in 1986 after 28-1/2 years of service. Ridenhour was also a WAVE in the Navy.

Harry R. Paucker

Harry Rudolph Paucker, 79, died Sunday, Jan. 21. He was an instrument maker and retired in 1972 from Langley after 30 years of service.

Lester A. Kurtz

Lester A. "Jack" Kurtz, 83, died Tuesday, Jan. 23.

Kurtz worked in government service for 40 years, the last 17 years in cost accounting at Langley, where he retired in November 1974.

Robert Andrews

Robert Andrews, died Monday, Feb. 5. He retired in 1985 after serving 34 years at Langley.

Merritt Selected as EO Officer

Vivian B. Merritt has been selected to head Langley's Office of Equal Opportunity Programs (OEOP). She is responsible for planning, implementing and managing programs to promote equal opportunity for employees at all levels without regard to age, race, color, sex, religion, national origin or disability. This includes serving as the principal advisor to the Center Director and senior staff regarding all equal employment opportunity matters; managing programs for women, racial and ethnic minorities, veterans and persons with disabilities; managing the evaluation, processing and resolution of employee concerns and complaints of discrimination; selecting and training EO counselors; monitoring EO contractor compliance; representing the Center with outside organizations to promote effective community relations; and managing the OEOP staff.

Vivian B. Merritt

Merritt began her Langley career in 1977 as a cooperative education student from Hampton Institute, now Hampton University, where she graduated with a bachelor's degree in business management with highest honors. After graduation, she worked in the Office of Equal Opportunity Programs as an administrative intern. In 1979, after completing a one-year program, Merritt became an equal employment specialist and served in various positions in OEOP for more than 17 years. These include management of the Discrimination Complaints and EO Counseling Program, Hispanic Employment Program, Affirmative Employment Program and others. In 1990, she was named deputy to the EO Officer.

Merritt holds a master's degree in public administration from Golden Gate University and has received numerous awards from both NASA and Langley in recognition of her outstanding contributions to furthering the goals of equal employment opportunity.

Merritt lives in Hampton and has three daughters, Keli, Kristin and Pamela and a three-year-old grandson, Jordan.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following Langley employees are approved leave recipients: Marilyn K. Aldrich, Janet L. Edmondson, Sally C. Johnson, Geraldine N. Pardue, Cassandra Stevens and Charles S. Washington.

Potential leave donors are requested to complete the "Request to Donate Annual Leave to Leave Recipient Under the Leave Transfer Program" form which may be found via your computer in Informed Manager. Send to Mail Stop 293, Office of Occupational Health Services, or fax to ext. 49114. All annual leave donations are greatly appreciated. For more information, call Karen Ridlon at ext. 43194.

Letters

From Tammy Jo Price:

"I would like to thank each person who donated leave to me while I was out of work. My husband and I are pleased to announce we have a healthy 9 lb. 13 oz. baby boy. I am truly grateful for everyone's donations! Thanks again."

News Researcher

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Ann Gaudreaux), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor. . . . . Catherine Watson

Editor. . . . . Ann C. Gaudreaux
Science and Technology Corp.

Assistant Editor. . . . . Jeane Shanks
Science and Technology Corp.

Photographer . . . . . Fred Jones

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

NASA Selects Crouch as Payload Specialist for Shuttle Mission

Dr. Roger K. Crouch and Dr. Gregory T. Linteris have been selected to fly as payload specialists on the 1997 Microgravity Science Laboratory mission.

Dr. Roger K. Crouch

Crouch worked at Langley from 1962 to 1985. In the late 1960s and early 1970s, he and Dr. James B. Robertson did research on the physics of semiconductors. Crouch began working on semiconductor materials and microgravity science in 1975 with Dr. Archibald L. Fripp Jr., Ivan O. Clark and William B. Debnam Jr., all of the Sensors Research Branch. The foursome worked on the space experiment for semiconductor growth in space, United States Microgravity Payload-3, that is flying on STS-75, scheduled for launch Feb. 22. Crouch also worked on crystal growth of compound semiconductors and conducted other microgravity experiments.

Crouch earned a doctorate in physics from Virginia Polytechnic Institute and State University, Blacksburg, Va. He is the lead microgravity scientist in NASA's Office of Life and Microgravity Sciences and Applications, Washington, D.C. The 55-year-old Crouch was an alternate payload specialist for STS-42, the first International Microgravity Laboratory mission. He now resides in Laurel, Md.

"Of course, I'm very pleased to have been chosen for this mission," Crouch said, "and I appreciate all those people who have been so supportive of me, who saw me along in my career."

Linteris, 38, earned a doctorate in mechanical and aerospace engineering from Princeton University, Princeton, N.J. He is a mechanical engineer at the National Institute of Standards and Technology, Gaithersburg, Md., where he is responsible for developing a research program on advanced fire suppressants. Linteris lives in Great Falls, Va.

NASA has designated Dr. Paul D. Ronney of the University of Southern California to serve as a backup, or alternate, to Crouch and Linteris. As an alternate, Ronney will undergo the same training as his counterparts, and will be ready to serve on the flight crew if necessary.

The 16-day Spacelab mission is scheduled for flight aboard the Space Shuttle Columbia on the STS-83 mission in the spring of 1997. Crouch and Linteris will conduct more than 25 investigations in microgravity sciences, such as fluid physics, combustion science and materials science. Ronney will serve in a key mission position as crew interface coordinator in the Spacelab Mission Operations Control Center at the Marshall Space Flight Center, Huntsville, Ala.

GWU's Holland Cited for Top AIAA Graduate Paper

Peter C. Holland, a 1995 master of science degree graduate from NASA–George Washington University's Joint Institute for Advancement of Flight Sciences (JIAFS), won first place in the American Institute of Aeronautics and Astronautics (AIAA) National Graduate Student Paper Competition held at the Aerospace Sciences meeting in Reno, Nev. in January.

Holland qualified for the national competition by winning AIAA's mid-Atlantic regional competition at Langley in April 1995. His paper, "A Far Field Approximation for High-Speed Impulsive Noise Reduction," was the result of research for his master's degree while he was a graduate research assistant in JIAFS. Dr. Ken Brentner, Aerodynamics and Acoustic Methods Branch, and Dr. Michael Myers of George Washington were his research advisors. Holland works for Allison Engine Co. in Indianapolis.

Bushnell Elected Fellow in Royal Aeronautical Society

BY MEGHAN WOODCOCK

Senior scientist Dennis Bushnell was recently elected a Fellow in the Royal Aeronautical Society. Bushnell said, "I recognize this as a great honor and I am very appreciative."

Dennis Bushnell

This is Bushnell's third election as fellow into a society. He was previously elected fellow in the American Institute of Aeronautics and Astronautics (AIAA) and the American Society of Mechanical Engineers. He has worked with the Royal Aeronautical Society, giving their Lanchester Lecture in 1992. The lecture series is named in honor of a researcher, who in the early 1900s, discovered the aircraft tip vortex and drag due to lift.

The Royal Aeronautical Society

Established in 1866, the Royal Aeronautical Society incorporates the Institute of Aeronautical Engineering, the Helicopter Association of Great Britain and the Society of Licensed Engineers and Technologists. The Society was given its royal charter by the Queen of England, and was established for the general advancement of aeronautical art, science and engineering and to promote that area of knowledge which distinguishes the profession of aeronautics.

The Senior Scientist

As senior scientist, Bushnell is on the staff of the Center Director and provides advice and direction for new research programs. He is the Center's focal point for long-term, high-risk, inventive research. Bushnell tracks Langley's research programs and advises the director concerning their quality and scope. His specific duties include the Directors Discretionary Fund, the H.J.E. Reid Award, Center Peer Reviews, the Distinguished Research Associates program and ICASE (Institute for Computer Applications in Science and Engineering). He also reviews all formal Center publications.

Bushnell received his bachelor's and master's degrees in mechanical engineering from the University of Connecticut, where he was a University Scholar, and the University of Virginia, respectively. He has given more than 100 seminars and presentations and is the author of over 200 papers. He received the AIAA Sperry and Fluid and Plasma Dynamics awards and the NASA Exceptional Scientific Achievement Medal. Bushnell has also delivered the ICASE Guggenheim lecture. He began his career at Langley more than 30 years ago as an aerospace engineer.

Smithsonian Speaker

Bushnell will be speaking at a reception July 9 on the future of aeronautics. The reception, given by the Smithsonian Institution in Washington, D.C., will feature a symposium on the present and future of flight in honor of a new gallery opening in the National Air and Space Museum.

MEEP . . .

Continued from Page 1

The MEEP Space Walk

MEEP will be attached to handrails on the Mir shuttle docking module during a space walk by mission specialists Linda Godwin and Michael (Rich) Clifford. When they have attached the four MEEP experiment containers to Mir, Godwin and Clifford will open the containers to expose the experiment materials to space and orbital debris. In October, the STS-76 crew came to Langley to examine the MEEP experiment containers and attaching hardware, and practice with the tools they will use to attach MEEP to Mir.

The MEEP Data

MEEP will remain attached to Mir until late 1997, when the four experiment containers will be retrieved by another space shuttle crew (STS-86) and returned to Earth for study.

"The debris which is brought back to Earth, after approximately a year and a half of being on orbit, will be analyzed using several techniques," Stover said. These techniques include a scanning electron microscope and spectroscopy to determine what the debris are made of and their relative sizes. "We'll be assessing what kind of debris there is and how those contaminants can actually collect on some of the different surfaces of a space station, and how those will affect the surfaces and also the performance of a station," Stover said. The data collected by all four experiments will be placed into an electronic archive that can be accessed via the Internet.

ICASE Colloquium . . .

Continued from Page 1

ground demonstrated to the world what NASA could do in situations of grave danger while working under extreme pressure. Following the successful recovery of the Apollo 13 astronauts on April 17, the accident investigation board began the long process of finding out what happened, and why.

Based on his personal experience as a member of this investigation board, Mark will describe the accident and the investigative process that discovered the sequence of events that led to it.

Mark was named Chancellor of The University of Texas System in 1984, and now teaches at the University of Texas at Austin. Before joining the University of Texas, he served as deputy administrator of NASA after being appointed by President Reagan in 1981. From 1977 to 1979 he was undersecretary of the U.S. Air Force, and was appointed secretary of the Air Force by President Carter in 1979. Prior to moving to Washington, D.C., he was the director of NASA Ames Research Center at Moffett Field, Calif.

Born in Germany in 1929, Mark came to the United States in 1940 and became a naturalized citizen in 1945. He received his bachelor's degree in physics from the University of California at Berkeley and his doctorate in physics from Massachusetts Institute of Technology. Mark has made significant contributions to nuclear and atomic physics and led the engineering development of many spacecraft and experimental aircraft. He is the recipient of numerous honors and awards, including two Distinguished Service Medals from NASA and the Distinguished Public Service Medal from the Department of Defense.

Space Shuttle Program Changes and Accomplishments Since 1986

Changes After the Challenger Accident

Following the Challenger accident, NASA conducted an exhaustive review to understand the causes of the tragedy. The agency made extensive changes to critical systems in an effort to promote safety and reliability. The program resumed flight operations in September 1988.

On June 6, 1986, the Presidential Commission on the Space Shuttle Challenger Accident, also known as the Rogers Commission, after Chairman William P. Rogers, submitted its report to the President. The report included nine recommendations for restructuring the shuttle program and safely returning the shuttle to flight. On June 13, 1986, President Reagan directed NASA to implement those recommendations as soon as possible and, in July, NASA reported to the President on its plans and progress for implementing each of those recommendations.

Redesigning and Improving

The solid rocket motors were extensively redesigned following the accident. This involved recertifying the boosters through a series of test firings at the Morton Thiokol facility in Utah. The redesign added an extra O-ring to the joints between the rocket segments, and greatly strengthened the physical connection between the segments. Heaters were added to the joints to prevent cold weather from affecting the sealing capability of the O-rings.

In addition to the redesign of the solid rocket motor and, in line with the Rogers Commission findings, extensive landing safety improvements were made. This included upgrades of the space shuttle orbiter tires, brakes and nose wheel steering mechanism, and a drag chute system was added.

Numerous hardware, software and safety improvements were incorporated, including the installation of a crew escape system that allows astronauts to parachute from the orbiter under certain conditions. Risk identification and reduction programs were put in place.

The space shuttle program was reorganized to ensure all necessary information was available to managers at all levels. Also in line with the Rogers Commission findings, experienced astronauts were placed in senior positions within the program management structure. Since the accident, astronauts have had a decisive voice in determining NASA's readiness to fly Shuttle missions.

All program documentation was reviewed, and previous waivers to flight rules or launch criteria were revoked. Re-establishment required detailed analyses by both contractor and civil service personnel at all levels of management.

Any technical issue that arises in the course of preparing for a given shuttle mission is subjected to independent assessment by the government workforce. In addition, NASA has encouraged independent oversight of various program issues from a variety of groups, including the National Research Council.

Through a series of open reviews, all significant issues and open items are elevated to a Flight Readiness Review Board chaired by the associate administrators for Space Flight and Safety. Through this process, full and open discussions of all potential issues is encouraged, and these issues are reviewed and assessed by all levels of program management, engineering, and safety organizations.

In addition to the formal open communication system, a system is in place to provide a mechanism for anonymous reporting of safety concerns.

Shuttle Mission Highlights

The first shuttle flight after the Challenger accident was STS-26 aboard the Discovery in September 1988. Including the January 1996 flight (the NASA designation is STS-72), there have been 49 shuttle missions since Challenger. Prior to Challenger, there were 24 shuttle missions. Counting all shuttle missions to date, including the Challenger, there have been 74 flights.

Since April 1981, the shuttle has carried approximately 2-million pounds of cargo and 699 major payloads into orbit. Since 1986 (and including the current mission), the shuttle fleet has had 49 successful launches. Since 1986, the shuttle has launched the Magellan spacecraft to Venus, the Galileo spacecraft to Jupiter and the Ulysses spacecraft to study the Sun. The shuttle also has deployed the Gamma Ray Observatory, the Hubble Space Telescope, and the Upper Atmosphere Research Satellite.

Space Shuttle Statistics in General

In 74 flights, the shuttle fleet has accumulated 580 days of flight time, 426 days since the return to flight in September 1988. That equates to 9.33 years of total person time in space, 7.05 years since the return to flight. The shuttle has flown 419 total crew members, 366 of whom were male and 53 of whom were female. Since many of those crew members flew more than once, the number of individuals flown has been 181 males and 26 females.

Through STS-72, a total of 9,141 tons of orbiter and cargo have been launched, including 1,258 tons of payload and supporting hardware, and 545 tons deployed and left in space. During two docking flights, six tons have been delivered to the Mir space station, and 0.9 tons have been retrieved from the Mir. The shuttles have retrieved 18.5 tons of payload from orbit. Through STS-72, the shuttle has flown a total of 699 payloads, including 300 for NASA, 143 for the Department of Defense, 106 for commercial interests, 76 for other nations and 74 educational payloads.

Through STS-72, the shuttle has deployed a total of 53 payloads, including three interplanetary spacecraft (Magellan, Galileo and Ulysses), 33 geosynchronous Earth-orbit satellites, nine small satellites, and one component – a new docking module – for the Mir space station.

Through STS-72, the shuttle has retrieved 21 payloads – 12 were deployed and retrieved on the same flight, and nine were retrieved for repair, refurbishing or analysis.

The space shuttle remains the only vehicle in the world with the dual capability to deliver and return large payloads to and from orbit. The design, now more than two decades old, is still state-of-the-art in many areas, including computerized flight control, air frame design, electrical power system, thermal protection system and main engines. Through STS-72, astronaut crews have conducted 32 extravehicular activities (spacewalks), 18 since the return to flight in 1988.

The shuttle is the most reliable launch system now in service anywhere in the world, with a success-to-failure ratio (as of STS-72) of .986. Since 1981, the shuttle fleet has flown more than 225 million miles in space, in excess of the distance from Earth to the Sun and back.

For additional information, contact: Ed Campion or Ray Castillo, NASA Headquarters, Washington, D.C. or phone (202) 358-1780 or (202) 358-4555.

Economic Impact Document Available over Internet

To save printing and mailing costs, the Office of Public Services has made the 1995 Economic Impact document available on the Internet. The book is a comprehensive summary of Langley's institutional and financial impact on the nation and the state of Virginia. Employees can access the document from the Langley Home Page or the following URL: http://www.larc.nasa.gov/org/pao/impact95/ Hard copies of the document are available from the Public Mail Center in Building 1153.

Reading's Fun Bookfair Returns

The Reading's Fun Bookfair will return to the Cafeteria, Building 1213, on Wednesday and Thursday, Feb. 26 and 27 from 9:30 a.m. to 2 p.m. A sample of previews will be displayed the previous Monday and Tuesday. Selections will include adult and children's books, stationary, photo albums and children's games, all at up to 70 percent off retail prices. No back orders will be taken, and selection is limited, so plan to make purchases early. For more information, call the Exchange Shop at ext. 41585.

Langley Emergency Announcement System

THE OFFICE OF SAFETY AND FACILITY ASSURANCE

Weather is an unpredictable factor in our lives. While forecast accuracy has significantly improved in recent years, it is still not perfect. When weather conditions are likely to create hazardous driving conditions for employees, Center management makes every effort to collect information from local area law enforcement agencies regarding traffic and road conditions. This information, evaluated with weather predictions, is used in determining whether the Center should continue normal operations. Then, as rapidly as possible, we make appropriate announcements through local television and radio broadcasts, as well as on our emergency announcement telephone system.

The decision and announcement procedure is:

- Any decision to delay work hours or to close the Center will be made as early as possible and, except for unforeseen circumstances, will be made prior to 5 a.m. on the day in question.
- A message announcing the decision will be placed on the emergency announcement telephone system (864-2111) by 5 a.m. The information is also provided to the media (television and radio) for broadcast at the same time.
- Any delay in opening the Center will be for either two hours or four hours from the normal beginning of each work shift. If weather or road conditions change, a second decision concerning delayed work hours may be made, but no more than one change will be made on any one day. For employees working the variable day schedule, day shift will be considered to be 8 a.m. to 4:30 p.m.
- If a delayed opening of two hours is announced at 5 a.m., that announcement will be updated at 7 a.m. If a delayed opening of four hours is announced at 5 a.m., that announcement will be updated at 9 a.m.
- In those cases where the weather or road conditions are extremely hazardous and the decision is made to close the Center for normal operations, the 5 a.m. announcement will not be modified until noon, at which time a decision applicable to second and third work shift personnel will be announced.
- Employees are responsible for monitoring radio and television announcements for changes to the Center's operational status. Employees not complying with announced changes to the Center's operational status will be charged appropriate leave to cover their absences.

We realize that many employees live relatively far from the Center and that it is necessary for those individuals to leave home earlier than usual when weather has created potentially hazardous driving conditions. When such weather conditions occur, the Center and all supervisors will recognize a liberal annual leave policy. We will also strive to announce Center opening schedules as quickly as possible.

Fortunately, these unique weather conditions do not occur frequently. When such situations do develop, employees should call the emergency telephone announcement system at 864-2111, and listen to radio or television stations for the latest information.

For more information, call Alan Phillips at ext. 47233.

Life after Langley

Retiree McIver — Still Reaches for the Stars

BY RON HARVEY

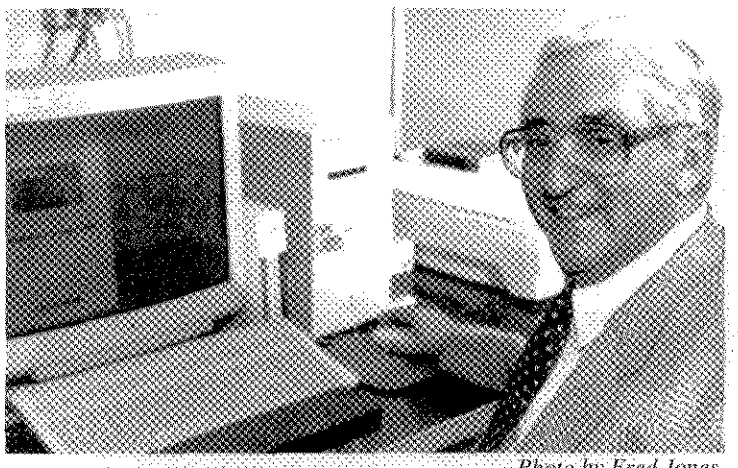


Photo by Fred Jones

Retiree Duncan McIver connects to the Internet during another one of his usual very busy days.

Duncan McIver is a man "who will risk going too far." And the risk of going too far – for reaching beyond one's grasp – is a path that McIver has chosen.

McIver, born in Sanford, N.C., started his NASA career in 1958 after graduating from the University of North Carolina Chapel Hill with a degree in physics. From those early days, McIver moved steadily up the ladder and even around the world.

In 1972, McIver became technical assistant to the director for electronics at Langley. McIver moved to NASA Headquarters in 1982, where he directed programs in guidance, controls and human factors.

McIver became the director of the National Aerospace Plane Office at NASA headquarters in 1986, which was the position he retired from in 1989. But, "retired" is not the best word to describe McIver. Since then, he has worked part-time as director of marketing for Eagle Aeronautic Inc. in Newport News. He has also been active in community affairs.

He is chairman of the Virginia Aerospace Business Roundtable, and has participated in Opportunity Virginia, the state's economic strategic planning initiative. In addition, McIver serves on the board of directors for the Virginia Air and Space Center and the Southeastern Virginia Regional Free-Net (SEVAnet) an organization that promotes the use of the Internet in the community.

He works closely with the NACA/NASA Alumni Association and serves as point man for the *Galaxy of Gifts* program, a joint effort with the United Way and the Association of Retarded Citizens, which generated three-quarters of a million dollars worth of goods for the Peninsula needy in its first year of operation.

Looking back on his NASA career, McIver especially enjoyed the time from 1985 to 1986 when he was a participant in the President's Executive Exchange Program. During that year, he served as the assistant to the vice president of Bechtel National Inc. in San Francisco, one of the world's largest engineering firms. During this exchange program, he visited London, Berlin, Rome and Madrid and had audiences with the Pope John Paul II and the King of Spain.

This well-traveled retiree has gone far during his career, but he has never forgotten his roots in his home state and on distant shores. In fact, in 1991 McIver and his son, Robert, retraced the footsteps of ancestors who emigrated from Scotland in 1802.

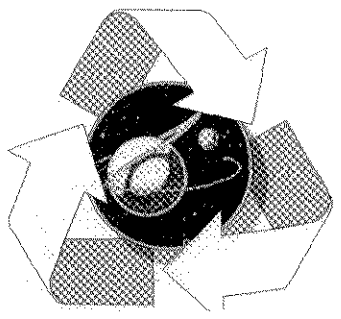
He visited their port of entry, Wilmington, N.C., and toured a museum which, to his surprise, had on display a Scottish McIver tartan donated by his ancestors. After visiting Wilmington, they flew to Scotland and toured the debarkation point for his ancestors, the four children of Kenneth McIver, who settled in the United States.

McIver and his wife, Pat, live in Williamsburg. They have two sons, Robert, who lives in Colorado, and Kevin, who resides in Atlanta.

McIver has enjoyed his association with NASA, but most of all he has enjoyed the "enthusiasm and creativity" of his many friends and co-workers.

As McIver continues his journey down life's "wonderful and exciting" road, he has summed up his life by remembering something from T.S. Eliot: "Only those who will risk going too far can possibly find out how far they can go."

Waste Prevention in the Office



BY KRISTEN KILLOUGH

Much has been said about pollution prevention and waste reduction throughout the Center, but those of us who work in an office may also be contributing to the growing waste problem.

Listed below are some tips for preventing unnecessary office waste that is easy to implement into your everyday activities.

- Use electronic mail (e-mail) or voice-mail to transmit messages instead of paper.
- Save important messages to a file, rather than printing them.
- Save documents on a disk instead of making hard copies.
- Replace hard copy files with electronic files whenever possible.
- Share reports, publications and filing systems instead of duplicating or purchasing multiple copies.
- Reuse office supplies such as file folders, notebooks, paper clips and rubber bands.
- Establish an exchange program area where staff can bring unused or reusable office supplies for redistribution.
- Avoid disposable items; use items that can be repaired, recycled, refilled or reused.
- Make double-sided copies.
- Use scrap paper for notes and drafts.

MS WALK® Needs Walkers

The MS WALK® for Multiple Sclerosis is a fundraising event that supports the National MS Society's efforts to find a cause and cure for multiple sclerosis as well as provide services for more than 1,600 people in Hampton Roads.

The walk is Sunday, April 14 on the Virginia Beach waterfront. Individual or team walkers are welcome. For more information on walking or volunteering, call (804) 490-9627.

For those who prefer to ride while helping the MS Society, there is also an MS 150 Bike Tour. Many local bicycle shops are providing training, and the society offers fundraising tips as well. Call the hotline at 490-9627.

Virginia Air and Space Center News

Virginia Air and Space Center
Hampton Roads History Center

STAR TREK: Federation Science®

STAR TREK: Federation Science® will be featured at the Virginia Air and Space Center through April 30. The exhibit features segments on living and working in space, fluid dynamics, spectroscopy, a planet walker, antimatter and nearly 40 other fascinating and interactive components.

STAR TREK: Federation Science® features real science and technology with the vision of the future portrayed through the popular television show. Visitors will navigate through an asteroid field, program a voice-activated computer, turn into a Klingon, visually beam onto an alien planet and command a starship. They will learn the way scientists do – through experimentation.

Cryogenics Demonstrations

How cold is outer space? Learn the answer to this and more at the center through cryogenics demonstrations each Saturday from now through April 28 at 12:15, 1:15, 2:15 and 3:15 p.m.

Participants will discover how organic and inorganic materials are affected by exposure to temperatures as cold as 300 degrees below zero by using liquid nitrogen. As active participants, visitors will also learn why astronauts wear specialized suits. Demonstrations are included with regular admission price.

Aliens R Awesome

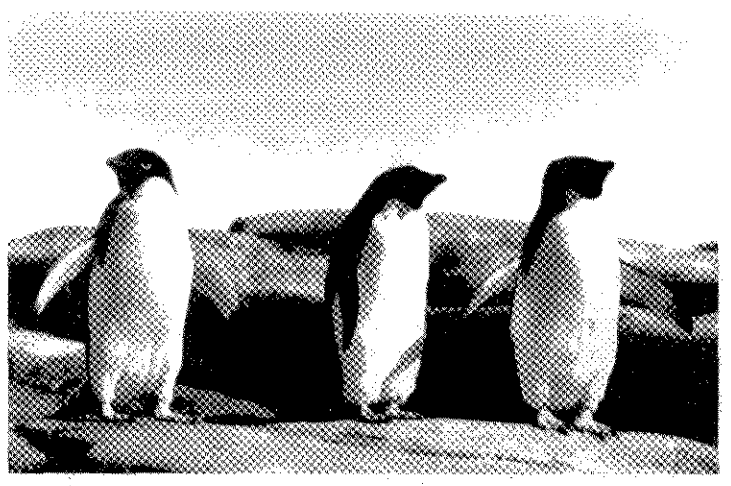
Children can create an alien in demonstrations every Saturday and Sunday at the center now through April in conjunction with the 6,000-square-foot interactive exhibit STAR TREK: Federation Science®. The demonstration, Aliens R Awesome, will take place every hour on the half hour from 10:30 a.m. to 4:30 p.m.

During the demonstrations, children can choose from three fictional planets with varying terrains and environments, and create aliens able to adapt to each planet.

Demonstrations are free with exhibit admission of $6 for adults, $4 for seniors, military, NASA and children 3 through 11. Call 727-0900 for more information and STAR TREK: Federation Science® extended hours.

Weekend Demos

Learn how astronauts communicate in space each Sunday during February and March from 11 a.m. to 4 p.m., at the center. Through hands-on activities, children will build their own communication pin and experiment with different types of space communications. Demonstrations are free with exhibit admission.



Antarctica . . . An Adventure of a different nature

Visitors can explore the icy beauty of the world's highest, driest, windiest and coldest continent as they take an adventure of a different nature in the IMAX® film *Antarctica*. The film is featured through May 26 in the center's IMAX® theater.

Antarctica is a land of extremes, with six months of daylight and six of total darkness. Visitors will spend time with Emperor penguins, Gentoo penguins, seals and whales in their habitat, and soar on a helicopter journey across the vast continent, home to fewer than 1,000 humans. Antarctica is also home to 35 species of birds, six species of seals, 12 species of whales and more than 200 species of fish. The bioluminescent krill, semi-transparent shrimp-like creatures, glow eerily in the nighttime ocean, and appear like giant red patches during the day.

Admission to the film is $5.50 for adults and $4.50 for military, seniors and children 3 to 11.

1996 Election, Part I: The Race Is On

BY LEE RICH, CONGRESSIONAL AFFAIRS OFFICER, EXT. 46529

Every four years America goes a little mad. In a process that, on occasion, resembles a demolition derby, one President, one vice president, all 435 members of the House of Representatives and one-third of the members of the Senate will be elected to office on Nov. 5. Reform of the Hatch Act two years ago gave federal government employees most of the political participation rights of other U.S. citizens. With 1996 campaigns for many offices already at full throttle, now seems a good time to review the provisions of the "new" Hatch Act.

The following lists provide examples of both permissible and prohibited activities for all NASA employees except those who are career members of the senior executive services (SES); career SES still falls under the "old," more restrictive Hatch Act. More information may be obtained from the Office of Special Counsel, an independent federal agency responsible for investigating violations of the Hatch Act, by calling 1-800-854-2824 or (202) 653-8944.

MAY:

- May be candidates for public office in nonpartisan elections
- May register and vote as they choose
- May assist in voter registration drives
- May express opinions about candidates and issues
- May contribute money to political organizations
- May attend political fundraising functions
- May attend and be active at political rallies and meetings
- May join and be an active member of a political party or club
- May sign nominating petitions
- May campaign for or against referendum questions, constitutional amendments, municipal ordinances
- May campaign for or against candidates in partisan elections
- May make campaign speeches for candidates in partisan elections
- May distribute campaign literature in partisan elections
- May hold office in political clubs or parties

MAY NOT:

- May not use their official authority or influence to interfere with an election
- May not collect political contributions unless both individuals are members of the same federal labor organization or employee organization and the one solicited is not a subordinate employee.
- May not knowingly solicit or discourage the political activity of any person who has business before the agency
- May not engage in political activity while on duty
- May not engage in political activity in any government office
- May not engage in political activity while wearing an official uniform
- May not engage in political activity while using a government vehicle
- May not solicit political contributions from the general public
- May not be candidates for public offices in partisan elections
- May not wear political buttons while on duty

In addition, NASA employees may provide information requested by Congress, its committees and staff; may make public statements concerning the agency's programs; and may, as private citizens, express opinions to Congress or anyone else on any subject.

Langley Activity Association Can Keep You Busy

LAA Social

The LAA will hold a Social on Feb. 23. The Buddy Parker Blues Band will be the entertainment at the social. This band was rescheduled due to the ice storm on Feb. 2. They will play from 5:30 to 8:30 p.m. Come to the H.J.E. Reid Conference Center and enjoy an evening of the blues.

LAA Raffle

Buy your tickets now for a chance to win two Busch Gardens season passes. Tickets cost 50 cents each and are available at the LAA office during normal office hours or the LAA Lounge after 4 p.m. The drawing will be held on Friday, March 29 at the LAA social.

LAA Country Western Dance

On Saturday, March 2, a Country Western Dance is scheduled. The cost is $3 per person. Dance lessons begin at 7 p.m. and the dance starts at 8 p.m. in the H.J.E. Reid Conference Center.

LAA Bingo

Every Thursday evening beginning at 7 p.m. in the H.J.E. Reid Conference Center the LAA sponsors Bingo games. Come join the fun!!

For more information about any of these Langley Activities Association events, call Andrea Whitesides at ext. 46369.

Career Transition Center Announces February/March Schedule

The latest Career Transition Assistance Program Center schedule is as follows:

Feb. 27, 9 a.m. to 4:30 p.m., *Integrating Covey's 7 Habits into the Job Search*

Feb. 29, 9 a.m. to 4:30 p.m., *Starting Your Own Business* (includes a business lawyer)

Mar. 7, 9 a.m. to noon, *So You Want to be a Consultant!*

Mar. 12 and 13, 9 a.m. to 4:30 p.m., Career Transition Seminar

Mar. 19, 9 a.m. to noon, Employer Panel – "Trends in the Career Marketplace"

Mar. 21, 9 a.m. to noon, *Communicating Effectively with Your Supervisor*

Call Susan Costello at ext. 45000 for more information and to register.

HU Professor to Speak at Ft. Monroe

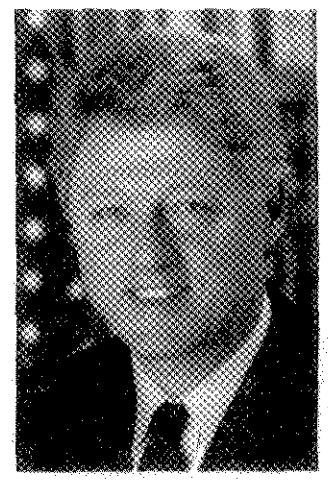
Dr. Roy E. Finkbine, assistant professor of history at Hampton University, will speak at a luncheon at the Fort Monroe Club, Feb. 29 at 11:30 a.m. His topic is "400 Years of African American Women's History Within the Public Sphere," in observance of this year's African American History Month theme honoring African American women. Finkbine is a specialist in 19th Century African American history and has published widely on the subject.

Tickets for the luncheon of ethnic foods are $5.70 per person and should be purchased by Feb. 26. For tickets or information, call 727-2122.

National African American History Month, 1996

by the President of the United States

A Proclamation



Today's children are fortunate to grow up in classrooms where they are taught to appreciate all of the many heroes of American history. While previous generations read textbooks that told only part of our nation's story, materials have been developed in recent years that give our students a fuller picture — textured and deepened by new characters and themes. African American History Month provides a special opportunity for teachers and schools to celebrate this ongoing process and to focus on the many African Americans whose lives have shaped our common experience.

This year, our observance emphasizes black women and the strides made to bring their achievements to the fore. From Sojourner Truth's sermons, to Mary McLeod Bethune's speeches, to the contemporary novels of Nobel laureate Toni Morrison, the voices of African American women have called attention to the twin burdens of racism and sexism and have invited listeners to discover the richness of traditions kept alive in back kitchens and workrooms. In churches and communities, and more recently in universities and statehouses across America, these women have fought extraordinary battle for social, economic and political empowerment.

Barbara Jordan once wrote, " 'We the people'; it is a very eloquent beginning. But when the Constitution of the United States was completed on the seventeenth of September, 1787, I was not included in that 'We the people.'"

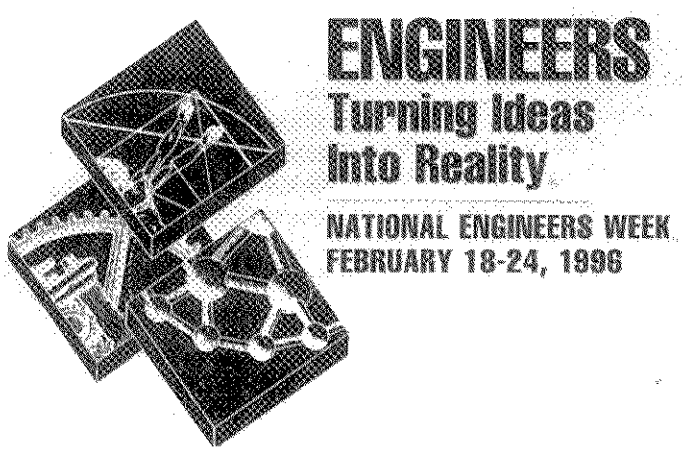
As we mourn the loss of this great American, let us honor her by seeking to further the progress made since those early days toward true equality and inclusion. During African American History Month and throughout the year, we must embrace the diverse strands of our story so that all children can see themselves in our nation's past and know that they have a role to play in seizing the future's countless opportunities.

NOW, THEREFORE, I, WILLIAM J. CLINTON, President of the United States of America, by virtue of the authority vested in me by the Constitution and the laws of the United States, do hereby proclaim February 1996, as National African American History Month. I call upon government officials, educators in schools, colleges, universities and libraries and all people of the United States to observe this month with appropriate ceremonies, activities and programs that raise the awareness of African American history and invite further inquiry into this area of study.

Bill Clinton

Engineers Week Volunteers Needed

Engineers Week volunteers are still needed to support the requests from 199 area schools. Currently 152 volunteers are giving 280 presentations at 149 schools. Langley is not yet able to fill requests for another 241 presentations at 50 schools. Volunteers are needed for Norfolk, Virginia Beach, Portsmouth and Chesapeake schools. Call Cathy Schauer at ext. 43314 or the Public Mail Center at ext. 43293 to volunteer or for more information.



College Scholarships Available to Dependents of NASA Employees

Application Information

March 29 is the deadline for submitting scholarship applications to the NASA College Scholarship Fund, a nonprofit organization established to award scholarships to qualified dependents of NASA and former NASA employees.

To be eligible for consideration, 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. In addition, applicants must have a combined high school and college (if any) grade-point average of 2.5 on a 4.0 scale or the equivalent.

Five scholarships will be awarded in the amount of $2,000 each for the 1996-97 academic year. The renewable scholarship is for a maximum of $8,000 over six calendar years.

Applications should be submitted directly to the Johnson Space Center in Houston, Texas, and must be received no later than March 29. Late applications will be returned unopened.

For more information on eligibility requirements and selection criteria, or to receive application forms, contact Kate Spruill of the Office of Human Resources at ext. 42606.

Gift from Michener

The scholarship fund was established 14 years ago as a result of a substantial, unsolicited gift offer by the Pulitzer Prize winning author James Michener. Many NASA employees have also contributed to the NASA College Scholarship Fund, primarily through the Combined Federal Campaign.

Summer Intern Program Announcement

Science Applications International Corp. (SAIC) of Hampton is seeking highly-qualified and strongly motivated upper level undergraduate and graduate students to participate in a Summer Intern Program, from May 28 to Aug. 30, in affiliation with an ongoing contract at Langley.

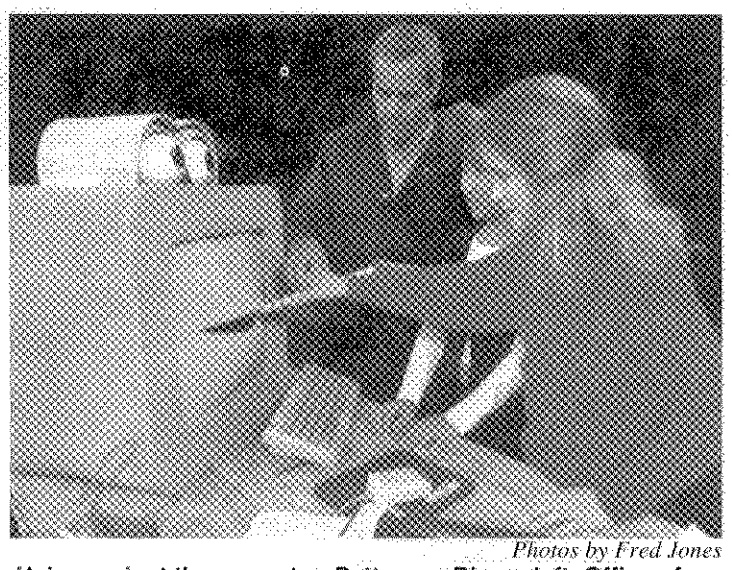
Candidates may have experience, a degree or be seeking a degree in any of the following fields: Earth science, physics, engineering, mathematics and scientific computer programming. Successful candidates must be U.S. citizens or eligible for employment with a U.S. government contractor.

All interested students should submit a resume by Feb. 28 to SAIC, Summer Intern Program, One Enterprise Parkway, Suite 300, Hampton, Va. 23666, or fax (804) 825-4968 or via e-mail saic+intern@larc.nasa.gov.

Distance Learning Initiative Project Kicks Off for Engineers Week

BY SHELLEY CANRIGHT AND CATHARINE SCHAUER

Langley's Office of Education launches its Distance Learning Initiative project and support of National Engineers Week this month, with a special satellite broadcast, *Think BIGG*, which will be distributed by television channel WHRO in Norfolk to school divisions on Feb. 27 to 29 at 9 a.m. and 1 p.m. This entertaining mathematics lesson uses characters Biggs, Mission Man and Arf, with the help of viewers, to find the fastest route to recovering an antidote for their sick computer friend Giggs (short for gigabytes).



Photos by Fred Jones

Using a giant thermometer, Patterson Biggs, left, Office of Education, helps Kaitlin Bowles of Nansemond-Suffolk Academy in Suffolk and Amory Cervarich of Blair Middle School in Norfolk take Giggs' (the computer) temperature. Giggs suffers from a computer ailment that Biggs and the students must find and cure before its too late for the computers of the world.

Clues to a Journey

Using mapping skills and mathematics formulas, the team's journey becomes a race against time. Animation and song provide important clues to viewers. Materials in support of the program will be distributed later in February to classrooms registered for Langley's National Engineers Week outreach.

The program supports National Engineers Week, Feb. 18 through 24. During the month of February, Langley employees visit elementary and middle school classrooms in a 50-mile radius with a variety of lessons and presentations. With the introduction of Langley's distance learning programming, students and teachers from 19 school districts in Southeastern Virginia and Northeastern North Carolina will also be reached. This new effort expands the Center's outreach tremendously.

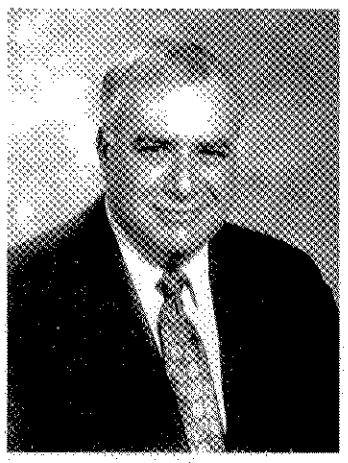
Support Learning

"Our goal," says Dr. Shelley Canright, director of Langley's K-12 programs and producer for the video program, "is to show how science, mathematics, and engineering relate to the world around the students and why their studies are important." In addition to launching Langley's Distance Learning Initiative, the program will serve to provide valuable feedback from teachers and students in developing a range of programs for Fall 1996.

The Engineers Week program, now in its sixth year, is the single largest outreach effort sponsored by Langley. Last year, 217 employees participated, reaching more than 19,000 students and teachers within 12 school districts in the Tidewater area.

The cast and crew of *Think Bigg* on the set at WHRO are, left to right, WHRO's Cheryl Zeek, scriptwriter and director Andrea Evans of Christopher Newport University's Teacher Enhancement Institute, and producer Shelley Canright, Office of Education, Amory Cervarich, Patterson Biggs and Kaitlin Bowles.

Director Supports Engineers Week/Distance Learning



Center Director Paul Holloway explains that "Executive Order 12821, signed in 1992 by President Bush, gave the federal government the added impetus needed to expand its outreach programs by allowing employees to participate in off-site activities that promoted math and science education.

"The National Engineers Week project, now in its sixth year, is an example of the Center's commitment to education," Holloway states. "We have a responsibility to encourage and help our young people prepare for life in a technological world."

"The United States must seek leadership of the evolving technological world. Providing positive role models is an effective way to capture the interest of students," Holloway continues. "As professionals, we should help develop the work force of the future. *Think Bigg* is yet another mechanism for reaching out to the students, especially those we can not visit personally during National Engineers Week."

Paul

Happenings

MOVING BOXES: Used moving boxes are now available from stock by submitting a LF55. The NSN is 8115-01-LP0-1674. If used boxes are unavailable, you will receive new boxes unless otherwise noted. No back-orders will be established. The charge for used boxes will be half the cost of new boxes. Please return all moving boxes to Building 1206, Stockroom for reissue.

TAX PREPARATION: Take the Tax out of your Return this year. Specializing in personal and small business income tax returns, offering accurate computerized tax preparation, reasonable rates with referral discounts and valuable information to reduce 1996 tax liability. Preparer has a bachelor's degree in accounting and obtains annual VITA certification. Call Wanda at 838-6546 for a quote and appointment.

INCOME TAX PREPARATION at your place. Call Nancy Taylor at 723-5227 for an appointment.

ECVP MEETING: FBI Supervisory Special Agent Melissa Anne Smrz will speak to the members and guests of the Engineer's Club of the Virginia Peninsula (ECVP) on March 21 at the regular monthly dinner meeting. The subject for the meeting will be "Forensic Science and DNA Analysis." Reservations are required. Call Abe Leiss at 877-2939 or Ron Harvey at 249-2322.

FOUND: Lapel pin from a museum in Boston. Pin was found in Building 1200 on Feb. 9. Call Security at ext. 43420 to identify and claim.

FOR SALE: Stackable washer and dryer unit. Frigidaire heavy duty washer and dryer with extended contract warranty from Luskins, good through August 1997. Unit was purchased August 1994, works perfectly, no problems. Asking $300 or best offer. Call 898-1738, ask for Dee.

TRAVEL: Great deals to Las Vegas, cruises to the southern Caribbean, Cancun, etc. Call Regina at Omega World Travel, ext. 47696, to find out more.

BROWN BAG SEMINAR: Jim Goltry of the American Red Cross will present a seminar on Red Cross services. The main areas of discussion will be blood services, volunteer services and emergency services. The seminar will be held in the cafeteria's private dining room at noon on March 6. All Langley employees are invited.

VOLUNTEERS NEEDED for Muscular Dystrophy Association (MDA) summer camp. Dates are June 16 to 21 in Wakefield, Va. Recruiting counselors for a one-on-one experience with campers. For information, call Meg Wade, MDA at 461-0177.

1996 STUDENT ENVIRONMENTAL CONFERENCE will be held Saturday, March 2 from 9 a.m. to 3 p.m. at Old Dominion University's Webb Center. Sponsored by the Hampton Roads Clean Community Systems, the conference is geared to students grades 7 though 12 and their teachers. For more information on schedules and registration, call Debbie Blanton at 728-2066 or 1-800-683-0922.

1995 SPINOFF BOOKS are here. They are available from the Technology Transfer Team, Technology Applications Group. To get a copy of the book please e-mail Ginger Freeman, g.l.freeman@larc.nasa.gov or by QuickMail address: Ginger Freeman.

VIRGINIA ELECTRONICS EXPO: A conference showcasing electronics manufacturing technology, will be held May 7 and 8 at the Pavilion Convention Center, Virginia Beach. The expo is sponsored by the Chesapeake Electronic Representatives Association and in cooperation with Virginia's Center for Innovative Technology. Technical seminars are scheduled for both days, as is a technical symposium. For more information, call Bonnie Lasky at (215) 822-6319.

FOR SALE: Hampton Club, 2BR condo, one bath, extra appliances, blinds, wall-to-wall carpet, security system, pool, near Langley. Asking $47,000. Call Ken Curtis at 827-1257.

HEALTH FOR LIFE: Has the winter cold and snow kept you inside, adding inches to your waistline? Spring is right around the corner and it's time to start thinking about fitting back into that spring wardrobe. The Health For Life weight loss class, sponsored by Langley's Fitness Center, starts soon. There are exercise classes and motivational seminars to get everyone back into the swing of spring. The program lasts 12 weeks, March 5 to May 23, with four brown bag luncheon seminars. If you are serious about losing weight the healthy way, call now and reserve your space, ext. 46387. Open only to civil service employees.

INCOME TAX PREP: Member of the National Association of Tax Practitioners. Electronic filing and direct deposit offered at no extra charge. Also do small business bookkeeping. We travel to you, by appointment. Call 874-3121.

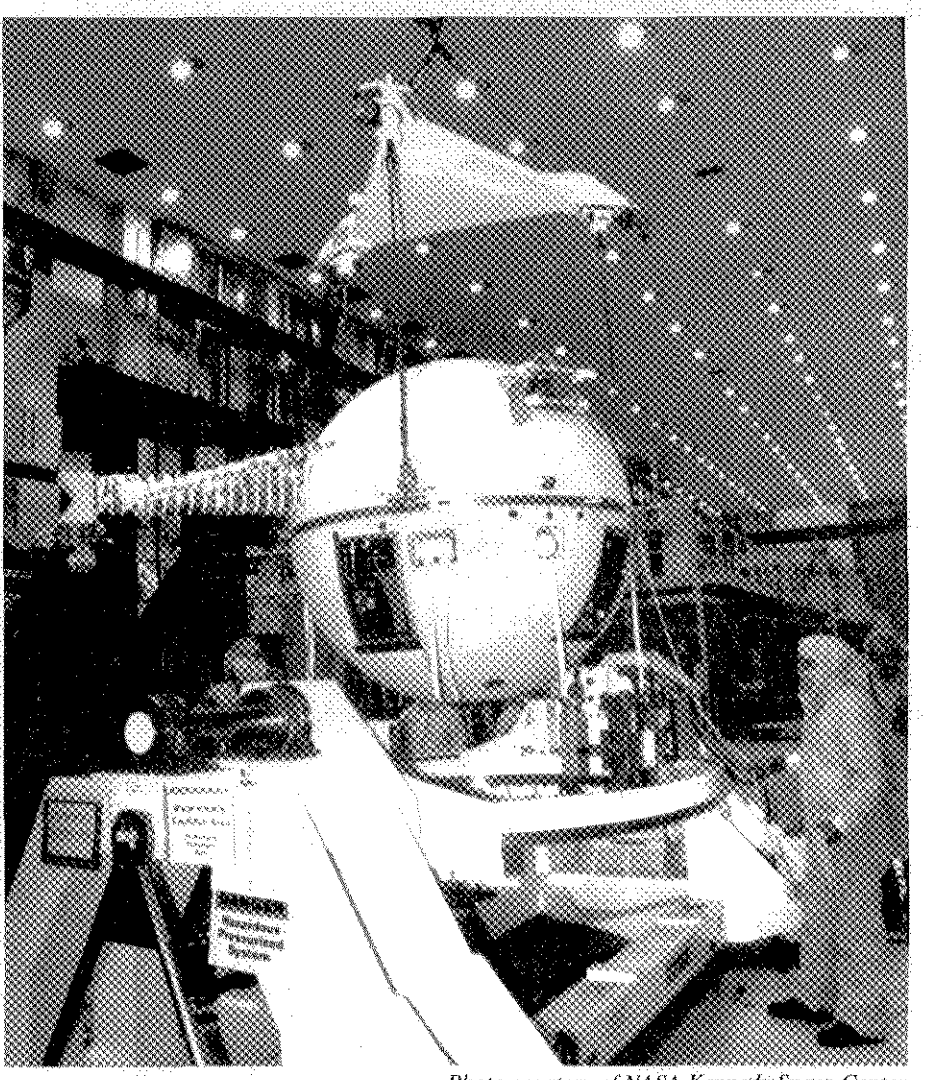


Photo courtesy of NASA Kennedy Space Center

John Powell, left, and Jim Nail, second from right, of McDonnell Douglas Space and Defense Systems prepare the satellite element of the Tethered Satellite System-1R (TSS-1R) for integration with its support unit in the Operations and Checkout Building. The TSS-1R is one of two primary payloads scheduled to fly aboard the space shuttle Columbia during STS-75, scheduled for launch Feb. 22. The TSS program is a joint venture between NASA and Agenzia Spaziale Italiana or Italian Space Agency. Once deployed to the 12-mile height on the mission, the satellite will be used to validate theories that such a system could be used to generate electrical power to power orbital systems.

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Researcher News

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Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 5 ❖ March 8, 1996

Pilots Test 'Synthetic Vision' with Windowless Landings

NASA has flight tested a "synthetic vision" concept that promises to help make supersonic flight practical and affordable for the average air traveler close to the turn of the century. The tests, in which pilots conducted windowless landings, were flown on Langley's 737 research aircraft and a Westinghouse BAC 1-11 test aircraft over a three-month period ending in January.

Sensors tested included a digital video camera, three infrared cameras and two microwave radar systems. The video and infrared images were combined with computer-generated graphics that gave the pilot cues during approaches and landings. One goal of the tests is to identify sensors that will replace or exceed the capabilities of human vision.

Researchers are hoping that by enhancing the pilot's vision with high-resolution video displays, aircraft designers of the future can do away with the expensive, mechanically-drooping nose of early supersonic transports. Forward-looking windows would be eliminated, making way for large-format displays filled with high-resolution images and computer graphics.

As envisioned, such an aircraft would carry about 300 passengers at speeds up to Mach 2.4, (about 1,400 m.p.h.) over a 5,000 nautical mile range. Travel time across the Pacific Ocean would be cut in half, with only an approximate 20 percent fare increase over current subsonic prices.

The tests were flown on NASA's Transport Systems Research Vehicle (TSRV), a Boeing 737 equipped with a windowless research cockpit, and the BAC 1-11 aircraft. About 20 flights took place from NASA's Wallops Flight Facility at Wallops Island, Va., and Langley Air Force Base in Hampton, Va.

The flight tests consisted of two phases. During the sensor data collection phase, the TSRV and BAC 1-11 flew typical approach, cruise and holding patterns, and tested the suitability of sensors to detect airborne traffic and ground objects. During the pilot-in-the-loop phase, the TSRV flew approaches and

Continued on Page 3

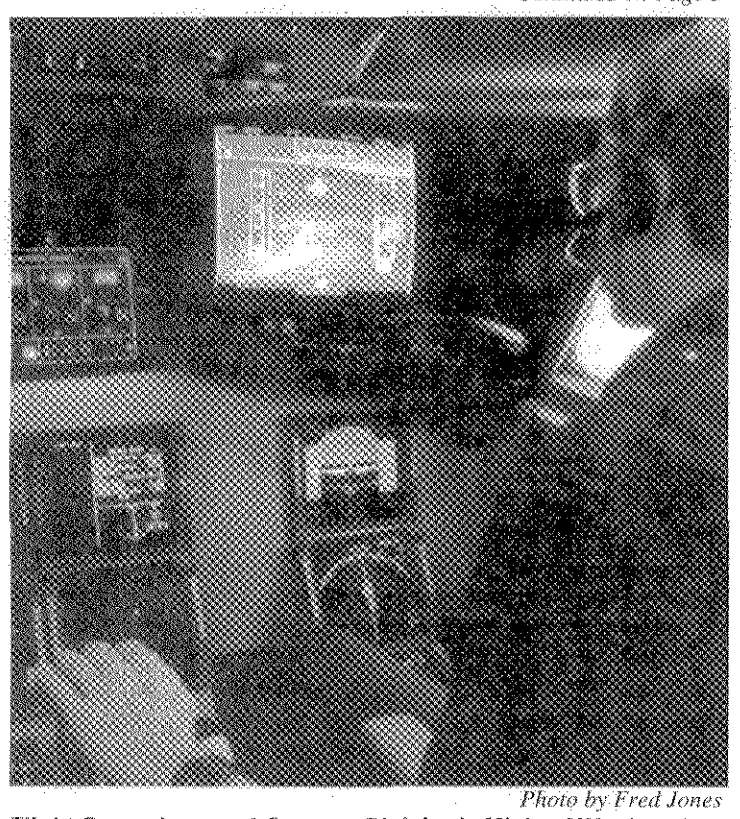

Photo by Fred Jones

Flight Operations and Support Division's Michael Wusk makes a "windowless landing" aboard Langley's 737 research aircraft in flight tests to develop technology for a future supersonic airliner. Cameras in the nose of the plane relayed images to a computer screen in the aircraft's "blind" research cockpit. Researchers in the High-Speed Research program office hope that by enhancing the pilot's vision with high-resolution video displays, aircraft designers of the future eliminate the expensive, mechanically-drooping nose of early supersonic transports.

Rustan Presents "The Clementine Mission" in March Colloquium

Colonel Pedro "Pete" Rustan Jr., USAF, *Clementine* Mission director, will discuss "The *Clementine* Mission" in a Colloquium at the H.J.E. Reid Conference Center at 2 p.m. on March 18. His talk will cover why the *Clementine* program was started, how it was managed and the implications for future small satellite projects.

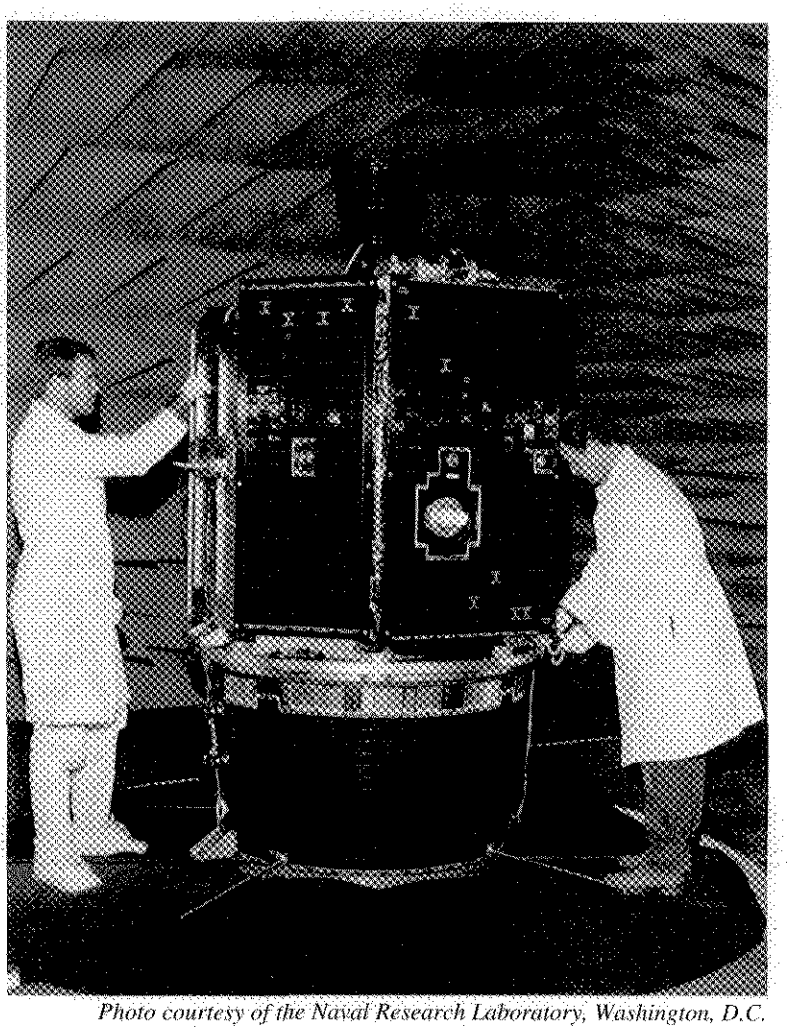

Photo courtesy of the Naval Research Laboratory, Washington, D.C.

The Ballistic Missile Defense Organization assigned primary responsibility for the *Clementine* spacecraft design, manufacture, integration and mission execution to the Naval Research Laboratory (NRL) in March 1992. The construction and integration of the spacecraft was completed in 22 months. The photo shows the spacecraft, on top of its interstage adapter, being prepared for testing in NRL's anechoic chamber. *Clementine* was essentially completed at this point and undergoing one of its final tests before being transported to Vandenburg Air Force Base in California.

Clementine Mission

The *Clementine* mission was approved by the Ballistic Missile Defense Organization (BMDO), then the Strategic Defense Initiative Organization director in January 1992. In March of that year the Naval Research Laboratory was selected as the lead agency to design, build and launch *Clementine*, with the Lawrence Livermore National Laboratory selected to integrate the payload. The payload would be a sensor suite of six cameras comparable to those which were planned for use in the now defunct Brilliant Pebbles program. Since NASA was not performing any lunar or asteroid missions at that time, the agency agreed to become a cooperative partner, providing a science team and tracking facilities.

NASA Partnership

The NASA partnership significantly strengthened the mission, because NASA lunar and asteroid scientists reviewed all aspects of the project, and provided suggestions that enhanced the project's scientific value.

The *Clementine* mission was to flight qualify 23 advanced, lightweight technologies, using three celestial bodies — the Earth, the Moon and a near-Earth asteroid, Geographos — as targets. On Jan. 25, 1994, the *Clementine* spacecraft was launched, on time and on budget, from Vandenberg Air Force Base on a Titan IIG refurbished booster.

In addition to the discussion about the mission, actual experimental results from the historical flight of the *Clementine* spacecraft will also be shown.

About the Speaker

Rustan is assigned to the National Reconnaissance Office as the director of the Small Satellite Development Office. He is responsible for developing alternative small satellite architectures and for building small spacecraft to meet specialized requirements.

Rustan received his Air Force commission from the Officer Training School in 1972. He received his bachelor's and master of science degrees in electrical engineering from the Illinois Institute of Technology, and completed his doctorate in electrical engineering from the University of Florida.

From 1987 to 1993 Rustan managed three Space Power Experiment Aboard Rockets (SPEAR) spacecraft and the Polar Ozone Atmospheric Measurement (POAM) program from 1989 to 1993. In 1992 he was selected to manage the *Clementine* mission, the first Department of Defense mission to deep space. As the mission director for the *Clementine* program, he selected and managed the integration and flight qualification of 23 advanced technologies. He has published more than 50 articles in scientific journals, several of which discuss the use of advanced technology and streamlined spacecraft program management.

News Briefs

Around the Agency

TRAFTON NAMED TO OFFICE OF SPACE FLIGHT – Wilbur C. Trafton, director of the Space Station Program, has been designated Acting Associate Administrator for the Office of Space Flight. The appointment was effective Jan. 29.

DIAZ NAMED GODDARD'S DEPUTY DIRECTOR – Alphonso V. Diaz has been named Goddard Space Flight Center Deputy Director, effective Feb. 4. He will be responsible for the center-level management of Space and Earth Science programs. Diaz joined NASA as a co-op student at Langley in 1964 and was actively involved in the Viking project from 1969 through 1977 in a variety of roles including the development and operation of the Viking Gas Chromatograph/Mass Spectrometer. He transferred to NASA headquarters in 1979 and served in a number of positions.

STUDENTS TO MAKE OBSERVATIONS USING HUBBLE SPACE TELESCOPE– Students in grades K-12, working with some of America's foremost astronomers, will have a chance this spring to help do real science observations using NASA's Hubble Space Telescope (HST). The resulting observations will be featured in a live, interactive telecast on NASA TV and public television in March and April. The time was offered for students by astronomers from a lively discussion and debate via the Internet. Students were challenged to go on-line to research and decide which planet in the solar system would be best to study. Neptune and Pluto were selected as targets by students who will be serving as HST "Co-Investigators." Over the next two months, mission planners will transform the students' selection into plans for the observations. Students will follow the progress of their upcoming observations via the Internet. The students then will be featured on "Live from the Hubble Space Telescope: Making Your Observations" airing at 1 p.m. EST, March 14, and on "Live from the Hubble Space Telescope: Announcing Your Results" airing at 1 p.m. EST, April 23.

NASA, MCDONNELL DOUGLAS TO UNVEIL X-36 – NASA and McDonnell Douglas Corporation (MDC) have announced a joint research program for a subscale vehicle, designated the X-36, that will demonstrate breakthrough technologies for future tailless fighters. The upcoming flight tests of the X-36, a remotely piloted tailless research aircraft, will demonstrate the feasibility for future tailless fighters that can achieve agility levels superior to today's fighters. The X-36 aircraft will be unveiled to the public for the first time in a joint NASA/MDC roll out ceremony to be held at MDC facilities March 19. The aircraft will then be shipped to Dryden Flight Research Center, Edwards, Calif., to prepare for its first flight this summer. "NASA research in aerodynamics, flight controls and propulsion continues to provide design options and tools for designers of future fighter aircraft," said NASA's X-36 program manager, Dr. Larry Birckelbaw of Ames Research Center, Moffett Field, Calif. "The X-36 technologies, which allow the reduction or removal of vertical tails, will reduce the weight, increase the range and improve the survivability of tomorrow's fighters," Birckelbaw said. The X-36 flight test program will establish the confidence to incorporate these technologies in future piloted vehicles.

NASA TO FORM INDEPENDENT REVIEW PANEL – NASA is forming an independent panel to review the loss of the STS-75 tethered satellite. Wil Trafton, acting associate administrator for the Office of Space Flight, announced Feb 26. The team will be chaired by Kenneth Szalai, director of the Dryden Flight Research Center, Edwards, Calif. A preliminary report with recommendations is due to Trafton within 75 days. "Given the public investment in the tethered satellite, it is important that we find out what went wrong," said Trafton. "To do any less would be a disservice to the American and Italian people." The review team will be chartered under NASA's Space Flight Operations Contingency Plan. This is standard practice with in-flight anomalies of this magnitude.

Apprentice Jacket Presentations

The top apprentice graduates of the 1995 Engineering Technician Apprentice Program were recognized by Dr. Kristin Hessenius, director, Internal Operations Group and chairperson of the Engineering Technician Advisory Committee, on Jan. 23.

Each graduate was presented with an apprentice plaque, and the top two graduates, David Sheldon and Eddie Rhyne were also given jackets funded by the Langley Exchange Council. The program extends congratulations to these graduates for a job well done and special thanks to the Langley Exchange Council for their contribution.

The graduates, front row, left to right, are David Sheldon, Lisa Hawks and Chad Rice. In the back row, left to right, are Dr. Hessenius, graduates David Coleman, Spencer Johnston and Eddie Rhyne, and Apprentice Program administrator Donna Martin.

In Memoriam

Theodore Creel Jr.

Theodore Roosevelt Creel Jr., 63, died Feb. 10. A native of Hopewell, Creel had been a Peninsula resident for the past 32 years.

Theodore R. Creel Jr.

Creel had been employed as a mechanical engineer in Langley's Flow Modeling and Control Branch at the time of his death.

"Ted was highly regarded by those he worked with in the engineering community," branch head William L. Sellers said. "Throughout his career he has made significant contributions to several NASA programs. His skills and research in hypersonic aerodynamics, interference heating and the measurements of boundary layer transition were of considerable assistance to both the Space Shuttle and National Aerospace Plane (NASP) programs. He will be missed at Langley."

Patrick J. Croall

Patrick J. Croall, 78, died Saturday, Feb. 24. He retired from Langley in 1975 as chief of the Classification and Organization Branch after 33 years of service which also included work with the Civil Aeronautics Administration, the Navy Department and NASA Headquarters.

Putnam Named Assistant Chief of Aerodynamics Division

BY MEGHAN WOODCOCK

Lawrence E. Putnam

Lawrence E. Putnam, former head of the Research Facility Branch, was selected as assistant chief of the Aerodynamics Division (AD) on Dec. 24, 1995.

Putnam has spent more than 30 years conducting aeronautical research at Langley, starting as an aeronautical research engineer in 1959. He was made assistant head of the Propulsion Aerodynamics Branch in 1979 and was later named head of the Transonic Aerodynamics Branch in 1986. In 1990, he took over as head of the High Reynolds-Number Aerodynamics Branch where he was responsible for the operation of the National Transonic Facility (NTF). Four years later Putnam moved to his last position as head of the Research Facilities Branch.

His three-decade career at Langley covers extensive research on propulsion/airframe system integration and aerodynamics. Putnam is an international authority in the area of wind tunnel operations, wind tunnel test techniques and applied aerodynamics. He has worked on aircraft performance, airframe and propulsion integration, Reynolds-number effects and applied computational fluid dynamics (CFD). Putnam is now responsible for overseeing the operation and improvement of the Aerodynamics Division's research facilities and guiding the development and implementation of research programs in Reynolds-number scaling and in test technique development. In the past, the aerodynamics facili-ties, including eight wind tunnels and two test facilities, were managed by different organizations at Langley. Putnam developed a coordinated plan for the operation of these facilities to improve their productivity, efficiency and data quality.

The new assistant chief of AD has received numerous awards and certificates of recognition from Langley in the past. He has also received several awards from the American Institute for Aeronautics and Astronautics (AIAA) including an Associate Fellow in 1983 and the AIAA Applied Aerodynamics Award in 1995 "for leadership in the advancement of applied computational fluid dynamics methods and the development and application of high Reynolds-number wind tunnel testing."

Putnam received his bachelor and master of science degrees in aeronautical engineering from the University of Virginia. He also holds a master's degree in engineering administration from the George Washington University (GWU). Putnam has continued his contributions to science by teaching two graduate courses at GWU's Joint Institute for Advancement of Flight Sciences (JIAFS) —one in Engineering Administration from 1987 to 1989 and one on Wind Tunnel Testing Techniques in 1995.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Ann Gaudreaux), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor. . . . . Keith Henry

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Science and Technology Corp.

Assistant Editor. . . . . Jeane Shanks
Science and Technology Corp.

Photographer . . . . . Fred Jones

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

Jet Aircraft: How Large a Source of Atmospheric Pollution?

CATHERINE E. WATSON

Every day, thousands of jet aircraft fly through the Earth's atmosphere, but scientists are still uncertain how much pollution is produced. To better understand this relatively unknown source of air pollution, researchers at Langley are measuring emissions from the engines of two NASA research jets – a Boeing 737 and a Boeing 757.

Collecting Data

During a two-week experiment, as part of NASA's Atmospheric Effects of Aviation Project (AEAP), a NASA T-39 jet will fly behind a NASA 737. Instruments aboard the T-39 measured various chemicals and small pollutant particles (called aerosols) emitted by the 737's engines. The T-39 data will be used to study how the 737's engine emissions disperse in the atmosphere, and how rapidly. Jet engine emissions can often be seen in the atmosphere in the form of contrails flowing behind the aircraft.

The NASA 737 will also fly over a ground-based laser system at Langley that can measure how many aerosols are emitted from the engines. These aerosol measurements can be used as tracers to study how air flows around the jet, dispersing the emissions into the atmosphere. Jet engine emissions have been shown to affect the concentrations of atmospheric water vapor and aerosols, and they may affect how clouds form and the concentrations of atmospheric ozone. Few actual measurements of their effects have been made.

Measuring Emissions

In addition to the ground-based laser system and the T-39, researchers from the University of Missouri-Rolla will measure engine emissions from both the 737 and the 757 in ground tests at Langley. Using a probe mounted near the rear of the engine, the researchers will measure how many aerosols are emitted by each engine and their relative sizes.

The data collected during this experiment will provide AEAP scientists with a unique data set to help them better understand how jet aircraft emissions are affecting our atmosphere and how these emissions are dispersed.

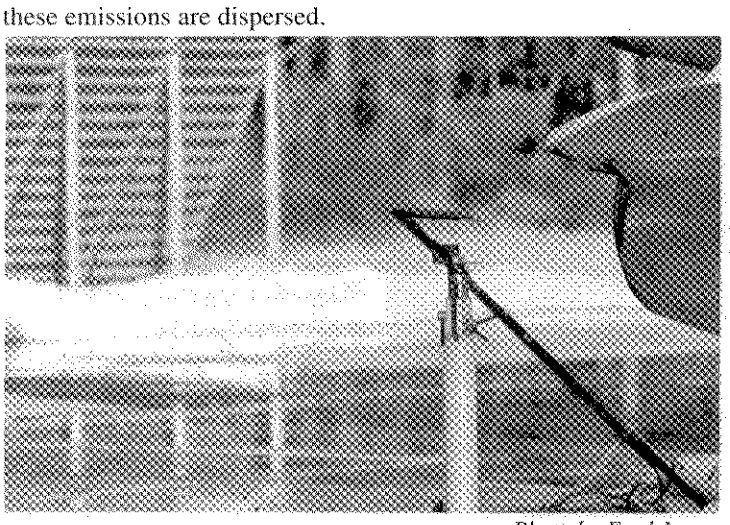


Photo by Fred Jones

Researchers from the University of Missouri-Rolla measure engine emissions using a probe mounted near the rear of an engine on the NASA 737. In ground tests in February, they measured how many small particles were emitted by both 737 engines and the relative sizes of the particles.

NACA Reunion VII Coming to Hampton

The seventh reunion of former employees of the National Advisory Committee for Aeronautics (NACA), predecessor to NASA, will be held in Hampton, Oct. 3 through 6. Langley, once known as the Langley Memorial Aeronautical Laboratory, will be the cornerstone of the visit by all former NACA employees and their spouses who will gather in Hampton to renew old acquaintances and talk of times past.

The 1996 reunion marks the 38th year since Congress transformed NACA into NASA, and the 20th anniversary of the first NACA reunion.

Hosting the reunion will be the Langley NACA/NASA Alumni Association. Cornelius "Neal" Driver is serving as Reunion VII chairman. The reunion will be headquartered at the Holiday Inn Hotel and Conference Center, Hampton, and a reception is planned for Oct. 4 at the Virginia Air and Space Center. A variety of other activities is planned.

To register or for more information, call or write : NACA Reunion VII, NASA Langley Alumni Association, Mail Stop 496, Hampton, Va. 23681-0001, (804) 595-1306.

Windowless . . .

Continued from Page 1

landings from the research cockpit and tested the pilot's ability to easily control and land the aircraft relying only on the sensor and computer-generated images and symbology.

The flight tests are part of the High-Speed Research (HSR) Program's Flight Deck Systems research effort, a part of which aims to develop technologies allowing airframe companies to design, build and certify a cockpit without forward facing windows. Such a cockpit is important to a high-speed civil transport because it would avoid the need to incorporate a Concorde-like drooped nose design, which adds weight and mechanical complexity and increases the fuel required for every flight.

The TSRV is a Boeing 737 aircraft that has been modified to incorporate a research flight deck in the passenger section. This research aircraft has been operated by NASA for more than 21 years and has conducted pioneering flight systems and aeronautics research ranging from electronic flight displays to first-of-its-kind satellite navigation and guidance, to proving the viability of airborne wind shear sensors.

The HSR Flight Deck research team includes Langley; NASA Ames Research Center, Mountain View, Calif.; The Boeing Co., Seattle, Wash.; McDonnell Douglas Corporation, Long Beach, Calif.; and Honeywell Incorporated, Phoenix, Ariz. Subcontractors supporting the flight tests included Rockwell Collins, Cedar Rapids, Ia; FLIR Systems, Portland, Ore.; and Westinghouse Electric Corp. in Maryland.

Weinstein Will Give Mattson Lecture

AIAA Hampton Roads Section's Engineer of the Year, Dr. Leonard M. Weinstein, will present a lecture entitled "High-Speed Flow Visualization — From Wind Tunnels to Flight " March 20 in the H.J.E. Reid Conference Center.

Weinstein, a senior research scientist, combined his hobbies of astronomy and photography with focusing schlieren technology to develop a schlieren system to photograph the flow field of aircraft in flight. The demonstration of this new technique now allows visualization of aircraft from the wind tunnel through flight. Weinstein's process has already been used to study sonic boom structures.

The Axel T. Mattson Lecture is an annual event recognizing local outstanding technical achievement.

Dr. Leonard M. Weinstein

Mattson was the first AIAA nominee to receive the Peninsula Engineers Council Engineer of the Year award.

The event begins with a social, cash bar at 6 p.m., followed by dinner at 7 and program at 8 p.m. The cost is $12 for members and guests; $15 for non members; $8 for students. Contact Tom Gates, 864-3400 or t.s.gates@larc.nasa.gov, or Beth Lee-Rausch, 864-2269 or e.m.lee@larc.nasa.gov, by March 15.

Photo by Sandy Gibbs

NASA 515, a Boeing 737, has been used on numerous research flights. It was outfitted with a digital video camera, three infrared cameras, two microwave radar systems and other equipment necessary to test flight "synthetic vision" for future windowless takeoffs and landings of the High-Speed Civil Transport.

Health Corner

March Blood Drive Seeks New Donors

The next blood drive will be held on Wednesday, March 20, from 9 a.m. to 3 p.m., in the H. J. E. Reid Conference Center. On Feb. 14, the Occupational Health Services Office staff members attended the American Red Cross 27th Annual Bloodmobile Sponsor Award program. Langley received the 1995 Outstanding Contributions Award for top blood donations, consistency and dedication to the Blood Drive Program. The Health Services staff wishes to thank all of Langley's blood donors for their continued support of the program. Your blood saves lives, and this is the best reward we can receive. We look forward to seeing you at the March blood drive.

Brown Bag Lunches and Health Seminars

Brown bag lunches and quarterly health seminars are planned for the spring and summer. Watch for upcoming announcements.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following Langley employees are approved leave recipients: Marilyn K. Aldrich; Janet L. Edmondson; Cassandra Stevens and Charles S. Washington.

Potential leave donors should complete the "Request to Donate Annual Leave to Leave Recipient Under the Leave Transfer Program" form found in the Informed Manager on your computer. Send forms to Mail Stop 293, Office of Occupational Health Services, or fax to 864-9114. Annual leave donations are greatly appreciated. For more information, call Karen Ridlon at ext. 43194.

Engineers Week Draws Support from Employees, Retirees

Photo by Paul Bagby

Langley retiree Steve Devan, right, gathers materials for classes he will teach at Indian Lakes Elementary, Landstown Middle and Salem Middle Schools, all in Virginia Beach, during National Engineers Week 1996. Jeane Shanks of the Public Mail Center assists Devan.

Classroom visitations will continue into mid-March. This year's program is targeted to students within a 50-mile radius who are in grades 3-7. Langley retirees, civil service employees and contractors are supporting the program that shows the students how math, science and engineering relate to the world around them and why their studies are important. The Engineers Week program is the single largest community outreach effort sponsored by Langley. Last year, 217 employees participated, reaching more than 19,000 students and teachers in 12 local school districts.

Through 155 volunteers, most teaching multiple classes, Langley has met requests from 285 teachers for National Engineers Week 1996. Of these 155 volunteers, 109 are civil service employees, two are retirees, and 44 are contractors.

Requests were received from 199 schools and 152 of them have been serviced with available volunteers. Civil service employees should charge their time for National Engineers Week to Job Order A5432.

Laws Provide for Bicycle Sidewalk Access and Safety

BY GALE HARVEY

Virginia State Code specifically provides for bicycle sidewalk access in §46.2-903: "No person shall ride or drive any vehicle other than a bicycle on the sidewalks of any county, city or town of the Commonwealth."

This statute is in accord with other state codes and the national Uniform Vehicle Code. Virginia counties, cities or towns may prohibit the riding of bicycles only on designated sidewalks or crosswalks (§46.2-904).

Virginia State Code supersede all city, town and county codes in the Commonwealth of Virginia. As an example, Hampton restricts bicycle sidewalk access only on a few sidewalks on commercial property, like a shopping center, but not on any municipal property. The reason for this is readily apparent: Bicycles and pedestrians are much more compatible than bicycles and motor vehicles. Langley has always had normal bicycle access to sidewalks.

The reason that bicycles are classified as vehicles (not motor vehicles) and, therefore, have the right to be ridden on roadways, is that most sidewalks have impediments to bicycles such as curbs. Many roads and routes don't have any sidewalks. When bicycles are ridden on roadways, additional safety precautions, like wearing helmets and highly-visible clothing, using bicycle-friendly routes and, where possible, riding in lanes, help to separate cyclists from drivers of motor vehicles.

Bicycle sidewalk access is prohibited only on a few sidewalks on commercial property and where posted.

Virginia State Code specifies operating procedures for both sidewalk and roadway use. For example, a person riding a bicycle on a sidewalk shall give an audible signal before overtaking and passing any pedestrian (§46.2-904). A courteous greeting such as, "Good morning, bike back," or ringing a bell are common signals.

Additional information about bicycle sidewalk access, courtesy and safety is available from the NASA Langley Bicycle and Pedestrian Safety and Advocacy Club which usually meets the fourth Friday of the month at 11:30 a.m. in the Executive Dining Room of the Cafeteria, Building 1213.

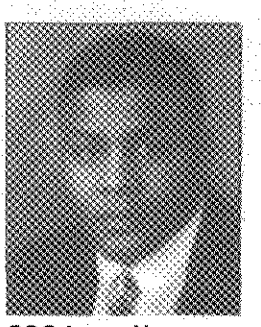
Career Programs Offered

For March and April, the Career Transition Assistance Program (CTAP) Center is offering two of its most popular training seminars: "Starting Your Own Business" and "So You Want to be a Consultant!" During both months we will be conducting our two- day seminar which covers career development from A to Z. CTAP is also introducing (for the really busy folks) lunch time "brown bag" seminars on Interviewing and Assertiveness. The electronic resume and the Internet are becoming more important tools in the job search everyday. Sign up for our seminar on these key instruments. If there are topics you would like to see offered, call CTAPC at ext. 45000.

- Mar. 7, 9 a.m. to noon, So You Want to be a Consultant! Building 1312
- Mar. 12 and 13, 9 a.m. to 4:30 p.m., How to Evaluate Career Alternatives and Manage a Successful Career Campaign Building 1216
- Mar. 19, 9 a.m. to noon, Trends in the Career Marketplace (employer panel) at the Pearl Young Theater
- Mar. 21, 9 a.m. to noon, Communicating Effectively with Your Supervisor, Building 1312
- Apr. 4, noon to 1 p.m., INTV 101 (Interview Basics) Building 1312
- Apr. 10 and 11, 9 a.m. to 4:30 p.m., How to Evaluate Career Alternatives and Manage a Successful Career Campaign, Building 1216
- Apr. 18, 9 a.m. to noon, The Landscape of Electronic Resume and the Internet, Building 1312
- Apr. 25, noon to 1 p.m., Assertive Communications and Your Career (brown bag lunch), Building 1312
- Apr. 30, 9 a.m. to 4:30 p.m., Starting Your Own Business, Building 1216

Call Susan Costello, ext. 45000, for more information and registration.

Proud Langley Mom Boasts of Son — Hero and Olympic Torchbearer



SSG Larry Haymes

Carrie Haymes, Seema Co. in the Paint Shop, Building 1292, is one very proud parent these days. She recently learned that her son, SSG Larry Haymes of the 4th Brigade, 91st Division of Tumwater, Wash., received the Hero Award from the American Red Cross.

Haymes was honored at a Real Heroes Award Breakfast in Tacoma, Wash., along with several other local heroes. He was chosen for the award in the military category for his efforts in saving the life of a gunshot victim last August in a shopping mall. Haymes pushed himself between the victim and the criminal, and then performed CPR on the victim for 30 minutes until paramedics could safely reach the scene.

As a result, he has also been recommended by the U.S. Army for the Soldier's Medal, its highest peacetime award.

In further recognition of his rescue efforts, the Atlanta Committee for the Olympic Games has chosen Haymes as a Community Hero Torchbearer for the 1996 Olympic Torch Relay. He will carry the Olympic Flame "in honor of the outstanding contributions you have made to others in your community," according to William Porter Payne, president and CEO of the committee.

Chairman of Mason & Hanger Retires

John C. Custer, chairman of the Board of Directors of the 169-year-old Mason & Hanger-Silas Mason Co., Inc. has announced his retirement after 45 years with the company.

Custer has a long history of service to the national space mission with oversight of service and support contracts at several NASA facilities including Langley.

CW Reenacts Gunpowder Incident

In April 1775 British marines confiscated the colony's gunpowder from the magazine in Colonial Williamsburg. The incident galvanized the colonists and did much to precipitate Virginia's participation in the American Revolution. Reenactments and vignettes from April 19 to 22, 1996 will recreate the turmoil that gripped Williamsburg during this pivotal event.

Army Science Conference Coming in June

The 20th Army Science Conference, sponsored by assistant secretary of the Army for Research, Development and Acquisition, will be held at the Norfolk Waterside Marriott and Convention in Norfolk, June 24 to 27. The conference theme is "Science and Technology for Force XXI."

The conference will feature the presentation of 160 papers and posters judged as the best among those submitted by Army scientists and engineers. Highlighted will be presentations in the fields of advanced materials and manufacturing; microelectronics and photonics; sensors and information; high-performance computing and simulation; advanced propulsion technologies and power generation; biological, chemical and nuclear defense; life, medical and behavioral sciences; environmental sciences and geosciences; and engineering sciences.

To receive an invitation, or for more information about registration, etc., call the Army Science Registration desk at (804) 357-4011 or fax requests for information to (804) 357-5108.

Science Project Comes Together As Students Successfully Launch Rocket

BY MARNY SKORA

Getting 40 high school students interested in the same science activity is a challenge. Actually having them to commit time after school to study physics is a real coup.

That's exactly what volunteers from the National Space Society (NSS) and American Institute of Aeronautics and Astronautics (AIAA) Hampton Roads Section did at Phoebus High School. From early October to mid-December, students in Jim Sherrard's physics class met at least once a week to design, build and test their own high-powered rocket.

The Phoebus students launched the rocket at NASA's Wallops Flight Facility Dec. 14. Cheers erupted as the rocket blasted off and rose over thirteen hundred feet into the air. The cheers were even louder as the blue and gold parachute deployed and guided the rocket safely to the ground. "It worked!" they yelled almost in unison.

NSS and AIAA volunteers realized what really worked was an educational process that reinforced principles of science that for these students were no longer only theory. "Above all, the students began to understand the value of teamwork," said Dianne DeTurris, project coordinator.

Verification: Space veteran checks out project . . .

Teaming with aerospace experts became almost routine as Phoebus students worked weekly with their AIAA and NSS mentors. Two months to the day they began the project, students got a visit from another rocket enthusiast, astronaut Norm Thagard.

As Thagard moved from group to group, students explained to America's record holder for "days in space" the status of their part of the project. Thagard then spoke to the class about his 115 days aboard the Russian space station Mir.

The astronaut's visit was a "bonus," said Laura Doherty, a member of the performance analysis group. "We never expected to meet an astronaut."

Critical Tests: Project nears completion . . .

The parachute group spent more time designing the parachute than making it. Before launch, they had an opportunity to test their calculations as well as their handiwork.

Students brought the chute to Langley where it was dropped from the 240-foot gantry, the same structure where Apollo astronauts practiced walking on the moon. The drop tested the speed at which the parachute would land, and confirmed for the students that the 12-foot-per-second rate of descent would give the rocket a soft landing.

Students also tested the ejection system that would separate the nose section and deploy the parachute. This test also allowed the group members to prac-tice folding the 10-gored fabric balloon into its cramped quarters, and ensured that the lines would deploy untangled.

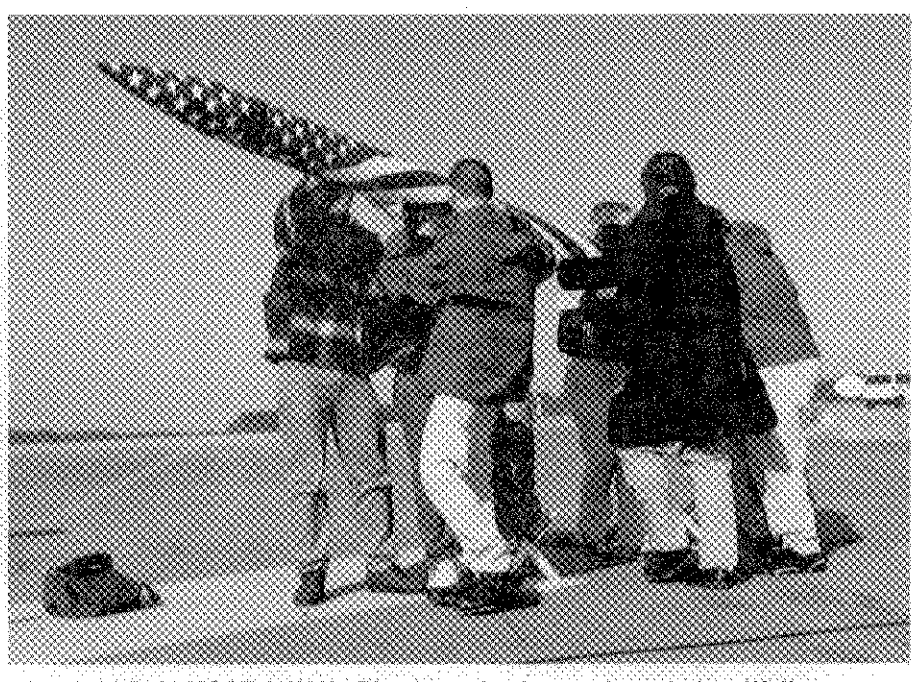
The ignition group had an opportunity to test their calculations about just how much black powder was needed to separate the rocket. The one-and-a-half grams they used proved just right.

Photos by Fred Jones

VISITOR FROM OUTER SPACE. Shelly Spencer explains to astronaut Norm Thagard the payload group chosen to fly a radiosonde to take data on pressure, temperature and humidity during the flight. David Hahn, far right, checks the work of Robert Bradley before the ignition test.

Launch Day: Students arrive at Wallops

Before launch, the would-be rocket scientists were tested in a flight readiness review at Wallops. Queries about construction, anticipated performance and safety were asked by Wallops Launch Coordinator Jeff Bland. One by one, students from the appropriate groups tackled the question, recounting the activities, the calculations and the trials of the previous two months that prepared them for the day's launch. Bland was convinced that the rocket was structurally sound and the students were well prepared to culminate their project.



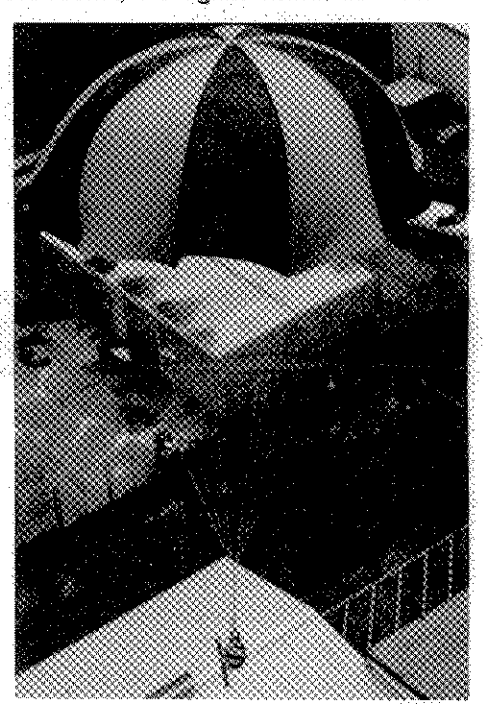
UP, UP AND ALMOST AWAY. Phoebus physics students help a Wallops electrical technician (second from right) lift the rocket and prepare to carry it to the launch pad. The higher they lift the rocket, the higher enthusiasm soars.

Near the launch pad, the students assembled the rocket. They checked the parachute shroud lines, inserted the fuses into the payload and measured out the black powder that would separate the rocket allowing the parachute to deploy.

A problem was discovered as the rocket was ready to go to the pad. No one could hear the altimeter beeping. The decision was announced – launch had to be postponed so that the payload could be rechecked. The nose cone was separated and the payload removed. There it was — a loose wire. A good connection was made and it was "go" for launch.

Several students carried the rocket to the pad. The sun was shining, the temperature was about 50 degrees, but during the 20-minute delay, the winds rose to about 15 m.p.h. Last minute calculations for wind were made and the countdown began.

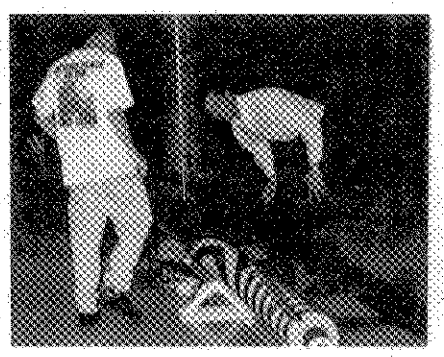
At the right moment, the red-white-and-blue missile shot off the pad and soared into the cloudless sky. The rocket shot straight up and, after what seemed like an eternity, the parachute deployed. Cheers rang out as the Phoebus school colors billowed in the wind.



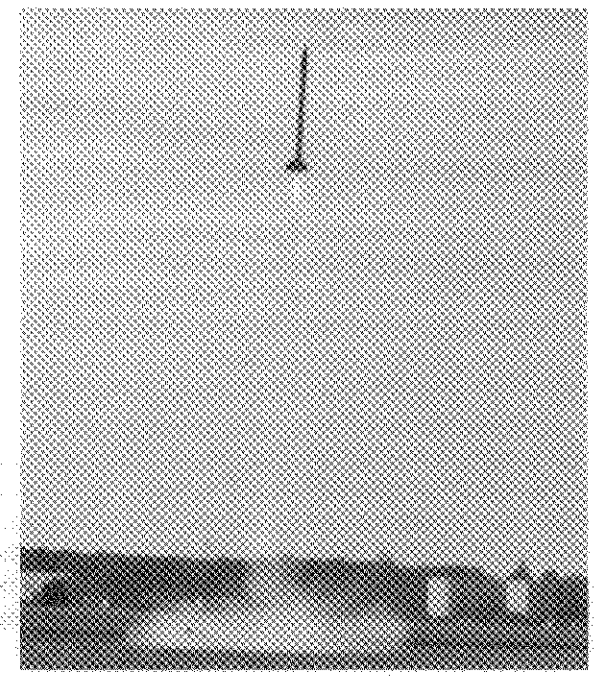
The parachute, dropped from Langley's gantry, pops open and floats gently to the ground.

Laura Doherty was part of the performance analysis team that predicted the rocket's progress and how it would fly. "We did all the calculations before launch so we would know what to expect and so we'd be prepared for what the rocket would do." Even she wasn't prepared for how exciting it would be on launch day. "It was great!" she yelled. "And what's even better, we can find it and can use it again."

The rocket drifted about a mile downwind and was recovered from a marsh. It was muddy but still intact. The payload was opened and the numbers were in. The altimeter clearly indicated that the rocket had reached an altitude of 1,331 feet – a major success. The real triumph, however, lies in how high the minds and ambitions of 40 local physics students soared that day.



STRAIGHT AS AN ARROW. The Phoebus High rocket, below, soars straight into the Eastern Shore's cloudless sky.



Ms. Foundation Offers Girls Scholarships and Awards

The Ms. Foundation for Women, through the Take Our Daughters to Work Program, has established a $60,000 scholarship sweepstakes for girls. Three girls, selected in a random drawing, will receive $20,000 in Series EE U.S. Savings Bonds to be used for secondary education, continuing education or college. ($20,000 face value of bonds redeemed at maturity, $10,000 present value) The school each winner attends will be awarded $1,500 to be applied to its girls' athletic program. No purchase is necessary to enter or claim a prize.

Why a Sweepstakes?

The sweepstakes has been established because Take Our Daughters to Work is committed to girls and their future development. Establishing a free nation-wide sweepstakes enables the Ms. Foundation for Women to help girls see the importance and promise of education, and to make the crucial connection between education and their futures.

By funding girls' athletic programs, the foundation encourages even more girls to feel confident about their bodies, which studies show enhances their overall self-esteem. According to the foundation, everyone has a stake in girls' education because when girls are healthy and educated, families, communities and the nation flourishes.

Who Is Eligible?

The sweepstakes is open to girls aged nine to 17 who are legal U.S. residents. To receive an entry form, send a self-addressed stamped envelope to Ms. Foundation for Women, Take Our Daughters to Work Sweepstakes Entry, P.O. Box 397, Camden, N.C. 27921. The deadline for requesting entry forms is May 15. Entry forms must be received by May 31. Winners will be chosen by June 30 and notified by telephone and mail.

FWPC to Celebrate Women's History Month

The Federal Women's Program Committee will celebrate Women's History Month with the Annual Female Achievers' Panel, March 21, 1 to 2:30 p.m., at the H.J.E. Reid Conference Center. Panelists, representative of the various career fields at Langley, will share their career highlights, lessons learned along the way, mentors, and tips for those who may wish to follow their career path. Refreshments will be served after the program to provide time for networking. Contractors are welcome. Langley employees may charge their time to Job Order B1011. For more information, call Patsy Campbell, ext. 43291.

Women in Science & Engineering (WISE) 1996 Annual Program

Women in Science and Engineering (WISE) 1996 Annual Program, "International Linkages in Science," will be held April 2 from 1 to 3 p.m. at the National Academy of Sciences in Washington, D.C. WISE is a volunteer group of National Research Council (NRC) staff members dedicated to fostering the increased participation and visibility of women in the scientific community.

The 1996 program will explore the ways that scientific research crosses national borders to improve the quality of science. Speakers are Lynn Goldman, assistant administrator for Prevention, Pesticides and Toxic Substances, Environmental Protection Agency, and Jane Lubchenco, president, American Association for the Advancement of Science. The program also includes a reception, a panel discussion, recognition of special students and an art exhibit. For more information, contact Gaelyn Davidson, WIDE 1996 Program chair via e-mail: GDavidso@NAS.edu or call the voicemail line (202) 334-3968.

MerMan and Family Show to Appear at Fort Eustis

Comedy combined with old-fashioned magic and illusions will be the order of the day when Mystical Magic MerMan comes to Fort Eustis on March 15 from 7 to 9 p.m. at the Jacobs Theater. The show is geared toward family audiences and tickets are available at the Fort Eustis ITT office and at DPCA Marketing, Building 210, room 103. For more information about tickets or Fort Eustis directions, call the Commercial Sponsorship coordinator at 878-2602 or 870-1932.

FWP and WIA Plan Langley's Take Our Daughters to Work 1996 Program

The Federal Women's Program Committee (FWPC), the Hampton Roads Section of Women in Aerospace (HRS of WIA), and the Newport News Branch of the American Association of University Women (AAUW), are co-sponsoring Langley's Third Annual "Take Our Daughters to Work Day" program April 25, in the H.J.E. Reid Conference Center, Building 1222. The Langley program will introduce girls, ages 9-12, to the technical community where their parents work.

What is the Program?

The concept was developed by the Ms. Foundation for Women, an education-oriented, nonprofit organization that provides a forum to learn about women's issues, networking, and professional growth. The program "Take Our Daughters to Work® Day" was held across the U.S. for the first time in April 1993. During the program, a parent takes his/her daughter to the workplace and introduces her to the working world. The focus is to broaden young girls' minds to the possibilities available to them. This program was developed to address the issue of gender bias in education where girls are not actively encouraged to develop math and science skills. Many organizations around the country observed this day last year including NASA Headquarters and most of the NASA centers.

The Langley Program

The Langley program will be a half-day structured event, 8 a.m. to 12:30 p.m, with the afternoon spent at the parent's workplace. This program is available on a first-come-first-served basis and is open only to NASA civil service personnel whose daughters did not participate last year.

The first 50 registrants (with completed forms), will be accepted, and a waiting list will be kept for cancellations and returning daughters from last year's program.

The registration deadline is April 5. The registration form requires the parent's supervisor's approval. It is the responsibility of the parent to inform the student's school principal and teachers of the absence. All the affected schools' principals will be informed of the program to ensure excused absences. A parent (mother or father) must escort their child at all times, including structured event and tour.

Parent/Child Programs

The half-day structured event will include registration, introductory remarks by a Langley official, followed by two hands-on activities for the students and, concurrently, a two-hour briefing for parents. The hands-on activities will focus on actively involving the students in understanding math and science concepts used at Langley. The two-hour briefing for the parents will feature an educational specialist on gender bias in education and tips on how to help children overcome difficulties in math and science skills.

The students' program will conclude with a video from the "Mission Earthbound Series" and a guided tour of a flight simulator in Building 1268A. The program will break for lunch at 12:30 p.m., with a reserved section for the parent and child to eat at the main Cafeteria, new addition section, Building 1213. The afternoon is left open for the parent to share with their daughter at the workplace.

Please return completed form to Patsy Campbell, FWP Manager, Mail Stop 178. For more information, call Campbell at ext. 43291, or Gaudy M. Bezos-O'Connor at ext. 45083. NASA civil service employees can charge their time to Job Order B1011.

Registration Form for: "Take Our Daughters to Work Day" April 25, 1996, 8:00 a.m. to 12:30 p.m.
H.J.E. Reid Conference Center, Building 1222

Parent's Name_____
Organization_____
Mail Stop_____ **Work Phone**_____
Supervisor's Approval_____
Student's Name_____
Age_____
School Name/ City_____

Do you wish to purchase a "Take Our Daughters to Work Day" T-Shirt @ $12 each (from Ms. Foundation)? If so, indicate how many of each size and enclose with this form your check (payable to Ms. Foundation): Adult sizes Medium_____ **Large**_____ **Extra Large**_____

Terms of Registration:
- **This program is offered to daughters of NASA Langley employees only.**
- **Each student must be accompanied by a parent or legal guardian at all times.**
- **Interested employees must receive approval from their supervisors to participate in this program.**
- **A limited number of children can be accommodated; therefore, only the first 50 registration forms will be accepted. Must be received by April 5, 1996.**
- **Please contact Patsy Campbell, 43291, if special accommodations or accessibility to buildings are required.**
- **Return completed registration form to Patsy Campbell, Mail Stop 178, or fax to ext. 48832.**

NASA Headquarters Sponsors Williamsburg Conference — Goldin to Speak

NASA Headquarters, Office of Human Resources, Education Division invites Langley employees to attend its 4th National Space Grant/EPSCoR* Conference May 20 through May 22 at the Williamsburg Marriott Conference Center.

The Space Grant Program, mandated by Congress in 1988, consists of university-based consortia in every state, Puerto Rico, and the District of Columbia. Consortia membership includes more than 550 academic, business, industry and government affiliates.

Langley civil service employees and contractors will find several discussions relevant to their interests. The preliminary agenda includes an address by the NASA Administrator Daniel S. Goldin, on Monday May 20. NASA Associate Administrators and/or other top officials from the strategic enterprise program offices are scheduled to speak on Wednesday, May 22.

The Focus: Research Enhancement

Research enhancement will be the main focus of conference discussions and exhibits. Other discussions will include the recruitment and retention of Native Americans to science and engineering, a NASA/Space Grant cooperative extension effort, undergraduate education and precollege education in the context of the National Education Standards. Poster sessions will focus on state consortium research activities.

Who Will Attend?

Conference attendees will include science, engineering, and other faculty from colleges and universities nationwide. Also attending will be executive representatives from the American Indian Higher Education Consortium, the American Indian Science and Engineering Society, the Carnegie Foundation for the Advancement of Teaching, the National Science Foundation, the National Science and Mathematics Coalition, and other federal and state agencies.

JOVE Coincides

Beginning Wednesday, May 22, the NASA University JOint VEnture (JOVE) in Space Science Research conference will overlap with the Space Grant/EPSCoR conference. On the afternoon of May 22 and, in conjunction with the NASA JOVE conference, several simultaneous NASA-focused research discussions will take place. For a list of the discussion topics, times and meeting locations, interested Langley personnel can contact NASA Space Grant Fellow Liz Ward at 864-3299, or via e-mail, e.b.ward@larc.nasa.gov

Who, What, When, Where and How

To attend the conference, either in whole or in part, a Langley employee will need to submit a completed registration form by April 12. The registration fee for Langley personnel that wish to attend a program session or the exhibit/poster displays has been waived. Langley employees that want to participate fully in the conference will need to submit a completed registration form and the registration fee by the April 12 deadline. (Fee includes conference reports, exhibit space, use of conference facilities, materials, transportation, meals, receptions, etc.)

Registration forms are available through the Office of Education business manager Pat Link at 864-8102. The Fourth National Space Grant/EPSCoR conference is being co-hosted by Langley's Office of Education and the Virginia Space Grant Consortium.

* EPSCoR is the Experimental Program to Stimulate Competitive Research.

About the Conference Logo

The conference logo, designed by Native American artist Gerald Dawavendawa, represents the exploration of the cosmos by people past and present. On the left side of the rainbow-shaped sky, the image of a supernova and crescent moon duplicate a prehistoric pictograph found in Chaco Canyon, N.M. This prehistoric record corresponds to an actual event dated to 1050 A.D. The many crosses represent stars. The large round images represent the sun, moon and Earth. The hand bears a Native American migration symbol. This symbol testifies of the people, their personal connection with space, their witness to its events, and their exploration of the cosmos.

Speakers Bureau Report Wraps Up 1995 Programs

The following volunteer speakers will complete the Speakers Bureau Report for 1995:

Dave Shuster spoke at the World of Work Fair, Ottobine Elementary School, about "Space Exploration;" and to Shea Terrace School, Portsmouth, at a Career Day.

Terry Clark spoke at the Reservoir Middle School ATOMS Program about "Space Technology;" and with **Rolando Padilla** at South Morrison Elementary School, Newport News, at a Career Day; and at Magruder Primary School about "The Solar System."

A Speakers Bureau ceremony to thank all of last year's participants will be held in late April. Details will be announced soon.

JOVE Retreat Will Dovetail With EPSCoR Event

The 1996 Annual NASA/University Joint Venture (JOVE) Retreat will be held May 21 - May 25, 1996 at the Radisson Hotel in Hampton.

Sponsored by NASA Headquarters and administered by the University Space Research Association from Huntsville, Ala., the JOVE pilot program began in 1989. The program develops institutional research capabilities and promotes science and engineering education through NASA/university partnerships. JOVE targets institutions that have had little or no involvement in the nation's aerospace program.

JOVE Research Connections

Participating universities use their JOVE research connection to enhance curriculum development, to provide student research opportunities, and to create outreach programs for the institution and for the surrounding community.

Educational outreach activities designed by the university, include, but are not limited to, special courses, space science survey courses for high school students, and summer space camps at the university for teacher or student enrichment.

What is the JOVE Experience?

The JOVE experience begins with a 10-week summer faculty research internship at a NASA center or at a mentor university. Summer faculty stipends are shared equally by NASA and the institution.

University commitment to the partnership involves granting faculty research release time during the academic year. A minimum of 25 percent full-time equivalent per faculty member must be obligated to a given research project. Student support for a project can vary and is determined on a case-by-case basis. The commitment to the JOVE program by both NASA and the university is for three years.

The Hampton JOVE Retreat

The Hampton JOVE Retreat in May will include talks on recent scientific developments, poster presentations of work generated by JOVE Faculty Research Associates, a tour of Langley Research Center, and an update on recent developments in the JOVE program—including an industry partnership feature. The Retreat will overlap with the Space Grant/EPSCoR conference on May 22.

For details on JOVE Retreat registration or specific agenda items, please contact NASA Space Grant Fellow Liz Ward at 864-3299 or via e-mail, e.b.ward@larc.nasa.gov

American Helicopter Society Presents World Soloist

In July 1994, Ron Bower, President of Austin Jet, broke all existing world speed records by flying his Bell 206 "LongRanger" solo around the world. Bower is a courageous advocate of rotorcraft technology, strongly believing in helicopter safety and reliability. His flight is a testimony to current helicopter technology, and was a challenging personal commitment which required meticulous but flexible planning, prudent risk management and persistent motivation.

Bower will discuss "Flying a Helicopter Solo Around the World" at a dinner meeting March 13 sponsored by the Hampton Roads Chapter of the American Helicopter Society.

Non-members, spouses and youngsters are welcome and encouraged to attend. A special children's menu is also available. Bower will be providing handouts describing his journey and will be pleased to personalize them after the talk. The dinner will be on Wednesday, March 13 at 5:30 p.m. at the Radisson Hotel in Hampton. Call Ruth Martin at 864-3723 for more information and reservations.

Happenings

WILLIAMSBURG SYMPHONIA will present two concerts featuring Bernstein's *Serenade on Plato's "Symposium" for Violin, Strings, Harp and Percussion*, Gustav Mahler's *Symphony #5* and Tchaikovsky's *Serenade for Spring*. The first will be on March 19 in Gaines Theatre auditorium, Christopher Newport University and the second on March 24 at Phi Beta Kappa Hall, Williamsburg. Both concerts are at 8:15 p.m. For more information or to order tickets, call 229-9857. The orchestra will present its final concert of the season on May 20.

VIRGINIA SYMPHONY: *The Rite of Spring* with North Carolina Dance Theatre March 16. NASA and contractors get 20 percent off tickets to Masterworks, Pops and Mozart concerts all season. Call the Virginia Symphony ticket store at 623-2310.

FOR SALE: Hampton Club, 2BR condo, one bath, extra appliances, blinds, wall-to-wall carpet, security system, pool, near Langley. Asking $47,000. Call Ken Curtis at 827-1257.

THE VIRGINIA CHORAL SOCIETY continues its 65th season with "Psalms, Canticles, and Hymns". James Powers will lead the full 80-voice chorus and the 16-voice ensemble in works by Britten, Williams Mozart, Poulenc, Faure, Lotti, Casals and others. Three performances are scheduled: Friday, Mar. 15 at 8 p.m at St. John Episcopal Church, Hampton; Saturday, Mar. 16 at 8 p.m. at St. Mark Lutheran Church, Yorktown, and Sunday, Mar. 17 at 3 p.m. at Bayside Presbyterian Church, Virginia Beach. Tickets are available at the door. For more information, call 851-9114.

The Choral Society is also sponsoring a fund raising event, a **Leprechaun Dance**, Sunday, March 17 from 6 to 9 p.m. in the Chesapeake Room of the Ramada Inn, Rte. 17, Newport News. Music is by Lynn Summerall and the Hotel Paradise Roof Garden Orchestra with vocalist Becky Livas. Heavy hors d'oeuvres, a cash bar, and door prizes are part of the event. Admission is $30 for singles, $50 for couples. For reservations, call 851-9144.

AT FORT MONROE get ready for the First Annual Pre-St. Patrick's Day Irish Stew Cook Off from 10 a.m. to 1:30 p.m., March 15 at the field adjacent to the Fort Monroe Bowling Center, Building 201. The event is free and open to the public. There is no entry fee and music is provided. Food and beverages will be on sale. Prizes will be awarded for the best stew, the stew with the best fragrance/aroma and the most unusual stew. Prizes will also be awarded for best costume, best display and most authentic stew. To register, for a copy of the official rules or for more information, call Maria Jackson at 727-3151 or fax 722-4248.

FOR SALE: Complete Computer system 486DX/33, 8Mb RAM, 256K Cache, 210Mb HD, 250Mb tape backup, 15" MAG .26 pitch monitor, Panasonic 2123 Color Printer, two serial ports, two parallel ports, 1.2Mb and 1.44 Mb disks, DOS 6.22, Windows 3.1, CP Backup, misc. software, utilities, etc. New color and black ribbons, paper, blank disks, more. Asking $995. **Dining chairs**, Parson's style, new, fully-upholstered, formal contemporary chairs that fit well in traditional setting, two arm chairs and four side chairs, royal purple fabric, originally over $1,300, asking $650. Call Mac at 877-7912.

Researcher News Survey

The Feb. 9 issue of the Researcher News contained a Reader Survey. It was designed to find out how the Researcher News staff members can better serve you, the readers, and your informational needs. Please complete and return the survey to Ann Gaudreaux, Mail Stop 146 by March 15. If your copy has been misplaced, call Gaudreaux at ext. 46126 for a replacement. Your replies can be faxed to ext. 48810 or sent via e-mail to a.c.gaudreaux@larc.nasa.gov or by QuickMail to Ann Gaudreaux. Thank you for your cooperation. Thank you to those who have already replied.

LAA ACTIVITIES: **LAA Raffle** – Tickets on sale now for a chance to win two season passes to Busch Gardens. Cost is 50 cents per ticket. The drawing will be held at the LAA Social on Friday, March 29. **LAA Country Western Dance** will be held on March 16. Lessons begin at 7 p.m. –dance at 8 p.m. Cost $3 per person. **LAA Bingo** – Every Thursday evening beginning at 7 p.m. in the Activities Building. Come join the fun!! **LAA Social** – The next scheduled social will be held on Friday, March 15, beginning at 4 p.m. All activities are in the H.J.E. Reid Conference Center.
1996 Federal Almanacs – The LAA has a few almanacs left for sale. The cost is $8 each. For more information about these activities, call Andrea Whitesides at ext. 46369.

COMMONWEALTH MUSICAL STAGE company will present Gilbert and Sullivan's *Pirates of Penzance*, Mar. 15 at 8 p.m. and Mar. 16 at 2 and 8 p.m. at the Virginia Beach Pavilion Theater. Among the cast members is Engineering Design Branch's Jim Price. Tickets are available by calling 340-5466.

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Researcher News

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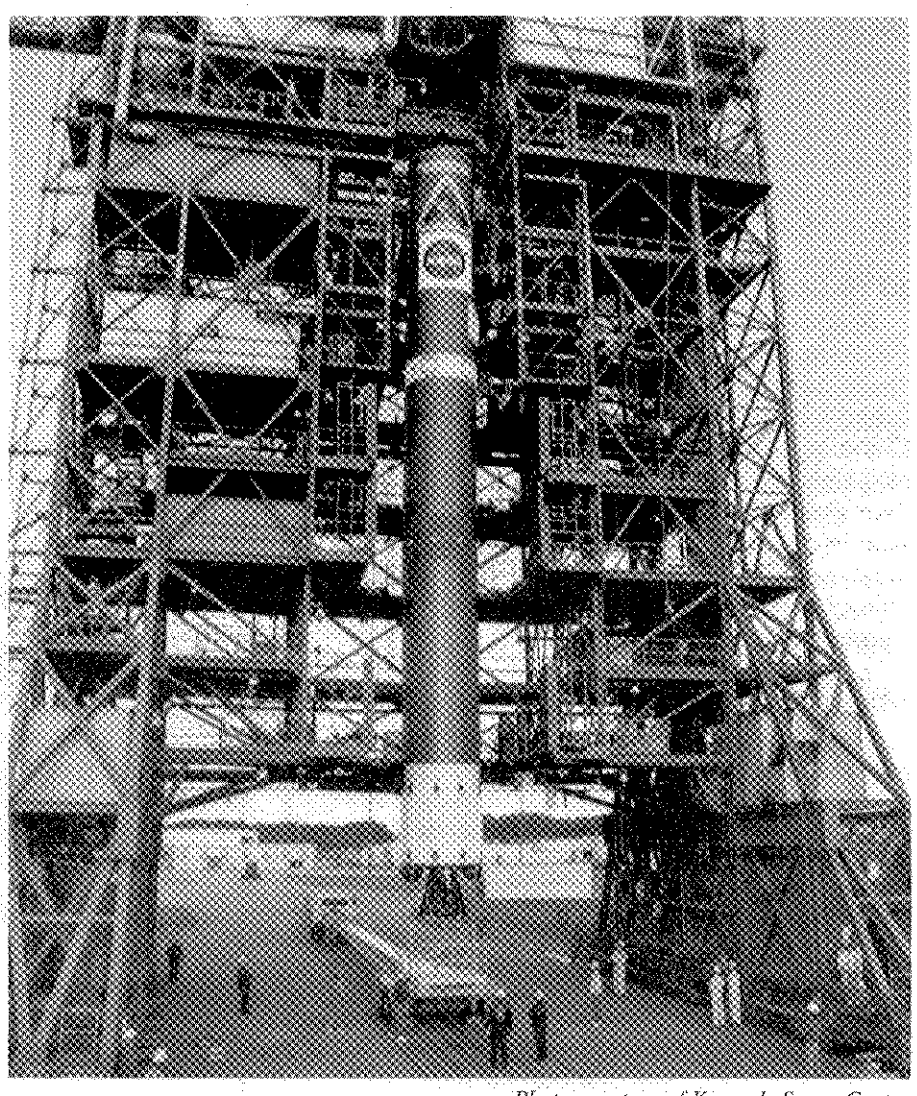


Photo courtesy of Kennedy Space Center

At Launch Complex 17 on Cape Canaveral Air Station, a first stage erection of a Delta II expendable launch vehicle is under way. To follow are the nine strap-on solid rocket motors and the second stage and, finally, a combined third stage/payload assembly with the payload encased in a protective fairing. This Delta II was launched from Launch Complex 17, Pad B, during a one-minute launch window Feb. 17, carrying NASA's Near Earth Asteroid Rendezvous (NEAR) spacecraft.

National Aeronautics and Space Administration
Langley Research Center

News Researcher

Bi-weekly Employee and Contractor Publication

Volume 10 ❖ Issue 6 ❖ March 22, 1996

April Colloquium Goes 'In Search of Cybernautics'

Steve Crow, Professor of Aerospace and Mechanical Engineering at the University of Arizona, will discuss the future of aviation in the information age on April 9, 2 p.m., in the H.J.E. Reid Conference Center.

Microprocessor speeds have increased by a multiple of 25,000 since their introduction 25 years ago; that rate of 50 percent each year shows no signs of slowing.

Personal computers now have the power to monitor hundreds of individual aircraft, and the Global Positioning System, with various enhancements, can provide all of this information. GPS vertical position accuracies have been demonstrated within one foot in recent experiments, and the research emphasis has shifted to issues of integrity, continuity and availability.

Inertial navigation systems contribute much to the reliability of GPS-based autoland systems; if the GPS data stream is interrupted, the INS can still complete a precision landing from an altitude of 200 feet.

Aviation's future may include automatic airplanes communicating among each other to schedule ground assets and to avoid collisions and wake vortex hazards, according to Crow.

The Federal Aviation Administration assures integrity of global navigation systems, develops and maintains the software rules of the air and provides expert pilots to handle emergencies from the ground via radio.

Some data analyses reveal that personal airplanes are just as efficient and fast as large turbofan transports over distances up to 1,000 miles, due to the time-consuming nature of the hub and spoke system.

By the year 2020, the airplane may rank with the automobile and computer as an agent of personal freedom, says Crow.

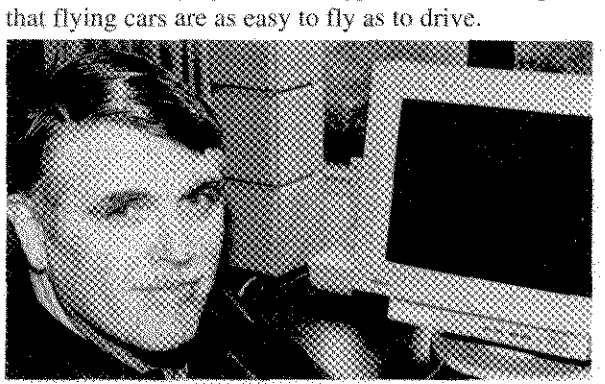
Lecture Addresses "Flying Cars"

Crow will also deliver a free Sigma Series lecture entitled "Flying Cars" at the Virginia Air and Space Center in downtown Hampton on the same day, April 9, 7:30 p.m.

Flying cars have nearly mythical appeal to almost everybody. The appeal is portal-to-portal transportation that breaks the bonds of road and traffic and that travels freely through the sky at the driver's will.

As part of the dream of aviation since the dawn of powered flight, flying car prototypes have been designed, built and tested by pioneers such as Glenn Curtiss, Ted Hall and Molt Taylor.

However, problems which have prevented commercial success of such flying cars include the complexity of the vehicle and its structure and the difficulty matching the low power requirements of street driving with the much higher power requirements of flight. The level of skill required by the operators of flying cars is another concern, although part of the appeal is an assumption that flying cars are as easy to fly as to drive.



Steve Crow, an engineering professor at the University of Arizona, will deliver two lectures locally.

Get a Grip

Photo by Fred Jones

Runway traction tests are part of a new study by NASA, Transport Canada and the FAA to enhance safety of airport ground operations and to relieve airport congestion during bad winter weather. The five-winter study will include braking tests with ground vehicles and instrumented aircraft like Langley's B-737. This test took place on a snow-covered runway at Jack Garland Airport, North Bay, Ontario, Canada last week.

Winter Runway Safety Examined in New Study

BY KEITH HENRY

The safety of aircraft takeoffs and landings will be enhanced with the knowledge and operational procedures expected from a new study of winter runway friction now underway.

The five-year government/industry study, called the Joint Winter Runway Friction Measurement Program, is being led by NASA and Transport Canada with support from the Federal Aviation Administration. Organizations and equipment manufacturers from Europe and several Scandinavian countries are also participating.

The study will include braking tests with instrumented aircraft and ground vehicles in the U.S. and Canada. Results may enhance safety for all ground operations and to help relieve airport congestion during bad weather. Results also will help industry develop improved tire designs, better chemical treatments for snow and ice control, more reliable ground vehicle friction measuring systems and runway surfaces that minimize bad weather effects.

Flight crew recognition of less-than-acceptable reported runway friction conditions prior to the "go/no go" or the "land/go around" decision point is one of the near-term program goals.

Langley's B-737 research aircraft and Canada's National Research Council Falcon-20 aircraft completed a week-long series of landing tests earlier this month on ice-, snow- and slush-covered runways at the Jack Garland Airport in North Bay, Ontario, Canada, about 200 miles north of Toronto.

Surface conditions were artificially varied to expand the range of data collected. Many different runway friction-measuring ground vehicles — vans, trailers and modified cars — took readings with continuous and fixed slip devices under similar runway conditions for comparison with each other and with the braking performance of the two instrumented aircraft.

Winter runway evaluations also are planned at the Brunswick Naval Air Station, Maine. Water contamination studies are planned at NASA's Wallops Flight Facility, Wallops Island, Va., and the FAA Technical Center in New Jersey.

"Data from the program will be used to quantify exactly how much improvement has been made in measuring runway friction since we performed similar tests with the FAA a decade ago. We hope to learn enough over the course of the study to confidently recommend international guidelines for aircraft and airport ground operations in winter weather," said Thomas Yager, lead NASA engineer on the project.

Broad-based changes in the industry since the 1980s strongly suggested a follow-up to a NASA-FAA study conducted between 1983 and 1988.

Improved measurement equipment, computer software and test procedures need to be evaluated. Data is also needed on new anti- and deicing chemicals, water/slush drag effects on new aircraft types and tire construction effects on hydroplaning.

The study also was suggested by strong international support for developing a standardized set of guidelines for runway friction measurement and reporting. In spite of advances in technology and operational procedures, safe winter operations remain a challenge for airport operators, air traffic controllers, airlines and pilots who must coordinate their efforts under rapidly-changing weather conditions.

Complicating the winter weather picture is that criteria for safe operations on a given runway snow condition differ from airport to airport, due to differences in grooving and pavements. Obtaining data relating various winter runway friction numbers to aircraft stopping distance requirements would be a significant step toward the development and adoption of standardized guidelines or tables to be used by pilots.

NASA, the FAA and Transport Canada have cooperated in several ground vehicle and instrumented aircraft studies aimed at improving aircraft ground performance in bad weather.

NASA and the FAA worked together as early as the 1950s to establish early slush-depth criteria for runway operations. A spin-off from later NASA aircraft hydroplaning studies resulted in the widespread practice of grooving automotive highways to improve tire traction during rainstorms.

In a modern spin-off application, much of the equipment being used to monitor runways is or will be used to measure highway pavement friction performance. In areas with high accident rates, pavement textures can be modified based on readings from ground friction measurement vehicles to improve the safety of automotive travel.

News Briefs

Around the Agency

NEW TYPE OF ASTRONOMICAL OBJECT DISCOVERED IN OUR GALAXY – NASA astronomers have discovered a new type of object towards the center of our Milky Way galaxy exhibiting a combination of behaviors never before seen in the 35-year history of gamma-ray astronomy. During the first day it was observed, the source produced more than 140 powerful bursts of gamma-rays; since then, it has settled down to a daily rate of about 20 bursts, and it is currently the brightest source of hard X-ray/gamma-rays in the sky. The discovery appeared in the scientific journal *Nature* by scientists from NASA's Marshall Space Flight Center, Huntsville, Ala.; the University of Alabama in Huntsville; the Massachusetts Institute of Technology in Cambridge, Mass.; and the University of Amsterdam in the Netherlands. Researchers discovered the unusual object in the southern sky in December 1995 through the use of an instrument known as the Burst and Transient Source Experiment, aboard NASA's Compton Gamma Ray Observatory spacecraft. Since December 2, the new burster has produced more than 1,000 hard X-ray bursts.

NASA ASSIGNS HAWLEY TO SECOND HUBBLE SERVICING MISSION – Dr. Steven A. Hawley, a veteran of three space shuttle missions before moving into management positions within NASA, has been returned to astronaut flight status and named to the crew of the second Hubble Space Telescope servicing mission. The mission, designated STS-82, is scheduled for February 1997 on Space Shuttle Discovery. Hawley's primary duty will be to operate the shuttle's 50-foot robot arm. He was a member of the crew of STS-31, which first deployed Hubble in April 1990. Hawley, 44, will join astronauts Mark C. Lee, Gregory J. Harbaugh, Steven L. Smith and Joseph R. Tanner, all previously named as mission specialists on the flight. A mission commander and pilot will be named later. In June 1990, Hawley left the astronaut corps to become associate director of Ames Research Center, Mountain View, Calif. He returned to the Johnson Space Center in August 1992 as deputy director of flight crew operations.

Virginia Air and Space Center News

Experience a safari to the "last great place on Earth ... where the herds still run free" — with the new IMAX film, *Africa: The Serengeti* , opening March 29 at the Virginia Air and Space Center in Hampton.

The Serengeti Plains are often considered the most important animal sanctuary on earth. *Africa: The Serengeti* features the Great Migration, which takes place within the two East African nations of Tanzania and Kenya, an area of more than 18,000 miles. Viewers go on a journey with more than 1.5 million animals as they travel some 500 miles across the Serengeti plains.

This IMAX film, five-stories high with wraparound sound, focuses on wildebeests as they set out on their yearlong odyssey, along with gazelles and zebras. Lurking close behind are the cheetahs, lions and crocodiles in search of food. Giraffes, elephants, monkeys, baboons, hyenas, jackals and vultures are featured in this film as they survive in the beautiful yet brutal habitat of the Serengeti.

Admission to the IMAX theater is $5.50 for adults and $4.50 for seniors, military, NASA employees and children. For more information, call 727-0900.

Lecturer To Address Adolescent Girls' Pain

Mary Pipher, Ph.D., author of *Reviving Ophelia: Saving the Selves of Adolescent Girls*, will discuss her research results on the topic April 25, 7:30 p.m., at Chrysler Hall in Norfolk.

Pipher reports that early-adolescent girls show a dramatic downslide in academic performance and in personal behavior. "They lose their assertive, energetic and 'tomboyish' personalities and become more deferential, self-critical and depressed. They report great unhappiness with their own bodies," she said.

"As I looked at the culture that girls enter as they become of age, I was struck by what a girl-poisoning culture it was," she continued. "America today limits girls' development, truncates their wholeness and leaves many of them traumatized."

To remedy this malaise, Pipher suggests working to build a culture that's "less complicated and more nurturing, less violent and sexualized and more growth-producing."

Tickets for the lecture are $10 and are available through the Junior League of Norfolk/Virginia Beach, area independent schools, the Chrysler Hall box office and any Ticketmaster location.

For more information, call 858-5472.

NASA Scholarships Available

March 29 is the deadline for submitting scholarship applications to the NASA College Scholarship Fund, a nonprofit organization established to award scholarships to qualified dependents of NASA and former NASA employees.

To be eligible for consideration, 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.

In addition, applicants must have a combined high school and college (if any) grade-point average of 2.5 on a 4.0 scale or the equivalent.

Five scholarships will be awarded in the amount of $2,000 each for the 1996-97 academic year. The renewable scholarship is for a maximum of $8,000 over six calendar years.

Applications should be submitted directly to the Johnson Space Center in Houston, Texas, and must be received no later than March 29. Late applications will be returned unopened.

For more information on eligibility requirements and selection criteria, or to receive application forms, contact Kate Spruill of the Office of Human Resources at ext. 42606.

In Memoriam

Robert Andrews

Robert Andrews, 67, died Monday, Feb. 5. A native of Boston, Mass., he retired from Langley in 1985, after 34 years of service. Andrews served as the head of the computer management branch.

Alumni Remember Troops

BY MARNY SKORA

The Langley Alumni Association is spearheading a drive to send items to American troops stationed in Bosnia.

"We are gearing up for what the alumni association has dubbed *Project Remember*, a show of support for our troops overseas," says George Brooks, project coordinator and former Langley director for structures.

Similar efforts were led by the alumni to support troops in Vietnam in 1967 and in the Desert Shield-Desert Storm campaign of 1990. These initiatives drew countless notes of thanks from American service members overseas.

The association's goal is 500 shoe-size boxes. Efforts are already underway to tap local business for personal care items, stationery and snacks. The boxes will also include simple games to help troops pass their spare time. Items will be packaged by alumni association volunteers and shipped by mid-April.

"Items that would be appreciated by military personnel are endless and limited only by our creativity," reports Brooks. The association hopes to include morale-boosters, such as snacks to satisfy in-between-meal cravings; writing materials — pens, stationery, envelopes and stamps; simple games such as playing cards, word puzzles, checkers and dominoes.

Each box will be worth about $10. For each $10 donation, donors will be offered the opportunity to have their name and address placed in the box. The donor of $20 or an equal amount of merchandise will be recognized in two boxes.

Boxes will be distributed to "Any Service Member." Checks may be made payable to the Langley Alumni Association and sent to Mail Stop 496 by March 30.

For more information, call George Brooks at 868-6013.

Hampton Hosts NACA Reunion

The seventh reunion of former employees of the National Advisory Committee for Aeronautics (NACA), predecessor to NASA, will be held in Hampton, Oct. 3 through Oct. 6. Langley Research Center, known as the Langley Memorial Aeronautical Laboratory in NACA days, will be a cornerstone of the visit by all former NACA people and their spouses.

This is the 38th year since Congress transformed NACA into NASA, as well as the 20th anniversary of the first NACA reunion. The Langley NACA/NASA Alumni Association will host this year's reunion.

The Holiday Inn Hotel and Conference Center in Hampton will be reunion headquarters, and the Virginia Air and Space Center will host a welcoming reception on Friday evening, Oct. 4. Scheduled activities include tours of historic Jamestown, Yorktown and Williamsburg and an evening in the Virginia Air and Space Center.

The reunion is also open to all NASA retirees and their guests. To register or to obtain further information, contact the NACA Reunion VII, NASA/LAARCAA, Mail Stop 496, Hampton, VA 23681-0001, (804) 595-1306.

Harold R. Compton

Harold Randolph Compton, 63, died Wednesday, Feb. 28. A native of Lynchburg, Va., he had been a Peninsula resident since 1959.

Compton retired from Langley in 1988 as an aerospace engineer after 32 years of service.

Francis J. Howard

Francis J. Howard, 95, died Friday, March 8, in Hampton. Howard, a Malden, Mass. native, retired from Langley in 1960 after serving as superintendent of Instrument Construction for more than 36 years.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor. . . . . Keith Henry

Editor. . . . . Mary Graves
Science and Technology Corp.

Assistant Editor. . . . . Jeane Shanks
Science and Technology Corp.

Photographer . . . . . Fred Jones

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

COMMUNITY CORNER

Reading Is Fundamental

BY MARNY SKORA

If you can read this, you are one of the lucky ones.

Illiteracy is one of the leading problems on the Peninsula. Nearly 20 percent of adults in Langley's neighboring communities of Hampton, Newport News, Poquoson and York County have less than a high school education and are at-risk for lacking basic literacy skills.

But literacy doesn't begin at age 25. Literacy is a lifelong challenge and needs to be attacked in early childhood. One cure for illiteracy is access to good books from early childhood through adult years.

Here's How You Can Help

The Peninsula Leadership Institute is collecting new and gently used books for preschool and school-age children.

If you want to help, examine your bookshelves to see if you can spare a volume or two to get a child on the road to routine reading.

Send your selection by April 15 to Mail Stop 154, in care of Marny Skora, Langley's community service officer.

Children on the Peninsula need a head start to become literate, contributing citizens. A good book is a great place to start.

Secretaries team up to refashion roles

BY DONNA SPELLER

The Internal Operations Group formed a team of secretaries one year ago to redefine and recast the role of administrative and secretarial support staff throughout the Group. Team members represent all levels of secretarial support within the Group, as well as all organizations.

Thus far, the IOG Secretarial Advisory Committee is considering these factors in its implementation plans:

• The shrinking work force, particularly the secretarial force

• Today's demand for computer-literate secretaries who use a variety of electronic media to conduct business transactions

• The availability, practicality and facility of the World Wide Web.

Current plans include:

• Identifying skill and knowledge "standards" for each secretary (i.e., proficiency in electronic mail, graphics software, file transfer/sharing protocols, et al.)

• Developing and implementing a Group-wide policy on phonemail usage

• Identifying training requirements and presenting in-house seminars for new technology

• Developing and implementing long-term solutions to problems associated with secretarial shortages

• Creating and maintaining an electronic reference homepage containing correspondence instructions and administrative information.

To that latter end, the team has created an IOG Secretarial Advisory Committee Homepage. Although still "under construction," this homepage already contains information on travel, payroll, equipment, locations, and secretarial procedures. Check out URL http://www.larc.nasa.gov/~ggott/org/secretary/home.html for a preview.

In partnership with managers, supervisors and staff, committee members continue to re-engineer secretarial and administrative support procedures within the IOG. The committee welcomes suggestions from other employees regarding the secretary's role as the 21st century nears.

The IOG Secretarial Advisory Committee: (seated, from left) Amy Pierro, Gloria Evans, Theresa Oden, Charlene Gleaton, Nannette Atkins, Velma Martin, Tammy Spellman; (standing, from left) Tanya Mercer, Jessica Dail, Brenda Graham, Shirwin Moore, Betty Maddrea, Stephanie Stockum, Octavia Judge, Velma Martin and Judy Hoyle.

Volunteers Fill Foodbank Full

Forty-two community volunteers became charter members of Joe's Job Corps March 2. The Saturday morning crew salvaged 16,503 pounds of food for the Peninsula Foodbank, enough for nearly 14,000 meals for the needy.

"It would have taken the small staff of the Foodbank 22 days to process this food," said Operations Manager Steve Barth. "Joe's Job Corps did it in less than four hours."

"Opportunities like this one target today's volunteers — people who are very caring, people who are goal-oriented and people who will work hard *after work* to make a difference," said Elyse Brown, director of The Volunteer Center. The effort was cosponsored by that organization and WVEC-TV.

WVEC-TV personality Joe Flanagan, who routinely experiments with different occupations in his "Joe's Job" segments, turned his energy to volunteer tasks and led cadres of willing workers on the Peninsula and Southside. Flanagan greeted the volunteers with a rousing pep talk, posed with the group and then got down to work—sorting, stacking and salvaging more than 18,000 pounds of food donated by area grocery stores.

"When we go food shopping and come across a dented can on the shelf, we reach behind it for the unblemished product," noted Barth. "Those dented cans and crushed boxes are passed on to the Foodbank."

Saturday's task was to separate the good from the bad, the salvageable from the unusable. More than a dozen Langley employees gave up a weekend morning to this greater cause.

"We started out at 9 a.m. as individuals interested in helping others," said Marny Skora, Langley's community service officer, "but we quickly became an effective team."

Most of the volunteers had never seen quite that much food or containers that were quite so large. The food arrives in gaylords, octagonal boxes three feet wide and four feet tall. About 20 such containers waited to be emptied, and work was easy until about halfway through the process. Then volunteers had to reach way down inside to grab the food. But Geraldine Tucker had a better idea. She climbed INTO the box and passed the food out to a chain gang of sorters, cleaners and boxers.

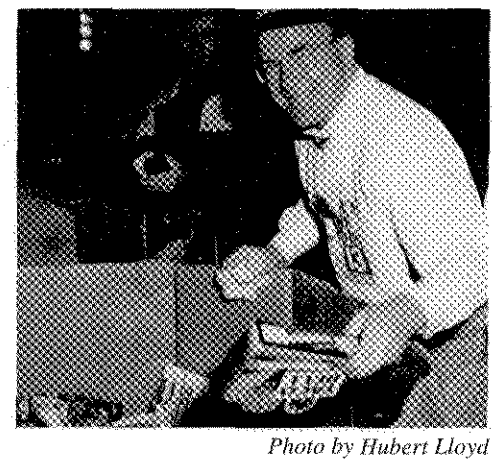
Food sorting brought with it an exercise in character-building. Langley graphic artist Karen Freidt brought her 6-year-old daughter Jessica to help. Jessica quickly began to understand that many people are less fortunate than she.

As Barth said of the volunteer effort, "One person makes a difference — and 42 people make a *big* difference."

Langley participants included Barbara Bodenstein, Barbara Cooke, Kevin Flood, Karen Freidt, Jessica Freidt, Gwen Leach, Kelly Murphy, Lauretta Payne, Didier Rault, Geraldine Tucker, Marny Skora, Stephanie Wise.

Photo by Hubert Lloyd

Community volunteers working at the Foodbank make up Joe's Job Corps. This group will be seen throughout March promoting volunteerism on Channel 13.



WVEC-TV personality Joe Flanagan, foreground, and Langley's Didier Rault sort food that will feed 10,000 hungry residents this month.

Photo by Hubert Lloyd

National Engineers Week

A Great Big Thanks

Analytical Services & Materials, Inc.
Terence A. Ghee

Computer Sciences Corp.
Susan S. Bowen

Computer Technology Associates, Inc.
Jeffrey Antol

EG & G Langley
Michael W. Schooley

George Washington University
Atherton A. Carty
Deanna Chipman
Christian M. Fernholz
Brad Green
Jonathan Hicks
Terry Johnson
Katherine L. Karr
Melvin Kosandchick
Susan Lynch
Russell W. Shane
Paul G. Wilkin

Lockheed Engineers & Services
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James R. Mack

Old Dominion University
Kathleen C. Powell
Pete Thomas

Retirees
Steve Devan
Abe Leiss
Robert E. Myers

Science Applications International Corp.
William C. Bolden
Kathryn A. Bush
Patricia L. Erickson
William L. Gianfagna
Gregory S. Herman
Linda A. Hunt
Andrew LaRoy
Dhirendra K. Pandey
Robert S. Wilson

Unisys Corp.
William A. Ragsdale

Wyle Laboratories
John Iacobucci

Civil Service Employees
Ledora R. Akanni
Gerald D. Alexander
Ruth M. Amundsen
Richard R. Antcliff
Robert A. Baals
Danny A. Barrows
Scott Bartram
W. Keith Belvin
Laurence J. Bement
Gaudy M. Bezos-O'Connor
Morton W. Boston
Darrell R. Branscome
Robert L. Calloway
Mark H. Carpenter
Michael A. Chapman
Terry O. Clark
Jeff I. Cleveland II
Bruce A. Conway
Vincent L. Cowling
Brad L. Crawford
Karen R. Credeur
Taumi Daniels
John Davis
Pamela A. Davis
Richard E. Davis
Prasun N. Desai
Russell J. DeYoung
Glen S. Diskin
David Dress
Rajendra R. Dubey
Marco A. Egoavil
Elka B. Ertur
Jeanette M. Farrah
Joseph M. Faulkner
Julie Favetti
Delma C. Freeman
Rosemary C. Froehlich
Henri D. Fuhrmann
Carl H. Gerhold
Lawrence Gilbert
Donner Grigsby
William L. Grose
Robert M. Hall
Charles E. Harris
Stephen F. Harvin
Lisa R. Hawks
Jeffery Hill
Yolanda L. Hinton
John C. Hoppe
Brian Howerton
C. Michael Hudson
Sam James
Frank P. Jones
Jerome T. Kegelman
Guy T. Kemmerly
William B. Kluge
John J. Korte
John E. Lamar
Allen M. Larar
Micheal J. Logan
Heather L. Madison
Angela J. Mason
Anthony J. Maturo
Marcus O. McElroy
Anna-Maria McGowan
Naomi McMillin
Byron L. Meadows
Clyde G. Medley Jr.
James B. Miller
Robert Miserentino
Gene S. Monroe
Mark A. Motter
Thomas M. Moul
Vivek Mukhopadhyay
Clifford J. Obara
Wendy F. Pennington
Joe W. Posey
Neil G. Price
Susan J. Rickard
Jim Rogers
Christopher L. Rumsey
Catharine G. Schauer
Matthew G. Sexstone
David D. Shuster
William Smith
Leroy Spearman
Ross M. Stannard
Brian K. Stewart
Robert A. Stuever
Sharon E. Tanner
Beverly A. Taylor
Geoffrey M. Tennille
Bill Tessis
Jim Thomas
James C. Townsend
Cheryl J. Tyler
Michael D. Uenking
William M. Vance
Dan D. Vicroy
Myra L. Walton
Martin R. Waszak
Catherine E. Watson
Sharon Welch
Robert J. Wheeler
Karen S. Whitley
Julie A. Williams-Byrd
Bill Willshire
Thomas J. Yager
W. Robert Young
Otto Youngbluth

BY CATHARINE G. SCHAUER

National Engineers Week is teamwork at its best.

It is more than the willingness of 110 Langley employees, 49 contractors and three Langley retirees to share their time with local educators and students.

This year's volunteers were there when we needed them, when we were all trying to do more with less. Their spirit and dedication to excellence enables them to successfully share their message that math, science and good communication skills are subjects used throughout life, and not just in the classroom. And their professionalism makes them serve as role models and reach out to tomorrow's work force.

The success of the Center's National Engineers Week program is twofold. First, our volunteers reached more than 22,000 students (3,000 more than in 1995), visited 162 schools and made more than 650 individual presentations – all with 54 fewer volunteers than participated in last year's program.

Second, the volunteers made a difference. They saw the excitement in the eyes of the students, and they received thank-you letters for their lessons. Although being a teacher for a day can be physically exhausting, it can also be emotionally revitalizing and personally rewarding.

Special thanks to the 162 volunteers whose names are listed here, some of whom participated on their own time, and to the managers and supervisors for helping to make this effort possible.

Thank you also to the Contractor's Steering Council for its support of this effort, to Women in Aerospace for cosponsoring the Engineers Week Workshop with the Office of Public Services, and to the Office of Education for providing the first of its distance learning programs, "Think Bigg," for distribution during National Engineers Week.

Photo by Hubert Lloyd

Lisa Higgins, a Lockheed Engineering and Science Corporation employee, shows the shuttle model to Scott Bickford of Science and Technology Corporation before her visit to Western Branch Middle School in Chesapeake.

People & Places

Photo by Hubert Lloyd

Tony Maturo, Employee Development Branch, tells students at Virginia Beach's Great Neck Middle School about NASA's accomplishments as detailed in the 1995 NASA *Spinoff* publication.

Dear Mr. I,
I really enjoyed you coming to our school to teach us about engineers. It was fun learning about engineers and what each of them do. I enjoyed looking at the things you passed around also. That was cool when you put water over Kay's head. Please come to our school again.

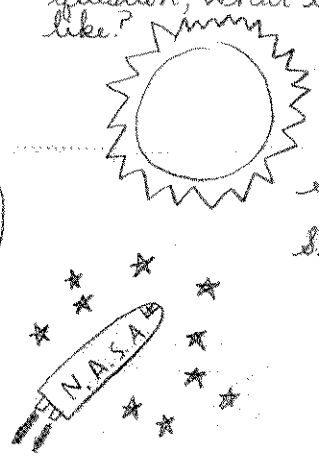
Sincerly,
Katie Evans

Katie Evans of T.C. Walker Elementary School in Gloucester writes to thank John Iacobucci of Wyle Laboratories for his visit to the school.

Dear Dr. Antcliff,

Thank you for coming. I liked the part where you dumped the liquid air into the container the best. It was really Cool! I learned a lot of neat things, it was really interesting. I only have one question, What is N.A.S.A really like?

Sincerly,
Stephen Strand



Stephen Strand of Tucker Capps Elementary School in Hampton wrote a thank-you letter – complete with illustration – to Dr. Richard R. Antcliff, Measurement Science and Technology Branch.

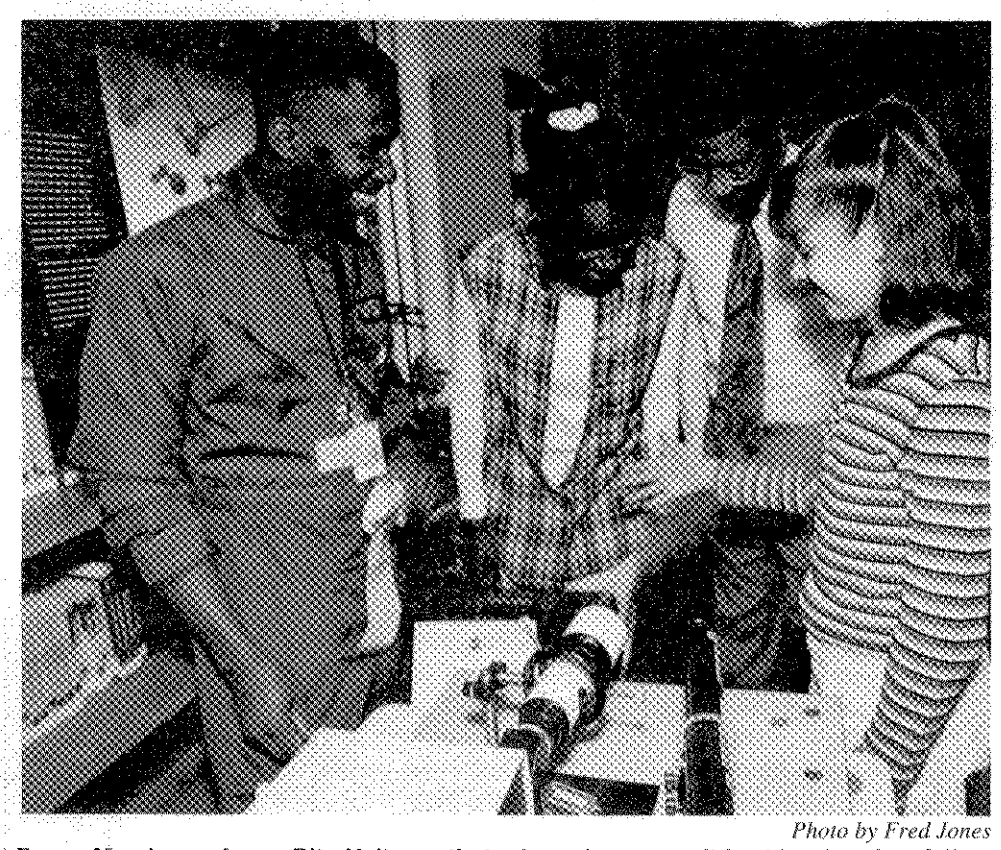


Photo by Fred Jones

Byron Meadows shows Rita Heitman that a laser beam won't hurt her hand as fellow student Tenishia Peoples and teacher Roscoe McCormick look on. Meadows presented a lesson on LIDAR (Light Detection and Ranging Technology) to the students at Lindsay Middle School in Hampton.

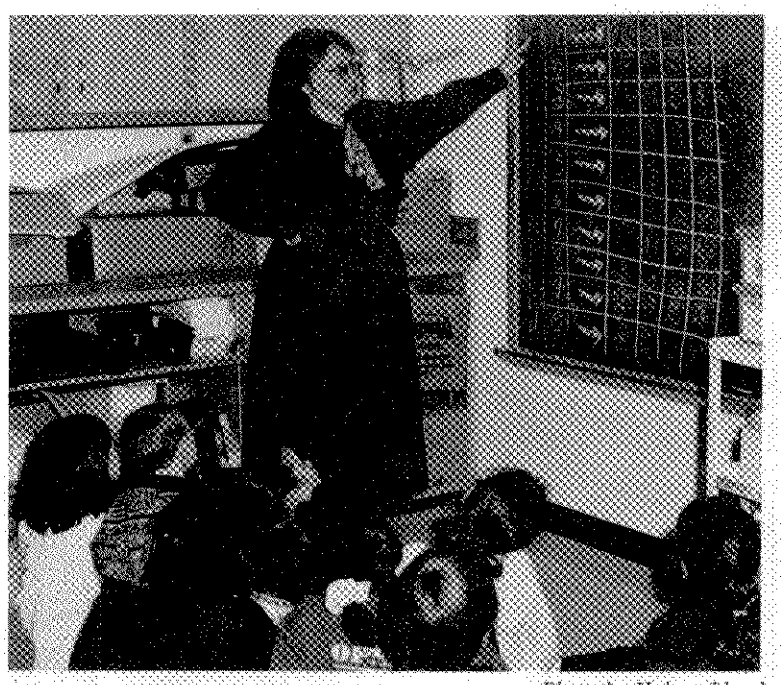
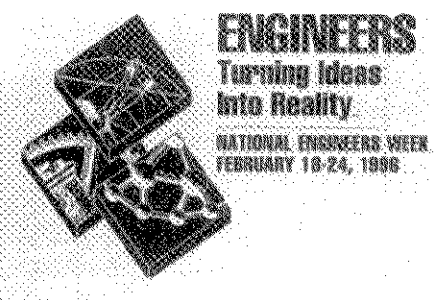


Photo by Hubert Lloyd

After teaching them the inner workings of a computer, Sharon Tanner, Fluid Mechanics and Acoustics Division, introduces the kids at Dutrow Elementary School in Newport News to the "magic" of binary numbers.



More Thanks!

A special thanks goes to Jeane Shanks, Audrey Coppedge, Nancy Flin and Scott Bickford of Science and Technology Corporation for their help during Engineers Week.

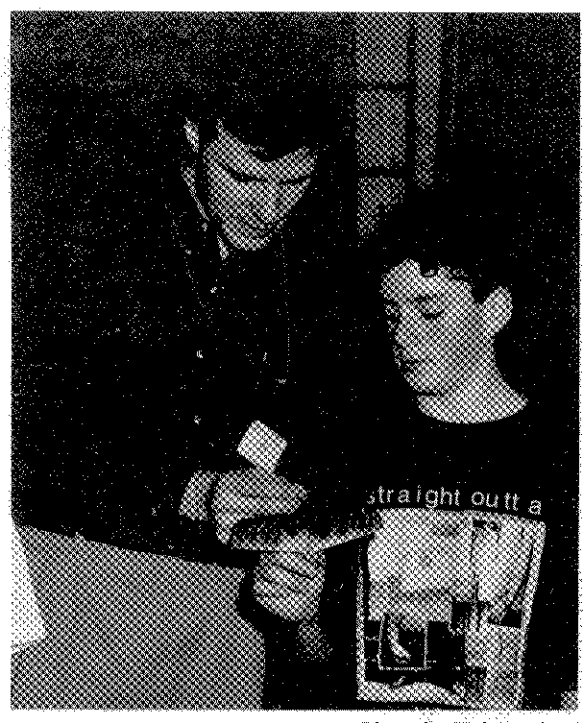


Photo by Hubert Lloyd

Guy Kemmerly, Subsonic Aerodynamics Branch, explains some of the principles of aerodynamics to Jason Mead at Brandon Middle School in Virginia Beach.

Happenings

INCOME TAX PREPARATION: Member of the Association of Tax Practitioners. Electronic filing and direct deposit offered at no extra charge. Also do small business bookkeeping. We travel to you, by appointment. Call 874-3121.

INCOME TAX PREPARATION at your place. Call Nancy Taylor at 723-5227 for an appointment.

INCOME TAX PREPARATION: Specializing in personal and small business returns, offering computerized tax preparation, reasonable rates with referral discounts and valuable information to reduce 1996 tax liability. Preparer has bachelor's degree in accounting and obtains annual VITA certification. Call Wanda at 838-6546 for quote and appointment.

HELP WANTED: Office of Equal Opportunity is seeking two NASA volunteers to serve as co-lateral EO counselors. Deadline April 15. Call Vivian Merritt at ext. 43290.

GARDEN CLUB: Applications for membership to the NASA Garden Club are accepted through March 29. Call Susie Carpenter at ext. 43876/43900.

RETIREE LUNCHEON John P. Weidner retired from NASA on March 1 after 34 years of service. Join us for a deli luncheon in his honor on April 10 at the Eaglewood Golf Club, Langley Air Force Base, from 11 a.m. to 1 p.m. The cost is $8 per person, including gift ($2.50 gift only). Checks can be made out to Anne R. Cary and sent to her at Mail Stop 168. Respond by April 1.

FOR SALE: York County waterfront home, 4 BR, 2.5 baths, 2,672 sq. ft., lots of extras. Asking $229, 900. View by appointment. Call 898-3923.

FREEDOM FROM SMOKING: Interested in giving up tobacco and need some assistance? Call Nancy LaCross of the American Lung Association at 723-4393 for more information. Seven-week class costs $50; orientation meeting is free.

FOR RENT: Poquoson townhouse. Living room has gas fireplace; eat-in kitchen plus dining room, 2 1/2 baths, gas heat, $650/mo. Call 838-6000.

VIRGINIA SYMPHONY: Spring Pops at Smithfield High School March 23, includes *Candide*, *Oklahoma! Kiss Me Kate* and more. Discount tickets available to NASA and contractors employees for Masterworks, Pops and Mozart concerts all season. Call Virginia Symphony ticket store at 623-2310.

LANGLEY KARATE CLUB invites you to discover Cuong-Nhu Oriental Martial Arts. Classes are held at the Langley Gymnasium on Mondays and Wednesdays from 5 to 7 p.m. NASA employees, co-ops, contractors and their immediate family members, age 12 and up, are welcome. New students for beginner class will be accepted until April 24. For more information, stop by the gym during class time, or contact Roy Albang at ext. 46160 or at 596-7736, 7 to 10 p.m.

FOR SALE: Denbigh/Brookside townhouse, end unit, corner lot, 2 BR, 2.5 baths, eat-in kitchen with bay window, dining room, den, all appliances. $64,900. Association dues paid till '97, 7 percent qualified VA loan. Call 565-1669.

FOR SALE: Condo with boat slip, Pine Cone Harbour in Hampton River community. 3 BR, 2 full baths, 1,455 sq. ft. For sale by owner, $79,900. Call 867-7703.

LANGLEY RUNNERS' CLUB held its Leap Year 5-K Race on Feb. 29. The top men runners were Bill Rogers with a time of 18:29; John Hoppe, 19:59; and Tom Jentink, 20:17. The top women runners were Anne Edwards, with a time of 29:49, and Pat Parker, 40:09.

NICOTINE ANONYMOUS is a free, self-help support group open to anyone who wants to stop using tobacco. Meetings are the third Wednesday of the month, 7 p.m., at the Langley Field Chapel Annex Building, Dodd Blvd., Langley Air Force Base. For more information, call Nancy at 723-4393.

CLASSIC WINDS SOCIETY will present a concert of wind chamber music at Green Springs Chapel, 3687 Ironbound Road, Williamsburg, March 22, 8 p.m. Tickets are $7 for adults and $5 for students and seniors, and will be available at the door. The Classic Winds Society specializes in wind music associated with early America. For more information, call 229-8578 or 850-0385.

LAA ACTIVITIES:
Social – Friday, March 29, 4 to 8 p.m. Black & White Blues will perform, beginning at 5 p.m. Drawing for chance to win two season passes to Busch Gardens.
Country Western Dance – Saturday, March 30. Lesson at 7 p.m.; dance at 8 p.m. $3 per person.
Easter Egg Hunt – Saturday, April 6, 10 a.m. to noon, H.J.E. Reid Conference Center. Free tickets are available at LAA office. Each child must have a ticket. Call Andrea at 46369.

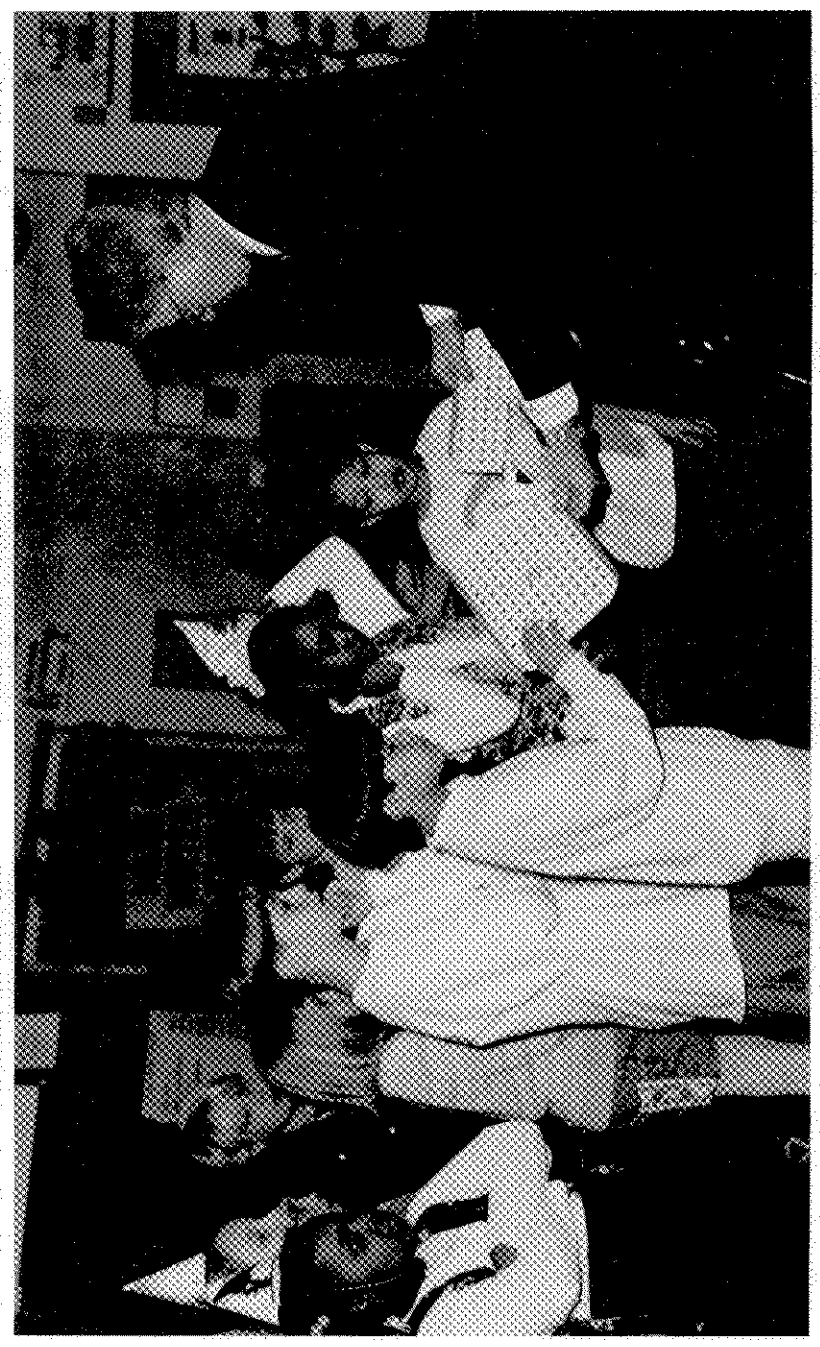


Photo by Bill Salyer

Darrell Branscome, director, Space and Atmospheric Sciences Program Group, taught a lesson on satellites and used students to create a "human satellite." Branscome visited Dare Elementary School in York County as part of National Engineers Week.

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Researcher News

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National Aeronautics and Space Administration
Langley Research Center

News Researcher

Bi-weekly Employee and Contractor Publication

Volume 10 ❖ Issue 7 ❖ April 5, 1996

Two More Milestones for U.S./Russian Cooperation in Space Shuttle Missions

NASA NEWS RELEASE

The third U.S. space shuttle mission to dock with Russian space station Mir, which launched early in the morning March 22 from Kennedy Space Center, features two firsts: the first American woman to serve as a crew member of Mir, and U.S. astronauts' first spacewalk conducted while the shuttle is attached to Mir.

Shuttle mission specialist and researcher Shannon Lucid, a five-time veteran of shuttle flights, will remain aboard the orbiting Mir station for the next four-and-a-half months, until Atlantis again docks to Mir in early August. The two spacecraft docked March 23 and undocked March 28.

Langley Leads Historical Testing

As manager of the shuttle's experiment project known as MEEP (Mir Environmental Effects Payload), Langley played a major role in the development of the four experiments implemented during this shuttle's mission.

A six-hour, docked spacewalk, planned for March 27, allowed mission specialists and third-time shuttle crew members Linda Godwin and Rich Clifford to attach to handrails on the Mir Shuttle docking module each Passive Experiment Carrier (PECs) – all designed and built at Langley.

The MEEP experiments will be retrieved during a spacewalk in about 18 months, during STS-86 . The four PECs will help to characterize the space environment at a 51.6-degree inclination, the same inclination at which the International Space Station will be built.

An Experienced Crew

Three-time shuttle crew member Kevin P. Chilton commanded the STS-76 crew. This is the second flight for mission pilot Richard A. Searfoss.

In addition to mission specialists Lucid, Godwin and Clifford, the shuttle crew members also include second-timer Ronald M. Sega, the payload commander.

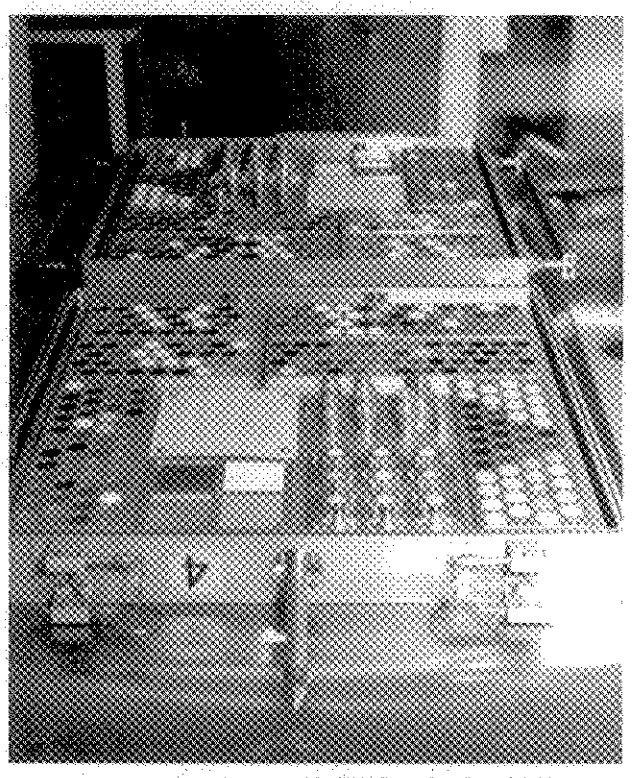
Shuttle Sets the Stage

STS-76 is the third in a series of nine space shuttle-Mir linkups planned between 1995 and 1998, including rendezvous, docking and crew transfers, to pave the way toward assembly of the International Space Station, set to begin in November 1997. The STS-76 mission was scheduled to last approximately nine days.

The Docking

STS-76 rendezvous and docking activities with the Mir actually began with the precisely timed launch of Atlantis, setting it on a course to meet the

(see SHUTTLE, page 3)



NASA photo by Carole Chapman

The Passive Optical Sample Assembly II, one of four experiments of the MEEP, awaits inspection in a clean room here at Langley.

To Russia with Teamwork

Joint Flight Research Program Begins with Tu-144 Roll-Out

NASA NEWS RELEASE

A modified Russian supersonic passenger jet rolled out of its hangar March 17 to symbolize the start of a joint six-month flight research program between NASA, a U.S. industry team and the Russian aeronautics establishment.

A Tu-144LL, a supersonic flying laboratory, will carry experiments in support of the Langley-led High-Speed Research (HSR) program and in cooperation with the Russian Tupolev Design Bureau. The HSR program, begun in 1990, teams NASA with U.S. industry to develop technology for a High-Speed Civil Transport (HSCT) by the turn of the century. The U.S. industry team for the Tu-144 project is led by Boeing with help from McDonnell Douglas, Rockwell, Pratt & Whitney and General Electric.

Post-Cold War Cooperation

The Tu-144LL project was enabled by an agreement signed in June 1993 in Vancouver by Vice President Al Gore and Russian Prime Minister Vicktor Chernomyrdin. This is the most significant joint aeronautics program to date between the two countries.

"Using the Tu-144LL is a perfect fit between our needs and their capabilities. It's a model for cooperative technology programs with Russia," said former NASA High-Speed Research program director Louis J. Williams. "This effort will give up-to-date information on the 'real world' conditions that a supersonic airliner operates in – data we wouldn't otherwise be able to obtain easily."

The project calls for the Russian-made aircraft to make 32 flights in six months, beginning this spring. All flights will be in Russia. Six NASA/U.S. industry experiments will be flown at various times throughout the period. Two more experiments will be conducted on the ground using a Tu-144 engine.

The Tu-144 can fly at Mach 2.3, or 2.3 times the speed of sound – approximately 1,500 miles per hour. Its speed and availability make it the perfect vehicle for NASA to conduct studies of high-temperature structures and materials, acoustics, supersonic aerodynamics and supersonic propulsion.

New and Improved Specs

To prepare the Tu-144 for flight, its original engines were removed in favor of larger and newer NK-321 augmented turbofan engines, originally produced for the Tupolev Tu-160 Blackjack bomber. Among other upgrades and modifications, the airliner's passenger seats were removed to make room for the experiments' instrumentation and data collection. The work is being done by the Tupolev Design Bureau, for which the Tu-144 is named. All Tu-144LL flights will originate from the Zhukovsky Airfield in Russia.

Seventeen Tu-144s were manufactured, including a prototype and five "D" models. The aircraft chosen for the flight test program is one of the D models, which have slightly different specifications than a production model. The world's first supersonic transport flight was made by a Tu-144 prototype on Dec. 31, 1968. The sleek, needle-nosed aircraft was originally designed for service in the Russian airline industry. A Tu-144 first flew passengers on a flight from Moscow to Alma-Ala, Kazakhstan, on Nov. 1, 1977.

A Faster Future

As envisioned by NASA's HSR program, the next-generation HSCT would fly 300 passengers at 2.4 times the speed of sound – crossing the Pacific or Atlantic oceans in less than half the time presently required on modern subsonic, wide-bodied jets – and at an affordable ticket price, estimated at less than 20 percent above comparable subsonic flights. The technology to make this HSCT possible is being developed by an unprecedented teaming of major U.S. aerospace companies in

(see TU-144, page 3)

Astronaut Relates Hubble Experience to Colloquium

BY MARNY SKORA

Spacewalker and mission specialist Dr. Kathryn Thornton will discuss the NASA's first – and most challenging – Hubble servicing mission in a special colloquium at 2 p.m., April 18, in the H.J.E. Reid Conference Center.

Thornton was aboard space shuttle Endeavour that launched Dec. 2, 1993, from the Kennedy Space Center. During the 11-day flight, the Hubble Space Telescope was captured and restored to full capacity through a record five spacewalks by four astronauts. After having traveled more than 4 million miles in 163 orbits of the Earth, the STS-61 crew returned from the successful mission in a night landing at Kennedy on Dec. 13.

Dr. Kathryn Thornton

Thornton and the other members of the Hubble Recovery Team were awarded the 1993 Collier Trophy, the nation's most prestigious aeronautical award.

Thornton was selected as an astronaut by NASA in May 1984. A veteran of three space flights, she has logged nearly 600 miles in space, including more than 21 hours of extravehicular activity.

Colloquium Lecturer Offers Twin Bill

The next lecture in Langley's colloquium series features Steve Crow, professor of Aerospace and Mechnical Engineering at the University of Arizona. "In Search of Cybernautics" will begin at 2 p.m., April 9, in the H.J.E. Reid Conference Center. Crow will also deliver a free Sigma Series lecture, "Flying Cars," at the Virginia Air and Space Center in Hampton, beginning at 7:30 p.m.

News Briefs

Around the Agency

LAWRENCE TO REPLACE PRECOURT AS NASA MANAGER IN RUSSIA – Astronaut Wendy B. Lawrence (Commander, USN) will replace Charles J. Precourt (Lt. Col., USAF), as the NASA manager of operational activities at Star City, Russia. As Director of Operations, Russia, Lawrence, 36, will support training and preparations of NASA astronauts at the Gagarin Cosmonaut Training Center (GCTC), Star City. She also will be the primary link between NASA and the GCTC management, coordinating all training and other operations involving NASA or contractor personnel in Star City. Lawrence is the sixth astronaut to serve in this rotational assignment. She will leave for Russia this month to join fellow astronauts John E. Blaha (Colonel, USAF, Ret.), Jerry M. Linenger (Commander, Medical Corps, USN), C. Michael Foale, Ph.D., and James S. Voss (Col., USA), who are training in Star City. Precourt will return to the Johnson Space Center to begin training as commander of the sixth Shuttle/Mir docking mission (STS-84).

NASA AIRBORNE SENSOR AIDS SUPERFUND SITE CLEAN-UP – Maps produced from a NASA airborne sensor are cutting costs and helping to speed the clean-up of hazardous waste at a Superfund site in Leadville, Colo. Several federal agencies, including the Bureau of Reclamation, the Environmental Protection Agency and the U.S. Geological Survey (USGS), are using the maps to find sources of acid mine drainage and heavy-metal contamination at the California Gulch Superfund Site. The contamination is the result of more than 130 years of mining activities associated with the Leadville Mining District, according to Felix W. Cook, Sr., director of the Technical Service Center at the Bureau of Reclamation, Denver, Colo. The maps were produced by the USGS, using data from NASA's Airborne Visible and Infra-Red Imaging Spectrometer (AVIRIS), developed and managed by the Jet Propulsion Laboratory (JPL), Pasadena, Calif. The AVIRIS instrument flies aboard a NASA ER-2 high-altitude research aircraft.

DELTA CLIPPER ROLLS OUT; FLIGHT TESTS TO BEGIN IN MAY – The four-stories-high, newly refurbished NASA Delta Clipper vehicle rolled out of McDonnell Douglas' facility in Huntington Beach, Calif., March 15 for transport to New Mexico in preparation for flight tests beginning in May. Dubbed the DC-XA, for Delta Clipper-Experimental Advanced, the unpiloted, single-stage vehicle is being developed under a cooperative agreement between NASA and its industry partner to demonstrate new technologies needed for a reliable, affordable, reusable launch vehicle that could be operated commercially by American industry, with NASA as one of its customers. The DC-XA will be the first rocket ever to fly with a composite hydrogen tank. Langley is helping to support DC-XA, as are New Mexico's USAF Phillips Laboratory, Kirtland Air Force Base, and the U.S. Army White Sands Missile Range; Dryden Flight Research Center, Edwards, Calif.; and NASA's Marshall Space Flight Center, Huntsville, Ala.

Voluntary Leave Transfer Program Helps Employees

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following Langley employees are approved leave recipients: Marilyn K. Aldrich, Janet L. Edmondson, Holly A. Elliott, Cassandra Stevens and Charles S. Washington.

Those interested in donating annual leave to recipients currently in the Voluntary Leave Transfer Program should send donations to Mail Stop 293, Office of Occupational Health Services. The "Request To Donate Annual Leave to Leave Recipient Under the Leave Transfer Program" form is available by computer in the "Informed Manager" program. Donations may be faxed to 864-9114. For more information, call Karen Ridlon at ext. 43194.

Huckins Named Deputy Associate Administrator for Space Science

Dr. Earle K. Huckins III has been selected as deputy associate administrator for the Office of Space Science at NASA Headquarters. He will be responsible for the management, direction and oversight of the space science flight program policy, launch vehicle requirements, technology infusion requirements and mission study reviews and assessments.

Huckins joined NASA in 1962 as a student trainee at Langley, where he specialized in spacecraft dynamics, stability and control. He held various management positions on Center, including mission integration manager for the Long Duration Exposure Facility (LDEF) Project, manager of the Large Space Structure Technology Program and deputy manager of the Space Station Evolutionary Definition Office.

Huckins was sent to NASA Headquarters as technical assistant to the associate administrator for Space Station. Before his current assignment, he served as Cassini Program director in the Office of Space Science; chief engineer in the Office of Space Flight; director, Space Station Engineering in the Office of Space Systems Development; and director of the Strategic Plans and Programs Division in the Office of Space Science.

Huckins received a doctorate degree in aerospace engineering from Virginia Polytechnic Institution and State University. He completed a program for management development at Harvard University Graduate School of Business Administration under a NASA fellowship.

Huckins is the recipient of a NASA Exceptional Service Medal, a Creative Management Award and numerous special achievement awards.

AIAA Associate Fellows Nominations Accepted

The American Institute for Aeronautics and Astronautics is currently accepting applications for membership upgrade to associate fellows. Deadline is April 15. Call Paresh Parikh at ext. 42244 for more information.

In Memoriam

Peter F. Korycinski

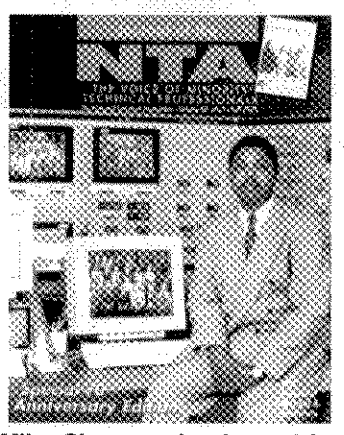
Peter F. (Pete) Korycinski, 78, died unexpectedly on Monday, March 11. He retired from Langley in 1977 after 35 years of service.

Korycinski began his Langley career in 1942 as an Aerospace Engineer in the former 16-foot High-Speed Tunnel of the Compressibility Research Division (CRD), now known as the 16-foot Transonic Tunnel.

Korycinski contributed to high-speed aeronautical research before becoming the technical assistant to the chief of CRD. He later was appointed as the technical assistant to the associate director and executive assistant to the director.

Chapman Named NTA President

Michael A. Chapman, of the Experimental Testing Technology Division, Data Systems and Instrument Support Branch, recently began a two-year term as national president of the National Technical Association, the nation's first minority technical professional association. As the newest president, he also appeared last fall on the cover of the organization's quarterly technical publication, *The Journal of the NTA: The Voice of Minority Technical Professionals.*



Mike Chapman is pictured in Langley's NTF control room on cover of the Fall 1995 issue of *The Journal of the NTA.*

Conceived and incorporated in the mid-1920s, the NTA acts as a forum for the exchange of information and ideas among minorities in technical fields of work and study. The association also seeks to prepare minority youth to meet the challenges of modern technology.

To that end, the NTA offers a national awards/scholarship program, a mentoring program and a national science competition for students, as well as student symposia and career awareness programs, several of which have been held here at Langley.

NTA's membership includes minority scientists, engineers, architects, mathematicians, computer specialists and math and science educators.

NTA has many professional chapters throughout the country, as well as student chapters, often associated with colleges and universities, under the guidance of the nearest local professional chapter.

Langley Claims Two Ames Awards

Two Langley employees, Robert Neely, Atmospheric Science Division, and Clyde Gumbert, Computational Fluid Dynamics, were awarded the 1995 Software of the Year Award during the Ames Commercial Technology Award Ceremony in November 1995.

Neely and Gumbert won under the "FAST, Flow Analysis Software Toolkit" category in this joint research and development effort with Ames Research Center, Mountain View, Calif.

Through its partnerships between NASA and industry, Ames Commercial Technology Office seeks to "maximize the leveraging of Ames resources, facilities and expertise, thereby accelerating two-way transfer of technology between NASA and the private sector."

Researcher News Names New Editor

Mary L. Graves has been selected by Science and Technology Corporation as the new editor of the *Researcher News.*

Mary L. Graves

A Hampton native, Graves stepped into the position the first week of March, coming to Langley from *Soundings*, an independent weekly newspaper serving Hampton Roads' military population. There, she served as copy editor and writer.

A former writer/editor with the U.S. Army, Graves has written for several area publications as well as for government contractors.

Graves takes over the editor's chair from Ann Gaudreaux, who moves down the street to Langley's Office of Public Affairs.

Send news items and story ideas to the *Researcher News* in Building 1153, Room 112, 1 West Reid Street, Mail Stop 146, NASA Langley Research Center, Hampton, Va., 23681-0001. The phone number is (804) 864-6126, and the fax number is (804) 864-8810.

Researcher News

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

Virginia Power To Use NASA Superplastic in Nuclear Plant

The state's nuclear power plants will receive a coating of a new NASA superplastic under an agreement pending between Virginia Power, Virginia Polytechnic Institute and State University and Langley.

The agreement was signed Friday, March 22, at the nuclear-powered Surry Power Station near Surry, Va.

The durable, temperature-resistant plastic, called LaRC™-SI, will be applied to the various metal and concrete infrastructure components of Virginia Power's two nuclear stations – Surry and North Anna – to reduce maintenance costs.

"This agreement and the use of LaRC™-SI is exciting in its possibilities," said Robert F. Saunders, vice president of Nuclear Operations at Virginia Power.

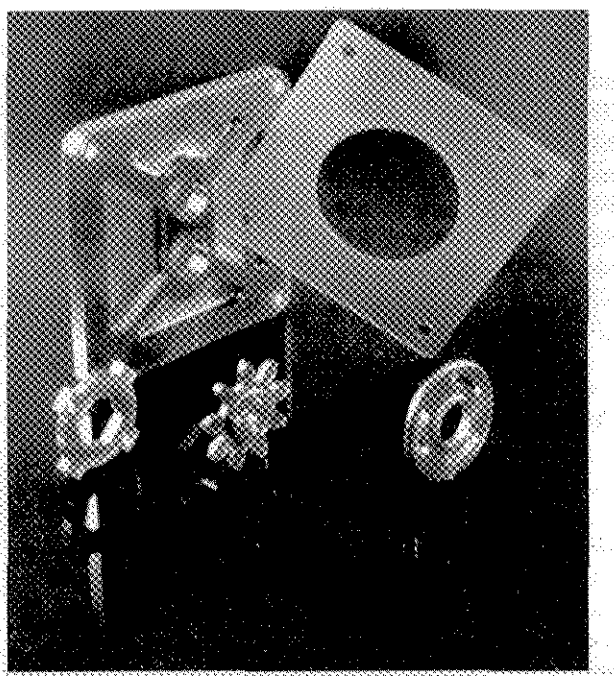
"We believe this product has several applications that will help us reduce our costs," he continued. "While North Anna and Surry are among the lowest-cost producers of electricity in the United States today, we continue to look for new, innovative ways to lower our costs even further.

"We're also glad to be associated with two other Virginia organizations in this enterprise. We look forward to finding new uses for this space-age product," Saunders said.

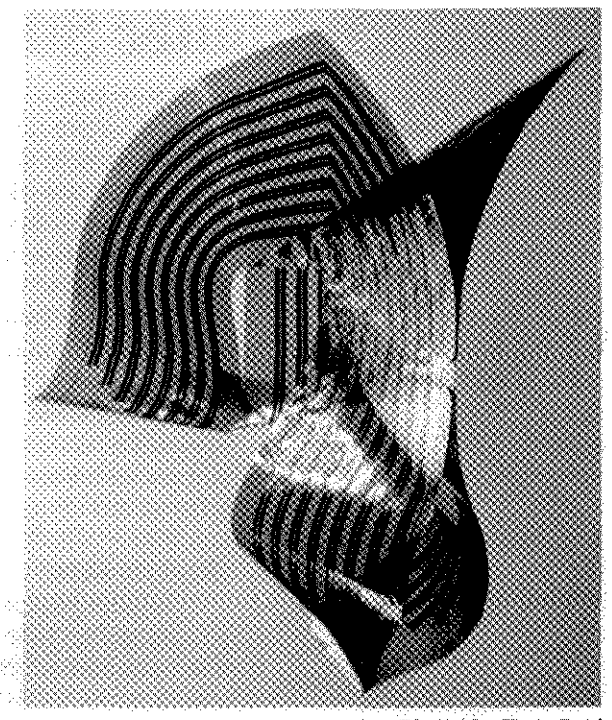
One of the applications Virginia Power plans to test involves service waterpipes. The pipes must be cleaned regularly to remove small biological organisms that live in the lake or river water and attach themselves to the inside of the pipes. While not a safety issue, these hydroids affect the plant's thermal performance, slightly lowering the electrical output of the generators.

"We believe that a coating of LaRC™-SI on the interior of these pipes will prevent the buildup of hydroids and possibly can eliminate the need to perform maintenance on these pipes as frequently as we have," Saunders said.

LaRC™-SI is a thermoplastic that can withstand elevated temperatures and harsh conditions that would degrade or destroy conventional plastics. It can be sprayed as a protective coating on materials such as complex circuitry. It can be combined with compounds, such as graphite, ceramics and metals, to create a hybrid material with characteristics of both.



The new thermoplastic can be used to make a variety of products, such as the gears shown above.



Photos by Katie Reid

The dark lines of this circuitry are coated with the LaRC-SI thermoplastic.

"If you mix graphite with it, it will feel like metal, not plastic," said Rob Bryant, the Langley researcher who invented the material. "If you combine it with ceramic powder, it'll feel like ceramic. Or you can leave it alone as a plastic. You can make gears out of it, use it in electronic circuitry or spray it to afford a protective coating."

Under the agreement, Langley will provide the technology. Virginia Tech will test the material to develop a final product and application process. Virginia Power will provide the funding, augment the testing procedures and provide facility access.

Langley Chosen Lead Center for Agency Scientific and Technical Information Program

BY LYNN HEIMERL

Langley has been named the lead center for the Agency's Scientific and Technical Information (STI) Program in a Memorandum of Understanding signed between Langley and NASA Headquarters.

Langley is now responsible for leading the initiative to redefine the Agencywide STI Program to adapt it to new customer and technological environments. Specific functions of the lead center include leading a Business Process Re-engineering initiative; assessing the viability of beginning cost-recovery schemes; enforcing continuous improvement processes; developing a NASA procedural guide; overseeing the Center for Aerospace Information (CaSI) — NASA's contractor-run depository and dissemination function; developing systems to identify, acquire, publish, disperse and access NASA STI; eliminating duplication of processes and systems; coordinating a virtual warehouse of STI; and acquiring economical commercial sources of STI for the Agency.

NASA Headquarters will retain authority over STI for policy and strategic plan approval, and evaluate Langley's performance in managing STI. According to George Roncaglia, "Langley plans a flexible management framework for the program that is guided by customer needs, an Agency perspective and a coordinated and cohesive plan."

The Agency has deemed that the STI program is mission critical to NASA and to its customers. Scientific and technical information is an essential product of research, enables technology transfer and helps ensure the competitive edge of U.S. aerospace companies and educational institutions, according to Roncaglia.

"The two-way process of fast transfer of internal and external information avoids duplication of research time and costs," he said.

"As lead center for STI, Langley is committed to promoting an aggressive, cost-effective and relevant Agencywide STI program — one that has strong ties to the information technology trends inside and outside the Agency, and is based on teaming and partnerships within and outside NASA," Roncaglia said.

For more information, call Roncaglia at the STI Program office at ext. 42374.

SHUTTLE

(continued from page 1)

orbiting station. During the following two days, periodic firings of Atlantis' small thruster engines gradually brought the shuttle closer to Mir.

Godwin and Clifford also worked with common U.S./Russian extravehicular activity hardware, such as safety tethers and foot restraints, and retrieved a video camera mounted on Mir.

Their EVA is one in a series aimed at testing possible equipment and procedures for the assembly and maintenance of the International Space Station.

During the docked operations, some planned joint activities centered around the middeck and SPACEHAB module. Equipment flown in the module includes items for the EVA, essential supplies for the Russians and U.S. supplies needed to support Lucid's stayed aboard Mir.

Two payloads enabled students to participate with the mission. *KidSat* made its first flight and provided students access to real-time images of the earth from their own observing instruments in space. The Shuttle Amateur Radio Experiment (SAREX), a veteran of several flights, allows students to talk with STS-76 crew members via ham radio.

The STS-76 mission is the 16th flight of Atlantis and the 76th for the space shuttle system. Landing was scheduled for the morning of March 31.

TU-144

(continued from page 1)

the multi-year HSR program.

The NASA HSR team is led by Langley's HSR Program Office and is supported by NASA's Dryden Flight Research Center, as well as by the Ames and Lewis Research Centers.

U.S. corporate partners in the HSR program are Boeing Commercial Airplane Group, McDonnell Douglas Aerospace, Rockwell North American Aircraft Division, General Electric Aircraft Engines and Pratt & Whitney.

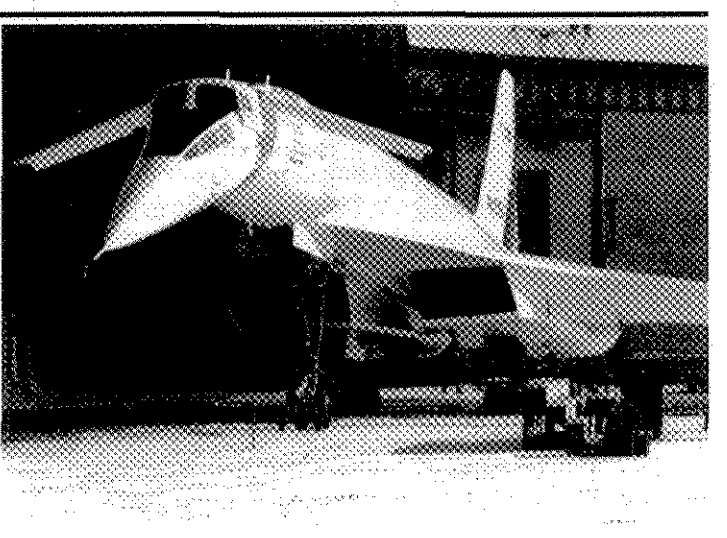


Photo by Peter Blakely

The modified Russian supersonic passenger jet known as Tu-144 rolls out of the hangar March 17 in Moscow to begin experiments for NASA's High-Speed Research program.

Office, Computer Supplies Soon Only a Few Mouse Clicks Away

If it seems to take forever to get those note pads, pens, paper clips and staples from Langley's Logistics Management Office, a more expedient solution is on the way.

The Small Purchase Facilitation Project Office (SPFPO) team's mission is to make ordering office supplies quicker, easier and more efficient. This cross-directional team of experts in logistics, purchasing, information technology, finance and quality assurance is working on a re-engineered electronic micropurchase process.

Shop On-Line

The soon-to-be implemented on-line purchase process, which will be tested as an Agency Pilot Project, is essentially an Internet/World Wide Web mini-shopping mall. Office and computer supplies, General Services Administration stock items, as well as items currently in Langley's stock, will be included initially.

The SPFPO Team is establishing an Internet capability with on-line catalogs and ordering features. Several vendors and the GSA will use the popular Netscape software and secured servers.

'Just-in-Time'

This pilot project aims to provide Just-in-Time (JIT), when-you-need-it, where-you-want-it deliveries, to transact bankcard purchases on-line, and to phase out of most stock items during a two- to three-year timespan, which will substantially reduce the current supply operation infrastructure at a potential savings of $1.5 million.

When in place, the system will work something like this:

To place an order for office supplies, click on a homepage store for office supplies, click on the items needed, enter the quantities desired, select a "checkout" icon and complete the transaction in a matter of minutes.

Learn To 'Stock' Up

During April or May, bankcard holders may attend a half-hour system training session in Langley's H.J.E. Reid Conference Center. Presentations and demonstrations will include the following topics:

- The present and future roles of Langley's stockroom
- Screening for excess property
- The employee's role in equipment control
- Using GSA's On-Line Advantage, Web-based shopping mall
- The proposed pilot program with Boise Cascade for JIT delivery of office supplies using the bankcard
- Internet shopping for computer supplies using the proposed pilot program with multiple zones
- Langley's evolving bankcard program
- Learning more about how to use the World Wide Web to conduct business.

Other commodity groups, such as maintenance hardware and industrial supplies, are also candidates for JIT and could be phased in over time as additional agreements are negotiated.

Stockroom Phases Out

Langley's Logistics Management Office currently receives thousands of orders a year for nearly 7,500 stock items. With the advent of the on-line purchasing process, the stockroom will gradually phase out of office supplies and will no longer be the source for them. But business will continue as usual until the implementation date for on-line ordering is announced.

Langley's Customer Focus Group, which provided the SPFPO with feedback on the acquisition of small goods and services, includes Bruce Adderholt, Becky Bales, James Dezern, Ken Frink, Brenda Graham, Jack Hughes, Janice Johnson, Boyce Lavender, Ginger Millar, Lisa Oliver, John Thompson, Reuben Williams and Kathy Young.

NASA Develops New Laptop Pilot Training Tool

NASA NEWS RELEASE

A NASA scientist has developed a prototype of a software program which helps pilots learn how to fly advanced commercial aircraft using a laptop computer.

Developed by Dr. Steve Casner, a researcher at the Ames Research Center, Mountain View, Calif., the program mimics the flight management system of an automated "glass" cockpit and allows flight training professionals to program their own learning materials and exercises for their students. The program operates on a Macintosh computer.

Go-Anywhere Computerized Tutor

"This is basically an electronic tutor that supports pilots in their training and in the ongoing learning process," Casner said. "Because of the decreasing size and increasing power of small computers, we are able to incorporate a tremendous amount of information into a small package and provide more learning opportunities. These opportunities can take place anywhere and at any time — whenever the need for further information or practice arises."

Casner spent two years working to emulate the program found in the aircraft's flight management computer. He received assistance in this effort from Smiths Industries, Boeing Commercial Aircraft Co., the Federal Aviation Administration, as well as from several U.S. airline carriers.

'Window Seats' on Flight to Training

The software program features five windows: a control/display unit, mode control panel, two maps showing the aircraft's lateral track and its vertical track, and a flight mode enunciator showing which flight systems currently control the airplane.

> **"As airplane systems become more complex, the training challenges for airline companies and pilots increase."**
>
> *Dr. Steve Casner, Ames Research Center*

In addition, a section to the right of the control/display unit permits text input and conversation with the pilots. The software program is designed to use video, audio and film clips to illustrate various flight sequences.

"When we want to demonstrate something, small versions of charts, videos and photos can be programmed into the laptop," Casner said. "My intent was to provide a platform that can be expanded by flight instructors and other pilots to meet their training needs.

"As airplane systems become more complex, the training challenges for airline companies and pilots increase," Casner said. "Our goal is to investigate new technologies and techniques that can help meet those challenges. Tools such as the laptop training device give pilots an opportunity to learn more on their own, to complement traditional classroom and flight simulation training."

NASA Technology Goes Worldwide

Casner has demonstrated the new program to several major U.S. airlines and has received inquiries from foreign carriers. He plans to test the program in a major airline's pilot training program.

The laptop pilot training tool transfers NASA research and technology to the aviation industry. Typically, once a technology is developed and evaluated, it is then provided to the industry for broad use," Casner said.

Student Pilots Fly High-Tech

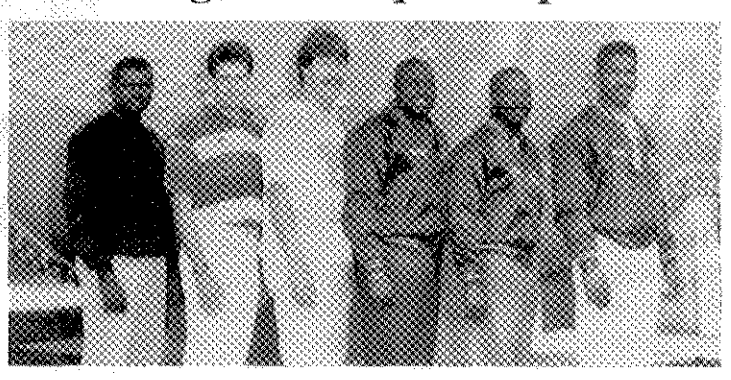
Casner also plans to create a training program for university students who are studying to become pilots. He hopes to produce a textbook and CD ROM introducing students to the modern flight management system.

"This should make information on modern flight management systems more available to a broad student population," Casner said.

"Many of the pilots of tomorrow are coming from universities where they have studied aviation for four years," he said. "We want to provide a mechanism for them to learn about this new breed of airplane equipped with a flight management system. With this learning opportunity, they will arrive at an airline with more knowledge and expertise."

Shootin' Some Hoops

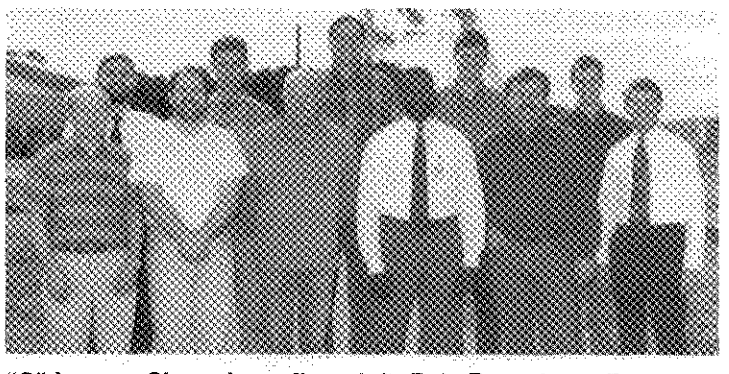
NASA Basketball Association's 1996 League Championship Teams



Photos by Peggy Hopkins

"A" League Champions: From left, John Simmons, Patrick Kenney, Paul Daspit, Stuart Cooke, Michael Powers, Sam James. Not pictured: Kendall Freeman, Clyde Medley.

"B" League Champions: From left, Marty Kaszubowski, Mike Jones, Vernon Dyke, Kirk Ayers, Will Nuckolls, James Allen. Not pictured: Clay Bennett, Dan Mazanek, Craig Neal, Joe Vega.



"C" League Champions: From left: Dale Bess, Larry Bement, Craig Humes, Larry Hoffman, Drew Wallio, Greg Nowicki, Woodrow Whitlow, Matt Hooker, Bobby Fox, David Dausch, David Throckmorton. Not pictured: Don Humes, Bob Lee.

Physicist Wilson Leads Team in Exploring Shielding Codes

BY MEGHAN WOODCOCK

Dr. John W. Wilson, a physicist with the Environmental Interactions Branch, leads a multidisciplinary team of researchers working on shielding (transport) codes. The team is researching the effects of radiation fields on electronic and biological systems. The project goal is to determine the optimal shielding materials for the design of future aircraft and spacecraft.

Wilson's research focuses mainly on the study of galactic cosmic rays (radiation found in space), as little is known about their biological effects and the nuclear processes by which they interact with materials.

Due to the multi-disciplinary nature of the activity – which spans atomic, nuclear, and particle physics; biophysics and biochemistry; and materials technology – the effort has required a broad base of NASA, Department of Energy and university cooperation.

What Are Shielding Codes?

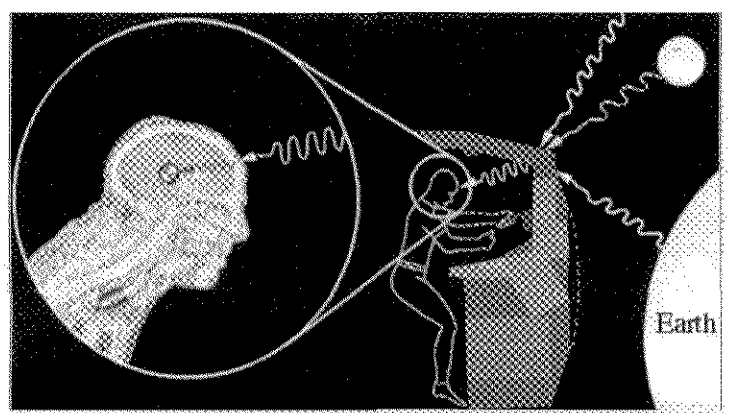
Shielding codes consist of solutions to hundreds of coupled partial differential equations that require several thousand cross-sections to determine the transmission properties of candidate shield materials.

When exposed to radiation, humans are injured at the cellular level, leading to the risk of cancer by subatomic particles traveling near the speed of light. So many subatomic particles exist in space — from protons to uranium nuclei — that it has taken years of study to determine what shielding protects from most types of those particles.

Moreover, each type of particle that flows through a shielding material reacts differently; some particles may pass through a material relatively unchanged, while others may break completely apart.

However, radiation still reaches the interior, and what may be proven shielding for the space shuttle itself may not be optimal for the people and instruments on board.

Shielding codes are used to calculate all of these variables, to design both manned and unmanned spacecraft and to evaluate the risk of adverse effects on devices, astronauts, passengers and crew on spacecraft and aircraft. Shielding codes also will be used to design future high-altitude aircraft.



A spacecraft or aircraft's shielding protects from three types of natural radiation: trapped radiation contained in the earth's magnetic field; rare but intense solar cosmic rays produced by solar disturbances on the sun; and galactic cosmic rays found in space.

Testing the Codes

The invisibility of radiation poses its own problem, since shielding has to be theorized and then tested for effectiveness. The space shuttle and various satellites serve as testbeds; theories are tested in expensive accelerator experiments.

Wilson and his team continue to test the effectiveness of shielding codes using the space shuttle. Once a shielding for an instrument aboard the shuttle is determined by the code, it is tested during a mission.

The instrument records radiation during the mission to see if the shielding meets expectations. This not only helps verify the accuracy of the code but also tests the reliability of the shielding.

Wilson team member Dr. Judy L. Shinn will soon fly two test sensors on the Lewis satellite, part of the Small Satellite Technology Initiative (SSTI) program.Lisa Simonsen of the Vehicle Analysis Branch is developing a shield model for the instruments for eventual validation.

Other verification tests are performed using massive accelerators which can cover four to five city blocks and are expensive to operate. Only about 100 tests are conducted on the shielding codes each year because of the cost of operating the accelerators. Wilson has already dedicated nearly 30 years to researching these shielding codes.

The Cancer Connection

Dr. Francis Cucinotta, a co-worker of Wilson, was awarded a Floyd L. Thompson Fellowship in 1995. Cucinotta is spending the first six months of this year at Johns Hopkins University and the remainder of the year at the Medical Research Council in the United Kingdom conducting spinoff research on shielding codes.

Cucinotta hopes to establish methods to reduce the risk to human tissue from lengthy exposure to different types of low-dose radiation.

This research is important to the design of the space station, as new shielding methods will help protect humans during long-duration missions, according to Wilson. The difficulties with finding an adequate shielding for long-duration exposure to radiation have also been a factor in the length of the shuttle missions. Understanding how to reduce the cancer risk for astronauts is critical to future manned space missions.

McSmith Brothers Share Langley Memories, Joys of Retirement

BY RON HARVEY

Two brothers from Tennessee whose avocation lay in aviation made a significant impact on the success of Langley's missions throughout the history of the Center, beginning with the National Advisory Committee for Aeronautics (NACA).

Older brother Duane McSmith became a flight instructor and came to NACA after several years of commercial and military flying. Younger brother Dwight became an apprentice model builder at NACA.

Duane, the Safety Man

During World War II, Duane was an instructor for both the Royal Air Force and the U.S. Army Air Corps cadets. His military service included flying the "Hump" in the China-Burma-India theater.

In the early 1950s, Duane joined the Langley Air Force Fire Department, where he established Langley's first fire prevention program. He retired in 1975 from Langley's safety office.

Since his retirement, Duane has worked as a safety consultant. He also built a lakefront retirement home in the Williamsburg area, where he and his wife Iva live and where brother Dwight and his wife Audrey are neighbors.

Since he still found himself too busy to properly indulge in the privileges of retirement – his hobbies of gardening, coin collecting and photography – Duane retired a second time and "headed for the hills" with his wife in their motor home.

Over the next several years, he drove more than 144,000 miles. The couple adopted the retiree maxim, "Why don't ya just ...?" They just climbed into their "home-on-wheels" and headed off in any direction, never knowing where they would end up.

During one cross-country jaunt up a northern route, Duane and Iva wandered into a rather dry, dusty climate. So Duane turned at the next intersection, and the next thing they knew, they were in Canada.

Although they loved the country's beauty, they woke up one morning to find the air vent on the motor home frozen closed. Without missing a beat, they simply headed south.

Dwight, the Crasher

Brother Dwight came to NACA Langley in 1942 as an apprentice model maker. From 1944 to 1946, he served in the Navy and was an "instructor of instructors." During his years at Langley, he worked in the machine and model shops, the hangar, the polymer lab and the crash facility. His work on the Echo satellite and the Mercury space capsule highlighted his career, as well as his work at the crash facility.

"It was a wonderful job where I was paid to intentionally crash more than 35 aircraft to study safety," he says.

Retired as operations manager of the crash facility in 1983, Dwight is a big fan of retirement.

"On a scale of 1 to 10, retirement is a 15," he says. That's not to say that his working days weren't good ones: He enjoyed his work at the crash facility so much that he wanted to continue his work after retirement.

Using the experience gained during his 41 years at Langley, Dwight became a founding member of the board of Mission Safety International in 1984. This organization improves the safety of some 450 small aircraft used by missionaries around the world.

Photo by Sandy Gibbs

Duane McSmith, left, and brother Dwight review a photo of a missionary aircraft that crashed in Papua, New Guinea.

As a member of Mission Safety International, he has received the William Cameron Townsend Award.

Dwight is actively involved with his church and is a ham radio operator. He also dabbles in radio-controlled aircraft, photography and "just making sawdust." Woodworking is a hobby the McSmith brothers share.

Besides that hands-on hobby and next-door addresses, the brothers continue to share a rare friendship which reaches beyond the many years they each spent at NACA/NASA Langley.

Every morning, Dwight picks up Duane's newspaper and takes it to his home next door. There they share a morning cup of coffee and "solve the world's problems – all before 8 o'clock in the morning," says Dwight. "It's a shame that the world just doesn't know what we do for it each morning."

Happenings

LAA ACTIVITIES:
Social – Friday, April 12, 4-8:30 p.m., featuring "Danny & the Del Notes."
Country Western Dance – Saturday, April 13. Lesson begins at 7 p.m.; dance at 8 p.m. $3 per person.
Bingo – Thursdays, 7 p.m., Activities Building. Call Andrea at 46369.

WILLIAMSBURG CHORAL GUILD presents Mozart's *Mass in C Minor* for its final concert of the season. "Spring Finale" includes performances at the West Point Christian Church, Euclid Blvd. (April 27), at St. Mark's Lutheran Church, 118 Old York-Hampton Rd. in Yorktown (May 5), and at the Williamsburg United Methodist Church, 514 Jamestown Rd. (April 30). Performances begin at 8 p.m. Tickets are $10 for adults and $7.50 for students; group discounts are available. For information and tickets, call 220-1808.

FOUND: An electronic control device, manufactured by Phonak, found in the parking lot of Building 1205. Call Security, ext. 43420, to identify and claim.

FOR SALE: Hampton Club, 2 BR condo, one bath, extra appliances, blinds, wall-to-wall carpet, security system, pool, near Langley. Asking $47,000. Call Edythe Lichtenstein at 886-1900 or 596-8484.

FOR SALE: Ice Show Tickets, Campbell's 1996 Tour of World Figure Skating Champions, April 11, Hampton Coliseum. Three tickets, Arena Z, Row 14. $35 each (face value). Call Dave Throckmorton at 898-5514.

LANGLEY TENNIS CLUB invites prospective members to call Renee Lake, ext. 41226, or Tom Yager, ext. 41304, for information.A get-acquainted social with doubles play is scheduled for Friday, April 19, 4-6 p.m All Langley tennis players are welcome.

VIRGINIA SYMPHONY presents *Haydn's Creation*, April 5 and 6, Chrysler Hall, Norfolk. Discounts to NASA and contractor employees. Call Virginia Symphony ticket store, 623-2310.

SUPPORT AVAILABLE: The Virginia Board for People with Disabilities is seeking applications from young disabled adults and from parents of young disabled children to attend "Partners in Policymaking," a free, eight-session training program for their benefit. "Partners" seeks to develop links between the disabled and the law- and policy-makers who can help them. Program sessions run from this September to May 1997. Application deadline is May 31. For more information and applications, call Diane Forrest, Langley's disability program manager, ext. 47718.

PROJECT REMEMBER: The Langley Alumni Association is spearheading Project Remember," a campaign to send care packages to U.S. troops stationed in Bosnia. The Association's goal is 500 boxes, each filled with about $10 worth of personal care items, stationery, snacks and simple games to help service members pass their spare time. Items will be packed by volunteers and shipped in April. Checks may be made payable to the Langley Alumni Association and sent to MailStop 496 by April 15. For more information, call George Brooks at 868-6013.

EASTER SUNRISE SERVICE: Fort Monroe's annual Easter sunrise service will begin at 6:30 a.m. April 7, at Continental Park on Fort Monroe. Rain site is the post theater, Building 42. Guest speaker is Dr. Vinson Synan, dean of the School of Divinity at Regent University in Virginia Beach. A community chorus, accompanied by the U.S. Army Continental Army Band, will perform. For more information, call 727-2611.

"INVESTING FOR WOMEN," a lunch-and-learn lecture by Stephen Lilly, financial consultant from Langley Federal Credit Union, April 15, 12:30 -1:15 p.m., in the private dining room of the main cafeteria, by the Langley Chapter of Federally Employed Women. Question-and-answer session to follow. A 6:30 p.m. session is set for a location to be determined. Call ext. 43291.

TRAVEL: Omega Travel offers packages to the Hawaii International Jazz Festival, July 7-23; to Branson, Mo., three days/two nights; to Disney's All-Star Music and Sports Resorts, three nights. For more information, call Regina Midgett at ext. 47696.

NASA INTERCENTER RACE COMPETITION: Spring races :10-Ks, April 8, 18, 23, and 29; 2-milers, April 10, 15, 25 and May 1. Races start at 5 p.m. on Doolittle Road. Walkers welcome. Langley employees, retirees, and on-site contractors earn points for Langley by participating in this agency-wide competition. For more information, call Richard Shearer at ext. 47036.

INDUSTRY SPOKESMAN TO BRIEF EMPLOYEES: Don Fuqua, president of the Aerospace Industries Association, former U.S. Congressman, former NASA Advisory Council member and current leading spokesman for the U.S. aerospace industry, will speak to Langley employees at 1 p.m., Tuesday, April 23, in the H.J.E. Reid Conference Center. He will review significant 1995 aerospace industry events and numbers, as well as project sales and job opportunities for the remainder of 1996.

Photo by Peter Blakely

U.S. Ambassador to Russia Thomas Pickering, third from right, addresses NASA officials, members of the press and industry representatives at the Tu-144 roll-out in Moscow March 17. (See story on page 1.)

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Researcher News

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News Researcher

Bi-weekly Employee and Contractor Publication

Volume 10 ❖ Issue 8 ❖ April 19, 1996

Crossflow Experiment Forges New Ground Between NASA, Industry

BY LANGLEY'S HLFC CROSSFLOW TEAM

Using a new and unique partnership approach to NASA-industry interaction, Langley and the Boeing Commercial Airplane Group successfully conducted a large-scale wind tunnel experiment. The Hybrid Laminar Flow Control (HLFC) Crossflow Transition experiment was aimed at improving transition prediction tools.

The project, the last to be conducted in Langley's 8-foot Transonic Pressure Tunnel, was completed last December, after nearly one year of two-shift operations. The tunnel, in Building 640, has since closed due to funding cuts, and remaining personnel were reassigned last month.

Origins of Laminar Flow

During 1990 and 1991, NASA, the U.S. Air Force and the Boeing Co. successfully demonstrated laminar flow on the left wing outboard of the engine nacelle of a B-757 commercial transport.

The success of the project overwhelmingly convinced the aircraft industry that laminar flow control is a technology worth pursuing for application to advanced subsonic and supersonic commercial transports. Successful application offers greatly reduced takeoff gross, operating empty weight, and mission fuel burn for advanced HLFC designs.

This technology could save U.S. airlines about $1 billion per year in fuel costs, if applied cost-effectively to the current U.S. subsonic, commercial fleet.

True Partnership

A diverse team from Langley and the Boeing Commercial Airplane Group of the Boeing Co. planned and conducted the HLFC Crossflow Transition experiment. Throughout the entire process, the team formed a relationship that fostered creative thinking and decisiveness regarding critical test issues.

Langley's contribution to the team cut across several branches, divisions, and groups. Each member developed a sense of ownership for his segment of the experiment, yet team members united for extended interchanges to address critical problems and concerns.

"It was a unique experience for researchers," said Charles Harris, facility manager of the 8-foot Transonic Pressure Tunnel. "It involved a close working relationship between Langley and Boeing in which teamwork – instead of the usual customer-vendor relationship – was central. Both took an equal team-ownership approach, building mutual trust and understanding. Without that kind of true partnership, I don't think we could have pulled it off."

The team made several week-long trips back and forth between Langley and Boeing's headquarters in Seattle, Wash., for face-to-face meetings during the experiment. They met every six weeks, alternating from one site to the other.

The process involved development of innovative experiment methods, test automation, risk reduction and extensive modifications of a large-scale wind tunnel. The experiment team also developed special hardware and software to provide computer-controlled operation of the entire experiment.

Computational fluid dynamic (CFD) researchers were directly involved in experiment planning. They helped to develop a test plan and to determine the types of data measurements needed for transition prediction code development.

Web-Connected

The HLFC Crossflow Transition Experiment used the World Wide Web extensively to document test progress. A unique electronic version of a logbook used for a typical tunnel test was developed. Researchers at the tunnel found entering information into the electronic logbook as easy as using a commercial word processing package, and personnel on the West Coast were able to track the progress of the test in near real time.

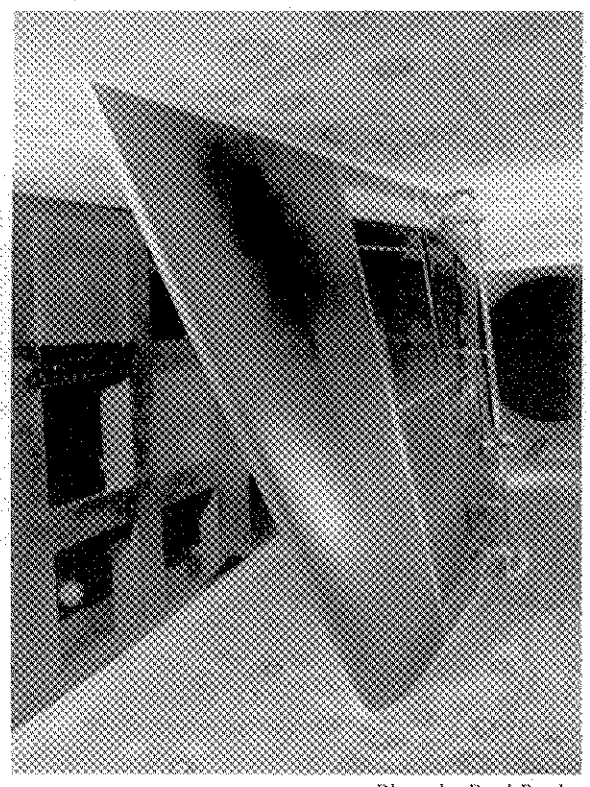


Photo by Paul Bagby

Above is a downstream view of the model installed in the recently closed 8-foot Transonic Pressure Tunnel. The liner installed on the floor and ceiling of the tunnel test section was used for the Hybrid Laminar Flow Control crossflow experiment. A commemoration ceremony for the tunnel, as well as an open house, was held today, April 19.

Concurrent Design

The design cycle for much of the hardware was started during the planning stage of the experiment to ensure that the hardware needed for the test would be available in time for the experiment. Many processes

(see CROSSFLOW, page 4)

May Colloquium Offers Jupiter Galileo Probe

The next speaker in the colloquium series is Marcie Smith, Galileo Probe manager, who will discuss "A Journey Through a Giant Planet: The Jupiter Galileo Probe Mission" on May 7, at 2 p.m., in the H.J.E. Reid Conference Center.

The Galileo Probe made history's first entry into the atmosphere of an outer planet, giant Jupiter, on Dec. 7, 1995. The probe plunged into Jupiter's swirling cloud tops and descended through turbulence, violent winds and clouds into the hot, dense atmosphere below. Smith will describe the probe systems and performance and will present an overview of its initial science results.

Marcie Smith

A graduate of the University of Virginia, Smith began working at NASA Ames Research Center in 1980. She has worked in the Space Projects Division since arriving at Ames, focusing on spacecraft operations. She has been a member of the Pioneer Operations Team since 1980, working on the Pioneer Venus Orbiter Mission, as well as on the Outer Solar System Extended Missions of Pioneer 10 and 11. She has been a member of the Galileo Team since 1992 and has been the Galileo Probe Manager since 1994.

(See related story on page 7.)

NASA's Aeronautics Budget Favors Research

NASA NEWS RELEASE

NASA's continued effort to become a leaner, more efficient agency through restructuring will be accomplished through significantly smaller budgets in the next few years. The center of its main restructuring vehicle, the Zero Base Review (ZBR), was concluded in mid-1995 and partially implemented this year. However, its greatest impact will be seen in fiscal years 1997 through 2000.

Here at Langley, ZBR means:

- Closing facilities/structures with a value of greater than $350 million by FY 2000
- Reducing/converting support contracts to performance-based contracts to save $100-150 million by FY 2000
- Obtaining information resources system services from Ames and Marshall and reducing requirements, resulting in savings of more than $60 million by FY 2000
- Transferring/consolidating research aircraft at Dryden by FY 1998
- Undertaking responsibility for agency-wide independent program evaluations and assessments.

The FY 1997 budget for the Science, Aeronautics and Technology branch of NASA equals $5,862.1 million out of a total NASA budget of $13,804.2 million, up from $5,845.9 million for FY 1996 out of a total NASA budget of $13,820.7 million.

The NASA Aeronautics Research and Technology budget request for FY 1997 totals $857.8 million.

High-Speed Research Program — $254.3 million

NASA's High-Speed Research Program is working on advanced technologies to address the environmental and economic issues involved in the potential market for high-speed civil transport. Major milestones in FY 1997 will include the development and selection of materials and structural concepts for wing and fuselage component test articles, and the completion of in situ atmospheric observations, which help determine the potential impact of an HSCT fleet on atmospheric chemistry.

Other efforts include continued investigations into high-lift aerodynamics, research to reduce propulsion inlet and fan noise, and work on advanced propulsion materials. Total FY 1997 funding for the program is $303 million.

Advanced Subsonic Technology Program — $187.2 million

The Advanced Subsonic Technology Program focuses on development of technologies for a safer, more efficient and environmentally sound global air transportation system, including subsonic aircraft.

(see BUDGET, page 4)

News Briefs

Around the Agency

FLY YOUR NAME TO SATURN – A high-tech equivalent of a message in a bottle will carry the signatures of thousands of vicarious space explorers aboard the Cassini mission to Saturn, scheduled for Oct. 6, 1997. Volunteer members of the Planetary Society, Pasadena, Calif., will help scan the signatures into digital form, the first such use of modern digital storage technology. The digital data will later be loaded onto a CD-ROM or other digital media, and then will be mounted onto the Cassini spacecraft during its final assembly at NASA's Kennedy Space Center, Fla. The disc will hold about a million names and should survive well beyond the duration of Cassini's 11-year mission. Cassini is a joint mission of NASA, the European Space Agency (ESA), and the Italian Space Agency (ASI). To participate, send signatures on a plain postcard until Jan. 1, 1997, or until the CD-ROM is full, to Suzanne Barber, MS 264-441, Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, Calif., 91109.

TRAFTON NAMED SPACE FLIGHT ASSOCIATE ADMINISTRATOR – Wilbur C. Trafton, acting associate administrator for the Office of Space Flight, Washington, D.C., since January, recently was named associate administrator for that office. He is now in charge of NASA's Human Exploration and Development of Space Enterprise and is responsible for establishing the policies and direction of NASA's human spaceflight programs. Trafton was named director of the Space Station program on Jan. 6, 1994, where he planned, budgeted and managed the International Space Station to be built and operated by the United States, Russia, the European Space Agency, Japan and Canada. In his new capacity, Trafton will continue to fill both the Space Station and Space Flight positions.

NASA SEEKS ENTRIES FOR 1996 SOFTWARE OF THE YEAR AWARD – NASA is calling for submissions for the 1996 NASA Software of the Year Award to give recognition to software developed and owned by the agency. NASA's Office of Safety and Mission Assurance, Washington, D.C., and the agency's Inventions and Contributions Board (ICB) sponsor the award. Last year's winners won nearly $200,000. The award, which includes a trophy, a certificate signed by the Administrator, and a monetary award of up to $100,000, will be presented to the author(s) of software in which NASA has an intellectual property interest; which has been supported, adopted, sponsored, or used by NASA; and which is significant to NASA's mission. Software programs must have been legally disseminated by NASA as commercial-grade products to the public beginning within the last three years. NASA Form 1329 (ICB Award Evaluation Questionnaire) must be submitted for each entry. Copies of the software, sample applications and data, and descriptive documentation of the package should be included, in addition to evidence demonstrating the impact and degree of innovation and suitability of the entry. Entries and supporting material must be submitted no later than May 15. For further information, call (202) 358-2468.

SPACE TECHNOLOGY HALL OF FAME WINNERS ANNOUNCED FOR 1996 – Three new commercial products that are spin-offs from NASA technology were recently inducted into the Space Technology Hall of Fame at the United States Space Foundation's 12th National Space Symposium in Colorado Springs, Colo. Fire-resistant airline seats, which originated during NASA's Apollo era, contain a polymer of fire-resistant materials. The anti-shock trousers system, also developed during the Apollo program at NASA Ames Research Center, led to adaptation of an antigravity suit originally used for pilots of high-performance aircraft. A modified version of the suit has helped people who suffer from internal bleeding, and most states now require ambulances to carry anti-shock garments. The radiant barrier, which NASA developed to protect astronauts from extreme temperatures, is a thin, lightweight, flexible polymeric film that is strong enough to stand up to space use. It is now used in building insulation, in automobiles and as food wrappers.

ANNOUNCEMENTS

Technical Library Research Workshops

The Technical Library will offer workshops in April and May. All the workshops will be held from 10 to 11 a.m. in the Library Training Room.

To register, e-mail workshops@tech library.larc.nasa.gov, or call ext. 42368, indicating the dates of the workshops that you wish to attend. You will receive an electronic confirmation of your registration.

Finding Structures and Materials Information (April 24): Learn search techniques using all library resources when doing research. Staff presents a sample search so participants learn which sources to consult.

Searching STILAS (May 1 and 15): Combining the search techniques from the Introductory and Advanced STILAS workshops, this class will show how to access STILAS using WebCat, the WWW interface. Learn to search Stilas and to request materials electronically.

Searching Uncover (May 8): Learn to access the tables of contents of approximately 17,000 journals and to set up your own current awareness profile.

Library Tours (May 16): With this orientation of library services and electronic resources, learn basic searching of STILAS, the on-line catalog. Become familiar with the Library's CDNET, a collection of networked CD-ROM titles. Learn the library's layout with a walking tour.

Searching Legacy (May 22): Learn how to search the Legacy CD-ROM which includes the bibliographic description and full text images of 179 NACA and NASA reports of interest to general aviation researchers.

For further assistance and information, call the Reference Desk at ext. 42356.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following Langley employees are approved leave recipients: Marilyn K. Aldrich, Janet L. Edmondson, Holly A. Elliott, Cassandra Stevens and Charles S. Washington.

Anyone interested in donating annual leave to recipients in the program should send donations on the "Request To Donate Annual Leave to Leave Recipient Under the Leave Transfer Program" form, via computer in Informed Manager to Mail Stop 293, Office of Occupational Health Services, or fax the form to ext. 49114. For more information, call Karen Ridlon at ext. 43194.

Career Programs Offered

The Career Transition Assistance Program (CTAP) Center is offering three of its most popular seminars in April and May: "Starting Your Own Business" (April 30, May 21), "So You Want To Be a Consultant" (May 15) and "Franchising: Fortune or Folly?" (May 30).

Also during April and May, CTAPC offers a two-day seminar that covers career development "from A to Z," including "Resume Basics." Lunchtime "brown-bag" seminars covering interviewing and assertiveness are new timesaving sessions. Seminars on the electronic resume and the Internet help make it easier to use these important job-search tools.

For more information or to suggest other topics, call CTAPC at ext. 45000.

- "Assertive Communications and Building Your Career," April 25, noon-1 p.m. (brown-bag seminar), Building 1312
- "Starting Your Own Business," April 30, 9 a.m.-4:30 p.m., Building 1216
- "Integrating Covey's 'Seven Habits of Highly Effective People' into Your Career Strategies," May 1, 9 a.m.-4:30 p.m., Building 1312
- "How To Evaluate Career Alternatives and Manage a Successful Career Campaign," May 7-8, 9 a.m.-4:30 p.m., Building 1216
- "So You Want To Be a Consultant," May 15, 9 a.m.-noon, Building 1312
- "Starting Your Own Business," May 21, 9 a.m.-4:30 p.m., Building 1216
- "Franchising: Fortune or Folly?" May 30, 9 a.m.-noon, Building 1216

CTAPC offers this thought: Our relationship with our boss is either antagonistic or mentoring. If it is the latter, *nurture* it. If it is the former, we, *not the boss*, must change the relationship.

Commuters May Avoid Coleman Bridge

BY MARNY SKORA

The Coleman Bridge is scheduled to be closed for traffic May 3-15 while the wider spans are floated into position.

The Coleman Commuter CONNECTION

A recent survey indicates that many Coleman Bridge commuters have made plans to avoid the West Point detour when the bridge is shutdown. However, traffic is still expected to be heavy, and delays are predicted. The Virginia Department of Transportation (VDOT) is cooperating with state police and the West Point sheriff's office to ensure safe traffic flow during the detour.

The VDOT, in cooperation with the Middle Peninsula Rideshare and the Virginia Department of Rail and Public Transportation, is offering free bus service during the 12-day shutdown. Buses will pick up passengers at several park-and-ride lots on the Middle Peninsula in the morning and will take them to major employers on the Peninsula. The buses will make a return trip in the afternoon. For more information, call (804) 758-4847.

Erin Kay Charters, Inc., and Chesapeake Launch and Salvage will operate a passenger ferry service during the May shutdown. The ferry will run from Sarah's Creek Marina to Wormley Creek Marina. Cost will be $5 one-way. A free shuttle bus will run from the park-and-ride lot on Rt. 216 on the Middle Peninsula and from the Patriot's Square Shopping Center park-and-ride lot on the Peninsula to the respective marinas. For more information, call (804) 642-5096.

Many hotels are offering reduced rates to Coleman Bridge commuters. Call 1-800-777-YORK for a list of participating hotels.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor. . . . . Keith Henry

Editor. . . . . Mary Graves
Science and Technology Corp.

Assistant Editor. . . . . Jeane Shanks
Science and Technology Corp.

Photographer . . . . . Fred Jones

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

Gate Security Beefed Up, Policies Clarified

Langley has implemented a new federally mandated interim Center Access Policy, effective April 1 and remaining in effect until a new formal policy is approved. The policy change is a result of a Department of Justice study, "Vulnerability Assessment of Federal Facilities," predicated by the Oklahoma City bombing attack one year ago.

All personnel in a vehicle – NASA, contractor, and Air Force alike – must display an appropriate personal identification card at all NASA gates for unrestricted access to the Center. Personnel in vehicles with a valid decal who display their identification cards in full view as they approach the gate will be waved through without being stopped. But if their identification is not plainly displayed, or if their vehicle does not have a valid decal, they will be stopped by a guard for a hands-on identification check. This also applies to family members requiring access to the Center. Anyone on Center property may be subject to discretionary hands-on identification checks at any time.

All personnel must display their NASA badge prominently at all times while on Center. All non-badged personnel, visitors, vendors, and delivery personnel must now obtain a badge from the Badge and Pass Office at the main gate on Commander Shepard Boulevard for access to the Center. Only this office will issue temporary or visitor badges, during the hours of 6:30 a.m. to 4:30 p.m. Special personnel and vehicle passes will be issued for Langley Activity Association-sponsored events and will restrict the holder to "open" areas of the Center, such as the cafeterias, recreation areas and the H.J.E. Reid Conference Center.

Vehicles carrying an individual who does not have a valid NASA badge or an approved form of identification must be parked in the lot outside of the Center, and the individual must obtain a badge from the Badge and Pass Office.

In addition, the gate at Durand Avenue will now be open for two-way traffic between the Center and the Air Force base, from 5:45 a.m. to 8 p.m., Sept. 1 to April 30. From May 1 to Aug. 31, the gate opening will extend to 9 p.m. The gate will be blocked at all other times.

Langley Air Force Base personnel received notification of the new policy a couple of weeks before the implementation date.

Access hours include normal Center flex-time hours, 6 a.m. to 6 p.m. The main gate is open 24 hours a day; the Wythe Creek Road gate is open from 5:45 a.m. to 6:15 p.m., Monday through Friday.

"The reaction to the new policy has been outstanding," said Charles Cockrell, chief engineer for the Center's Office of Safety, Environment and Mission Assurance. "We had a meeting scheduled on the first day of implementation to iron out any problems we found, but we cancelled the meeting because we had nothing to discuss."

Most people were prepared for the changes, so virtually no problems have occurred so far, Cockrell said. "Some of the Air Force personnel didn't realize that, to get back onto the Center in the afternoon, they had to show their badge a second time." But that still has not been a major problem, he said.

"Basically, we are eliminating unenforceable or inconsistently enforced requirements and are strictly enforcing the policies we have kept or added," Cockrell said. "Now it's a 100 percent check: Everyone entering the Center must have a badge, with no exceptions."

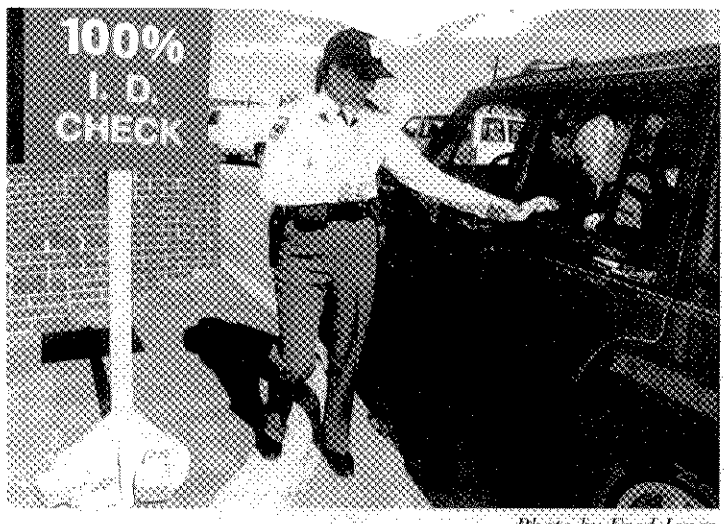


Photo by Fred Jones

Two-year-old Bryan Barrows, son of NASA employee Danny Barrows, displays his own identification badge to Donna Outen, Mason and Hanger security gate guard, during the first week of the new policy's implementation.

Business Computing Moves to Lewis Research Center

BY LISA YU

The end of an era has arrived at Langley's business mainframe computing, part of the Management Information Systems Branch in Information Systems Services Division. As of Feb. 26, business computing operations have moved to the NASA ADP Consolidation Center (NACC) at Lewis Research Center, Cleveland, Ohio.

After a trouble-free, month-long trial cycle of financial reporting at Lewis, all operations at Langley ceased March 29, and the transparent transition was complete. Langley no longer can access the mainframe computer locally but can continue business computing operations via telecommunications at the remote site.

Three years ago, NASA began an evaluation of a proposal to consolidate mainframe business computing systems, which consisted of centralizing hardware and software maintenance and management and eliminating redundancies. Last year, NASA's newly appointed chief information officer, John Lynn (now retired), directed that the consolidation idea be implemented in fiscal year 1996, and Marshall Space Flight Center was designated as the lead center for the NACC project.

Since last July, Information Systems Services Division's Management Information Systems Branch has focused on migrating Langley's business computing activities to the NACC, and plans were developed to migrate mainframe processing to Lewis Research Center in November. After several schedule delays, a "mock" move was conducted in early February, paving the way for the final migration of the production later that month.

With the completion of the successful migration, Langley transferred $2 million in peripheral hardware to upgrade Lewis/NACC equipment.

This migration is feasible and cost-effective partly because of the advances made in computer network technology. Sophisticated file transfer protocol, coupled with highly reliable fiber optic technology, allows business computing processing at Lewis Research Center that is transparent to the user, with no effect on the transactions or the people involved. Statistics collected so far show no degradation in response time or in customer satisfaction.

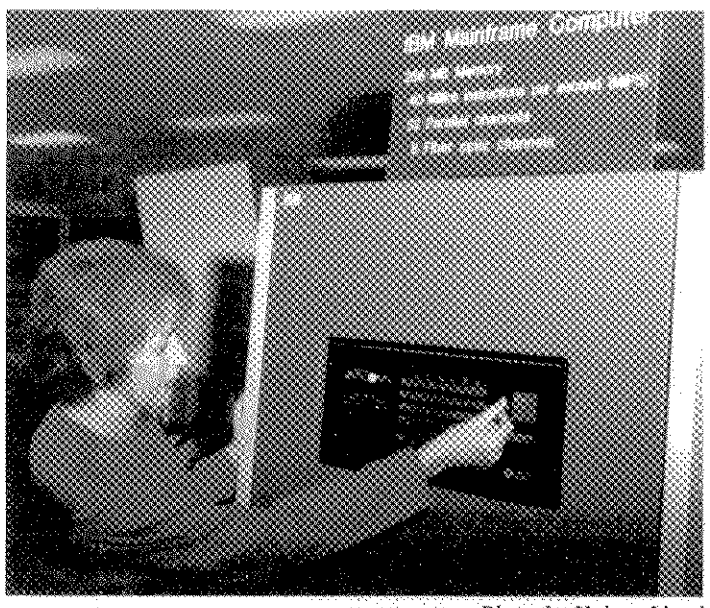


Photo by Hubert Lloyd

Jeannette George, the last remaining employee of the original Business Data Systems Project Office, turns off the IBM mainframe switch at the business computing operations branch, symbolically ending 23 years of mainframe computer processing operations at Langley.

Langley's New Piston Design May Spark Motor Revolution

Imagine what a maker of racing engines or snowmobiles or outboard motors could do with a lightweight engine that thrives on the demands of high-temperature and high-power output. The added potential of greater fuel economy and lower hydrocarbon emissions heighten the consumer appeal that much more.

The technology to make such a futuristic, even oilless engine is being developed today, and NASA Langley Research Center is offering U.S. companies the opportunity to license it for a variety of markets.

During a technical briefing at Langley last month, officials explained the advantages of carbon-carbon composite material for high-performance pistons and other applications. The heated, blackened carbon filament and resin material is embedded in a carbon matrix. It was originally developed for high-temperature space and aeronautics applications, including a thermal protection system for the space shuttle.

Langley has tested prototype pistons in gasoline engines and has successfully demonstrated the benefits of the new material system. It's light, strong, clean, self-lubricating and able to withstand temperatures up to 2,500 degrees Fahrenheit – well above the 1,100-degree melting point of aluminum. That means less pollution and greater mileage, especially for diesel-powered vehicles.

The downside is the high price tag of the pistons; the ones made at Langley run between $500 and $1,000 each. With the expected improvements to the manufacturing process, the cost is also expected to fall to between $20 and $120 per piston, making them much more readily incorporated into private industry.

The first takers likely would be makers of high-performance engines, such as those in race cars, with airplanes, snowmobiles, jet skis and lawnmowers following closely behind.

SHUTTLE RUN

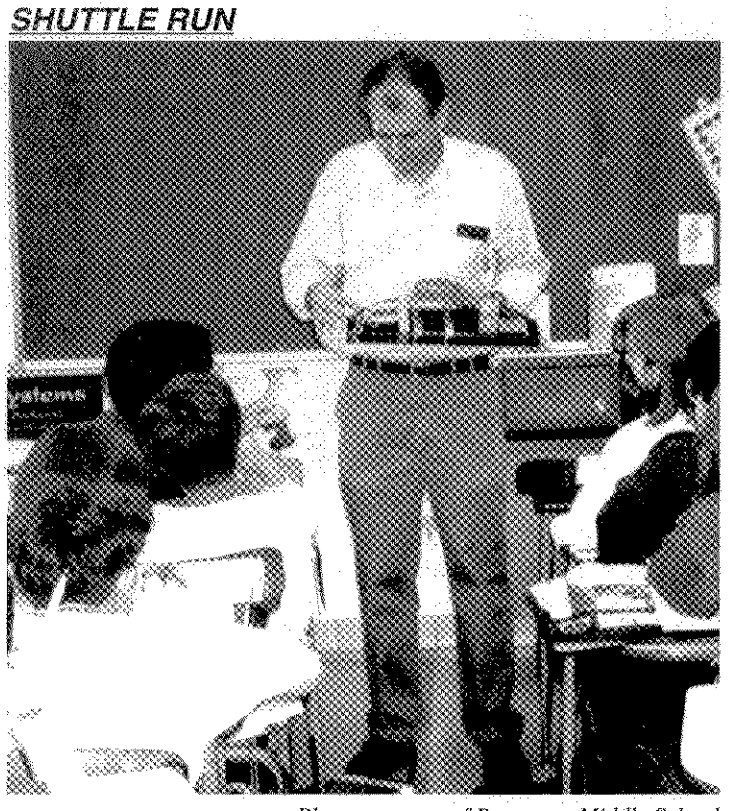


Photo courtesy of Poquoson Middle School

Steve Wilkinson of Langley's Flow Modeling and Control Branch explains the electronic needs of the Bacteria Inoculation in Space project to Susie Durant's seventh-grade life science class at Poquoson Middle School. The school recently participated in the Student Experiment Module (SEM) concept, an educational initiative of the NASA Shuttle Small Payload Project. In the SEM concept, NASA provides small containers, or modules, which can accommodate small zero-gravity experiments designed and conducted by students. These experiments then fly on a five-to-ten-day shuttle flight, scheduled for this November.

Langley Gains Space Science Support Office

BY CATHY WATSON

As part of NASA's effort to shift more program control to its centers, an element of the Headquarters Office of Space Science has been transferred to Langley.

The new Space Science Support Office (SSSO) will be part of the Center's Space and Atmospheric Sciences Program Group. Branches within the Office of Space Science previously performed the function of the SSSO.

Center Director Paul F. Holloway said, "We are delighted to accept the challenges and responsibility bestowed by NASA Headquarters on the Center in selecting Langley to manage the process of choosing quality science missions for space science missions in the next generation."

SSSO Territory

The SSSO will be responsible for the Discovery, Explorers, and Solar-Terrestrial Probe programs Announcement of Opportunity (AO) processes. The office will write and release AOs, collect the responses, and organize and manage response review panels.

The SSSO will conduct independent evaluations to assure that selected investigations meet established criteria and will provide high-quality science return. The office will present its findings and recommendations to Headquarters.

After an investigation has been selected, the SSSO will assess program activities to assure tasks are completed on schedule and within budget, and will participate in mission reviews and technical audits. The office will manage and conduct independent and external independent readiness reviews of space sciences missions.

The SSSO also will provide program management, strategic planning, and integration for the overall Langley space science support activities.

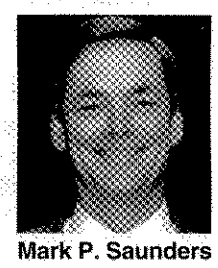
Explorer, Discovery, and Solar-Terrestrial Probes Programs

The Discovery, Explorer and Solar Terrestrial Probe programs provide frequent access to space for small space science missions that perform high-quality scientific investigations using small to mid-sized spacecraft.

These programs continue to seek reductions in the cost of developing spacecraft to provide more frequent launch opportunities for space science missions, while aiding in the transfer of space technology to the private sector. The Discovery program supported the Mars Pathfinder, the Near Earth Asteroid Rendezvous and the Lunar Prospector missions.

SSSO Leadership

Mark P. Saunders will lead this new effort as Head of the Space Science Support Office. Saunders, formerly Discovery program manager at NASA Headquarters, assumed his duties April 15. He will head an SSSO staff of five.



Mark P. Saunders

CROSSFLOW

(continued from page 1)

occurred simultaneously, involving numerous Langley organizations and requiring an organized team effort.

Data Acquisition

Due to the volume of data obtained from the experiment, a database system was used to organize the test results, eliminating the need to archive the information at the end of the test. The Scientific Applications Branch of the Information Systems and Services Division developed the database system used throughout the test.

Rapid Prototyping

Due to the large scope and constrained schedule for this test, some elements were developed during the test operation. "Rapid prototyping" enabled interim solutions to get on-line quickly, maintaining the experiment schedule, while final solutions continued to evolve.

End Results

Knowledge obtained from the results of this experiment will reduce the risks involved with applying HLFC. The successful implementation of this test is a major achievement in the research capability for Laminar Flow Control at Langley and could lead to a new generation of energy-efficient aircraft.

Moreover, the partnership approach shared by Langley and Boeing will serve as a prototype for future NASA-industry interactions. The Boeing Commercial Airplane Group said that this team set a new standard for cooperative NASA-industry research projects, and that this program, which began in March 1993, has proven to be a good model for NASA-industry cooperation.

"It was my perception that Boeing was pleased with the whole operation and would like to do more research using this type of cooperative approach," said Harris. "And a lot of us felt that it was the most fun that we have had in research in a long time."

Crossflow Experiment Team Receives NASA Langley Group Recognition Award

The following members of the crossflow experiment team were recognized for outstanding innovation and technical achievement in the design, development and implementation of the NASA/Boeing Commercial Airplane Group Hybrid Laminar Flow Control Crossflow Experiment:

Fluid Mechanics and Acoustics Division
- Jerome T. Kegelman
- Latunia G Pack
- Craig L. Street
- Richard W. Wlezien

Aerodynamics Division
- Cuyler W. Brooks
- Charles D. Harris
- Peter F. Jacobs
- Patricia G. Reagon

Operations Support Division
- James M. Curro
- Patrick T. Bower
- Sean M. Britton
- James A. Clark
- Donald L. Day
- Wendy J. Johnson
- Carlton G. Pike
- Curtis Swackhammer
- Alfred E. Thomas

High Technology, Inc.
- Shelly A. Spencer

Information Systems Division
- Catherine K. Cronin
- Kenneth G. Jones

Engineering Testing Technology Division
- William M. Langford
- Vernon E. Watkins, Jr.

BUDGET

(continued from page 1)

The FY 1997 budget request includes funding for research in noise reduction, terminal area productivity, aging aircraft, integrated wing design, propulsion systems, environmental assessment, short-haul aircraft and fiber optic and power-by-wire control systems and composite materials. The total FY 1997 funding for the program is $228 million.

High-Performance Computing and Communications Program – $23.3 million

NASA's High-Performance Computing and Communications Program is part of a multi-agency effort to boost supercomputer speeds and communications capabilities.

The 1997 budget request includes funding for continued research on advanced computing tools, with a continued emphasis on cost-effective, high-performance computing for aerospace design. The total FY 1997 funding for the program is $59 million.

Research and Technology Base Program – $354.4 million

The Research and Technology (R&T) Base Program provides for research in airframe, propulsion, aviation operations and information systems and in rotorcraft technology.

The R&T Base Program develops tools for analysis and design processes in aerodynamics; propulsion and power; materials and structures; controls, guidance and human factors; flight systems; and systems analysis. The program also promotes and fosters partnerships with industry, universities and government agencies.

The program provides the leadership necessary to accomplish our national aeronautical goals. It provides high-risk, breakthrough concepts, technologies and tools. It also develops, sustains and enhances world-class skills and capabilities for next-generation aeronautical systems.

Photos by Hubert Lloyd

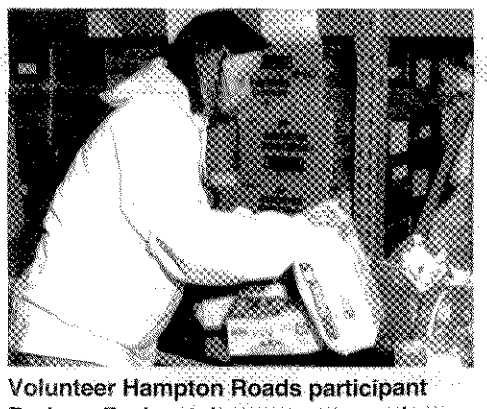
Left, "Day of Caring" volunteers, from left, Judy Cottle, Willard Bauserman, Allen Langford and Carlos Liceaga team up on a building project at the Girl Scout Council's summer camp. Above, "Teacher for a Day" Tony Maturo talks about NASA to sixth-grade students at Great Neck Middle School during this year's National Engineers Week.

Volunteers Receive Week-Long Thanks for Year-Long Commitment

BY MARNY SKORA

More than 89 million people volunteer in the United States, and many are Langley employees and retirees. They serve food at soup kitchens, help homeless families find shelter, mentor students, deliver meals to homebound senior citizens and much more. But still more remains to be done.

As every level of government downsizes, leaving a shrinking social safety net, citizen involvement has never been more important. National Volunteer Week, April 21-27, recognizes those who serve and highlights opportunities to engage others in volunteerism.



Volunteer Hampton Roads participant Barbara Bodenstein prepares a package of baby goods at the Foodbank.

Center Director Paul F. Holloway joins other corporate leaders across the country in saluting volunteers.

"During National Volunteer Week, I want to thank Center volunteers for helping to make Langley's Community Service program a viable and vital link in solving community problems," he said.

Langley sponsors several visible and highly successful programs that offer creative solutions to community concerns. Nearly 125 employees participated in the **Community Day of Caring**. These volunteers assisted 35 nonprofit agencies and accomplished 50 tasks at locations throughout the area. Projects included building homes, boxing food, painting, plumbing, landscaping and laughing with day-care children and senior citizens.

Employee-initiated holiday projects provided warm clothing for nearly 50 needy children. In addition, more than 170 dozen cookies and treats, as well as fruit, were provided to the **Salvation Army**'s mobile soup kitchen, adding some cheer at a holiday meal for the homeless.

Langley's **National Engineers Week** school visitation program placed over 170 volunteer teachers in classrooms in 12 local school districts. This community service effort allows role models to interact with young potential scientists, engineers, mathematicians and technicians of the future.

Langley's Alumni Association's **"Galaxy of Gifts"** project helps community nonprofit agencies provide donated products to people in need. This effort recruited 77 member agencies and distributed some $500,000 worth of products to local charities in their first year.

A dozen Langley volunteers joined other community-minded individuals at the Foodbank in early March as part of an effort called **"Volunteer Hampton Roads."** The Saturday morning crew salvaged more than 16,000 pounds of food, enough for nearly 14,000 meals for the area's hungry.

With "Project Remember," the Alumni Association sends items to our service people stationed in Bosnia.

These group projects add to the individual commitment and personal activities of countless current and former employees. The tasks are varied, and the volunteer skills are innumerable, but the focus is clearly singular — to help our neighbors.

National Volunteer Week recognizes the yearlong activities of these caring individuals and their counterparts across the country.

COMMUNITY CORNER

Volunteer Hampton Roads HELPs with Spring Cleaning

BY MARNY SKORA

The second Saturday community service project is scheduled for May 4 at the Hampton Ecumenical Lodgings and Provisions (HELP) shelter at 3006 Victoria Blvd., Hampton. HELP is a nonprofit organization that provides lodging and food for the homeless in our community. Services include a community food pantry, a financial assistance program and a short-term family shelter.

Volunteer Hampton Roads is a project sponsored by the Volunteer Center to address critical needs in the community through one-day volunteer opportunities.

Here's How You Can Help

Spring spruce-up will be the order of the day at the HELP shelter. Volunteers will work from 10 a.m. until 2 p.m. Activities will include interior and exterior painting, washing windows and walls and erecting a stockade fence. There's something for everyone, and no experience is necessary.

Langley employees interested in volunteering May 4 should call Marny Skora at ext. 43315.

LAA Aerobics Implements Surgeon General's Report

The U.S. Surgeon General's office will release next month a report on physical activity and health that offers conclusive evidence of the dangers of physical inactivity. The Langley Activities Association Aerobics Club will incorporate these findings and updated guidelines for exercise and nutrition in its spring classes.

Drs. Michele Macaraeg and Craig Streett, certified personal trainers who formed the LAA Aerobics Club in 1990, recently attended the 1996 IDEA International Personal Training Summit in Anaheim, Calif. Presented by IDEA, the international association of fitness professionals, the summit featured the latest developments in fitness research and strength training, alternative training techniques and updates in nutrition and exercise safety.

The LAA Aerobics Club has incorporated this new research into spring classes that are fun and effective for maintaining fat loss.

The aerobics club now offers low-impact and step classes, including muscle step, cross-training circuits, karate-plus-aerobics and ballet sculpt, plus new techniques in stretching. Classes are Tuesdays and Thursdays, 5-6 p.m., and Saturday, 9:30-10:30 a.m., in the LAA Gym. For more information, call ext. 42295.

Blood Donors Roll Up Sleeves

The March 20 Blood Drive at Langley brought out 243 donors, seven of whom were first-time donors, according to coordinators Peter J. Edgette and Karen Ridlon of the Occupational Health Services Office and JoAnn Schiffer of the American Red Cross.

A big "thank you" goes to these donors: 15 gallons, William J. Debnam; 11 gallons, Joseph M. Price and Marcella F. Hogge; nine gallons, James R. Young; seven gallons, Kathryn A. Smith; five gallons, David K. Burnette, George B. Finelli, Clarke H. Morledge, and Timothy G. Wood; four gallons, Clinton Duncan; three gallons, Kevin L. Marlowe; two gallons, Ginger L. Freeman, Dana C. Gould, and Jay M. Brandon; one gallon, Angela K. Nadeau, Samuel James, David A. Rutan, Uwe K. Steinbau, James R. Miskell, N. Duane Melson, Lucretia M. Schoch, Roy Jacob, and Paula R. Rawles.

First time donors included Harry Edelstein, Nancianne Judge, Anette Carter, Keisha R. Armistead, Timothy S. Meidinger, Ray Ristorcelli and Avik Banerjee.

The next Blood Drive will be May 22, 9 a.m. to 3 p.m., at the H.J.E. Reid Conference Center.

Researcher News Survey Results: Readers Sound Off

BY ANN GAUDREAUX

The Feb. 9 issue of the *Researcher News* contained a reader survey, conducted to find out how the *Researcher News* staff could serve its readers better, as well as to try to meet the informational needs of the Center.

Although the survey took only a few minutes to complete, only 153 responses were received. The following are the results of the survey, along with the comments received.

How would you rate the *Researcher News* as a source of information . . .

I . . . from NASA Langley senior staff (152 responses)
8 – no opinion (5%)
18 – poor (11%)
28 – fair (18%)
55 – good (36%)
35 – excellent (23%)
8 – information not important to me (5%)

II . . . to help plan your NASA career (154)
28 – no opinion (18%)
45 – poor (29%)
26 – fair (17%)
22 – good (14%)
6 – excellent (4%)
27 – information not important to me (17.5%)

III . . . about individual researchers and/or projects at NASA Langley (152)
1 – no opinion (.06%)
7 – poor (5%)
21 – fair (14%)
69 – good (45.3%)
51 – excellent (33.5%)
3 – information not important to me (2%)

IV . . . about individual researchers and/or projects at other NASA centers (155)
4 – no opinion (2.5%)
30 – poor (19%)
38 – fair (25%)
49 – good (31.5%)
22 – excellent (14%)
12 – information not important to me (8%)

V . . . about NASA Langley as a whole (155)
1 – no opinion (.06%)
12 – poor (7.7%)
26 – fair (16.7%)
74 – good (47.7%)
41 – excellent (26.4%)
1 – information not important to me (.06%)

VI . . . about NASA as a whole (154)
3 – no opinion (2%)
33 – poor (21.4%)
39 – fair (25%)
55 – good (35.7%)
18 – excellent (12%)
6 – information not important to me (3.8%)

VII – What percentage of your information about NASA Langley do you currently get from the *Researcher News*? (156)
2 – no opinion (1%)
61 – less than 25% (39%)
25 – 25 to 49% (16%)
41 – 50 to 74% (26%)
26 – 75 to 99% (16.6%)
1 – 100% (.06%)

VIII – What percentage of your information about NASA as a whole do you get from the *Researcher News*? (156)
4 – no opinion (2.5%)
74 – less than 25% (47.4%)
27 – 25 to 49% (17.3%)
31 – 50 to 74% (20%)
18 – 75 to 99% (11.5%)
2 – 100% (1.2%)

IX – Does the *Researcher News* provide you with information in a timely manner? (150)
114 – Yes (76%)
36 – No (24%)
(3 – no response)

X – If the *Researcher News* were available only via the Internet, would you read it? (159)
63 – Yes (41%)
89 – No (58%)
7 – Maybe (.05%)
If no, why?
Comments included: No computer, no Internet connection/on-line services, and either can't get access or have no intention of getting either a computer or access; prefer to have a paper copy to carry around and read when convenient; have not read *LaRC This Week* since it has gone on-line or have read it and found it very inconvenient ("It used to take five minutes to read *LaRC This Week* ... now it takes an hour"); too much trouble; don't want to use work time to read the in-house publications; spend too much time already reading computer screens/e-mail, etc.; not worth the effort; wouldn't read it as often or even remember to read it; not enough time; "Web is a horrible interface for newspapers"; *RN* is easier to read.

XI – What are your favorite features in the *Researcher News*?
9 – retirees; 28 – research/researchers; 10 – Around the Agency; 2 – the budget process; 16 – Page One items; 16 – co-workers stories; 18 – stories about Langley-specific items; 24 – Happenings; 7 – tech transfer; 41 – People & Places features; 4 – state of the art news; 15 – News Briefs; 4 – Congressional updates; 18 – Directors' Message/news from HQ and/or Administrator; 2 – photos; 2 – history; 5 – In Memoriam; 1 RN Survey; 5 – educational features; 5 – volunteers stories; 1 – cartoon; 2 – thank-you letters; 1 – Apprentice grad stories; and 2 – humor columnist.

XII – What are your least favorite features in the *Researcher News*?
3 – retirees; 4 – research; 8 – Around the Agency; 1 – co-worker items; 1 – Langley-specific items; 13 – Happenings; 5 – People & Places; 1 – state of the art; 6 – News Briefs; 2 – humor columnist; 11 – Speakers Bureau; 13 – HQ "propaganda"; 1 – stories about short-term people; 1 – Engineers Week; 1 – everything else; 4 – community stories; 1 – other centers; 5 – education; 2 – LARSS students; 1 – Total Quality Management (TQM); 1 – In Memoriam; 1 – grip & grin.

XIII – What type of stories would you like to see get increased coverage in the *Researcher News*?
37 – Langley/NASA research - people and results; 1 – Around the Agency; 1 – budget process; 3 – Page One; 11 – co-workers; 15 – Langley stories; 3 – Happenings; 7 – tech transfer; 18 – People & Places; 12 – state of the art; 1 – News Briefs; 5 – history; 2 – HQ stories; 9 – political process; 1 – poems/stories; 2 – more timely distribution; 8 – stories about technicians and their work; 1 – Union column; 3 – LAA sports and other activities; 4 – space shuttle mission information; 11 – community service; 5 – more information from Langley and NASA headquarters; 4 – more other NASA centers; 1 – more surveys; 7 – Letters to the Editor (uncensored opinions); 9 – investigative reporting; 1 – point of contact for more information on stories; 2 – Town Meetings; 2– contractor contributions; 3 – job opportunities; 2 – World Wide Web information; 2 - cafeteria menus; 4 – stories about branches and divisions featuring their work and the people that do the work; 1 – alumni news; 1 – TSP funds; 1 – new paper format; 1 – humor column; 5 – career information.

Additional comments:
Comments ranged from the *RN* is a "piece of PR fluff" from senior management to "*RN* is an excellent source of information" and an "excellent publication." Some thought money could be saved by putting some form of *RN* on the Internet or printing fewer paper copies and posting them in branch and division offices. Most surveyed who had additional comments still wanted some form of written communication on Center.

Note: Number of responses per question is in parentheses. Although 153 questionnaires were returned, when the number of responses is higher than the number of surveys returned, it indicates more than one choice of response.

Galileo Scientists Report Changing Findings About Jupiter

NASA NEWS RELEASE

Scientists continuing to analyze information returned by the Galileo atmospheric probe that plunged into Jupiter last December report more surprises about the giant gas planet.

Most significantly, the ratio of the elements that make up 99 percent of the Jovian atmosphere — helium and hydrogen —now closely matches that found in the sun, suggesting that Jupiter's bulk composition has not changed since the planet formed several billion years ago. Estimated amounts of key heavy elements such as carbon and sulfur have increased, but minimal organic compounds were detected, and estimates for Jupiter's wind speeds have climbed still higher.

Probe scientists report these refined results at the Lunar and Planetary Science Conference in Houston, Texas. The ratio of helium to hydrogen by mass is key to developing theories of planetary evolution. Galileo probe scientists first estimated that Jupiter's ratio was 14 percent. More comprehensive analysis of results from the probe's helium abundance detector has raised this estimate for Jupiter to 24 percent, compared to 25 percent for the sun.

"The revised helium abundance indicates that gravitational settling of helium toward the interior of Jupiter has not occurred nearly as fast as it apparently has on Saturn, where the approximate helium-to-hydrogen ratio is just 6 percent," said Dr. Richard Young of NASA's Ames Research Center, Mountain View, Calif. "This then confirms that Jupiter is much hotter in its interior than its neighbor Saturn, the next largest planet in the solar system."

These new helium results are raising related estimates for the abundances of other key compounds, such as methane.

Several heavy elements, including carbon, nitrogen and sulfur, are significantly greater in abundance on Jupiter than in the sun.

"This implies that the influx of meteorites and other small bodies into Jupiter over the eons since its formation has played an important role in how Jupiter has evolved," said Young.

However, minimal organic compounds were detected, indicating that such complex combinations of carbon and hydrogen are rare on Jupiter and that the chances of finding biological activity on Jupiter similar to that found on Earth are extremely remote.

The strong Jovian atmospheric winds of more than 400 m.p.h. persisted far below the one cloud layer detected, strongly suggesting that heat escaping from deep in the planet's interior drives the winds, rather than solar heating. Since all the outer giant planets exhibit strong winds, scientists hope that understanding Jupiter's winds will lead to important new insights into their unusual meteorology, Young said.

Further analysis of probe data has confirmed the preliminary report that the Jovian atmosphere appears to be relatively dry, with much less water than anticipated on the basis of solar composition and predictions from data sent by the Voyager spacecraft that flew by Jupiter in 1979. Probe measurements now suggest that Jupiter has less water than the sun.

Scientists confirmed that the probe's instruments found lightning on Jupiter to be about one-tenth of that found on Earth in an area of the same size, although the lightning is about ten times more energetic than on Earth, Young said.

Only an atmospheric entry probe could have gathered the detailed information that Galileo has discovered, Young said. Complete detailed results of the Galileo probe data analysis will be reported in the May 10 issue of *Science* magazine.

NASA Joins in Study, Celebration of Comet Hyakutake

NASA NEWS RELEASE

NASA recently conducted a variety of activities designed to study the Comet C/1996 B2 Hyakutake and will share this information, as well as ongoing amateur and student observations of the comet, with the general public.

What Is a Comet?

A comet is a small, icy body that orbits the Sun in an elongated orbit that can be disturbed by the ongoing orbits of the planets. Resembling a "dirty snowball," a comet typically has a relatively tiny nucleus, often less than six miles across.

When radiation from the sun warms a comet, ice particles from its nucleus tend to "steam" outwards, creating a large coma or surrounding atmosphere and a tail of material that streams away from the Sun.

In some cases, the coma and tail can be thousands or even millions of miles across, offering dramatic viewing opportunities. Comet Hyakutake has the potential to provide just such a spectacle.

According to the Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass., Comet Hyakutake's passage to Earth is the nearest of any comet since 1983, and the fifth closest this century.

Comet Visibility

Discovered on Jan. 30 by Japanese amateur comet hunter Yuji Hyakutake using powerful binoculars, the comet was expected to be as bright or brighter than the stars of the Big Dipper. The comet made its closest approach to Earth on March 25, at a distance of about 9.3 million miles.

Weather and light pollution permitting, it was visible as a dimly glowing cloud in the northern night sky to the left of the handle of the Big Dipper, as seen from North America

Hubble's Shot

Several NASA spacecraft, including the Hubble Space Telescope, photographed Comet Hyakutake.

Hubble had an especially rare and challenging task. Astronomers say it is unlikely such a comet will ever come this close to Earth again during Hubble's planned operational lifetime. Since Hubble is not actively controlled from the ground and the comet's position is not precisely known, viewing the speeding visitor was especially tricky. The telescope was preprogrammed to point at a selected spot in the sky where the comet appeared at a specific time.

Planned Hubble science observations of Comet Hyakutake included high-resolution imagery and ultraviolet spectroscopy. Near the time of the comet's closest approach, Hubble was able to see details as small as four miles across. Astronomers also hoped to see jets of dust emerging from the comet's nucleus.

NEAR's Point of View

NASA's recently launched Near Earth Asteroid Rendezvous (NEAR) spacecraft was scheduled to take images of the comet as a calibration exercise. Although NEAR offers a different vantage point from Hubble, its camera was not designed to image objects at such large distances.

NASA Observations

Several NASA-supported ground-based observatories also will study the comet through April, as the comet approaches perihelion, or its closest distance from the sun.

NASA's Infrared Telescope Facility (IRTF) on Mauna Kea, Hawaii, dedicated several days of observing time to study the release of dust and ice grains from the nucleus of the comet. These ices are composed primarily of water.

Spectral observations of the molecules vaporized from the nucleus provided samples of molecular abundances that were present at the time of the formation of the Solar System. The Extreme Ultraviolet Explorer spacecraft made observations of neon and helium for comparison with the water production rates to be measured by the IRTF.

Star-Studded Night

Images from IRTF and many other sources were posted to a "virtual star party" on the Internet called the "Night of the Comet," sponsored by NASA's Ames Research Center, Mountain View, Calif., NASA's Stratospheric Observatory For Infrared Astronomy (SOFIA) program, and its K-12 Internet Initiative. This home page allows anyone with access to a computer and a modem to post and observe Hyakutake images, to track the progress of the comet, to converse with NASA experts, to learn about astronomy and to participate in experiments.

"Although the project is just getting started, the initial response has been tremendous," said SOFIA project educator Bob Hillenbrand. "Virtually every state is covered, plus Puerto Rico, and observers are participating from every part of the globe, including Taiwan, Australia, Africa, Russia, South America and Europe."

"Night of the Comet" can be accessed via the Internet at URL: http://www.comet.arc.nasa.gov comet/

Photo by Joel S. Levine and David P. Kratz

Comet Hyakutake was about 10 million miles away from the Earth, its closest approach, on March 24. The comet is currently traveling toward the sun at a speed of about 100,00 miles per hour. After its closest approach to the sun in early May, it will be visible from the southern hemisphere. The three brighter stars in the upper portion of the photograph are the stars in the handle of the Big Dipper.

Educated Gaze

Students in California, Virginia, New York, Delaware and Japan have begun a regular campaign of observing Comet Hyakutake using an automated 24-inch telescope at Mount Wilson, Calif., through the NASA-supported Telescopes In Education (TIE) project.

"We are scheduling one school or group to observe each day of the week," said Gilbert Clark, TIE project manager and organizer of the comet campaign. He expects the observations to continue, weather permitting, through at least part of April, as the comet moves from an early-morning object in the southwest sky to an early-evening object in the northwest sky.

Students will control the telescope and receive their images via telephone lines at their schools, using desktop computers and commercial software. The software package allows them to perform digital image processing to enhance contrast and other features, as is done with spacecraft images. They will send their observation notes and images to the TIE project's World Wide Web page.

Earth's Cosmic Visitor

BY JOEL LEVINE

The Earth has a visitor, whose last journey to our area was about 8,000 years ago. Comet Hyakutake is composed of a frozen nucleus, only several miles in diameter, consisting of frozen gases, including water and carbon dioxide, surrounded by a tenuous atmosphere or coma, and a tail extending out more than 10 million miles.

As Comet Hyakutake approached the sun from the distant reaches of the solar system, the frozen gases in the nucleus became heated and vaporized, forming the coma and tail. Particles emitted from the sun, called the "solar wind," caused the gases in the tail to be pointed away from the sun.

Comets date back to the beginning of the solar system, some 4.5 billion years ago. Some astronomers have hypothesized that a certain percentage of the gases in the Earth's atmosphere and the water in the oceans may have been supplied by cometary impacts in the early history of the solar system.

Happenings

VIRGINIA SYMPHONY: Flash Cadillac, April 19-20; Family Series concert "Cinderella," April 20. Masterworks concert April 26-27, includes Schubert Symphony No. 9. NASA and contractors discounts. Call Virginia Symphony ticket store, 623-2310.

WILLIAMSBURG CHORAL GUILD presents Mozart's Mass in C minor ("Great Mass") for the final concert of its 1995-96 season. The "Spring Finale" schedule includes performances at the West Point Christian Church, Euclid Blvd. (April 27); at the Williamsburg United Methodist Church, 514 Jamestown Rd. (April 30); and at St. Mark's Lutheran Church, 118 Old York-Hampton Rd., Yorktown (May 5). Performances begin at 8 p.m. Tickets are $10 for adults and $7.50 for students; group discounts are available. For information and tickets, call 220-1808.

FOR SALE: Condo with boat slip, Pine Cone Harbour in Hampton River Community. 3 BR, 2 full baths, 1,455 sq. ft. For sale by owner. $79,900. Call 867-7703.

SAIL AWAY: Sailing lessons are available this summer at the Langley Yacht Club, with 4 four-week adult sessions, 5:30-8:30 p.m., on either Mondays and Wednesdays or Tuesdays and Thursdays. One new session starts each month from May to August. The cost per session is $120, plus $12 for a sailing book. Two junior sessions are offered, beginning June 17 and July 15. Each session lasts for 4 weeks and meets Monday through Friday from 8 a.m. to noon. The cost is $225 per session. Powerboat classes are also available. For more information, call the Langley Marina at 764-7220.
A Marina Open House is scheduled for Saturday, June 22, 9 a.m.-5 p.m. Rain date is June 29. The marina is located at 200 Thornell Avenue (Building 607).

FOR SALE: 10 amps Kenmore vacuum cleaning system, 1 year old, fully equipped. $70 or best offer. 1988 Dodge Caravan, new state inspection, reliable, must sell $3,000 or best offer. Call Roger Oelke at 864-8947 until April 19; after that, call 864-3459 (R. Everett).

NASA INTERCENTER COMPETITION: Spring race schedule follows: 10-K races, April 23 and 29; 2-mile races, April 25 and May 1. May 1 walk/run is cosponsored by the Langley Fitness Center to begin National Fitness Month. Races start at 5 p.m. on Doolittle Road. All Langley employees, retirees, and on-site contractors earn points for Langley by participating in this agency-wide competition. Walkers are welcome. For more information, call Richard Shearer at ext. 47036.

FORE! NASA Golf Association's (NGA) day/night tournament is April 26, on Langley's Red Course. NGA membership not required. For more information, contact Tom Yager at ext. 41304. Thirteen more tournaments are scheduled through October, as well as weekend golf outings to Ocean City, Md., Pinehurst, N.C. and Myrtle Beach, S.C.

TOUR FOR CURE: The MS 150 Bike Tour, "Tour for Cure," is May 18-19. New route begins at the Suffolk Airport, touring to Murfreesboro, N.C. For more information, call 490-9627.

FOR SALE: Denbigh/Heatherstone. Assumable 6.5 percent mortgage on 3-year-old, two-story home, 3 BR, 2.5 baths, family room w/ fireplace, eat-in kitchen, gas heat, garage. Convenient to Ft. Eustis and Newport News Park. $98,000. Call 874-0966.

FOR RENT: Sanibel Island, Fla. Elegant waterfront 1 BR condo on Gulf of Mexico, ground floor, pool, tennis, full kitchen, on-site management. $625/week, May to September. Brochure available. Call Dick Campbell at 565-1849.

HELP! Langley's two Help Desks are now one first-line support group. Now call ext. 43250 for help. Calls are entered into an on-line system where they are tracked through to a satisfactory resolution.

RECYCLE: Toner cartridges and corrugated cardboard are now being picked up for recycling. Proceeds will be added to the Recycling Fund at LaRC. Call ext. 45765 for toner pickup. Cardboard and paper are collected together. For more information, call Dave Steigerwald at ext. 48058.

LAA AMATEUR RADIO: Langley Activities Association has allowed the Langley Amateur Radio Club to conduct a Field Day – June 22, 2 p.m., to June 23, 2 p.m. – on the Activities Center grounds. Call James E. Byrd (864-5961 or j.e.byrd@larc.nasa.gov) to indicate your participation interest. An additional organizational meeting will be held Tuesday, May 7, 8 p.m., at the Salvation Army building on Big Bethel Road. Families and interested visitors are welcome during Field Day.

ENGINEERS WEEK: Comments received from Engineers Week volunteers and from the schools the Center serviced during National Engineers Week are compiled and available for review in the Public Mail Office, Building 1153, Room 115.

CORRECTION: In the March 22 *Researcher News*, Robert J. Wheeler was incorrectly listed in the civil service employees column of the volunteers for National Engineers Week. He is employed as a contractor for Analytical Services & Materials, Inc.

Researcher News

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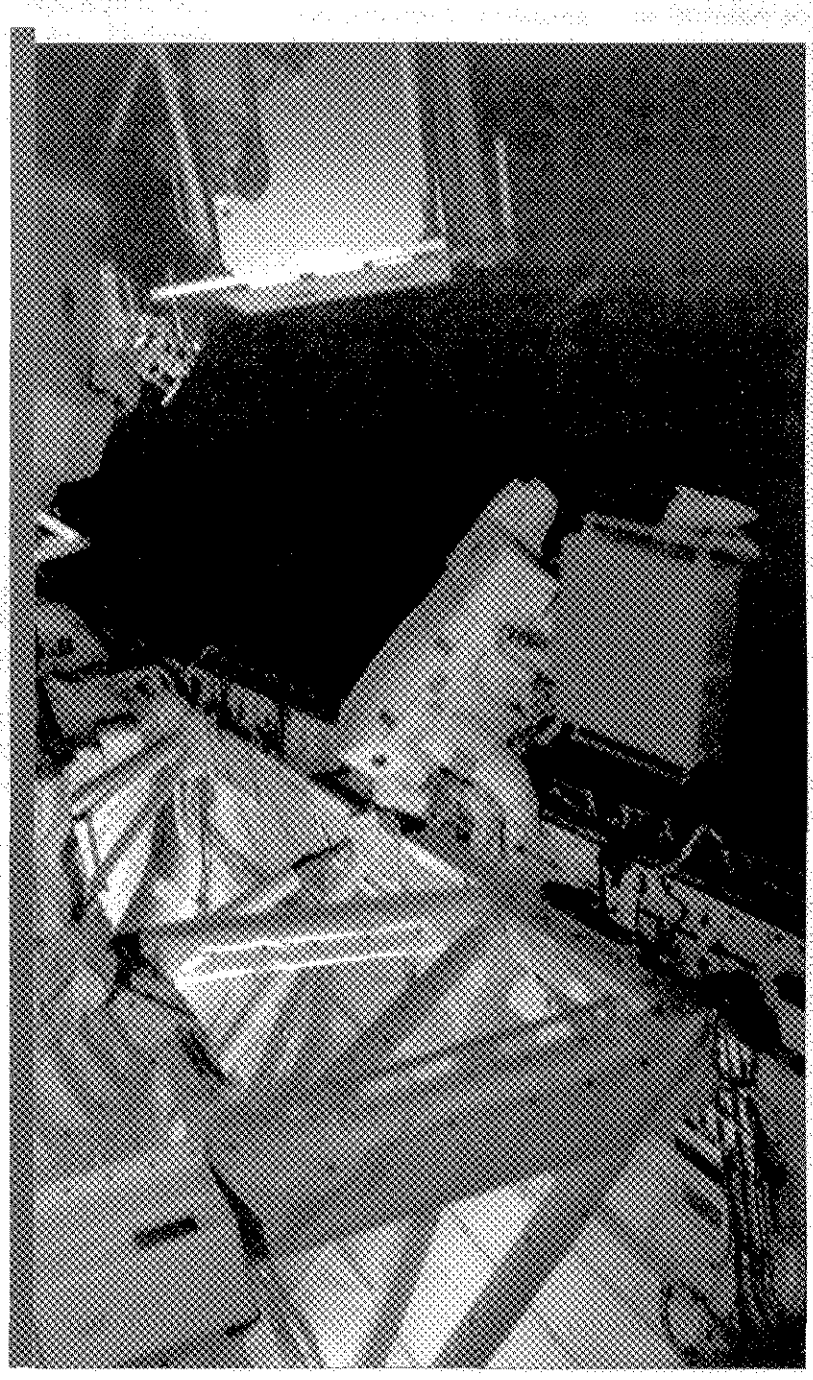

On the port side of Atlantis' cargo bay, astronaut Michael R. (Rich) Clifford, STS-76 mission specialist, attaches the Mir Environmental Effects Payload (MEEP), developed here at Langley, to the shuttle during a spacewalk March 27. Clifford joined astronaut Linda M. Godwin for the first-ever extravehicular activity involving NASA astronauts while their mother ship was docked with Russia's Mir space station. The docking module, delivered to Mir during Atlantis' previous mission, appears in the upper right corner. An electronic still camera recorded the image.

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Langley Research Center

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Langley Supports High-Risk Shuttle Test of Inflatable Antenna

BY TOM CAMPBELL

NASA Langley has played a significant role in the inception and development of a current experiment to test the feasibility of in-space inflatable antennas.

As part of NASA's In-Space Technology Experiments Program (IN-STEP), the Inflatable Antenna Experiment (IAE), will be deployed aboard STS-77, scheduled to launch May 16.

Robert Freeland of NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., is managing the experiment; L'Garde, Inc., a private company in Tustin, Calif., is developing it. Dr. Costa Cassapakis, Gayle Bilyeu, and Gordon Veal of L'Garde, Inc., are heading the project.

Since its inception in the late 1980s, the IN-STEP continues to sponsor low-cost, high-payoff technology payloads. Langley's then-Antenna and Microwave Research Branch – now the Electromagnetics Research Branch (ERB) – initiated the IAE in 1989.

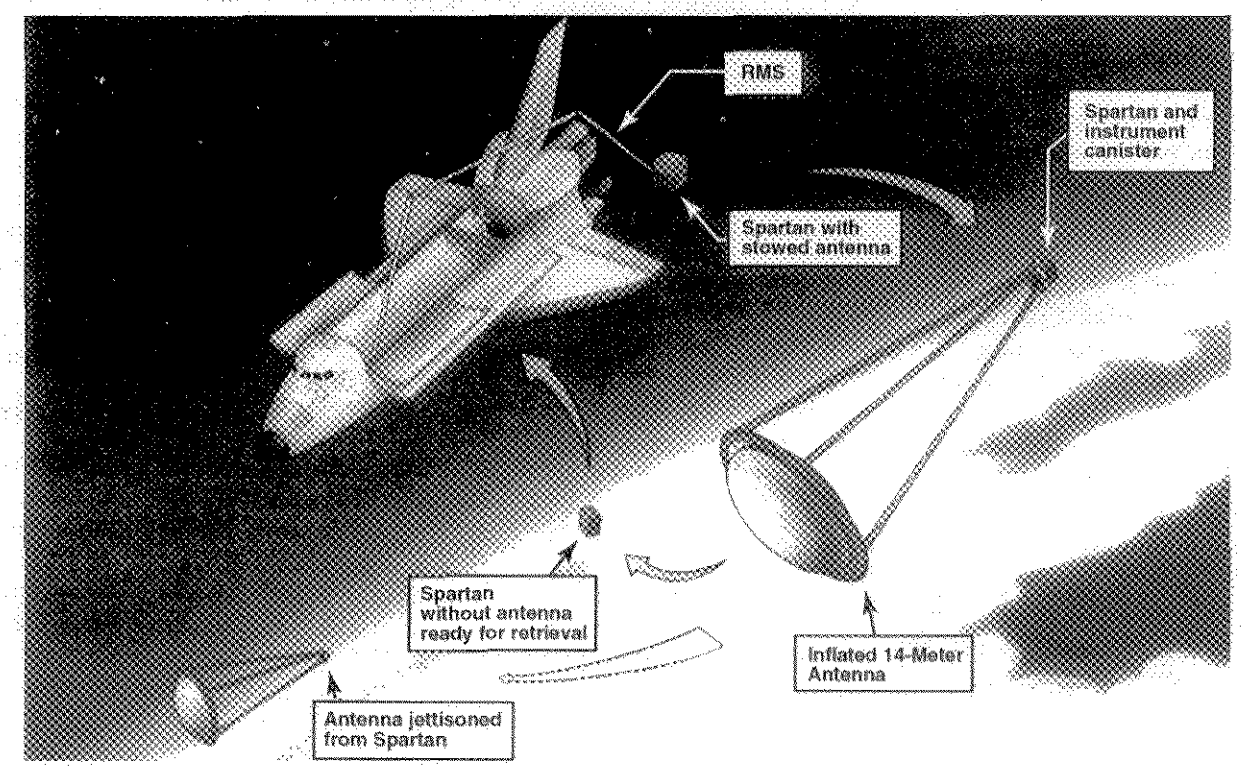

Photo courtesy of Jet Propulsion Laboratory and L'Garde, Inc.

Inflatable Antenna Experiment sequence: Shuttle RMS releases Spartan satellite overboard with stowed antenna; Antenna and struts deploy and inflate from satellite; Satellite discards antenna; Satellite retreived by Shuttle RMS retrieves satellite and returns it to Earth.

The Need for an Inflatable Antenna

Large, space-deployable antennas are needed for mobile communications, Earth remote sensing, and space-based radar systems. Due to the traditionally high cost to develop and launch such antennas, new technology must be cheaper, faster and better.

Inflatable antenna concepts can be just that – low-cost, lightweight and highly deployment reliable. The IAE is the first attempt to deploy and inflate such a large reflector antenna in space.

How it Works

The inflatable antenna developed by L'Garde, Inc., is a 14.7-meter diameter reflector. This unique structure consists of a smooth, mirror-like surface and a thin, transparent membrane canopy.

The reflective surface is attached to an inner tube-like structure, which attaches to three straight tube-struts. The entire assembly attaches to the Spartan spacecraft.

The space antenna inflates like a life raft or an airplane escape chute, except it is inflated with gas.

This antenna is constructed from only inexpensive membrane materials. Deployment is simple because the structural elements unfold one-by-one from the spacecraft box container as they inflate.

The experiment is also cost-effective, using the Spartan recoverable spacecraft as the experiment carrier. With the STS as its vehicle to orbit and back, the Spartan provides a platform for the antenna and experiment equipment, power, attitude control, recording of experiment data, as well as a separation system for the ejection of the experiment. The Spartan Project Office is the mission manager for the experiment.

Recording Devices

High-resolution, wide-angle and narrow-angle television cameras will monitor the deployment. A digital imaging radiometer will measure the smoothness of the reflector surface in space. Engineering monitors will measure inflatable pressures, temperatures, sun angle, and time reference.

Television and high-resolution cameras will photograph the antenna inflation from the shuttle, since the cameras on board the experiment will be too close to the to the antenna to view the initial stages of inflation.

Experiment Sequence

The Spartan is placed overboard by a mechanical arm called the STS Remote Manipulator System (RMS). Once the orbiter moves a safe distance away and the Spartan has been stabilized, a command from the Spartan to the experiment controller initiates the inflation process.

When the canister doors open, a spring-loaded floor pushes the folded antenna out of the "box." The inflation system then provides nitrogen gas to start the inflation. The entire deployment and inflation process will take about five minutes.

The smoothness of the reflector antenna at several sun angles will be determined during the first couple of orbits. After the antenna is inflated, both it and the Spartan will move away from the orbiter.

After about four-and-a-half hours of operation, the Spartan satellite will discard the antenna. The next day, the mechanical arm will retrieve Spartan 207.

Project Teamwork

Langley initiated the development of the IAE, conducted Phase A with L'Garde, Inc., and obtained approval for Phase B funding. Langley management transferred the project to JPL for Phase C/D and for implementation of the flight experiment.

Langley's Materials Research Division, Antenna and Microwave Research Branch (now ERB), and Advanced Space and Remote Sensing Branch contributed to the research for this project.

In addition to Langley, L'Garde, Inc. and JPL, the University of Colorado and the University of California at Los Angeles have supported the technology involved in the IAE.

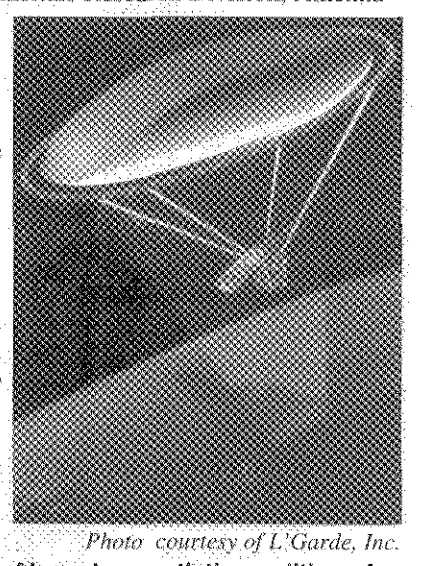

Photo courtesy of L'Garde, Inc.

Above is an artist's rendition of the concept for using the inflatable reflector for a remote sensing satellite to measure soil moisture from space.

Expected Results

A successful experiment on STS-77 means new opportunities in the development and use of large space structures. Also, completion of this high-risk experiment will mean safer and more cost-effective uses of large deployable antennas in space.

As soon as the flight experiment ends, JPL will compile the resulting data, and final reports will reach NASA Headquarters by the end of this fiscal year.

Aerospace Spokesman Predicts Industry Upturn

BY MARNY SKORA

Don Fuqua, president and general manager of the Aerospace Industries Association (AIA), former U.S. Congressman and the nation's leading aerospace spokesman, will forecast the industry's yearlong and future positions at an employee briefing May 21, 1 p.m., at the H.J.E. Reid Conference Center.

Fuqua believes that the aerospace industry of the next millennium will be leaner and more efficient, financially and technologically sound, and driven primarily by a commercial rather than a defense workload. Although aerospace employment and sales were down in 1995, Fuqua predicts a rebound. The industry, he believes, must replace the skills lost with the elimination of half a million jobs and, now more than ever, must entice young people to consider aerospace as a career.

Don Fuqua

May Colloquium To Explore Jupiter Galileo Probe Mission

As the next colloquium speaker, Marcie Smith, Galileo Probe manager, will discuss "A Journey Through a Giant Planet: The Jupiter Galileo Probe Mission" on May 7, at 2 p.m., in the H.J.E. Reid Conference Center.

News Briefs

Around the Agency

NASA HEADQUARTERS FACES ADDITIONAL PERSONNEL CUTS – NASA employees were notified in mid-April that agency management will develop a plan to accelerate the downsizing of the agency's headquarters and to reduce the number of headquarters workers from its current level of 1,430 positions to 650-700 by Oct. 1, 1997, including a Reduction in Force. NASA's existing downsizing plan calls for a reduction in its headquarters staff from an October 1993 level of 2,200 positions to 1,073 positions by October 2000. The new plan increases the target reduction by approximately 400 employees and accelerates the timetable for completing the reduction. Agency officials had previously identified 239 positions moving from the headquarters to NASA's field centers, of which 110 have already taken place or are in process. Officials do not expect the number of jobs being transferred to NASA centers to be increased above the 239 level. Agency officials will put the new headquarters structure in place to provide the foundation for the NASA centers to review their staffing needs, meet budget and program priorities, and set new staffing goals.

Boeing Company Thanks Langley Director

BY ANN C. GAUDREAUX

The Boeing Company recently thanked Center Director Paul F. Holloway for Langley's technology contributions to the new Boeing 777, which include the modern glass cockpit; graphite epoxy structures, such as floor beams, empennage (the stabilizing tail assembly) and flaps; digital data bus; and fly-by-wire.

Langley has also helped the 777 program by providing many unique research tools and facilities such as computational fluid dynamics algorithms; wind tunnels; airframe, engines and community noise reduction work; and flight safety studies.

Photo by Fred Jones

Don Adams of the Boeing Company thanks Langley Director Paul Holloway (left) for the Center's contributions to the Boeing 777. Holloway accepts a model of the airplane on behalf of the Center.

In addition to thanking Langley for its critical contributions to the 777 program, Don Adams, director of Domestic Marketing for Boeing's Defense and Space Group's Eastern region, presented the Center with a model of the new airplane.

"Loaning the model to Langley," Adams said, "is significant because of the Center's many contributions to aeronautics and, specifically to the design and building of the Boeing 777."

Adams expressed the company's thanks as he cited Langley's support of commercial aviation through its research and technology studies. The first 777 was delivered to United Airlines last May.

"It is really important to us at Langley when a customer like the Boeing Corp. uses and appreciates our technology. This is the reason for our existence," Holloway said during the presentation.

NASA Air Shuttle Service Flies to D.C.

To help continue to lower NASA's travel costs, Langley now has access to the NASA-8 aircraft for shuttle service between Goddard Space Flight Center,Wallops Flight Facility, Headquarters, and Langley Research Center.

This six-month trial, which began last month, will determine whether the service is feasible and economically advantageous. Langley personnel with business in the Washington, D.C. area are encouraged to use this service.

Regularly scheduled flights run every Monday, Wednesday, and Friday between Langley and Washington National Airport. Tuesday and Thursday flights are between Wallops and Baltimore-Washington International Airport. Nine passengers per flight are permitted. Omega Travel will schedule all seat reservations. Authorized passengers include civil servants and contractors with approved NASA travel orders, as well as other government employees or other personnel performing assignments directly related to NASA activities.

The shuttle bus between Langley and NASA Headquarters will operate only Tuesdays and Thursdays for the remainder of the air shuttle service trial period, ending in September.

Virginia Air and Space Center News

'Destiny in Space' Docks at VASC – The center offers the IMAX film *Destiny in Space* through May 26, with showtimes at 11 a.m. and 1 p.m. daily. *Destiny in Space*, narrated by Leonard Nimoy, features never-before-seen footage from recent space shuttle missions, including shots from the Hubble telescope deployment and service, a tethered satellite experiment and spacelab activities. For more information, call 727-0900.

Weekend Paper Chain Demonstrations – In conjunction with its IMAX film presentation, *Africa: The Serengeti*, VASC offers weekend wild animal paper chain demonstrations for children, Saturdays and Sundays, 11 a.m. to 4 p.m., now through May 24.

Out-of-This-World Summer Camps – Kids can travel beyond their imaginations at the VASC's summer camps: *Super Heroes Training Academy*, ages 7-12, June 24-28, 9 a.m.-3 p.m.; *The Magic of Sparks, Bits and Microchips*, ages 7-12, July 8-12, 9 a.m.-3 p.m.; *Aliens 'R' Awesome*, ages 5-6, July 8, 10 and 12, 9 a.m.-noon; *Astronaut Adventure I*, ages 7-12, July 15-19 and Aug. 5-9, 9 a.m.-3 p.m.; *Astronaut Adventure II*, ages 7-12, July 22-26 and Aug. 12-16, 9 a.m.-3 p.m.; *Astro Archaeology*, ages 7-12, July 29-Aug. 2, 9 a.m.-3 p.m.; *Just Plane Fun*, ages 7-12, Aug. 19-22, 9 a.m.-3 p.m. For more camp information, call 727-0900, ext. 780.

Announcements

Course Offers How-Tos in Management, Change

"Managing and Implementing Change," a live satellite broadcast over Channel 15, will be presented May 9, 1:30-4:30 p.m., in Building 1194A, Room 203/204. Registration is not required.

This seminar will explore the Theory of Constraints, an overall framework for helping businesses determine *what* to change, what to change *to* and *how* to change.

The course will cover thinking processes designed to understand the true goal of an organization, to identify the root causes of problems, and to implement continuous improvement strategies.

Dr. Eli Goldratt, developer of business management philosophies and systems, will lead the seminar.

For more information, call George Allison at ext. 42594.

Mechanical Engineering Training Opportunities

"A Practical Guide to Engineering Materials: Steels and Non-Ferrous Metals," a live satellite broadcast over Channel 15, will be presented May 10 and 17, 11 a.m.-5 p.m., in Building 1194A, Room 203/204. Registration is not required.

The course will be recorded and available in the Learning Center the following week. Materials will be available in the downstairs lobby of Building 1194A by 10 a.m. on the days of the broadcast.

This metals-related course is for anyone associated with mechanical engineering materials. A later session is planned covering plastics, ceramics, composites, concrete and wood.

The instructor, Dr. Eric Price, is a professor in the School of Mechanical and Aerospace Engineering at Oklahoma State University.

For more information, call George Allison at ext. 42594

TransportationWorkshop Proceedings Published

Conference proceedings for the "Transportation Beyond 2000: Technologies Needed for Engineering Design" workshop, held during Sept. 1995, are now available as NASA CP 10184 (Parts 1 and 2). Branch copies for Langley attendees are now being distributed. For limited extra copies, call Lawrence D. Huebner, ext. 45583, Mail Stop 168. For video recordings of the workshop presentations, call the Video Production Section at ext. 46749.

WBS Course Offers Management Training

A Work Breakdown Structure (WBS) course will be offered May 14-15, 8:30 a.m.-4 p.m., at Old Dominion University's Peninsula Graduate Center, 2713 Magruder Blvd., Hampton North Office Park I complex, Suite D, Room 209.

The course provides the principles necessary to understand NASA's policies, requirements, guidelines and procedures used in WBS. Requirements will be covered as they apply to both contract Statements of Work and NASA in-house project work activities.

To register, send an Application for On-Site Training (NASA Langley Form 24) to DeAnna L. Wooster, Mail Stop 137.

For more information, call Robert Letchworth at ext. 45205.

Mars Symposium Explores Red Planet

Hosted by NASA, the Planetary Society, and the Lockheed Martin Corporation, the 1996 Mars Symposium, "Mars Revisited: A Forward Look," will be held at the National Academy of Sciences, Washington, D.C., July 18-19.

The program will begin July 18, at 7 p.m., with a public lecture on Mars exploration. NASA Administrator Daniel Goldin and Dr. Carl Sagan have been invited to speak.

The July 19 symposium, held from 9 a.m. to 4 p.m., will feature Dr. Mike Carr, former Viking Orbiter Imaging Team Leader.

Carr, along with others, will summarize current knowledge of Mars and will discuss future scientific exploration, including the upcoming Pathfinder and Discovery missions.

For more information and reservations, call Judy Cole at 865-7604, fax 865-8721, or e-mail cole@stcnet.co

Voluntary Leave Transfer Program

The following Langley employees are approved leave recipients under the Voluntary Leave Transfer Program: Marilyn K. Aldrich, Janet L. Edmondson, Holly A. Elliott, Carl S. Larsen, Cassandra Stevens and Charles S. Washington.

For donation instructions and more information, call Karen Ridlon at ext. 43194.

News Researcher

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

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Photographer . . . . . Fred Jones

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

Project Mercury Celebrates 35 Years

BY ANN C. GAUDREAUX

Thirty-five years ago on May 5, 1961, Alan Shepard was propelled into space aboard the Mercury capsule, Freedom 7. His 15-minute flight was part of Project Mercury, the United States' first manned space program.

The objectives of the Mercury program, six manned flights from 1961 to 1963 and eight unmanned flights, were specific: To orbit a manned spacecraft around the Earth, to investigate man's ability to function in space, and to recover both man and spacecraft safely. Project Mercury included the first Earth orbital flight, made by John Glenn in February 1962.

With its inception in 1958, the five-year project was a modest first step toward the nation's as-yet-unnamed goals in space. Seizing the moment created by Shepard's success, on May 25, 1961, President John F. Kennedy defined those goals as he made his stirring challenge to the nation: The United States will land a man on the moon and return him safely to Earth before the decade's end.

Langley engineers largely led the Mercury program, as well as that of the succeeding Gemini and Apollo efforts. Mercury gave Langley the broader public recognition it had previously enjoyed only within the aerospace community.

Langley's Call to Arms

With the birth and growth of the U.S. space program, Langley Research Center and its staff quickly accommodated the nation's rush to make human spaceflight a reality. Once dedicated exclusively to the advancement of aeronautics, Langley engineers were reassigned and asked to help solve problems far removed from their original training and experience.

"Basic" research was supplanted by "project" work as the Langley laboratory was renamed NASA Langley Research Center. The physical plant was dramatically expanded, as was the Center's staff and budget.

For the first time, Langley began to work with large contractors on major research endeavors in a busy time for both researchers and the nation.

Project Management

President Dwight D. Eisenhower delegated authority for the country's manned space program to the National Aeronautics and Space Administration in 1958. The first NASA administrator, T. Keith Glennan, assigned the working-level responsibility to Langley's assistant director, Robert Gilruth, who formed the Space Task Group (STG) to manage Project Mercury.

As Project Mercury matured, the STG grew. By the summer of 1959, 400 people were assigned to finish mission definition studies and to begin the advanced engineering work.

As more ambitious plans for space exploration were being mapped out, NASA expanded its facilities and built the Manned Spacecraft Center, now Johnson Space Center, in Houston, Texas. As construction was completed, Gilruth and the Space Task Group transferred to Texas.

Still, three divisions remained at Langley: flight systems, engineering and operations.

Building Blocks

Even before Project Mercury took shape in 1958, Langley scientists and researchers had been working on a variety of rocket designs. Two resulting programs, "Little Joe" and "Big Joe," played major roles in Mercury's development.

Little Joe, a solid-fuel rocket, was one of the earliest U.S. launch vehicles based on the principle of the clustered rocket engine. The 50-foot-tall, 14-ton rocket first blasted off from Wallops Island, Va., in October 1959, soaring 40 miles out over the Atlantic Ocean.

Little Joe carried instrumented payloads to various altitudes and allowed engineers to check the operation of the escape rocket and recovery systems – information important to Project Mercury.

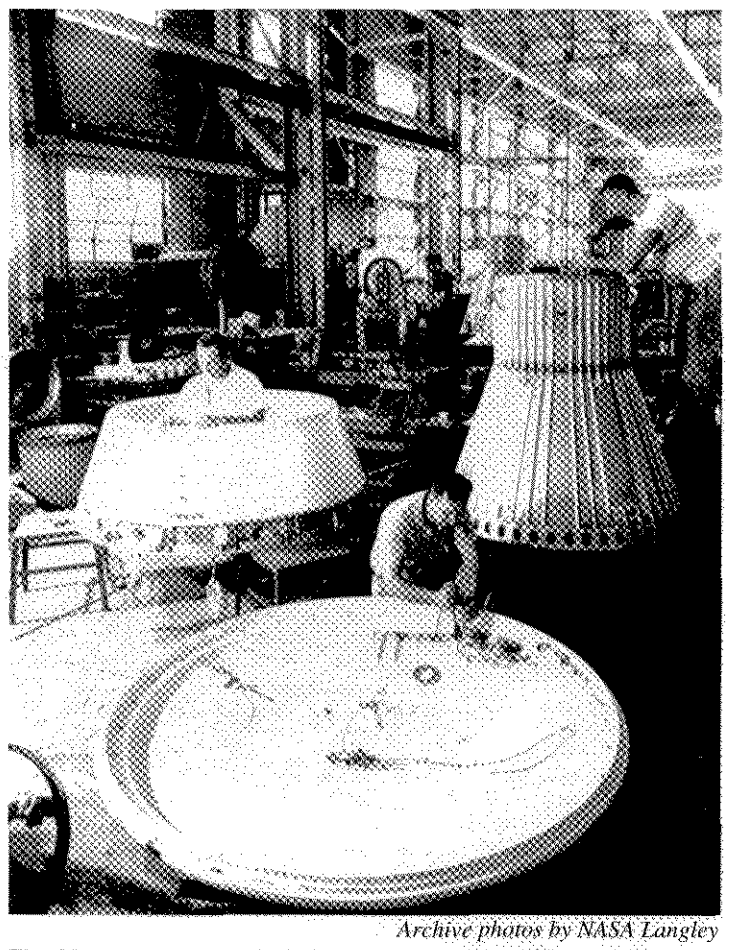
A Little Joe rocket also sent a monkey into space, providing flight engineers with a better idea of how the Mercury astronauts would fare on their subsequent flights.

Big Joe, a one-ton, full-scale instrumented mock-up of the proposed Mercury spacecraft, successfully lifted off on Sept. 9, 1959. The first step in providing a launch vehicle for Project Mercury, Big Joe proved that a capsule could be launched 100 miles into the air, separate from the Atlas rocket and fall back to earth in simulated orbital reentry conditions. The blunt-body capsule had performed just as Langley wind-tunnel tests and other laboratory studies had predicted.

'Roger, Over and Out'

Long-range communications were also Langley's responsibility. Mercury's

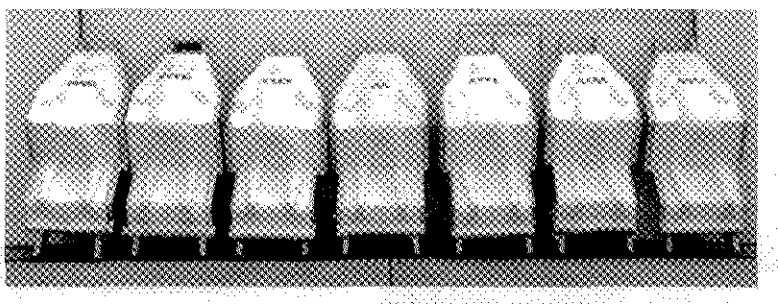
(see MERCURY, page 4)



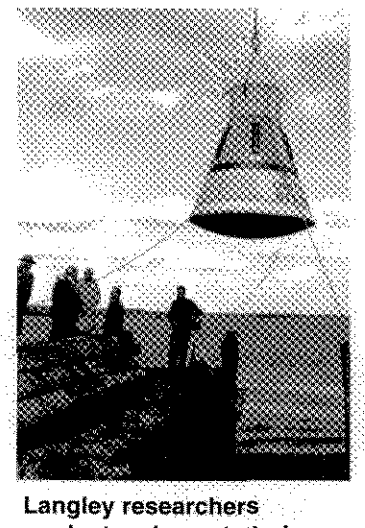
Archive photos by NASA Langley

The Mercury program's "Little Joe" launch vehicles were constructed at Langley in 1959.

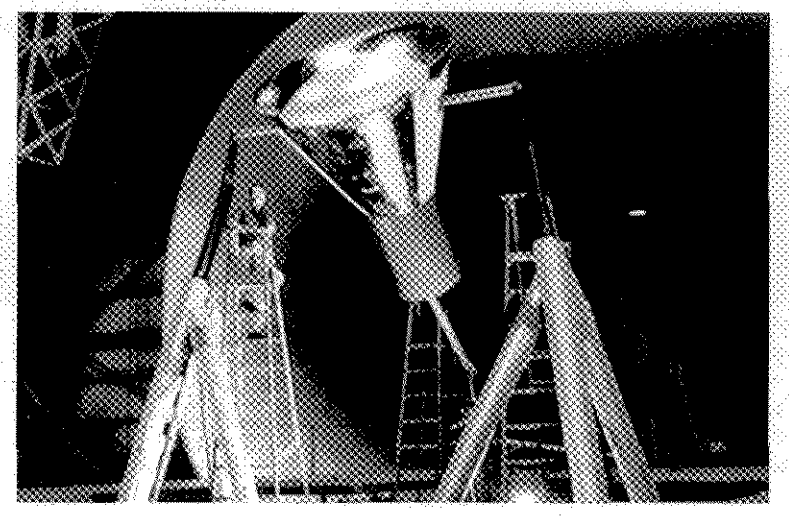
The original seven Mercury astronauts were from left, front row: Virgil "Gus" Grissom, Scott Carpenter, Donald "Deke" Slayton and Gordon Cooper; back row: Alan Shepard, Walter Schirra and John Glenn.



Molded astronaut couches line the Langley model shop wall. The names of the test subjects – Langley employees – are written on the backs.



Langley researchers conduct an impact study test of the Mercury capsule in the Back River in Hampton, Va.



A full-scale model of the Mercury capsule is tested in the 30- by 60-Foot Wind Tunnel.

Photo by Fred Jones

Children in the Langley Child Development Center's kindergarten class place flowers around the tree planted at the LCDC in tribute to the children killed in the Oklahoma City bombing April 19, 1995. The memorial ceremony was held on the first anniversary of the attack.

Victims of Oklahoma City Bombing Remembered in Memorial Ceremony

Tree Dedicated at Child Development Center

BY KEVIN MARLOWE

"That never again shall there be such a dark and ominous day," read Kathryn Skinner, director of the NASA Langley Child Development Center (LCDC) at an April 19 memorial ceremony. The event, held at the LCDC, marked the first anniversary of the bombing of the Alfred P. Murrah Federal Building in Oklahoma City.

Langley Associate Director Ming Tang then dedicated a newly planted tree and a series of plaques to the children whose lives were lost in the tragedy.

"As Americans, we are repulsed by wanton conduct," Tang said to the assembled crowd of about 50 LCDC parents, staff, and students. "As government workers, we are betrayed by intrusion into our ranks. But as parents, we feel the strongest injustice. We are absolutely incensed at an attack on children.

"The tree that stands in this location is a living symbol of the loss of 15 precious lives," Tang continued. "It is a symbol of the courage and compassion of an entire country. It is a symbol of how close to home this tragedy was felt ...."

The 8-foot-tall river birch tree stands on the corner of East Taylor Blvd. and Lindbergh Way and is surrounded by five plaques, each inscribed with a portion of a poem.

Concluding the ceremony, the children of the LCDC kindergarten class filed past the memorial and placed flowers at the base of the tree.

LCDC PTA members Deneace Hines, of the Programs and Resources Division, and Yvonne Beyer, of the Office of Human Resources, planned and executed the ceremony.

"We plant this tree so that the memory of the children and others lost will always be with us," said Wendy Pennington, LCDC PTA President.

MERCURY

(continued from page 3)

tracking range project provided the largest and most logistically challenging Langley effort within the mission.

Prior to Project Mercury, most long-distance communications were done via undersea telegraph cable or radar. Langley researchers had to build their own global communications system to help ensure Project Mercury's success.

Site contractors plotted, surveyed and built communication sites worldwide. The resulting system could maintain constant radio communications with the orbiting Mercury astronauts.

Langley supervised these site contractors and, within two years, saw an around-the-world-for-the-first-time communications system power up, providing the foundation of the present-day Mission Control Center.

'Original Seven' Trained at Langley

The astronaut search process quickly focused on military test pilots. Langley's Charles Donlan and Robert Champine participated in the selection team, which scrutinized hundreds of military records and ultimately chose seven pilots to be Mercury astronauts.

Known forevermore as the "Original Seven," these first American astronauts came to Langley to begin their training for spaceflight: Air Force Capts. L. Gordon Cooper Jr., Virgil I. "Gus" Grissom, and Donald K. "Deke" Slayton; naval aviators Lt. M. Scott Carpenter, Lt. Comdr. Alan B. Shepard Jr., and Lt. Comdr. Walter M. Schirra Jr.; and Lt. Col. John H. Glenn Jr., United States Marine Corps.

Langley engineers with expertise in reentry physics, astronomy, and celestial mechanics and navigation educated the men in graduate-level space sciences courses. Each astronaut was assigned to a specific technical field for further training.

The STG staff put the astronauts through several spaceflight simulation systems and techniques to familiarize them with the Mercury capsule and to evaluate their effectiveness with the capsule control systems.

The training at Langley also included scuba-diving operations which simulated weightlessness and possible sensory disorientation during reentry from space.

In Langley's large hydrodynamics tank and in the Back River behind Langley's east area, the Mercury astronauts also learned how to exit the space capsule as it floated in the water.

Project Mercury ended in the summer of 1963 after several successful orbital flights. The STG completed its move to the Manned Spacecraft Center in Houston, Texas, as NASA and the nation geared up for the Gemini and Apollo programs.

NASA Langley's Contributions to Project Mercury

- Assisted in the Big Joe program
- Implemented the Little Joe program
- Planned and implemented the Mercury tracking and ground instrumentation systems
- Administered numerous aerodynamic, structural materials and component evaluation and development tests
- Provided engineering, shop instrumentation and logistics support for much of the Space Task Group in-house testing
- Provided administrative support and office space from late 1958 to mid-1962, when the STG moved to Houston

Tailless X-36 Blazes Trail for Aero Research

MCDONNELL DOUGLAS NEWS RELEASE

NASA and McDonnell Douglas have unveiled a subscale prototype aircraft that could dramatically change the design of future stealthy fighters.

Called the X-36, the advanced research vehicle lacks vertical and horizontal tails and uses new split-aileron and engine thrust-vectoring concepts for flight control. The innovative design promises to reduce weight, drag and radar signature and to increase range, maneuverability and survivability of future fighter aircraft.

The 28-percent-scale prototype was designed and built in only 28 months for $17 million. Developed by a team from NASA Ames Research Center and McDonnell Douglas, the X-36 incorporates many technical breakthroughs in aerodynamics, propulsion and flight controls.

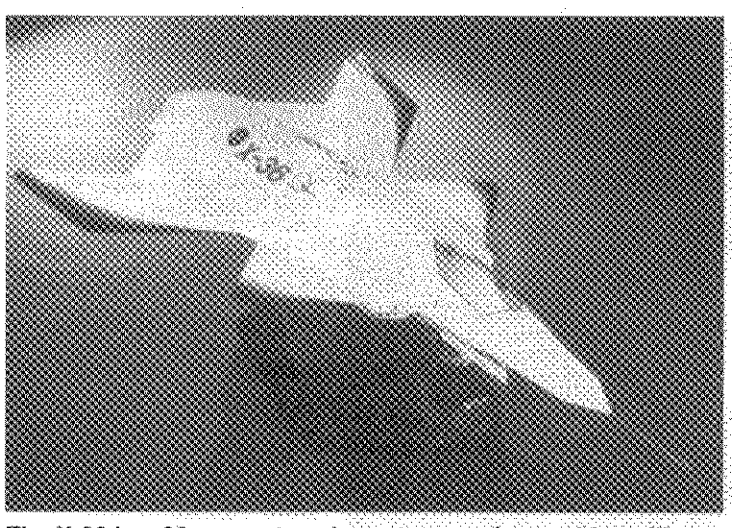
The X-36 represents the research-and-development operation's rapid prototyping capabilities. The subscale, remotely piloted X-36 will demonstrate critical technologies at a fraction of the cost of a full-scale piloted aircraft.

The X-36 weighs 1,300 pounds fully fueled and is 19 feet long, 11 feet wide and about 3 feet high. It is powered by a Williams Research F112 engine that provides 700 pounds of thrust.

Two prototypes are being built as part of the program. A first flight of the aircraft is scheduled for this summer at NASA's Dryden Flight Research Center, Edwards Air Force Base, Calif. A total of 25 flights, to be conducted by McDonnell Douglas, are scheduled during a six-month flight test program designed to prove the aircraft's superior agility. Initial tests will focus on the low-speed, high angle-of-attack performance of the X-36.

The X-36 program is being conducted under an approximately 50/50 cost-share agreement between McDonnell Douglas and NASA. McDonnell Douglas is responsible for fabricating the two X-36 prototypes, and NASA Ames is responsible for continued development of the critical technologies and flight test activities.

McDonnell Douglas has been working under contract to NASA Ames Research Center, Moffett Field, Calif., on tailless aircraft research since 1989.



The X-36 is a 28 percent scale prototype of a stealthy tailless fighter designed and developed cooperatively by NASA and McDonnell Douglas. Removing the vertical tails lowers the weight, drag and radar cross-section. The X-36 demonstrates the feasibility of future tailless fighters that can achieve agile levels superior to today's fighters. Flight testing will take place this summer.

Two Langley Runners Take the 100th Boston Road

BY MARY GRAVES

The passion began simply enough. For Todd Lacks, a 35-year-old contract specialist with NASA Langley's Grants and Services Branch, it was the most-often-made New Year's resolution – to get in shape.

For Will Riddell, a 27-year-old resident research associate here with the National Research Council, it was "something I'd wanted to do since high school."

For both men, running – and, subsequently, marathon training – has gained an intensity that led to last month's participation in one of the most renowned races in the country – the Boston Marathon.

With qualifying times of 2:59 for Lacks and 3:01 for Riddell – both results of the Marine Corps Marathon last November in Washington, D.C. – the two fellow employees and members of the same informal runners group crossed the finish line in Boston with times of 3:08 and 3:24:44, respectively.

Not bad, they agree, considering the crowded and rather "crazy" conditions of this 100th running of the race famous, or infamous, for its "Heartbreak Hill," a killer climb at mile 20 of the 26.2-mile, mostly downhill course.

Including the more than 2,000 unofficial "bandit" runners, about 40,706 striders packed the two-lane starting "line"– which stretched quite a ways through the small town of Hopkinton, where the race began, says Lacks. The course stretched through about nine hamlets before reaching the downtown Boston finish line.

"It was a big parade," says Riddell, a Boston-area native who grew up watching the race on TV. "Crowds were five or six people deep. The whole town was excited about it. I just tried to take it all in, to enjoy the masses of runners and spectators."

Both he and Lacks heeded warnings not to expect to run a "personal best" – there were just too many people.

"You'd have to move around a lot of people if you wanted to run fast," says Riddell, "and that takes a lot of energy."

So instead of "going for a good time," the two just relaxed and had a good time.

"Pre-race, Hopkinton became a 'marathon village' with refreshment tents and entertainment," says Lacks. "As the race began, there were people as far as you could see. It looked like a Woodstock, with all the people cheering and the mud from the previous days' wet weather."

Perhaps fatefully, the weather cleared for race day, rising to about 50 degrees, with a reported headwind that Riddell says he never felt.

"It was perfect," he says. "Beautiful, absolutely gorgeous," agrees Lacks.

The past year's marathon training with a group of friends paid off for both runners, who ran up to 70 miles per six-day week to prepare for their qualifying run in D.C.

"I'd definitely do Boston again – for fun," says Riddell.

"This experience could never be duplicated," says Lacks. "The 100th running of Boston only happens once."

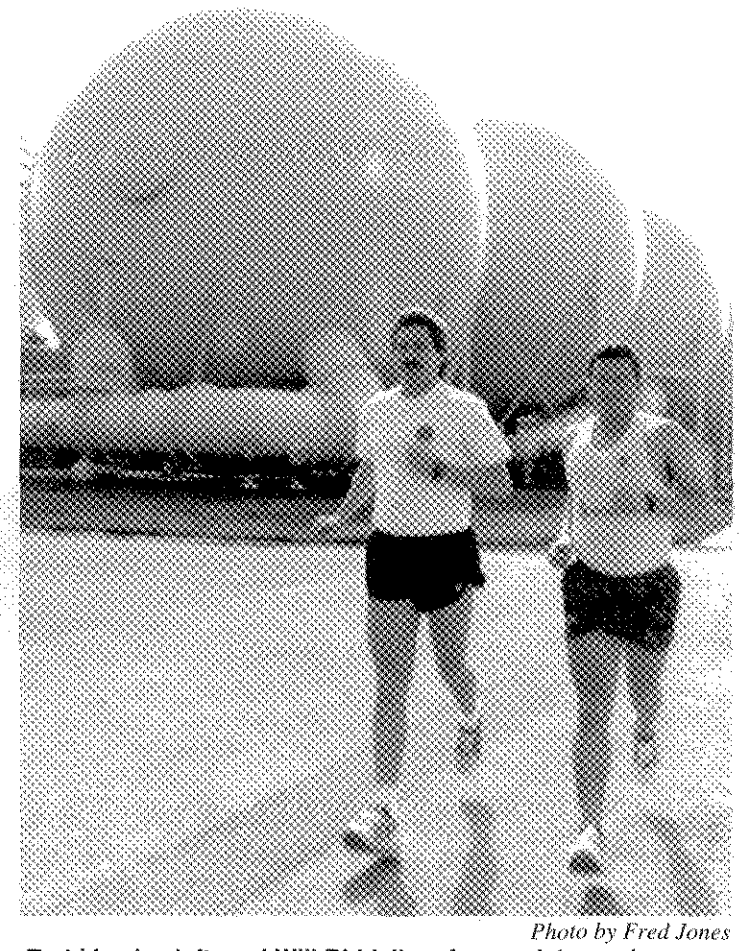


Photo by Fred Jones

Todd Lacks, left, and Will Riddell go for a quick run down Langley Blvd. The two marathoners will now concentrate on shorter runs – local 5Ks and 10Ks – during the summer.

Speaker's Bureau March Activities

James C. Barnes spoke to Old Dominion University's Engineering and Physics Department regarding "Advanced Solid State Laser Development at Langley Research Center."

Joe Heyman told Old Dominion University's mechanical engineering graduate students about "NASA Langley Research Center: A National Lab Resource for U.S. Competitiveness."

Rob Rivers spoke to the University of Florida's Department of Aerospace Engineering on "Langley Research Center Wake Vortex Research." He also addressed the International Electrical Testing Association Conference on "Industry/Government Partnerships for U.S. Competitiveness."

Bill Grant addressed the Hampton Roads Clean Community Systems' 1996 Student Environment Conference on "Silent Summer for Fourth: The Effect of Acid Rain and Ozone."

Al Ragsdale addressed a Thomas Nelson Community College advanced calculus class on "Basic Orbital Mechanics."

Kurt Severance spoke to an Old Dominion University scientific visualization class on "Projects in the Data Visualization and Animation Lab."

Irwin Schauer spoke to a Focus on Quality group in Norfolk on March 15 about "Strategic Planning."

Cary Spitzer stressed "The Importance of Math to Career Development" at the Math Counts State of Virginia Competition.

As part of the Washington and Lee University Distinguished Lecture Series, Jag Singh discussed "Positron Annihilation Spectroscopy in Materials Research."

Vicki Connors addressed a North Carolina State department seminar regarding "Global Observations and Impacts of Biomass Burning and Air Pollution."

Christine Darden spoke to the Hampton Roads AIAA Student Chapter about sonic boom research.

Michael Uenking visited Western Branch Intermediate School to discuss the solar system.

Dave MacInnes spoke to groups at Poquoson Middle School ("Materials at Very Low Temperatures"), Poquoson Elementary School ("Minerals and Crystal Structures"), New Horizons Technical Center ("My Adventures as a Material Scientist") and the College of William and Mary ("Only God and Chemists Can Make a Metal").

Photo by Fred Jones

SPEAKERS BUREAU AWARD WINNERS. Center Director Paul Holloway presented the awards in a ceremony April 22 at the Pearl Young Theater. Winners, from left, are Mary Ann Smith, Bruce Fisher, Karen Freidt, Michael Uenking, John Mouring, Catharine Fay, Paul Holloway, Richard Davis, Cary Spitzer, Cathy Schauer, Leroy Spearman, Terry Clark. Not pictured are Don Lansing, Jane Hogge, Vickie Connors, Nancy Kruse, Christine Darden, Pamela Davis, Joel Levine, David Shannon. Shannon received the Speaker of the Year award.

Kudlinski Named ISSD Assistant Division Chief

BY MEGHAN WOODCOCK

Robert Kudlinski is the new Assistant Division Chief for the Information Systems and Services Division (ISSD). He most recently served as a Special Assistant to the Division Chief of the Information Systems Division (ISD) before that division merged with the Scientific and Technical Information Division to form ISSD.

Robert Kudlinski

Kudlinski's major responsibility is to integrate and re-engineer the scientific and business computing functions of the division in concert with agency-wide alliances and consolidations of information technology products and services.

Kudlinski joined the Center in 1980 as a student intern. During his internship, he developed Langley's first interactive, computer-assisted software packages to generate adaptive grids around various aircraft configurations. This capability helped form the basis of the Geometry Laboratory (GEOLAB).

Kudlinski became a permanent Center employee in 1984, after graduating from the Massachusetts Institute of Technology with a bachelor of science degree in electrical engineering.

He served as the Assistant Branch Head for the Flight Software and Graphics Branch beginning in 1991.

In 1994, he was named Special Assistant to the Division Chief of the ISD. There, he was responsible for strategic planning and implementation of its missions, including Langley's Communications and Central Computing Infrastructure, flight simulation facilities, business and scientific computing applications and one of NASA's Earth Observing System Distributed Active Archive Centers.

In addition to his Langley position, Kudlinski served on numerous national and NASA committees on software engineering and policy, including the NASA Software Engineering Advisory Board and the Ada 9x Government Advisory Panel. He was recently selected to receive a NASA fellowship to the Syracuse Maxwell Executive Education Program, which he will attend in August.

Happenings

PENINSULA AMATEUR RADIO CLUB (PARC) will join the City of Newport News in its Centennial Celebration, Saturday, May 18. PARC will operate a special ham radio station and provide parade communications. For more information, call Don Sterbel, KR4DS at 874-0416, or Rene Valladares, KE4WMG at 875-9633.

CALLING ALL BLOOD DONORS: All LaRC employees, contractors, and retirees are invited to attend the next blood drive on Wednesday, May 22, 9 a.m.-3 p.m., in the H. J. E. Reid Conference Center. The remaining 1996 blood drives will be held July 24, Sept. 25 and Nov. 27. Charge your time for the blood drive to J.O. B1004. For more information, call Karen Ridlon at ext. 43194.

FOR RENT: Magruder Commons townhouse, 2 BR, 1 1/2 baths, all appliances, rear court, utility room, 3 miles from Langley. $575/mo. plus deposit. Call (804) 824-1340 weekdays; 357-7940 weekends.

ATTENTION BIBLIOPHILES : American Book Display Book Fair will return to the Langley cafeteria (Building 1213) on May 22 and 23, 9:30 a.m.-2 p.m. Save up to 70 percent off retail prices. Sample books will be displayed outside the Exchange Shop on May 20 and 21. For more information, call ext. 41585.

TICKET DISCOUNTS: The Exchange Shop is selling discounted tickets to many area attractions, including AMC Movie Theaters, Colonial Williamsburg and Jamestown-Yorktown, Nauticus, Virginia Air & Space Center and Busch Gardens. Lowest prices on Kings Dominion tickets are available through May 19. For more information, call ext. 41585.

COLEMAN BRIDGE DETOUR UPDATES: For information on detour routes and bus schedules during the Coleman Bridge closing, May 3-15, tune in to Gloucester Cable Channel 24 or WXGM Radio 99.1 FM, or call the rideshare answering machine line at (804) 758-4847.

STARTING A HIGH-TECH BUSINESS: The Hampton Roads Technology Alliance presents a seminar entitled "Starting and Growing a High-Tech Business: An Evening with Those Who've Done It," May 21, 5-7:15 p.m., at the Holiday Inn Coliseum Conference Center in Hampton. The panel discussion features local successful high-tech entrepreneurs, as well as a reception. Cost is $10 at the door, cash only. Register before May 16 by phone (766-7850), fax (766-2214), or e-mail at hrta@patc.org

TRAVEL SPECIALS: Royal Caribbean cruises – three-night Bahamas, from $329; three-night Baja Mexico, from $279; seven-night Eastern Caribbean, from $699; seven night Southern Caribbean, from $849. Book by May 31 for best rates and accommodations. Call Omega World Travel, 864-7976.

WORKSHOP: "Enabling Technologies for Smart Aircraft Systems," H.J.E. Reid Conference Center, May 14-16. For more information, contact workshop web site, http://afcmac.larc.nasa.gov, or r.w.wlezien@larc.nasa.gov.

TIDEWATER CLASSICAL GUITAR SOCIETY presents Michael Lorimer on May 10 at the Nauticus in Norfolk and on May 11 at the Williamsburg Regional Library Arts Center, 515 Scotland St., Williamsburg. Tickets are $10 for adults, $7 for students and seniors. For more information, call 625- 2411 or 566-3304.

CHEST PAIN AND MEDICAL PRACTICES: Acute Cardiac Team and Center for Systematic Acute Patient Care, Medical College of Virginia Hospitals, presents a seminar entitled "Systematic Approach to the Management of Chest Pain: A Paradigm for Re-engineering in Medicine," May 31-June 2, at the Williamsburg Marriott. For more information, call Bonnie Ware at (804) 828-4980, fax 828-4181.

WILLIAMSBURG SYMPHONIA presents pianist Oxana Yablonskaya on May 18, 8:15 p.m., at the Williamsburg Regional Library, and on May 20, 8:15 p.m., at Phi Beta Kappa Memorial Hall. For tickets and more information, call 229-9857.

KITTY NEEDS HOME: 1-1/2-year-old female tabby cat, 7 lbs., spayed, declawed, needs quiet loving home. Must be kept indoors; no kids or other pets. This shy but affectionate cat comes free and with accessories to the right home. Call Mike or Lisa at 596-7936.

FOR SALE: Like-new contemporary glass dining room table (6 feet by 4 feet, with 7/16-inch beveled glass) and 6 chairs (pale jade cloth-upholstered). Paid $1,200 new, will sell for $700 or best offer. Call Mike or Lisa at 596-7936.

CHESAPEAKE BAY RAILROADERS' OPEN HOUSE AND FLEA MARKET: The free Open House is May 4, 10 a.m.-5 p.m., and May 5, 1-5 p.m., just east of Route 17 on Dare Road in Grafton. The Flea Market is May 4, 10 a.m.-4 p.m., at Dare Elementary School, two blocks east of the club on Dare Road. Admission is $2 for adults; no charge for children under 12. For more information, call 898-0717.

Photo by Sandy Gibbs

FUTURE RESEARCHERS. Students from Crittendon Middle School in Newport News attended Langley's annual Female Achievers Panel in March. The event is sponsored by the Federal Women's Program Committee in celebration of Women's History Month. Panelists (not pictured), representing all NASA Langley skill groups, included Dr. Christine M. Darden, High-Speed Research Project Office; Catherine Sue Jones, Research Models and Support Section; Kathy A. Kurke, Chief Counsel; Dr. Janet M. McKenzie, Employee Development Branch; and Sherry B. Richardson, Materials Division. Keisha Armistead, Financial Management Division, served as moderator.

National Aeronautics and Space Administration

Langley Research Center
Hampton, Virginia 23681-0001

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Researcher News

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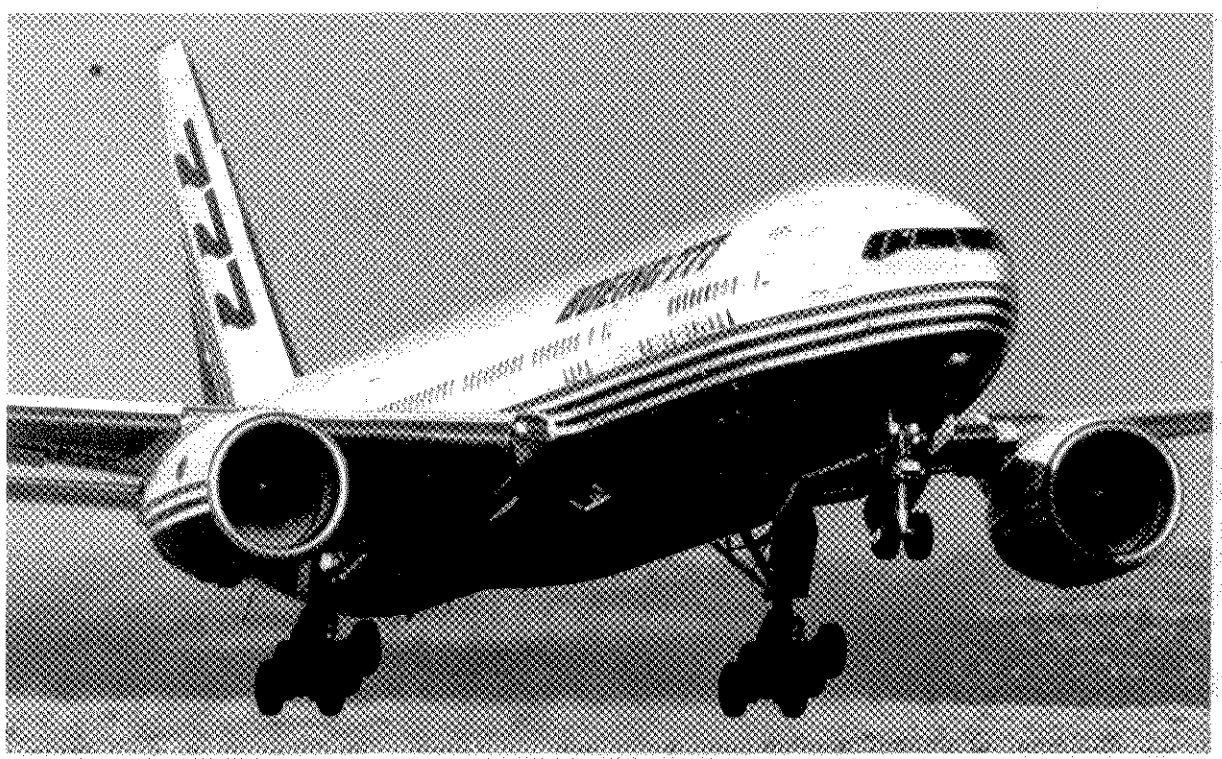
National Aeronautics and
Space Administration
Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 10 ❖ May 17, 1996

Boeing 777 Lands at Langley; Brings to Life Center's Role



NASA Langley file photo

The Boeing 777 commercial passenger jet visited NASA Langley May 10 as a gesture of thanks to the Center and its employees for their research contributions to the airplane's development.

Fresh from being honored as the greatest achievement in American aerospace in 1995, the new Boeing 777 airplane, along with Boeing Airplane Company officials, visited NASA Langley May 10 as a gesture of thanks for NASA's contributions to its creation.

Nearly 2,000 Langley employees and retirees turned out to tour the airplane and to accept Boeing Vice President Robert Spitzer's thanks to the Center.

Hailed as a triumph of technology, the Boeing 777 and its developers received the National Aeronautic Association's Collier Trophy in ceremonies in Washington, D.C., May 9.

Basic research performed at NASA's four research centers contributed significantly to the precedent-setting jet's design concepts. According to Boeing Company estimates, the 777 fleet has captured three-quarters of the market for airplanes in its class, further strengthening this country's positive balance of trade in aeronautics.

"It is really important to us at Langley when a customer like the Boeing Company uses and appreciates our technology. This is the reason for our existence," said Langley Director Paul Holloway.

The 777 was designed for medium- to long-range passenger flights and is the largest twin-engine jet manufactured today. United Airlines conducted the jet's first passenger-carrying flights in May 1995.

June Colloquium Faces Frontiers of Imagination

Senior Chief Scientist Dennis Bushnell will present the next colloquium lecture June 4, 2 p.m., in the H.J.E. Reid Conference Center. He will discuss envisaged advanced concepts across the speed range, including personal air transportation, advanced subsonic and supersonic long-haul transports and air-breathing space access.

Bushnell believes that a virtual revolution in civilian aeronautics may result from advances in technology. Long-haul air travel could benefit from the technology explosion in "teletravel" and could provide solutions for the international balance of payments and concentrated population pressures on the environment.

Dennis Bushnell

Bushnell began his career at Langley 33 years ago as an aerospace engineer, serving as Section, Branch, and Associate Division Chief in Fluid Mechanics. He has contributed to Gemini, X-15, Apollo, the space shuttle, aircraft energy efficiency programs, national aerospace plane, advanced hypersonic facilities, cooperative aeronautical programs with Russia and the current X-plane program.

Fuqua To Address Langley Employees

Aerospace spokesman Don Fuqua, president and general manager of the Aerospace Industries Association, will address Langley employees at a briefing May 21, 1 p.m., at the H.J.E. Reid Conference Center.

Fuqua will discuss the industry's future, which he believes will be more economically and technologically sound, relying increasingly on a commercial workload.

NASA Langley's Contributions to the Boeing 777

Fundamental research performed at NASA's four research centers contributed significantly to the Boeing 777's design concepts.

NASA Langley-developed analytical technologies and facilities used by Boeing in its product development work included:

• Fundamental mathematical procedures for computer-generated airflow images which allowed advanced computer-based aerodynamic analysis

• Wind tunnel test, confirming the structural integrity of 777 wing-airframe integration in Langley's Transonic Aerodynamics Tunnel (for which Boeing reimbursed NASA)

• Knowledge of how to reduce engine and other noise for passengers and terminal area residents.

Radial tires like those used on the 777 recently

(see BOEING, page 4)

Langley Engineer Named NASA's Newest Astronaut

The launch of Space Shuttle Endeavour this month holds special significance for NASA Langley's Charlie Camarda. For one thing, STS-77 is carrying an experiment that was analyzed by the Thermal Structures Branch, which Camarda heads.

It's also the first time that Camarda, despite 22 years at Langley, will see a shuttle launch in person – and with the knowledge that, in a couple of years, he'll be the one on top of the rocket.

"It's going to be a lot more meaningful to me this time," said Camarda, who is among 35 people chosen this year for astronaut training.

Camarda will report to Johnson Space Center in Houston on August 12 to begin training and evaluation as a mission specialist. After about a year of training, he and the other astronauts will receive technical assignments within the Astronaut Office to prepare them for shuttle flight assignments.

Camarda, a Virginia Beach resident, said he learned he'd been chosen as an astronaut candidate on April 29, just before he was to make a presentation.

"My heart was beating out of my chest," said the New York City native. "I've always wanted to be an astronaut."

He first applied to the program in 1978, but was not selected. Now, at 44, Camarda is the second-oldest to be picked in this year's astronaut class, which includes 10 pilots and 25 mission specialists candidates chosen from more than 2,400 applicants.

Camarda's Thermal Structures Branch is helping to develop and to test materials and structures for the X-33 program, which is developing a next-generation spaceship called the Reusable Launch Vehicle (RLV).

The RLV program teams NASA and industry to produce a lower-cost, quicker-turnaround space vehicle. An RLV boasts a single, permanent "fuel tank" to fly into space and back without the need for disposable rockets, such as those on the space shuttle.

Photo by Fred Jones

Charles Camarda

STS-77 will carry Langley's Metallic Thermal Protection System (TPS) experiment to test materials that could be used to shield an RLV. Metallic TPS have survived ground and flight tests to demonstrate resistance to high- and low-speed impact, rain erosion, lightning strike and aerothermal and aeroacoustic loading conditions.

The STS-77 launch is scheduled for May 19.

(See related stories on pages 2 and 4.)

News Briefs

Around the Agency

NASA SELECTS ASTRONAUT CLASS OF 1996 – Thirty-five astronaut candidates will arrive at the Johnson Space Center on August 12 to begin a period of training and evaluation. This year's class consists of 10 pilot and 25 mission specialist candidates selected from more than 2,400 applicants. Following about one-year of evaluation and training, the astronauts will receive technical assignments within the Astronaut Office to further prepare them for shuttle flight assignments. This largest class since the first 35 shuttle astronauts were named in 1978 includes: Navy Cmdr. David M. Brown; Coast Guard Lt. Cmdr. Daniel C. Burbank; Yvonne D. Cagle, M.D.; Fernando (Frank) Caldeiro; Charles J. Camarda, Ph.D.; Air Force Major Duane G. Carey; Navy Lt. Cmdr. Laurel B. Clark; Air Force Capt. Edward M. Fincke; Army Lt. Col. Patrick G. Forrester; Navy Lt. Cmdr. Stephen N. Frick; Navy Lt. Cmdr. John B. Herrington; Joan E. Higginbotham; Marine Corps Capt. Charles O. Hobaugh; Air Force Capt. James M. Kelly; Navy Lt. Mark E. Kelly; Navy Lt. Scott J. Kelly; Air Force Major Paul S. Lockhart; Marine Corps Major Christopher J. Loria; Sandra H. Magnus, Ph.D.; Michael J. Massimino, Ph.D.; Richard A. Mastracchio; Navy Lt. Cmdr. William C. McCool; Navy Cmdr. Lee M. Morin; Navy Lt. Cmdr. Lisa M. Nowak; Donald R. Pettit, Ph.D.; John L. Phillips, Ph.D.; Mark L. Polansky; Paul W. Richards; Piers J. Sellers, Ph.D.; Navy Lt. Cmdr. Heidemarie M. Stefanyshyn-Piper; Daniel M. Tani; Air Force Capt.. Rex J. Walheim; Peggy A. Whitson, Ph.D.; Army Major Jeffrey N. Williams; Stephanie D. Wilson.

FORCE LEAVES NASA – Charles T. Force, Associate Administrator for NASA's Office of Space Communications, has left NASA, effective May 6, to pursue commercial business interests. He was named Associate Administrator for Space Operations in July 1989. He joined NASA in 1965 as Director of the Guam tracking station and, except for a brief return to industry in the early 1980s, has held increasingly responsible positions at NASA since that time. He was instrumental in the development, construction and operation of the Tracking and Data Relay Satellite System (TDRSS), which cut NASA's telecommunications costs in half, yet increased data acquisition and communications contact time with spacecraft.

Langley Video Production Group Wins Technical Awards

The Video Production Group at NASA Langley Research Center recently won two awards in the Society for Technical Communication's (STC) International Technical Video Competition (ITVC), a competition open only to top winners in STC's local contests.

The "NASA LaRC Paper Recycling Program" video, produced by Marie Zoll, won a third-place merit award in the "Public Service" category. The "LaRC-SI" video, produced by Kim Tatum, garnered a second-place achievement award in the category "Communicating Science to the Public." The films were produced in the Visual Imaging Branch (VIB), Information Systems and Services Division (ISSD).

The Society for Technical Communication (STC) sponsors the International Technical Video Competition to identify, recognize, and encourage excellence in the production of videotapes in communicating technical concepts. The competition serves to honor the combination of talent, creativity, and scientific understanding that are unique to communicating technical material through the video medium.

The Society for Technical Communication is the world's largest professional organization serving the technical communication profession. Based in Arlington, Va., STC has more than 20,000 members and 139 chapters worldwide.

VASC Offers Summer Tours of Langley

Summer motor tours of NASA Langley Research Center will blast off from the Virginia Air & Space Center in downtown Hampton, beginning May 25 and running through August.

Weekend tours are available May 25 through June 30, at 10:30 a.m. and 1:30 p.m. on Saturdays and at 1:30 p.m. on Sundays.

Memorial Day tours begin at 10:30 a.m. and 1:30 p.m. Beginning July 1, tours will run Monday through Saturday at 10:30 a.m. and 1:30 p.m. and at 1:30 p.m. Sunday.

The tour costs $4 with the purchase of any VASC admission ticket. For more information, call 727-0900.

Barnes Named Optical Society Fellow

Dr. Norman P. Barnes of Langley's Remote Sensing Technology Branch was named to be a Fellow of the Optical Society of America. He was nominated by Dr. William B. Grant of Langley's Atmospheric Research Branch.

Barnes will be installed during the CLEO Conference in Anaheim, Calif., this summer. Only about 0.1 percent of the members of the Optical Society are Fellows.

Nomination is based on work performed during one's career and on service to the optical community.

Barnes' community contributions include two multiyear terms serving on the Advanced Solid State Laser Conference Committee, once as co-chair of the conference; one multiyear term serving on the CLEO Conference Committee; and a one-year term on the Optical Remote Sensing of the Atmosphere Conference committee. He has also reviewed papers for journals.

His career contributions involve both solid-state lasers and nonlinear optics. Much of his work during the past 10 years has involved laser sources for optical remote sensing applications.

During the course of his career, he has authored or coauthored more than 100 presentations for national and international conferences, as well as more than 80 articles published in refereed journals.

Madaras Receives Team Award

For his contribution to the successful flight of STS-70 through his "professional skill, technical insight and personal dedication," Dr. Eric J. Madaras, Nondestructive Evaluation Science Branch, received the Manned Space Flight Awareness Team Award.

Madaras conducted an advanced nondestructive evaluation of technology inspection.

The award was presented in March by Langley Director Paul Holloway on behalf of NASA astronauts.

The remainder of the team was composed of members from Marshall Space Flight Center in Alabama.

Announcements

Schauer Recognized by Virginia Press Women

Cathy Schauer, Office of Public Services, received two awards from the Virginia Press Women Association at their Communications Conference last month. She won first place for the publicity for Langley's 1995 Combined Federal Campaign in the Internal Communications, nonprofit category. This entry will compete in June with the National Federation of Press Women.

She also earned a second-place award in the Public Service category for her role as chairman and project manager of Langley's National Engineers Week outreach effort to local schools and the Hampton Roads community.

Performance Measurement Training Course Set

A performance measurement course is being offered May 20-23, 8:30 a.m.-4 p.m., at the Old Dominion University's Peninsula Graduate Center, 2713 Magruder Blvd., in Hampton.

This course will provide an understanding of the criteria with which contractor performance measurement systems must comply to obtain govern-ment certification.

To register, promptly send an Application for On-Site Training (NASA Langley form 24) to DeAnna Wooster at Mail Stop 137. For more information, call Robert Letchworth at ext. 45205.

Proposal-Writing Course Offered Via Satellite

"Writing and Evaluating a Request for Proposal (RFP) for Asynchronous Transfer Mode (ATM)," a live satellite broadcast over Channel 15, will be presented May 24, 11 a.m.-5 p.m., in Building 1194A, Room 203/204. Registration is not required.

This course examines writing an RFP for ATM technology and analyzing the responses thoroughly.

The instructor, Dr. James A. Metzler, is the director of Consulting Services at Strategic Networks Consulting, Inc.

The course will be recorded and available in the Learning Center the following week.

For more information, call George Allison at ext. 42594.

Communications Seminar Explores Varied Styles

"Communicating in the Workplace: Understanding Women's and Men's Conversational Styles," a live satellite broadcast over Channel 15, will be presented May 30, 1:30-4:30 p.m in Building 1194A, Room 203/204. Registration is not required.

Talking is part of every aspect of getting work done. In her bestselling books, linguist Deborah Tannen discusses different conversational styles and their impacts on others.

For more information, call George Allison at ext. 42594.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following Langley employees are approved leave recipients: Marilyn K. Aldrich, Janet L. Edmondson, Holly A. Elliott, Carl S. Larsen, A. Wayne Richardson, Cassandra Stevens and Charles S. Washington.

Anyone interested in donating annual leave to recipients in the program should send donations on the "Request To Donate Annual Leave to Leave Recipient Under the Leave Transfer Program" form, via computer in Informed Manager to Mail Stop 293, Office of Occupational Health Services, or fax the form to ext. 49114. For more information, call Karen Ridlon at ext. 43194.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor ..... Keith Henry

Editor ..... Mary Graves
Science and Technology Corp.

Assistant Editor ..... Jeane Shanks
Science and Technology Corp.

Photographer ..... Fred Jones

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

Langley METEORS Mission Gets Green Light

Mesosphere-Thermosphere Emissions for Ozone Remote Sensing Mission To Fly Next Summer

BY MARY GRAVES

A new NASA Langley mission, Mesosphere-Thermosphere Emissions for Ozone Remote Sensing (METEORS), was recently selected for flight by the Office of Space Science, NASA Headquarters. Currently underway, the project's anticipated launch date is July or August 1997 from White Sands Missile Range in New Mexico.

Langley's Role

Langley is the science lead for the experiment, coordinating the science team activities and defining the science of the mission, the overall goals, the measurements and the instrumentation.

Langley's Dr. Martin Mlynczak, a research scientist for the Space and Atmospheric Sciences Program Group, Atmospheric Sciences Division, Theoretical Studies Branch, is the principal investigator.

Other science team members include Dr. Patrick Espy, Utah State University; Dr. J.-H. Yee, Johns Hopkins Applied Physics Laboratory; Francis Schmidlin, NASA Wallops Flight Facility; B. Thomas Marshall, G&A Technical Software, Hampton, Va.

The Mission

The METEORS suborbital mission will go up about 120 miles on a standard Nike Improved-Orion rocket to measure ozone concentrations, using three distinct methods simultaneously for the first time. The mission is as much to compare the three methods of studying the ozone as to compare the information obtained from those methods. Measurement recording will occur between 30 and 60 miles into the Earth's atmosphere, focusing on the mesosphere and lower thermosphere.

"It's a difficult job to do," said Mlynczak of the task to measure ozone, "because we're so far away and there's not much ozone to measure.

"So to measure it, we have to go through this remote technique of looking at the radiation emitted by ozone directly and by other molecules as a proxy. It's a much more involved process than we use in the lower atmosphere," he said.

Measurement Methods

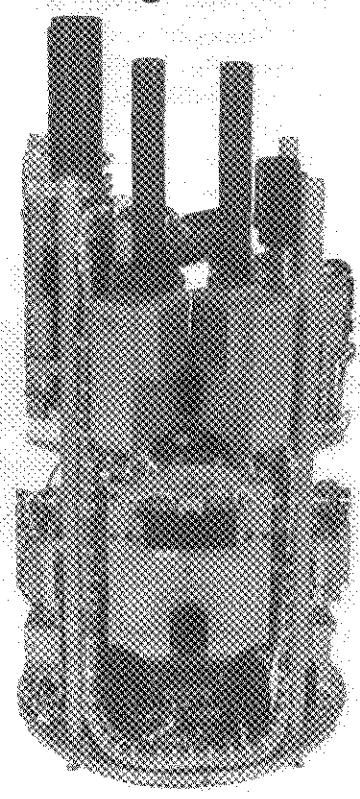
That process during the METEORS mission will include three rocket measurement methods, all previously used separately to measure ozone within the past five years, but never used at once in a comparison study, "to see if they make sense together – to see which one is more accurate, to see if they agree and how they compare," said Mlynczak.

The spectrometer will measure, in various wavelengths, how much radiation the ozone emits directly. Scientists will relate this data directly to ozone concentrations, since the ozone itself is emitting the radiation.

The radiometer will measure those molecular oxygen emissions at a specific wavelength of 1.27 microns, and the spectrograph will measure them at 762 nanometers. These two measurements will serve as proxies for ozone concentration; they measure emissions that don't come directly from the ozone but are related to it. "The intent is to determine how well we understand the relationship," said Mlynczek.

Pathfinder Study

The METEORS mission is a preliminary pathfinder study to the Thermosphere-Ionosphere-Mesosphere Energetics and Dynamics (TIMED) satellite mission set for the end of this decade. Langley's Sounding of the Atmosphere using Broadband Emission Radiometry (SABER) instrument will be a key component of that mission. In addition to his duties as principal investigator for the rocket mission, Mlynczak will serve as the associate principal investigator for SABER.



The CADO (Chemistry and Dynamics of Odd-Oxygen) payload shown here, last flown in 1995, is being refurbished for the METEORS program. The black cylinders at the top of the payload are the telescopes and baffles for the various radiometric instruments.

"METEORS will give us a heads-up and time to work some of the spectroscopy issues that we need to address before the SABER mission flies," said Mlynczek. " We'll use the information we get to improve the models that go into SABER data analysis so that we'll have more confidence in the SABER data when it comes out."

Solar Applications

METEORS will also look at ozone levels in comparison with other levels of the atmosphere to aid in the study of solar heating efficiency.

"We want to know how much ozone is up there because the wind, air motion and circulation in the mesosphere are strongly governed by ozone," said Mlynczak. "Ozone absorbs ultraviolet radiation, heating the mesosphere. We need to know how much the mesosphere is heated relative to its cooling to gain a basic understanding of the circulation dynamics of the region.

"With that basic understanding, eventually we want to tie it all together with the stratosphere and the lower atmosphere – to see how the entire atmosphere, from the surface to the edge of space, works together.

NASA Langley's Aeronautical Oddities

From the "roaring '20s" to the present, Langley researchers and engineers have aimed to perfect the best aerodynamic designs conceivable. In the process, many unusual designs have passed through the Center's research and flight test facilities.

Some of these aeronautical oddities have made significant contributions to the development of flight, illustrating the importance of the imagination, innovation and skill of industry and NASA Langley researchers.

YO-31 Model Finds Second Lifetime

Distinguished Langley research associate Hewitt Phillips got a 16th-birthday present in 1934 that has hung around for some 60 years.

Since the rubber-band-powered model YO-31 airplane kit, a gift from his parents, lost its appeal to the teen-ager, he just didn't finish putting it together – until just two years ago.

In the fall of 1994, Phillips used the original drawings from the kit to construct a replica of the model Y10-43, a later version of the YO-31, spending up to 70 hours on the model, he says.

The scale model is constructed of balsawood and tissue, and the fuselage is painted the original olive drab color.

Phillips entered the model in the 1995 U.S. Indoor Model Plane Championships held at East Tennessee State University. Although Phillips' model didn't make the contest's 90-second flight requirement, the 1933 design is still competitive, flying for 70 seconds.

Hewitt Phillips

Gull-Winged Aircraft Swoops into Langley's History

BY MARK CHAMBERS AND MEGHAN WOODCOCK

The monoplane known as the Douglas YO-31 had a gull-wing design that made it an intriguing aircraft which appeared in the United States' steadily growing military arsenal during the early 1930s.

And, although this concept had already been pioneered in Germany, Langley played an important role in developing, evaluating and optimizing the lift and drag qualities of the wing.

Designed by the Douglas Aircraft Co., predecessor to today's McDonnell Douglas, in the late 1920s, the YO-31 was one of the first airplanes tested in Langley's 30- by 60-Foot Full-Scale Tunnel when the facility became operational more than 60 years ago.

The gull-wing design improved the airplane's use as an observation aircraft. With the wings placed at pilot level rather than above the cockpit, the pilot could see both above and below the plane, making it ideal for scouting duties.

According to distinguished Langley research associate Hewitt Phillips, the gull-wing design featured a thin root, or base, to allow the pilot better vision. Brace wires were then added to the design to support the wings' narrow base – double-bracing on the bottom with single-bracing on top.

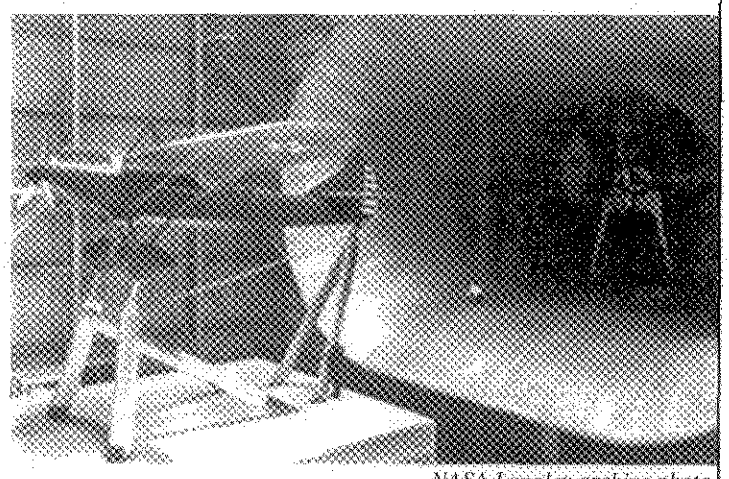
The elliptical shape of the wing also gave the airplane more lift.

"The idea was to get a smoother curve that has less drag then putting a sharp break in the contour," Phillips said.

According to Phillips, later versions of the YO-31 featured a small bulge in the underside of the fuselage – an extra accommodation for an observer/gunner.

By the 1930s, the military services were using observation planes increasingly, a reflection of the United States' growing aerial

(see ODDITIES, page 4)



NASA Langley archive photo

The lift and drag characteristics of the YO-31 were studied in NASA Langley's Full-Scale Wind Tunnel in the early 1930s.

Shuttle Mission STS-77 To Expand Space Commercialization Frontier

NASA NEWS RELEASE

NASA's fourth shuttle mission of 1996 is devoted to the continuing effort to help open the commercial space frontier.

During the flight, designated STS-77, Endeavour and a six-person crew will perform microgravity research aboard the commercially owned and operated SPACEHAB Module. Endeavour's crew also will deploy and retrieve a research satellite and perform rendezvous operations with a test satellite.

Flight Schedule

Launch of Endeavour was set for the morning of May 19 from Kennedy Space Center. An on-time launch and full 10-day mission duration will result in a landing on May 29 at 7:09 a.m. EDT at Kennedy Space Center's Shuttle Landing Facility in Florida.

Shuttle Crew

The STS-77 crew is commanded by John Casper, making his fourth shuttle flight. The pilot for the mission, Curt Brown, is making his third flight.

Four mission specialists are assigned to the flight: first-timer Andrew Thomas, third-flight veterans Dan Bursch and Mario Runco, and Canadian astronaut Marc Garneau, who making his second flight.

Endeavour's Payloads

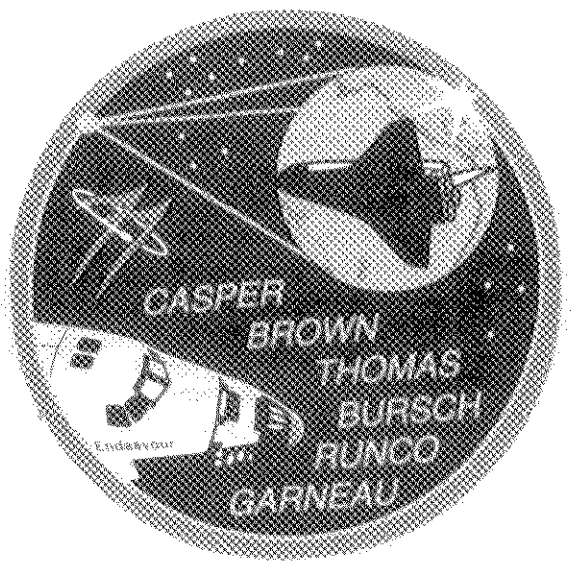
Primary payloads include experiments flying aboard the pressurized, commercially developed SPACEHAB Module, the Inflatable Antenna Experiment (IAE) to be deployed aboard the free-flying Spartan-207 carrier spacecraft, and a suite of four technology experiments known as Technology Experiments for Advancing Missions in Space (TEAMS), in the shuttle's payload bay.

Additionally, secondary experiments on the flight will include a "Brilliant Eyes" cryo-cooling experiment, a facility for examining the effect of microgravity on small aquatic creatures, and a small facility for examining the microgravity effects on simple living systems.

SPACEHAB Support

NASA contracted SPACEHAB, Inc. in 1990 for the lease of their SPACEHAB Space Research Laboratories for a series of flights. STS-77 marks the fourth flight of the SPACEHAB under this contract.

The SPACEHAB single module will carry nearly 3,000 pounds of experiments and support equipment for 12 commercial space product development payloads in biotechnology, electronic materials, polymers and agriculture, as well as several experiments for other NASA payload organizations.



One of these, the Commercial Float Zone Facility (CFZF) has been developed through international collaboration between the U.S., Canada and Germany. It will heat various samples of electronic and semiconductor material through the float zone technique.

SPACEHAB will also carry the Space Experiment Facility (SEF), which will grow crystals by vapor diffusion. This experiment is expected to yield large, defect-free crystals that are important for electronic applications and remote sensing.

Inflatable Antenna

In addition to the SPACEHAB module, the Goddard Space Flight Center's deployable Spartan 207 is another one of the primary payloads on this flight and the most ambitious Spartan mission to date. It will deploy and test the IAE, an experiment meant to lay the groundwork for future technology development in inflatable space structures. It will be launched and inflated like a balloon on orbit. The experiment will validate the deployment (inflation) and performance of a large inflatable antenna during a 90-minute mission. The antenna structure then will be jettisoned and the Spartan spacecraft recovered at mission end.

TEAMS

The four experiments called TEAMS will reside inside Endeavour's cargo bay: The Global Positioning System (GPS) Attitude and Navigation Experiment (GANE) will determine to what accuracy the GPS system can supply attitude information to a space vehicle; the Vented Tank Resupply Experiment (VTRE) will test improved methods for in-space refueling; the Liquid Metal Thermal Experiment (LMTE) will evaluate the performance of liquid metal heat pipes in microgravity conditions; and the Passive Aerodynamically Stabilized Magnetically Damped Satellite (PAMS) payload will be a technology demonstration of the principle of aerodynamic stabilization in the upper atmosphere of low-Earth orbit.

Cameras on the shuttle will record the PAMS satellite as it is deployed. Later during the mission, the shuttle will rendezvous with the satellite on two separate days and will point the PAMS measuring system, while cameras aboard the shuttle record the satellite's movements.

The Brilliant Eyes Ten Kelvin Sorption Cryocooler Experiment (BETSCE) carries an instrument that can quickly cool infrared and other sensors to near absolute zero using the evaporation of hydrogen. BETSCE is a technology demonstration experiment to show that these cryocoolers, called "sorption coolers," can operate in the absence of gravity.

Life and Microgravity

NASA's Office of Life and Microgravity Sciences and Applications, Washington, D.C., is responsible for the Aquatic Research Facility (ARF) and the Biological Research In a Canister (BRIC) experiments.

The ARF is a joint Canadian Space Agency/ NASA project and will be making its first flight into space on Endeavour.

The ARF allows sophisticated investigations with a wide range of small aquatic species. The facility will permit scientists to investigate the process of fertilization, embryo formation and development of calcified tissue and feeding behaviors of small aquatic organisms while in microgravity.

The BRIC payload has flown several times. The focus this time will be on the tobacco hornworm during its metamorphosis period. This study will examine the synthesis of protein necessary to form muscle. This study may aid in research on the effects of microgravity on the human endocrine system.

Speakers Bureau April Activities

Shelley Canright spoke to students at Williams Elementary School in Virginia Beach on "The Importance of a Good Education."

Terry Clark addressed students at Virginia Beach's Larkspur Middle School on the "Relevancy of Math and Science to One's Future."

Christine Darden, spoke at the Southeastern Universities and Colleges Coalition for Engineering Education's Women Engineering Board's annual conference on "The Globalization of the Aerospace Industry and Its Implications."

Joe Heyman spoke to SAIC's senior management about "NASA Langley Intellectual Property Technology Transfer."

Jane Hogge talked to students at William Byrd Middle School in Vinton, Va., about NASA's planetary studies, and to children at Roanoke's Round Hill Elementary School about the space program.

Sam James spoke to students at Syms Middle School in Hampton about technology education.

Bill Kinard talked to children at Rawls Byrd Elementary School in Williamsburg about the Mir space station.

David MacInnes addressed Norfolk State University on "Only God and a Chemist Can Make a Metal."

Paul Miner addressed the IEEE, Old Dominion University student chapter, about the need for computer engineers to know mathematical logic.

David Shuster spoke to students at Cape Hatteras School in Buxton, N.C., about propulsion.

Ledora Akanni spoke to students at Great Bridge Middle School in Chesapeake about science, math and engineering careers.

BOEING

(continued from page 1)

underwent strength and durability testing at Langley's Aircraft Landing Dynamics Facility.

Boeing has drawn from basic research and technology developed by NASA Langley over the years and applied this knowledge in several areas for the 777:

- Modern glass cockpit, a system that uses computer technology to integrate information and to display it on monitors in easy-to-use formats
- Digital data system, an easily reconfigurable computer network that allows an aircraft's computers to communicate with each other
- "Fly-by-wire" system for control of wing and tail surfaces, replacing bulkier and heavier hydraulic control systems
- Increased use of lightweight aerospace composite structures for increased fuel efficiency and range.

The 777's aerodynamically efficient wing cross-section concept evolved from many years of NASA's analytical and wind tunnel work performed as part of its basic aeronautical research program.

NASA centers at Ames, Dryden and Lewis also contributed to fundamental research and technologies adopted for the 777.

Taken as a whole, these advances contribute to airline profit margins and passenger service, savings and safety.

ODDITIES

(continued from page 3)

doctrine. Several YO-31 variants were stationed at then-Langley Field from the mid-1930s into the early '40s. The YO-31 itself was still used as a trainer aircraft at the outbreak of World War II.

The gull-wing design was also used on scouting and observation airplanes by the Germans and the British during that war. The famous Vought F4U Corsair fighter plane used an inverted gull wing that helped it to outmaneuver most Japanese fighters in the skies over the Pacific during World War II.

The Virginia Air and Space Center in Hampton now displays a restored F4U Corsair.

Alumni Association's 'Project Remember' Sends Boxes to Bosnia

BY MARNY SKORA

NASA Langley's Alumni Association continues to show its appreciation to U.S. service personnel stationed overseas – this time to those in Bosnia.

The association, with help from the Center and many caring citizens, prepared 549 boxes filled with personal care items, snacks, brain teasers and games.

More than 150 donors contributed, said project coordinator George Brooks. For every $10 donation in money or supplies, the donor's name was included in a box.

Individuals, companies and organizations stepped forward to help. Floyd and Margaret Brooks came down from Virginia's Northern Neck to help, after collecting funds for about 100 boxes in their community. Amoco Oil Company, the Wythe Exchange Club and Woodman of the World each helped to support some of the 20,000 men and women currently stationed in Bosnia.

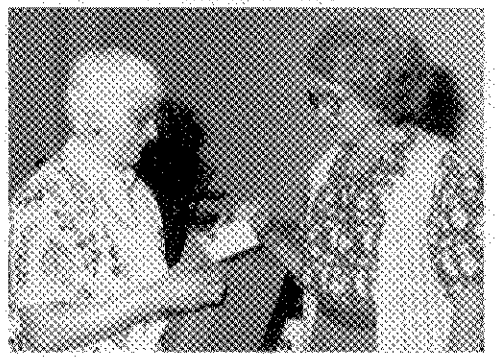
Dow Chemical donated plastic bags. Nations Bank and Ft. Eustis and Langley credit unions donated pens and stationery. Galaxy of Gifts donated the personal care items. The NASA Langley Exchange donated the 25 pennies that went into each box to be used as checkers and to play the brain teasers included.

Alumni Association members met here, first to package the stationery, to assemble the games, to count the pennies, and to fill the plastic bags with candy. Then they assembled and filled the boxes and prepared them for shipping.

Langley's Graphics Section designed the promotional poster and logo for the project. The Publications Office printed the donor cards and donated packing equipment, and the Logistics Department donated the use of a trailer as headquarters for the effort.

An Army truck from Fort Monroe's Logistics and Transportation Office carried the boxes off on their journey to "Any Service Member, Bosnia."

Langley Alumni Association volunteers pack the more than 500 boxes that went to service members in Bosnia: from left, Ray Hook, Duncan McIver, Shirley Davis, Ada Ward, Mary Mesic, Ernie Hook, George Brooks, Harvey Hubbard, Miriam Elliott, Charlotte Tyeryar, John Witherspoon and Phil Everhart.



Gladys Hardrath, left, assists Beryle Brooks with a Project Remember box as she includes a donor card identifying the box's sponsor.

Photos by Sandie Gibbs

Astronauts Award 'Silver Snoopys' To Honor Professional Excellence

This year's Silver Snoopy Awards, given by NASA astronauts to research scientists they consider to be the best in their respective professions, went to four Langley engineers in a ceremony here April 18: Robert B. Davis, Todd C. Denkins, Melvin J. Ferebee Jr. and Gale A. Harvey. Astronaut Dr. Kathryn Thornton presented the awards.

The "Snoopys" denote the professionalism and dedication with which an employee carries out his responsibilities, serving as an example and gaining the respect of co-workers and management.

Todd C. Denkins

Todd C. Denkins is the technical project engineer for the deployment of the Mapping of Air Pollution from Satellites (MAPS) instrument on the Space Station Mir and was a key member of the MAPS flights STS-59 and STS-68. He provided technical and managerial leadership in the development and modification of flight hardware for instrument reliability. His engineering efforts and coordination with the MAPS instrument during the two missions – flown only six months apart – contributed greatly to their success.

Robert B. Davis

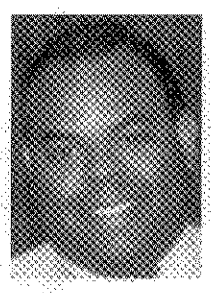
Robert B. Davis has 34 years of experience with NASA performing engineering analyses in structural vibration, stress analysis, loads analysis and fracture mechanics, including development of sophisticated finite element models. He develops structural design criteria for shuttle payloads and space instruments, advanced aircraft and aerospace test models.

Davis recently completed engineering structural analyses which qualified the Photogrammetric Appendage Structural Design Experiment (PASDE) for space flight. Atlantis, STS-74, successfully launched the experiment on Nov. 12, 1995. PASDE observed and photographed the Russian Mir solar array during docking with the shuttle.

Davis contributed to this successful project as a team member with research, design and test personnel.

Melvin J. Ferebee Jr.

Melvin J. Ferebee Jr. has performed critical systems analysis studies for the International Space Station and Space Shuttle programs.



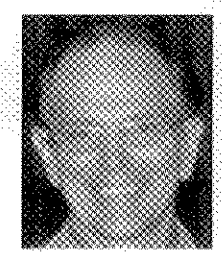
He formulated major Space Station Program management strategies during the 1993 Space Station redesign.

As a resident member of the redesign team in Crystal City, Va., he provided a critical liaison function among the three design concept analysis teams and tracked requirements issued by the team's engineering group.

Ferebee served on the redesign management team and developed the "host center" concept, which was eventually adopted by the International Space Station Program.

Gale A. Harvey

Gale A. Harvey has more than 30 years of experience in spectroscopy, photoelectric and photographic instrumentation, absolute calibration, field and laboratory measurements and testing. He is recognized as the nation's foremost authority on observational meteor spectroscopy and is known internationally in the field of meteor astronomy.



Harvey is the principal investigator for the ongoing Orbiter Outgassing Project, which measures the amount of outgassing from payload bay liners after each flight.

He has also upgraded the environmental test chambers at Langley in support of the Center's shuttle-based experiments.

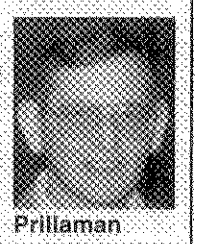
Space Flight Awareness Awards

The 1996 Space Flight Awareness Awards went to Thomas J. Yager, Structural Dynamics Branch, and to Paul D. Prillaman, Office of Mission Assurance, during the Silver Snoopy Awards ceremony April 18.

As a senior research engineer, Yager conceives, conducts and directs research on aircraft tire friction and wear and on steering and braking systems. He has worked with the Space Shuttle program since the 1970s.

Yager

As a quality assurance specialist, Prillaman has contributed to the Orbiter and to the Shuttle Infrared Leeside Temperature Sensor and Measurement of Air Pollution from Satellites instruments.



Prillaman

Happenings

ASIAN-PACIFIC AMERICAN HERITAGE MONTH: The Fort Monroe Club will host a luncheon May 21, 11 a.m., to honor Asian-Pacific Americans. Guest speaker Daphne Kwok, executive director of the Organization of Chinese Americans Inc., will address "Asian-Pacific Americans Sharing Experiences To Influence the Future." The public is invited to this oriental buffet; tickets are $5.75 per person. For tickets or more information, call 727-3253/3632/3633.

FOR SALE: Outer Banks Beach Club time shares, 1 BR, $4,000 each. 1996 dues paid. June 2-9; Sept. 22-29. Call 867-7394.

FOR SALE: Outer Banks Beach Club time shares, 1 BR, $2,000 each. 1996 dues paid. Jan. 25-Feb. 1, 1997; Nov. 24-Dec. 1, 1997. Call 867-7394.

BOOKKEEPING SERVICES: For small and large businesses, offering a wide range of accounting, payroll and tax services. Call Suzanne at 874-3121.

STARTING A HIGH-TECH BUSINESS: The Hampton Roads Technology Alliance presents a seminar entitled "Starting and Growing a High-Tech Business: An Evening with Those Who've Done It," May 21, 5-7:15 p.m., at the Holiday Inn Coliseum Conference Center in Hampton. The panel discussion features local successful high-tech entrepreneurs, as well as a reception. Cost is $10 at the door, cash only. Register before May 16 by phone (766-7850), fax (766-2214), or e-mail at hrta@patc.org

RETIREMENT THANKS: I would like to thank all my friends and colleagues for my wonderful retirement luncheon on April 30. Kathy and I will always remember your very kind words, expressions of warmth, nice gifts and humorous mementos. We had a great time! Mick Hall

FOR SALE: Two ball pythons. One is 12 inches long, good disposition, with 25 gallon tank and heat pad, $80; one is 5 feet long, very active, with tank and heat rock, $200. Call 245-1736.

FOR SALE: 386DX-33 IBM compatible computer with 5Mb RAM, 425Mb hard drive, 1Mb Trident Video Card, ProAudio Spectrum 16 Sound Card, 14-inch Super VGA monitor, 14.4 Modem, Microsoft Word 6.0, Excel 4.0. $450 or best offer. Call Melvin at 865-6428.

FOR RENT: Sanibel Island, Fla. Elegant waterfront 1 BR condo on Gulf of Mexico, ground floor, pool, tennis, full kitchen, on-site management. $625/week, May to September. Brochure available. Call Dick Campbell at 565-1849.

FOR RENT: Hampton Club condo, 1BR, new carpet, newly painted, all appliances, washer/dryer, second floor, security system, 3 miles from Langley. $425/mo., utilities not included. Call 838-8422.

ADVANCED DEGREE ACKNOWLEDGMENTS: If you received an advanced degree or expect to complete the requirements for an advanced degree this year, contact George Allison at Mail Stop 309, or call ext. 42594.

VIRGINIA CHORAL SOCIETY and the High Wycombe Choral Society from England will present "Lord Nelson Mass" by Franz Joseph Haydn, and "Te Deum" by Michael Haydn, May 25, 8 p.m., at Temple Baptist Church in Newport News, and May 26, 8 p.m., at Sacred Heart Church in Norfolk. Artistic directors from both societies will conduct portions of the concert. Area soloists will also perform. Tickets are $7 for general admission, $18 for families up to four, and $5 for seniors, students and military. Tickets are available at the door, or call 851-9114 for reserved seating.

TICKET DISCOUNTS: The Exchange Shop is selling discounted tickets to many area attractions, including AMC Movie Theaters, Colonial Williamsburg and Jamestown-Yorktown, Nauticus, Virginia Air & Space Center, Kings Dominion and Busch Gardens. For more information, call ext. 41585.

ATTENTION BIBLIOPHILES: American Book Display Book Fair will return to the Langley cafeteria (Building 1213) on May 22 and 23, 9:30 a.m.-2 p.m. Save up to 70 percent off retail prices. Sample books will be displayed outside the Exchange Shop on May 20 and 21. For more information, call ext. 41585.

HEALTH & FITNESS: Due to reductions in support service contract funding, the hours of the Fitness Center and Health Clinic will be reduced. Effective May 1, the Fitness Center will be open 7 a.m-6 p.m.; the Health Clinic will be open 7 a.m.-3:30 p.m.

OKLAHOMA MEMORIAL: Ken Matthews Landscape Nursery in Grafton donated the tree planted at the memorial ceremony held April 19 at the Langley Child Development Center in commemoration of the Oklahoma City bombing. Hi-Tech Engraving in Newport News donated the plaques.

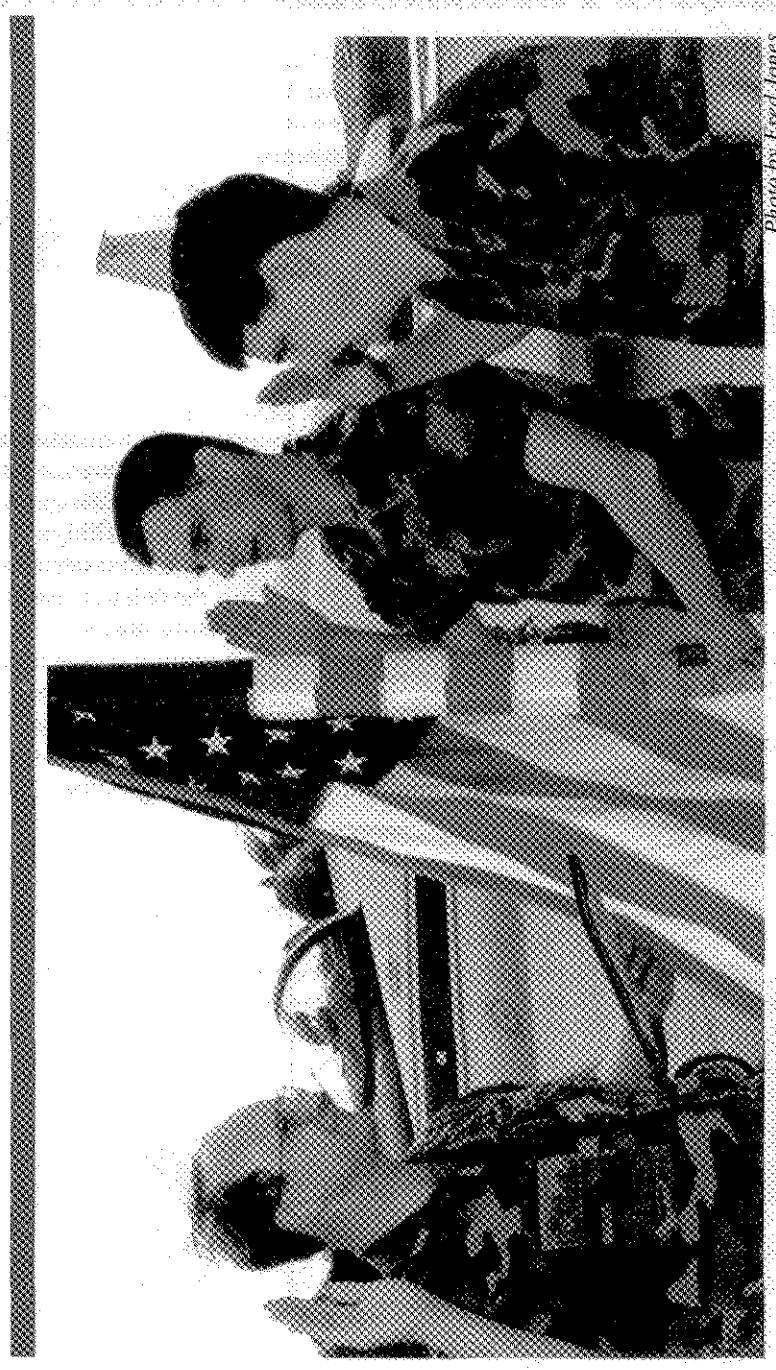


Photo by Fred Jones

I DO SOLEMNLY SWEAR – Army Sgts. 1st Class Keith Leatherwood, 35, center, and Dale Short, 31, right, re-enlist in front of the hangar here April 26 in the first-ever re-enlistment ceremony at the Center. Both aviation maintenance technicians are assigned here from the U.S. Army Research Laboratory, Vehicle Structures Directorate (VSD), in support of the Army-NASA Master Agreement. Short, a nine-year Army veteran from Roanoke, Va., re-upped for four years; Leatherwood, a Memphis, Tenn., native and a soldier for 15 years, extended for six years. Lt. Col. Pete Weiland, left, also of the VSD, officiated at the ceremony.

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Volume 10 ❖ Issue 11 ❖ May 31, 1996

New C-17 Aircraft Blows into Langley

McDonnell Douglas Says 'Thanks' for Center's Design Contributions to Latest Military Jet Transport

BY MARK CHAMBERS

Photo courtesy of McDonnell Douglas

McDonnell Douglas brought the C-17 to Langley on May 24 as a thank-you to the Center and its employees for their contributions to the design of the new military jet transport.

The military's next generation of jet transport, the McDonnell Douglas C-17 Globemaster III, visited NASA Langley Research Center on May 24 as a gesture of thanks to the Center for its contributions to the airplane's design.

McDonnell Douglas drew from fundamental research performed by NASA's four research centers in designing the huge aircraft for the U.S. Air Force Air Mobility Command. The visiting C-17 came from Charleston Air Force Base, S.C.

Aeronautical concepts conceived at NASA in the last 40 years have been incorporated into the military's next generation of jet transports, most recently the Air Force's McDonnell Douglas C-17 Globemaster III.

The company was recognized in 1994 for its innovative C-17 design when it received the prestigious Collier Trophy, American aviation's greatest annual achievement award. Current missions include airlifting much-needed cargo and supplies to Bosnia.

Including Langley, four NASA centers contributed to the C-17. Ames Research Center in Mountain View, Calif.; Dryden Flight Research Center in Edwards, Calif.; and Lewis Research Center in Cleveland, Ohio, also contributed.

The C-17 has performance characteristics that distinguish it from its predecessors, including long-range capability, outstanding aerodynamic efficiency, ease of ground operations, heavy cargo payload capability, and the abilities to perform extensive airdrops over hostile territory and to make precision landings and takeoffs from short or makeshift runways.

"The C-17 is the right airplane at the right time," said Norbert Smith, a McDonnell Douglas senior manager. "It's an airlifter that our deployed forces will get much use from, as demonstrated at Tuzla Airfield in Bosnia. It has today's technologies and will take the Air Force into new concepts in operations and deployments well into the future.

"With the C-17, both the Air Force and McDonnell Douglas have benefitted significantly from the contributions of NASA's innovative technology applications," Smith said.

The C-17 program is a prime example of the often-lengthy aerospace technology maturation process – the time it takes for technology concepts to be applied. The Defense Department launched its Cargo-Experimental program in 1979, and the Air Force selected McDonnell Douglas as the manufacturer of the envisioned C-17 in 1981. The company employed the NASA-derived technologies that became available to industry within the last four decades, and the first C-17 rolled off the assembly line in 1991.

Powered Lift

A key element of the aircraft is a flap system conceived by Langley engineer John Campbell and developed by a team of researchers here in the mid-1950s. The "externally blown flap" or "powered-lift system," enables the airplane to make slow, steep approaches with heavy cargo loads.

The steep approach helps pilots make precision landings with the aircraft, touching down precisely in the spot desired on limited runway surfaces. This was accomplished by diverting engine exhaust downward, giving the wing more lift.

In the flap system, the engine exhaust from pod-mounted engines impinges directly on conventional slotted flaps, according to Joseph Johnson, a retired Langley engineer and member of that research team.

Aircraft with blown flaps operate with roughly twice the lift of conventional jet transport aircraft, he said.

The concept was studied extensively in Langley's wind tunnels, including tests of flying models in the 30 x 60-Foot Tunnel. The patented flap has been applied to jet transports with both conventional and swept wings.

Photo by Fred Jones

NASA Langley technician Greg Shanks inspects a high-wing military transport model between wind tunnel tests.

Takeoff-and-Landing Research

Included in the Air Force procurement specification for the C-17 was Short Takeoff and Landing (STOL) aircraft research. This work was conducted on flight simulators and on the Augmentor Wing Research Aircraft at NASA Ames Research Center.

During the development program, McDonnell Douglas conducted simulations on the Ames Vertical Motion Simulator to develop the C-17 flight control system and head-up display. Ames performed flight demonstrations with the Quiet Short Haul Research Aircraft to show the Air Force and McDonnell Douglas design features of the flight control system and head-up display. These features would provide precision-approach path control and accurate landing performance for the C-17.

McDonnell Douglas applied the flight demonstration results to the design of the aircraft's spoiler control system and flight-path symbol display to achieve the anticipated improvements.

Ames provided the Air Force and McDonnell Douglas with information on wind shear response and control techniques that were investigated in STOL simulations. The Air Force has incorporated these techniques in operating procedures for the C-17.

Finally, Ames provided the Air Force with extensive briefings on aerodynamic performance, stability and control, flying qualities, augmented control and displays, and flight test techniques for powered lift aircraft to prepare for the C-17 flight test program.

(see VISIT, page 3)

NASA Research Contributions to the C-17

- Powered Lift System – specially designed wing flaps that divert engine exhaust downward
- Short Takeoff & Landing – aided by flight control system and head-up display technology
- Supercritical Wing – wing shape reduces drag for increased aerodynamic efficiency
- Winglet – vertical wingtip extensions for increased aerodynamic efficiency
- Fly-by-Wire – a lower volume, lightweight replacement for hydraulic control systems
- Engine Research – technologies for improved performance and fuel efficiency
- Composite Materials – increased use of lightweight graphite-epoxy structures for greater fuel efficiency and range

News Briefs

Around the Agency

HAMPTON UNIVERSITY AMONG NASA PRECOLLEGE GRANT WINNERS – NASA's Office of Equal Opportunity Programs announced the selection of nine minority universities to receive a three-year grant, Precollege Awards for Excellence in Mathematics, Science, Engineering, and Technology (PACE/MSET), for educational outreach projects: California State University, Los Angeles, Calif.; Elizabeth City State University, Elizabeth City, N.C.; Fayetteville State University, Fayetteville, N.C.; Hampton University, Hampton, Va.; Lehman College, Bronx, N.Y.; Northwest Indian College, Bellingham, Wash.; Pasadena City College, Pasadena, Calif.; Southwestern Indian Polytechnic, Albuquerque, N.M.; Saint Augustine's College, Raleigh, N.C. Each university will receive up to $100,000 per year for the three years of the grant based on performance and availability of funds under the program. The grants are intended to help students who have been historically under-represented in college-preparatory mathematics and science classes to gain the skills necessary to pursue science, engineering and related fields in college. The grant program targets institutions of higher education, especially Historically Black Colleges and Universities, Hispanic Serving Institutions, Tribal Colleges and other minority universities whose student enrollment of underrepresented minorities exceeds 50 percent. The PACE/MSET grant program is sponsored by the Office of Equal Opportunity Programs, Washington, D.C.

SOHO IMAGES COMET HYAKUTAKE'S APPROACH TO THE SUN – NASA, the European Space Agency (ESA) and the Naval Research Laboratory (NRL) have released a set of unprecedented images representing a time lapse movie of Comet Hyakutake making its close approach to the sun. The observations were made April 29 to May 6 with the NRL-built Large-Angle Spectrometric Coronagraph (LASCO) instrument on the Solar and Heliospheric Observatory (SOHO) spacecraft. The comet, estimated to have an orbital period of 10,000 years, came within about 20 million miles of the sun and is seen in the images against the background of the million-degree hot outer atmosphere of the sun, the corona. Scattering of sunlight in the Earth's atmosphere prevented good views from the ground during the comet's "perihelion passage," when it was closest to the Sun. The LASCO images show the head of the comet and three clearly visible tails that behave differently as Hyakutake swings around the sun. The comet's tails could clearly be seen changing their relative direction over the seven-day observation period as the sun's forces acted upon them. LASCO is a joint project between NRL, the Max Planck Institut fur Aeronomie (Germany), the Laboratoire d'Astronomie Spatiale (France), and the School of Physics and Space Research at the University of Birmingham (UK). SOHO is a project of international cooperation between ESA and NASA.

Announcements

Configuration Management Goes On-Line

Langley facilities in the configuration management (CM) program are now accessing their configuration-controlled documents and drawings through a new on-line database called CM On-Line (CMOL). CMOL allows users to view, print, and redline copies of their configuration-controlled documents directly from the database using an Internet Browser on their desktop computer terminals on the LaRCNET.

DynCorp, the Langley CM Contractor, developed CMOL to make the CM documentation process faster and easier for the facilities and to get the users out from under the paper avalanche. DynCorp has placed more than 900 documents of more than 21,000 pages and 6,000 drawings into the on-line database for instant access. Now users always have access to the latest approved version of their documents and drawings, and no longer need to maintain paper document files.

DynCorp has made CMOL easy to use. The user simply ties into the web server located at DynCorp, follows on-screen, step-by-step instructions to download the viewers, and then searches the database for the needed document or drawing.

On-screen instructions are easy to follow, and the users' manual is also on-line for learning about the system.

For further information about CMOL and other applications, contact Todd Lockhart at DynCorp Information and Engineering Technology, 303 Butler Farm Road, Suite 105, Hampton, Va., 23666; at Langley Mail Stop 906; or at (phone) 865-0223 or (fax) 865-7225.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following Langley employees are approved leave recipients: Marilyn K. Aldrich, Holly A. Elliott, Carl S. Larsen, A. Wayne Richardson, Cassandra Stevens, Charles S. Washington.

Anyone interested in donating leave to recipients in the program should send donations on the "Request To Donate Annual Leave to Leave Recipient Under the Leave Transfer Program" form via computer in Informed Manager to Mail Stop 293, Office of Occupational Health Services, or fax the forms to ext. 49114. For more information, call Karen Ridlon at ext. 43194.

One Leave Recipient Says Thanks to Donors

I would like to thank everyone who donated leave during my recent absences while I was recuperating from eye surgery. Everyone was so supportive with their cards wishing me well and their telephone calls checking on my progress. Thank you for your kindness. Janet Edmondson.

George Washington Courses To Begin

The George Washington School of Engineering and Applied Science at NASA Langley Research Center will offer new courses leading to the Master of Engineering Management degree, beginning in the 1996 fall semester. Individual interviews will be conducted on Center on June 19. For more information, call the GW-NASA Office at ext. 41982, or send E-mail to gwu+jiafs@larc.nasa.gov, or fax to 864-5894, URL: http:/ www.seas.gwu.edu/seas/jiafs.

NACA Reunion Coming to Hampton

The NACA ReunionVII is set for Oct. 3-6 in Hampton. All former NACA employees and members of NASA Langley Alumni Association and guests are invited. Send registration forms no later than July 1 to P.O. Box 6260, Newport News, Va., 23060-3850. For more information, call 595-1306.

Lecture Looks into the Future

NASA Langley's Senior Chief Scientist Dennis Bushnell will present a colloquium lecture June 4, 2 p.m., in the H.J.E. Reid Conference Center. He will discuss "Frontiers of the 'Responsibly Imaginable' in Aeronautics."

All colloquium lectures are videotaped and are available from the Center library.

Notices regarding upcoming and recent past colloquium and Sigma Series lectures are available on the World Wide Web (using Mosaic or Netscape) at http://oldtown.larc.nasa.gov/Lectures/lectures.html or from the NASA Langley Home Page http://www.larc.nasa.gov/larc.html under "General Information about NASA Langley Research Center."

Job Fair, Career Seminars Offered

The Second Annual Langley Research Center Job Fair will be held July 25, featuring many high tech, Fortune 500 companies and smaller local businesses. The Career Transition Assistance Program (CTAP) Center's "How To Do a Job Fair" seminars, June 27 and July 23, can help you prepare. CTAP's "Financial Planning for Women by Women" seminar, June 26, will feature local female financial counselors who are experts at preparing for a secure financial future. Advance registration is required for all seminars.

- "The Perils of Telephone Interviewing," June 3, 9-11 a.m., Building 1194
- "What Is So Different About Private Sector Employment?" June 5, 9 a.m.-noon, Building 1216
- "How To Evaluate Career Alternatives and Manage a Successful Career Campaign," June 12-13, 9 a.m.-3 p.m., Building 1216
- "Stress Management," June 18, 9 a.m.-noon, Building 1216
- "Resume 101 - You Gotta Have a Resume!" June 20, 9 a.m.-noon, Building 1216
- "Financial Planning, Investing and Retirement ... For Women, By Women," June 26, 9 a.m.-noon, Pearl I. Young Theatre
- "How To Win at a Job Fair," June 27, 10-11:30 a.m., Building 1312

All NASA civil service employees and their spouses are eligible for this authorized NASA training. For more information or to register, call Susan Costello at ext. 45000.

Virginia Air & Space Center News

Superman, Batman, Spiderman, the Hulk, Wonder Woman, Captain America and other famous crusaders are invading the Virginia Air & Space Center all throughout the summer. Now through Sept. 8, "SUPER HEROES: A High-Tech Adventure" teaches mere mortals the marvels of science and technology.

The 5,000-square-foot exhibit, developed and produced by the Oregon Museum of Science and Industry, explores night vision, ultrasound imaging and sonar in seven theme areas:

The ***Crime Lab*** employs the scientific methods of observation, exploration and experimentation to solve a mystery with Batman.

The ***Training Center*** explores the mysteries of sonar, parabolic microphones and biofeedback with the Hulk and the Human Torch.

The ***Work-Out Room*** measures athletic ability and endurance against the Silver Surfer and Captain America.

The ***Hospital*** delves into ultrasound imaging and fiber optics with Superman and the Atom.

The ***Night Vision Tunnel*** employs image intensifiers to see through total darkness.

The ***Factory*** "deflects" with Wonder Woman.

The ***City Street*** challenges visitors against the Flash and Spiderman.

Admission is $6 for adults and $4 for seniors, military, NASA employees and children under 12 years of age.

For more information, call 727-0900.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

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Science and Technology Corp.

Photographer ..... Fred Jones

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

Langley 'Takes Our Daughters to Work'

BY PATSY CAMPBELL

For the third consecutive year, Langley employees participated in the national Take Our Daughters to Work Day, April 25. The Federal Women's Program Committee, the Hampton Roads Section of Women in Aerospace, the Newport News Branch of the American Association of University Women (AAUW) and Langley Federal Credit Union cosponsored the event.

The focus was to broaden young girls' minds to the career possibilities available to them, while addressing the issue of gender bias in education, where girls often are not actively encouraged to develop math and science skills.

In addition to the 50 parents and 50 daughters who participated here, five "at-risk" students from Machen Elementary School in Hampton visited the Center. Their volunteer employee sponsors – Laura Brewer, Elka Ertur, Veloria Martinson, Carmen Torres-Nisbet and Julie Williams-Byrd – offered these students a unique opportunity to learn of career fields in the aerospace industry that they otherwise may have not encountered.

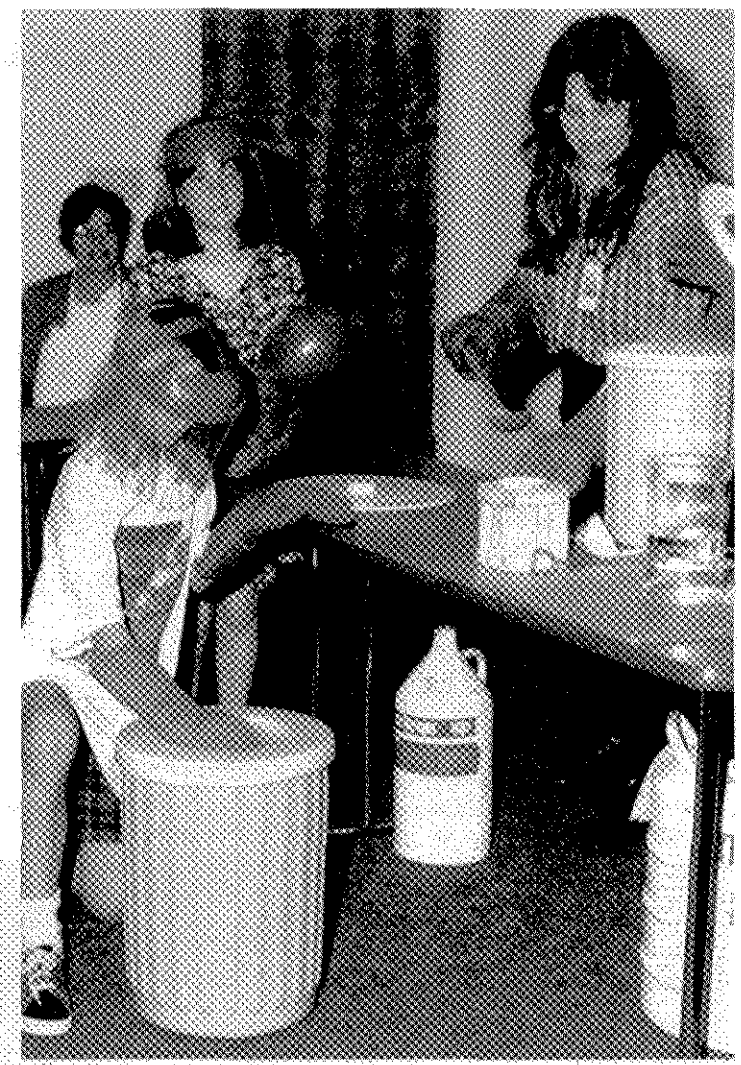
Gaudy Bezos-O'Connor of Technology Applications Group; Anna-Maria McGowan of the Aeroelasticity Branch; Dr. Mary Ann Smith of the Chemistry and Dynamics Branch; and Patricia Davis of the Acoustic, Optical and Chemical Measurement Branch, led the students in hands-on activities in the H.J.E. Reid Conference Center.

In addition to visiting their parent/sponsor's workplace, the students toured the flight simulator, led by Debbie Martinez and Miguel Alvarez, both of the Simulation Systems Branch.

Elizabeth Hawa of the Virginia Department of Education and Margaret Keator of the AAUW spoke to the parents about gender bias in education and offered tips on how to help children overcome difficulties in math and science skills. Rafaela Schwan of Langley's Office of Education shared information on Educational Opportunities at the Center.

To view the video of the day's events, call ext. 3291.

Ana-Maria McGowan leads students through a lesson in space communication. The "astronaut" student tries to build a Lego "space structure" using only verbal instructions from her "ground controllers."



Photos by Peggy Hopkins

Dr. Mary Ann Smith leads students through safety procedures for handling liquid nitrogen and conducts interactive demonstrations of the substance's effects on silly putty, balloons, rubber bands, a hot dog, and various balls.

Local Consulting Company First To License Langley Software

A Hampton Roads company has become the first to license computer software from NASA Langley as part of the agency's effort to transfer technology to U.S. businesses.

The software was originally developed to improve and speed the structural design of a future aerospace plane for Langley's Hypersonic Vehicles Office. Future uses will include high-technology applications as well as down-to-earth uses in the transportation and marine industries and in building construction.

This is a pioneering step for both NASA and the company, Collier Research & Development Corp. For NASA, it represents the emerging recognition of the value of computer software as a transferrable technology. The software intellectual property rights are being treated similarly to hardware patent rights.

For Collier R&D, the move represents a broadening of its business from engineering consulting to the development and marketing of software technology.

The Peninsula Advanced Technology Center and the technology application group at NASA Langley assisted the small Hampton-based company in preparations for winning the license. The licensing is consistent with the City of Hampton's plan to nurture local technology-based companies.

Collier R&D is transforming the NASA research computer code into a commercial software package called "HyperSizer" for use by government and private industry. The software offers more accurate and efficient structure analysis and optimization. Its capability will be expanded over time.

VISIT

(continued from page 1)

Supercritical Wing

Like other military transports, the C-17 uses a "supercritical" wing. Advanced airfoil designs enhance the range, cruising speed and fuel efficiency of jet aircraft by producing weaker shock waves that create less drag and permit high efficiency.

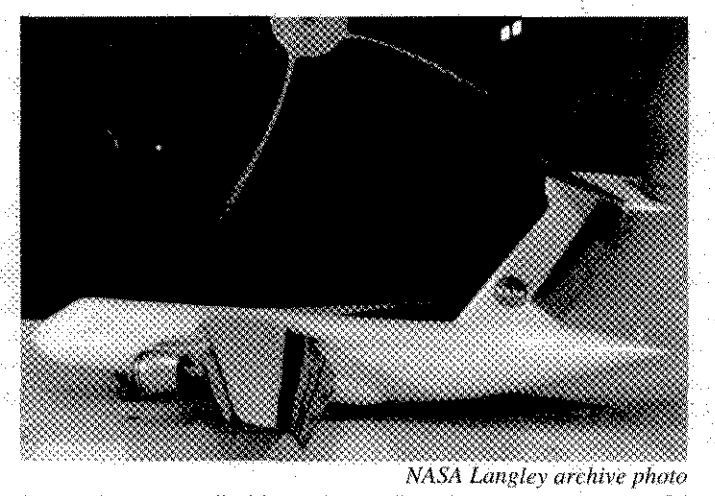
NASA Langley engineer Richard Whitcomb conceived this innovative technology through wind tunnel research in the 1960s. The agency researched the idea in flight in an F-8A at NASA Dryden and later on an F-111 aircraft.

Winglet

In the mid-1970s, Whitcomb again contributed to the C-17 design with the winglet concept, also developed through wind tunnel research. Winglets are small, winglike vertical surfaces at each wingtip of an aircraft that enable the airplane to fly with greater efficiency. They direct flow at the wingtip to produce a forward force on the airplane, similar to the sail on a sailboat.

The concept was first demonstrated in flight on a corporate Gates Model 28 Longhorn series Learjet, and further tested on a DC-10 aircraft as part of the NASA Aircraft Energy Efficiency Program.

Winglets were installed on a KC-135A tanker on loan from the Air Force and flight tested at NASA Dryden in 1979 and 1980. Eventually, winglets were applied to the C-17.



NASA Langley archive photo

Here, the externally blown flap – first demonstrated in NASA Langley's Full-Scale Tunnel – was applied to a C-5 Galaxy model during the early 1970s.

Fly-by-Wire

Fly-by-wire flight-control technology was developed from the F-8 digital fly-by-wire program that began at Dryden in the 1960s. In a flight research program that began in 1972, Dryden demonstrated the feasibility of the concept, and digital fly-by-wire technology was first used on a production aircraft – the F-18 – in 1978. Since then, it has been incorporated into many other aircraft, including the C-17.

Engine Research

NASA Lewis and the Ener-gy Efficient Engine Program contributed technologies to the F117-PW-100 (PW2037) engines on the C-17. These technologies led to improved performance and efficiencies of the fan, compressor and turbine components and overall superior fuel consumption for this engine.

Composite Materials

NASA Langley's Projects and Structures Directorates played major roles in developing composites technology incorporated on components of the C-17 design. Sixteen-thousand pounds of composite materials have been applied to the aircraft. Several of the major control surface and secondary structural components of the C-17 are made of composites.

The most direct contribution to C-17 applications was the development of the DC-10 graphite-epoxy upper-aft rudders.

These rudders have accumulated more than 500,000 flight hours since they were introduced into regular airline service in 1976. One rudder alone has flown for 75,000 hours. The control surfaces of the C-17 follow the same multirib configuration as the DC-10 rudders.

NASA and Department of Defense Join Forces To Cut Costs

NASA NEWS RELEASE

Langley Air Force Base and NASA Langley Research Center will save the government some $445,000 by jointly using an alternate fueling facility. The measure is one example of the Department of Defense (DoD) and NASA's most recent efforts to share resources and to save money.

The Aeronautics and Astronautics Coordinating Board (AACB), chaired by Under Secretary of Defense for Acquisition and Technology, Dr. Paul Kaminski, and NASA Acting Deputy Administrator, Gen. John Dailey, met recently to review the results of several months of work by both agencies.

This initiative, begun in 1995, is intended to achieve significant reductions in investment and operations costs and to enhance mission effectiveness and cost efficiencies through increased cooperation among DoD and NASA activities at all organizational levels.

"These are not new savings but efficiencies we've found to take care of the budget cuts we have already been allocated," Dailey said.

By combining spacecraft technology demonstrations and sharing results from each other's experiments having similar objectives, officials have estimated a potential cost avoidance of $60 million. Additional examples of cost savings include:

At Edwards Air Force Base/Dryden Flight Research Center in Edwards, Calif., $14 million is saved through sharing a C-17 aircraft hangar, and another $60,000 a year can be saved by sharing the cryogenics systems facility there. Also at Edwards/Dryden, NASA will use the Air Force's aircraft paint facility, saving $128,000 a year, and the Air Force will use Dryden's tracking radar to save $370,000 a year. Employees of the two facilities also cooperate to share a day care facility for their families.

"These are not new savings but efficiencies we've found to take care of the budget cuts we have already been allocated."

– Gen. John Dailey, NASA Acting Deputy Administrator

At the Army's Redstone Arsenal/Marshall Space Flight Center, Huntsville, Ala., the Army will save $200,000 a year by using Marshall's photo laboratory.

At Patrick Air Force Base/Kennedy Space Center, Fla., NASA will save money by using the Air Force's medical supplies for its employee health facility.

The AACB will continue to look for new areas where DoD and NASA can work together to save money, Dailey said.

The AACB work was accomplished through joint DoD and NASA Integrated Product Teams in seven major areas: Technology and Laboratories, Major Facilities, Space Launch, Center/Base Support and Services, Satellite Tele-metry, Tracking and Command, Personnel Exchange and Interagency Agreements.

These teams developed recommendations covering a wide range of activities, from specific technologies, such as micro-electromechanical devices and fly-by-light systems, to infrastructure improvements, such as combined support contracts at field centers and exchange of scientists and engineers. Recommendations made for standardization of telemetry, tracking, and command and control may save a lot of money and increase efficiency in the future.

Implementation of the recommendations will be monitored through the standing panels of the AACB. A report documenting the effort will be available in August.

Low-Cost Aircraft Navigation System To Aid Global Climate Change Studies

NASA NEWS RELEASE

A low-cost aircraft navigational system developed by NASA is making it possible for scientists to make precise maps of ice sheets that should yield valuable data on the potential effects of global climate change.

The system uses a personal computer to provide navigational data to the cockpit and allows aircraft pilots to fly flight paths to an accuracy of one foot. This, in turn, allows the scientists on board the aircraft to map the icy terrain below to within four inches.

NASA and university researchers today began their sixth mission since 1991 to map the ice sheets of Greenland. These missions are providing researchers with a baseline set of measurements to help them better understand glacial changes that may be due to global climate change.

Newest Technology

The new navigation system that is aiding these researchers took less than six months to develop, according to Wayne Wright, system developer at the NASA Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Va.

The system currently uses an IBM-compatible 486 personal computer, but it can be installed in an aircraft using a lap-top computer. The total cost of the system is less than $3,000, Wright said.

A receiver in the aircraft tuned to the Global Positioning System of orbiting satellites acquires precise position information and then compares these readings to a predetermined flight path. The navigation system then generates steering signals that are sent to the autopilot to direct the aircraft toward its optimal path.

Broader Applications

In addition, the system presents an aircraft position display to the pilot. This display allows the pilot to determine if the aircraft is right or left of the flight path centerline to within one foot. The system also can show the pilot position data on a larger scale, or the "big picture," such as the entire flight path.

"This system can be used on other aircraft-based Earth science missions to map varied terrain, such as volcanoes and coastlines," Wright said.

Navigational Nintendo

NASA pilot Rich Rogers compares using the navigational system to interacting with an aircraft piloting video game.

"Flying science 'lines' requires great precision and is both challenging and fun at the same time," Rogers said. Close coordination between the pilots, the aircraft flight crew and science team is needed to successfully operate the navigation system and to accomplish the Greenland mission, he added.

"This system can be used on other aircraft-based Earth science missions to map varied terrain, such as volcanoes and coastlines."

– Wayne Wright, Wallops Flight Facility

NASA ice mapping project scientist Bill Krabill calls the system "absolutely critical to be able to refly flight lines with a tolerance of 150 feet," which is the scientific requirement.

"It is the only means by which this project can be properly accomplished," Krabill said.

"In fact, the navigational system allows the aircraft to be flown within approximately 20 feet of previously measured points on the ice sheets," Wright said. This enables the researchers to gather accurate measurements at a single data point and to record any regional changes from previous flights.

Icy Lands of Greenland

The current mission will include mapping previous data points over Greenland and new data points over Iceland and Spitsbergen. Points on the northern coast of Greenland are of particular interest because other satellite data indicate a possible decrease in the ice sheet's elevation, Krabill said.

An estimated 10-inch decrease in the average height of the central Greenland ice sheet would result in a 0.04-inch increase in sea level of the world's oceans.

Lasers, Radar Used To Map the Ice

During the mission, which runs from mid-May to mid-June, a P-3B aircraft from Wallops will carry four instruments for mapping the ice sheets. The instruments include a laser ranging system from Wallops called the Airborne Topographic Mapper I (ATM I), a profiling laser system from Goddard, and an ice-penetrating radar from the University of Kansas in Lawrence.

The fourth instrument, still under development, is a smaller version of ATM I. The 400-pound ATM II is approximately half the size of the ATM I.

Ground Truth

Researchers located on the ice in Greenland will conduct ground truth studies beneath the flight path of the aircraft to verify the airborne data. The field team includes researchers from Ohio State University in Columbus, the University of Arizona in Tucson, and the University of Nebraska in Lincoln.

The ice mapping program is conducted by Wallops for NASA's Office of Mission to Planet Earth, Washington, DC.

Disabilities Awareness

Handicaps Not Always Visible

BY CAROL SATTERWHITE

When driving around a parking lot looking for a space, have you ever observed someone pulling into a handi-cap space and thought, "If I had a handi-cap hanger or plates, I could park a lot closer," or "That person doesn't look handicapped to me"?

But even though the person getting out of his vehicle in that space may *appear* to be perfectly healthy, he may have a heart condition which limits his ability to walk far in adverse weather conditions, i.e., extreme heat, humidity or cold, which cause his heart to be overworked by his inability to breathe properly. He may have other cardiovascular problems which restrict proper circulation to his legs, making it painful for him to walk far.

Or he could have one of many other "invisible" medical conditions which warrant his "handicapped" status and his need for special amenities.

Anyone who unlawfully uses a handicap parking space is subject to a fine of $50 to $200. Using the space when the handicapped person is not in the vehicle – even though it is equipped with a qualifying tag or plate – is also a violation of the law.

Collier Chosen as Sloan Fellow; Prepares To Head for MIT

BY MEGHAN WOODCOCK

Dr. Fayette S. Collier, manager for the Integrated Wing Design Element of the Advanced Subsonic Technology (AST) program at NASA Langley, is the recipient of the 1996 Massachusetts Institute of Technology (MIT) Sloan Fellowship. As a Sloan Fellow, he will be spending a year of study at MIT's school of management beginning Flag Day, June 14.

Collier hopes to learn new ways of management and is required to write a master's thesis on the subject.

"I am exploring lots of ideas," Collier said of his thesis. "I want to focus on something that helps NASA work on a crucial problem that will, in the end, help us manage our programs more effectively."

Collier, a Hampton native, has had six years of experience managing Langley programs. He was the project manager for various NASA-sponsored projects from 1990 to 1992, when he was named to head the Laminar Flow Control Project Office. There, he managed both the subsonic and supersonic laminar flow technology programs. He took over his current position in the AST program in 1994.

Collier is currently working on advanced technology for subsonic commercial transports, focusing on wing design concepts. He manages a technical team composed of people from Langley, Ames Research Center in Mountain View, Calif., NASA Headquarters in Washington, D.C., and industry.

"I have technical management skills," Collier said. "Part of the reason for wanting this fellowship is to get a better perspective on general management practices."

Collier traveled to MIT for an orientation week and met some of the other 55 people from around the country and the world who will participate in the program. He was up against agency-wide competition for the MIT Sloan fellowship.

"It was like winning the lottery," Collier said of being selected. "There are a lot of good people out there."

Collier earned his bachelor's, master's and doctorate degrees in aerospace engineering from Virginia Polytechnic Institute and State University in 1981, 1982, and 1988 respectively. He is a member of Sigma Gamma Tau, the National Aerospace Honor Society.

Collier is also a senior member of the American Institute of Aeronautics and Astronautics and a member of the Society of Automotive Engineers. In 1992, he won an Outstanding Leadership Award for superior leadership to the Hybrid Laminar Flow Control Team.

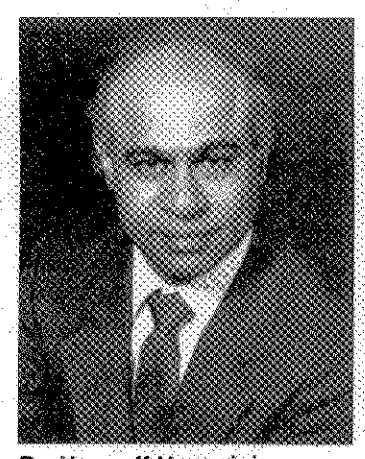
Dr. Fayette S. Collier

Former ICASE Director Returns to Academic World

BY MARY GRAVES

Dr. Yousuff Hussaini, the former director for the Institute for Computer Applications in Science and Engineering (ICASE), located at NASA Langley, recently left ICASE and the research field for an academic position.

Hussaini now holds an endowed superchair in high-performance computing and is director of Interdisciplinary Graduate Curriculum and Research in Computational Science and Engineering at Florida State University. He was chosen after a yearlong national search to fill the position, which includes six new associated faculty positions and a $4 million endowment.


Dr. Yousuff Hussaini

A renowned mathematician and computational scientist, Hussaini has always maintained a special interest in the education and training of young scientists.

"His main concentration is the general excellence of scientific research, and education has always been important to him," said Dr. Gordon Erlebacher, ICASE Research Fellow. "He has found that the way to achieve that excellence is to develop the innate talents of scientists as he sees them. And although he spends a lot of effort developing young scientists, he does the exact same thing with senior scientists. And, in turn, the knowledge they gain from his interaction with them trickles down to their students."

A native of India, Hussaini earned an engineering doctoral degree in 1970 at the University of California at Berkeley. After serving for six years in several leadership positions at the Indian Space Research Organization, he won a research fellowship at NASA's Ames Research Center in California in 1976, arriving at Langley's ICASE as a research scientist in 1978. Here, he served as ICASE director from 1992 until his departure this past February.

During the 18 years he spent here, Hussaini contributed to the research areas of spectral methods and fluid mechanics. His work in spectral methods resulted in a book, *Spectral Methods in Fluid Dynamics* (Springer, 1987) which has become the standard bibliographic reference in this field.

Hussaini also co-founded a graduate program, the Virginia/ICASE/LaRC Program in High-Performance Computing and Communication.

"He ensured the effective transmittal to NASA of the latest technology in the disciplines of interest to NASA," said Erlebacher. "This helped the visibility of both ICASE and NASA in the outside world."

LUCKY LADIES

Photo by Hubert Lloyd

LANGLEY'S HIGHLY PRIZED SECRETARIES – The Federal Women's Program Committee's Annual Salute to Secretaries was held at the H.J.E. Reid Conference Center on April 24. The day's events included several raffle drawings. Some of the winners include, from left, Laura Eure, Leanne Cranfill, Connie Jones, Geraldine Tucker, Rose Mustain, Connie Smith, Karen Evans and Dina Weiss.

Three Decades at Langley Leave Retiree Fulfilled

BY RON HARVEY

Leaving Langley and ending his lengthy career here was far from his mind one April morning in 1981, as Sullivan R. "Sully" Donadio watched the space shuttle Columbia return from space on its maiden flight. He and hundreds of other Center employees had gathered at the H.J.E. Reid Conference Center to witness the safe return of the astronauts.

Donadio savored that moment, he says, realizing the wonderful opportunity he had experienced working with the people of Langley during this historic moment.

Apprentice machinist Donadio arrived at Langley on December 2, 1958, to begin a four-year apprentice school program. After more than 36 years here, the career he calls "wonderful" ended when he and 272 other Center employees opted to take a buyout in March 1995.

After starting his career in the machine shop, Donadio later moved to the model shops as head of the composite models section. His next move sent him to the position from which he would retire – assistant chief of the Fabrication (FAB) Division.

Under Donadio's leadership, the FAB division's National Transonic Facility fan blade replacement team completed that project in record time, he says. The blades at the facility had been destroyed when a small cover panel broke loose and came down the tunnel wiping out the blades.

Since his retirement, Donadio has maintained a "busy but flexible schedule," he says. He and his wife, Testa, have five daughters and five grandchildren.

He has also been active with his church, serving as the director of the Seaford Baptist Church Sunday School, as well as on the building and personnel committees.

Donadio continues to practice the craftsmanship he has always enjoyed, he says, doing woodworking for his home and tinkering with his cars and trucks.

Retiree Sully Donadio now enjoys more time with his 3-year-old grandson, Matthew Walker, one of five grandchildren.

An avid hunter, he also likes repairing and building firearms, he says. He enjoys the peace and quiet of hunting trips, along with the challenge of the "still hunt," which requires the hunter to blend into the natural environment. But most of all, he says, he enjoys the camaraderie of his fellow hunters.

Happenings

TICKET DISCOUNTS: The Exchange Shop is selling discounted tickets to many area attractions, including AMC Movie Theaters, Colonial Williamsburg and Jamestown-Yorktown, Nauticus, Virginia Air & Space Center, Kings Dominion and Busch Gardens. For more information, call ext. 41585.

FREEDOM FROM SMOKING: For help in giving up tobacco, call Nancy LaCross of the American Lung Association at 723-4393. A seven-week smoking cessation class costs $50. A free orientation is set for June 4, 7 p.m.

BOOKKEEPING SERVICES: For small and large businesses, offering a wide range of accounting, payroll and tax services. Call Suzanne at 874-3121.

VASC SUMMER CENTER MOTOR TOURS: Now through August, the Virginia Air & Space Center offers summer motor tours of NASA Langley Research Center. Tours cost $4 with the purchase of any VASC admission ticket. For tour times, call 727-0909.

FOR SALE: House in Berkeley's Green in Williamsburg-Rt. 5 area, 2 stories, 4 BR, 2-car garage, deck, gas heat, on cul-de-sac. Community has pool, tennis courts, clubhouse. $149,000. Call 229-5662 before 9 p.m. for appointment.

FOR SALE: 1970 Galaxy boat, 1971 85 HP Johnson motor, trailer and 2 gas tanks. Needs some work. May be seen at NASA Langley. $500 cash. Call 229-5662 before 9 p.m.

RETIREMENT LUNCHEON: Loretta W. Watkins, former property disposal officer, will retire on June 3. A luncheon in her honor will be held today, May 31, 11 a.m., at Sammy and Nicks Family Restaurant, 2718 W. Mercury Blvd. For more information or to contribute to a gift fund, call Dollie McCown at ext. 43561.

FOR SALE: Condo with boat slip, Pine Cone Harbour in Hampton River Community. 3 BR, 2 full baths, 1,455 sq. ft. For sale by owner. $79,900. Call 867-7703.

VIRGINIA SYMPHONY: Outdoor concert at Norfolk Botanical Garden, June 5, 7 p.m. Tickets at the gate, or call the Virginia Symphony ticket store at 623-2310.

FOR SALE: 8-year-old Colony Pines home, 935 Chartwell Drive in Newport News, 3 BR, 2 1/2 baths, formal living and dining rooms, family room with fireplace, eat-in-kitchen, fenced yard with deck, garage, lots of extras. $106,800. Call 872-9307.

FOR SALE: 386DX-33 IBM compatible computer with 5Mb RAM, 425Mb hard drive, 1Mb Trident Video Card, ProAudio Spectrum 16 Sound Card, 14-inch Super VGA monitor, 14.4 Modem, Microsoft Word 6.0, Excel 4.0. $450 or best offer. Call Melvin at 865-6428.

TECHNOLOGY EXHIBIT: NASA government employees are invited to attend a Lockheed Martin Technology Exhibit, June 6, 8:30 a.m.-3:30 p.m., at the H.J.E. Reid Conference Center.

FOR SALE: 1989 Nissan 240SX, power steering, power brakes, power windows, air conditioning, cruise control, AM/FM cassette, power sunroof, heads-up display, 80,000 miles, maintenance records available. Blue book value $6,500; will sell for $5,800. Call 249-2693.

VIRGINIA SOCIETY FOR THE PHOTOGRAPHIC ARTS EXHIBITION: May 31-July 7, Charles H. Taylor Arts Center, 4205 Victoria Blvd., Hampton. Free. For more information, call 722-2787.

SUMMER VENDORS: The Langley Cafeteria will host a summer series of vendors, beginning with Cleo Enterprises, June 5, 10:30 a.m.-2 p.m., selling a large selection of fun watches, all at $14.99. Brimmers' Books will hold a book sale June 6, 10:30 a.m.-2 p.m. Sponsored by NASA Langley Exchange Shop. For more information, call ext. 41585.

BIG BANDS AT BUCKROE: June 2-Aug. 25, 7-9 p.m., Buckroe Park, Hampton. Free. For more information, call 727-6429.

HAPPY BIRTHDAY!

The **National Air and Space Museum** of the Smithsonian Institution, Washington, D.C., is 20 years old this summer.

On the museum's July 1 birthday, the U.S. Navy Commodores will present a free concert at 3 p.m. "SkyQuest," a new planetarium program, opens June 22. "You Can Fly" information centers and the "Explainers" program will run June 28 through July 1. Child pilot Vicki Van Meter will autograph copies of her book *Taking Flight* on June 29. The museum's "most ambitious" IMAX film, *Cosmic Voyage*, will premiere Aug. 9. "How Things Fly," an interactive exploration of the scientific principles of aviation and spaceflight, opens Sept. 20.

Averaging more than eight million visitors each year, the National Air and Space Museum is the world's most-visited museum. Located at Sixth Street and Independence Ave. S.W., it is open from 10 a.m. to 5:30 p.m. daily, and admission is free.

For show times and ticket prices, call 202-357-1686.

Photo by Sandie Gibbs

ALL ABOARD – A new Boeing 777 commercial aircraft and officials from the Boeing Airplane Company visited NASA Langley's hangar May 10 to thank Center employees for their contributions to the plane's development. More than 1,500 people attended an official ceremony and toured the twin-engine passenger jet. Center Director Paul F. Holloway; Dr. Robert E. Whitehead, NASA's associate administrator for aeronautics; Gen. John R. Dailey, NASA's acting deputy administrator; and Robert E. Spitzer, vice president for engineering, Commercial Airplane Group, The Boeing Company, all officiated at the morning ceremony.

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National Aeronautics and Space Administration
Langley Research Center

News Researcher

Bi-weekly Employee and Contractor Publication

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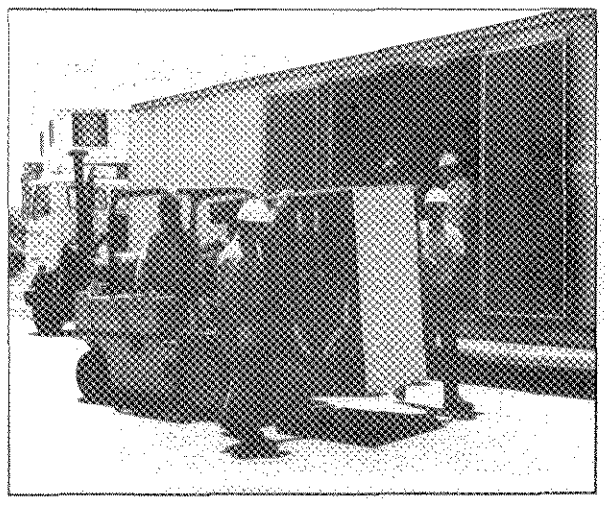
Langley's CRAY-2 Supercomputer Moves to Virginia Air & Space Center

BY ANN C. GAUDREAUX

The CRAY-2 supercomputer, used at Langley for nearly a decade to simulate flight for hundreds of research aircraft, is now housed at the Virginia Air & Space Center for public display. The computer was moved to the downtown Hampton museum May 30.

"The Virginia Air & Space Center is excited to be able to display and interpret the supercomputer that has contributed to the advancement of aeronautics and space research at NASA Langley," said Kim Maher, Virginia Air and Space Center CEO and executive director.

The machine was manufactured by world-wide supercomputer leader Cray Research, Eagan, Minn., and was one of the most powerful computers in the world when it was installed in 1988. The CRAY-2 has been replaced with one of the latest supercomputer systems from Cray Research, which is even more powerful and more cost-effective.



Photos by Katie Reid

EG&G workers guide the CRAY-2 Voyager's heat exchanger from the truck that carried it from Langley to the Virginia Air & Space Center.

The computer, named "Voyager" by researchers at NASA Langley, will be displayed at the Virginia Air & Space Center, which plans to build an exhibit around the computer. Cray Research donated additional exhibitry to the display and covered moving costs for the event. The exhibit is expected to be ready for visitors by early fall.

"The CRAY-2 has more memory than several hundred personal computers and an aggregate speed of more than 1,000 personal computers," said Joe Drozdowski, manager of supercomputers, Advanced Computer Systems Branch. "It has been used at Langley to simulate aerodynamic flow over flight vehicles, to predict certain chemical reactions, to analyze and predict the flow within rocket engines, to simulate the atmospheres of other planets, and to predict galactic collisions and interactions in space."

Bill Mace, the former director for electronics at Langley who retired in 1989, was on Center when Voyager was purchased, installed and dedicated.

"Things have progressed so rapidly — almost beyond my imagination — in such a short time, it is hard for me to believe," Mace said when he learned about the supercomputer's move.

Voyager consists of a mainframe containing four processors and a billion-byte memory, disk storage and its own liquid-immersion cooling system. The large central memory could hold 10 full sets of the *World Book Encyclopedia* and, using its incredible speed, could read all that information in a single second.

Computationally, the CRAY-2 can achieve up to one billion arithmetic operations per second—or one gigaflop, in the language of supercomputers.

How fast is a gigaflop? At that rate, Voyager can sum up the Social Security numbers of all U.S. citizens in less than 1/4 second.

Voyager's central processor is guided through the glass doors of the Virginia Air & Space Center, where it will remain on display.

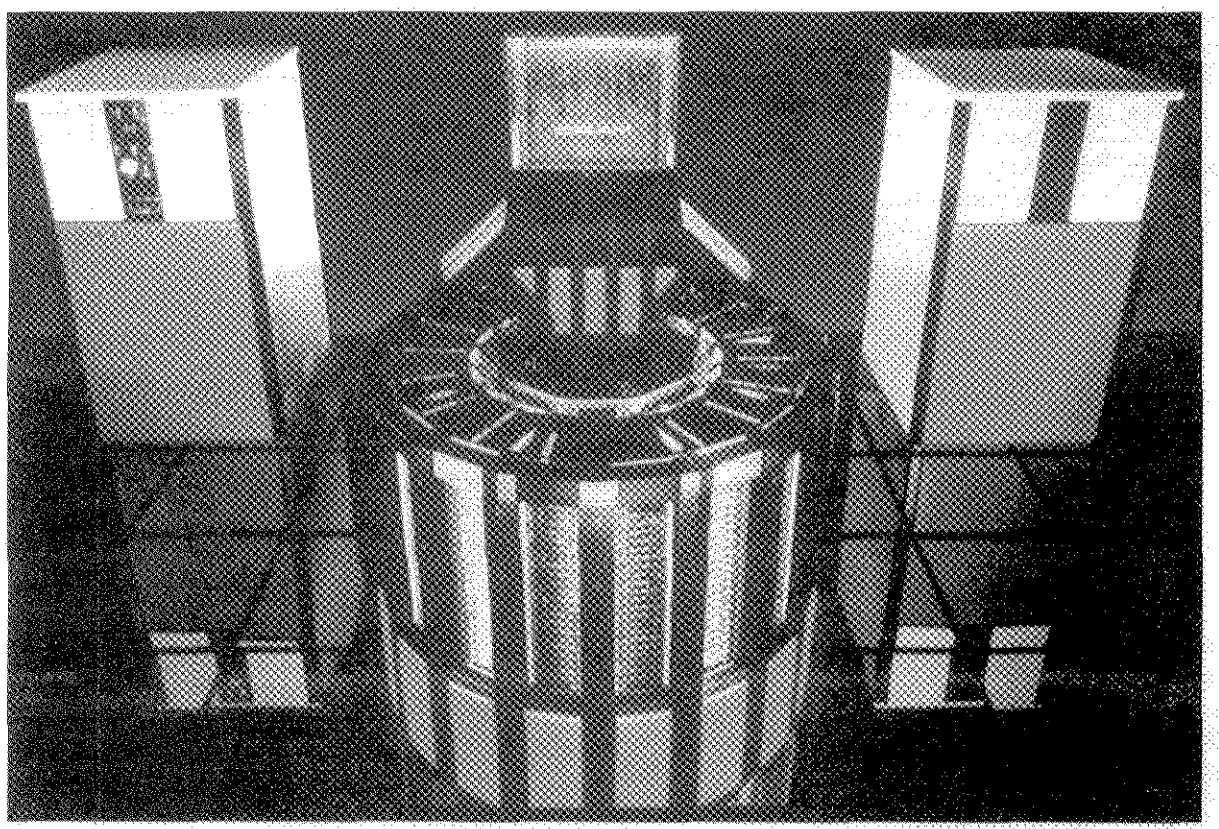
"In less than one day," Drozdowski said, "Voyager can do all the computing that was done at NASA Langley during the entire year 1970. It has been a very effective tool for researchers here, and we are glad that others will get to see a machine that has affected many areas of research and development on Center."

The Virginia Air & Space Center is Langley's official visitor center. According to Glenn Woodward, who works on the center's exhibits, the CRAY will be used to demonstrate some of the benefits of using supercomputers, especially in aircraft design.

The Virginia Air & Space Center is located at 600 Settler's Landing Road in downtown Hampton, and it includes interactive exhibits on aeronautics and space as well as Virginia history. The museum houses an IMAX® theater and offers special programs for children and adults.

Cray Research is a subsidiary of Silicon Graphics, Inc., and is a major provider of supercomputing tools and services.

"We are happy that Cray Systems has been a part of NASA's important research, helping to simulate complex aerodynamic design techniques that would be impossible, too costly or too dangerous to research in the physical world," said Cray spokesperson Mardi Larson.



NASA Langley Archive photo

The CRAY-2 supercomputer, with its systems of central processing units and electronic storage, was installed at Langley in 1988 and brought the Center's computing capabilities to a state-of-the-art level.

State-of-the-Center Address

"Seizing Opportunity" is the theme for this year's state-of-the-center address, July 8 and 9, at the H.J.E. Reid Conference Center.

Four sessions, led by Center Director Paul F. Holloway and Deputy Director H. Lee Beach, are scheduled so that as many employees, retirees and contractors as possible may attend. The sessions are based alphabetically on last names; but anyone may attend any session.

July 8: 9:30-10:30 a.m. (A-E)
1:30-2:30 p.m. (F-K)
July 9: 9:30-10:30 a.m. (L-R)
1:30-2:30 p.m. (S-Z)

News Briefs

Around the Agency

SAFETY PANEL TO CONDUCT SPACE SHUTTLE PROGRAM REVIEW –

At the request of the White House, NASA has asked the Aerospace Safety Advisory Panel to undertake a focused review of the space shuttle program, concentrating on the safety of the shuttle in light of management changes, planned shuttle upgrades and flight rates to build and support the International Space Station. The panel will submit its final report through NASA to the White House by the end of November. The shuttle program has been at the forefront of the agency's efforts to reshape its management and organizational structure. Changes in the shuttle program include plans to consolidate operations to a single prime contractor, downsizing the workforce, and reducing the cost of operations and management.

COMMANDER, PILOT, FLIGHT ENGINEER ROUND OUT STS-83 CREW –

U.S. Air Force Lt. Col. Jim Halsell will command the long-duration Microgravity Science Laboratory mission set for launch on board Columbia in the spring of 1997. Halsell will be joined on the flight deck by pilot U.S. Navy Lt. Susan Still, the first of the 1995 class of astronauts to be assigned to a space shuttle flight, and Mission Specialist Mike Gernhardt, Ph.D. They join Payload Commander Janice Voss and Mission Specialist Don Thomas previously named to the flight, along with Payload Specialists Roger K. Crouch and Gregory T. Linteris. Halsell, 39, has flown twice on the space shuttle – as pilot on Columbia during the STS-65 mission in July 1994 and on Atlantis for STS-74, the second shuttle-Mir docking mission. Still, 34, will be making her first space flight on STS-83. Gernhardt, 40, has flown previously on Endeavour during STS-69.

Job Fair, Career Seminars Offered

The Second Annual Langley Research Center Job Fair will be held July 25. The Career Transition Assistance Program (CTAP) Center's "How To Do a Job Fair" seminars, June 27 and July 23, can help you prepare. Advance registration is required for all seminars.

- "Stress Management," June 18, 9 a.m.-noon, Building 1216
- "Resume 101 - You Gotta Have a Resume!" June 20, 9 a.m.-noon, Building 1216
- "Financial Planning, Investing and Retirement ... For Women, By Women," June 26, 9 a.m.-noon, Pearl I. Young Theatre
- "How To Win at a Job Fair," June 27, 10-11:30 a.m., and July 23, 9-10:30 a.m., Building 1312
- "How To Evaluate Career Alternatives and Manage a Successful Career Campaign," July 9-10, 9 a.m.-3 p.m., Building 1216
- "The Electronic Landscape and the Net," July 12, 9 a.m.-noon, Building 1312
- "Networking," July 16, 10-11:30 a.m., Building 1312
- "Starting Your Own Business," July 18, 9 a.m.-4:30 p.m., Building 1216

All NASA civil service employees and their spouses are eligible for this authorized NASA training. For more information or to register, call Susan Costello at ext. 45000.

Announcements

Thank You to Donors for May Blood Drive

Two hundred and forty-two donors participated in the May 22 Langley blood drive, including four first-time donors, according to coordinators Peter J. Edgette and Karen Ridlon of the Occupational Health Services Office and Amy Allison of the American Red Cross.

Thanks go to all of our donors, and congratulations to the following donors: 15 gallons – Billy Beasley; 14 gallons – Harvey W. Murray, Jr.; 11 gallons – Daniel J. Dicarlo; 9 gallons – Lemuel E. Meetze and Linda A. Hunt; 7 gallons – James L. Dillon and Gregory S. Keat; 6 gallons – Paul D. Aronsohn; 5 gallons – William P. Chambers, Vincent B. Cruz, Lynn Ray Seals and Jon E. Thompson; 4 gallons – Kevin J. Laferriere; 3 gallons – Michael D. Chattin and Roscoe G. Nicholas; 2 gallons – Eric K. Svendsen; 1 gallon – Roland Hatten and Frederic H. Stillwagen.

Linda R. Smith, Paul W. Bradshaw, Stephanie A. Runyan and Eric C. Stewart were first-time donors.

The next blood drive will be July 24, 9 a.m. to 3 p.m., at the H.J.E. Reid Conference Center.

Leave Recipient Thanks Donors

"As one of the recipients of the donated leave program, I would like to extend my sincere thanks to those of you who donated your leave to me during my time of need.

"I will always remember your generosity and prayers, and I am eternally grateful that I am employed by such a caring organization."
Geraldine N. Pardue

April Speakers Bureau Lecture List Completed

Debbie Carroway and Mike Cisewski addressed the Virginia Beach campus of ECPI College of Technology regarding SAGE III.

Terry Clark spoke to Larkspur Middle School students on "The Relevancy of Math and Science to One's Future."

Christine Darden spoke to Ely High School students in Fort Lauderdale, Fla., and to participants in that city's Museum of Discovery and Science's Family Science Forum on "Lowering the Boom."

Dr. Norman Johnston addressed Old Dominion University's student chapter of the American Chemical Society about engineering.

Shuttle Bus Service Offers Free Ride

The NASA Langley shuttle bus runs from the center to NASA Headquarters and NASA Goddard Space Flight Center and back on Tuesdays and Thursdays.

The shuttle, equipped with a restroom, can seat up to 12 passengers. Civil servants and qualified contractors with travel orders may request seats at no cost on a first-come, first-served basis. For reservations, call Omega World Travel at ext. 42104.

Normal operating times follow:

6:30 a.m.	Depart Langley from cafeteria parking lot
7 a.m.	Stop at Williamsburg* pickup point if needed
9:30 a.m.	Arrive at NASA HQ, Washington, D.C.
10:30 a.m.	Arrive at NASA Goddard, Greenbelt, Md.
2:30 p.m.	Depart NASA Goddard
3:30 p.m.	Depart NASA HQ
6 p.m.	Stop at Williamsburg* drop-off point if needed
6:30 p.m.	Arrive NASA Langley, cafeteria parking lot

*Williamsburg pickup/drop-off point is the Days Inn located across from Water Country USA. The Days Inn lobby is available for waiting passengers. Make arrangements in advance with Omega World Travel for Williamsburg pickup.

1995 Runner of Year Repeats Center Title

John Hoppe of the Acoustic, Optical and Chemical Measurement Branch has been named the 1995 Langley Runner of the Year. He earned 55.64 points in the NASA Intercenter Competitions, with three firsts and a second in his age group in the four races of the 1994 Spring and Fall NASA Intercenter Competitions. His times were 39:37 and 39:42 in the 10-K and 12:00 and 12:03 in the 2-miler. Hoppe also won the title in 1978 and 1994.

Steve Sudik of Computer Sciences Corp. finished in second place with 49.64 points, and Don Brown of Lockheed Engineering & Sciences Co. was third with 35.14 points.

Others in the top ten included Gale Harvey, 28.64; Pat Parker, 28.48; Wei Anderson, 28.32; Bill Rogers, 26.32; Al Graham, 25.14; Bernice Becher, 24.32; and Mel Anderson, 24.14.

For more information about the Langley Runners' Club, call Richard Shearer at ext. 47036.

Langley Retiree Seeks Bone Marrow Donors

A bone marrow drive will be held June 23, noon to 6 p.m., at Yorkminster Presbyterian Church in Grafton, for Wayne Darnell, a recent Langley retiree. The Yorktown resident suffers from leukemia, a disease curable only with a bone marrow transplant. He retired from Langley's Atmospheric Sciences Division in 1995 after 33 years of service.

To find a potential bone marrow match, a small blood sample is taken to determine blood type and genetic markers. That information then goes into the National Marrow Donor Registry.

If the registered potential donor's blood sample mixes successfully with the recipient's blood, a match has been found. The Red Cross then contacts the individual and explains the subsequent procedure in detail.

If the donor agrees to follow through with the rest of the process, he undergoes a complete physical examination before the bone marrow extraction is conducted.

About three percent of the donor's marrow is taken from the hip bones, where some 60 to 70 percent of adult bone marrow is found. The marrow regenerates within a few weeks, and the donor may experience some lower back discomfort for about a week.

For more information, call the Red Cross at 631-2052, or the National Marrow Donor Program at 1-800-526-7809.

New Phone System for NDES Personnel

The Nondestructive Evaluation Section has a new phone system. Customers can reach NDES personnel at the main number, ext. 47778, or at the numbers listed below.

Bob Berry	44095
Wayne Boston	49257
Larry Cooper	44107
C.H. Greenhalgh	49270
Meg Holloman	48571
Jack Hughes	44110
Carolyn James	48564
Glen King	44123
Phil McElveen	49263
Barbara Pritchard	48570
Ed Taylor	48572
Myra Walton	49254
Marcus Wayne	49269

Call Toll-Free Number for Special Information

Employees phoning for weather and other urgent information affecting NASA Langley now have a toll-free number to use if they live outside the local calling area, thanks to the Communications and Networks Branch.

The new number is **1-888 664-2111.** Note that, while the number is toll-free, it is not an 800 number.

Anyone may call the toll-free number, but employees are urged to use it only if they live outside the local area. For those within the local calling area, the number is 864-2111.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor . . . . . Keith Henry

Editor . . . . . Mary Graves
Science and Technology Corp.

Assistant Editor . . . . . Jeane Shanks
Science and Technology Corp.

Photographer . . . . . Fred Jones

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

Discretionary Funds Allow Special Research Projects To Fly

BY MARY GRAVES

An airplane without wings? An external rib for swept wings? A roadable helicopter?

Such unconventional concepts may not see the initial light of day within customary aeronautical research budgets. But thanks to the Langley Directors Discretionary Fund (DDF), innovative, creative and even revolutionary ideas can find their way to the drawing board and maybe into ongoing, mainstream research.

Fundamental Funds

Like all government agencies and all NASA centers, Langley is allocated a yearly "discretionary fund" from the agency administrator's office. After the applicable program support is subtracted, various projects are funded with the balance.

NASA's fiscal year 1996 budget plan allocated $2,283,000 to Langley's DDF, some $1.8 million of which remained for those "various projects" throughout the whole Center.

"It is not an aeronautics fund, not a space fund, not a space access fund, not an atmospheric sciences fund," says Senior Scientist Dennis Bushnell, administrator of Langley's DDF. "It is for all of these areas which we research. It covers everything."

A Garden of Ideas

And the many proposals that Bushnell and the Langley Science Council receive for evaluation cover just about everything.

"We get such a diverse set of stuff," he says, "and all proposals are different. We're looking at apples, oranges, pears and kumquats."

The mix currently includes the "Inboard Wing Concept" project by Leroy Spearman, Systems Analysis Branch, and the "Optical Fiber Laser Sensing" project by Herbert Hendricks, Sensors Research Branch – two of more than 30 projects funded by the DDF this year.

Seventeen of those are new endeavors; 14 are continuations that won a second or third year via the competitive process. Funding for each project is capped at a nominal maximum of $100,000 per year for up to three years, according to Bushnell.

"The second and third years, you have to submit whole new proposals, and you have to go through the same competition," he says. "It's totally competitive. All you've got going for you [in a repeat competition] is whatever you've accomplished the first year or two."

Preparing the Soil

The DDF provides "a mechanism for initial investigation of new and different ideas on an exploratory basis," says Bushnell. It's a venue for work which hasn't had enough time, effort or attention to earn its way into the ongoing programs.

"This is a fertile nursery for ideas that – if they are successful or if they look good initially – could be put into mainstream activities," he says. "It's meant to be the initial work on long-term, high-risk, high-payoff concepts."

The DDF supports mostly in-house research ideas, but collaborative efforts in conjunction with in-house research may also be considered, says Bushnell.

"We are trying to put more of an emphasis on end products," he says. "You can either work on research for tools or on research for end products. Ultimately, we're after better airplanes, better spacecraft, better space access and better atmospheric science."

Planting the Seeds

The annual proposal process begins each spring, when all professionals on Center personally receive a solicitation letter from Bushnell – a change he instituted when he took this job last year.

"When we went from an organizational to a direct solicitation last spring, we almost doubled the number of proposals that came in," he says. "We also now get more proposals from a broader cross-section of research areas." This year's requests totaled about 80.

The Harvest

Researchers have about three months to submit their proposals, which are then evaluated by the Langley Science Council – a group of nine scientists who are "among the best technical people in their fields," says Bushnell.

The Council judges proposals according to four criteria: scientific/technical merit; value to NASA Langley; the project plan; and the project's personnel, equipment and facilities. Project approvals are announced about three months after the submission deadline.

The diversity of ideas does make the evaluations difficult, Bushnell says, and no absolute standard exists.

"All the proposals are reviewed by good people and are reviewed uniformly by the same people. We can and do use on-Center-but-external-to-the-Council experts if we feel we need to [obtain additional guidance regarding a proposal]," he says.

Researchers must obtain their supervisors' approval to submit a proposal. Publications resulting from the research also are expected to appear in NASA reports and/or journals.

Supervisors are expected to keep tabs on the project's status, just as they would for any other work performed by their people, says Bushnell.

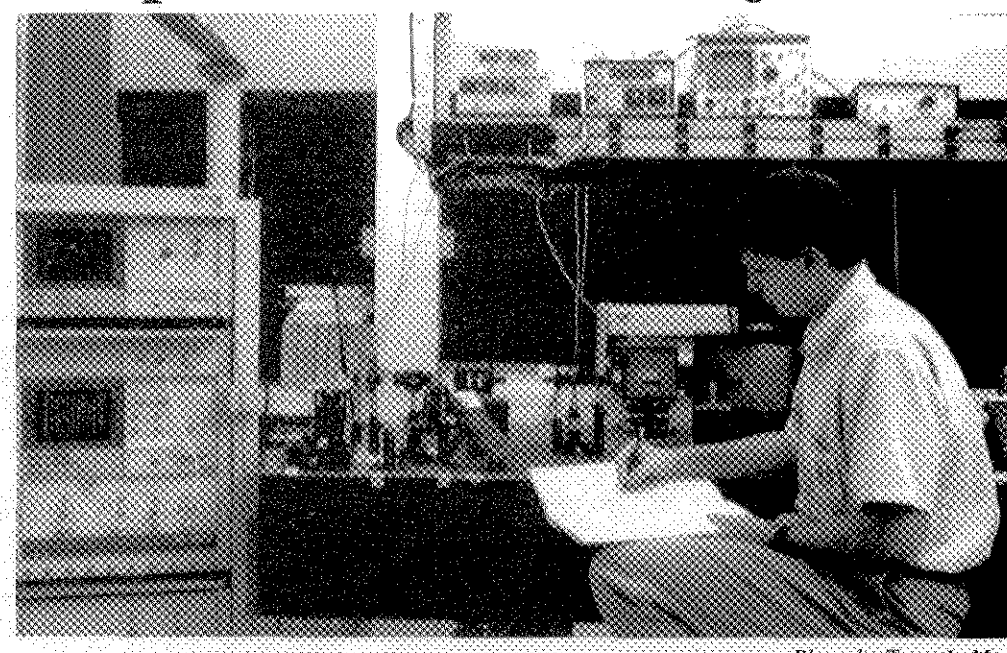
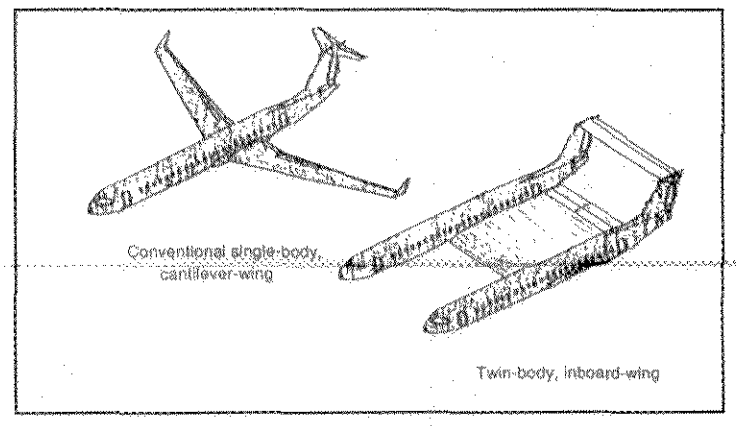


Photo by Terry L. Mack

OPTICAL FIBER LASER SENSING – Tony Cook, an electrical engineer in the Sensor Research Branch, records data for the development of a fiber laser for water vapor sensing. The instrument that provides the information is an optical spectrum analyzer, which measures the wavelength and intensity of the optical fiber laser, thus providing a means for measuring various parameters of the laser.



INBOARD WING CONCEPT – This concept provides a way to increase a transport airplane's capacity while increasing its aerodynamic efficiency and improving flight safety. The capacity for a conventional transport would be doubled through the use of two bodies.

NASA To Comply with ISO 9000 Quality Management Standards

BY BILL WESSEL AND SHERRY HARPER

NASA Headquarters, NASA Centers, and NASA Suppliers now must comply with the requirements of the International Standardization Organization (ISO) 9000 series of Quality Management System Standards. The guidance is a result of the NASA Quality Management System Policy.

The 9000 series is an internationally accepted basic quality management system accepted by more than 120 countries. Certification of compliance to ISO 9000 is required for exchange of products and services internationally.

The ISO 9000 Standard is a basic quality system containing the essential requirements for good and efficient business management. The system is comprised of some 20 quality system elements, including management responsibility, contract review and control of design, documents, data, process, inspection, measuring and test equipment.

Private sector competition, a desire to increase international market shares and customer requests for compliance are driving much of NASA's supplier core to the ISO 9000 quality management system.

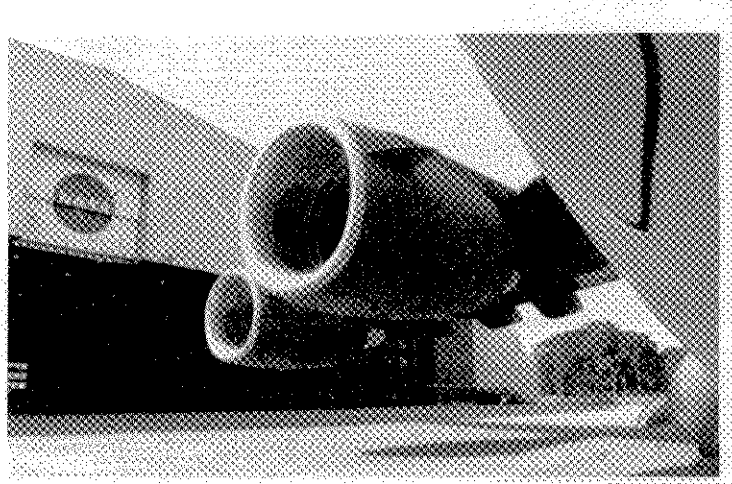
The federal sector is also moving to reduce government standards and to use commercial quality standards when possible. To that end, a single quality management program – one that is acceptable to the entire federal sector as well as to the suppliers – is being developed in concert with industry. The Government and Industry Quality Liaison Panel has recommended compliance to the standards of the 20 elements of the ISO 9000 to meet the basic quality system requirements.

Facilitation of the implementation of the ISO 9000 Standard at Langley is the responsibility of the Office of Safety, Environment, and Mission Assurance (OSEMA).

Globemaster III Visit Pays Tribute to Center

Photos by Fred Jones

The U.S. Air Force's McDonnell Douglas Globemaster III approaches Langley's runway and lands smoothly for a four-hour visit here May 24 in tribute to the Center's contributions to the plane.



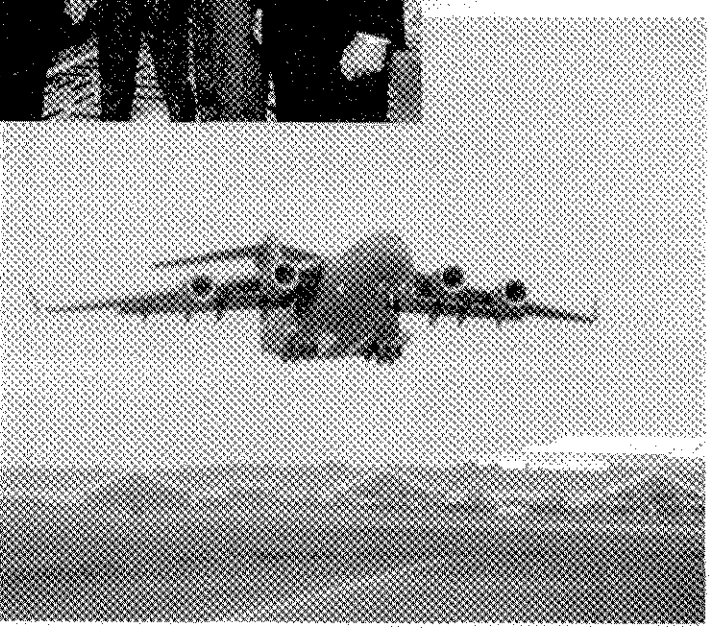
The huge turbines of the C-17 seem to dwarf the hangar.

Air Force personnel ready the C-17 for a visit by Virginia state dignitaries and Langley employees.

Inside Langley's hangar, U.S. Rep. Bobby Scott (D-Va.), left, shares a smile with Sen. John Warner (R-Va.); Sen. Charles Robb (D-Va.); Stan Ebner and Tom Goldman of McDonnell Douglas; Rep. Herbert Bateman (R-Va.) and Gen. Richard Hawley, commander, Air Combat Command, U.S. Air Force.

Right, the C-17's cavernous cargo hold awaits inspection. Left, Robb, Warner and Bateman show off their new NASA hats.

Left, Center Director Paul Holloway, left, joins Warner and Robb as Maj. Bruce Bowers and Capt. Brenda Cabral, U.S. Air Force Reserve, answer questions inside the plane.



Above, Center employees line up to board the aircraft and to see the end product of this collaboration among the U.S. Air Force, NASA and McDonnell Douglas. Right, the Globemaster III says a final thanks and goodbye as it leaves Langley.

Langley Education Programs Challenge Students, Teachers

Photos courtesy Langley Education Dept.

LeRuth Pendergrass, a 1995 LARSS student from Hampton University, worked in the Research and Technology Group, Materials Division, with Dr. Robert S. Rogowski.

LARSS, ASEE Offer Selectees Summer of Study

BY TERRI WILSON
LARSS PARTICIPANT

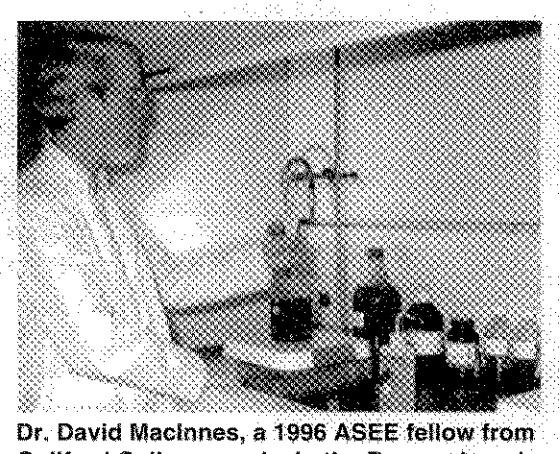
Summer on Center means the arrival of another group of participants in the Langley Aerospace Research Summer Scholars (LARSS) program and in the American Society for Engineering Education (ASEE) program. Chosen from hundreds of applicants, the students come from as far away as Puerto Rico and Alaska. Most LARSS and ASEE participants began their studies here June 3.

The LARSS Program

Celebrating its 10th anniversary, the LARSS program brings college students to Langley each summer. The program was established by Dr. Samuel E. Massenberg in 1986. Rising juniors, seniors, or first-year graduate students engage in intensive study under a designated mentor for a 10-week period. Students will complete a research project in their chosen fields.

The program stimulates interest in aerospace research and encourages students to pursue advanced degrees in their particular fields.

Out of more than 300 applicants, 124 students from 55 different universities were chosen to participate.



Dr. David MacInnes, a 1996 ASEE fellow from Guilford College, works in the Research and Technology Group, Materials Division, with Dr. John W. Connell. He is working to develop plastic polymers that will make air travel more efficient.

The ASEE Program

The ASEE program was established in 1964. This year, the program is a joint effort between Hampton University and NASA Langley Research Center. The 10-week program endeavors to further the professional knowledge of qualified engineering and science faculty members in aerospace research in order to enhance their teaching activities.

From more than 120 applicants, approximately 42 faculty members representing 28 different universities were chosen to participate in innovative research. They will gain exposure to technical lectures from distinguished scientists and engineers here at Langley.

For more information about either program, contact the Office of Education, Rafaela Schwan, LARSS Program Coordinator, at ext. 45298, Mail Stop 400, or Debbie Young, ASEE Program Coordinator, at ext. 45215.

Minority College Students Begin Summer Study with Center Mentors

BY GERRI RANKIN

Eighteen students from Spelman College, Florida A&M University and Morehouse College arrived May 28 to begin their summer research.

The students are participants in the Women in Science and Engineering (WISE) Program, part of the Increasing Minority Access to Graduate Engineering (IMAGE) Program, and in the Strategic Preparedness Advancing Careers in Engineering (Project SPACE) Program. These programs encourage minority enrollment in science and engineering courses.

Through mentoring at one of the NASA Centers, the programs allow the student to experience first hand what science and engineering professions offer in the aerospace industry. The mentors are among some of Langley's best engineers, scientists, and technicians who volunteer 10 weeks of their time to help with the students' research and learning experience. Among them are Dr. Joycelyn Simpson, Materials Division; Christyl Johnson, Aerospace Electronics Division; Dr. Patrick Minnis, Atmospheric Sciences Division; J. Everitt Brown, and Vernet Boone, Operations Support Division; and Lisa Jones, Structures Division. Simpson, Johnson and Jones are longtime supporters of these programs and have devoted much valuable time mentoring.

A WISE Student

Tiffani Murray, a WISE Program scholar, will be assisting Mary Jane Strickland in the transfer of data from 8,000 nine-track tapes to 51/4-inch optical disk platters. She will also configure a web page so that vital information can be transferred between members of the Data Management Branch.

Murray, a Hampton resident and honor graduate of Kecoughtan High School, is a double major in computer science/computer engineering at Spelman College in Atlanta, Ga. She is a member of the National Society of Black Engineers and was named to Who's Who Among American High School Students at Kecoughtan.

"I'm very pleased with the work I have been assigned to do because it gives me a chance to apply the things I've learned at Spelman this past year," she says. Her older sister is also a WISE scholar who is now earning her doctorate in industrial engineering.

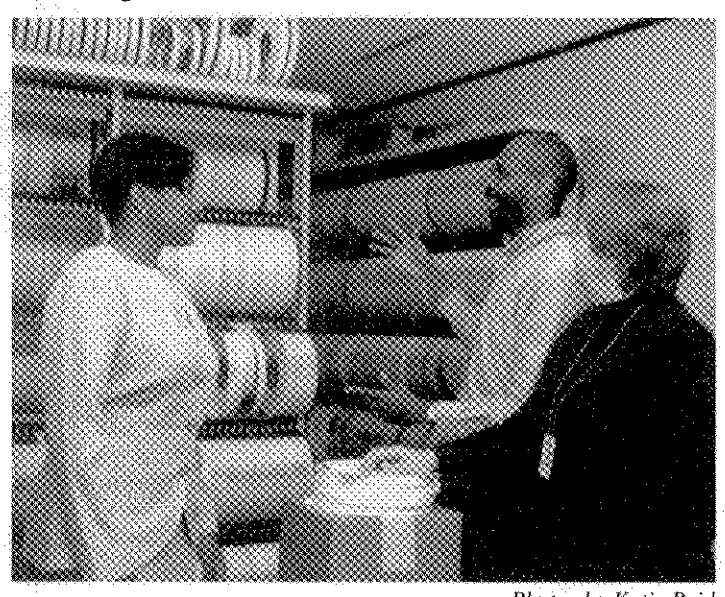
Out in SPACE

Erick Crouse is participating in Project SPACE. A 1994 honor graduate of Hampton High School, he is a physics/mathematics major at Morehouse College in Atlanta.

"Erick will perform statistic studies, designed to assist in the validation processes for the Earth Radiation Budget Experiment (ERBE) and the Clouds and Earth's Radiant Energy System spacecraft sensors calibration coefficients," says his mentor Robert Lee of the Radiation Sciences Branch.

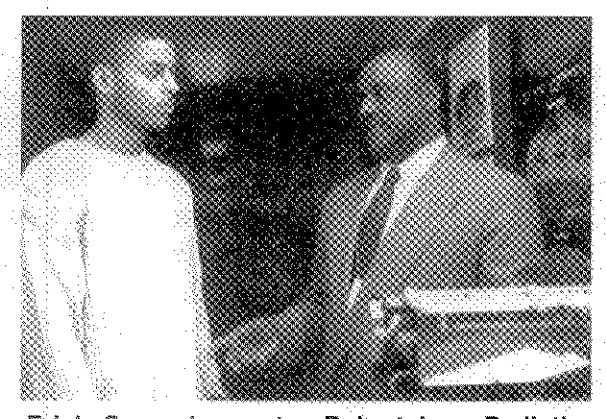
"The statistical portion of my work is going to be very beneficial since I will be able to use what I'm learning in the upcoming school year," Crouse says. He looks forward to learning to use the method of least squares to analyze the data and to obtain understandable results.

"I think the next several weeks will be an excellent learning experience," he adds.



Photos by Katie Reid

Tiffani Murray discusses her project with her mentor, Calvin Mackey, and Mary Jane Strickland, of the Data Management Office.



Erick Crouse's mentor Robert Lee, Radiation Sciences Branch, describes the design and operation of the ERBE nonscanner engineering modeling system.

AdVentures

FOR RENT: Cottage at Kill Devil Hills 9.5 mile post, N.C. Sleeps nine, AC, cable TV, microwave, fully furnished. Weekly rates, three-day minimum. Call 868-6427.

FOR SALE: House in Berkeley's Green in Williamsburg-Rt. 5 area, 2 stories, 4 BR, 2-car garage, deck, gas heat, on cul-de-sac. Community has pool, tennis courts, clubhouse. $149,000. Call 229-5662 before 9 p.m. for appointment.

FOR SALE: 1970 Galaxy boat, 1971 85 HP Johnson motor, trailer and 2 gas tanks. Needs some work. May be seen at NASA Langley. $500 cash. Call 229-5662 before 9 p.m.

FOR SALE: York County-Grafton Woods Townhome. 3BR, 2.5 baths, with breakfast area and buffet bar, open great room with gas fireplace. Private terrace with 20 x 10-foot patio. $84,900. Call Ron or Janice Joslin at 898-1824.

NACA REUNION VII: Oct. 3-6 in Hampton. All former NACA employees and members of NASA Langley Alumni Association and guests are invited. Send registration forms no later than July 1 to P.O. Box 6260, Newport News, Va., 23060-3850. For more information, call 595-1306.

PENINSULA AMATEUR RADIO CLUB: The public is invited to join PARC during Field Day, June 22-23. PARC will operate continuously for 24 hours from Newport News Park to test its emergency communications capabilities. For more information, call 875-9633.

LAA CARNIVAL: Aug. 16-17. See our web site, "1996 Carnival" under "General Information" on the Lantern Home Page. Call Geoff Tennille at ext. 45786, Skip Schroeder at ext. 47320, or the appropriate chair listed on the web to volunteer or to make suggestions.

AMERICAN METEOROLOGICAL SOCIETY: June 19, 5:30 p.m., at Old Point Steak & Spaghetti House, 33 E. Mellen St., Phoebus. For more information, call ext. 41812.

VOLUNTEERS NEEDED for the 1996-97 school year to serve as modeling instructors for students in Denbigh High School's Aviation Academy, a magnet program in aeronautics/avionics/aviation maintenance education. The academy is located at Newport News/Williamsburg International Airport. Volunteers spend 4-6 hours a week working with academy students in model building. For more information, call Curtis Grant, academy director, at 886-2745.

VASC SUMMER CENTER MOTOR TOURS: Now through August, the Virginia Air & Space Center offers summer motor tours of NASA Langley Research Center. Tours cost $4 with the purchase of any VASC admission ticket. For tour times, call 727-0909.

TECHNOLOGY 2006 Conference, Oct. 29-31, Anaheim Convention Center, Anaheim, Calif. Sponsored by NASA, the Technology Utilization Foundation and *NASA Tech Briefs* magazine. For more information, call 1-800-944 NASA, or fax to 212-986-7864.

TICKET DISCOUNTS: The Exchange Shop is selling discounted tickets to many area attractions, including AMC Movie Theaters, Colonial Williamsburg and Jamestown-Yorktown, Nauticus, Virginia Air & Space Center, Kings Dominion and Busch Gardens. Sign up at the shop to win four Busch Gardens tickets. Drawings are held one week in advance of the ticket date. Also, save $5 on Busch Gardens tickets through July 8. For more information, call ext. 41585.

SUMMER VENDORS: The Langley Cafeteria hosts a summer series of vendors, and the next guest vendor is Dorling Kindersley Family Library, June 20 and 21, 10:30 a.m.-2 p.m. Prices start at $10. All orders can be picked up at the cafeteria July 3 and 5, 10:30 a.m. to 2 p.m. Sponsored by NASA Langley Exchange Shop. For more information, call ext. 41585.

AIAA GOLF OUTING: The American Institute of Aeronautics and Astronautics (AIAA) will have its annual golf outing on June 27, 1 p.m., at the Langley Air Force Base Golf Course. Call John Paulson at ext. 45071 by June 17.

AIAA SPRING PICNIC: The American Institute of Aeronautics and Astronautics (AIAA), Hampton Roads Section, will have its annual spring picnic on June 27, 4:30-7 p.m., at the picnic grounds of the H.J.E. Reid Conference Center. Cost is $5 for members, guests and golf outing players; $7 for nonmembers; $3 for student members; $2 for children ages 6-12. Register by noon on June 24. Contact Odilyn Santa Maria at ext. 45104 or at a.l.santamaria@larc.nasa.gov or Tom Gates at ext. 43400 or at t.s.gates@larc.nasa.gov

HAPPY BIRTHDAY TO U.S. ARMY, FLAG: Fort Monroe will conduct a pageant commemorating the Army's 221st birthday and the U.S. flag's 219th birthday on June 14, 11 a.m., at the installation's Continental Park. Free and open to the public, the event will feature the U.S. Army Continental Band, the Fort Monroe Color Guard, flags representing America's past and soldiers dressed in period uniforms. In case of inclement weather, the pageant will be cancelled.

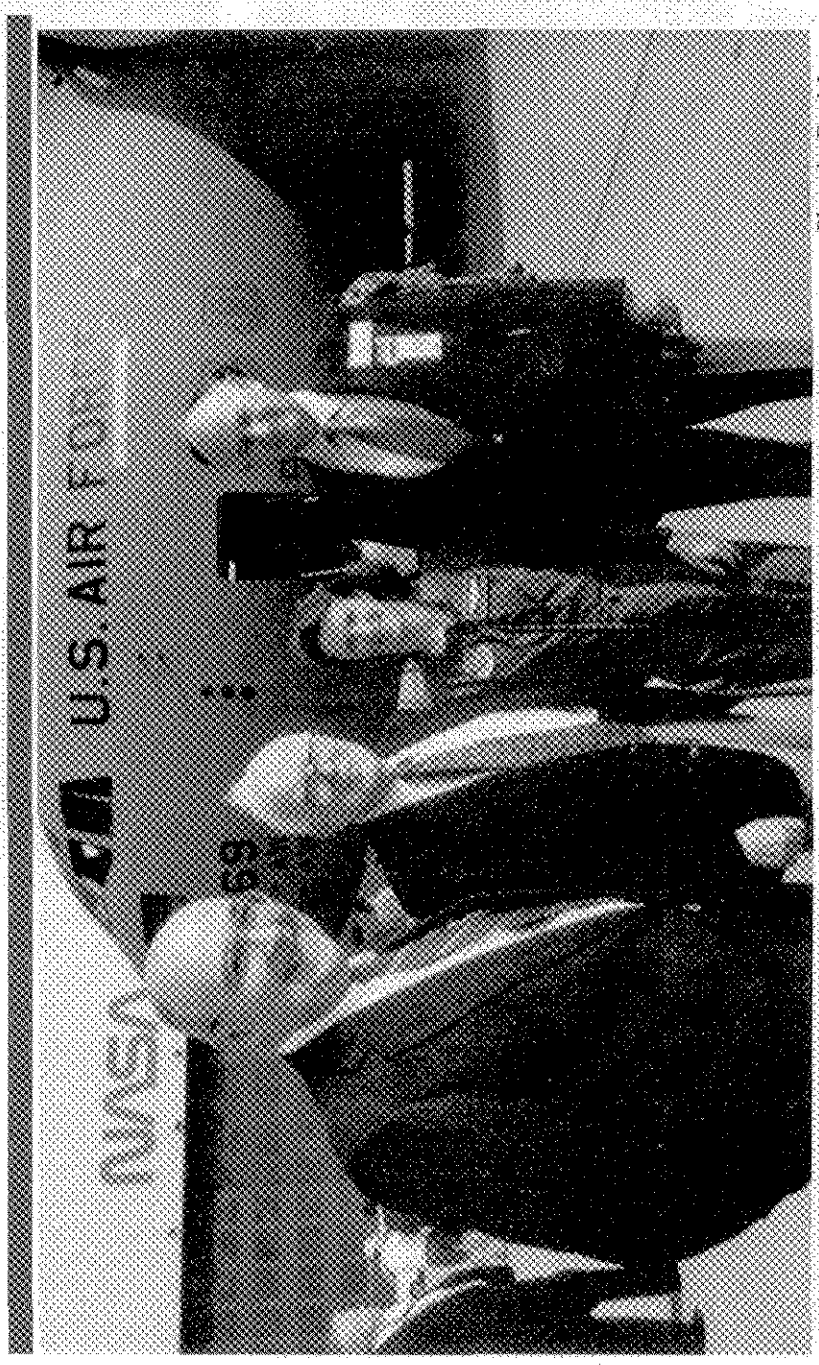


Photo by Fred Jones

TEAM EFFORT – Representatives from each division of the team that brought the C-17 to life gathered outside the Langley hangar after the May 24 ceremony here recognizing the Center's contributions to the plane: Norbert Smith, left, of McDonnell Douglas; Langley retiree Dr. Richard Whitcomb; Capt. Brenda Cabral, U.S. Air Force Reserve; and Stan Ebner of McDonnell Douglas. Whitcomb is the inventor of the aircraft's supercritical wing and winglet.

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Researcher News

National Aeronautics and
Space Administration
Langley Research Center
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National Aeronautics and
Space Administration
Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 13 ❖ June 28, 1996

Viking's Journey to Mars, Via NASA Langley

BY CATHERINE E. WATSON

Twenty years ago, on July 20, 1976, the first Viking lander touched down onto the surface of Mars. The successful flight to Mars of the Viking spacecraft, and the subsequent perfect entry and landing sequence of the Viking Lander, were the culmination of nearly a decade of work by NASA employees and contractors – and the beginning of new chapter in human exploration of the Red Planet.

NASA gave Langley overall responsibility for managing Project Viking in December 1968. Langley had recently proven her mettle with the successful management of the Lunar Orbiter project, which had provided the Apollo project with detailed maps of the lunar surface. Landing sites were chosen using this information.

James Martin, who had been the assistant manager for the Lunar Orbiter project, was chosen by then-Center Director Edgar Cortright to lead the Viking Project. Martin had come to Langley from Republic Aviation in September 1964.

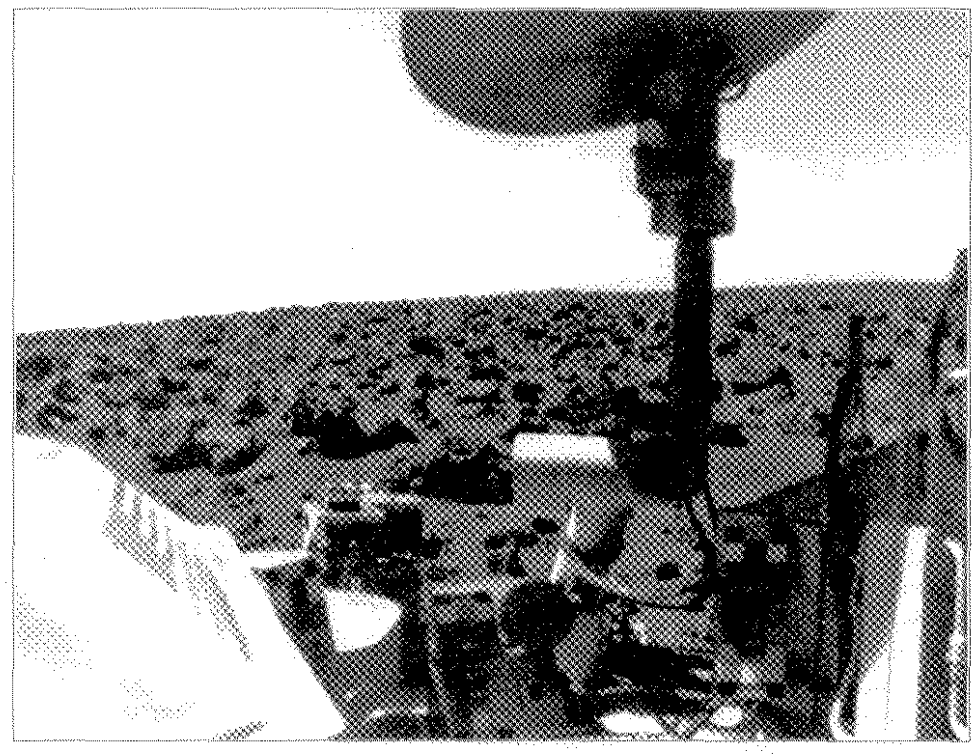
Langley Rises to the Challenge

In addition to overall project management, Dr. Gerald Soffen, a Langley scientist, would chair the Viking Science Steering Group, and Dr. William Michael Jr., also of Langley, would lead the Viking Radio Science Team.

By 1970, more than 250 Langley employees were committed to the Viking project. Fred Staggs, a test engineer, now in Langley's Research and Technology Group, took his family from one coast to another in support of the Viking project.

"The work was hard but very rewarding," Staggs said. "My family still talks about it today, all the things we saw and did."

Staggs, now a contract manager, remembers working 13 hours a day, seven days a week with contractors in Denver to build and test the Viking landers. After living in Denver for 14 months, Staggs took his family to "the Cape," where they lived for 10 months as Staggs helped prepare the Viking spacecraft for its launch to Mars. After the launch, Staggs and his family went to the Jet Propulsion Laboratory in Pasadena, Calif., for 14 months. There, Staggs helped monitor Viking on its journey to Mars, as well as data from the landers after their touchdowns.



NASA Langley Archive photo

The boulder-strewn field of red rocks reaches to the horizon nearly two miles from Viking 2 on Mars' Utopian Plain. The high-gain antenna is pointed toward Earth. Viking 2 landed Sept. 3, 1976.

"We were pushing the envelope of technology," he said, since the computers aboard Viking each contained only 64k of memory. "It would take a month sometimes to prepare a command [to send to the one of the orbiters or landers]." And there was no room for error once a command was sent.

Paul Prillaman, now in the Office of Safety, Environment and Mission Assurance, also worked at the Martin plant in Denver doing quality assurance work for all mechanical parts during the building of the landers. Like Staggs, Prillaman eventually found himself at the Cape where he worked on quality assurance for Lander II.

"We approved every change that was made on the flight hardware," Prillaman recalled. "[Those were] exciting times – [we] really accomplished something. The most memorable time I had working at Langley Field was [during] Project Viking."

Project Viking Results

Project Viking's mission was to obtain detailed scientific information about the structure, atmosphere and surface of Mars – including the possible existence of past or present life forms – thereby increasing understanding of the the solar system's origin and evolution.

In the end, neither Viking lander found any signs of life on Mars. The landers provided extensive data, however, on the composition of the Martian atmosphere and soil, including several years of data on Martian weather.

The Langley-led radio team used radio signals from the Viking spacecraft to measure the amount of delay in the radio signals caused by the sun's gravitational field, confirming Albert Einstein's prediction to an estimated accuracy of 0.1 percent.

(see VIKING, page 5)

Colloquium Communiqué

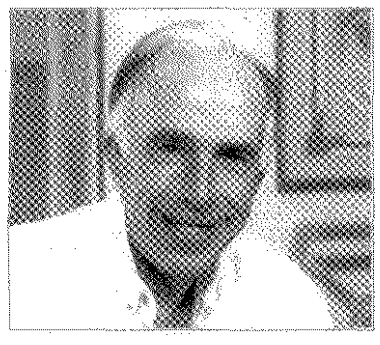
Viking Vision: NASA's Planetary Missions

Twenty years later, Solar System Studies Still Scratching the Surface

BY DANA DUNHAM

Former NASA Langley Director Dr. Edgar M. Cortright will present a Colloquium lecture entitled "Viking and the Exploration of the Solar System," July 16, 2 p.m., in the H.J.E. Reid Conference Center. Civil service personnel should charge their time to B1010.

The journey to the surface of Mars began not with the launch of the Viking spacecraft in 1975, but many years earlier, with the creation of NASA. Cortright, who led the evolution of the lunar and planetary programs, will add his personal perspective to this still-unfolding story.



Dr. Edgar Cortright

How did those space programs evolve? Who were the key players? What were the successes and the failures? Notably, how did Langley become involved and establish a record of mission success? What did we learn from Viking? Was it worth the effort and cost? Where do we go from here?

Cortright will point to mission highlights and to some of the people who made them happen.

Part of the original task force to organize and lead the newly created NASA, Cortright transferred from the NACA Lewis Flight Propulsion Laboratory to Washington, D.C., in 1958. He played a key role in planning and implementing many space flight projects, ranging from meteorological satellites to spacecraft that explored the moon and planets.

Ten years later, he came to Langley and served as Center director until 1975, during the Viking mission.

He then left government service to work in industry, first as technical director of Owens-Illinois Corporation and then as president of the Lockheed-California Company, from 1978 to 1983, when he retired. Since then, he has remained active and is a founding director of the nView Corporation.

Cortright is the author of many technical reports and articles and the editor of two books, *Exploring Space with a Camera* and *Apollo Expeditions to the Moon*.

He will also present "Viking and the Exploration of the Solar System" as a part of the Sigma Series that evening at 7:30 p.m., at the Virginia Air and Space Center in Hampton. The lecture is free and open to the public.

After the presentation, the IMAX film *Destiny in Space* will be shown at regular prices: adults, $5.50; seniors, military and NASA employees (and family) with identification, $4.50; and children under 12, $4.50.

Notices concerning upcoming and recent past Colloquium and Sigma Series lectures are available on the World Wide Web at http://oldtown.larc.nasa.gov/Lectures/lectures.html or from the NASA Langley Home Page at http://www.larc.nasa.gov/larc.html under General Information about NASA Langley Research Center.

To borrow a Colloquium lecture videotape from the Langley library, call ext. 42389.

News Briefs

Around the Agency

ASTRONAUT KATHY THORNTON TO LEAVE NASA – Veteran astronaut Dr. Kathryn C. Thornton will leave NASA on Aug. 1 to join the faculty of the University of Virginia. Thornton, 43, has more than 950 hours in space, including more than 21 hours of extravehicular experience. Thornton joins the faculty as a professor in the School of Engineering and Applied Sciences and also will serve as director of the Center for Science Education.

ENGEN NAMED NEW DIRECTOR OF NATIONAL AIR AND SPACE MUSEUM – Retired Vice Admiral Donald D. Engen, U.S. Navy, has been appointed director of the Smithsonian Institution's National Air and Space Museum. Engen replaces Martin O. Harwit and will assume his new duties in early July. Since January 1995, Engen has been the Ramsey fellow at the National Air and Space Museum. He also serves on NASA's Aviation Safety Reporting System board of advisors and on the Federal Aviation Administration's Research, Engineering and Development board.

1996 SHARP PLUS APPRENTICES SELECTED – NASA and the Quality Education for Minorities (QEM) Network have selected 300 high school students as apprentices to engage in science and engineering research activities as part of NASA's SHARP PLUS Research Apprenticeship Program. Under the guidance of mentors, students spend eight weeks in residence at 14 universities. SHARP PLUS seeks to build the pool of students for math, science and engineering college majors and careers.

Job Fair, Career Seminars Offered

The Second Annual Langley Research Center Job Fair will be held July 25. The Career Transition Assistance Program (CTAP) Center's "How To Do a Job Fair" seminar, July 23, can help you prepare. Advance registration is required for all seminars.

- "How To Evaluate Career Alternatives and Manage a Successful Career Campaign," July 9-10, 9 a.m.-3 p.m., Building 1216
- "The Electronic Landscape and the Net," July 12, 9 a.m.-noon, Building 1312
- "Networking," July 16, 10-11:30 a.m., Building 1312
- "Starting Your Own Business," July 18, 9 a.m.-4:30 p.m., Building 1216
- "How To Win at a Job Fair," July 23, 9-10:30 a.m., Building 1312
- **Job Fair**, July 25, 9 a.m.-3 p.m., H.J.E. Reid Conference Center

All NASA civil service employees and their spouses are eligible for this authorized NASA training. For more information or to register, call Susan Costello at ext. 45000.

Announcements

Speakers Bureau Activities for May

George Allison spoke to students at Churchland Elementary School in Portsmouth about aeronautical careers.

Bobby Braun addressed the Georgia Institute of Technology graduate school about launch vehicle design, as well as the school's undergraduate students on "Multidisciplinary Design Optimization."

Nettie Faulcon spoke to the students of I.C. Norcum High School in Portsmouth about careers in math, science and technology.

Jane Hogge talked to the first-graders at Herman L. Horn Elementary School, Vinton, Va., about NASA's space program.

Karen Jackson and Ed Fasanella teamed up to talk to students at Western Branch Middle School in Chesapeake about aerospace careers. Jackson also addressed the Poquoson Ruritan Club's annual recognition banquet about "The Changing Work Environment."

Naomi McMillin talked to students at Yorktown's Coventry Elementary School about "An Aeronautical Experiment: The Baroncopter Spins Again."

Mary Ann Smith spoke to students at Peninsula Catholic High School about cryogenics.

Dan Vicroy talked about careers in aerospace to students at Sedgefield Elementary School in Newport News.

Technical Library Offers Tours, Workshops

The Technical Library offers workshops and tours throughout July, from 10 a.m. to 11 a.m., in the Library Training Room (301).

To register for the workshops, call ext. 42368 or e-mail workshops @techlibrary.larc.nasa.gov Indicate the dates of the workshops that you wish to attend. Registrations are confirmed electronically.

- ***Searching STILAS on the World Wide Web*** (WWW) (July 3)

Combining the search techniques from the Introductory and Advanced STILAS workshops, this class will show how to access STILAS using WebCat, the WWW interface. Learn to search STILAS and to request materials electronically.

- ***Finding Electronic and Computer Information (July 10)***

Learn search techniques using library resources (staff, print, and electronic). Staff will present a sample search on a subject such as "circuits" so participants will learn which sources to consult for information.

- ***Library Tours (July 11, 18, 25)***

The tours include orientations of library services and electronic resources. Learn basic searching of STILAS, the online catalog. Become familiar with the Library's CDNET, a collection of networked CD-ROM titles. Learn the layout of the library with a walking tour.

- ***Searching UNCOVER on the WWW*** (July 17)

Learn how to access the table of contents of approximately 17,000 journals on the Web and how to set up your own current awareness profile through this electronic service.

- ***Searching CoreAero (July 24)***

Learn to search CoreAero, a database that will be a single point of access for aerospace information, accessible through the STILAS character interface and WebCat. It is currently comprised of unclassified and unlimited citations from NASA RECON. Citations from other government and commercial sources will be added later.

- ***Searching the Internet (July 31)***

Learn different ways to search Internet resources from the Library's home page. Find scientific and business sites and learn to evaluate their usefulness.

Customer Services Listed on the Web

An HTML version of the ISSD Customer Services directory is now available on the Web at URL: http://cabsparc.larc.nasa.gov/ISSDCS/issdcs.html

This list is provided as a service of the Information Systems and Services Division. For more information about the use of the Customer Services List, call the Operations Control Office (OCO) at ext. 46562 or e-mail to: isdcs+oco@larc.nasa.gov

Pins Now Available for Apprentice Alumni

Lapel/tie pins for Apprentice Program alumni are now available from the Employee Development Branch. Contact Rose Mustain at ext. 42588 or at e.r.mustain@larc.nasa.gov Leave your name, extension, and mail stop. Quantities are limited.

Turner Awarded Silver Snoopy

Langley electrical engineer Clayton P. Turner, of the Electro-Optics and Controls Branch, was presented the astronauts' Silver Snoopy Award in a ceremony here April 18. Turner is currently the Technical Project Engineer for the Gas Permeable Polymer Materials project.

Financial Management Course Offered Again

Due to a large response, the Resources and Financial Management Overview course will be repeated July 18 through 19, from 8:30 a.m. to noon.

Presented by Chief Financial Officer Joseph R. Struhar, this course is an in-house program for supervisory personnel. It is a portion of the required training for new supervisors and a review for experienced supervisors.

The resource portion covers the federal budget cycle, as well as NASA's and Langley's roles in the budget process and workforce planning. The financial section addresses the NASA and Langley internal funding and controls, as well as financial reporting, accounting, payroll and travel.

To enroll in this course, send an Application for On-Site Training to DeAnna Wooster at Mail Stop 309 or at fax number 48543 by today, June 28.

Although the course is geared to Langley supervisors, other personnel may enroll as space permits. For more information, call ext. 42591.

Nominations Sought for OPM Seminars, Fellowships

Langley is seeking nominees for Office of Personnel Management (OPM) seminars on management development, for Brookings Management programs and for NASA-sponsored fellowships. All group and division offices should receive memoranda which list these programs and eligibility guidelines.

One- or two-week management education programs at the OPM Management Development Seminar centers in Lancaster, Pa., and Denver, Colo., are open to GS/GM-13s and above who have not attended an OPM seminar in the previous five years.

Brookings Institution conferences are for senior-level managers, GS/GM-15, and Senior Executive Service (SES).

NASA-sponsored fellowships are available for managers and nonmanagers from GS-12 to SES. Management fellowships offer up to one year of study at leading universities. Nonmanagement fellowships allow research or coursework at any institution here or abroad, with a faculty sponsor.

Competition for NASA fellowships begins on Center. Nominees then enter the agency-level competition.

For more agency fellowship information, check the internet at http://www.hq.nasa.gov/office/HR-Education/training.

Applications for all of these programs may be initiated by the individual and must be passed on to the group level. All nominations must have group endorsement by July. Competition for these programs is limited to Langley civil servants. For more information, call ext. 42339.

Thanks to Volunteers for 'Project Remember'

"To the members of the Langley Alumni Association, the Center staff and other friends who participated in 'Project Remember,' I offer my thanks for a job well done and for your expressions of caring and kindness." George Brooks, Project Coordinator

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor. . . . . Keith Henry

Editor. . . . . Mary Graves
Science and Technology Corp.

Assistant Editor. . . . . Jeane Shanks
Science and Technology Corp.

Photographer . . . . . Fred Jones

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

Lighter-Than-Air Transports Researched, Tested at Langley

BY MEGHAN WOODCOCK

If you look back at aerial photos of Langley Air Force Base from the 1920s and '30s, you will see an immense hangar on the northwest side of then-Langley Field. This hangar housed the Army's 19th Airship Squadron, which was stationed there from 1920 to 1935.

In fact, Langley Field was the base for 17 different airships and many types of free balloons, beginning with America's entry into World War I.

NACA's Role

As James Hansen noted in *Engineer in Charge*, personnel from the National Advisory Committee for Aeronautics (NACA) "assisted the squadron with speed and deceleration runs for army airships and improved takeoff, landing, and docking procedures." This led to an even more active involvement by the NACA and to the beginnings of the scientific study of Lighter-Than-Air (LTA) vehicles here in the United States.

A Bird's-Eye View

During World War I, Germany used rigid airships, or *zeppelins*, extensively for military and commercial flight. Britain's largest fear was of the German airships' bombing capabilities. However, it was the airships' observational usefulness that captivated the American military.

Unable to buy a German zeppelin, the U.S. Army acquired the Italian-built *Roma*, as well as other LTA vehicles, to learn more about their military potential. The *Roma* was the first large airship flown by the U.S. military, and its assembly and christening brought much fanfare. Then tragedy struck.

Roma's Fiery Crash

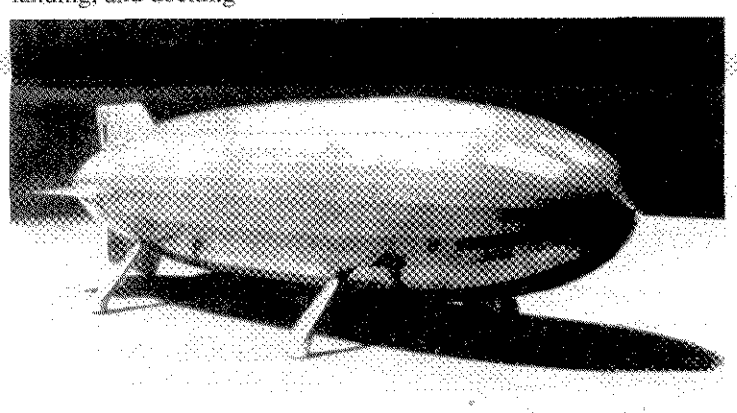
On a test flight originating here at Langley, the nose of the gas bag collapsed. The *Roma* was forced down, hitting power lines near the Norfolk Naval Air Station, causing the hydrogen-filled structure to erupt into a fiery explosion.

Despite the destruction of the *Roma*, LTA advocates believed the use of helium gas and the continued study of airship aerodynamics and structures would eliminate tragic accidents. The Navy, in particular, still aggressively sought to research and flight test airships because of their potential for maritime patrol.

Tunnel Testing

The military turned to the NACA for more extensive research on LTA vehicles. While such activity was common at the time, testing model air-ships in NACA Langley wind tunnels was an unusual depar-ture from research on airplanes.

Besides work on the seals or "envelope" closures for airship gas cells, NACA Langley's research contributions included the perfection of instruments that measured the turning radius of airships. NACA Langley also conducted aerodynamic investigations of the monstrous U.S.S. *Akron* airship.



NACA Langley Archive photo

A 1/40 scale model of the *Akron* airship was tested in the Langley Full-Scale Tunnel. Airships eventually were deemed an unsafe method of transport in the late 1930s.

NASA Langley's Aeronautical Oddities

From the "roaring '20s" to the present, Langley researchers and engineers have aimed to perfect the best aerodynamic designs conceivable. In the process, many strange designs have passed through the Center's research and flight test facilities.

Some of these aeronautical oddities have made significant contributions to the development of flight, illustrating the importance of the imagination, innovation and skill of industry and NASA Langley researchers.

Max Munk, acclaimed Langley physicist of the 1920s, and Robert T. Jones, equally acclaimed aerodynamicist of the 1930s and '40s, both began their careers researching airships.

Airship *Akron*

The *Akron* was to be the Navy's first "flying aircraft carrier", a special design permitted small biplanes to be carried inside the hull. In 1931, scale models of the *Akron* were tested in the 20-foot Propeller Research Tunnel and in both the closed- and open-throat designs of the Variable Density Tunnel.

Predicting the stability of proposed aerodynamic designs for airships was difficult because the scale models used in wind tunnel tests did not always correlate to the flight trials of full-scale airships.

In the mid-'30s, the Navy requested an investigation into the *Akron's* ground-handling capabilities. Engineers simulated landings and other ground maneuvers using a 19-foot model of the Akron (1/40 scale) in the Full Scale Tunnel.

End of an Era

To the dismay of some NACA researchers, Langley ended its research on airships in 1938—one year after the explosion of Germany's greatest zeppelin, the *Hindenburg*.

The succession of spectacular crashes and explosions over the preceding two decades had led the American public to conclude that airships were unsafe. No American airline ever bought or used airships commercially.

Beyond Ballpark Blimps

Today, of course, we are familiar with the sight of helium blimps hovering over sporting events.

Aerospace Daily recently reported that two U.S. companies, Skysat Communications Network Corp. and Av-Intel Inc., have pro-posed to use airships at high altitudes to carry equipment for cellular or personal com-munications, as well as for television and radio broad-casting.

Instead of carrying passengers, these new airships would function like satellites, presenting entirely new research questions, which might well end up being researched by a new crop of young engineers at Langley.

Langley Learning Laboratory Comes Alive Over Airwaves

First Live Broadcast Joins Education Office, Teachers in Interactive Program

BY SHELLEY CANRIGHT

Lights, cameras, action – and reality was in the making. From its electronic studio, the Office of Education broadcast its first live, interactive program to teachers in Hampton and Newport News on June 6.

With this event, Langley conducted its first official distant educational endeavor as the Code R-designated Center of Excellence for Distance Learning.

The satellite program, "From TV Viewer to Active Learner," was developed in support of an earlier video program – "Navigating: How Do I Get There from Here?" – developed and broadcast in support of National Engineers Week in February.

The first program targeted educators in elementary schools, grades four through six. The broadcast collected feedback from educators on the quality and usefulness of the program design.

The program exposed teachers to the content and activities that were featured in the student "Navigating" program. It also provided an inquiry-based approach to examining how one learns from media, as well as suggestions to teachers for helping students get the most out of instructional videos. Teachers were able to call and to fax in questions and comments during the broadcast.

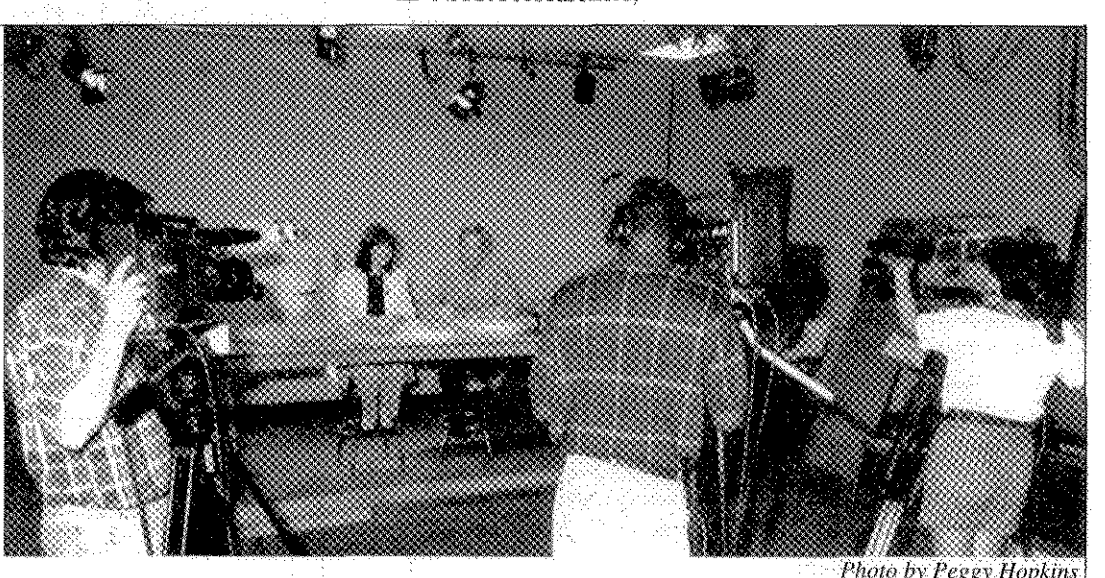


Photo by Peggy Hopkins

Program hosts Dr. Shelley Canright, Center education programs officer, and Patterson Biggs, aerospace education specialist, go "on air" to help elementary and middle school teachers integrate aeronautical charts into math and reading lessons. Cameramen Chris Link, left, Vernon White and Kim Tatum provide the technical know-how to produce the broadcast.

Both the student and teacher programs are prototypes for a proposed *Think BIGG* instructional video series. The proposed 1996-97 series would contain distinct episodes that target specific mathematics concepts or skills through a problem-based, aeronautics-related situation. Main characters Biggs and the animated Mission Man provide the problem and clues for students to use in resolving the problem.

Each *Think BIGG* episode will include a live, interactive teacher program and a prerecorded student program. The series will include supporting print materials and computer links.

Wing-Box Successfully Tested for RLV Program

BY ANN C. GAUDREAUX

A full-scale segment of a graphite-composite wing designed for a reusable launch vehicle (RLV) was successfully "tested to failure" at Langley's Structures and Materials Research Lab to determine the maximum load that the wing-box could carry and its mode of failure.

The wing-box broke at twice the design limit load. "Load" is defined as the forces that a component of the vehicle experiences during take-off, landing and various maneuvers. Design limit load is the maximum load that a component is expected to experience one time during the life of the vehicle.

"Knowing at what load and how a structural component fails is essential to being able to design a vehicle that will be safe at all expected flight conditions," Dr. Wayne Sawyer said. Sawyer works in the Thermal Structures Branch and serves as Langley's principal investigator for the wing-box test program for the X-33 RLV.

This is the first structural test of a full-scale component designed and fabricated to validate the use of a graphite-composite primary structure for the RLV. The test results validated the design, analysis and fabrication procedures with excellent agreement obtained between the predicted results and the experimental results.

The wing-box test component, 6 feet wide by 10 feet long by 3-1/2 feet deep, was designed and fabricated by a Rockwell International/ Northrop-Grumman industry team, using a high-temperature graphite bismaleimide composite material. The use of graphite-composites for the primary structure – the wings; the thrust structure, which connects the engines to the vehicle; and the intertank, which connects the fuel tanks of the RLV – is essential for a cost-effective launch system that can also meet the weight requirements for a single-stage-to-orbit vehicle.

NASA and the aerospace industry are testing reusable launch vehicles as future spacecraft that can be used in the commercial market as well as for scientific research. Future RLVs may be designed to lower the costs of research and manufacturing in space.

Structural health monitoring sensors also were installed on the test component to verify their use for the RLV. An effective health monitoring system would reduce the need for physical inspections of critical components, such as the wings or the fuel tanks, and could significantly reduce operation costs and improve launch reliability. Langley responded to requests by its industry partners, Rockwell International/Northrup-Grumman, to accelerate the tests by four months, advancing the time of testing from 11 months to seven months. Langley researchers successfully conducted the tests ahead of schedule so that the industry partners could include the results in their RLV Phase II, X-33 proposal.

Three companies are presently bidding on Phase II of NASA's RLV program; NASA will announce the winner of the competition by July 1.

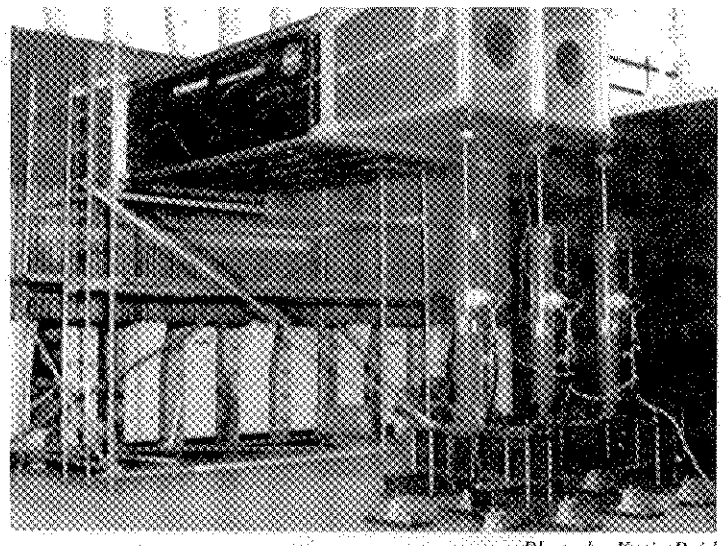


Photo by Katie Reid

This full-scale segment of a graphite-composite wing box, designed for use in a reusable launch vehicle, was successfully "tested to failure" in Langley's Structures and Materials Research Lab.

Revolutionary Launch Vehicle Renamed for Space Pioneer

NASA NEWS RELEASE

NASA Administrator Daniel S. Goldin has announced that the agency's experimental DC-XA flight vehicle — a vertical takeoff and landing rocket ship — will be renamed "Clipper Graham" in honor of the late Lt. Gen. Daniel O. Graham.

"NASA is committed to developing and demonstrating reusable launch vehicle technologies," Goldin said. "Graham was a visionary who championed the promise of fully reusable single-stage-to-orbit vehicles at a time when the majority of the space community were skeptics. We're doing this in commemoration of his vision in opening the space frontier."

Formerly called the Delta Clipper, the four-story DC-XA is currently conducting a series of unmanned flight tests in New Mexico for NASA. The project was conceived to provide NASA's Reusable Launch Vehicle Program with an early, small-scale flight demonstration of advanced technologies required by reusable launch vehicles. The DC-XA, developed by the Department of Defense, incorporates the latest advances in technology, propulsion systems and composite materials.

X-34 Contractor Selected for Negotiations

NASA NEWS RELEASE

NASA has selected Orbital Sciences Corp., Dulles, Va., for final negotiations leading to the award of a contract to build a small, reusable technology demonstrator vehicle, known as the X-34, and to begin flight testing it in late summer of 1998.

The contract includes the first two X-34 flight tests and covers a program valued at approximately $60 million.

The fast-track X-34 program calls for demonstrating a vehicle that will be capable of flying up to 25 times a year at a cost of $500,000 or less per flight, attaining altitudes of at least 250,000 feet, and flying at speeds of up to eight times the speed of sound.

Other specifications for the vehicle include use of advanced thermal protection systems and demonstration of the ability to fly subsonically through rain and fog.

Flights of the X-34 will involve testing of new technologies such as composite material structures, composite tanks and new, integrated avionics, as well as demonstrations of safe abort and autonomous landing techniques for high cross winds, using advanced landing systems. The selection of Orbital Sciences for negotiations follows the NASA Research Announcement in March which restructured the X-34 program.

The current program puts primary emphasis on demonstrating key technologies for a small, reusable vehicle, not tied to potential commercial applications. The X-34 effort is part of NASA's Reusable Launch Vehicle technology program, aimed at reducing the cost of access to space and at promoting new space services and other activities that will improve U.S. economic competitiveness.

Hatch Act Spells Out Election Year Rules

Some Restrictions Still Apply to Federal Employees' Political Participation

United States citizens will elect to office their president, vice president, all 435 members of the House of Representatives and one-third of the members of the Senate on Nov. 5. Reform of the Hatch Act two years ago gave federal government employees most of the political participation rights of other U.S. citizens, but certain restrictions remain.

The following lists provide examples of both permissible and prohibited activities for all NASA employees, except those who are career members of the senior executive services (SES); career SES still falls under the previous, more restrictive Hatch Act.

For more information, call the Office of Special Counsel, an independent federal agency which investigates violations of the Hatch Act, at 1-800-854-2824 or (202) 653-8944.

Federal employees **may:**

- Be candidates for public office in nonpartisan elections
- Register and vote as they choose
- Assist in voter registration drives
- Express opinions about candidates and issues
- Contribute money to political organizations
- Attend political fund-raising functions
- Attend and be active at political rallies and meetings
- Join and be an active member of a political party or club
- Sign nominating petitions
- Campaign for or against referenda, constitutional amendments, municipal ordinances
- Campaign for or against candidates in partisan elections
- Make campaign speeches for candidates in partisan elections
- Distribute campaign literature in partisan elections
- Hold office in political clubs or parties
- Provide information requested by Congress, its committees and staff
- Make public statements concerning the agency's programs
- Express opinions to Congress or anyone else on any subject.

Federal employees **may not:**

- Use their official authority or influence to interfere with an election
- Collect political contributions unless both individuals are members of the same federal labor organization or employee organization and the one solicited is not a subordinate employee
- Knowingly solicit or discourage the political activity of any person who has business before the agency
- Engage in political activity while on duty
- Engage in political activity in any government office
- Engage in political activity while wearing an official uniform
- Engage in political activity while using a government vehicle
- Solicit political contributions from the general public
- Be candidates for public offices in partisan elections
- Wear political buttons while on duty.

Air Force Cadets Trade Classroom for Langley Lab

BY MARY M. SPRACHER

Two Air Force Academy seniors left behind their marching boots, their engineering textbooks and the foothills of the Rocky Mountains for a unique opportunity to apply what they've learned.

Cadets 1st Class Andrea Houk and Devin O'Dowd arrived at NASA Langley on May 19 to spend five weeks working with researchers in the Measurement Science and Technology Branch.

Houk, an aeronautical engineering major, is assisting in the acquisition and analysis of Particle Image Velocimetry (PIV) data sets for tests being performed for the Structural Acoustics Branch. Houk is learning how to set up the PIV system, which provides a way to measure velocity fields, with the hope that she can take her knowledge back to the Air Force Academy and help set up a similar system there.

"I'm learning a lot about what NASA really does, that it's not just about the space shuttle," Houk says. "Working here is a good experience. We're getting a good view of what's on the other side, the civilian side, and how what we're learning in school can be applied in the professional world."

O'Dowd, also an aeronautical engineering major, is assisting in the analysis of acoustic microphone array data for the Langley Airframe Noise Program.

"I'm learning a lot about the scientific research process," he says. " I'm also gaining computer skills."

"I'm learning a lot about what NASA really does, that it's not just about the space shuttle."

Andrea Houk, Air Force Cadet 1st Class

Each summer the Air Force Academy, in Colorado Springs, Colo., sends its top cadets, rank ordered by academic and military performance, to various Air Force and government laboratories. There, the sponsored cadets work on a variety of research projects, typically for five to six weeks. The program is designed for top cadets between their junior and senior years.

One of NASA Langley's major selling points for the two cadets was location. "I really like this base and the area it's in," Houk says. "I like how so much of American history is all based right here."

"One reason I came to Langley was to get to do some traveling," says O'Dowd, "to see [Washington] D.C., Yorktown, Kitty Hawk, Williamsburg, Manassas. Langley was my first choice, even over places like Eglin Air Force Base [Fort Walton Beach, Fla.], because I would rather be here where I could see the sights."

Other than a trip to Boston, this is the first time the Albuquerque, N.M., native has seen the East Coast, he says.

He will return to the academy this summer to teach survival training. After graduation next May, he hopes to earn his master's degree at George Washington University or another civilian school.

An Oxford, Ohio, native, Houk will teach basic training when she returns to the Academy this summer, she says. After graduation, she hopes to attend graduate school and earn her master's degree. Then she will "go wherever the Air Force sends [her]."

Five Army Employees Retire from Langley This Year

BY HENRY RUSSELL

The first half of 1996 has marked the retirement of five Army employees from NASA Langley:

Mary Lee Taylor retired in March after more than 25 years of service to the Army as a secretary and then as an office services clerk. She was one of the first Army employees to work at Langley when the Army Office was first established here in 1969. She served as the Army Office timekeeper. Her immediate plans include traveling, writing a book, and spending time with her family in Florida.

Ned Johnson retired in May after serving more than 30 years as an accountant in the NASA Office of the Comptroller, Financial Management Division. He worked for NASA for the first seven years of his career, then switched to the Army. Johnson, a life-long resident of the Hampton Roads area, plans to remain here.

Jammie Bohlken also retired from the Army in May just as she reached the 30-year mark. She served as the lead budget analyst for the three Army commands at Langley and was responsible for the day-to-day interactions between the Army and NASA in all aspects of budget affairs. Her immediate plans include getting through her daughter's wedding, resting, and considering employment as an accountant for a local bowling league.

Kanu Gandhi retired in May after more than 30 years with the Army as a mechanical engineer. Gandhi first came to NASA Langley from Watertown, Mass., in the fall of 1992 as the result of a base closure at that site. He may return to India to pursue the teachings of Mohandas K. Gandhi, his late grandfather.

Raul Dominguez, a mechanical engineer, also from Watertown, Mass., took an early retirement. He had served the federal government for eight years. The early retirement will give him time with his family in New Mexico. He will either join the family construction business or pursue employment with private industry in the Southwest.

Spokesman for Space

NASA Langley retiree Charlie Nixon, who now lives on North Carolina's Outer Banks, has become a favorite guest speaker of that area's elementary school students. He talks to the youngsters – mostly third-, fourth- and fifth-graders – about his experiences working at NASA Langley and about the future of space exploration. Nixon has spoken to schoolkids in Kitty Hawk, Kill Devil Hills, Manteo and Cape Hatteras.

VIKING

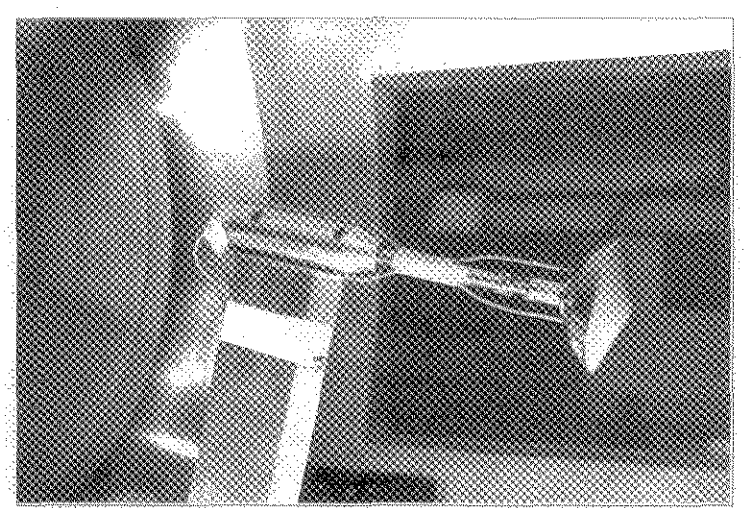
(continued from page 1)

Project Viking was turned over to the Jet Propulsion Laboratory on April 1, 1978. Viking Lander I transmitted data from July 20, 1976, until Nov. 11, 1982; Viking Lander II transmitted from Sept. 3, 1976, until April 11, 1980.

The Viking Orbiter I mapped the surface of Mars until Aug. 7, 1980, and Orbiter II until July 25, 1978, providing more than 52,000 high-quality photos.

The Viking mission was terminated on May 21, 1983, after controllers had tried unsuccessfully for more than six months to regain contact with Lander I. The original contract called for the landers to last for only 90 days – but both exceeded that time frame by several years.

Today, many Project Viking veterans remain at Langley, scattered throughout divisions that didn't exist 20 years ago, working with computers and other equipment they could only dream about then. But their continuing commitment to understanding our planet and universe has remained constant in an ever-changing research environment.



NASA Langley Archive photo

A Viking model is tested in Langley's 20-inch Mach 6 CF-4 tunnel.

Mars Symposium Explores Red Planet

Hosted by NASA, the Planetary Society and Lockheed Martin Corporation, the 1996 Mars Symposium, "Mars Revisited: A Forward Look," will be held at the National Academy of Sciences, Washington, D.C., July 18-19.

Dr. Carl Sagan will begin the program with a public lecture on Mars exploration, July 18 at 7 p.m. NASA Administrator Daniel Goldin will chair a panel on future exploration.

The July 19 symposium, held from 9 a.m. to 4 p.m., will feature Dr. Mike Carr, former Viking Orbiter Imaging Team Leader.

Carr and others will summarize current knowledge of Mars and will discuss future scientific exploration, including the upcoming Pathfinder and Discovery missions.

For more information and reservations, call Judy Cole at 865-7604, fax 865-8721, or e-mail cole@stcnet.co

National Spaceweek Picnic, Model Rocket Launch

The Langley Chapter of the National Space Society will hold its annual picnic and model rocket launch July 20, from 10 a.m. to 4:30 p.m., at the H.J.E. Reid Conference Center. Model rockets – built at the event or brought by participants – will be launched in the field behind the Reid Center.

Food concessions will be set up adjacent to the launch area from 11 a.m. to 2 p.m. For more information, call ext. 45375.

AdVentures

FOR SALE: Entertainment center, all oak and hardwood, holds up to 32-inch TV, light blonde finish. $425, compare at $900-plus. Cocktail table with hand-crafted glass top, 17 inches tall by 36 inches wide by 66 inches long. $400. Call 728-0379.

FOR SALE: Jenny Lind crib with mattress, excellent condition, $75; Jenny Lind changing table, excellent condition, $25; Graco stroll-a-bed stroller, excellent condition, $30; Century infant car seat/carrier, excellent condition, $25; Century port-a-bed, excellent condition, $40. Call 867-7319 after 5 p.m.

FOR SALE: Cape Fear 17-inch fiberglass Carolina skiff, with cuddy cabin, 70-horsepower Yamaha in outboard well, new canopy, fish finder, trailer with electric winch. $3,500. Call John Lasley at 463-1823.

FOR SALE: 1985 Toyota Camry. $2,750. For more information, call 838-6000.

FOR SALE: House in Berkeley's Green in Williamsburg-Rt. 5 area, 2 stories, 4 BR, 2-car garage, deck, gas heat, on cul-de-sac. Community has pool, tennis courts, clubhouse. $149,000. Call 229-5662 before 9 p.m. for appointment.

FOR SALE: 1970 Galaxy boat, 1971 85-horsepower Johnson motor, trailer and 2 gas tanks. Needs some work. May be seen at NASA Langley. $500 cash. Call 229-5662 before 9 p.m.

FOR SALE: Indian Cove Resort lifetime membership at Virginia Beach. Large, full-service campground with two swimming, fishing, boating. Priced to sell quickly at $1,250. Call 865-0586.

BOOKKEEPING SERVICES: For small and large businesses, offering a wide range of accounting, payroll and tax services. Call Suzanne at 874-3121.

LANGLEY KIWANIS CLUB FORMING: Kiwanis, an international service organization that supports many community charities, is forming a new club serving the NASA Langley community. For more information, call 851-5533 or 851-0750.

ALUMNI SUPPER: The NASA/LaRC Alumni Association will have its annual covered dish supper on July 18, 6 p.m., at the H.J.E. Reid Conference Center. For more information, call 595-1306.

TICKET DISCOUNTS: The Exchange Shop is selling discounted tickets to many area attractions, including AMC Movie Theaters, Colonial Williamsburg and Jamestown-Yorktown, Nauticus, Virginia Air & Space Center, Kings Dominion and Busch Gardens. Sign up at the shop to win four Busch Gardens tickets. Drawings are held one week in advance of the ticket date. For more information, call ext. 41585.

VASC SUMMER CENTER MOTOR TOURS: Now through August, the Virginia Air & Space Center offers summer motor tours of NASA Langley Research Center. Tours cost $4 with the purchase of any VASC admission ticket. For tour times, call 727-0900.

TECHNOLOGY 2006 Conference, Oct. 29-31, Anaheim Convention Center, Anaheim, Calif. Sponsored by NASA, the Technology Utilization Foundation and *NASA Tech Briefs* magazine. For more information, call 1-800-944 NASA, or fax to 212-986-7864.

NACA REUNION VII: Oct. 3-6 in Hampton. All former NACA employees and members of NASA Langley Alumni Association and guests are invited. Send registration forms no later than July 1 to P.O. Box 6260, Newport News, Va., 23060-3850. For more information, call 595-1306.

LAA CARNIVAL: Aug. 16-17. See our web site, "1996 Carnival" under "General Information" on the Lantern Home Page. Call Geoff Tennille at ext. 45786, Skip Schroeder at ext. 47320, or the appropriate chair listed on the Web to volunteer or to make suggestions.

FOURTH AT THE FORT: Fort Monroe's annual Fourth of July celebration, 4-9:30 p.m., at Walker Field, features live bands, fireworks, food concessions, amusement rides, games and military exhibits. The public is invited, and admission is free. A rain date, July 5, is planned for the 106th Army Band concert and the fireworks. For more information, call 727-2312/3302.

3...2...1...LIFTOFF: The Thermal Structures Branch is hosting a farewell reception for Dr. Charles J. Camarda, who is leaving for Johnson Space Center as a candidate in the astronaut program. Come to the Thermal Structures Laboratory, Building 1267, July 17, 1-4 p.m., to say good-bye to Charlie.

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Researcher News

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23681-0001

Official Business. Penalty for Private Use $300.

Paul F. Holloway

H. Lee Beach

Four sessions have been scheduled to permit as many employees, retirees and contractors as possible to attend. You are invited to come to a specific session based on your last name. If that conflicts with another activity, you are welcome to attend one of the other three sessions.

Monday, July 8

9:30 - 10:30 a.m.
A to E

1:30 - 2:30 p.m.
F to K

Tuesday, July 9

9:30 - 10:30 a.m.
L to R

1:30 - 2:30 p.m.
S to Z

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Seizing Opportunity

H.J.E. Reid Conference Center • 14 Langley Boulevard

National Aeronautics and Space Administration
Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 14 ❖ July 12, 1996

NASA Honor Awards Spotlight Center's Best

H.J.E. Reid Awards Acknowledge Langley-Authored Research Works

BY DANIELLE BECK

The 40th annual NASA Honor awards were presented June 26 at the H.J.E. Reid Conference Center to 61 individuals and groups. These awards recognize employees who have made outstanding contributions to NASA and Langley. Center Director Paul F. Holloway and Dr. H. Lee Beach Jr., deputy director, presented the awards.

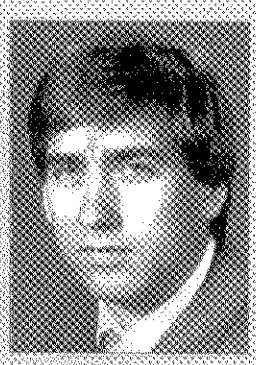
The qualification process begins as Langley sends employee nominations to NASA. Administrator Daniel Goldin approves the agency's most prestigious honor awards and presents them to carefully selected individuals and groups who have made outstanding contributions to NASA's mission.

VIPs in attendance included Richard T. Whitcomb, the first-ever award recipient. Whitcomb received a Distinguished Service Medal from NACA in 1956 for the discovery and experimental verification of the area rule, which permitted supersonic flight by aircraft.

H.J.E. Reid Award

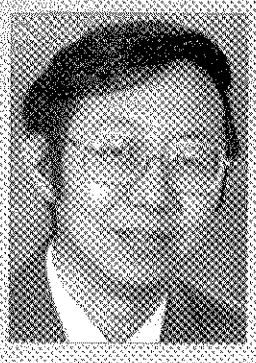
The H.J.E. Reid Award recognizes the outstanding scientific or engineering paper authored by a Langley employee or group of employees. This year's winners, pictured below, were honored for the outstanding papers entitled "Injection Seeding I: Theory" and "Injection Seeding II: Ti: Al2O3 Experiments."

James C. Barnes



William C. Edwards

Norman P. Barnes



Liang-guo Wang

(see AWARDS, pages 4-6)

Thank you, Paul, for all you've done here during the past 36 years

Center Director To Resign Post

Paul F. Holloway has announced he is stepping down as director of NASA Langley Research Center no later than early October.

Holloway said he is stepping down now to allow the appointment of a center director who could make a longer-term commitment to steering NASA Langley through the challenges facing the agency the rest of the decade.

"This is the lull before the November election, and after that, NASA Langley is going to need the services of a center director who is willing to stick around for a while," said Holloway, a NASA Langley employee since the beginning of his aerospace career in June 1960. "Everyone knows I have been considering leaving shortly, and this is a good time to do it."

Paul F. Holloway

"Paul Holloway will be missed," said NASA Administrator Daniel S. Goldin. "His career spans almost the entire history of the Space Age, and his many achievements at Langley are a tribute to his talent, his professionalism and his dedication to the importance of NASA aeronautical programs. We wish him all the best in the future."

The 58-year-old Poquoson native said that he may remain in federal service but has yet to decide his future plans. Holloway will work closely, he said, with the NASA Associate Administrator for Aeronautics, Dr. Robert Whitehead, to ensure an orderly transition.

"This has been my life for so many years, and I have made many friends," Holloway said of his time here. "But I am confident that the wonderful people of Langley will carry on the reputation of this center as a world-class facility."

Holloway was named center director in October 1991 and is the sixth since Langley was founded in 1917 as the nation's first civilian aeronautical research laboratory.

Since joining NASA at Langley, Holloway has seen his career advance steadily. He has worked primarily on the space side of the research center and contributed directly to the development of the space shuttle.

In addition, Holloway has represented Langley on numerous space station, shuttle and space transportation committees and boards and served three high-level tours of duty at NASA Headquarters in Washington, D.C.

Holloway specialized in hypersonic aerodynamics, boundary layer transition and flow separation, analysis of entry flight mechanics and Earth orbital and planetary space missions. He has written 42 technical publications in his fields of expertise.

Holloway began his NASA career at Langley more than 36 years ago as an aerospace research engineer. He was appointed head of the Systems Analysis Section, Aero-Physics Division, in 1969; head of the Aerospace Operations Analysis Branch, Space Systems Division, in 1971; and chief of the Space Systems Division in 1972. In May 1975, Holloway became director for space. In February 1985, he was named deputy director of Langley.

Holloway has earned numerous awards, including the NASA Outstanding Leadership Medal, the NASA Exceptional Service Medal, the NASA Distinguished Service Medal, the NASA Equal Employment Opportunity Medal, the Presidential Rank of Meritorious Service, and two Senior Executive Service

(see DIRECTOR, page 7)

Reusable Launch Vehicle Rockets Forward

After Langley Lets Go of Phase I, X-33 RLV Heads West for Phase II

BY ANN C. GAUDREAUX

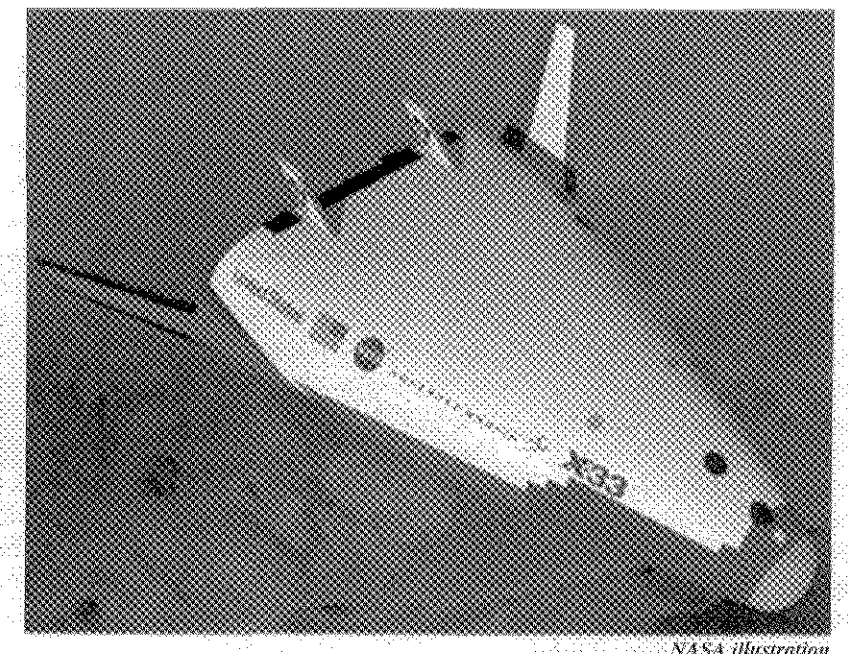
Due largely to Langley's role in the Phase I development of reusable launch vehicles (RLV), the country's next generation of space transportation took a more tangible turn early this month, as NASA announced the finalist for its X-33 RLV technology program competition July 2.

Lockheed Martin Corp. – one of three California-based contract bidders – will continue the Phase II portion of the program, which will focus on efforts to build and fly a scaled-down prototype of a reusable space transportation vehicle by 1999.

Technologies developed during the first phase of the X-33 program have included research, analysis and testing at Langley.

"Langley employees were involved in a wide range of promising technologies for the X-33 program that can be used in future space systems for the government and commercial sectors," said Jim Arrington of the Thrust Management Office. Arrington heads the Center's efforts for the X-33 RLV program.

NASA is testing reusable launch vehicles as future spacecraft that can be used in the commercial market as well as for scientific research. The RLVs of the future are being designed to lower the transportation



NASA illustration

The winning RLV design, from Lockheed Martin Corporation, features a wedge-shaped ship with a "lifting body," capable of vertical takeoff and horizontal landing.

(see RLV, page 7)

News Briefs

Around the Agency

SEGA LEAVES ASTRONAUT CORPS – Astronaut Ronald M. Sega, Ph.D., left NASA on July 1 to rejoin the faculty at the University of Colorado at Colorado Springs. Sega was selected as an astronaut in 1990, making his first shuttle flight in 1994 aboard Discovery. From November 1994 to March 1995, Sega served as NASA's Director of Operations, Russia, responsible for managing NASA activities supporting astronaut and cosmonaut training for flight on the Russian Mir space station. His second shuttle flight was in 1996 as payload commander for the third shuttle/Mir docking mission aboard Atlantis. Sega had been on an extended leave of absence from the university. He returns as Dean of the College of Engineering and Applied Science.

Budget Process Continues To Foster Uncertainties

BY LEE RICH

This year's fiscal year 1997 budget process, driven by the November elections and by the late passage of the budget resolution, promises to be less traumatic than last year's difficulties. Members of Congress are focused on Nov. 5: All 435 seats in the House of Representatives and 33 seats in the Senate are up for re-election, and the presidential race is on.

With the budget timetable behind schedule and, despite a budget resolution cut of $15 billion in the Clinton administration's nondefense discretionary spending budget, appropriations measures may remain relatively clean in an effort to avoid the gridlock/veto spiral of last year.

The VA-HUD bill has passed in the House, with NASA's appropriation (HR 3666) set at about $13.6 billion. Mission to Planet Earth (MTPE) was cut by $220 million.

The House of Representatives passed FY '97 NASA appropriations for $13.6 billion – $5.3 billion for Human Space Flight; $5.6 billion for Science, Aeronautics and Technology; $2.5 billion for Mission Support; the balance for Inspector General and miscellaneous.

(see BUDGET, page 7)

Job Fair, Career Seminars Offered

The Second Annual Langley Research Center Job Fair will be held July 25. The Career Transition Assistance Program (CTAP) Center's "How To Do a Job Fair" seminar, July 23, can help you prepare. Advance registration is required for all seminars.

- "Networking for Contact Development," July 16, 10-11:30 a.m., Building 1312
- "Starting Your Own Business," July 18, 9 a.m.-4:30 p.m., Building 1216
- "How To Do a Job Fair," July 23, 9-10:30 a.m., Building 1312
- **Job Fair**, July 25, 9 a.m.-3 p.m., H.J.E. Reid Conference Center
- "Negotiating Salary and Benefits," Aug. 1, 9 a.m.-noon, Building 1312
- "How To Evaluate Career Alternatives and Manage a Successful Career Campaign," Aug. 7-8, 9 a.m.-4:30 p.m., Building 1216
- "Starting Your Own Business," Aug. 21-22, 9 a.m.-4:30 p.m., Building 1216
- "Making Yourself Indispensable," Aug. 27, 9 a.m.-noon, Building 1216
- "So, You Want To Be a Consultant!" Aug. 29, 9 a.m.-3 p.m., Building 1216

All NASA civil service employees and their spouses are eligible for this authorized NASA training. For more information or to register, call Susan Costello at ext. 45000.

Announcements

Math, Science Students Win 1996 NTA Awards

NASA Langley cosponsored the 11th National Technical Association (NTA) Technical Student Symposium in Mathematics and Computer Science, held at Norfolk State University (NSU) in April. The symposium provided a forum for 24 NSU seniors to present results of their yearlong research activities to a peer audience in a technical forum. Langley NTA members Martha Brown, Stan Woodard, Elijah Kent, Glenn Hines, Michael Chapman and John Bowen judged the event. Two students won awards in the computer science category, and three in mathematics.

National Press Women Recognize Schauer

The National Federation of Press Women presented Cathy Schauer, Office of Public Services, with a first-place national award in June for her role as publicity chairman for Langley's 1995 Combined Federal Campaign in the nonprofit internal communications category.

July Blood Drive Set; Needs Center Donors

All Langley employees, contractors and retirees may attend the next blood drive, July 26, 9 a.m. to 3 p.m., in the H.J.E. Reid Conference Center.

Blood drives for the remainder of the year will be held Sept. 25 and Nov. 27. Charge your time for the blood drive to J.O. B1004. For more information, call Karen Ridlon at ext. 43194.

Pins Now Available for Apprentice Alumni

Lapel/tie pins for Apprentice Program alumni are now available from the Employee Development Branch. Contact Rose Mustain at ext. 42588 or at e.r.mustain@larc.nasa.gov Leave your name, extension, and mail stop. Quantities are limited.

Safety Awards Presented

James Dezern, Composites and Polymers Branch, and Edwin Zellers, Management Information Systems Branch, received Facility Safety Head awards from the Executive Safety Board.

EO Office Announces Personnel Changes

Patsy L. Campbell, equal employment specialist in the Office of Equal Opportunity Programs (OEOP), has been appointed Langley's Hispanic Employment Program manager (HEPM). She also serves as the Center's Affirmative Employment Program manager and Federal Women's Program manager.

The previous HEPM, Vivian B. Merritt, was promoted to OEOP head in February.

Campbell is currently coordinating with Langley Air Force Base's HEPM to cosponsor an event for Hispanic Heritage Month in September. To submit ideas, contact her at ext. 43291 or e-mail p.l.campbell@larc.nasa.gov.

Dollie M. McCown recently became Discrimination Complaints and EO Counseling Program manager in the OEOP. She comes from the Logistics Management Office and was a co-lateral EO counselor for 14 years. Contact her at ext. 43561, or send e-mail to d.m.mccown@larc.nasa.gov.

Kimberly A. Stefani joins the OEOP staff as an interpreter for the Center's deaf and hard-of-hearing employees. She is a temporary, part-time appointment and comes to Langley from Hampton City Schools, where she served as a sign language interpreter. Contact her at ext. 41090 or e-mail k.a.stefani@larc.nasa.gov.

Langley Contractors Steering Council

The Langley Contractors Steering Council (LCSC) was formed in November 1990 to serve as a catalyst for a cooperative working relationship between Langley and its contractor community.

LCSC provides a framework for informal working relationships between contractors and the Center, provides a forum for discussion among contractors on issues of mutual interest, and facilitates communications.

Membership consists of representatives from each of Langley's on- and near-site contractor organizations, as well as Langley organizations.

LCSC meets monthly on the third Thursday of each month and is co-chaired by Dr. Belinda H. Adams, assistant director for planning, and a council-elected contractor member who serves a limited term.

Anderson King, Technology Applications, Inc./DynCorp I&ET, became co-chair earlier this year. Outgoing co-chair H. Pat Haney of Lockheed Engineering and Services Co. received a leadership award for his service the past two years.

As one of many cooperative efforts between Langley and its contractors, the LCSC joins NASA each year in supporting National Engineers Week. Nearly a third of the Langley volunteers who participated this year came from the contractor community.

LCSC meetings allow Langley to keep its contractors informed of important changes in government procurement and to seek their input about new Center regulations.

New Web Site Solicits Ideas

Advanced Concepts & Technology (ACT) is an on-line idea solicitation Web site sponsored by the Langley senior scientist. Located at http://www.larc.nasa.gov/lantern/act/, the dynamic site encourages NASA researchers to "think forward, think high risk, think different" and allows for interactive feedback – anonymously, if desired – on ideas, questions, and comments.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following Langley employees are approved leave recipients: Marilyn K. Aldrich; Catherine K. Cronin; Holly A. Elliott; A. Wayne Richardson; Cassandra Stevens; Charles S. Washington.

Anyone interested in donating leave to recipients in the program should send donations on a "Request To Donate Annual Leave to Leave Recipient Under the Leave Transfer Program" form via computer in Informed Manager to Mail Stop 293, Office of Occupational Health Services, or fax the form to ext. 49114. For more information, call Karen Ridlon at ext. 43194.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor ..... Keith Henry

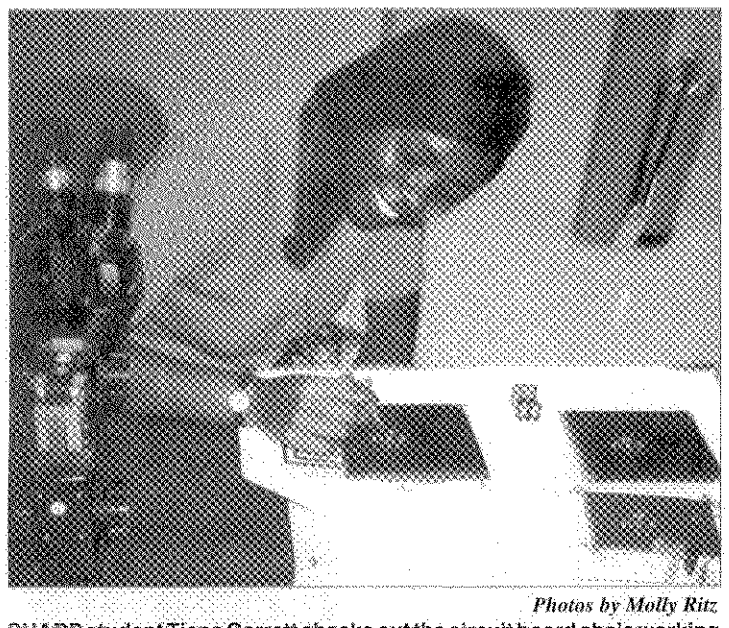
Editor ..... Mary Graves
Science and Technology Corp.

Assistant Editor ..... Jeane Shanks
Science and Technology Corp.

Photographer ..... Fred Jones

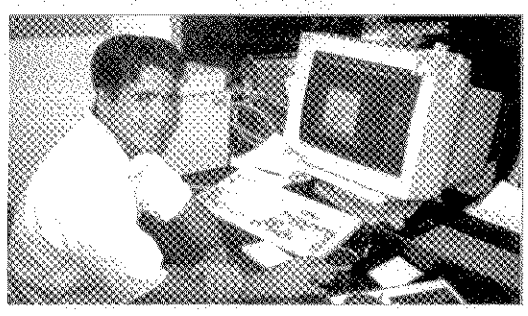
The privilege of listing announcements in this publication is restricted to the employees, contractors and retirees of the Langley Research Center. Articles must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

SHARP Students Reflect Acronym



Photos by Molly Ritz

SHARP student Tiana Garrett checks out the circuit board she's working on as part of her project with SAIC.



SHARP student David Spracher works on a computer graphics program called "Jello."

BY MOLLY RITZ

Instead of relaxing at the beach this summer or working at a fast food restaurant, some local high school students are working with Langley employees through NASA's Summer High School Apprenticeship Research Program (SHARP).

Students selected for SHARP must show strong interest and aptitude in engineering, mathematics and science. The eight-week program was developed to give students opportunities to gain valuable work experience in the fields they may eventually plan to study.

"I enjoy working here because of the hands-on experience and learning about the engineering world," said Delwyn Lee, a Granby High School student working in the Aerodynamic Measurement Branch.

"I have the opportunity to see many different facilities that I normally would not see," said David Spracher, a rising senior at Tabb High School.

While working in the Scientific Applications Branch with Computer Sciences Corp., Spracher is spending most of his time learning how to use different computer graphics programs.

"I get excited when I finally figure out how to execute a program," Spracher said.

"SHARP has allowed me to broaden my scope on my future educational experiences," said Tiana Garrett, a student at I.C. Norcom High School who is working with Science Applications International Corp. (SAIC). "When I came to Langley, I wanted to enter the medical profession, but now I'm leaning more towards engineering."

"The program allows me the chance to work alongside an actual researcher, gaining valuable, hands-on experience," said Cyntrica Eaton, also a Norcom student working with SAIC, "because there are some things you just cannot learn from a book."

The students receive daily assignments that require detail and precision. They prepare both oral and written reports and engage in enrichment activities. A mentor is assigned to each student to guide him through daily tasks.

"Working with my mentor and other Langley staff is the best part of my visit so far," said Josh Johnson of Bruton High School. He is working with Computer Sciences Corp.

"I'm not a computer whiz, and I feel fortunate enough to be able to learn such neat things here," Johnson said.

NASA Technology Travels to Area Classrooms

BY MOLLY RITZ

Teachers from mostly Hampton Roads-area elementary and middle schools are visiting Langley this summer to take part in the Teacher Enhancement Institute (TEI).

The teachers are here to learn how to integrate math, science and technology into their schools' curricula using NASA's aviation and aeronautical concepts. The teachers will also sharpen their Internet skills and become familiar with the Office of Education's distance learning programs.

"The overall theme of the institute is to introduce the problem-based learning model, with an emphasis on aeronautics," said Tina Marshall-Bradley, TEI coordinator. The instructors will introduce and model new innovative techniques for the teachers to use in their classrooms.

Through a competitive selection process, Langley offers three, two-week TEI workshops, exposing teachers to daily instruction by other educators, NASA specialists and various special guests.

Photo by Derek Felton

TEI participants learn about an aviation concept called "Bernoulli's Principle."

"The program is exciting and fun, and it always keeps me on my toes," said Wanda Trimble, from Kingsolver Primary School in Louisville, Ky. "My experience in the program definitely will be rewarding for my students this fall."

"The TEI program is action-packed," said Cordelia Ossi, a participant from Larchmont Elementary School in Norfolk. "I am always doing something new."

"The program is giving me a new perspective on teaching," she continued. " I am now able to understand the aeronautical concepts behind mathematics and science. I'll go back to school this fall with a new enthusiasm for those disciplines."

During the upcoming academic year, the teachers will develop and implement an aeronautics lesson unit.

NASA will provide ongoing support and three follow-up workshops during the year. Upon completion, teachers will earn three graduate credits from Christopher Newport University.

Photo by Molly Ritz

Wanda Trimble experiments with the unmanned space flight concept.

Watson Heads to Harvard for NASA Fellowship

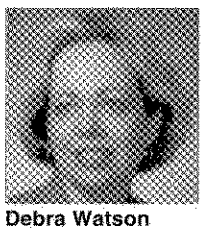
BY DANIELLE BECK

Debra E. Watson, chief of Langley's Programs and Resources Division, has received the Lucius N. Littauer Master in Public Administration (MPA) Fellowship at Harvard University.

Watson will report for the 10-month program at Harvard's John F. Kennedy School of Government later this month and will return to Langley next June. She competed agency-wide for the fellowship and is NASA's sole recipient.

The program will allow her to revisit and build upon her existing managerial skills, Watson said, and will provide exposure to current managerial practices, public policy issues and new financial management concepts.

The MPA program, for mid-career professionals working in public service, strengthens participants' policy analysis and management skills and prepares them to assume positions of greater leadership and responsibility, she said.



Debra Watson

Watson is excited, she said, and feels honored to represent NASA and Langley in the prestigious fellowship program.

"How many times are you given the opportunity to go back to school in the middle of your career?" she said.

After receiving a master's degree in business administration from the College of William and Mary, Watson completed the Education for Public Management program at Cornell University.

She began her Langley career in 1974 as a management intern. For the past 22 years, she has served the Center in many capacities, from contract specialist to lead program analyst and, now, division chief.

Multi-Cultural Leadership Team Corner

What's Your Diversity IQ?

1. A majority of the African-American community prefers the term
   A. Black
   B. African-American
   C. Negro
   D. Person of color
2. The Federal Family and Medical Leave Act expands the definition of parent-child relationship to include
   A. Gay and lesbian partners
   B. Anyone who took the place of a parent
   C. Biological parent only
   D. Aunts or uncles who live nearby
3. Recent surveys of corporate managers, university professors, doctors, lawyers and first-line supervisors reveal that, in a comparable job, women earn
   A. One dollar for every dollar that a man earns
   B. 80 cents for every dollar that a man earns
   C. 40 cents for every dollar that a man earns
   D. 70 cents for every dollar that a man earns
4. In the 1990-91 recession, a net job loss was experienced only by
   A. Hispanics
   B. Women
   C. African-Americans
   D. None of the above
5. According to the recent survey of executive women in industrial and service companies, women identified their greatest professional obstacle as:
   A. Personal vs. professional trade-offs
   B. Convincing others of their ability
   C. Limited education
   D. Lack of managerial experience
   E. Lack of confidence

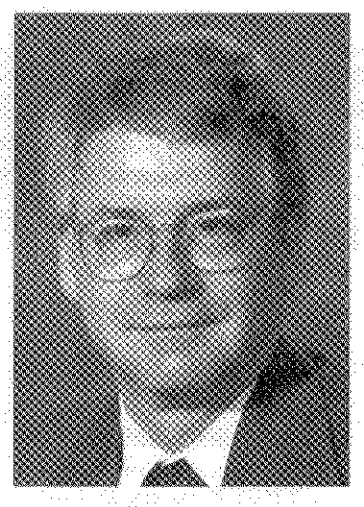
Answers are on page 8.

NASA Honor Awards

Outstanding Leadership Medal

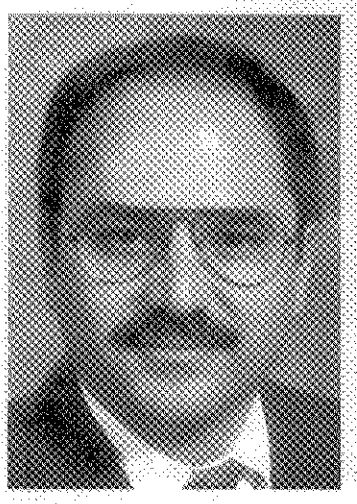
This medal is awarded for notably outstanding leadership affecting NASA's technical or administrative programs. It may recognize an act of leadership or sustained contributions, based on an individual's effectiveness as a leader, on the productivity of the individual's program or on demonstrated ability to develop the administrative or technical talents of other employees.

James M. Russell III
For outstanding contributions to middle atmosphere chemistry and dynamics as principal investigator for the HALOE experiment on the Upper Atmosphere Research Satellite.



Darrell R. Branscome
For outstanding leadership and personal dedication to the Nation's Civil Space Program.

Bruce J. Holmes
For outstanding leadership and management of General Aviation research and technology.



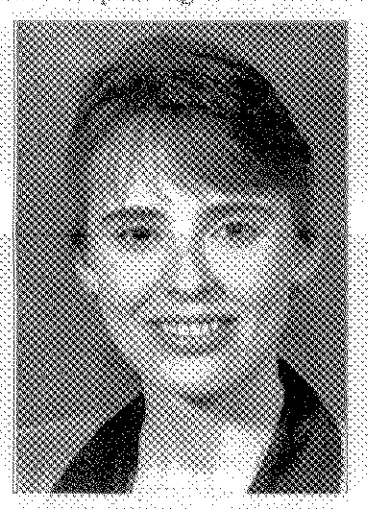
Humberto T. Garrido
For exemplary sustained leadership resulting in improved and effective safety and mission assurance support for NASA.

M. Patrick McCormick
For outstanding leadership in conceiving, developing and implementing spaceborne remote sensors that have advanced scientific understanding of processes in the atmosphere.

Exceptional Service Medal

This medal is awarded for significant, sustained performance which demonstrated unusual initiative or creative ability, resulting in substantial improvements or contributions in engineering, aeronautics, space flight, administration, support or space-related endeavors.

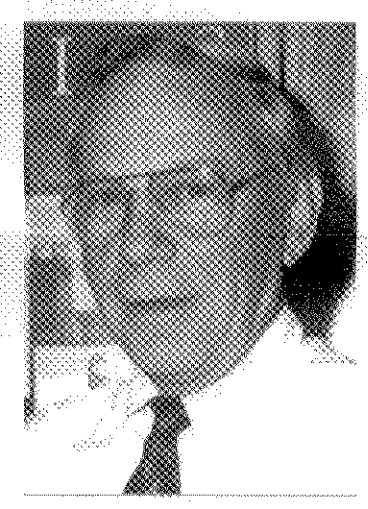
Barry N. Hogge
For outstanding contributions and leadership in managing technical support to Langley's aerospace research facilities.



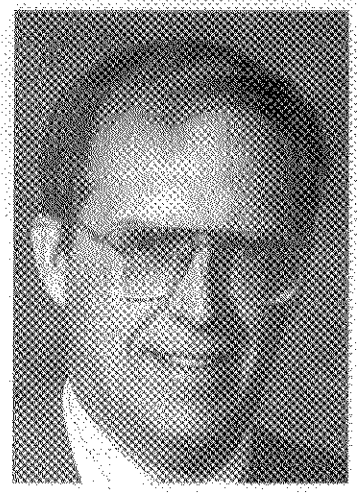
Catherine J. Prohaska
For outstanding achievement in the development and execution of resources implementation procedures to support NASA's and Langley's missions.

Virginia B. Marks
For exceptional contributions in administrative, resource and logistics support to the agency's High-Speed Research Program.

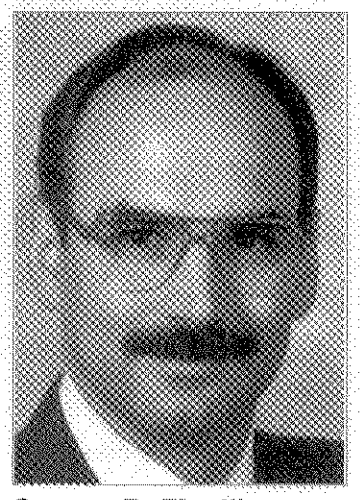
Kenneth L. Jacobs
For exceptional controls engineering and up-front studies for NASA's advanced aerospace research facilities.



George G. Steinmetz
For exceptional service to the NASA Air Transportation Systems Programs.

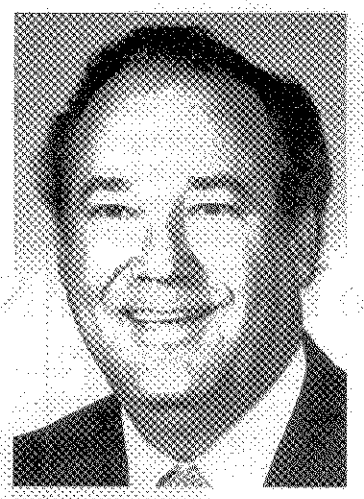


Blair B. Gloss
For exceptional service in the development and improvement of NASA's major wind tunnel facilities.

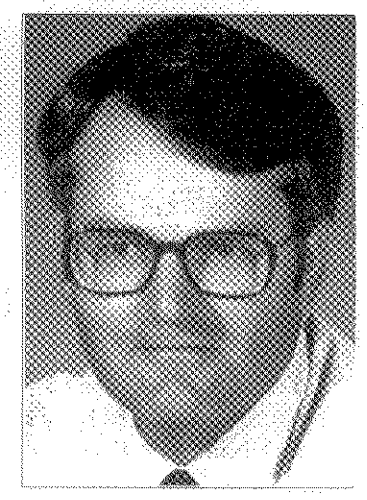


George B. Finelli
For exceptional service in managing the Computing and Critical Disciplines Programs and for contributions to flight software development.

John G. Davis Jr.
For exceptional service and management of Advanced Composites Research and Technology Programs.



R. Thayer Sheets
For exceptional service and leadership in implementing the agency's Small Business Innovative Research Program.



H. Benson Dexter
For exceptional leadership and initiative in developing composite materials and manufacturing processes for airframe structures used for commercial transport and general aviation aircraft.

Not Pictured:

Charles W. Antill Jr.
For exceptional technical contributions leading to the successful flight demonstrations of NASA's first spaceborne lidar, LITE, and first autonomous airborne differential absorption lidar, LASE.

Robert A. Baals
For exceptional technical contributions in support of aerospace research conducted at Langley's Acoustics Research Laboratory.

David S. Coombs
For outstanding achievement and sustained performance in mechanical fabrication to support NASA projects.

Kathy A. Dezern
For exceptional performance in support of the Fluid Mechanics and Acoustics Division and the Research and Technology Group.

Karen W. Evans
For exceptional service to the Office of the Director and to Langley Research Center.

James M. Hoell Jr.
For exceptional sustained service in planning and directing the NASA Global Tropospheric Experiment Project.

Carl E. Horne
For sustained outstanding performance as the Center's principal electrical engineering resource for test facilities.

Timothy P. Stubbs
For exceptional achievements in goods and services acquisition to support Langley's mission.

Vernon E. Watkins Jr.
For exceptional initiative and creativity leading to improvements in wind tunnel test article production and test integration.

NASA Honor Awards

Exceptional Achievement Medal

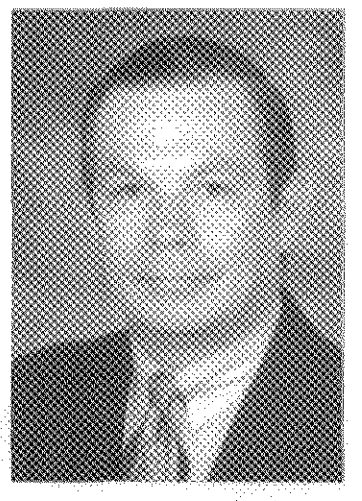
This medal is awarded for a significant, specific accomplishment or contribution that resulted in a substantial improvement in operations, efficiency, service, financial savings, science or technology.

Ronald R. Krodel
For leadership in reengineering and implementing a new small purchase acquisition process.

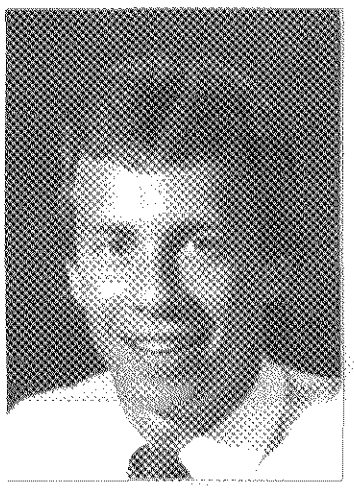
Dana J. Dunham
For exemplary performance in leading efforts to restructure flight dynamics test facilities in support of Center goals.

Junilla I.Boatwright Applin
For outstanding leadership in the design, development, integration, and successful flights of the Gas Permeable Polymer Materials experiment.

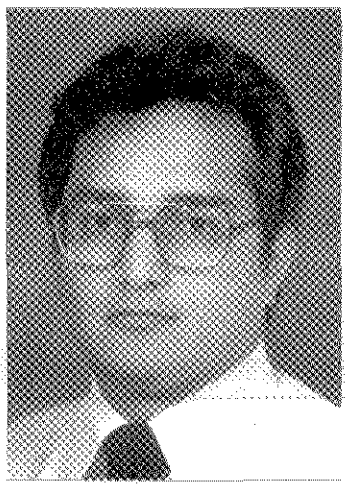
Alvah S. Moore Jr.
For exceptional achievement and long-term dedication to the development of the Lidar Atmospheric Sensing Experiment.



Charles M. Southall III
For exceptional initiative and creativity in leadership of the Operations Support Division.



Robert D. Braun
For outstanding achievement in application of flight systems entry analysis to space missions and commercial launch services.



Vincent B. Cruz
For outstanding contributions to the design, development and fabrication of a Multichannel Cryogenic Pressure Sensor Module for the space shuttle's main engine.

Not pictured:

Plesent W. Goode IV
For exceptional performance in developing unique telerobotics technology and applying it to NASA and industry needs.

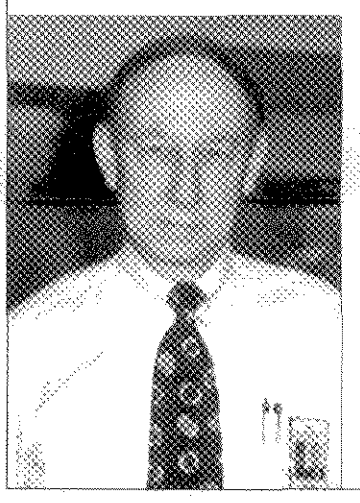
Syed Ismail
For outstanding contributions to atmospheric active remote sensing and to the understanding of significant atmospheric processes through the development of the Laser Atmospheric Sensing Experiment.

Min Namkung
For exceptional achievement in the development of electromagnetic NDE technologies.

Connie G. Stott
For exceptional achievement in managing the Langley Research Center Bankcard Program.

Exceptional Engineering Achievement Medal

This medal is awarded for unusually significant engineering contributions toward achievement of NASA's mission.



Melvin C. Gilreath
For major engineering achievements in the development of radar cross-section measurement systems for advanced aircraft applications.

Not pictured:

William M. Hall
For outstanding engineering contributions leading to the successful demonstration flights of NASA's first autonomous airborne DIAL instrument, the Lidar Atmospheric Sensing Experiment.

Public Service Group Achievement Award

This group award goes to a group of non-government employees in recognition of outstanding accomplishment and substantial contribution to NASA's mission.

Mason and Hanger Incorporated RI & QA Laboratory, accepted by Davis S. Rabon Jr.
For outstanding dedication and support to the improvement of quality in materials and supplies by Langley Research Center.

Group Achievement Award

This award recognizes the coordination of many individual efforts to produce an outstanding accomplishment and substantial contribution to NASA's mission.

Active Noise Control Team, accepted by Richard J. Silcox
For conducting creative and pioneering studies of active noise and vibration control.

Advanced Composites Structures and Materials Technology for Transport Aircraft Team, accepted by John G. Davis Jr.
For innovation, dedication, and teamwork in the successful completion of the Advanced Composites Technology Phase B Program.

AST Noise Reduction Broadband Fan Noise Experiment Team, accepted by Dennis L. Huff
For innovation, dedication, and cooperation in the timely planning and implementation of the AST Noise Reduction Broadband Fan Noise Experiment.

Formal Methods Research Team, accepted by Ricky W. Butler
For development of formal methods technology to improve the integrity of life-critical computer systems and for demonstrated efficacy to the U.S. aerospace industry and the FAA.

Fuselage Structural Integrity Analysis Team, accepted by Charles E. Harris
For developing an accurate structural analysis methodology for predicting the structural integrity and residual strength of fuselage structures with widespread fatigue damage and long cracks.

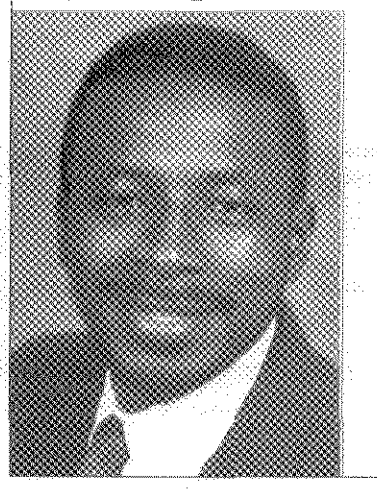
(see AWARDS, page 6)

Exceptional Scientific Achievement Medal

This medal is awarded for unusually significant scientific contributions toward achievement of NASA's mission, recognizing individual contributions to or enhancements of the field of science.

Lamont R. Poole
For outstanding contributions to the understanding of the role of stratospheric clouds and aerosols in the chemistry of the Earth's ozone layer.

Equal Employment Opportunity Medal



This medal is awarded for outstanding achievement and contributions to NASA's Equal Employment Opportunity programs, either within government or within community organizations or groups.

Woodrow Whitlow Jr.
For outstanding service and personal commitment to the goals of Equal Employment Opportunity and its implementation at Langley.

Findings from Hubble Deep Field Home In on Distant Galaxies

NASA NEWS RELEASE

Astronomers analyzing the Hubble Deep Field — the faintest view of the universe taken with NASA's Hubble Space Telescope — have identified what may prove to be the most distant objects observed to date. Scattered among the nearly 2,000 galaxies in the Hubble images, which were taken last December, researchers at the State University of New York at Stony Brook (SUNY) and collaborators found several dozen galaxies they believe exhibit characteristics which make them appear to be more distant than any seen previously. Six of the galaxies appear to be more distant than the farthest quasars, the current distance record holders. Their results were published in the June 27 edition of the British science journal *Nature*.

The candidate galaxies are so far away they may have existed when the universe was less than five percent its present age. If this early galaxy population can be confirmed through further observations, it means that such galaxies would have formed remarkably early in the history of the universe, only a few hundred million years after the Big Bang. The images also give an estimate of how many galaxies were forming at this time in the very early universe.

In one of the first detailed studies of the statistical properties of these distant galaxies, Kenneth Lanzetta and Amos Yahil, of SUNY at Stony Brook, and Alberto Fernandez-Soto, of the University of Cantabria, Spain, have attempted to determine the distance of each of the galaxies based on their colors.

"Since light travels at a finite speed, the galaxies are seen as they were in the distant past, allowing us to study the birth and growth of galaxies versus time," says Lanzetta. "Our results have implications bearing not only on the formation and evolution of galaxies but also on the ultimate fate of the universe," adds Yahil.

The team's distance estimates rely on the relationship between speed and distance in the expanding universe. The expansion of the universe causes the light from distant galaxies to be "redshifted." This means that light which leaves a distant galaxy as blue arrives at Hubble as red because of the expansion of space. For a nearby galaxy, the shift from blue to red is relatively small. But for a distant galaxy, the shift is dramatic, because the light is crossing a larger volume of space.

The researchers took the colors of different kinds of nearby galaxies and redshifted them on a computer to compare with the colors of galaxies observed by Hubble. For each galaxy, they assigned a "most probable" redshift based on the best match to the "spectral templates" they developed.

While the procedure is not definitive for any individual galaxy, the authors contend that it is correct for the majority of galaxies and gives a good overall view of the distribution of distances of the galaxies seen in the Hubble image. If the redshifts are correct, then the light from these galaxies was emitted when the universe was far less than one billion years old.

"I am delighted to see the images being used for such studies. The discovery of high-redshift galaxies is a provocative result, and extremely interesting if it is right," says Harry Ferguson of the Space Science Telescope Institute in Baltimore, Md., a member of the team that obtained the Deep Field Observations. "It's going to be extremely difficult to confirm, but that will be a high priority for the new infrared camera that is going on the telescope next February."

The Hubble Space Telescope spent ten days in December 1995 observing a single tiny patch of sky. These observations resulted in the deepest image of the sky, revealing galaxies fainter than had ever been seen before. The striking full-color image of the distant universe was unveiled at the American Astronomical Society Meeting in January, and for the last six months has been the subject of intense study worldwide.

The Space Telescope Science Institute is operated by the Association of Universities for Research in Astronomy, Inc., for NASA, under contract with the Goddard Space Flight Center, Greenbelt, Md. The Hubble Space Telescope is a project of international cooperation between NASA and the European Space Agency.

AWARDS

(continued from page 5)

HALOE Science Data Validation, Data Processing, and Flight Operations Team, accepted by James M. Russell III
For outstanding contributions to the success of the HALOE/UARS satellite experiment through data validation studies, science data processing code development, and execution of instrument flight operations.

High Pressure Air Project Team, accepted by Carlos S. Perez-Ramos
For outstanding design, implementation, and activation of the High Pressure Air Project.

Langley Research Center Soluble Imide Development Team, accepted by Robert G. Bryant
For outstanding technological achievement in the development of LaRC™-SI.

LASE Experiment Team, accepted by Alvah S. Moore Jr.
For the successful demonstration of the first fully autonomous differential absorption lidar system used to study important atmospheric processes for NASA's Mission to Planet Earth.

National Transonic Facility Productivity Assessment/Improvement Study Team, accepted by Henry S. Wright
For outstanding engineering accomplishments in the assessment of productivity issues crucial to the National Transonic Facility.

Pegasus Support Team, accepted by John W. Paulson Jr.
For outstanding accomplishments in support of the Pegasus XL Program.

Galileo Probe Entry Environment Team, accepted by James N. Moss
For development and application of advanced computational and experimental techniques that defined the thermal entry environment for the successful Galileo probe mission to planet Jupiter.

Public Service Medal

This medal is awarded for exceptional contributions to NASA's mission by an individual who was not a government employee during the performance period.

John F. Finger
For outstanding technical guidance and innovation in the field of electromagnetics research and measurement techniques in support of the Agency's Advanced Aircraft Program.

The late Clayton E. Howerton, accepted by his nephew, Barry Kidwell
For outstanding technical contributions to the ERBE and CERES experiments.

Shimer Zane Pinckney
For exceptional achievement in advancing state-of-the-art methods for predicting dual-mode ramjet/scramjet flowpath performance and in resolving levels of propulsion performance for airbreathing hypersonic vehicles.

Norbert F. Smith
For outstanding dedication and liaison efforts in supporting Langley's mission.

Edgar A. Starke Jr.
For exceptional contributions in advanced materials and structures for aeronautics and space transportation systems.

Editor's Note: Photos were not available for the above award recipients.

NASA, Industry-Developed Software Helps Damaged Planes Land Safely

NASA NEWS RELEASE

Airplanes that suffer major equipment failures or explosions will be able to land safely using new software jointly developed by scientists at NASA Ames Research Center, Moffett Field, Calif., and McDonnell Douglas Corp., St. Louis, Mo.

In less than a second, the damaged aircraft's computer will be able to "relearn" to fly the plane using special neural net software. Grave problems, such as partially destroyed wings, fuselage holes and sensor failures, greatly alter how an airplane handles, and pilot controls may not work or might respond oddly, according to NASA aerospace engineers.

"Once we prove neural net software can rapidly learn to fly a crippled jet fighter and help pilots land it safely, then engineers will be more likely to use the intelligent software in power plants, automobiles and other less complicated systems to avoid disasters after equipment failures," said NASA Ames computer scientist Charles Jorgensen.

Jorgensen is the principal investigator for the four-year Intelligent Flight Control Program at Ames. Preliminary flight tests are underway at NASA Dryden Flight Research Center, Edwards, Calif., using early versions of the new software installed in a modified F-15 jet fighter.

Simple neural net software that can "learn" has been used since the 1960s with computer modems which enables them to receive error-free data over noisy telephone lines, according to Jorgensen.

Airplane sensors can send speed, direction and force data to the computer program. The aircraft's computer compares the pattern of what is actually happening to the aircraft with a pattern showing how the airplane should fly.

If there is a mismatch, the computer software makes the system work with a new pattern.

Jorgensen's Neural Net Group at Ames is working with McDonnell Douglas aerospace engineers to develop the software and modify aircraft to enable them to recover during flight following severe damage or unexpected events.

RLV

(continued from page 1)

costs for research and manufacturing in space.

NASA envisions that the Phase II portion of the X-33 program will demonstrate that technologies are in hand for industry to attract private investment in the commercial development and operation of full-scale, next-generation launch systems.

"Significant levels of demand for RLV-based launch services are expected from all U.S. space sectors – civil, commercial, military and intelligence – as well as from foreign governmental and commercial space sectors," Arrington said. "The private sector could play a significant role in managing the development and operation of a new reusable space transportation system."

Workers from Langley, a NASA Center of Excellence for Structures and Materials, performed research for reusable cryogenic tank systems, composite structures, the metallic and composite thermal protection system, vehicle systems analysis, aerodynamic and aerothermodynamic testing and analysis, structures and materials and flight control technology development.

Reusable Cryogenic Propellant Tanks

The cryogenic propellant tanks in a X-33 RLV vehicle, which hold liquid hydrogen and withstand extremes of heat and cold in space, comprise 80 to 90 percent of the vehicle's weight. Langley has been involved in investigating alternate designs and in testing subcomponent parts, as well as large-scale test articles, for use in the X-33 RLV program.

Langley investigated its own sandwich designs with a honeycomb core and advanced cryogenic foam insulation samples, made from a high-temperature, highly durable polyimide, called LaRC™-IA.

Langley tested several alternate designs in which tank structural pieces, cryogenic insulation, thermal protection system and integrated health monitoring features were all incorporated.

By including all of these parameters from the beginning of the design, a lighter-weight, operable, efficient and reliable tank system can result.

Systems Analysis Contributions

Employees from the Vehicle Analysis Branch were part of the system analysis teams of each of the three RLV contractors, providing analysis results over a broad range of design issues. Key contributions were made in these areas:

- Development of the aerodynamic configuration to meet the needs of the systems design and operational flight environment
- Finding the best configuration design features to provide the strongest flight control characteristics while reducing weight and cost
- Development of flight control logic and guidance algorithms to provide acceptable vehicle flying characteristics – taking the RLV from hypersonic speeds to landing, even under the presence of severe winds
- Description of the aerodynamic heating design environments, based on integrating the flight path information with heating data from combinations of experimental and computational sources
- Description of operational maintenance characteristics based on space shuttle and aircraft databases
- Development of flight abort strategies which allow safe aborts with limited landing sites.

Metallic Thermal Protection System

Two of the three RLV industry teams have proposed metallic thermal protection systems (TPS) as a durable, lightweight and highly operable solution for RLV that can significantly reduce life-cycle costs and can ensure an all-weather vehicle capability.

Langley has the lead in developing metallic and refractory (heat-resistant) TPS. In-house efforts involve design, analysis and testing of metallic TPS, particularly a "superalloy" honeycomb TPS concept.

This concept consists of a foil-gage metallic box encapsulating a low-density fibrous insulation material that is mechanically attached to the vehicle's structure.

Improvements to this system include a more efficient insulation, a simpler, lighter weight arrangement and a quicker-release fastener system for easier installation and removal. Metallic TPS have survived a series of ground and flight evaluations to demonstrate resistance to high- and low-speed impact, rain erosion, lightning strike and different aerothermal and aeroacoustic conditions.

Two metallic TPS concepts were flight-tested on the space shuttle Endeavour in May on STS-77. The tests confirmed aerothermal performance of the metallic TPS.

Structures Tested

A full-scale segment of a graphite-composite wing-box – the inner structure of an RLV wing – designed for a reusable launch vehicle successfully "tested to failure" to determine its maximum load and its mode of failure. Tested at the Structure and Materials Research Lab, the wing broke at twice the design load limit.

This was the first structural test of a full-scale component designed and fabricated to validate the use of graphite-composite primary structure for the RLV.

Composite materials were developed for this wing-box to make it strong and lightweight. It was designed and fabricated by a Rockwell International/Northrop-Grumman industry team, using a high-temperature graphite bismaleimide composite material. The test results validated the design, analysis and fabrication procedures.

A sensor system was also installed on the test component to verify its use as a Vehicle Health Monitoring (VHM) system for assessing the RLV's structural integrity. The VHM system consisted of both fiber-optic and acoustic emission sensors that measure and record wing-box strains, bending and acoustic events associated with structural damage.

"An effective health monitoring system will provide real-time nondestructive evaluation during ground and flight operations," said Leland Melvin, Nondestructive Evalu-ation Science Branch. "Routine inspections of critical components, such as wings or fuel tanks, can be virtually eliminated, therefore significantly reducing operation costs and improving launch reliability."

Testing New Materials

Researchers from the Materials Division are conducting tests to determine the mechanical properties and to evaluate the microstructures of lightweight alloys for application in the X-33 and other RLV vehicles. Time-dependent properties for reuse are under investigation in both Russian and U.S. alloys.

Aerothermodynamics Testing

The Aerothermodynamics Branch formed three teams of research engineers to work with industry partners. The teams provided experimental and computer databases across the speed range from entry to landing, as well as the aeroheating, both in TPS design and thermal-structural analysis, for the industry X-33 configurations.

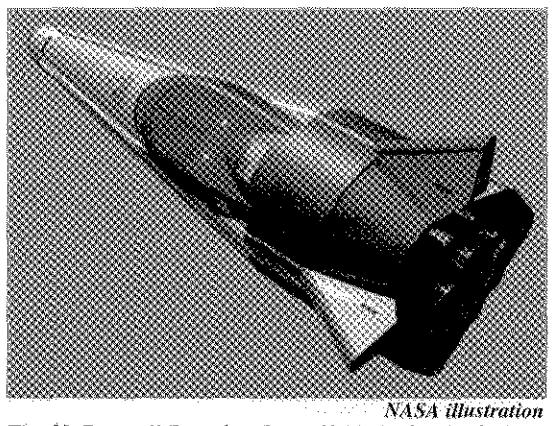
"Langley provided the teams with high-quality contributions, from model design and fabrication to wind tunnel testing and computational analysis," said John Paulson, Experimental Hypersonics Branch.

Using cast-ceramic heating models and the Relative Phosphor Thermography System, both developed on Center, branch personnel could provide surface heating distributions within minutes after a wind tunnel test.

This capability of generating both aerodynamics and heating data in the same time frame enabled, for the first time, simultaneous consideration of both aerodynamics and aeroheating information for rapid configuration assessments and optimization decisions.

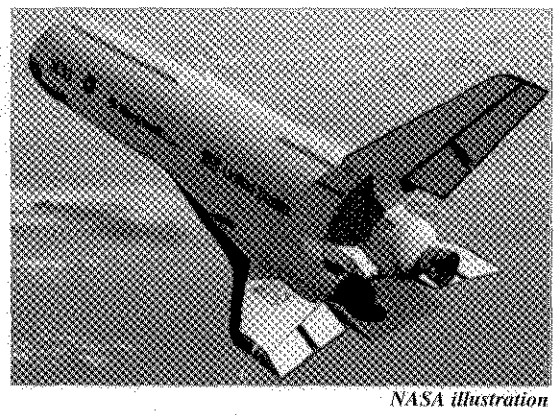
"This first phase has successfully represented a new way of doing business, where the government is teamed with industry partners and the industry has the lead," Arrington said.

"Teaming with industry partners worked well, and all three teams had a significantly better configuration for the Phase II proposals than would have been possible without Langley's efforts," Paulson said.



NASA illustration

The McDonnell-Douglas Corp. X-33 design included a nose-cone configuration and pop-out legs. This RLV would launch and land vertically.



NASA illustration

Most closely resembling the present space shuttle, the Rockwell International Corp. X-33 design was 103 feet long to a wing span of 50 feet.

DIRECTOR

(continued from page 1)

Distinguished Presidential Rank Awards.

He is a Fellow of the American Institute of Aeronautics and Astronautics and the American Astronautical Society and is a member of the International Academy of Astronautics.

Holloway graduated from Poquoson High School in 1956 as salutatorian and has a bachelor of science degree and honors in aeronautical engineering from Virginia Polytechnic Institute and State University. He also attended the Advanced Management Program at Harvard Business School.

BUDGET

(continued from page 2)

The administration has expressed dissatisfaction with funding cuts in a number of programs in the bill, including MTPE. The Senate VA-HUD Appropriations Subcommittee was scheduled to mark up its bill in mid-July, followed by full committee and floor action.

Speculation persists that an Omnibus Budget package – a type of continuing resolution for the year or for the first few months of FY '97 – is in the offing, since only 20 or so potential legislative days remain between July 1 and Oct. 1, the start of the new fiscal year. Campaigning and conventions will take up much of the next few months.

Thirteen appropriations bills and three reconciliation bills, required by the Budget Resolution, must be passed by both the House and the Senate and must be signed by the president before the FY '97 budget process is completed.

AdVentures

TRAVEL SPECIALS: 3-4-day Bahamas Cruise from $249; 7-day Caribbean cruise from $599; Nonstop air service to New York City, Miami, Chicago from Norfolk, $59-$129. Call Omega World Travel at 864-7696.

FOR SALE: Indian Cove Resort lifetime membership at Virginia Beach. Large, full-service campground with swimming, fishing, boating. Priced to sell quickly at $1,250. Call 865-0586.

FOR SALE: 1993 Fleetwood Prowler 27.5-foot, fifth-wheel camper with super slide, full awning, sleeps six. $13,000. Can sell with 1994 Ford F350 XLT, extended cab, 460 engine, all power options, including 40/20/40 power seats. $34,000 for package. Call 890-3042.

FOR SALE: 1976 Mercedes Benz 240D, new headliner, winter electric connection for engine. $3,000. Call 722-7045.

BOOKKEEPING SERVICES: For small and large businesses, offering a wide range of accounting, payroll and tax services. Call 874-3121.

FOR SALE: Computer system, Pentium/PCI, CD ROM, sound, monitor, Windows 3.11 and other software. $950. Call 890-2540.

FOR SALE: House in Berkeley's Green in Williamsburg-Rt. 5 area, 2 stories, 4 BR, 2-car garage, deck, gas heat, on cul-de-sac. Community has pool, tennis courts, clubhouse. $149,000. Call 229-5662 before 9 p.m. for appointment.

FOR SALE: 1970 Galaxy boat, 1971 85-horsepower Johnson motor, trailer and 2 gas tanks. Needs some work. May be seen at NASA Langley Credit Union. $500 cash. Call 229-5662 before 9 p.m.

FOR SALE: Denbigh home, 3BR, 2 baths, living room with fireplace and cathedral ceiling, family room, laundry room, fenced yard, back covered porch, shed. $89,900. Call 865-0136.

VASC SUMMER CENTER MOTOR TOURS: Now through August, the Virginia Air & Space Center offers summer motor tours of NASA Langley Research Center. Tours cost $4 with the purchase of any VASC admission ticket. For tour times, call 727-0900.

TECHNOLOGY 2006 Conference, Oct. 29-31, Anaheim Convention Center, Anaheim, Calif. Sponsored by NASA, the Technology Utilization Foundation and *NASA Tech Briefs* magazine. For more information, call 1-800-944 NASA, or fax to 212-986-7864.

NACA REUNION VII: Oct. 3-6 in Hampton. All former NACA employees and members of NASA Langley Alumni Association and guests are invited. Send registration forms no later than July 1 to P.O. Box 6260, Newport News, Va., 23060-3850. For more information, call 595-1306.

3...2...1...LIFTOFF: The Thermal Structures Branch is hosting a farewell reception for Dr. Charles J. Camarda, who is leaving for Johnson Space Center as a candidate in the astronaut program. Come to the Thermal Structures Laboratory, Building 1267, July 17, 1-4 p.m., to say good-bye to Charlie.

LAA CARNIVAL: Aug. 16-17. See our web site, "1996 Carnival" under "General Information" on the Lantern Home Page. Call Geoff Tennille at ext. 45786, Skip Schroeder at ext. 47320, or the appropriate chair listed on the Web to volunteer or to make suggestions.

LANGLEY KIWANIS CLUB FORMING: Kiwanis, an international service organization that supports many community charities, is forming a new club serving the NASA Langley community. For more information, call 851-5533 or 851-0750.

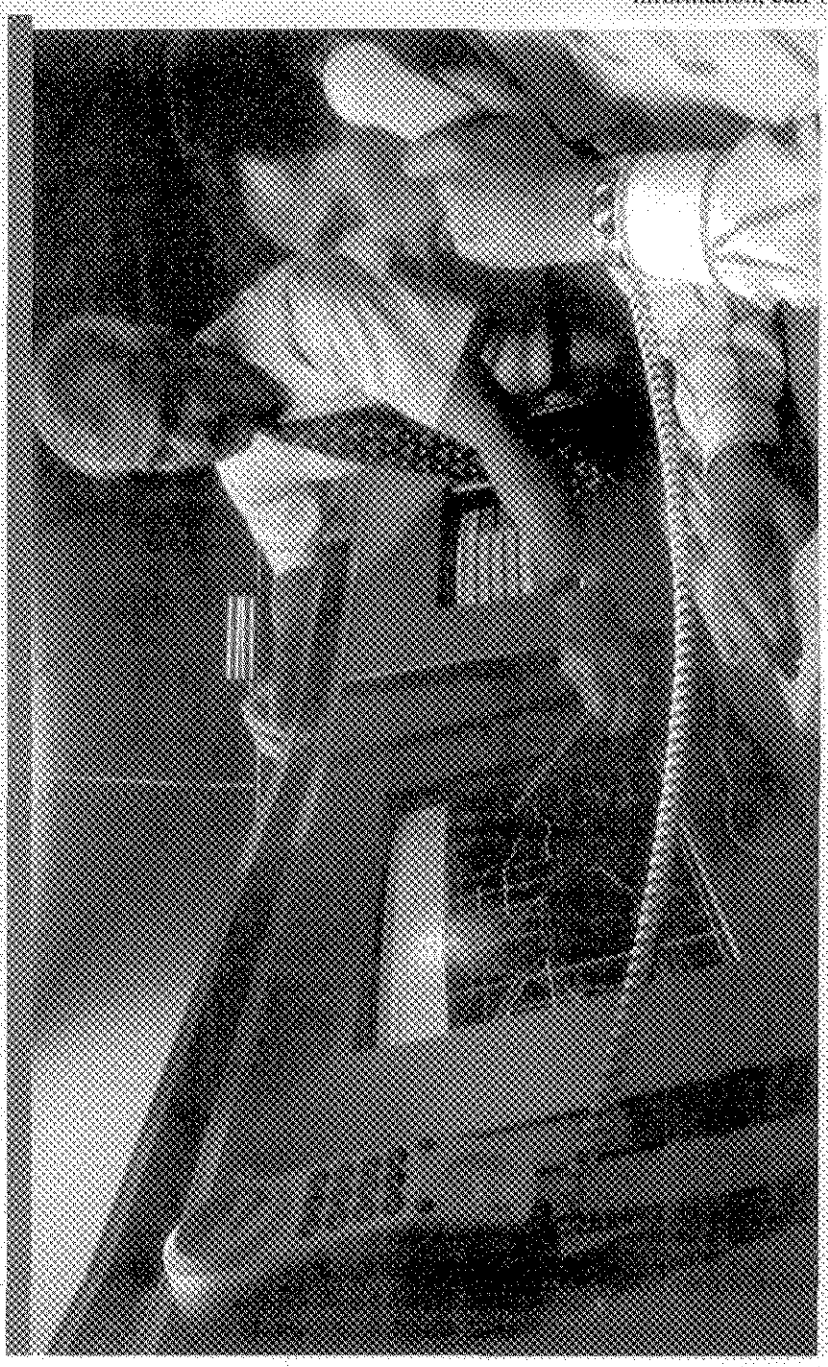
Answers to Diversity IQ Quiz (page 3): 1. D; 2. B; 3. D; 4. C; 5. D.

ALUMNI SUPPER: The NASA/LaRC Alumni Association will have its annual covered dish supper on July 18, 6 p.m., at the H.J.E. Reid Conference Center. For more information, call 595-1306.

A MODEL SOCIETY: The Tidewater Chapter of the International Plastic Modeler's Society will host its annual national convention at the Virginia Beach Pavilion, July 25-27, 9 a.m.-9 p.m. For more information, call 596-6876 or 850-2181.

PICNIC, ANYONE? The NASA Langley Tennis Club will have its annual picnic July 31, from 4 p.m. to 7:30 p.m., at picnic shelter #1. Besides food and drinks, mixed-doubles tennis will be scheduled on all four courts. Picnic is free to members; $2 for nonmembers and guests. Call Tom Yager at ext. 41304 or Marco Egoavil at ext. 47247, before July 30.

IT'S A WILD LIFE: The Virginia Air & Space Center presents a slide show and lecture by wildlife photographer Spook Skelton on July 27, at 1 p.m. and 3 p.m., in the center's small theater. For more information, call 727-0900.



NASA photo

GROUND CONTROL TO MAJOR TOM – NASA and its Federal Aviation Administration and industry partners have developed a revolutionary new air traffic control system to be used during the Olympics in Atlanta. The ground monitoring system used by air traffic controllers is located at Dobbins Air Force Base, Ga. Enhanced navigation systems will enable pilots to see traffic information, including other aircraft positions, as well as airports and hazards to navigation.

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'Highways in the Sky' Ready for Atlanta Olympics

BY KEITH HENRY

NASA, the FAA and industry partners have provided the technology for a revolutionary new system to be used during the Olympics to move air traffic efficiently and safely in uncontrolled airspace over predetermined "highways in the sky."

When athletes took to the field in Atlanta for the 1996 Summer Olympic Games, specially equipped helicopters were there to transport high-value commercial goods and to provide essential public safety services. Approximately two million people are expected to visit the Atlanta region during the Olympics, July 19-Aug. 4.

The Atlanta Olympics offer a rare opportunity to demonstrate advanced communications/navigation/surveillance (CNS) flight systems for future air traffic management. Specially equipped helicopters and supporting ground stations will enable dozens of Atlanta-based companies to overcome the expected transportation burden and will generate an estimated $20 million in revenues. For medical, disaster and law enforcement agencies, critical emergency services will be significantly enhanced.

The $2-million CNS technology development effort was co-funded by NASA, the FAA and eight general aviation companies, all members of the Advanced General Aviation Transport Experiments (AGATE) consortium.

Photos by Fred Jones

The specially equipped helicopters used in Operation Heli-Star will be capable of self-dispatch in a "free-flight" mode during the Olympic games.

AGATE was formed in 1994 to revitalize U.S. general aviation through advanced technology development and deployment. General aviation includes everything from personal helicopters and fixed-wing aircraft to business, public and commuter aircraft.

The AGATE consortium is participating in the Olympic project through its flight systems team, led by Langley. Industry team members are ARNAV Systems Inc., Puyallup, Wash.; Harris Corp., Melbourne, Fla.; PanAm Systems, Minneapolis, Minn.; AvroTec Inc., Portland, Ore.; Digital Equipment Corp., Greenbelt, Md.; ARINC, Annapolis, Md.; Terra Corporation, Albuquerque, N.M., and NavRadio, Golden, Colo.

By providing key technologies, AGATE is contributing to a massive FAA-led effort to manage air traffic in the Atlanta region during the Olympics and to lay the groundwork for future air traffic management and regional disaster emergency response concepts.

Other partners working with the FAA on the initiative include Georgia Tech Research Institute, Helicopter Association International, Georgia Emergency Management Agency and the Atlanta Vertical Flight Association, an association of Atlanta businesses and municipalities. The overall FAA initiative for the Atlanta Olympics is called Operation Heli-Star.

Up to 50 helicopters equipped with AGATE-designed avionics will participate in the joint Atlanta operation. The Heli-Star program demonstrates the effectiveness of helicopters equipped with this system for improved safety, security and economics in urban operations. More than 1,400 expected hours of flight-time during the Olympic games will yield data on operational use and human factors.

"It is amazing what the AGATE Olympic team has accomplished in a short period of time," said Bruce Holmes, manager of the general aviation office at Langley and director of the AGATE consortium. "The FAA estimates that this effort would have required more than three years using traditional government contracting procedures. This is a dramatic testimonial to the efficiency of the consortium approach to doing business with and within the federal government and a prime example of 'reinventing' government."

The AGATE-developed flight system is the first to demonstrate the combined use of digital data link

(see OLYMPICS, page 4)

'Power for the Future' Flies into Oshkosh '96

"Power for the Future" will be the theme of the dynamic new NASA exhibit at this year's Experimental Aircraft Association (EAA) Fly-In Convention and Sport Aviation Exhibition, Aug. 1-7, at Oshkosh, Wis.

Technical aerospace forums featuring the latest innovations in aerospace research will be presented in tents located beside the NASA exhibit area.

A news conference will be held Aug. 2 to roll out NASA's LoFlyte remote-control aircraft. The 25-foot aircraft will be flown at NASA Dryden in August to demonstrate neural net control of a hypersonic configuration at subsonic speeds.

A news conference will be held Aug. 3 to present awards to the winning university teams for the second annual NASA/FAA National General Aviation Design Competition. A second news conference will be held Aug. 4 to discuss two new government-industry initiatives – NASA's new General Aviation Propulsion (GAP) program and the FAA-led Atlanta Short-haul Transportation System (ASTS), now called Operation Heli-Star.

The GAP program is a new effort that will bring NASA and industry together to address a critical need to improve the affordability and performance of U.S. general aviation aircraft propulsion systems.

Operation Heli-Star is responsible for fostering both air and ground transportation during the 1996 Summer Olympics in Atlanta and for integrating the two into one efficient transportation system.

New Cockpit Weather System Takes to the Skies

BY MARY M. SPRACHER

A NASA Langley-developed system that can provide pilots with up-to-date, easy-to-read and easily accessible weather information is taking to the air.

Langley, United Airlines and McDonnell Douglas are evaluating a DC-10 equipped with an experimental cockpit weather system and other innovative technologies. The DC-10 flew a "show and tell" flight in the San Francisco area on July 15 and will soon begin flying normal passenger-carrying service around the nation through September.

NASA Langley photos

The onboard CWIN system continually receives the latest weather information and displays it on a touch-screen monitor, shown here installed in a cockpit simulator.

Weather plays a significant role in the efficiency of transportation aircraft. Timely routing around hazardous weather increases the margin of safety between airplanes and potentially dangerous conditions, leading to significant operational cost savings, increased safety, and improved passenger and crew comfort. To efficiently route aircraft around such conditions, pilots need the up-to-the-minute status of the weather along an aircraft's intended flight path.

Developed by Dr. Charles H. Scanlon, of Langley's Flight Dynamics and Control Divsion, the Cockpit Weather Information (CWIN) system can provide flight crews with up-to-date graphical weather data in a more timely and easy-to-understand manner than current methods. Flight crews now receive in-flight weather updates in the form of voice or printed data, leaving them to assimilate information into a mental picture of the conditions near their intended path. This is time-consuming and may not present a clear or accurate picture. Also, current radar readings can be limited by distance and blockages.

"CWIN is like having an interactive mobile weather channel," said Scanlon. The system receives

(see CWIN, page 4)

News Briefs

Around the Agency

LANGLEY AMONG NASA'S SOFTWARE OF THE YEAR AWARD RECIPIENTS – The Tetrahedral Unstructured Software System (TetrUSS), developed by NASA's Langley Research Center, headed by Dr. Neal Frink of the Transonic/Supersonic Aerodynamics Branch, won a 1996 NASA Software of the Year Award. TetrUSS is an aerodynamic analysis and design system that is widely used throughout U.S. industry, government and universities to study aerodynamics and other problems in spacecraft, rotorcraft, automotive, turbomachinery, and medical analysis and design. The other winning entry is the Linked Windows Interactive Data System (LinkWinds) software developed by the Jet Propulsion Laboratory, Pasadena, Calif., headed by Dr. Allan Jacobson. Link-Winds is the world's most powerful viewer for scientific examination of geophysical and climata-logical data retrieved from satellite remote sensing. The award is granted to individuals who develop software to enhance NASA's mission and to assist the U.S. aerospace industry in maintaining world-class technology. NASA will present the awards at the Technology 2006 Conference to be held in Anaheim, Calif., this October.

NASA SELECTS ORGANIZATIONS TO DEVELOP TECHNOLOGIES FOR AIR-BREATHING ROCKET ENGINE – NASA's Marshall Space Flight Center, Huntsville, Ala., has selected five teams to develop technologies for air-breathing rocket engines. This is the next step toward developing new rocket propulsion technologies that could take NASA into the next century. The selected organizations are Gen Corp Aerojet, Sacramento, Calif.; Kaiser Marquardt, Van Nuys, Calif.; Pennsylvania State University, State College, Pa.; Rockwell Aerospace/Rocketdyne, Canoga Park, Calif.; and United Technologies/Pratt and Whitney, West Palm Beach, Fla. Called a rocket-based combined cycle propulsion system, this new propulsion system would use an engine that consumes atmospheric oxygen and then uses a stored oxidizer when beyond the Earth's atmosphere. By reducing the amount of stored oxidizer and improving the engine performance, the weight and cost of the system could be significantly reduced. This activity is part of NASA's Marshall-managed Advanced Space Transportation program.

NASA TECHNOLOGY HELPS NAVY FIND UNEXPLODED ORDNANCE – NASA scientists have turned over to the U.S. Navy the first phase of a data analysis program designed to find unexploded ordnance and mines in bays and harbors that were once used as gunnery ranges and test areas. Space program technology and computer applications are being adapted by NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., to help identify underwater mines and ordnance in data from existing Navy sonar, laser and magnetic instruments. JPL is also providing a chemical detector that will sniff out small traces of explosives in the water. The Mobile Underwater Debris Survey System, or MUDSS, demonstrates various technologies that can be used to survey former defense sites for unexploded waste. Once the Navy finds the debris, the problem is turned over to the U.S. Army, which disposes of all unexploded military waste. MUDSS, a partnership with the Naval Coastal System Station, Naval Surface Warfare Center in Florida, is now halfway through its three-year effort.

NASA Success Stories Sought

Are you aware of any products or services in the private sector that are using NASA technology to make the lives of Americans better?

If so, you may want to fill out the survey located on the Web at URL: http://change.oact.hq.nasa.gov//NASASuccessStory.html

Once you submit this information, you will receive an e-mail message confirming that it was received.

By using this page, you can help your successes or those of your colleagues to receive due acclaim, and you can help to educate the public about the many ways that NASA Langley research and development improve lives.

For more information, contact Sherry Sullivan at ext. 42556 or e-mail at s.l.sullivan@larc.nasa.gov.

Appropriations Bill Awaits Approvals

BY LEE RICH

With few legislative days left in which to complete the 13 appropriations measures needed to fund federal departments, agencies and programs for the 1997 fiscal year, members of Congress are putting on a full-court press.

The Veterans Administration, the Department of Housing and Urban Development (HUD) and independent agencies' appropriations bill (HR-3666), under which NASA receives funding, has been marked up and passed by both the House of Representatives and the Senate. The differences between the marks of the two legislative bodies will be worked out in conference.

Once House and Senate conferees have produced a final bill, the measure will be voted on by both chambers. If passed, it will go to the president for his signature.

The Office of Management and Budget has informed the committees that, although the Senate bill is more acceptable, the administraiton still opposes cuts in the funding request for the Environmental Protection Agency, HUD, National Science Foundation and Americorps. Should HR-3666 not be signed by Sept. 30, a continuing resolution may be instituted this year.

Announcements

CFC Seeks Testimonies

Langley's Combined Federal Campaign (CFC) Committee is looking for a few civil service, contractor, or retired employees who have either been helped by or who volunteer to help CFC organizations.

As part of the Center's CFC publicity campaign this year, we hope to highlight some of "our own" in future *Researcher News* articles. To share your involvement, call Cathy Schauer at ext. 43314 or Woodrow Whitlow at ext. 46033 by Aug. 22.

Speakers Bureau's Spring Activities

Al Ragsdale spoke to the Junior Astronauts Club at Burbank Elementary School in Hampton about "Flying to the Moon."

Lance Bush and Melvin Ferebee visited Winthrop University in Rock Hill, S.C., to talk about space.

Barry Gibbons spoke to the Poquoson Kiwanis Club on "Technology Commercialization: Langley's New Way of Doing Business."

Bill Kinard addressed the Rotary Club in Newport News regarding the space station.

Michael Uenking spoke to the U.S. Navy's Family Housing Department in Norfolk about "Apollo and NASA's Role in Space and Aeronautics."

Darnell Thanks Langley for Bone Marrow Drive

"I offer my personal thanks to the many Langley and contractor employees and family members who came to the Red Cross bone marrow donor drive given in my name on June 23 in York County. More than 200 people offered blood samples and became registered donors in the National Marrow Donor Program. I was thrilled to see this wonderful response and am very grateful to each donor who came." – Wayne Darnell

Coleman Bridge Set To Open All Lanes

The Coleman Bridge will be open to four lanes of traffic on Aug. 2. Tolls will be collected beginning Aug. 3 in the northbound direction only; no tolls are collected from southbound motorists.

For commuters enrolled in the Fastoll system and for motorcyles, tolls are 50 cents; for noncommuters in two-axle vehicles, $2; for noncommuters in three-axle vehicles, $6; for noncommuters in four-or-more-axle vehicles, $8.

For more information about Fastoll, call 1-888-327-8655. The Fastoll Customer Service Center is located in the Gloucester Point Shopping Center, one mile north of the bridge.

CTAP Center Names Aakre New Manager

Anne Aakre has joined Langley's Career Transition Assistance Program Center as manager, replacing Joe Aloisi.

Aakre has been employed by Resource Consultants, Inc., managing and providing outplacement and transition services for federal government agencies for the past four years.

She comes to the Center after managing the transition services supporting the realignment of the Naval Undersea Warfare Center, Norfolk Detachment, to Newport, R.I.

As regional site manager at Ft. Ord, Calif., Aakre coordinated the provision of outplacement and transition services for Department of the Army soldiers, civilians and family members affected by Base Closure and Realignment Commission decisions.

She also participated in the development, marketing and provision of services to the Naval Supply Center, Charleston, S.C.

CTAP Center Offers August Seminars

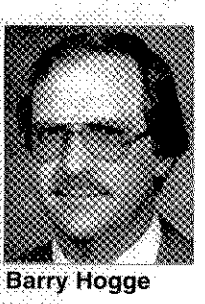
The Career Transition Assistance Program (CTAP) Center offers the following seminars during August. Advance registration is required for all seminars.

- "Negotiating Salary and Benefits," Aug. 1, 9 a.m.-noon, Building 1312
- "How To Evaluate Career Alternatives and Manage a Successful Career Campaign," Aug. 7-8, 9 a.m.-4:30 p.m., Building 1216
- "Starting Your Own Business," Aug. 21-22, 9 a.m.-4:30 p.m., Building 1216
- "Making Yourself Indispensable," Aug. 27, 9 a.m.-noon, Building 1216
- "So, You Want To Be a Consultant!" Aug. 29, 9 a.m.-3 p.m., Building 1216

All NASA civil service employees and their spouses are eligible for this authorized NASA training. For more information or to register, call Susan Costello at ext. 45000.

Correction

Barry N. Hogge, of the Aero-Acoustic and Hypersonic Propulsion Operations Section, was misidentified in the July 12 issue of the *Researcher News* as Jim Smith of the Structures and Materials Research Support Branch. Hogge received the Exceptional Service Medal for outstanding contributions and leadership in managing technical support to Langley's aerospace research facilities.



Barry Hogge

The *Researcher News* regrets the error.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor ..... Keith Henry

Editor ..... Mary Graves, Science and Technology Corp.

Assistant Editor ..... Jeane Shanks, Science and Technology Corp.

Photographer ..... Fred Jones

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

Aviation Posters Picture Path of NASA Research

BY DANIELLE BECK

The combined efforts of several Langley personnel have resulted in a first-time NASA Aeronautics Enterprise poster set which focuses on commercial and general aviation and research aircraft.

Representing Aeronautics

Dr. Samuel Massenberg, director, Office of Education, initiated the project as a response to a request from the Aeronautics Education Coordinating Committee to create a three-poster presentation representing the aeronautics portion of NASA's vision and mission.

"We created the posters to demonstrate NASA's dedication to the world of aviation, not only its contributions to space," Massenberg said. "We wanted an effective method to inspire students, to create learning opportunities and to enlighten inquisitive minds."

Center Creativity

The posters were designed on center, from the copy to the graphics, as a cooperative effort between civil service and contractor personnel.

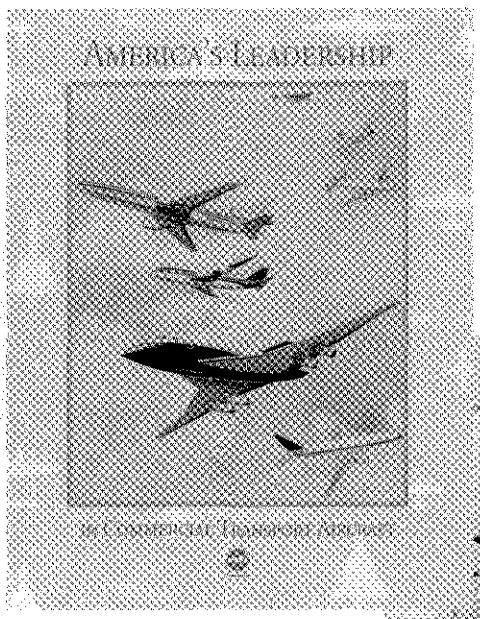
Dr. Sid Siddiqi, aeronautical engineer for Aviation Technology Applications, and Kathy Powell, education specialist in conjunction with Old Dominion University, constructed brief descriptions of each aircraft and NASA's contribution.

Dr. Marchelle D. Canright, Center education programs officer, and Peter Thomas, precollege education specialist, created the curriculum portion of the publication.

Bill Kluge, Langley Information Systems and Services Division, Graphics and Design Section, was the illustrator-aviation artist for the project.

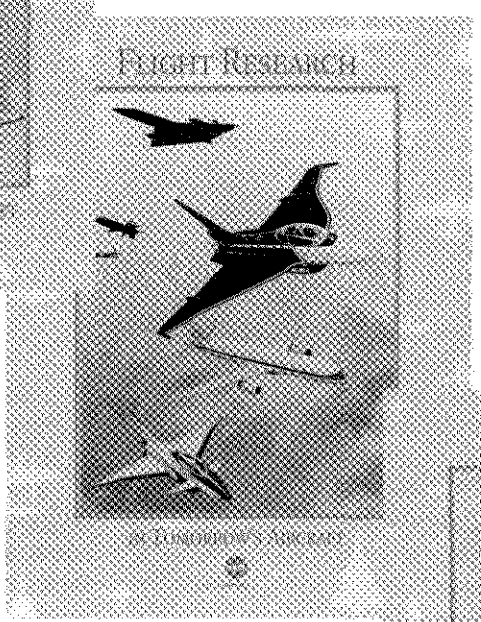
Karen Freidt, also of the Graphics and Design Section, designed the layout of the reverse side of each poster.

Each poster features full-color art on the front and a combination of historic information, classroom activities and explanations of basic aerodynamics on the reverse side.



Commercial Aircraft

The commercial aircraft poster depicts the transformation of commercial aircraft from an adventure in the 1920s through the safe and reliable form of major air transportation it has become today.

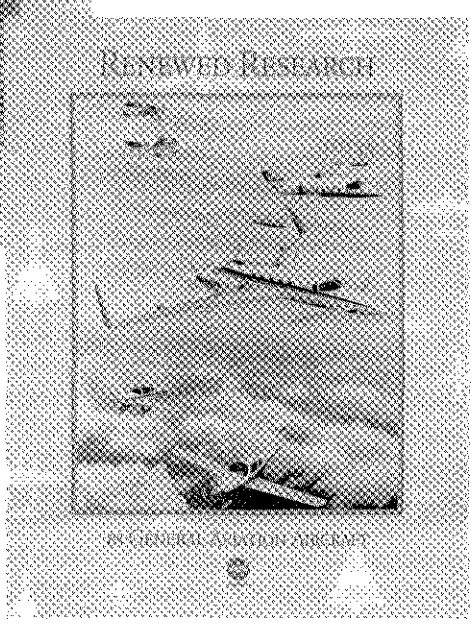


General Aviation

The general aviation aircraft poster depicts six historically significant aircraft, from the 1950s through the present, that have served the public's needs for personal, business, sport and recreational aviation.

Research Aircraft

The research aircraft poster depicts the era following World War II when National Advisory Committee for Aeronautics researchers began to apply flight science with equations and wind tunnels.



Posters, Posters

Each center has a limited supply of the posters, which are available to teachers and other educators for use in the classroom or in group instruction. The network of NASA Teacher Resource Centers throughout the country handles distribution.

Posters will be distributed to educators at the Oshkosh, Wis., airshow in August and at the opening of the Smithsonian Institution's exhibit, "How Things Fly," in September in Washington, D.C.

On Center, educators may obtain the posters at the Public Mail Center in Building 1153.

Elementary School Teachers Cloak Math, Science in Space, Aeronautics

BY MOLLY RITZ

Teachers from 10 states are visiting Langley this summer to take part in the NASA Education Workshop for Elementary School Teachers (NEWEST).

The teachers are here to learn how to motivate their students in mathematics and science by using aeronautics, space and technology concepts.

During the 10-day program, they also become acquainted with Spacelink, NASA's electronic service for educators. Teachers will be able to use the service in their own classrooms.

"I am learning so many things that are going to help me turn my students on to space and all that it possesses," said Darla Posney from Tarentum, Pa. "I really love the program. It is a real extension of what I do in the classroom."

The NEWEST program uses hands-on, minds-on experiences to teach valuable scientific and technological information. These activities include exploring the properties of air and its impact on flight, considering why things do and don't fly, constructing models of launchable hot air balloons and rockets, and inventing a model to demonstrate the properties of air.

Photo by Molly Ritz

Sally Jensen, left, Darla Posney and Jean Engle make nine-foot-tall, tissue-paper hot air balloons to illustrate the lighter-than-air and motorless flight concepts.

The program's second half focuses on space science and involves exploring the light spectrum; the relationship of the sun, Earth and moon; moon mapping; plotting lunar landings; and working to translate the experiences to the classroom.

"I really need more interactive activities that can attract my students' attention," said Patricia Matkoviac, from Newport, Mich. "I lack a strong aeronautical background, and I am learning how to incorporate aeronautics into my science curriculum in a captivating way which will definitely benefit my students."

During the NEWEST program, teachers have the opportunity to visit several facilities, to study with actual researchers, and to learn about current NASA projects.

"I cannot wait to tell my students I worked alongside real scientists," said Sandra Falsioni from Trumen Elementary in West Seneca, N.Y. " I am so honored to be here and to tour such a wide variety of facilities."

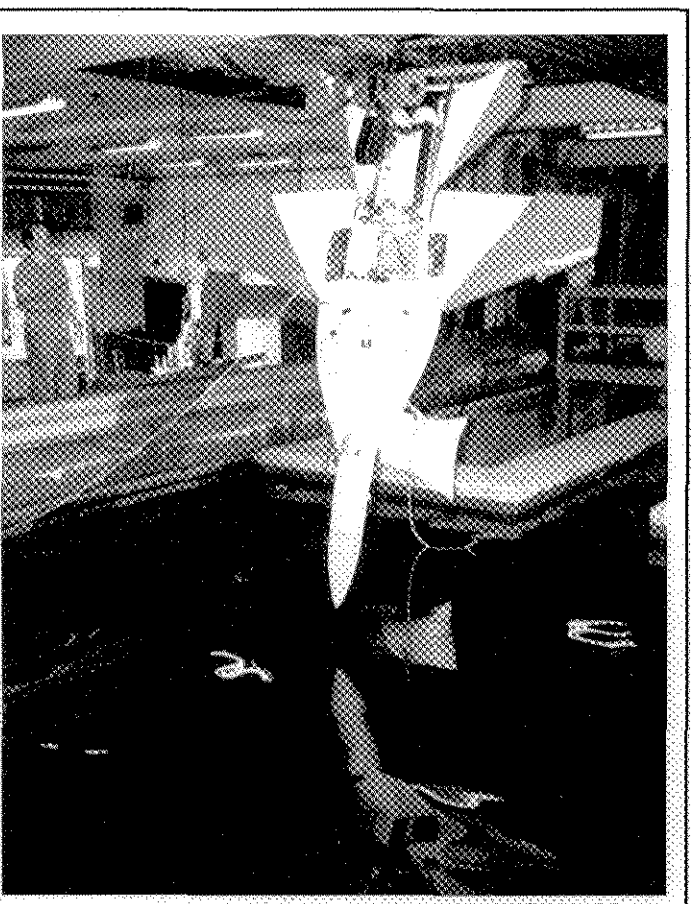


Photo by Fred Jones

GOOD TO THE LAST DROP – The F-18E drop model undergoes seaworthiness testing in the Langley Tow Tank. Flights of the 22-percent scale model are terminated by deploying a parachute over water. The model then is retrieved by boat. The seaworthiness testing also validated the active flotation subsystem that augments the model's buoyancy. The F-18E drop model will be used to study the low-speed characteristics of the Navy's latest fighter design.

'Day of Caring' Offers Center Opportunity To Get Involved

BY MARNY SKORA

Langley will join other community-minded organizations to sponsor this year's Community Day of Caring on Sept. 5.

Last year, the Day of Caring mobilized nearly 600 workers from area businesses and federal facilities. Volunteer assignments ranged from painting and planting to constructing playgrounds for children and houses for families. Special talents were needed for plumbing, electrical, air conditioning, landscaping, carpentry and computer projects.

Volunteers also completed general clean-up and fix-up chores, helped with day camps and stocked food pantries.

Earl Freeman, Operations Support Division, described his work as "kitchen duty." He and his fellow volunteers cleaned and painted the complete kitchen complex at the Boys and Girls Club, including ceiling, walls and cabinets.

Nannette Adkins, Logistics Management Office, reported a day of hard work but a rewarding experience at the Peninsula Legal Aid Center.

"I was disappointed that we didn't have enough volunteers to complete the project," she noted.

Civil service employees interested in participating in this fifth annual event should contact Marny Skora at ext. 43315 for a volunteer form. The first 100 Langley employees to register will be granted administrative leave.

Contractors who wish to participate should contact their corporate office. Langley retirees are invited and encouraged to participate, as well.

Photo by Sandie Gibbs

NASA's Carol Fowler, center, of the Visual Imaging Branch, works with Trina Dishman of Canon and Bob Carnegie of the Hampton Fire Department to create a play area for local kids at the YMCA during the 1995 Day of Caring.

OLYMPICS

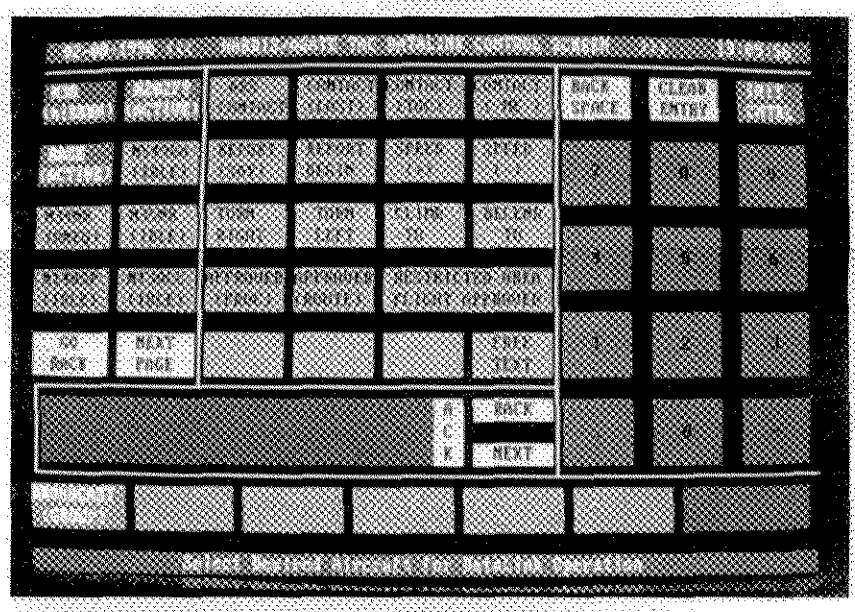
(continued from page 1)

communications and Global Positioning System (GPS) satellite navigation technologies working together to provide the pilot with accurate, easy-to-interpret graphical information about the relative positions of other aircraft and ground-based GPS systems.

Aircraft positions also will be linked to radar-like ground consoles where air traffic managers and security per-sonnel will be able to monitor their location and send data linked messages to air crews.

The specially equipped aircraft will also be capable of self-dispatch operations in a "free-flight" mode during the Olympic games. The Atlanta project provides AGATE with the first large-scale demonstration of free-flight capabilities.

After Atlanta, AGATE plans further development of free-flight capabilities for general aviation use nationwide.



This touch-screen data entry device will be used for voiceless air-ground communications via digital data-link.

Disabilities Awareness

Opening Up Helps Others Learn

BY GERRY PARDUE

This is an invitation to write a short article for the *Researcher News*' "Disability Awareness" spot about your experiences regarding a personal or family member's disability – visible or invisible – or a traumatic experience faced and overcome.

We all have our own values and needs, and each one of us may react differently in the same circumstances and may have different viewpoints to share with others.

The most difficult part of sharing something personal can be the fear that others may not understand. But the only way anyone *can* understand is to learn from those who know. Each person's story needs to be told.

Your thoughts can encourage others with similar problems or can open the eyes of your coworkers to whatever problems you might have in the work environment. Co-workers need to be aware of your problems and your needs. Help them to help you, and help other disabled people at the same time.

You do not have to be a member of the Satellite Committee for People with Disabilities to contribute, and you may request anonymity.

CWIN

(continued from page 1)

information, including surface observations, terminal forecasts, radar summaries and lightning strike data, from a satellite data link. The system can also provide weather trend information and has zooming capabilities that enable the user to see information from the entire nation or to focus on specific areas.

The CWIN system can construct color graphic, moving and textual displays, as well as other tools to aid in weather-related decisions. The aircraft's intended path can also be plotted and seen in relationship to the weather.

All of this is displayed on a 10.4-inch multi-color liquid crystal display with a touch-panel overlay that allows the desired information to be easily selected. Data is continually received and stored by the system, allowing for instantaneous access to the latest information.

The up-to-date information provided by this system will allow pilots to plan en-route weather avoidance more effectively.

The system can enable pilots to fly shorter routes, to use less fuel and to clear storms by greater distances, thus improving safety and comfort.

In CWIN simulation studies conducted in 1993, both the distance flown and the amount of fuel burned were decreased by 5 percent. Clearance of storms was increased as pilots were able to triple the distance between their planes and dangerous conditions.

CWIN is one of a number of applications that will be shown on the experimental Electric Resource System (ERS), a smart information terminal in the cockpit.

"United is excited to host CWIN on our ERS evaluation," said Dave Witchey, CWIN program manager for United Airlines. "CWIN is an elegant example of information that enables pilots to collaborate on making earlier, safer, more efficient decisions."

Both CWIN and ERS are steps towards the "free flight" concept envisioned for the future. Today airplanes must follow designated, and sometimes congested, flight paths.

With free flight, pilots would be free to choose their own routes, with restrictions only as needed.

"CWIN gives you a better tool to pick your route and self-optimize your flight," Scanlon said.

McDonnell Douglas is the primary contractor for the project, under a contract which runs from May of 1995 through this December. The contractor has been responsible for the implementation of the system's hardware and software and is facilitating the evaluation.

United Airlines and Computing Devices International are subcontractors on the project. Other companies also contributed.

Aviation Students Take to the Skies with Model Planes

BY CAROLE TODD

Thirty-two Newport News high school students, part of the city's new aviation magnet program, saw the principles of flight come to life last month.

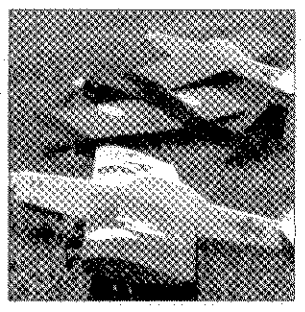
After a year of study and three months of painstaking, hands-on work, the students' model airplanes hurtled through the air, powered by two ounces of gasoline and controlled by two 60-foot-long wires.

Dorothy Henrickson, a rising sophomore aviation magnet student, is ready to drill holes to mount the engine on her wrinkle-free wings.

Under the watchful eyes of teachers and volunteers, the students worked in pairs to hook the wires onto their planes' wings, to lash the plastic gas tanks to the body with rubber bands, and to fly the model planes in circles.

The aviation magnet program, located at Denbigh High School, is the only one of its kind in Virginia and was launched with the help of NASA Langley, Newport News Alliance for Youth, Cities in School Inc., Hampton University, Hughes Aircraft Co., the Department of Defense and the Newport News/Williamsburg International Airport.

Lt. Col. Curtis Grant has been director of the aviation magnet program since its inception in September. The program's students are flourishing, he says, in an environment that blends rigorous, integrated academic classes; up-close-and-personal attention by faculty; the discipline of the Junior ROTC program; and hands-on model building.



Students must apply to become involved in the magnet program, which prepares them for careers in aviation maintenance. Once selected, they attend Denbigh High School to complete the program's requirements.

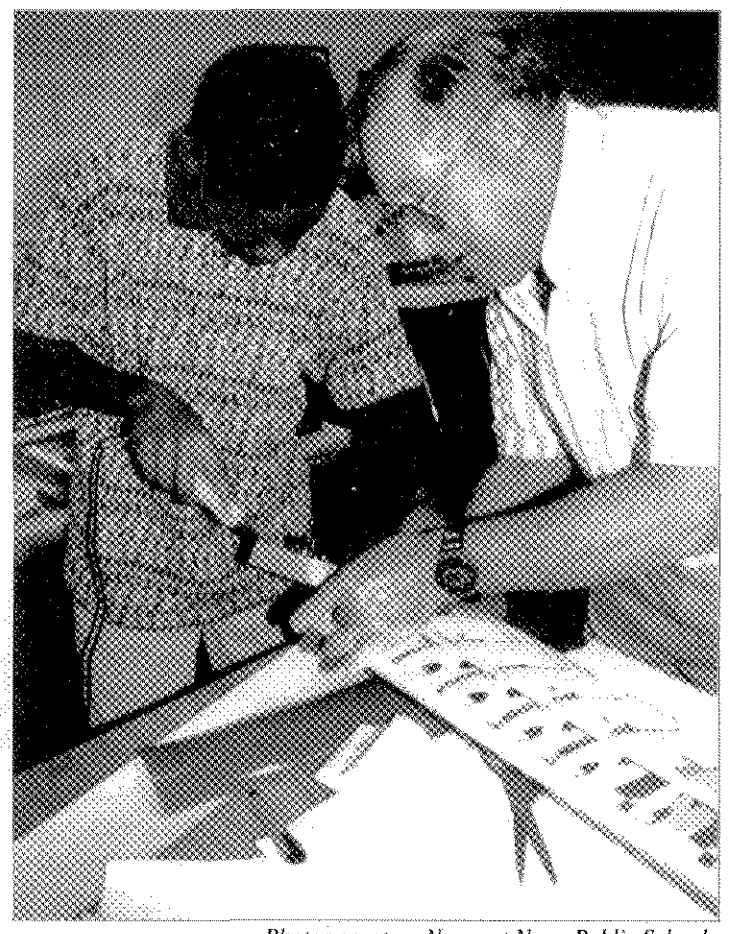
Students had the added bonus this spring of working with volunteer model airplane enthusiasts. A newspaper article about the program led retired Langley engineer Joe Block to recruit several retired modelers to spend four to six hours a week helping students assemble their models.

Volunteers range from former pilots and aviation mechanics to design and aeronautical engineers. Four of them – Block, Bob Champine, Lee Person and substitute volunteer Bob Rainey – are retired Langley employees.

Champine, who retired from after 32 years as a test pilot, thinks the message of teamwork and discipline is getting through to the students. He speaks highly of Dorothy Henrickson, 15, who wants to major in aviation and engineering in college.

"She was so proud when she covered the wing of her plane without a wrinkle," Champine said.

Person, a retired Langley test pilot and former Marine, especially likes the JROTC component.



Photos courtesy Newport News Public Schools

Rising sophomore aviation magnet student Demetrius Smith irons on the wing material as retired NASA engineer Joe Block holds it taut.

"The kids need the discipline that comes with JROTC. It can make a big difference whether or not they get into the service," he said.

Enrollment next year will jump to 125 and with it the need for volunteers, said Block.

For more information or to volunteer to help students build models, call Lt. Col. Curtis Grant at 886-2745.

Langley Folks – Past and Present – Open Many Eyes to NASA's World

After 15 years or more with the Center, these volunteers share their Langley treasures

BY MOLLY RITZ

Nearly three dozen Langley employees and retirees volunteer in various capacities here and at the Virginia Air and Space Center (VASC), offering their time and knowledge to the Hampton Roads community.

Langley Tour Guides

More than 20 Langley specialists take time out of their busy work schedules to accommodate requests for facility tours.

"The tours I help out with are just a tiny sideline," said Ray Whipple, an aerospace technologist in the spin tunnel where new military fighters are tested. "I enjoy being involved in the development of new high-performance aircraft. I conduct tours of the tunnel for aviation-related organizations that understand and appreciate the work being done here."

And since Whipple is a member of the Center's Toastmasters Club, the 16-year Langley veteran gets to practice his public speaking skills while giving tours, he said.

Steve Yaros, an aerospace technologist who has also worked here for 16 years, gives tours to visitors interested in exploring Langley's facilities for the day. He works in the 14-by-22-foot subsonic wind tunnel.

Photos by Molly Ritz

NASA Langley retiree Lloyd Fisher stands next to the Apollo 12 capsule at the Virginia Air & Space Center.

> **"I volunteer because I feel I can impact people's lives by educating them with what I learned from Langley...."**
>
> *Lloyd Fisher*
> *NASA Langley retiree*

"I enjoy giving tours because I get to meet a cross-section of interesting people," Yaros said, "and I see Langley facilities that I normally would not experience."

VASC Volunteers

"I volunteer because I feel I can impact people's lives by educating them with what I learned from Langley years ago," said Lloyd Fisher, who retired from Langley after 33 years of service.

Fisher retired from the Landing Systems Branch, where he worked on the landing gear for the Apollo 12 lunar module and the Viking lander projects.

Sue Seward, who also retired after a 33-year career at Langley, worked in the Technical Library and now volunteers at the VASC Teacher Resource Center.

"There was never a dull moment when I worked at Langley. Engineers needed research done, and I was the one they came to for help," Seward said. "I had the opportunity to learn a wide variety of different things over the years."

Getting the Word Out

Mary Levin spends three hours a week working in Langley's Public Mail Center. Her late husband Ross worked here for 37 years, so she is quite familiar with the Center.

"I enjoy volunteering at a variety of places," said Levin, who also volunteers at the VASC and with the American Cancer Society.

Langley's Office of Public Services has organized a group called "Operation Communication," which recruits volunteers for the center.

"We are always looking for new volunteers who are familiar with what takes place on Center," said Olin Jarrett, Public Services Specialist.

NASA Langley technician Ray Whipple prepares to test a military aircraft model in the Langley spin tunnel.

AdVentures

FOR SALE: Three-drawer steel office desk. $40. Call 245-1736.

FOR SALE: Waterfront home in Hampton, 3 BR, 2 baths, great room, Florida room, cathedral ceilings, fireplace, eat-in kitchen, attached garage, bulkhead, pier, ceiling fans, privacy fence. Minutes from Langley, Oyster Point and Hampton Roads Center Parkway. $98,000. Call 865-9559.

FOR SALE: House in Hidenwood, 4 large BR, 2.5 baths, 2 stories, dining room, eat-in kitchen, family room with fireplace and built-ins. Near Yates, Gildersleeve and Menchville Schools. $134,000. Call 930-8225.

FOR SALE: 1988 Ford Escort GL Station Wagon; 59,600 miles; new tires. $2,500. Call 877-4372.

FOR RENT: Kiln Creek condo in Windbrook Complex, 2 BR, 2 baths, jacuzzi, gas fireplace, all appliances, pets allowed, available immediately. $650/month. Call 872-0729 evenings or 873-2111 days.

PICNIC, ANYONE? The NASA Langley Tennis Club will have its annual picnic July 31, from 4 p.m. to 7:30 p.m., at picnic shelter #1. Besides food and drinks, mixed-doubles tennis will be scheduled on all four courts. Picnic is free to members; $2 for nonmembers and guests. Call Tom Yager at ext. 41304 or Marco Egoavil at ext. 47247, before July 30.

VASC SUMMER CENTER MOTOR TOURS: Now through August, the Virginia Air & Space Center offers summer motor tours of NASA Langley Research Center. Tours cost $4 with the purchase of any VASC admission ticket. For tour times, call 727-0900.

TECHNOLOGY 2006 Conference, Oct. 29-31, Anaheim Convention Center, Anaheim, Calif. Sponsored by NASA, the Technology Utilization Foundation and *NASA Tech Briefs* magazine. For more information, call 1-800-944 NASA, or fax to 212-986-7864.

LAA CARNIVAL: Aug. 16-17. See our web site, "1996 Carnival" under "General Information" on the Lantern Home Page. Call Geoff Tennille at ext. 45786, Skip Schroeder at ext. 47320, or the appropriate chair listed on the Web to volunteer or to make suggestions.

NACA REUNION VII: Oct. 3-6 in Hampton. All former NACA employees and members of NASA Langley Alumni Association and guests are invited. Send registration forms no later than July 1 to P.O. Box 6260, Newport News, Va., 23060-3850. For more information, call 595-1306.

VIRGINIA CHORAL SOCIETY hosts "Afternoon Delight," a benefit concert and ice cream social, Aug. 4, 3 p.m., Trinity Lutheran Church in Newport News. Tickets, $8 advance and $10 at the door, cover the concert and refreshments, and are available from any chorus member, or call ext. 44006. For more information, call 851-9114.

LANGLEY KIWANIS CLUB FORMING: Kiwanis, an international service organization that supports many community charities, is forming a new club serving the NASA Langley community. For more information, call 851-5533 or 851-0750.

SURF'S UP: Newton Sims Memorial Regatta, July 28, Buckroe Beach, 9 a.m.-5 p.m. A one-day, Olympic-style course windsurfing race. For more information, call 851-3224.

SWINGIN' SUNDAYS: Big Bands at Buckroe, Sunday nights throughout the summer, Buckroe Park, 7-9 p.m. Free. For more information, call 727-6429.

ARTIST'S PORTFOLIO: Now through Sept. 1, the Charles H. Taylor Arts Center in Hampton presents a juried exhibition of the region's foremost artists. Hours are 10 a.m. to 6 p.m., Tuesday through Friday, and 1 p.m. to 5 p.m. on weekends. Admission is free. For more information, call 722-2787.

SUPER HEROES ®: A High-Tech Adventure is featured at the Virginia Air & Space Center in Hampton through Sept. 8. The blockbuster interactive exhibit was designed and created by the Oregon Museum of Science and Industry. Imaginations of young and old alike will soar with Batman, Superman, Spiderman, the Incredible Hulk, Wonder Woman, and Captain America – all super heroes dedicated to the good of society. The exhibit showcases a hospital, factory, training academy, tunnel, workout room, crime lab and city street, where visitors can join the super heroes in making the world a better place in which to live. Enter this unique world, and join Batman to solve a mystery in the crime lab, or climb Spiderman's giant web. For more information, call 727-0900.

BLOCK PARTY: Downtown Hampton's Block Party, Saturday nights throughout the summer, Queens Way between King and Eaton Streets, 6-10 p.m. Free. For more information, call 930-4731.

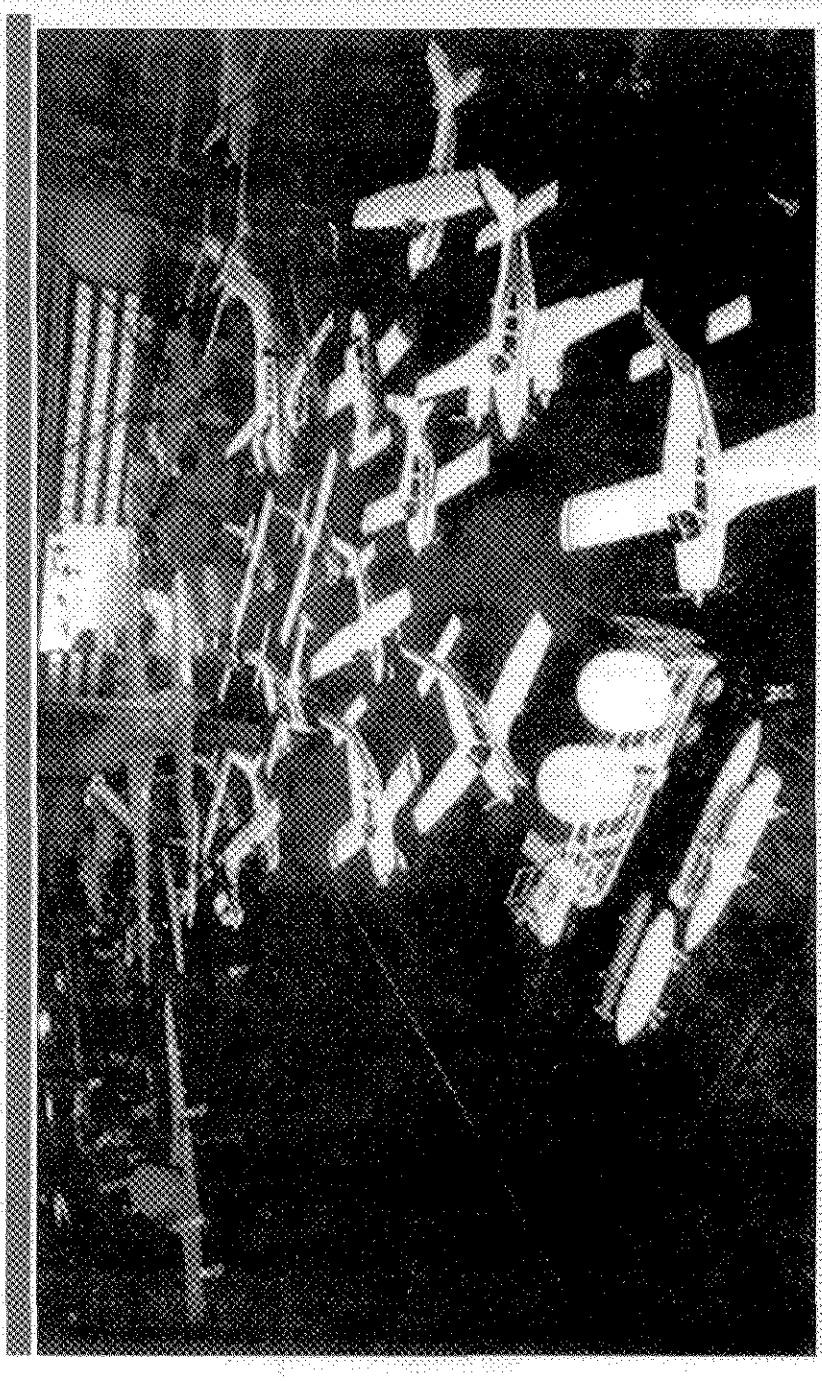


Photo by Fred Jones

BASTION FROM BERTHA – Aircraft from the Langley Aero Club, Virginia Institute of Marine Science, Langley Air Force Base and Fort Eustis all took refuge in NASA Langley's hangar June 12 as a precaution against the potential damaging forces of Hurricane Bertha. Although the storm made landfall on the North Carolina coast, Hampton Roads still felt its effects in the form of heavy rain and strong winds.

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Langley Research Center
Hampton, Virginia 23681-0001
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National Aeronautics and
Space Administration
Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 16 ❖ August 9, 1996

New NASA Langley Center Director Named

Dr. Jeremiah F. Creedon has been named director of NASA Langley Research Center, where he began working 33 years ago as an engineer.

NASA Administrator Daniel Goldin announced the appointment July 31 in Washington, D.C., and it took effect Aug. 5.

"NASA is fortunate to have a man of Dr. Creedon's caliber to take the helm of the Langley Research Center," Goldin said. "I am confident Dr. Creedon's extensive experience and first-hand knowledge of aeronautics research will serve him well in this new position."

Creedon succeeds Paul F. Holloway, who, after 36 years at Langley, announced July 2 that he would step down as Center director as soon as a replacement was found. Holloway will assist Creedon in a transition role.

"I'm honored to have been selected to this position," said Creedon, "and I will do the best that I can. Thanks to my predecessor's outstanding contributions, the Center is in an excellent position for the future. I'm sure the excellent people at Langley will maintain and even improve their contributions to the nation."

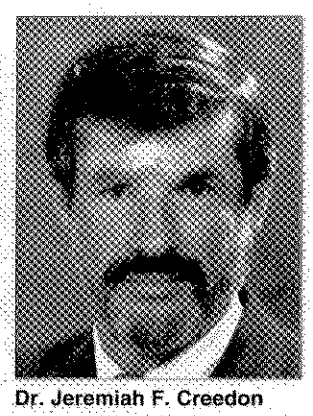
Creedon, 56, is the seventh Langley director since the Center was established in 1917 as the nation's first civilian aeronautical laboratory. NASA Langley has about 4,500 civil service and contractor employees and a $633.8-million fiscal 1996 budget.

Creedon has been serving the Center as director of the Airframe Systems Program Office. Until February of this year, he was director of the Aeronautics Program Group, a position he had held since February 1994.

Creedon began his career at Langley in 1963 as a research engineer in the Navigation and Guidance Research Branch, Instrument Research Division.

Since 1970, he has held a variety of management positions in both aeronautics and space research. Creedon was named head of the Control and Information Systems Section in 1970, assistant head of the Avionics Technology Research Branch in 1979, chief of the Flight Control Systems Division in 1982, and head of the Flight Systems Directorate in 1985.

A Rhode Island native, Creedon graduated from the University of Rhode Island with bachelor and master of science degrees and a doctorate in electrical engineering in 1961, 1963 and 1970, respectively. He was a Sloan Fellow in 1982-83 at Stanford University and received a master of management science degree.


Dr. Jeremiah F. Creedon

Creedon is the author of more than 30 technical articles and is a fellow of the American Institute of Aeronautics and Astronautics.

He received the Presidential Rank of Meritorious Executive in the Senior Executive Service in 1989 for his outstanding contributions to the management of NASA programs. In 1990, Creedon received the NASA Outstanding Leadership Medal. In 1995, he received the Presidential Rank of Distinguished Executive in Senior Executive Service.

Model of LoFLYTE Aircraft Unveiled, Ready for Testing

BY MARY M. SPRACHER

A jet-powered model aircraft equipped with state-of-the-art flight control technologies was recently displayed at a briefing in Oshkosh, Wis.

The Low-Observable Flight Test Experiment (LoFLYTE) aircraft has been developed by Accurate Automation Corp. in Chatanooga, Tenn., for NASA and the U.S. Air Force. The program contracts are administered through NASA Langley and the Air Force Wright Laboratory in Dayton, Ohio, under the Small Business Innovative Research (SBIR) program.

The experimental LoFLYTE aircraft will be used to explore new flight control techniques involving neural networks. The model is a Mach 5 "waverider" design which is a futuristic hypersonic aircraft configuration that actually cruises on top of its own shockwave. Waverider aircraft, powered by airbreathing hypersonic engines, would fly at speeds above Mach 4.

LoFLYTE represents the first known flying waverider vehicle configuration, but in the upcoming flight tests at NASA's Dryden Flight Research Center in California, it will be flown at subsonic speeds to explore take-off and landing control issues.

Photo by Mike O'Hara
Jeff Seymour, right, president of SWB Turbines, and company technician Bill Morse adjust the landing gear of the LoFLYTE model.

The 100-inch long, remotely piloted aircraft has been designed to demonstrate that neural network flight controls are superior to conventional flight controls. Neural networks are computer systems that actually learn by doing. The computer network consists of many interconnected control systems, or nodes, similar to neurons in the brain. Each node assigns a value to the input from each of its counterparts. As these values are changed, the network can adjust the way it responds.

The LoFLYTE model's flight controller will consist of a network of multiple-instruction, multiple-data neural chips. The network will be able to continually alter the aircraft's control laws in order to optimize flight performance and to take the pilot's responses into consideration. Over time, the neural network system could be trained to control the aircraft. The use of neural networks in flight would help pilots fly in quick-decision situations and would help damaged aircraft land safely, even when controls are partially destroyed.

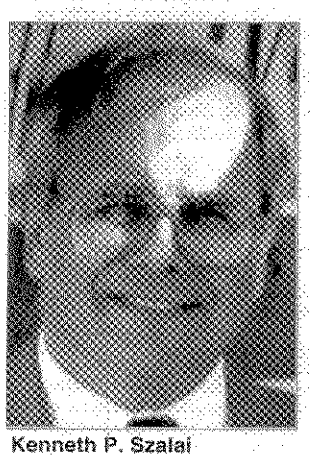
The initial configuration for the aircraft was developed here at Langley, and then Accurate Automation Corp. integrated the neural network into the Langley

(see LOFLYTE, page 4)

Colloquium Communiqué

Dryden Director To Uncover Flight Research

Kenneth P. Szalai, Director of the NASA Dryden Flight Research Center in Edwards, Calif., will present a colloquium lecture on Aug. 14, 2 p.m., in the H.J.E. Reid Conference Center.


Kenneth P. Szalai

The lecture, entitled "Flight Research: Discovering the Real, the Imagined, the Overlooked, and the Unexpected," will validate the value of flight research and will pose new questions to be solved by future experimental aircraft. Szalai prepared the presentation for the General Electric Aviation Lecture at the Smithsonian National Air and Space Museum in January of this year.

Szalai draws upon his 31 years of flight research experience to trace the involvement of NASA and its predecessor, the National Advisory Committee for Aeronautics, in X-plane research from the X-1 through X-31. He also discusses the contributions of these and other research programs at Dryden to everything from airliners to the space shuttle.

Szalai's career at Dryden began in 1964. On several research aircraft programs, he held research and systems engineering positions in which he investigated flying qualities, integrated flight controls, and fault tolerant-flight critical systems. He served as director of the Dryden Research Engineering Division from 1982 through 1990.

All colloquium lectures are videotaped and are available from the Center library. Civil service personnel should charge their time to B1010.

NASA SBIR Companies Exhibited at Oshkosh

BY MEGHAN WOODCOCK

Three Small Business Innovative Research (SBIR) Phase II award-winning companies exhibited at Oshkosh, Wis., at this year's Experimental Aircraft Association's Annual Fly-In Convention and Sport Aviation Exhibition, Aug. 1-7. The exhibits were housed in NASA's exhibit hangar.

Aurora Flight Sciences of Manassas, Va., focused its exhibit on Single-Lever Power Control technology for small general aviation (GA) aircraft. This technology replaces up to five traditional engine controls with a single controller receiving input from a digital engine control system.

Global Aircraft of Starkville, Miss., also exhibited their NASA SBIR Phase II technology development. A low-cost, low-noise, composite material propeller blade designed for small general

(see EXHIBITS, page 4)

News Briefs

Around the Agency

CAMERON TO LEAVE ASTRONAUT CORPS – Shuttle astronaut and U.S. Marine Corps Col. Ken Cameron left NASA Aug. 5 to pursue other career interests. Cameron, selected as an astronaut in 1984 and a three-time shuttle flight veteran, will join Hughes Training, Inc., as executive director for the company's Houston operations. Cameron first flew as pilot on STS-37 in 1991 and served as commander on STS-56 in 1993 and STS-74 in 1995.

CREW NAMED TO SIXTH SHUTTLE-MIR DOCKING MISSION – Four crew members have been named to join U.S. Air Force Col. Charles J. Precourt on Atlantis for the sixth scheduled docking mission between the space shuttle and Russia's Mir space station. Precourt was named commander of the mission last February. Pilot and Air Force Lt. Col. Eileen Collins will join Precourt on the flight deck. Mission specialists for the flight are U.S. Marine Corps Maj. Carlos Noriega and Edward Lu, Ph.D., the first mission specialists from the 1995 astronaut class to be assigned to a shuttle flight. Rounding out the crew is European Space Agency astronaut Jean-Francois Clervoy. Atlantis also will carry mission specialist Mike Foale to the Mir space station to begin a planned four-month stay as part of NASA's Phase One Program. Foale will replace Jerry Linenger, scheduled to arrive at Mir in January during the STS-81 mission. Linenger will return to Earth on Atlantis as a member of the STS-84 crew. Collins, 39, will be making her second journey into space. She previously flew as pilot on STS-63 in February 1995 as Discovery was maneuvered to within 10 meters of the Mir space station, setting the stage for subsequent rendezvous and docking missions. Noriega, 36, and Lu, 33, will be making their first flights into space after successfully completing their required training and preparation. Clervoy, 37, flew previously on Atlantis during STS-66, the third Atmospheric Laboratory for Applications and Science in 1994. STS-84 will be his second space shuttle flight. Foale, 39, has spent the past year in Russia training for his stay on board Mir. He flew on STS-45 on Atlantis in 1992, STS-56 in 1993 and STS-63 in 1995, both on Discovery. Linenger, 41, flew on STS-64 aboard Discovery in September 1994. Atlantis will carry the Spacehab double module and will remain docked with the Mir space station for five days, transferring supplies and experiments between the two spacecraft in addition to the astronaut exchange.

VASC Marks Record Year

Strong community support, a cohesive board and professional staff, dynamic traveling exhibits and innovative educational programs contributed to making the Virginia Air & Space Center's (VASC) 1996 fiscal year the most successful in the museum's history, said Kim L. Maher, executive director and chief executive officer.

Virginia Air and Space Center
Hampton Roads History Center

Attendance at the downtown Hampton museum increased 17 percent, participation in educational programs more than doubled and membership increased 20 percent. The VASC ended the year with revenues exceeding expenses by more than $150,000. These funds will be used to develop new exhibits.

Maher credits her board of directors with charting the year's success by adopting and helping to implement a new strategic plan.

The museum's "Strategic Plan 2000" emphasizes development of educational programs and exhibits and formation of community partnerships.

Featured in the new traveling exhibits program this year were *Greenhouse Earth*, the blockbuster exhibit *Star Trek: Federation Science* and the current interactive exhibit, *Super Heroes: A High-Tech Adventure*.

In addition, the VASC significantly expanded its permanent exhibit collection. NASA Langley's Cray II supercomputer, *Voyager*, now resides in the center. Further, the Langley-sponsored Internet exhibit, *Surfing the Net*, has helped the museum to become an electronic communication site.

The center opened an aeronautics gallery, highlighted by an exhibit called *Higher, Faster, Further: Reaching the Edge of Space*, recently acquired from the Smithsonian's National Air and Space Museum. The Hawker XV-6A Kestrel, also from the Smithsonian, has been added to the center's aircraft collection.

The U.S. Navy donated two complete cockpit sections to the museum, an A-6E Intruder and an F-14A Tomcat.

"All these exhibits played a major role in bringing new audiences and members to the center," said Maher. "People now have reasons to visit more than once a year."

In addition to preserving and interpreting national

(see VASC, page 4)

Announcements

CFC Seeks Testimonies

Langley's Combined Federal Campaign (CFC) Committee is looking for a few civil service, contractor, or retired employees who have either been helped by or who volunteer to help CFC organizations.

As part of the Center's CFC publicity campaign this year, Langley hopes to highlight some of "our own" in future *Researcher News* articles. To share your involvement, call Cathy Schauer at ext. 43314 or Woodrow Whitlow at ext. 46033 by Aug. 22.

'Reinvention Roundtable' Found on the Net

The Spring 1996 issue of *Reinvention Roundtable*, a National Performance Review publication, is available on the Internet at http://www.npr.gov. Click on "News Room," and look for the Roundtable.

Federal Employees Invited To Learn of Legislative Changes

Jeanne Evans, administrative assistant for Rep. Owen Pickett (D-Va.), will present a talk entitled "Regulations Affecting Federal Employees," Aug. 15, 1-2:30 p.m., in the H.J.E. Reid Conference Center. The event is open to everyone, and Langley employees may charge their time to J.O. B1011.

Evans will discuss the changes Congress has proposed regarding retirement, health plans and other issues and will answer questions about how these laws affect local federal employees.

Langley's Federal Women's Program Committee will present its annual Supervisor of the Year and Employee of the Year Awards immediately following Evans' presentation.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following Langley employees are approved leave recipients: Marilyn K. Aldrich, Gresha P. Brown, Catherine K. Cronin, Cassandra Stevens, Charles S. Washington.

Anyone interested in donating leave to recipients in the program should send donations on the "Request To Donate Annual Leave to Leave Recipient Under the Leave Transfer Program" form via computer in Informed Manager to Mail Stop 293, Office of Occupational Health Services, or fax the forms to ext. 49114. For more information, call Karen Ridlon at ext. 43194.

One Leave Recipient Says 'Thank You'

"I would like to thank everyone who donated leave to me while I was out of work due to my pregnancy and my daughters' health. My daughters were born two months early and very small, and with so much to worry about regarding their health, it was nice not to have to worry about my leave situation on top of that. It was a blessing to be able to stay with them until they were strong and healthy. I very much appreciate the leave donated to me and all of the concern about me and my daughters during the months that I was out. It is nice to know that so many people care. Thank you." Holly Elliott

Technical Library's August Workshops

The Technical Library offers workshops and tours during August. All workshops will be held from 10 to 11 a.m. in the Library Training Room. To register, e-mail workshops@techlibrary.larc.nasa.gov, or call ext. 42368, indicating the dates of the workshops that you wish to attend. You will receive electronic confirmation of registration.

Searching FirstSearch on the WWW (Aug. 14 and 28):

FirstSearch provides a number of resources, including online catalogs, databases, and bibliographic files, through a single Web interface. This class will introduce FirstSearch and will demonstrate approaches for searching and retrieving information.

Searching CoreAero (Aug. 21):

CoreAero is a database that is a single point of access for aerospace information through the STILAS character interface and WebCat. The database is comprised of unclassified and unlimited citations from NASA RECON. Citations from other government and commercial sources will be added.

Library Orientation (Aug. 22):

Learn about library services and electronic resources. Learn basic searching of STILAS, the online catalog. Become familiar with the library's CDNET, a collection of networked CD-ROM titles. Learn the library's layout with a walking tour.

CTAP Center Offers August Seminars

The Career Transition Assistance Program Center offers the following seminars during August. Advance registration is required for all seminars.

- "Starting Your Own Business," Aug. 21-22, 9 a.m.-4:30 p.m., Building 1216
- "Making Yourself Indispensable," Aug. 27, 9 a.m.-noon, Building 1216
- "So, You Want To Be a Consultant!" Aug. 29, 9 a.m.-3 p.m., Building 1216

All NASA civil service employees and their spouses are eligible for this authorized training. For more information or to register, call Susan Costello at ext. 45000.

News Researcher

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

NASA Langley's Aeronautical Oddities

From the "roaring '20s" to the present, Langley researchers and engineers have aimed to perfect the best aerodynamic designs conceivable. In the process, many strange designs have passed through the Center's research and flight test facilities.

Some of these aeronautical oddities have made significant contributions to the development of flight, illustrating the importance of the imagination, innovation and skill of industry and NASA Langley researchers.

Langley Races To Develop America's First Jet Plane

BY MEGHAN WOODCOCK

Langley's research on America's first jet airplane commenced only after U.S. military leaders transferred the job to the National Advisory Committee for Aeronautics (NACA) in 1943.

Although the NACA had always prided itself on its unwavering demand for technical excellence, the agency failed to invent jet technology.

Before World War II, the NACA did little of its own research on power plant technology. However, Langley engineers had been pursuing work on the transonic realm of flight. Since American researchers deemed jet propulsion too heavy to be practical, no group at Langley felt challenged to work on the problem.

Beyond Langley, other factors prevented America from developing jet technology first. World War II, in exposing the jet propulsion work of the British and the Germans, completely reversed American attitudes towards jet propulsion.

The NACA was now in charge of helping the U.S. to "catch up" with the Europeans. The race began with research on America's first jet airplane, the Bell XP-59A Airacomet.

Doubting the Dreamers

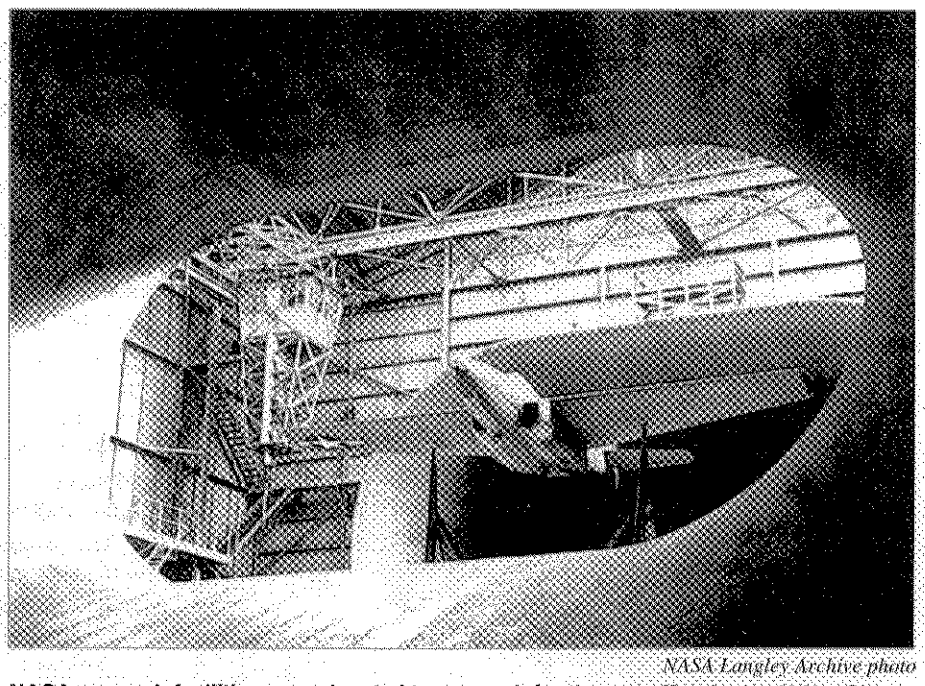
From the beginning, jet technology seemed to be a wild, uncontrollable impossibility. The new technology was expensive, with little benefit over the propeller engine.

In 1923, the NACA published a paper by the Bureau of Standards declaring jet propulsion "impossible." Thus, NACA's engineer-in-charge, Henry Reid, recommended that the agency refrain from researching jet propulsion.

Then in 1938, at the Navy's request, Vannevar Bush led a committee for the National Academy of Sciences to study gas turbines, concluding that the engines "might be all right for ships" but were "too big and ponderous for flight."

NACA personnel widely accepted these reports and thus hampered further investigation into the transonic range of speed.

However, European researchers came up with innovative ideas regarding aircraft propulsion systems, in effect starting the turbojet revolution.



NASA Langley Archive photo

NACA research facilities were devoted to research for the war effort in the 1940s. Shown above, the Bell XP-59A Airacomet – America's first jet plane – undergoes drag cleanup in Langley's Full-Scale Tunnel.

Engineers at War

German engineer Hans von Ohain designed the engine that successfully propelled the world's first turbojet airplane – the He-178 – in 1939. Support from both the Air Ministry and industry sped Germany's initial design, explaining that country's jump on the technology.

The story was different for Frank Whittle, designer of Britain's first successful turbojet engine. Whittle was granted a patent for his design in 1930 but was unable to develop the engine then.

However, despite financial setbacks and initial lack of support, England flight-tested its first jet plane – the Gloster E 28/29 – in 1941, two years after the He-178.

America Joins Jet Age

World War II made bringing America onboard necessary. In *Jet Age,* Whittle remarked on the urgency: "The night attacks in particular were becoming a serious threat to the U.K. [United Kingdom] production."

So in 1941, Sir Henry Tizard of the U.K. and U.S. General "Hap" Arnold agreed that the U.S. should back up English engine production, under the condition that the transferred technology would be treated as a top military secret. Arnold selected General Electric to develop the Whittle engine and Bell Aircraft to develop the airframe for a fighter airplane.

Whittle traveled to America in 1942 to help in the production of his design. In Virginia Dawson's *Engines and Innovations,* Whittle recalled that "until we pushed the button and showed this thing running, the Americans wouldn't believe it would work."

That October, the U.S. did fly its own version of the jet airplane in California – the Bell XP-59A, powered by two G.E. I-A Whittle engines. Unlike the research airplanes flown by the Germans and British, the Airacomet flew with a full armament system.

(see AIRACOMET, page 4)

LARSS Program Welcomes College Students for Its 10th Year

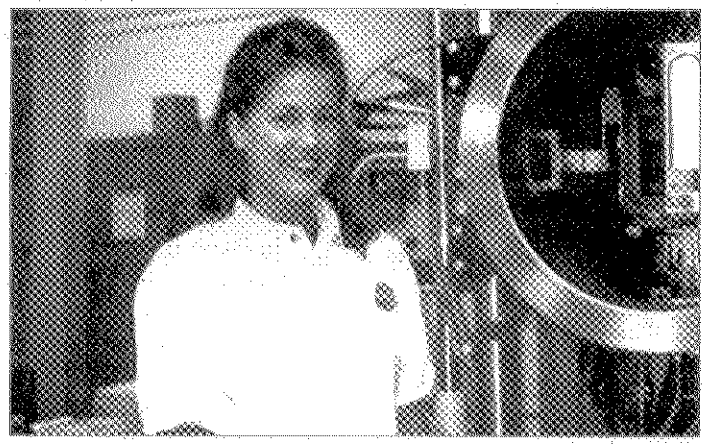


Photo by Molly Ritz

LARSS student Kathleen Sienko will work to characterize materials for solar probe spacecraft.

BY MOLLY RITZ

College students are visiting Langley this summer to participate in the 10-week Langley Aerospace Research Summer Scholars (LARSS) program.

Dr. Samuel E. Massenberg established the program in 1986 to expose students to research experiences in their chosen field.

The students must complete designated research projects under the careful supervision of their mentors.

The LARSS program has grown considerably over the years, with enrollment jumping from the initial 80 to a current 127 students.

They Come From Afar

Students from as far away as Puerto Rico are taking part in the program.

"I have always dreamt of working at NASA since I was a little girl, so I did not think twice when I was offered the opportunity," said Vanessa Indarte, a student from the University of Turabo in Gurabo, Puerto Rico. "I like the mentor experience the best because my mentor, Judith Watson, treats me as a colleague, and she is always willing to help me."

Indarte is working in Langley's Structural Mechanics Branch. She is pursuing a degree in mechanical engineering and hopes to attend graduate school.

Learning Experience

The students come to Langley to apply what they have learned in the classrooms of their universities.

"Seeing the actual applications of textbook material has really enhanced my formal educational experience," said Kathleen Sienko, a student at the University of Kentucky in Louisville.

Sienko, who is working in the Environmental Interactions Branch, hopes to pursue her dream of representing the nation in space. She moved one step closer to that goal this summer by earning her pilot's license through Langley Air Force Base, she said.

Research Projects

"I am working on so many different research projects this summer with my mentor William Ball," said Benjamin Dunton, a student at Christopher Newport University in Newport News.

Dunton is working in the Internal Operations Group, and said he enjoys working with Geographical Information Systems.

Rich in Resources

The LARSS program's goal is to encourage participants to pursue graduate degrees in their fields of interest by exposing them to Langley's research resources and facilities.

"I have seen wind tunnel testing, flight simulators and much more," said Marcella Jarmillo, a student at the University of New Mexico in Albuquerque. "I do not have a background in aerodynamics, so this has been a wonderful opportunity."

Jarmillo is working in the Office of Safety and Environment.

Disabilities Awareness

Dizzying Meniere's Disease

You're sitting in a good spot this time; there's no one blocking your view. You have your favorite drink and a bag of popcorn. You focus on the screen, eager to enjoy the movie, when suddenly the room starts to spin – slowly, at first, but before you can catch your breath, you enter a swirling kaleidoscope of ceiling to floor, ceiling to floor, until you are completely panic stricken and extremely nauseated. You remember that you're in a public place. What can you do? You call out for help.

Meniere's Syndrome is a disease affecting the inner ear. It is characterized by progressive hearing loss, tinnitus (noises in the ear), vertigo, nausea and vomiting.

Although it is considered one of the "invisible" disabilities and cannot be detected unless it strikes without warning (and it generally does), Meniere's Syndrome can be debilitating.

While there is no known cure for this disease, some of the symptoms may be controlled with proper diet and prescribed medications.

Many with this condition suffer from depression and insomnia because of the persistent buzzing or ringing noises in the ear. These noises generally start in one of the ears but can gravitate to the other ear with age. Total deafness usually does not occur, but progressive hearing loss is apparent with age.

Double-Amputee 'Golden Knight' To Speak Here

Dana Bowman, Named Disabled Veteran of 1995, Inspires Others with his Courage, Determination

BY BECKIE WILLIAMS

U.S. Army Sgt. 1st Class Dana Bowman, a renowned motivational speaker for disability awareness, will speak to Langley employees and guests Aug. 21, 2 p.m., in the Pearl Young Theater, Building 1202. Employees should charge their time to Job Order A5006.

The program is sponsored by the Office of Equal Opportunity and the Satellite Committee for People with Disabilities.

Bowman, a double amputee who was named the Disabled American Veterans' 1995 Disabled Veteran of the Year, is the community liaison for the Army's Golden Knights Parachute Team, headquartered at Fort Knox's U. S. Army Recruiting Command.

His duties include supervision of all the coordination involved in the preparation of Golden Knights, publicity, and public information.

One of Bowman's priorities is to campaign for improved access to high-tech prostheses for service personnel, both active and retired, and to encourage all amputees to reach their personal recovery goals.

A 15-year Army veteran and a Golden Knight since 1993, Bowman is still an active member of the elite parachuters. He has performed more than 100 jumps since the Feb. 6, 1994, accident which resulted in the loss of both his legs.

Sgt. 1st Class Dana Bowman

The accident occurred during the team's annual training in Yuma, Ariz., as Bowman and his Golden Knights partner, Sgt. Jose Aguillon, collided in mid-air while performing a diamond track jump. Aguillon was killed.

In November 1994, Bowman turned this tragedy into triumph when he became the first double amputee to reenlist in the United States Army. He even skydived into the reenlistment ceremony.

Bowman's message to his audiences is simply, "What I've done, you can do. I have plenty of reason to live. If I fall, I'll get back up. I do every time."

When he's not at work with the Golden Knights, Bowman enjoys scuba diving, hot-air ballooning, snow skiing and country-western dancing.

He also spends much of his personal time working with other amputees and disabled people and is working on a study for the Undersecretary of the Army on ways to improve the military medical system.

AIRACOMET

(continued from page 3)

NACA Catches Up

From 1941 to 1943, Langley engineers pursued research on a ducted-fan jet propulsion system designed by Italian engineer Secondo Campini. The system added additional thrust with a fan.

Although research on the Campini system was halted, Langley proved that the system worked. But Langley engineers were still unaware of the advancements of turbojet technology.

Some NACA engineers heard rumors of the Airacomet in 1942, but most learned of the Bell XP-59A after the project's declassification the following year.

Great Britain dominated the turbojet engine field during and shortly after World War II. While America's wartime aero-nautical work lagged behind, the NACA helped to forge the nation's leading position after the war.

This American "takeover" was due partly to continued British and German technical assistance, as well as England's lack of proper research facilities. Still, Langley's preliminary research on jet engine technology vastly improved designs for jet airplanes.

LOFLYTE

(continued from page 1)

design. Successful tests of the waverider concept in Langley's 12-foot Low-Speed Wind Tunnel and 30-by-60-foot Full Scale Tunnel preceded this model aircraft's development.

Construction of the model was completed at SWB Turbines of Appleton, Wis. This company provided the small turbine engines that power the model. The shell of the model was made at Mississippi State's Raspet Flight Research Laboratory and then shipped to SWB Turbines so the engine and radio control gear could be installed.

The waverider was chosen as the testbed for the neural networks because the configuration has an inherently high hypersonic lift-to-drag ratio. If neural networks can control this "worst-case scenario" configuration, then they should be able to handle any other desired configuration.

The waverider configuration was chosen also because it allows for long hypersonic cruise ranges of up to 8,000 miles. At an altitude of 90,000 feet, the Mach 5 waverider could fly at a rate of one mile per second.

The technologies being implemented in the LoFLYTE program may eventually find their way into commercial, general aviation and military aircraft.

"We want to make the public aware that the government is getting a good return on its SBIR-invested money," said Robert Pegg of Langley's Hypersonic Vehicles Office. "We hope this project will help us further demonstrate that the SBIR program is a viable investment for the American people."

EXHIBITS

(continued from page 1)

aviation airplanes were on display. Global Aircraft is also developing a flight training airplane – the GT-3 – that incorporates NASA-developed laminar air-flow technology.

Innovative Aerodynamics Technologies of Poquoson received an SBIR Phase II contract for developing a desktop software package that allows GA aircraft designers to run advanced laminar flow analyses.

NASA recognizes the role that small, entrepreneurial business can provide to the revitalization of the country's GA industry. NASA's SBIR and Small Business Technology Transfer (STTR) programs offer small businesses the opportunity to fund their commercially viable innovations. Projects that lie within the NASA mission and can be commercialized in the marketplace compete for funding awards.

These two programs also create a facilitation path to transfer NASA-funded research and technology to company projects for appropriate commercialization.

Both the SBIR and STTR programs have three phases. Phase I is a feasibility study for six months (SBIR) or 12 months (STTR), where companies may be awarded up to $70,000 or $100,000 respectively.

Only companies that have received Phase I awards are invited to submit proposals and to compete for Phase II awards. These proposals are for research and development efforts lasting up to two years and can be awarded up to $600,000 and $500,000 respectively.

In Phase III, companies commercialize their products with no financial assistance from the federal government.

Since the inception of the GA revitalization efforts, NASA has funded more than $18 million in contracts to small high-tech businesses in support of the GA program. Thayer Sheets is manager of the SBIR and STTR programs for NASA Langley.

VASC

(continued from page 2)

achievements in air and space exploration, the museum's mission is "to stimulate interest in the sciences through entertaining interaction with educational exhibits, programs and films."

This year's educational programs were specially designed to meet the state's new standards of learning. Offerings included summer camps, overnight experiences and school outreach programs.

With much corporate support, the VASC also has been able to develop an "opportunity fund" that allows it to offer educational programs to disadvantaged youth.

Board members Duncan E. McIver, Raymond B. Bottom Jr. and William M. Grace were reappointed last month; Edwin C. Kilgore, George R. Goodson Jr. and Charlie W. Hill were newly elected to the board of directors.

The coming year's new exhibits include *International Space Station, Exploring the Red Planet: Project Viking* and *The Science of Sports*.

Governor's School Students Taste Aerospace Life

BY MOLLY RITZ

Fifteen high school students from throughout the state are working at NASA Langley this summer as part of the Virginia Governor's School program.

The program's goal is to acquaint the students with aerospace careers represented at Langley. They will experience first-hand some subject areas they will study as undergraduates. They will also see some aspects of the life of a researcher and will see applied science in action.

Mentoring Experience

The students have the opportunity to work one-on-one with a Langley technician, researcher or scientist and gain valuable hands-on experience. They are assigned to a NASA mentor who best meets their engineering and science interests.

"I feel that, if I were not working one-on-one with a mentor, this program would not be any different than a modified classroom," said Victor Beck, a Salem High School student from Virginia Beach who is working in the Development and Testing Branch. "My mentor is very helpful, and he is always willing to involve me in any job he is working on."

Beck is working alongside David Shuster and plans to pursue a career in aerospace engineering.

Tough Competition

The competition to attend a Governor's School program is rigorous. The students are chosen based on their grade point average, course level and extracurricular activities.

"I am so excited to be here this summer," said Wendy Williams, a Kempsville High School student from Virginia Beach who is working in the Development and Testing Branch.

Williams believes she was selected for the program because of her enthusiasm for learning and her desire to experience her dream.

"The caliber of students in the program is enough to make even the highest-ranking students become humble,", said Williams.

Future Goals

The Governor's School program is intended to introduce students to an assortment of new concepts and ideas they have never seen before. Through this experience, they become capable of applying the theories they have learned in the classroom to real-life situations.

"One part of me yearns to muddle through the theoretical side of science because I could discover something incredible, and the other part has started to see the more practical engineering side which makes realities out of dreams," said Williams.

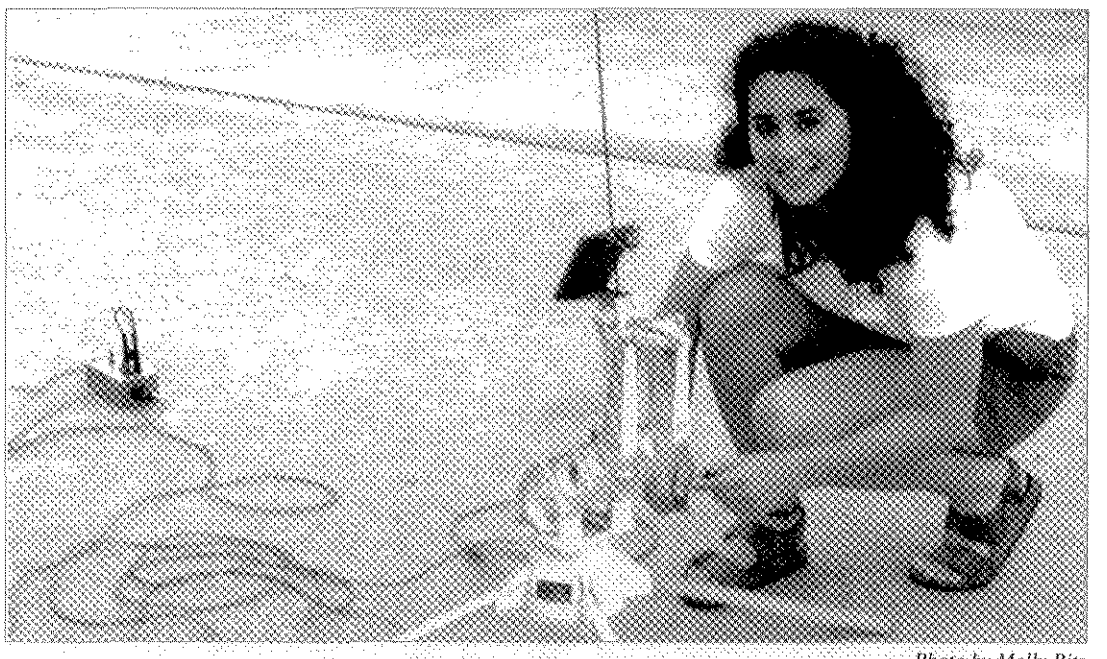


Photo by Molly Ritz

Governor's School student Wendy Williams prepares to launch a test rocket as part of her aerospace project.

Teachers Participate in ATTAC 2000

BY MOLLY RITZ

Three high school teachers are spending part of their summer here at Langley to take part in the Approach to Training and Competency (ATTAC 2000) teacher internship program.

This program is an integral part of Virginia Peninsula Chamber of Commerce's Business/Industry/Government-Education (BIG-Ed) collaborative effort. The program seeks to improve tomorrow's workforce by assisting the participants with an understanding of vital concepts needed to succeed in the business world.

"The program has taught me to influence my students to be self-motivators," said Paul Maertus, a science teacher from Kecoughton High School in Hampton. "I will go back to school this fall with oodles of information to share with them."

ATTAC 2000 allows teachers the opportunity to apply knowledge gained in their academic environment to hands-on activities.

"I cannot wait to show my students how many different flight concepts can be applied to mathematics," said Claire Ouellette, a mathematics teacher from Bethel High School in Hampton. "The airplane activities that I was introduced to at Langley are going to come in handy when I teach statistics to my ninth-graders."

The teachers have witnessed the relevance of math, science, communications and occupational education to the workplace. With the help of Langley's Office of Education faculty, the teachers learn to expand their knowledge of possible applications within their subject areas and to use this knowledge to benefit students as they enter the business world.

Photos Now Available Via Desktop

Desktop searching is now available for the L-numbered Langley photographs in the photo archives.

Langley's photo lab has placed the records of the Photo Archives on STILAS to take advantage of its searching capabilities, as well as its ability to mount both text and images. With the text records and scanned images together, researchers can find images more easily.

Using any Langley computer with Netscape access, researchers can search for images via WebCat, the Internet version of STILAS. After selecting an image found online, the researcher then asks the photo lab to make a file, a print, or a transparency of the image.

The Internet address is http://stilas/; the generic login is *library*.

A photo archives work station is also available at the photo lab.

Photo archivist Jeanette Hoskinson developed the idea for an automated archives search system and got it off the ground.

"There's been a move for a long time to automate this system's availability from just my computer to all computers on Center and to add online images," she said. "This system is the first of its kind on STILAS. It's pretty much leading edge."

Researchers can search for photos from among the more than 38,000 records of photo archive images. These records cover some 200,000 images from 1981 to the present, as well as selected older images. Currently, about 300 scanned images can be viewed online, and more are added daily.

"From this point on, we hope to include at least one image online from every archived photo job shot," said Hoskinson. "That should give us about a thousand images by the end of the year."

Langley's system, which "is meant not as an end-user image manipulation system, but rather as a finding aid for images," may become the prototype for the other NASA centers to automate their photos for STILAS searching, said Hoskinson. Researchers here will eventually have the capability to search libraries at other NASA centers, as well, as each center comes online with the STILAS system.

"It gives everyone a great deal of flexibility. I like it because it gets back to the idea of one NASA – that we're all working together."

A Quick Guide to Using WebCat in Photo Searches

WebCat has all of the records for the photo archives from the present back to 1981, as well as some earlier records. It also maintains links to available digitized images to view some of the photos online.

1. In the Netscape location window, enter http://stilas/ and press *return* or *enter*.

2. The STILAS screen will come up. Click on the WebCat button.

3. The login screen will come up. In the UserID window, type *library*, and click on the login button.

4. Click on the Library Catalog button, and search selection buttons will come up. Select any of these.

5. When the lookup screen comes up, enter your search term and search the entire catalog, *or* click on the location button, which will bring up a menu. From that menu, select PHOTO-ARCH, to search only the photo archive collection. Place the cursor in the search window. Type in the terms or numbers needed for the search, and click on Search Catalog.

User Tips

To locate a particular L-numbered photo, type it as L11-1111 (no spaces); if you do not know the exact number, or if you are searching for the group of photos that an image is cataloged with, use the $ sign to replace unknown number, i.e., L91-99$. For more complex searches, place *and*, *or*, or *not* between words, i.e., "aircraft and model"; "aircraft or model"; "aircraft not model."

When a list of photos is retrieved, click the view button to see the record. If a digitized photo is available for viewing, a thumbnail of the photo will appear in the record. Click on the thumbnail to bring up a screen-sized version of the photo.

For assistance with searches, call photo archivist Jeanette Hoskinson at ext. 47963 or 49554, or call the Technical Library reference desk at ext. 42356.

Ancient Whale Surfaces at NASA Langley Site

3.5-Million-Year-Old Mammal Unearthed During Utility Dig

Thanks to the sharp eyes of contractors, the fossil remains of a 3.5-million-year-old whale have been discovered at NASA Langley.

The bones of the 30-foot juvenile baleen whale were found July 15 by contractors working at a piping trench under construction. The findings include a partial skull, tympanic bulla (part of a whale's ear bones), vertebrae, and rib and jawbone fragments.

NASA Langley is loaning the remains to the College of William and Mary for study, said John Mouring, Langley's facility master planner and preservation officer.

The discovery opens a window into the history of the NASA Langley site about 3.5 million years ago, when the Atlantic shoreline was probably 30 to 40 miles west of its present location and covered the Center, said Dr. Gerald (Jerre) Johnson of William and Mary's geology department.

"The research opportunity will provide insight into the development of whales through geologic time," Johnson said.

Preliminary work indicates the whale bones are the remains of an almost-mature creature that died and was quickly buried on a broad, wave-swept sand shoal.

The bones lay about four feet below the ground's surface in a reddish-brown sandy clay of the upper weathered part of the Yorktown Formation. The lower beds in the trench are sands comprised of broken marine mollusks, barnacles and other groups. This soil grades upward into the weathered part of the Yorktown Formation containing the whale remains.

Dr. Gerald Johnson

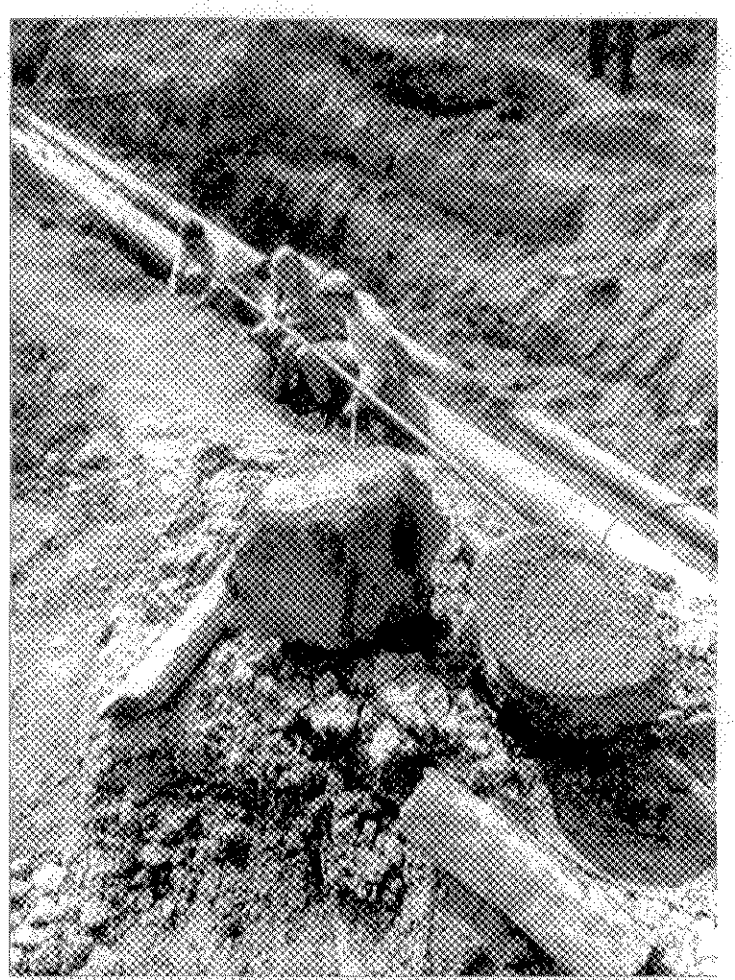
Shell material that once surrounded the whale has been dissolved away by groundwater. A gravelly sand and mud sequence overlies the whale-bearing beds; these were deposited in an ancestral Chesapeake Bay about 100,000 years ago.

The highly broken condition of most of the shells in the beds immediately below the whale tells of the strong wave and current activities that prevailed in the area when the whale came to rest on the sea floor.

Johnson said the chronological age of the whale is based upon the relative size of the tympanic bulla to the vertebra, and the degree of fusion of the plates on the central part of the vertebrae. The size of the ear bone indicates a baleen rather than a toothed whale.

The whale remains were discovered by two surveyors for Sverdrup Technology Inc. and a utility contractor, T.A. Sheets. The Sheets crew was digging an 8-foot-deep piping trench in the old rocket test area of the Center on the south side of Lewis Loop near East Bush Road.

The surveyors, Vanessa Butler and Kit Cain, were working in the area when they spotted two vertebrae and assorted rib pieces unearthed by the Sheets crew.



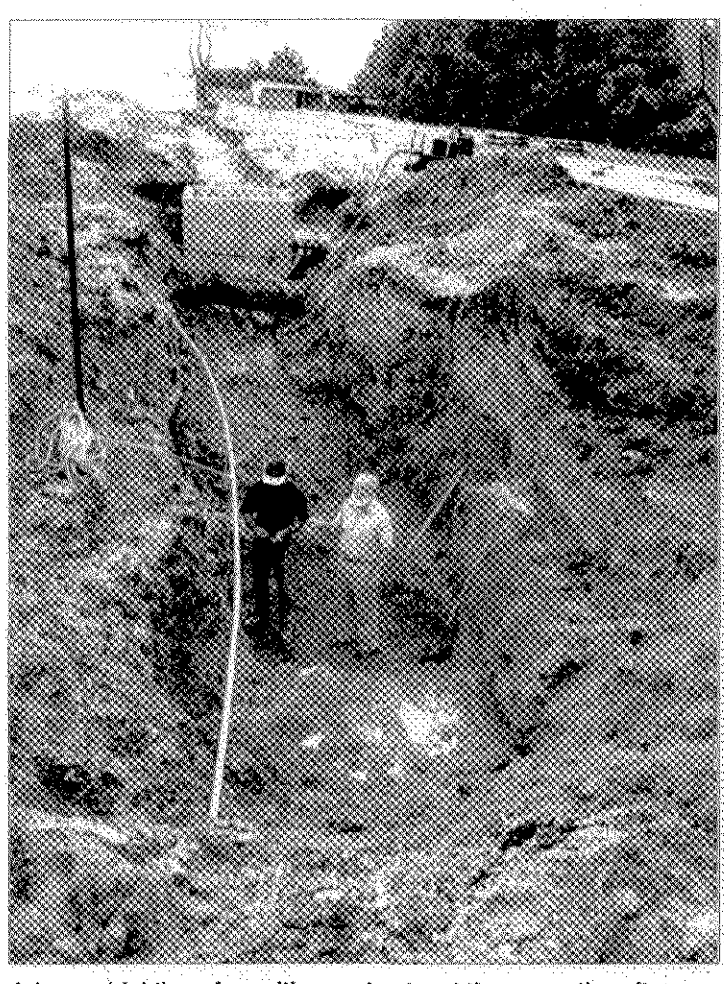
Photos by Fred Jones

Mark Leeper, left, Dr. Gerald Johnson and Scott Giorgis work together to excavate the head of the ancient whale found on Center. Leeper and Giorgis are graduate students at the College of William and Mary.

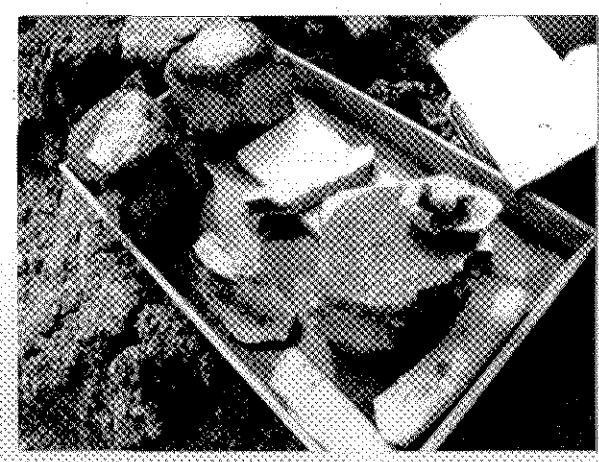
Knowing that Langley grounds are rich in prehistoric and historic artifact resources, and that they are managed here by law, the surveyors took the bones to Mouring.

Mouring determined that animal remains not associated with an archaeological context do not require preservation in the federal system (except for Bureau of Land Management and National Forests).

"This is paleontology – not cultural resources," he said. "If it is human-related (prehistoric or historic), it must be managed here at Langley under the National Historic Preservation Act."



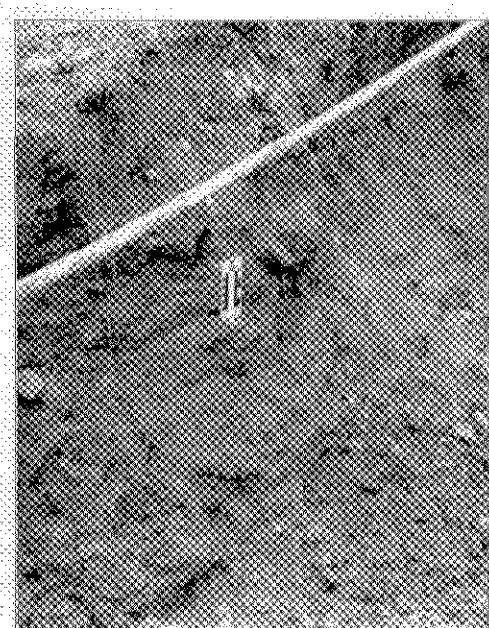
Johnson (right) confers with a contractor at the excavation site.



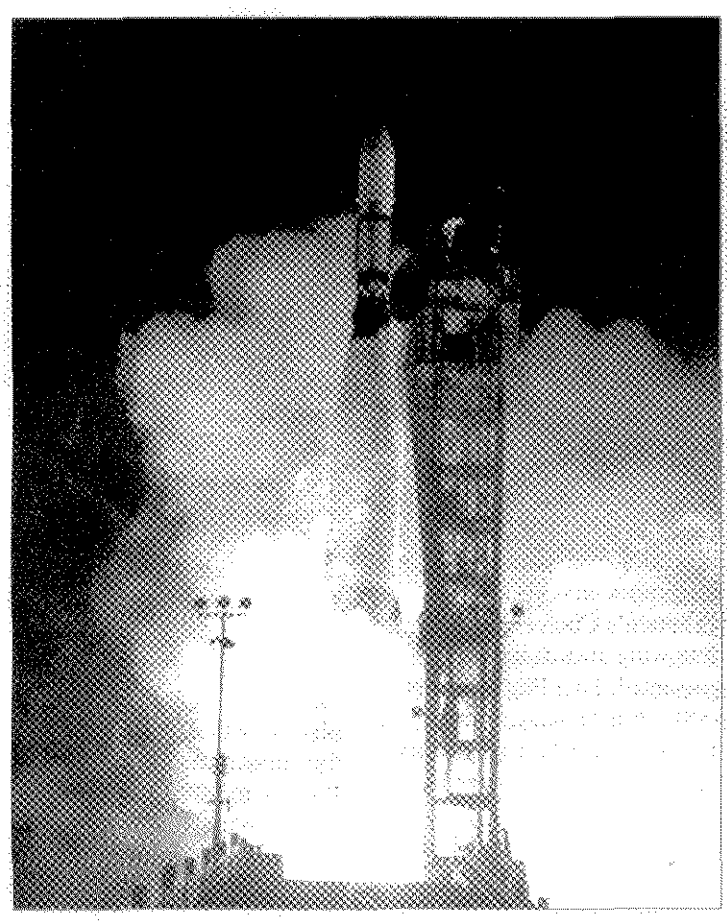
Several of the whale bones were placed in a wooden box.

Surveyors Vanessa Butler and Kit Cain display some of their unusual findings.

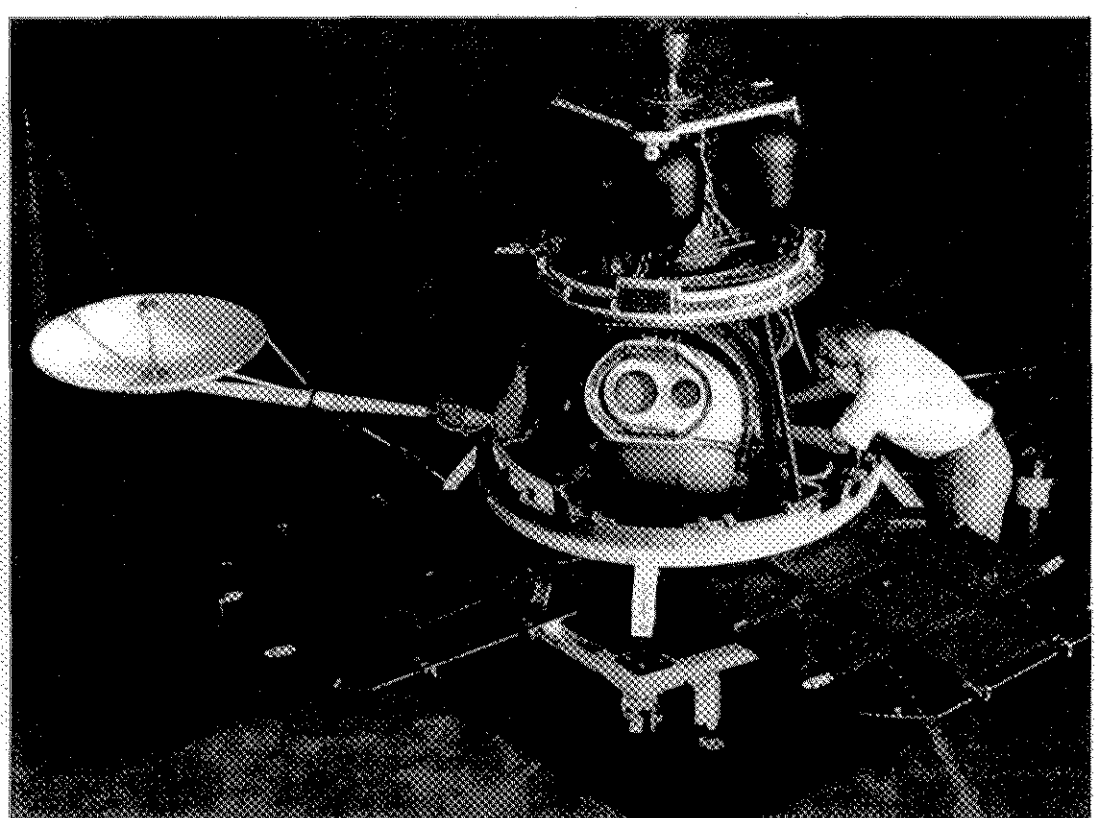
John Mouring, left, and Johnson examine some of the whale bones collected.



A geologic linear scale measures the dimensions of fossil remains.



The Atlas-Agena D launched the Lunar Orbiter spacecraft into space.



NASA Archive photos

Between 1966 and 1967, the Langley-managed Lunar Orbiter Program helped put five Lunar Orbiter spacecraft, like the one above, into orbit.

'Round the Moon and Back

First Lunar Orbiter Launched 30 Years Ago

The first of five Lunar Orbiter launches headed for the moon in August 1966, just three years after NASA initiated the project. The final launch in this swift and highly successful project followed almost exactly a year later.

Managed by Langley Research Center, the Lunar Orbiter Project (LOP) was conceived after President John F. Kennedy committed the nation to a manned lunar landing. The project goal was to support the Apollo mission by photographing the best possible landing sites for the spacecraft. To this end, the orbiter's camera had to capture details of the moon's topography in high-resolution pictures.

The urgency of the U.S. commitment to a manned lunar landing was the driving force behind the LOP. In order for Lunar Orbiter to successfully help the Apollo project, a no-time-to-lose posture ruled the schedules of Langley and the Boeing Co., the prime contractor. All aspects proceeded concurrently: spacecraft development, mission design, operational plan and preparation of ground equipment, computer programming, testing plan.

As a result, Lunar Orbiter began circling the moon only 27 months after Langley signed with Boeing, and LOP became a model space exploration program.

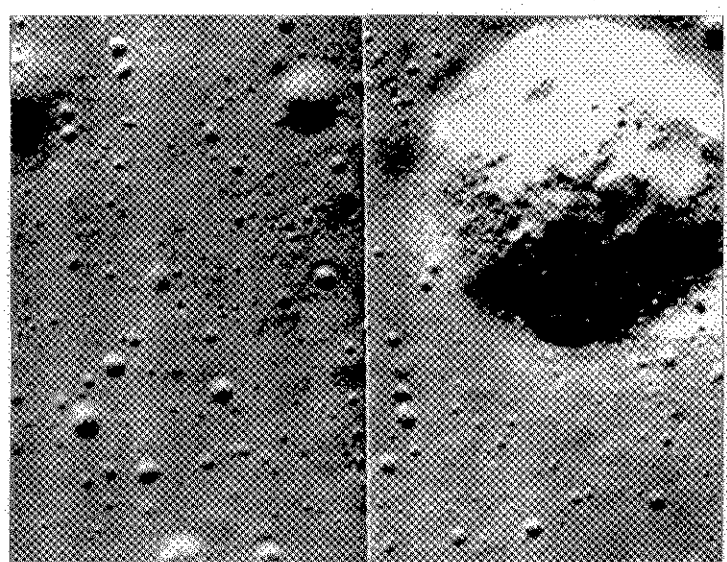
Not bad for Langley's first-ever deep-space flight project. Center Director Floyd Thompson named Clifford H. Nelson as project manager. Just eight others joined Nelson in the Lunar Orbiter Project Office (LOPO), located in a room of the 16-Foot Transonic Tunnel: engineers Israel Taback, Robert Girouard, William I. Watson, Gerald Brewer, John B. Graham, Edmund A. Brummer; financial accountant Robert Fariburn; and secretary Anna Plott.

From start to finish, Langley's LOPO remained a small organization; the original staff of nine grew no larger than 50. Still, just four men ran the show.

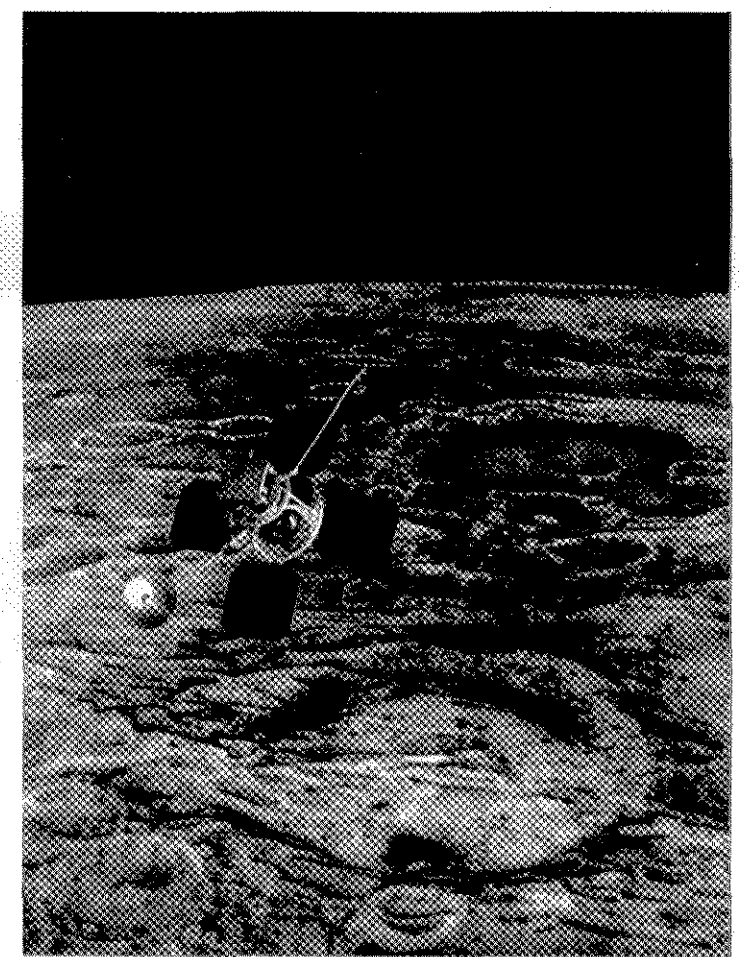
Nelson managed the project; James V. Martin assisted Nelson; Taback led the spacecraft production and testing; and Bill Boyer headed launch and flight operations.

In one of the most worthwhile undertakings of the project, this Langley group managed to convince mission control to allow them to incorporate into the Lunar Orbiter I mission the untried and somewhat risky maneuver of photographing the Earth, as well, from space. The spacecraft's camera successfully pointed away from the moon and toward the Earth on Aug. 23, 1966, resulting in the world's first view of the Earth from space. It was called "the picture of the century" and "the greatest shot taken since the invention of photography."

All five Lunar Orbiter missions succeeded beyond expectations. Launches ran three months apart in the space of one year – from August 1966 to August 1967. Onboard cameras took some 1,654 photos, covering 99 percent of the moon's surface; 840 were of proposed Apollo landing sites, 814 captured the "dark side," and six looked back at the distant planet Earth.



Lunar Orbiter II's telephoto lens took this photograph of the lunar surface. These two framelets have been enlarged five times.



By the end of the program, the Lunar Orbiter had photographically mapped 99 percent of the moon's surface.

Historical Dates for Lunar Orbiter Project

Implementation of the Lunar Orbiter Project (LOP)	Aug. 30, 1963
Source Evaluation Board Presentation to NASA Administrator	Dec. 4, 1963
Choice of Contractor for LOP for Negotiations	Dec. 20, 1963
Formal Negotiations Begin	March 17, 1964
Formal Negotiations End	March 20, 1964
Contract Go-Ahead	March 25, 1964
Contract Formally Entered Into	May 7, 1964
Preliminary Design Review	October 1964
Spacecraft Design Review	February 1965
First Launch	Aug. 10, 1966
Second Launch	Nov. 6, 1966
Third Launch	Feb. 4, 1967
Fourth Launch	May 4, 1967
Fifth Launch	Aug. 1, 1967

AdVentures

FOR SALE: 1993 Kenmore bottom-freezer refrigerator; 1,921 cubic feet; white; all accessories. $600 or best offer. Call Bobbie at 838-2949.

FOR SALE: 1973 Winner boat, 21 feet long, Cox tilt trailer; 1993 Evinrude motor, 88 horsepower, used less than 30 hours, $4,500. Call Ida at 851-1665.

FOR SALE: House in Berkeley's Green in Williamsburg-Rt. 5 area, 2 stories, 4 BR, 2-car garage, deck, fireplace, gas heat, on cul-de-sac. Community has pool, tennis courts, clubhouse. $149,900. Call 229-5662 for appointment.

FOR SALE: MGB car parts, floorboards to fenders to brake parts, fit almost all production years. Call 827-7950 evenings.

VOLUNTEERS NEEDED to drive for Virginia Air & Space Center's NASA Langley motor tours. Active or retired. Call Bill Terrill at 722-5228.

VASC SUMMER CENTER MOTOR TOURS: Through August, the Virginia Air & Space Center offers summer motor tours of NASA Langley Research Center. Tours cost $4 with the purchase of any VASC admission ticket. For tour times, call 727-0900.

TECHNOLOGY 2006 Conference, Oct. 29-31, Anaheim Convention Center, Anaheim, Calif. Sponsored by NASA, the Technology Utilization Foundation and *NASA Tech Briefs* magazine. For more information, call 1-800-944 NASA, or fax to 212-986-7864.

TAKE A WALK: The 1996 American Heart Walk is Sept. 21 to help fight heart disease and strokes. The five-mile walk winds through the new Sandy Bottom Park in Hampton. Registration begins at 9 a.m., and the walk starts at 10 a.m. NASA Langley will gather a team together for the walk; all employees and contractors are encouraged to participate. For more information and to sign up, call the Fitness Center at ext. 46387.

LAA CARNIVAL: Aug. 16-17. See our web site, "1996 Carnival" under "General Information" on the Lantern Home Page. Call Geoff Tennille at ext. 45786, Skip Schroeder at ext. 47320, or the appropriate chair listed on the Web to volunteer or to make suggestions.

NACA REUNION VII: Oct. 3-6 in Hampton. All former NACA employees and members of NASA Langley Alumni Association and guests are invited. Send registration forms no later than July 1 to P.O. Box 6260, Newport News, Va., 23060-3850. For more information, call 595-1306.

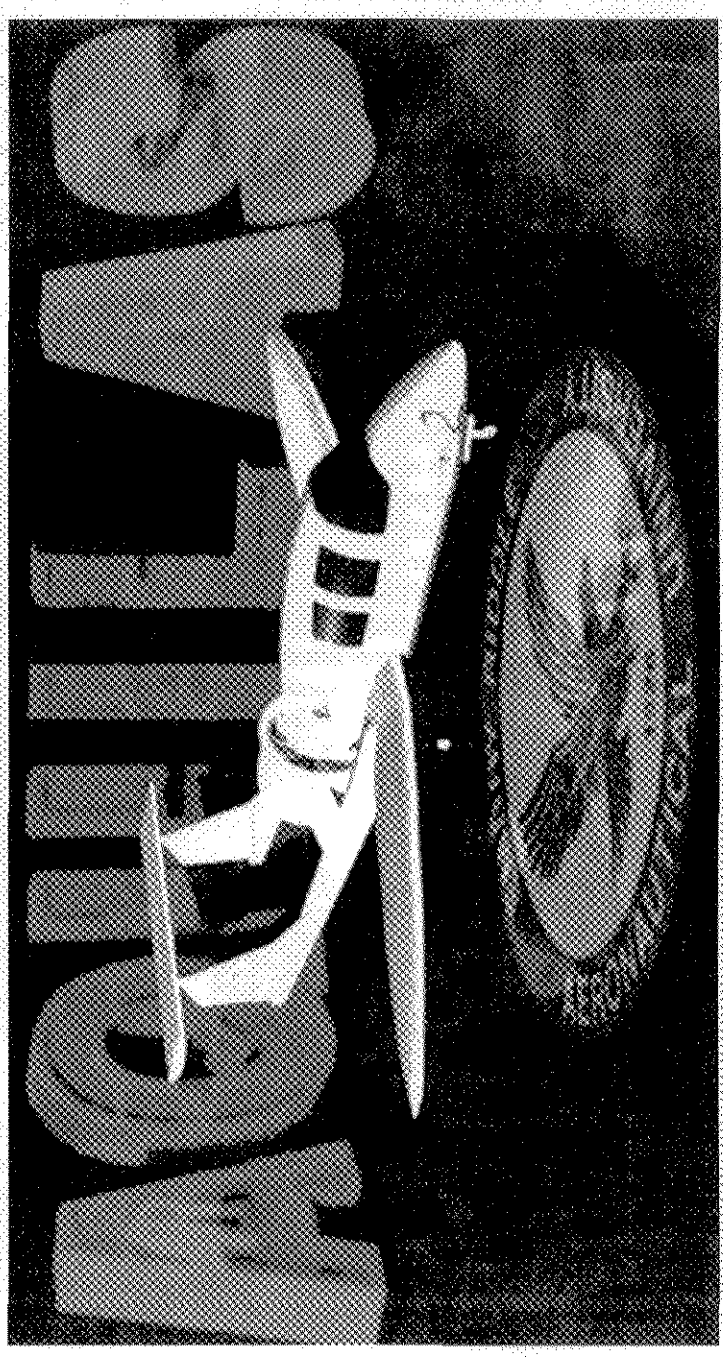
FORE! The NASA Golf Association offers two golfing events open to nonmembers: a two-person, mixed-doubles team tournament, Aug. 29, on Langley's Blue Course, with a 1 p.m. shotgun start; and a golfing trip to Myrtle Beach, S.C., Oct. 3-6, including play at four different championship golf courses. For more information and/or entry forms for either of these events, call Tom Yager at ext. 41304.

SKI VAIL: The Peninsula Ski Club is sponsoring a ski trip to vail for Jan. 18-25, 1997. For information and reservations, call Bill Hunter at 874-0913.

AIAA GOLF TOURNAMENT RESULTS: The Hampton Roads Chapter of the American Institute of Aeronautics and Astronautics (AIAA) held its annual golf tournament at the Eaglewood Golf Course at Langley Air Force Base on June 27. Eleven foursomes competed in the "Captain's Choice" event. The following awards were presented: First Flight winner (58) – Jim Thomas, Dave Lorincz, Kyle Anderson, Jerry Anderson; First Flight runner-up (64) – Charles Miller, Mike DiFulvio, Richard Wheless, John Paulson; Second Flight winner (69) – Andrea and John Whitesides, Bobby Huffman and Alan Frizzell; Second Flight runner-up (69) – Geoff Tennille, Tom Yager, Pel Phillips; Low Score for Mixed Team (75) – Kathryn Paulson, Bruce Holmes, Mike Durham, Dan Vicroy.

SUPER HEROES ®: A High-Tech Adventure is featured at the Virginia Air & Space Center in Hampton through Sept. 8. The blockbuster interactive exhibit was designed and created by the Oregon Museum of Science and Industry. Imaginations of young and old alike will soar with Batman, Superman, Spiderman, the Incredible Hulk, Wonder Woman, and Captain America – all super heroes dedicated to the good of society. The exhibit showcases a hospital, factory, training academy, tunnel, workout room, crime lab and city street, where visitors can join the super heroes in making the world a better place in which to live. Enter this unique world, and join Batman to solve a mystery in the crime lab, or climb Spiderman's giant web. For more information, call 727-0900.

BLOCK PARTY: Downtown Hampton's Block Party, Saturday nights throughout the summer, Queens Way between King and Eaton streets, 6-10 p.m. Free. For more information, call 930-4731.



...AND THE WINNER IS – This Embry-Riddle Aeronautical University student design of the Aquilas II aircraft placed first in the 1996 NASA/Federal Aviation Administration National General Aviation Design Competition. The innovative design for a four-passenger, twin-boom aircraft with pusher propulsion incorporates outstanding safety features with lowered vehicle production, maintenance and operating costs. The team from the Daytona Beach, Fla., university received a cash award of $3,000; a $5,000 award went to the school's Aerospace Engineering Department. The award was presented earlier this month at the Experimental Aircraft Association's Annual Fly-In Convention and Sport Aviation Exhibition in Oshkosh, Wis. The competition allows university students to participate in a major national effort to revitalize the U.S. general aviation sector.

National Aeronautics and Space Administration

Langley Research Center
Hampton, Virginia 23681-0001

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National Aeronautics and Space Administration
Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 17 ❖ August 23, 1996

New NASA Programs Unveiled at Oshkosh Convention

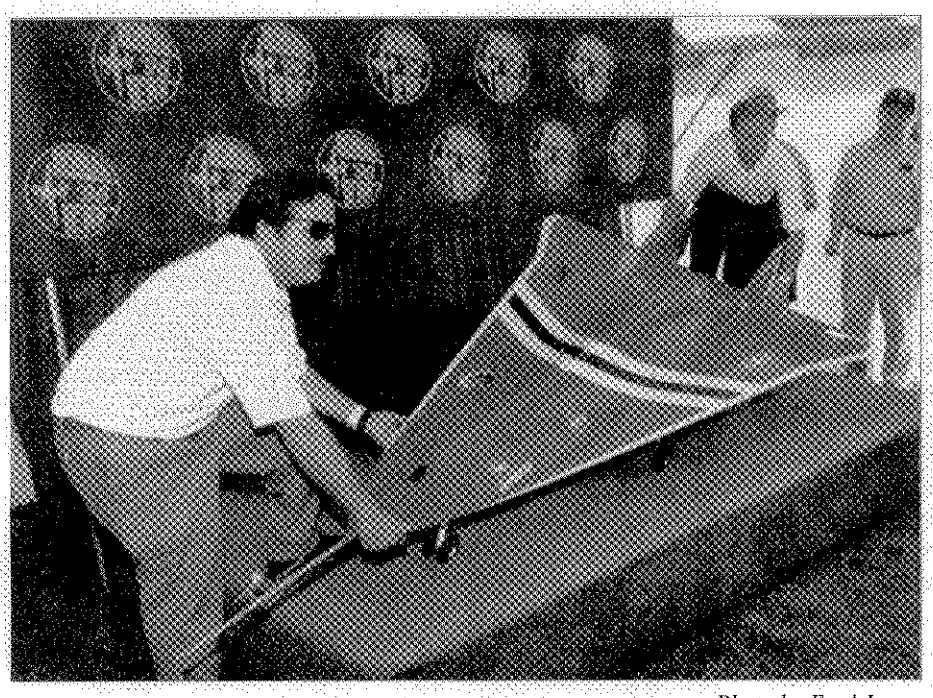

Photo by Fred Jones

The LoFLYTE model was unveiled at a news briefing at the Experimental Aircraft Association's Convention in Oshkosh, Wis.

LoFLYTE, GAP, Heli-Star, GA Design Contest Make Headlines During Annual Event

BY MEGHAN WOODCOCK

NASA teamed with the U.S. Air Force and the Federal Aviation Administration to make news at the annual Experimental Aircraft Association's Fly-In Convention at Oshkosh, Wis., earlier this month.

Hypersonic Aircraft Unveiled

At a news briefing Aug. 2, representatives from NASA Langley and the Air Force unveiled a jet-powered test aircraft built to demonstrate technologies that will allow an aircraft's flight control system to learn by mimicking the pilot's flight inputs.

The 8-foot-4-inch remote-controlled aircraft is a Mach 5 "waverider," a hypersonic configuration to be flown subsonically in initial flight tests this month.

The test aircraft, called the LoFLYTE, was developed by Accurate Automation Corp., Chattanooga, Tenn. The program is managed by NASA Langley Research Center and the Air Force Wright Laboratory, with flight testing conducted by NASA's Dryden Flight Research Center.

Bridging the GAP

NASA Associate Administrator for Aeronautics Robert Whitehead announced a new government-industry initiative known as the General Aviation Propulsion (GAP) program at a news conference Aug. 3. NASA, together with the FAA and the U.S. aviation industry, created the GAP program to address the critical need to improve affordability and performance of U.S. light general aviation aircraft propulsion systems. GAP is managed by NASA Lewis Research Center, represented at the briefing by Lewis' Carol Russo and Leo Burkardt.

"The goal of the GAP program is to bring more affordable engines for light airplanes to market by the end of the decade. These government and industry investments lay the foundations for a small aircraft transportation system that makes general aviation available for more people to enjoy with new levels of safety and affordability," said Whitehead. The focus of the GAP program is on light general aviation aircraft that have six seats or less.

This four-year, technology development program will be implemented through Cooperative Agreements with the U.S. aviation industry. NASA plans to announce the GAP program winner this fall.

"This industry competition will bring vital new engine technology to general aviation pilots who have been flying 40-year-old engines," Whitehead said.

NASA's GAP program consists of two parts: the Intermittent Combustion Engine Element, which will address the reciprocating engines currently used in light aircraft; and the Turbine Engine Element, which will address gas turbines, the type of engines currently used in commercial jetliners.

The Intermittent Combustion Engine Element aims at reducing engine prices by one-half while substantially improving reliability and maintainability, as well as meeting future emission and noise requirements. These engines will be significantly more user-friendly, with simpler engine controls, easier starts in cold weather, and reduced cockpit noise and vibration.

Reducing the price of small turbine engines by a factor of 10 is the primary goal of the Turbine Engine Element. Today's modern turbine engines are user-friendly and environmentally compliant.

Modern turbine engines' reliability and smoothness contribute to aircraft safety. High acquisition costs (compared to reciprocating engines) have been a major factor hindering their application in the light aircraft market. Designing a simpler engine with fewer parts, automated manufacturing methods and common engine components across a wide spectrum of applications will help to achieve low costs.

Operation Heli-Star a Success

Also at the Aug. 3 news briefing, FAA Associate Administrator for Research George Donahue reported on the joint NASA/FAA/industry initiative, known as Operation Heli-Star, that took place during the Summer Olympics at Atlanta, Ga. The FAA-led program was responsible for fostering both air and ground transportation during the Olympics and integrating the two into one efficient transportation system.

(see OSHKOSH, page 3, and related story, pages 6-7)

Colloquium Communiqué

Author Wages 'Innovation War' for 25th Anniversary Lecture

Christoph-Friedrich von Braun

Christoph-Friedrich von Braun will present the 25th anniversary colloquium lecture entitled "Research and Development and Innovation: How Much Is Too Much?" in the H.J.E. Reid Auditorium on Sept. 3 at 2 p.m. Civil service personnel should charge their time to B1010.

Von Braun is the nephew of Langley's first colloquium lecturer, Werner von Braun.

Von Braun's presentation will reflect his controversial 1994 book, *The Innovation War*, which points to the dangers associated with excessive speed of innovation. Originally published in Germany, it has been updated, translated into English and published in the United States this year.

As von Braun's book relates, faster development of new products, and thus, the faster substitution of obsolete products, results in proportionately declining product life cycles. The faster new products enter the market, the less "shelf-life" the old ones have and the faster they exit the market.

As product innovation speeds up, so declines product life cycle. An escalation process arises that feeds on itself, resulting in saturated markets.

Escaping such technology races is not easy. A company or a nation can lose money, market share, revenues and its future if it does not spend enough – or if it spends too much – on research and development.

The key, therefore, to technology-induced success, says von Braun, is to define and implement an effective research and development program.

Von Braun grew up in Italy, Germany and the United Kingdom. He graduated from law school at the Free University of Berlin in 1969 and earned a Ph.D. in space law from the University of Freiburg, Germany in 1972. He also holds a master of science degree in technology management from Massachusetts Institute of Technology.

Engaged in technological development and the economic and social impacts of advanced technologies, von Braun has been an engineering consultant in technology assessment, an industry analyst and head of corporate research and development strategy. Since 1990, he has been an independent consultant in technology and organizational development.

Von Braun will also present "Research and Development and Innovation: How Much Is Too Much?" as a part of the Sigma Series that evening at 7:30 p.m. at the Virginia Air & Space Center in Hampton. The free lecture is open to the public.

Notices concerning upcoming and recent past colloquium and Sigma Series lectures are available on the World Wide Web (using a browser such as Mosaic or Netscape) at http://oldtown.larc.nasa.gov/Lectures/lectures.html or from the NASA Langley Home Page http://www.larc.nasa.gov/larc.html under General Information about NASA Langley Research Center.

All colloquium lectures are videotaped and are available from Langley's library.

FYI

What:	Sigma Series Lecture Followed by IMAX film *To Fly*
When:	Sept. 3, 7:30 p.m.
Where:	Virginia Air & Space Center 600 Settlers Landing Rd. Downtown Hampton
Cost:	(For film) NASA and contractor employees and family, with ID, $4.50
Info:	727-0900

News Briefs

Around the Agency

METEORITE YIELDS EVIDENCE OF PRIMITIVE LIFE ON EARLY MARS – A NASA research team of scientists at the Johnson Space Center (JSC), Houston, Texas, and at Stanford University, Palo Alto, Calif., has found evidence that strongly suggests primitive life may have existed on Mars more than 3.6 billion years ago. The NASA-funded team found the first organic molecules thought to be of Martian origin, several mineral features characteristic of biological activity, and possible microscopic fossils of primitive, bacteria-like organisms inside of an ancient Martian rock that fell to Earth as a meteorite. An annual expedition of the National Science Foundation's Antarctic Meteorite Program found the meteorite in 1984 in Antarctica. It was preserved for study in JSC's Meteorite Processing Laboratory and its possible Martian origin was not recognized until 1993. The two-year investigation was co-led by JSC planetary scientists Dr. David McKay, Dr. Everett Gibson and Kathie Thomas-Keprta of Lockheed-Martin, with the major collaboration of a Stanford team headed by Professor of Chemistry Dr. Richard Zare, as well as six other NASA and university research partners. Stanford's detection of an apparently unique pattern of organic molecules, carbon compounds that are the basis of life, several unusual mineral phases that are known products of primitive microscopic organisms on Earth, and structures that could be microsopic fossils all led to the suggestion of life, said McKay. All of these things were found within a few hundred thousandths of an inch of one another, offering "the most compelling evidence," he said. The researchers are putting this evidence out to the scientific community for other investigators to verify, enhance or attack as part of the scientific process, said Gibson, in hopes of resolving the question within a year or two. The igneous rock in the 4.2-pound, potato-sized meteorite has been age-dated to about 4.5 billion years, the period when the planet Mars formed. It is one of only 12 meteorites identified so far that match the unique Martian chemistry measured by the Viking spacecraft that landed on Mars in 1976. Many of the team's findings were made possible by very recent technological advances in high-resolution scanning electron microscopy and laser mass spectrometry. Although past studies of this meteorite and others of Martian origin failed to detect evidence of past life, they were performed without the benefit of the technology used in this research.

CREW MEMBERS NAMED TO LIFE SCIENCE MISSION – Two mission specialists have been named to a 16-day space shuttle mission to gather information on how humans and animals adapt to space and the ability of humans to survive in a microgravity environment for an extended period of time. Astronauts Richard M. Linnehan, DVM, and Dafydd (Dave) Rhys Williams, M.D., (Canadian Space Agency) are the first crew members named to support the STS-90 Neurolab mission, scheduled for launch in March 1998. The remaining crew members will be named later.

Disabilities Awareness

Motor Neuron Disease Crippling

BY MARVIN B. DOW

A senior research engineer at Langley, I have motor neuron disease which, over the course of a few years, has rendered my legs nearly useless and has forced me to walk with crutches. In the past year, the disease has attacked my speech centers, resulting in difficult and halting speech. No treatment exists.

The people here at Langley willingly assist those in obvious need. Collectively, they have made it possible for me to continue working.

So, I thank the contract specialists from the Acquisition Division who bring meetings and papers to my office. Likewise, I thank the managers and my fellow researchers in the Structures and Materials Divisions who schedule meetings near my office and who come to my office for discussions. I thank my fellow researchers in the Mechanics of Materials Branch who constantly help me with the physical tasks which have become difficult or impossible.

Most of all, I thank Jo Sawyer, the branch secretary, and Benson Dexter for their constant assistance. None of these persons asks about my condition, and I do not want them to ask. They are here and that is sufficient.

Announcements

Day of Caring Set for Sept. 5

Langley Research Center will again join local community-minded organizations to sponsor the Community Day of Caring on Sept. 5.

Last year, the Day of Caring mobilized nearly 600 employees of area businesses and federal facilities. More than 125 Langley employees participated. Volunteer assignments ranged from painting and planting to constructing playgrounds for children and houses for families.

The first 100 Langley civil service employees interested in participating in this community service event who complete the Day of Caring Volunteer Form will be granted up to eight hours administrative leave. Contractors who wish to participate should complete the form after contacting their corporate office.

For forms or more information about the Day of Caring, call Marny at ext. 43315.

Sandusky Appointed Professor in JIAFS

Robert R. Sandusky Jr. has been appointed professor of engineering and applied science in the Joint Institute for Advancement of Flight Sciences (JIAFS) of the George Washington University. In addition to his teaching duties, he will supervise graduate students in aircraft design and systems analysis. He will also work with Langley organizations in these areas.

Farassat Receives Aeroacoustics Award

Dr. Fereidoun Farassat, senior research scientist in the Aeroacoustics Branch, received the Aeroacoustics Award at the American Institute of Aeronautics and Astronautics/Confederation of European Aerospace Societies Aeroacoustics Conference. The award was for the "pioneering development of theoretical and computational aeroacoustics in the time domain for propellers, rotors, and ducted fans."

Farassat, an associate fellow in the AIAA and a 17-year Langley veteran, is known for his contributions in noncompact acoustic source theory, applications of generalized functions, Kircchhoff formulations for moving surfaces, and unsteady aerodynamics.

George Washington U. Offers Degree Programs

The George Washington University's School of Engineering and Applied Science's Joint Institute for Advancement of Flight Sciences at NASA Langley Research Center offers the following degrees: master of science; professional and doctor of science in aeroacoustics, aeronautics, astronautics, fluid mechanics and thermal sciences, structural engineering and structural dynamics; and master of engineering management. Registration period for the fall semester is in progress.

For a complete listing of courses and telephone registration procedures, contact the university office at ext. 41982 or e-mail at gwu+jiafs@larc.nasa.gov, Fax: 804 864-5894, URL: http://www.seas.gwu.edu/seas/jiafs.

'97 Calendars Available

The 1997 calendars are available to be ordered through GSA Advantage using government IMPAC Visa cards. To reduce the total number of requests, each group/division/branch secretary should submit, in advance, requirements for her respective area.

The Stock Numbers for the Calendars are listed below:

- NSN: 7510-01-337-4707 wall calendar, displays three months, 11-5/8" x 8-7/8" U/I PG (10 each per PG)
- NSN: 7510-01-337-4712 calendar desk blotter, 17" x 22" U/I EA
- NSN: 7510-01-363-3705 calendar pad, regular flipover, 3" x 3-5/8" U/I EA
- NSN: 7510-01-363-4997 calendar pad, executive flipover, 3-5/8" x 5-7/8" U/I EA
- NSN: 7530-01-337-4698 weekly appointment book, 11" x 8-1/2" U/I EA
- NSN: 7530-01-363-6707 looseleaf appointment book refill, for six-ring binder U/I EA

July Bloodmobile Tally

Langley's Red Cross Bloodmobile reports 254 total donors for July, including 12 first-time donors, according to coordinators Karen Ridlon and Amy Parrish.

Donors and total amounts donated are listed below: 13 gallons – Pendleton M. Jackson; 12 gallons – Richard L. Chattin; 9 gallons – Henry E. Freeman Jr., Ronald B. Lewis, Lawrence D. Huebner; 7 gallons – James D. Adkins, Fred L. Beissner Jr., James L. Thomas, Christopher M. Cagle; 6 gallons – James K. Adams, Vincent B. Cruz, Michael S. Dashiell, Merrick D. Creech; 5 gallons – James T. Berry, Gene S. Monroe Jr., Roger D. Martin, Donald S. George; 4 gallons – Stephen B. Jones, Robert K. Borchardt, Robert A. Ross; 3 gallons – Benjamin M. Copeland Jr., Richard E. Martin; 2 gallons – Matthew G. Sexstone, Maury H. Jackson, Vicki S. Storman; 1 gallon – Danny M. Taylor, Gerald L. Gregory, Laura M. Brewer, Christina L. Martin, Timothy D. Wright, Jeffrey T. Matney, William G. Tomek.

First-time donors included Leon Cole, Shawn Miguel Taylor, Chanda Durnford, Donna Sullivan, William Johnston, Greg L. Mekkes, William Rogers, Johnna Jones, Sudipta Chatterjee, Susan K. Hoban, David Hutchinson and Kenya Whitaker.

In Memorium of Robert Cecil Thomas

Robert Cecil Thomas, a contract specialist in the Supply, Construction and ADP Contracts Branch, died June 26. A Poquoson native and a graduate of Virginia Polytechnic Institute and State University, he had been a Langley employee since 1989.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

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Science and Technology Corp.

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Photographer . . . . . Fred Jones

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

'Neighborhood Networks' Links Housing Units in Virginia Beach to Affordable Technology

Network To Promote Job Training and Educational Opportunities

BY ANN C. GAUDREAUX

Thanks to a government/industry partnership, residents of a Virginia housing project will receive free job and computer skills training and education.

The Virginia State Housing and Urban Development (HUD) Office, WHRO, Old Dominion University and NASA Langley Research Center are jointly supporting the application of the Affordable Technology To Link America's Schools (ATLAS) as part of the "Neighborhood Networks" project within the state.

A Neighborhood Networks Internet classroom opened with a press conference at Friendship Village in Virginia Beach on July 26.

A two-bedroom apartment has been donated by owners VMH Inc. to serve as the Friendship Village Internet and classroom site. It will be used by residents of the neighborhood housing project to support job and computer skills training and education for adults and children.

The Internet site will also be tied via electronic network to Birdneck Elementary School, which serves Friendship Village. It will be one of several such sites that HUD has helped open throughout the country by obtaining the cooperation of landlords, housing associations, local businesses and government agencies.

This is the first active Neighborhood Network site in Virginia, and several are planned for the near future.

The Neighborhood Network program is setting up the Virginia Beach site as a model for others in Virginia.

"The program hopes to create a desire for low- to moderate-income families to move to housing areas where an Internet connection is available for job and educational training," said Charles Famuliner, director, Multifamily Housing for HUD in Richmond.

"The computer training will act as a springboard to help get people off welfare by preparing them for the job market where computers are increasingly playing a major role. It will give children an opportunity to follow up classroom computer activities after they return home."

ATLAS is a technology commercialization initiative that grew out of NASA Langley's High-Performance Computing and Communications/Information Infrastructure Technology and Applications program. Through ATLAS, NASA has made a commitment to enhance math and science education programs for grades kindergarten through 12 with the integration of computational science and wide-area communications, such as the Internet.

NASA and ATLAS share a joint goal: To connect more than 70,000 K-12 school sites nationally by the year 2000 in support of the president's goal to connect all of America's schools.

NASA Langley will provide ATLAS orientation sessions to explain the technology design and applications. WHRO will serve as the Internet Central Site and will provide the telecommunications link for Friendship Village.

WHRO, the public broadcasting station for eastern Virginia, was recognized as a national telecommunications facility because of its leadership in the use and application of technology for education.

"A local firm, Unified Research Laboratories, Inc. (URLabs), was formed based on the computer network technology begun at NASA Langley, and out of which the ATLAS project was born," said Dr. Joe Heyman, director of NASA Langley's Technology Applications Group. "URLabs will offer more advanced computer solutions for Friendship Village."

In addition to Internet access, the Virginia Employment Commission and Virginia Beach Library are just two sources of the training and educational software that will be available for residents of Friendship Village.

Another federal agency, the Federal Bureau of Investigation (FBI) Norfolk Office, through its community outreach program, will add its expertise to the educational Neighborhood Networks project. An FBI special agent and an FBI computer specialist will be on hand to provide support for the initial computer training sessions.

Teacher interns from Old Dominion University's School of Education will provide follow-up training for Friendship Village residents.

Representatives from NASA Langley's Technology Applications Group and Research and Technology Group, the FBI, WHRO and URLabs, and officials from Virginia Beach, HUD and Birdneck Elementary School will be available to answer questions about the Friendship Village network.

OSHKOSH

(continued from page 1)

The Advanced General Aviation Transport Experiments (AGATE) consortium provided the special airborne equipment and ground monitoring stations that enabled the Operation Heli-Star program to operate safely and efficiently. AGATE's support of the Atlanta Olympics was managed by the AGATE flight systems industry team led by Langley.

Use of the new technology enabled the position of nearby aircraft whose flight path may conflict with one's own operation to be displayed in the cockpit. The Atlanta experience marked one of the first public uses of cockpit display of traffic information with data received directly via Global Positioning Satellite (GPS)/Automatic Dependent Surveillance (ADS) broadcast from another aircraft.

Design Competition Winners Named

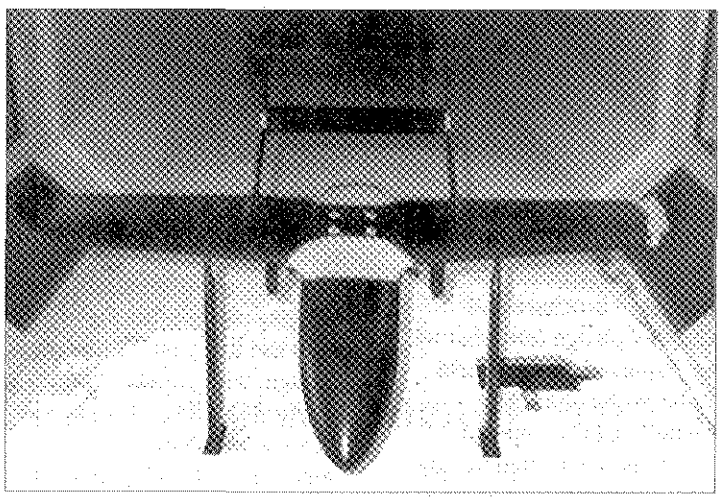
Whitehead and Donohue announced the winners of the 1996 NASA-FAA-AOPA National General Aviation Design Competition at the Aug. 3 news briefing.

The competition, which is in its second year, allows university students to participate in a national effort to revitalize the U.S. general aviation sector. Teams of undergraduate and graduate students from U.S. engineering schools work with faculty advisors to address design challenges for a small aircraft transportation system.

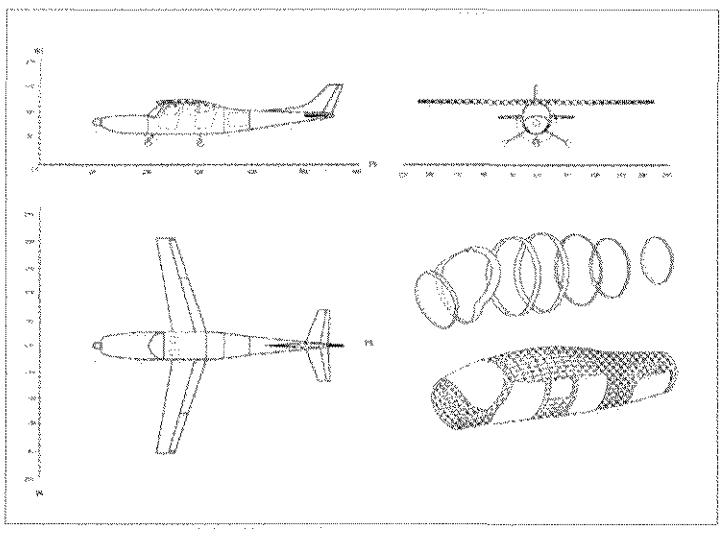
"We are excited to see the quality and quantity of participation in this design competition during its second year," said Whitehead in praise of the students. "We know that long hours and hard toil went into these projects; it showed in the design proposals."

The first-place award went to Embry-Riddle Aeronautical University. The second-place award was presented to three Kansas universities that worked together on a joint design project: the University of Kansas, Wichita State University and Kansas State University. The design team from Pennsylvania State University received the third-place award.

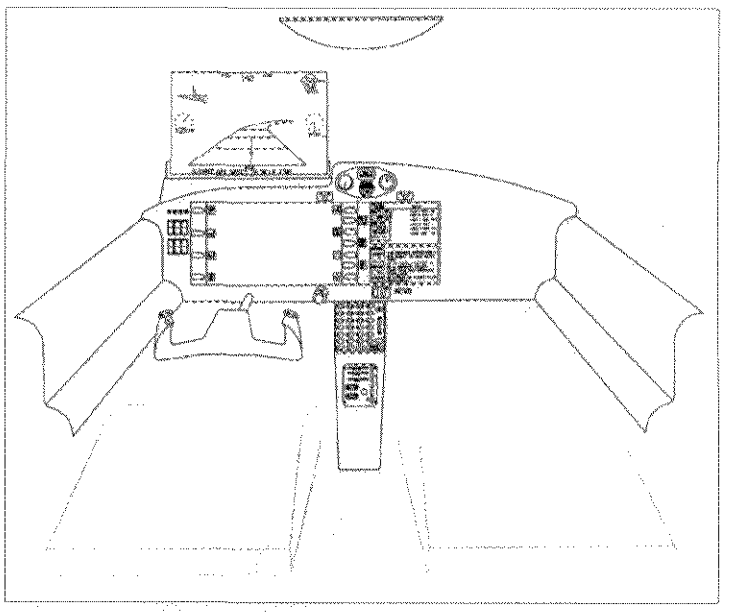
A special award for Greatest Retrofit Potential, (sponsored by the Aircraft Owners and Pilots Association Air Safety Foundation), was given to the design team from Ohio State University.



This Pennsylvania State University design placed third in the design competition.



The University of Kansas, Wichita State University and Kansas State University submitted a joint design project that took the second-place award in the National General Aviation Design Competition.



A special award for Greatest Retrofit Potential went to the design team from Ohio State University for this design.

Virginia Peninsula

BY CATHARINE G. SCHAUER

The time for this year's Combined Federal Campaign (CFC) is approaching, and we'd like Langley's campaign to have a personal touch.

Have you ever made a difference? Has someone returned to you years later to thank you for the efforts you thought were not received or recognized? Have you ever seen your time investment pay off? Have you or has someone you know benefitted from a charity directly?

The CFC includes a wide variety of charities with many volunteers who have stories to tell; people who have benefitted from the charities themselves have stories to tell, as well.

Langley's Office of Public Services is looking for "a few good stories," ones with depth and compassion, showing love and a helping hand, that can be tied into the CFC.

Do you have a story to share? If you do, contact Cathy Schauer by Sept. 1 at ext. 43314, Mail Stop 154, QuickMail, or e-mail at c.g.schauer@larc.nasa.gov.

Photo by Sandie Gibbs

1996 CFC Committee members include (from left) Joe Heyman, Marie Lane, Susan Price, John Fogle, Mary Sue Henriksen, Woodrow Whitlow. Not pictured: Catharine Schauer, Kelly Hayhurst.

1996 Langley CFC Committtee

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Director, Technology Applications Group		
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Marie F. Lane - AFGE Representative	**226A**	**44252**
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Kelly J. Hayhurst - CFC Loaned Executive	**159**	**46215**
Fluid Mechanics and Acoustics Division		
k.j.hayhurst@larc.nasa.gov		

Artist Looks in Mirror To Depict CFC Theme

Langley Graphics Co-op Uses Soft Shapes, Colors in Abstract Design

BY CATHARINE G. SCHAUER

A Langley design representing hope for the future and help for others has been selected by the Peninsula Combined Federal Campaign (CFC) as this year's official logo.

Ruby Manadero, a co-op student in the Graphics Branch, used the Peninsula's 1996-97 theme, *If it is to be, it's up to me*, to design the logo, which will be used Peninsula-wide for this year's campaign brochure, pledge cards, posters and related publicity. NASA Langley will also use the logo on the electronic version of the campaign brochure and Langley pledge form that will be displayed on the World Wide Web and for the Center's CFC campaign.

"I knew I wanted the logo to look solid, bold and simple. It was fun and a challenge, and I knew that 'it was up to me' to do my part," Manadero said. "I used oval shapes to give a gentle overall feeling to the logo."

The logo is more than just an attractive design. In the color representation, the artist sees the large blue oval with the white lines going through it as a graphic representation of a mirror. A person is looking into the mirror, represented by the oval at the top left, which represents a person's head, and the three-quarter oval at the bottom, which is the person's arms. The head and arms are green to signify life.

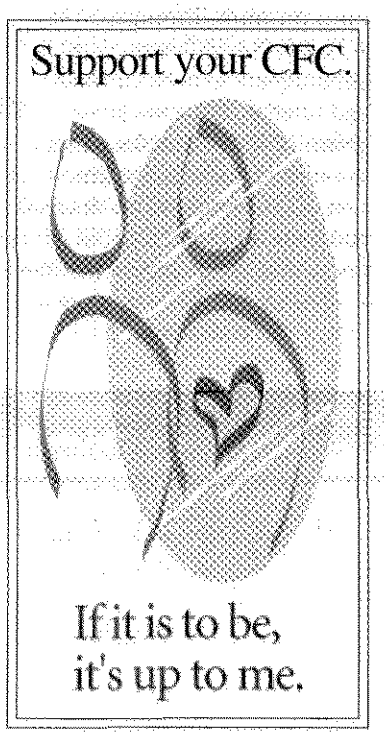
The reflection in the mirror represents how we want to see ourselves – as good, kind and helpful. Those ovals are a darker blue. The "arms" are intertwined, so the person can be the caring and sharing person in the mirror, represented by the heart (shown in red).

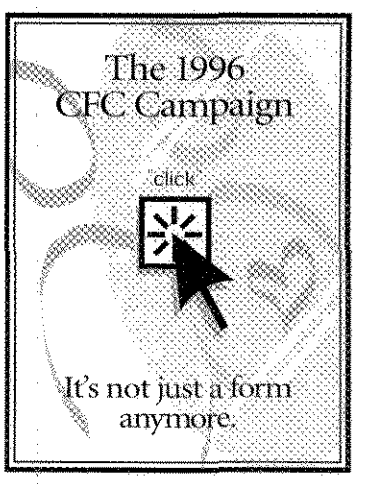
"I am so pleased that Langley created this logo for us to use this year," said Jack Clough, who directs the Peninsula's CFC. "It is so creative and shares the importance of each person's role in helping his or her neighbor."

This is the second consecutive year NASA Langley has designed the CFC logo.

In addition to creating the logo, Manadero designed the cover for the Center's official CFC kick-off program, which will be Sept. 24, 1 p.m., in the H.J.E. Reid Conference Center.

Manadero has been a Langley co-op for one year. She will graduate from Virginia Commonwealth University in May 1997 with a bachelor's degree in fine arts. She hopes to work in the three-dimensional animation field, creating visual effects for either television or film.





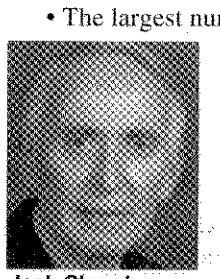
CFC's Peninsula Campaign Manager Urges Langley To Continue Giving Ways

Clough Praises Center's Successful Participation in Past CFC Campaigns

BY JACK CLOUGH

The people of NASA Langley continue to be the CFC leader among federal organizations on our Peninsula, with

- The highest participation rate of any major federal group (73.4 percent)
- The highest average gift of any major federal group ($162.44)
- The highest per capita gift of any major federal group ($119.24)
- The largest number of $500-plus and $1,000-plus givers of any major federal group (161 and 32, respectively).



Jack Clough

These are not just statistical phenomena but also prime indicators that Langley has a tremendous spirit of caring and sharing.

I could not help but be struck with the reaction of U.S. Olympic swimmer Janet Evans at the moment the bomb exploded July 27. As she was being interviewed by a German TV correspondent, the bomb exploded, and Evans instinctively grabbed his arm. He was there for her when she needed someone to hold on to.

During times of need, we instinctively reach out for help. Our CFC is there when we need it.

And Langley is always there to help the less fortunate through the Combined Federal Campaign. I encourage you to join your colleagues again this year and to be as generous as you can. Remember: "If it is to be, it's up to me."

Editor's Note: Jack Clough is the United Way program manager for the CFC, Combined Virginia Campaign and the inaugural Combined Public Service Campaign (local governments and schools).

Education Office Program Brings Graduate Students Here

Master's Candidates Help To Foster Ties Between Aerospace Industry, Academia

Photo by Lloyd Evans

Graduate Students Researchers Program participant Maria Walden presents a lecture on "fuzzy logic" to summer interns and other personnel of the Langley Structural Dynamics Division.

BY MOLLY RITZ

Twenty-six new graduate students are taking part in Langley's Graduate Students Researchers Program (GSRP) this summer.

The GSRP's goal is to enhance research ties to academia and our nation's aerospace industry. Participants are selected based on their research interests and their compatibility with NASA's programs in space, life and earth sciences, and aerospace technology. Fellowships of up to $22,000 are awarded to each student for one year and are renewable, based on their progress, for up to three years.

"I am interested in atmospheric science research, and NASA is definitely recognized in that arena," said Susan Durlak, who is spending her summer at Goddard Space Flight Center in Greenbelt, Md., working in the Climate and Research Branch. Durlak attends the University of Cincinnati, where she is pursuing her doctoral degree in atmospheric science.

The selection process for the GSRP is tough, as approximately 100 students take part in the program each year. Participants are selected based on competitive evaluation of their academic qualifications, plan of study and use of NASA research facilities.

"The selection process is very challenging," said Maria Walden, who majors in electrical engineering at North Carolina Agricultural and Technical State University in Greensboro."I was competing against many students from big-name universities. I was attending Virginia State at the time, which is not known for engineering."

Walden has spent two years at Langley working on her master's degree in electrical engineering controls.

The students leave the program with a great deal of experience that will allow them to excel in their future endeavors.

"The GSRP has enabled me to focus especially on my research and to open my eyes to many things," said Mark Hale of Georgia Tech University in Atlanta, Ga., where he majors in aerospace engineering.

Hale has written a variety of papers related to his major and has attended a number of conferences while taking part in the GSRP. These activities have expanded his knowledge of airplanes, he said, and have given him a new enthusiasm for what the future may hold.

Shuart Heads to Harvard for NASA Fellowship

BY DANIELLE BECK

Dr. Mark J. Shuart, assistant chief of the Structures Division, is the 1996 recipient of NASA's fellowship to the Harvard University Program for Management Development. Shuart will spend Sept. 8 through Nov. 22 at Harvard University, in Cambridge, Mass.

This 12-week fellowship program emphasizes fundamental management skills and techniques and stresses the interrelationships among businesses, the government and the public interest.

"I expect that lessons from this program will have immediate applications to my appreciation of business processes and strategic alliances, two key issues for our Center," said Shuart.

Mark Shuart

Shuart came to Langley in 1977. During his time here, he has studied the response and failure of advanced composite aerospace structures. Shuart was selected as the assistant head of the Structural Mechanics Branch in 1989 and the assistant chief of the Structures Division in 1992.

Recently, Shuart has been the Level III manager for the Advanced Composites Technology Program and has contributed to Langley's Federal Lab Review and Zero Base Review Teams and Research and Technology Group's Business Practices Design Team.

Shuart received his bachelor's and master's degrees in engineering mechanics from Virginia Polytechnic Institute and State University in 1976 and 1978, respectively. He received his doctorate in applied sciences from the University of Delaware in 1985.

NASA Fan

Eight-year-old Lindsey Scott holds her prized NASA photo of planet Earth for her school picture last year. Lindsey, a rising third-grader at Plaza Elementary School in Virginia Beach, has pictures of all of the planets and even a NASA poster hanging in her bedroom.

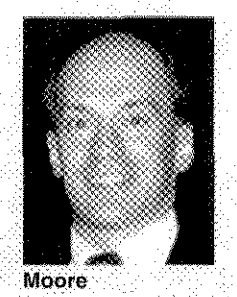
Four Langley Employees Complete NASA's Professional Development Program

Four Langley employees graduated from the NASA Professional Development Program (PDP) at NASA Headquarters, Washington, D.C., July 23.

Vickie S. Conners, Chemistry and Dynamics Branch; Christopher L. Moore, Space Systems Engineering Branch; J. Milam Walters, Systems Engineering Office; and Sharon S. Welch, Guidance and Control Branch, participated in this development opportunity as some of "NASA's high-potential employees."

Conners

The Professional Development Program enables agency personnel to work in developmental assignments, usually for 12 months, at another center or organization. The program seeks to provide future NASA leaders with a broader perspective of the agency and its impacts.



Moore

This year's class included 26 participants from nine NASA centers.

Addressing the graduating class, NASA Deputy Administrator Gen. John R. Dailey said that NASA supports the program as a way of preparing agency employees for more important roles in the future.

"This agency operates at a level above the rest of the world, and it is our responsibility to ensure that we stay there," he said.

Class spokeman Vincent Johnson of Johnson Space Center said that his class had embarked on "a voyage of discovery" of themselves and their agency.

Walters

The Professional Development Program began in 1987-88 and incorporates and replaces several prior work experience programs. The resulting restructured program provides more options and flexibility to both employees and managers in NASA organizations.

Welch

The program includes opportunities to learn about the host organization's operations. Participants assigned to Headquarters or Goddard Space Flight Center will also learn about NASA's relationship with other fedeal agencies and with Congress.

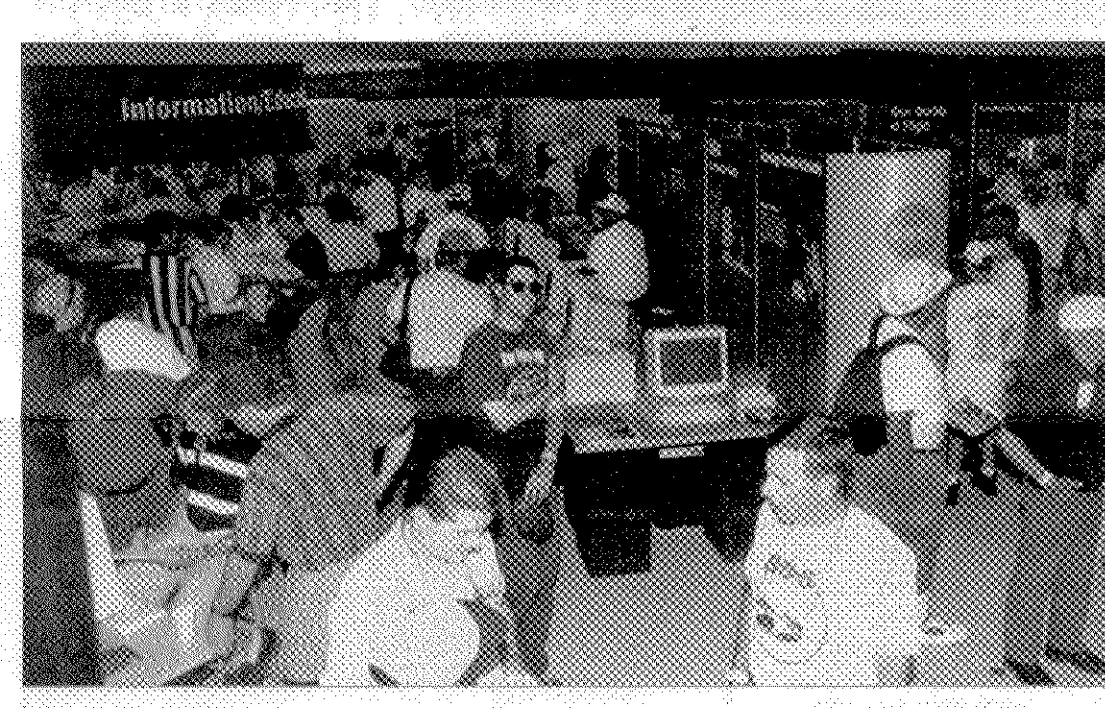
The PDP also provides an option for each NASA organization to implement a local component of the program, offering the choice of work experience on-center. This allows employees who are unable to relocate geographically to gain similar types of professional growth within their own installation. Through the local option, employees still may participate in some of the agency-wide PDP activities.

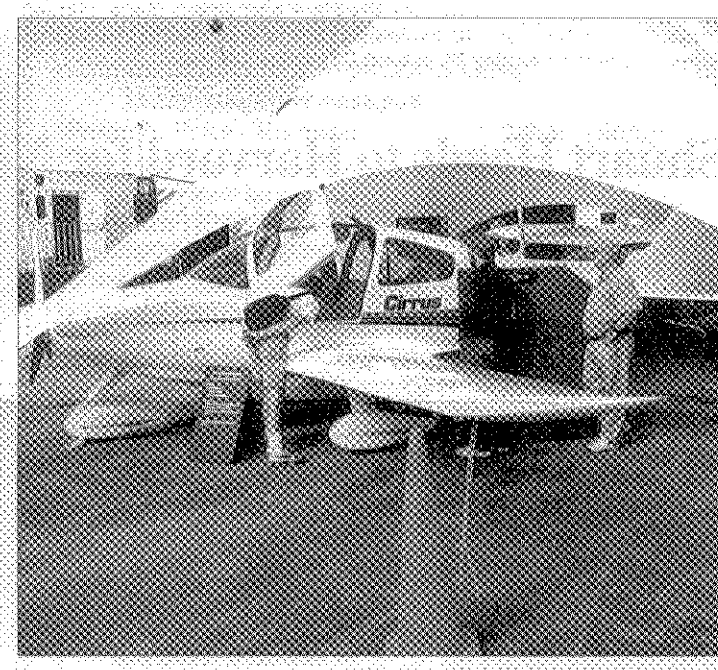
All program participants are selected through an equally administered competitive process. Installations select their participants based on their own internal competitive process.

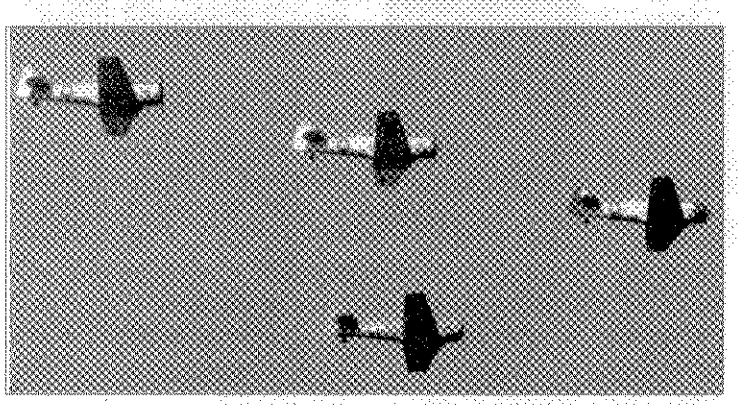
Centers are currently recruiting candidates for the 1997-98 program year. For more information, call Elaine Gause, Langley's PDP training coordinator, at ext. 42591.

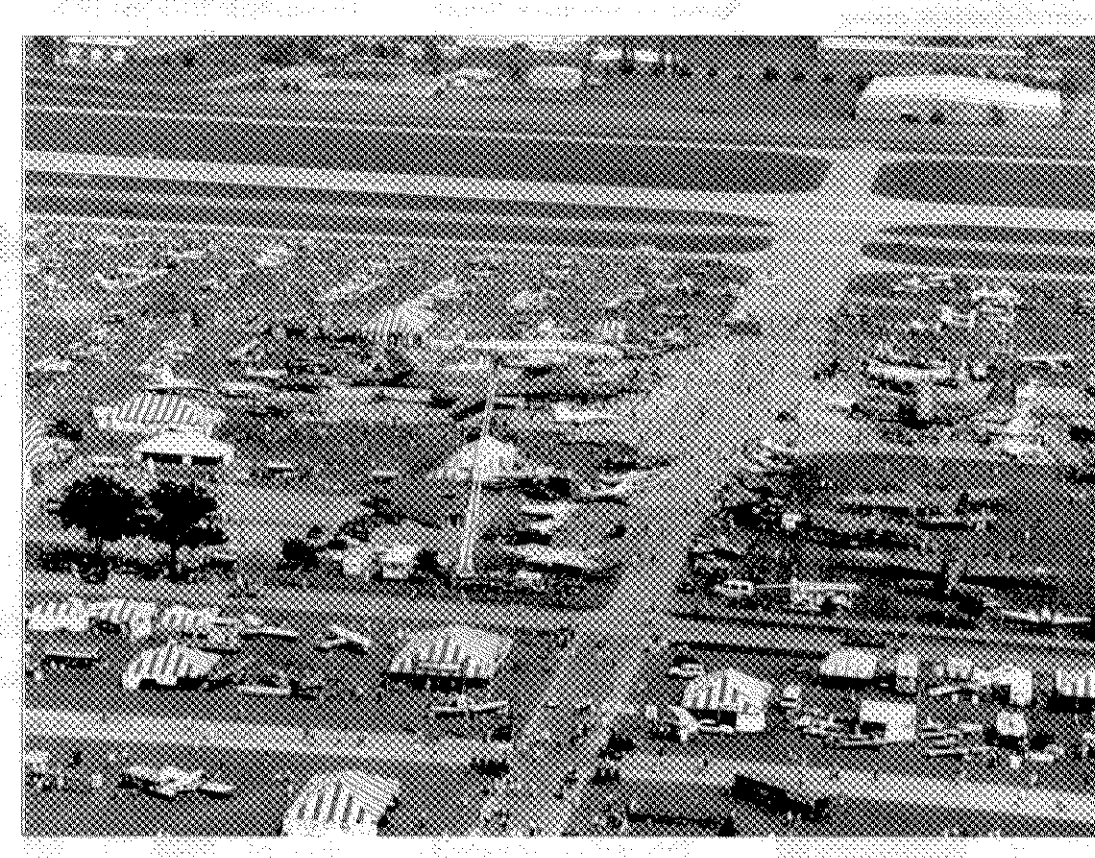
NASA, Langley Participate in '96 Oshkosh Convention, Exhibition

Photos by Fred Jones

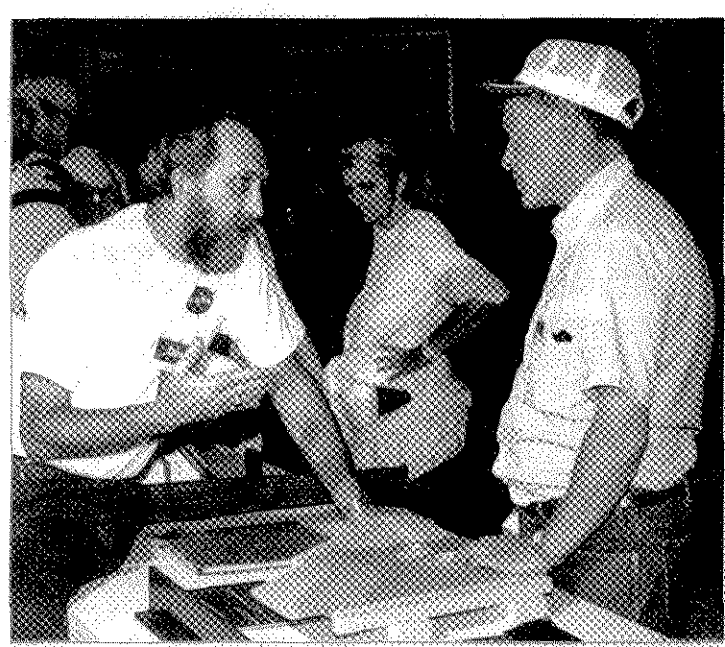








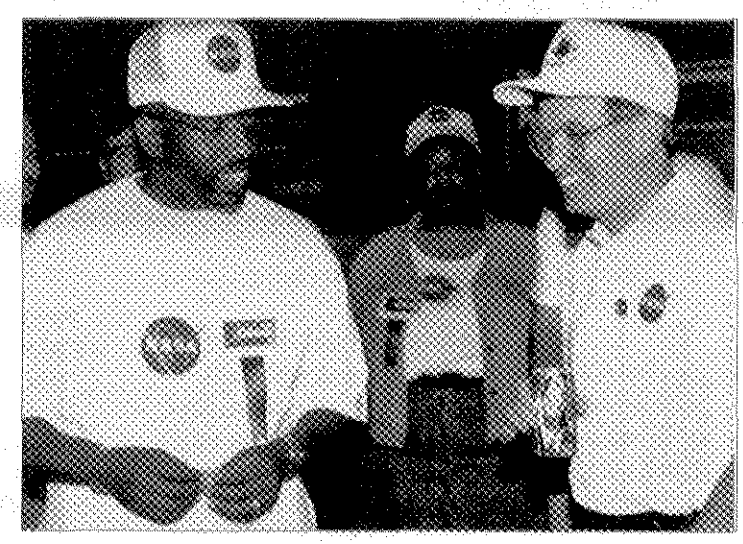
Sport Aviation Exhibition



Langley's Bill Fogle, left, of the Numerical Control and Integrated Structures Section discusses a vacuum-assisted resin transfer molding process with a member of the Experimental Aircraft Association.

Michelle Bacon and her son Gary, of Jackson, Wis., listen to NASA technician Scott Young, left, explain how a carbon-carbon piston works. Young works in Langley's Materials Research Operations Section.

Nancy Holloway, right, of Langley's Microelectronics and Sensor Development Section explains to convention-goers how to use piezoelectric wafers to make a fluid pump.



Art Gooden, left, of Langley's Advanced Computer Systems Branch shares an Oshkosh moment with Dr. Robert Whitehead, NASA Associate Administrator, Office of Aeronautics.

Inside Exhibits Rival Outside Aerial Displays at Oshkosh Event

BY MEGHAN WOODCOCK

The spectacular aerial stunt shows put on daily at the Experimental Aircraft Association's 1996 convention in Oshkosh, Wis., drew regular crowds, but visitors also flocked to the popular NASA exhibit area during the Aug. 1-7 event.

"Power for the Future" was the theme of this year's NASA exhibit, which highlighted NASA's aeronautics research and aerospace technologies. Representatives from across the agency were on hand to answer questions for visitors. Speakers also presented forums on various aerospace topics in tents beside the NASA hangar.

Outside the NASA exhibit building was a multi-purpose general aviation futuristic cockpit display mounted in both a high-wing and a low-wing aircraft. The aircraft was electronically connected to an on-site ground station and satellite dish for the display of graphical weather and text messaging. The technology is also capable of receiving information on the location of other aircraft flying in the area and sending the location of one's own aircraft.

Inside, a live satellite link from the Olympics graphically presented these same technologies demonstrated real-time on nearly 50 participating helicopters flying over Atlanta.

The integration of these advanced technologies is one element of the NASA-industry Advanced General Aviation Transport Experiments (AGATE) program, created to revitalize general aviation in this country. The AGATE-equipped helicopters were part of a massive effort by the FAA and other organizations to move high-value cargo and to provide public safety and security services during the Olympics.

To the side of the exhibit building sat NASA's newest traveling exhibit, the Mobile Aeronautics Education Laboratory. In this 53-foot trailer, visitors experienced a state-of-the-art classroom that used new technologies to teach science and math, with NASA aeronautics as a theme.

The first program, "Exploring Aeronautics: Cross-Country Flight," gave visitors a chance to complete a flight plan and to take a virtual-reality flight in a vintage World War I plane. Activities involved gathering key flight data from the Internet and other workstations, then testing the ideas in a wind tunnel to interpret real-life images at a remote sensing workstation.

Visitors discovered what NASA is doing to make a next-generation supersonic airliner possible in "High Speed for World Travelers." Colorful photos and graphics explained how the agency is tackling the three environmental issues – exhaust emissions, airport noise and sonic boom – that, if solved, will make it easier for U.S. industry to design and build an aircraft which will revolutionize air travel.

Various displays showed how NASA aeronautics is paving the way for the aircraft and aviation systems of tomorrow. The displays included windshear and icing, modernizing cockpits, advanced composite materials and NASA's effort to revitalize subsonic planes and the nation's airspace system.

Other exhibits displayed research to make engines more efficient and less noisy, development of new control systems that use fiber optics and electric actuators, high-alpha or high angle-of-attack research and new research in high-performance aircraft and rotorcraft. The displays explained how NASA technology is applied in products such as new engines and nacelles for the Boeing 777 to small aircraft, automobiles and sailboats.

Although NASA's Oshkosh exhibit was geared toward aviation, additional displays highlighted the agency's programs in space exploration. Featured was the latest information on Mars Pathfinder, Mission to Planet Earth, international Space Station and Hubble Space Telescope.

NASA's expert craftspersons were available to discuss and demonstrate how they make wind tunnel models, test instruments and the other devices that make NASA's advanced aeronautics research possible.

AdVentures

FOR SALE: Kiln Creek home, 3BR, 2.5 baths, 2-car garage, large kitchen and family room, vaulted ceiling in dining room and foyer, lot backs up to dense woods. $123,900 or $14,000 and assume at 7.5 percent. Call 872-0591.

FOR SALE: Hampton waterfront home with panoramic bay and river views, concrete bulkhead, deck, fireplace, jacuzzi, hardwood and ceramic tile floors, cedar paneling, detached garage and cul-de-sac location. $149,900. Call Teresa Jenkins at 595-8895.

FOR SALE: 1984 Bach-Stradivarius trumpet, model 72, with case and leather case protector. $500. Call 877-5748.

FOR SALE: 1993 Kenmore bottom-freezer refrigerator, 21-cu. ft., white, excellent condition. $525 or best offer. Call 838-2949.

FOR SALE: 1983 Dodge Colt, runs well, clean inside, new tires, new brakes, new exhaust system. $1,500 or best offer. Call 851-1990.

FOR SALE: 1969 GM Rally wheels; 15-by-8-inch rims with center caps and beauty rings; two rims mounted with L60-size tires. $575. Call 865-4241 after 4 p.m.

FOR RENT: Rancher in Somerville area of Seaford, 3-4 BR, 2 baths, jacuzzi, fireplace, great room, kitchen appliances, 2-car garage, large backyard. $1,100/mo. Call 825-3321 or 249-6737 (voice mail).

FOR SALE: Craftmatic mechanized double bed with vibrator, Simmons Beautyrest mattress. $950. Call 229-7445.

FOR SALE: Scandinavian sofa with matching chairs and footstools, wool fabric; two end tables, natural-finished teak. $1,000. Call 229-7445.

VOLUNTEERS WANTED: Volunteers are needed to staff aerospace exhibits at the Virginia State Fair, Sept. 26-Oct. 6. For more information, call Donna Roper at ext. 42505.

VASC SUMMER CENTER MOTOR TOURS: Through August, the Virginia Air & Space Center offers summer motor tours of NASA Langley Research Center. Tours cost $4 with the purchase of any VASC admission ticket. For tour times, call 727-0900.

TECHNOLOGY 2006 Conference, Oct. 29-31, Anaheim Convention Center, Anaheim, Calif. Sponsored by NASA, the Technology Utilization Foundation and *NASA Tech Briefs* magazine. For more information, call 1-800-944 NASA, or fax to 212-986-7864.

TAKE A WALK: The 1996 American Heart Walk is Sept. 21 to help fight heart disease and strokes. The five-mile walk winds through the new Sandy Bottom Park in Hampton. Registration begins at 9 a.m., and the walk starts at 10 a.m. NASA Langley will gather a team together for the walk; all employees and contractors are encouraged to participate. For more information and to sign up, call the Fitness Center at ext. 46387.

NACA REUNION VII: Oct. 3-6 in Hampton. All former NACA employees and members of NASA Langley Alumni Association and guests are invited. For more information, call 595-1306.

FORE! The NASA Golf Association offers two golfing events open to nonmembers: a two-person, mixed-doubles team tournament, Aug. 29, on Langley's Blue Course, with a 1 p.m. shotgun start; and a golfing trip to Myrtle Beach, S.C., Oct. 3-6, including play at four different championship golf courses. For more information and/or entry forms for either of these events, call Tom Yager at ext. 41304.

CALLING ALL HAMS: A free 10-week classroom course leading to an FCC Amateur Radio "No-Code Technician" license will begin Sept. 5, 7-9:30 p.m., at the Virginia Air & Space Center, 600 Settlers Landing Road, Hampton. Preregistration is required. Call Steve Silsby at 886-1407 evenings.

SUPER HEROES ®: A High-Tech Adventure is featured at the Virginia Air & Space Center in Hampton through Sept. 8. Visitors can join superheroes Batman, Superman, Spiderman, the Incredible Hulk, Wonder Woman, and Captain America in the interactive exhibits. For more information, call 727-0900.

DESTINY IN SPACE, an IMAX film narrated by Leonard Nimoy, runs through Sept. 1 at the Virginia Air & Space Center in Hampton. The film features never-before-seen footage from recent space shuttle missions, as well as shots from the Hubble Telescope deployment and service, a Tethered Satellite experiment and Spacelab activities. Show-times are 11 a.m. and 4 p.m. daily. For more information, call 727-0900.

YOGA CLASS: Meets for four Mondays, 5:30-7 p.m., beginning Sept. 9. Fee is $24 for YMCA members or $30 for nonmembers. To register, call 722-9044.

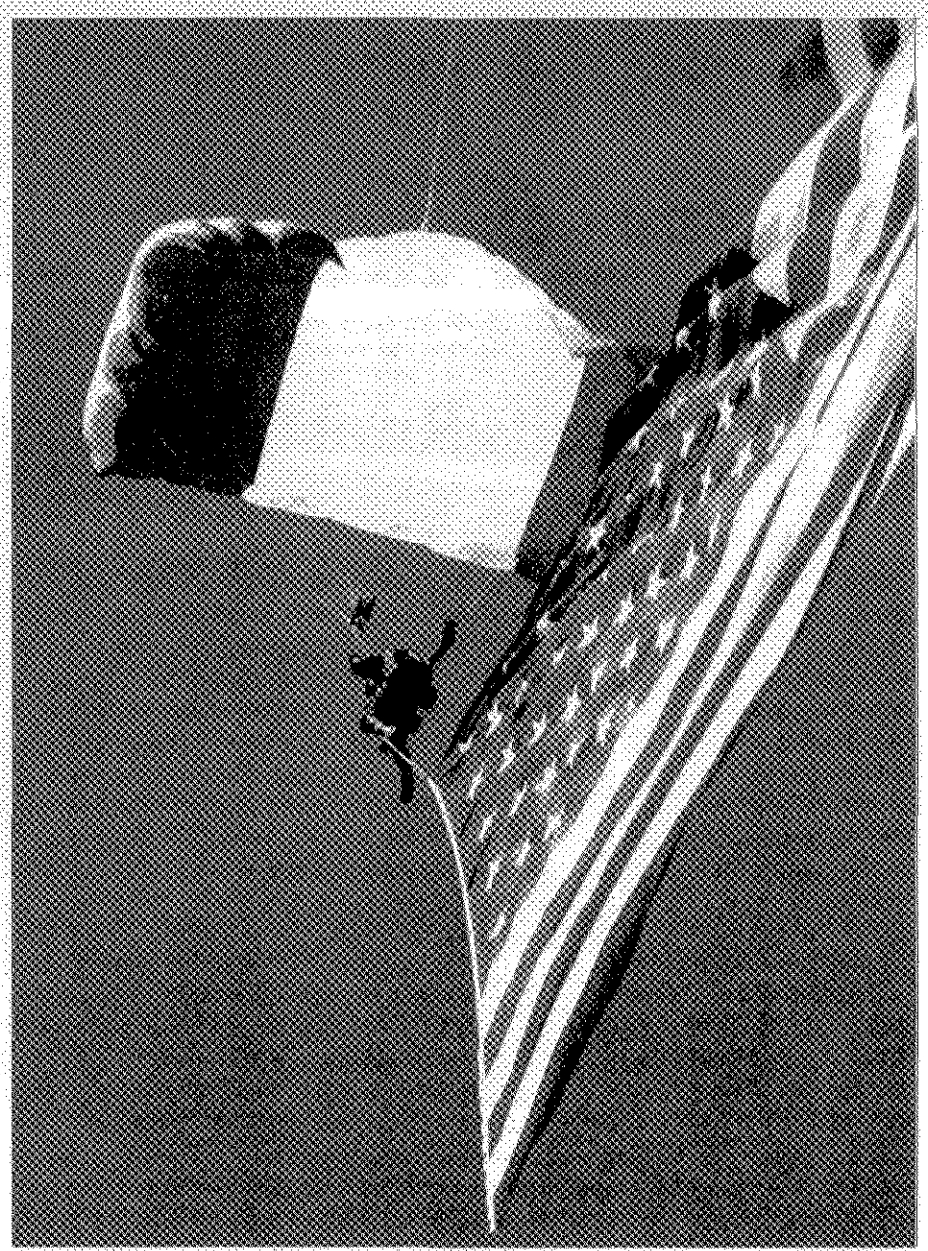


Photo by Fred Jones

STARS AND STRIPES FOREVER – A member of the Liberty Parachute Team performs at one of the many air shows at the 1996 Fly-In Convention and Sport Aviation Exhibition at Oshkosh, Wis., Aug. 1-7.

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Researcher News

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Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 18 ❖ September 6, 1996

NASA Searches Pacific Ocean for Pristine Air

BY CATHERINE E. WATSON

In a search for pristine air, NASA Langley researchers will spend September and October flying over the Central Pacific Ocean. Atmospheric scientists need to know how the atmosphere behaves without human influences in order to better understand the effects of human activities on the Earth's atmosphere.

Langley researchers had hoped to find pristine air over the northwest Pacific Ocean during the 1991 Pacific Exploratory Mission (PEM)-West experiment, but pollution was found in that region as well, thousands of kilometers from the industrialized areas of the Asian coastline. The 1991 PEM-West data also showed that some of the pollution found over the northwest Pacific could have come from as far away as Europe and North America.

The Langley researchers involved in PEM-Tropics will use instruments located on several islands, and aboard the NASA P-3B and DC-8 aircraft, to measure chemicals in the atmosphere, as well as study the weather patterns over the Central Pacific. The Central Pacific Ocean is, perhaps, the last remaining region of the world's lower atmosphere that is relatively free of human-induced atmospheric pollution.

Dr. Bruce Anderson, a PEM-Tropics researcher and senior research scientist in the atmospheric studies branch, said, "The emphasis of [PEM-Tropics] is to try to gain an understanding of what the air chemistry is like today, before any significant changes occur in these areas."

"If we can find some pristine air, we can test some of our basic theories about atmospheric chemistry in undisturbed conditions," said Dr. Robert Harriss, director of the science division in NASA's Office of Mission to Planet Earth. "One of the most important of these issues is determining the capability of the

(see PACIFIC, page 5)

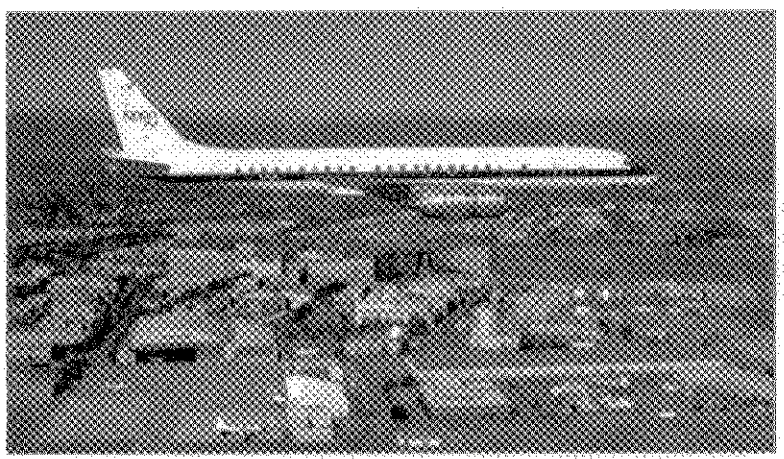


Photo courtesy NASA Ames Research Center

Five NASA Langley experiments will be flown aboard this NASA DC-8, based at NASA Ames Research Center, Calif. Three other Langley experiments will be flown aboard the NASA P-3B, based at Virginia's Wallops Island Flight Facility.

NASA, ODU Work Toward Wind Tunnel Agreement

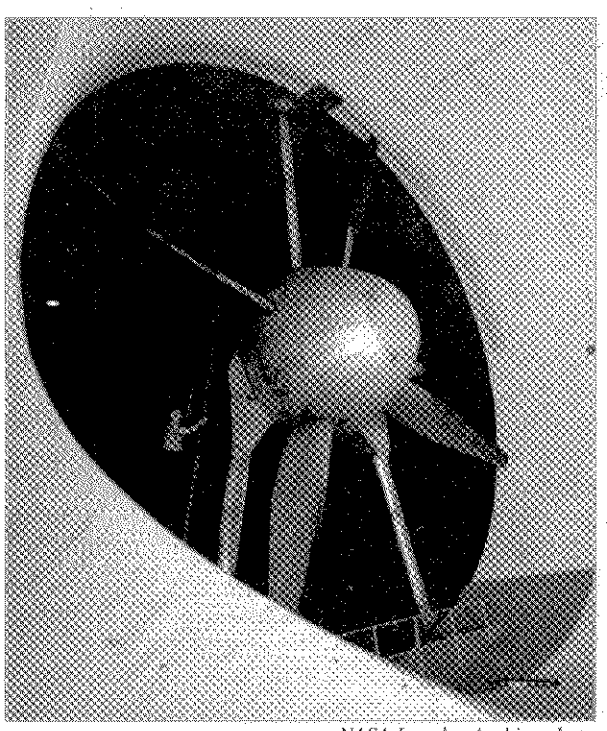
Interim Measure Allows University To Ready Tunnel, Conduct Tests on Aircraft Model Nose Cone

BY KEITH HENRY

NASA Langley Research Center and Old Dominion University are working toward an agreement that would allow ODU to operate a NASA wind tunnel as a private venture.

The 30-by-60-Foot Full-Scale Wind Tunnel was retired by NASA in the fall of 1995 to allow for an orderly consolidation of aeronautical testing facilities at a time of shrinking federal budgets, while enabling essential center capabilities to be preserved.

At the time of its closing, officials announced that possible alternative uses were under study.



NASA Langley Archive photo

Old Dominion University is preparing to use Langley's 30-by-60-foot tunnel for aeronautical research. Langley closed the facility in October 1995 as a cost-saving measure.

Working Partnership

If negotiations are successful, the agreement between NASA and ODU would work much like a lease except that no money would change hands.

In the meantime, the parties have signed an interim memorandum of agreement which can remain in effect until it is superseded by the final agreement or until Oct. 30, whichever comes first.

The interim agreement allows ODU early access to the tunnel to begin preparations for a test of an aircraft model nose cone for the Air Force Wright Aeronautical Laboratories, Dayton, Ohio. Details of the final agreement are being worked by facilities and legal offices at NASA Langley.

Valuable Research Potential

"This is a remarkable opportunity for the university," said Dr. Jim Cross, Dean of the ODU College of Engineering and Technology. "The 30-by-60 wind tunnel is an asset with enormous potential to impact regional economic development in the aeronautical sector, and the educational and research programs of the college."

ODU has designated the non-profit Old Dominion University Research Foundation as the university's operating agent for the agreement.

Under terms of the interim agreement, the ODU foundation would provide all personnel and staff required to operate and maintain the facility. The foundation would also be responsible for the maintenance and repair of all equipment and systems required for the operation of the facility and would pay for electricity to power the facility.

University Would Augment Tunnel's NASA/AirForce History

The historic facility is owned by NASA but is located on Langley Air Force Base property. NASA's access to the facility has been through permit with the U.S. Air Force Air Combat Command, 1st Fighter Wing.

The tunnel was NASA's oldest operating wind

(see WIND TUNNEL, page 5)

Langley To Market New Technologies at EXPOTECH '96

Coliseum hosts industry, government exhibits

Langley has joined with other area technology-based organizations to support EXPOTECH '96, the Peninsula's trade and technology show set for Sept. 10-11 in the Hampton Coliseum. Langley will fill eight of approximately 80 exhibit booths, with representatives eager to explain promising new technologies and their market potential.

Langley technologies exhibited this year range from computing capabilities that provide solutions for Internet access for schools to a thermal bond inspection system for use with structures and materials to detect defects, measure thickness or monitor the fabrication process.

Technology Application Group's Joe Heyman will participate in the NASA and Jefferson Lab (formerly CEBAF) Technology Preview Symposium both days of the show from 9 to 9:45 a.m.

Other Langley technology exhibits include:

- Rotating Self-Nulling Eddy Current Probe for detection of fatigue cracks hidden under rivet heads
- Periodontal Structures Device for early detection of gum disease
- LaRC RP 46, a high-temperature polyimide resin composite for easy-to-use application to improve adhesives, printed circuit boards and foams
- Next-Generation Molded Magnets technology which offers potential for low-cost, easier-to-manufacture magnets that are resistant to thermal shock.

A limited number of free passes have been distributed to the group directors for NASA Langley employees who would benefit from attending EXPOTECH.

A nationally recognized exposition, EXPOTECH was created to stimulate and encourage commercialization of developing technology as a result of downsizing affecting U.S. defense contractors.

Panel discussions and seminars will deal with subjects including financing, licensing and technology education.

School groups are invited to School Group Field Day from noon to 3 p.m., Sept. 11.

Interactive student demonstrations will include Langley's crash test simulation and Jefferson Lab's cryogenic exhibit, among others.

EXPOTECH is coordinated by the Peninsula Advanced Technology Center in association with Langley, Jefferson Lab, the Virginia Peninsula Economic Development Council and the Industrial Development Authorities for the cities of Hampton and Newport News.

News Briefs

Around the Agency

COSMONAUT KONDAKOVA NAMED TO STS-84 CREW – Veteran Russian cosmonaut Elena Kondakova has been named as a mission specialist for STS-84, joining six astronauts already named to Atlantis' 1997 flight to dock with Russia's Mir space station. Kondakova, an engineer with RSC Energia in Russia, previously held the single space flight endurance record for a woman, having spent 169 days in space as flight engineer for the Mir 17 crew from October 1994 to March 1995. U.S. astronaut Shannon Lucid will have surpassed that record on Sept. 7. Kondakova will join U.S. Air Force Col. and STS-84 commander Charlie Precourt, Air Force Lt. Col. and pilot Eileen Collins and fellow mission specialists U.S. Marine Corps Maj. Carlos Noriega, Edward Lu, Ph.D., Jean-Francois Clervoy of the European Space Agency and Michael Foale, Ph.D. Kondakova becomes the third Russian cosmonaut to fly on the shuttle as a mission specialist, following Sergei Krikalev (STS-60) and Vladimir Titov (STS-63).

LAWRENCE AND WOLF TO TRAIN FOR MIR MISSIONS – U.S. Navy Cmdr. Wendy B. Lawrence and David A.Wolf, M.D., have been selected to train for stays on Russia's Mir space station. Lawrence will begin a four-month stay on Mir in September 1997. She will launch aboard Atlantis as part of the STS-86 crew and will become a member of the Mir 24 crew, which will be replaced by the Mir 25 crew during Lawrence's tour on the Mir. Wolf will replace Lawrence on Mir, arriving aboard Discovery during the STS-89 mission, currently targeted for early 1998. He will be a member of both the Mir 25 and 26 crews during his four-month tour on orbit. Lawrence, 37, flew previously on STS-67, a 16-day flight of the ASTRO observatory in 1995. Wolf, 39, flew on STS-58 in 1993, a 14-day life sciences mission.

CREW NAMED TO FIRST SPACE STATION ASSEMBLY FLIGHT – U.S. Marine Col. Robert D. Cabana will command the first space shuttle mission to carry hardware to space for the assembly of the International Space Station in late 1997. Joining Cabana on the flight deck for mission STS-88 aboard Endeavour will be pilot Marine Maj. Frederick "Rick" Sturckow, a member of the 1995 astronaut class who will be making his first space flight. Rounding out the crew are veterans U.S. Army Maj. Nancy Currie, U.S. Air Force Col. Jerry Ross and Jim Newman, Ph.D. The seven-day mission will be highlighted by the mating of the U.S.-built Node 1 station element to the Functional Energy Block (FGB), which will already be in orbit, and two spacewalks to connect power and data transmission cables between the Node and the FGB. The FGB, built by Boeing and the Russian Space Agency, is scheduled for launch on a Russian Proton rocket from the Baikonur Cosmodrome in Kazakstan in November 1997. Node 1 will be the first Space Station hardware delivered by the space shuttle.

Disabilities Awareness

Meniere's Syndrome Sufferer Speaks

BY MARK E. STORM

I was surprised to see an article on Meniere's Syndrome in the *Researcher News*.

I have had similar inner ear problems and was out of work for more than a year because of the debilitating effects. As a contractor, I got caught between contracts and insurance companies. It was an extremely hard battle to fight because people, including physicians, don't comprehend how devastating inner-ear problems are.

Meniere's syndrome and inner-ear problems are an "invisible" disability, just as the *Researcher News* article states. There are no outward signs of a problem. You look OK to others, even though you can barely walk or function.

The cycle of vertigo and dizziness never stops for some people. It can continue for years.

I'm better now; my symptoms have disappeared except for a complete hearing loss in one ear.

The Vestibular Disorders Association provides information and resources for people with inner-ear problems. Contact this organization at P.O. Box 4467, Portland, Ore. 97208-4467; (503) 229-7705; fax: (503) 229-8064; e-mail at veda@teleport.com; Internet Web sites at http://www.teleport.com/~veda/ and http://www.adworks.com/dizzy/vestib.html.

Announcements

Avionics Training Offered

A digital avionics systems course is being offered Sept. 30-Oct. 4, 8:30 a.m.-4 p.m., in Building 1229, Room 120.

Coordinator and lecturer will be Cary R. Spitzer, founder and president of AvioniCon, Inc., an international avionics consulting firm. Spitzer worked in NASA's avionics research program from 1978 to 1994.

This course benefits:

- Specialists who need to broaden their avionics perspective
- Managers and technical personnel who require a broad overview of leading-edge avionics
- Research and development personnel working on the dual use of military and civilian technologies in avionics

The course includes:

- An up-to-date integrated view of digital avionics systems from both technological and developmental perspectives
- Unique focus on the system level and its concurrent treatment of military and civil applications
- Insiders' perspective of emerging, state-of-the art concepts.

The course begins with avionics system design requirements in the context of aircraft/mission objectives, standards, and the use of top-level design tools.

To register, send an Application for On-Site Training (NASA Langley Form 24) to DeAnna Wooster at Mail Stop 137. For more information, call George Allison at ext. 42594.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following Langley employees are approved leave recipients: Marilyn K. Aldrich, Holly A. Elliott, Wendy B. Lessard, A. Wayne Richardson, Debra P. Shimek, Cassandra Stevens, Charles S. Washington.

Anyone interested in donating leave to recipients in the program should send donations on a "Request To Donate Annual Leave to Leave Recipient Under the Leave Transfer Program" form via computer in Informed Manager to Mail Stop 293, Office of Occupational Health Services, or fax the form to ext. 49114. For more information, call Karen Ridlon at ext. 43194.

Blood Drive Brings Thanks

"Sincere thanks to each of you who donated blood to the Red Cross Blood Drive in my name. I am now home and doing well." – Donald R. Warner

Ethics Training 1996

Individuals who were scheduled for the 1996 Standards of Conduct Training and were unable to attend may now obtain the video version from the Learning Center. For more information or to reserve a copy, contact Dhustie Zervakos at ext. 42325, or e-mail at d.l.zervakos@larc.nasa.gov. Contact your training coordinator to determine your need for this training.

Next Blood Drive Set

All NASA employees, retirees and contractors are invited to attend the next blood drive on Sept. 25, 9 a.m. to 3 p.m., at the H.J.E. Reid Conference Center. Charge your time to J.O. B-1004. For more information, call ext. 43194.

In Memoriam of Charles F. Barnett

Charles F. Barnett, 78, died Aug. 9 at his home in Newport News. Employed at NASA since 1944, the Illinois native retired in 1973 as director of personnel for NASA Langley.

1997 General Aviation Design Competition Opens

NASA and the Federal Aviation Administration are sponsoring a General Aviation Design Competition for the 1996-97 academic year that is open to undergraduate and/or graduate students at U.S. aeronautical and engineering universities.

In its third year, the Langley-managed competition engages students in a national effort to revitalize the U.S. general aviation sector and seeks to educate students on the importance of general aviation for business and personal use, as well as for its economic importance.

Student designs are judged by a panel of experts from industry, government and academia. All teams receive written evaluations of their design packages. At least $11,500 may be given in cash awards, including a $500 special award from the Aircraft Owners and Pilots Association Air Safety Foundation for the design with the greatest potential for retrofit in currently operating aircraft.

General aviation includes all flight operations except military services and commercial airlines. The 212,000 general aviation aircraft in service in the U.S. account for 62 percent of all U.S. flight hours, while providing 540,000 jobs and contributing $40 billion to the U.S. economy.

For the purposes of the competition, general aviation aircraft are defined as: fixed-wing, single-engine, single pilot, propeller-driven aircraft for two to six passengers. Performance specifications are 150-300 knots with an 800-1,000-mile range.

On behalf of NASA and the FAA, the Virginia Space Grant Consortium coordinates the competition. For guidelines, call 757-865-0726, e-mail at vsgc@pen.k12.va.us., or check the Internet for www.vsgc.odu.edu.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor ..... Keith Henry

Editor ..... Mary Graves
Science and Technology Corp.

Assistant Editor ..... Jeane Shanks
Science and Technology Corp.

Photographer ..... Fred Jones

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

LAA Carnival Features Food, Fun, Festivities

Once-Annual Event Makes Strong Comeback with New Version

BY GEOFF TENNILLE

The 1996 Langley Activities Association Carnival was a huge success, thanks to many dedicated volunteers. Some 3,000 to 4,000 people converged on the LAA grounds Aug. 16 and 17 to enjoy all the activities and food.

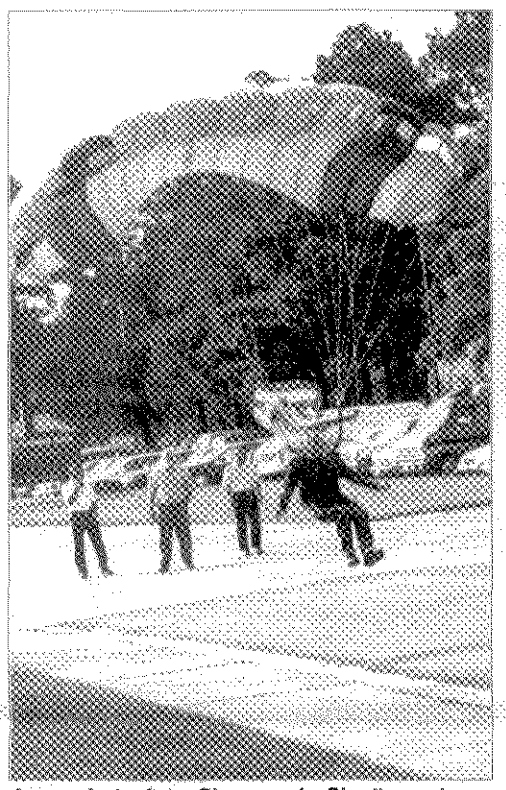
Attractions included bingo; video games; a children's midway, rides and face-painting; arts and crafts; sporting activities; a casino; and special displays and exhibits in and around the H.J.E. Conference Center.

Entertainers included the Cumberland County Line Band, the Hampton Express Band, New Dominion Bluegrass and the LAA Carnival return of Middle Eastern dancing by Desert Wind and Caravan East.

The carnival had been a summer tradition at Langley up through 1989 and was always a greatly anticipated event. The LAA tried to revive as much of that old spirit as possible, with help from this year's Carnival Monarch Connie Smith of the Management Information Systems Branch, as well as from Tammy Seward of the Aerodynamic Measurement Branch. Smith sold more than 3,600 raffle tickets; Seward sold more than 2,900. Some $5,500 in raffle prize money was awarded to 32 winners.

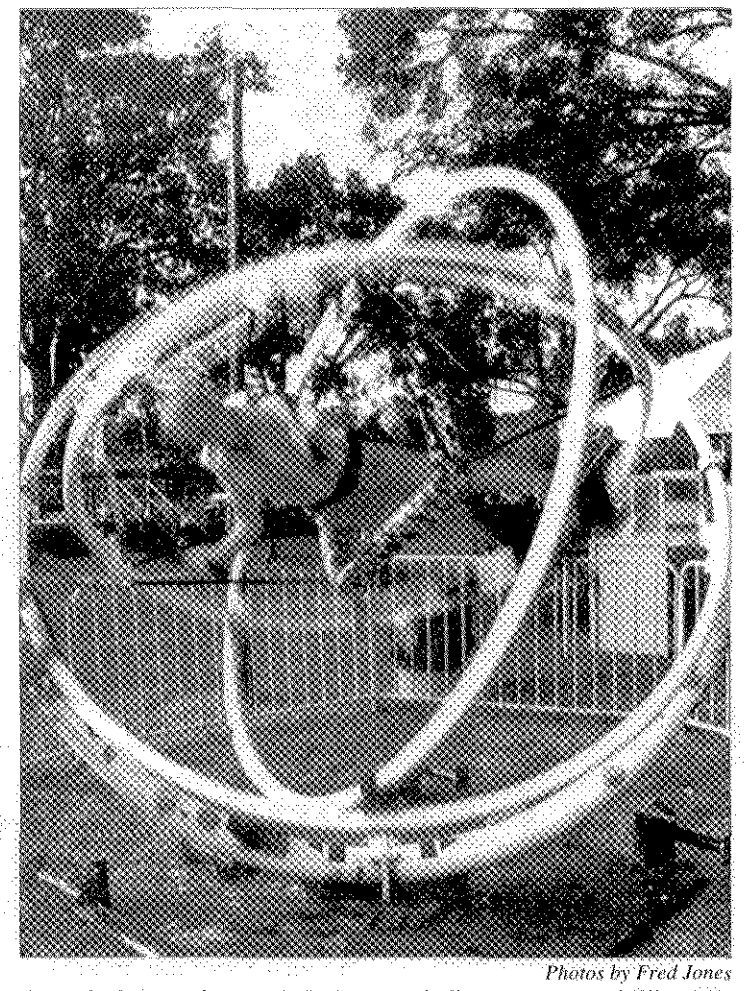
The carnival will return next year with additional activities and is tentatively set again for the third weekend in August. A firm date will be announced after arrangements for the rides and games are completed.

Since this was the first carnival after a seven-year hiatus, the LAA wants to improve the event next year and welcomes any comments or suggestions.



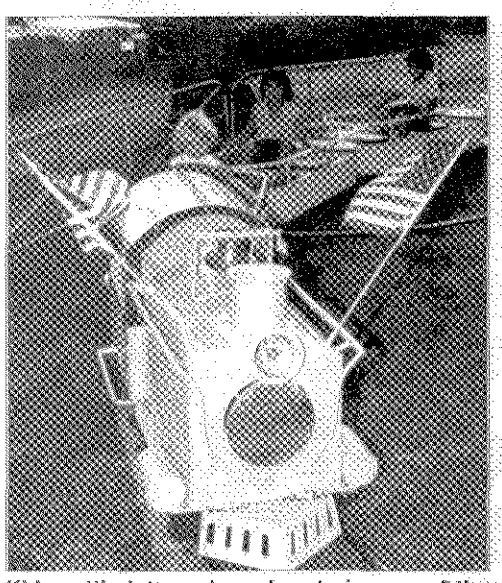
A parachuter from Chesapeake Skydivers drops in to deliver the Carnival Monarch's crown.

Carnival Monarch Connie Smith accepts congratulations from Roy Harris, assistant director for research and engineering.



Photos by Fred Jones

A carnival-goer takes a spin in the spaceball, one of the carnival's many rides and games, all provided by T.C.'s Enterprises of Wicomico, Va.



Kids settle into a choo-choo train, one of the many rides available for the little ones.

Langley folks take advantage of all the good food on hand – made available by our own Center cafeteria.

Speakers Bureau Needs Volunteers for Expanded Outreach Effort

BY CATHARINE G. SCHAUER

The Speakers Bureau is the Center's link with organizations and other groups that want to learn more about the work done at NASA Langley Research Center. Personnel who do the work share their projects and enthusiasm with others. Additional volunteers are needed so this outreach effort can be expanded.

The bureau reaches out to our most important customer, the American taxpayer.

Volunteers are needed to discuss these and other topics:

- Advanced Aviation Aircraft
- Aircraft Noise Reduction
- General Aviation Aircraft
- Rotorcraft
- National Airspace System
- Composite Materials for Aircraft
- Computer Technology
- Atmospheric Sciences
- Wind Tunnels
- Partnerships with Industry and Government
- High-Speed Civil Transport
- Aircraft Safety
- Commercialization of NASA-Developed Technology
- Space Transportation
- Space Station
- Space Shuttle
- Spacecraft and Remote Sensing
- Wind Tunnel Testing Technology
- Business Process Re-engineering.

This volunteer organization is made up of civil servants, contractors, and NASA retirees who represent NASA as speakers. They address civic, professional, educational and other non-profit organizations.

In addition to responding to the local community, Langley supports the five-state area of Virginia, West Virginia, North Carolina, South Carolina and Kentucky.

When available, speakers are provided at no cost. They cannot accept outside compensation or honorariums. The requesting organization is asked to cover travel, lodging, and meal costs incurred outside a 50-mile radius of the Center.

Speakers do not participate in events of a political or commercial nature or where any group has been unlawfully secluded or segregated on the basis of race, color, religion, sex or national origin. Talks are given during both duty and nonduty hours, on weekdays and weekends.

For more information or to volunteer, call Langley's Speakers Bureau Coordinator, Cathy Schauer, at ext. 43314 or 43309, or send a fax to ext. 47732, or an e-mail to c.g.schauer@larc.nasa.gov.

Virginia Peninsula

Calling All Retirees

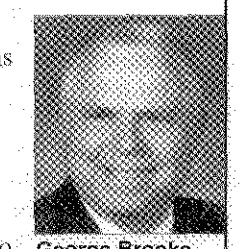
BY GEORGE BROOKS
NASA RETIREE

In recent years, NASA Langley retirees were not included in the annual Combined Federal Campaign (CFC). This year, however, any retiree may participate in the CFC by making a one-time cash donation.

To obtain a pledge card and more information, contact CFC Program Manager Jack Clough at 873-9328, ext. 23, or at 739 Thimble Shoals Blvd., Suite 400, Newport News, Va. 23606.

After working with local agencies supported by CFC funds for some 15 years, I'm convinced that these agencies are essential to our community – and that they deserve our support. They continue to help children, the elderly, the homeless, the ill and other members of our community who depend on these agencies.

As NACA and NASA employees, we did great things for our country; as retirees, we are a dynamic force, willing and able to support our community. Count us in for the CFC campaign.


George Brooks

CFC Contributions Opened to Contractors, Retirees

According to new federal Office of Personnel Management regulations, published in the Nov. 24, 1995 issue of the *Federal Register* (Vol. 60, No. 226), Section 950.103, contractor personnel and federal retirees are now eligible to contribute to the Combined Federal Campaign.

The regulation states:

"Current federal civilian and active duty military employees may be solicited for contributions using payroll deduction, checks, money orders or cash. Contractor personnel, credit union employees and other persons employed on federal premises, as well as retired federal employees, may make single contributions to the CFC through check or money order. These nonfederal employees may not be solicited but are to be provided the opportunity to participate in the CFC."

This year's CFC goal for Langley is $285,000.

'The CFC and the Good People in Our Community'

BY JOE HEYMAN
VICE CHAIRMAN
1996 CFC CAMPAIGN

There are good people in our community. They make a difference by demonstrating care and consideration for others. Through so many life experiences, those caring people are with us. Sometimes we do not realize they are helping us.

A young girl has her first team-building experience with her Brownies troop. A young man proudly attains the status of an Eagle Scout. The volunteers who contribute their time and energy help make these experiences part of the richness of life. For some, the interaction with a "big brother" represents a world view sadly distant from their daily reality.

But that experience plants a seed – a seed that, in many, matures into a life filled with harvests once thought beyond the horizon.

The organizations that help our communities depend on volunteers and/or full-time staff. The Combined Federal Campaign (CFC) gives all civil service employees and retirees an opportunity to designate charities we wish to help.

We buy insurance for our homes, our cars and our health because we cannot live with the statistical risk of facing a major loss. Thus, we embrace a group of similar people in our insurance companies to spread the risk over a larger group. When one suffers a loss, all parties contribute to help the victim. Insurance for one is made possible by the large number of people enrolled.

How about insurance for a community? What does an insurance policy look like for an entire community? I believe one part of it looks like the CFC.

Our communities are a lot more than the sum of insurance policies and contracts. Community volunteers understand that the greatest contribution is to give someone a helping hand, especially someone we do not know. The enthusiasm volunteers bring to life can lift a fellow worker or neighbor over the barrier they are facing.

I like to think of the CFC as the enabling investment that helps create an environment filled with people who care: the caring professional who counsels a person in need, the volunteer who helps a young cancer patient cope with a frightening disease, the newly found friend who changes despair to hope and understanding.

Our social infrastructure is like a complex tapestry, woven with many diverse threads. The weft and the warp are tightly bound, composed of fiscal resources and volunteers. The tapestry includes all the contributions of our community with a different pattern for each person.

Girl Scouts, the Society for Prevention of Cruelty to Animals, the Red Cross, the American Heart Association – hundreds and hundreds of organizations are there to help when needed. We all need help at some point in our lives, and we all want to help others.

There are good people in our community. They help keep the looms spinning, creating the wonderful patterns that enrich life, that help our friends, our neighbors, our community. They bind the occasional loose or broken threads that are an inevitable part of life. They volunteer and contribute to "insure" the health of our society. They make the difference.

Joe Heyman

When you give to the CFC, you ensure the strength and continuity of the fabric of life.

There are good people in our community.

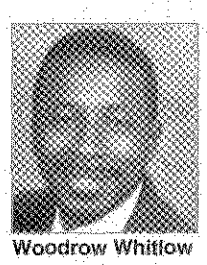
Theme Must Become Attitude – 'If It Is To Be, It's Up to Me'

BY WOODROW WHITLOW JR.
CFC CHAIRPERSON

The 1996-1997 Langley Combined Federal Campaign (CFC) is drawing near. This year, we have set a campaign goal of $285,000. Although the goal is ambitious, it is one that we can meet with the full support of each member of the Langley family.

The campaign slogan for this year is "If it is to be, it's up to me." To improve the difficult and unfortunate situations that we see and encounter each day, this is the attitude that each of us should adopt.

If help is be provided, each of us must place that responsibility upon ourselves. The CFC offers us that opportunity to do our part to help those who are less fortunate: needy children, homeless families, people unable to afford a nutritious meal, people suffering life-threatening illnesses and countless others. Few of us can say that our lives have not been touched in some way by such situations.


Woodrow Whitlow

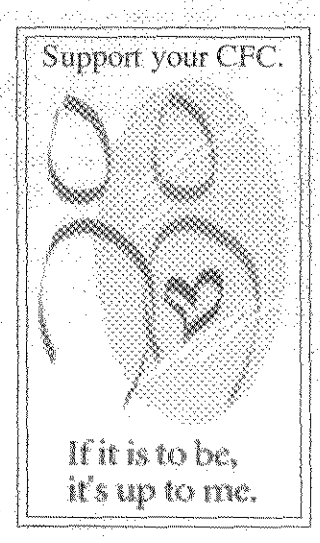
Indeed, many of us have friends, family and neighbors who have been helped by a CFC-supported agency. Since fewer government services are available for those who need them, our help is needed more than ever.

So each of us must believe that "if it is to be, it's up to me," and we must do what we can to help. We never know when one of us or a loved one may need the services of a CFC-supported agency. By supporting the CFC, we provide the comfort of knowing that if help is needed, it will be available.

If you either have a favorite cause or would like to support an agency that helps you in some personal way, adopt the attitude "If it is to be, it's up to me," and support the CFC. Your contribution can be designated for those agencies that affect your life.

Shortly after the Sept. 24 Langley CFC Kickoff, your CFC "key persons" will solicit your gift and will be available to answer any questions that you may have about the CFC. You may give either with a one-time donation or through regular payroll deductions.

This year, we begin new processes that will make giving easier. Your key persons will be trained to assist you in using these processes.



We have set an ambitious campaign goal, but with everyone believing in this year's theme, it is a goal that we can reach.

Langley has long been a leader in giving and helping and has a strong tradition of supporting the CFC. I am confident that Langley employees again will lead the way in helping their fellow citizens.

Considering the CFC's rich history of providing help for those less fortunate, I am honored to have been chosen to chair Langley's 1996-1997 Combined Federal Campaign. As chairperson, I encourage each of you to support the CFC with as generous a donation as you can afford. It's an investment that provides lasting returns.

Shebalin Wins Yearlong Fellowship to England

BY MEGHAN WOODCOCK

Dr. John Shebalin, Senior Research Scientist with the Fluid Mechanics and Acoustics Division, Research and Technology Group, leaves Sept. 11 for a yearlong Floyd L. Thompson fellowship at City University in London, England. Dr. Bassam Younis of the Civil Engineering Department will act as Shebalin's academic host during his stay.

Shebalin will conduct research on complex turbulent flows, with and without heat transfer. He is one of three researchers selected this year for Langley's prestigious Thompson fellowships.

Shebalin's current research is in the analytical and numerical study of fluid turbulence.

"Turbulence occurs in fluid mechanics because fluids can behave in a highly nonlinear and unstable manner," Shebalin explained. "Although turbulence has been under active study for more than a century, it is still not well understood, and its effect on the performance of aerospace vehicles often cannot be accurately predicted.

"However, the ability to accurately predict turbulence effects is critically important in the design of advanced aerospace systems. This is one of the greatest challenges the national aerospace community has before it," Shebalin said.

Langley's Cray YMP supercomputer was used to run the large-scale computations in Shebalin's numerical studies.

Shebalin began his Langley career in 1987 in the Antenna and Microwave Research Branch, where he performed research relating to atmospheric entry.

John Shebalin

Specifically, his research dealt with the magnetic field generation and plasma dynamics in ionized flow surrounding a hypersonic reentry vehicle.

Shebalin transferred to the former Theoretical Flow Physics Branch in 1992. That same year, he was detailed for a year as a visiting scientist at the Institute for Computer Applications in Science and Engineering (ICASE) at NASA Langley. He moved to his current position in the Aerodynamic and Acoustic Methods Branch in 1994.

Shebalin received bachelor's and master's degrees in physics from Old Dominion University in 1972 and 1976, respectively. He received a Ph.D. in physics from The College of William and Mary in 1982.

Shebalin has participated in American Institute of Aeronautics and Astronautics (AIAA) meetings and was an active member of the AIAA Plasma Dynamics and Lasers Technical Committee from 1989 to 1994. He has also written about 60 technical papers.

"I am excited, professionally and personally, about going to London," Shebalin said. "The fellowship will be professionally broadening, and it will allow me to help Langley meet the challenges which lie ahead.

"This opportunity for 'cross-pollenation' of fresh ideas is one of the fundamental purposes of the Thompson Fellowship Program," he said, "and NASA Langley will ultimately reap the benefits."

Farrow Awarded Penn State Fellowship

BY MEGHAN WOODCOCK

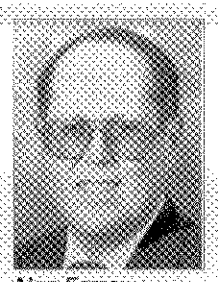
Alan Farrow, head of the Facilities Program Development Office, received a fellowship from Pennsylvania State University. He will attend the university's Strategic Leadership Program Sept. 15 through 27.

The fellowship strives to develop managerial strategic leadership skills in team building, cooperation, communication and problem-solving capabilities. NASA provides one or two participants each year for this two-week program at Penn State University, State College, Pa.

Farrow has spent 33 years at NASA managing various programs for the agency. From 1968 to 1980, he was employed at Johnson Space Center as a senior project engineer. In 1980, he was transferred to NASA Headquarters, where he spent eight years serving in the Office of Facilities as program manager for the Code R centers.

Farrow joined Langley in September 1988, when he was assigned as the Center's deputy of the Facilities Program Development Office. Two years later, he took over his current position as head of that office.

Farrow manages the Center's major and minor Construction of Facilities (CoF) programs. He also manages the Center master plan and maintains a computer-generated version of the plan that is available to all organizations at Langley and that can be updated on a real-time basis.


Alan Farrow

Farrow also manages the Real Property, Facilities Space Utilization, Geographic Information System and the Americans for Disabilities Act facility improvement programs, including the oversight and management of historic and culturally significant activities, artifacts and five National Historic Landmarks.

In addition to his regular assignment, Farrow has been designated as the Internal Operations Group's product line deputy for institutional facilities and infrastructure. In this position, he will coordinate Langley's re-engineering and institutional process change and strategic long-range planning for our "City of Langley."

In 1968, Farrow earned a bachelor's degree in mechanical engineering from the University of Texas, Arlington campus, where he became a member of the Tau Beta Pi Engineering Honor Society. He was recognized by NASA with a Cost Reduction Award in 1978 and received an Outstanding Leadership Award in 1991.

NASA Scientists Puzzle Over New Celestial Find

NASA NEWS RELEASE

Scientists at NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., have discovered a unique and baffling object that may be either an unusual asteroid or an extinct comet.

The object, designated 1996 PW, was detected Aug. 9 by astronomers using data from the Near-Earth Asteroid Tracking (NEAT) program that employs a JPL-developed camera mounted on a U.S. Air Force telescope atop Mt. Haleakala on Maui, Hawaii.

Puzzled scientists are still trying to understand exactly what object 1996 PW is and where it came from.

"This is a misfit in the grand scheme of things," said Eleanor Helin, a planetary astronomer at JPL and the NEAT Principal Investigator.

At first look, the object, which has a diameter of about five to ten miles, appears to be an asteroid, a chunk of rock that orbits the sun, Helin said.

However, unlike most typical asteroids, which inhabit orbits no further out than the planet Jupiter, 1996 PW has a highly elongated, comet-like orbit that stretches into the vast outer reaches of the solar system far beyond Neptune and Pluto. Its orbit has a period currently estimated at 5,000 years, according to JPL research scientist Dr. Michael Keesey.

Although 1996 PW is in an orbit resembling that of a long-period comet, no gaseous emissions or other normally expected comet-like activity have been observed, even during its current closest approach to the sun, Helin said.

Helin and other astronomers studying the object believe that this raises the possibility that it was once an active comet, but is now inert, either because its ice and gases have been stripped away or because it is covered and insulated by a crust of nonvolatile materials.

Due to the current position in space of 1996 PW, scientists will have an excellent window of opportunity to study the object more thoroughly over the next six months.

WIND TUNNEL

(continued from page 1)

tunnel at the time of its closure. The unique facility had been modified several times over its 64 years to keep up with the growing size of aircraft and with improvements in test techniques, but last year it was shut down, and the process was begun to shift its work to other NASA wind tunnels.

The cavernous wind tunnel was completed in 1931 to test the aerodynamic characteristics of full-scale models and actual airplanes at operational flight speeds. Originally called the "Full-Scale Tunnel," it was declared a National Historic Landmark in 1985.

Model Testing Eclipsed

Full-scale testing eliminated the uncertainties of model testing and provided basic information prior to and during flight testing. Contemporary studies in the renamed 30-by-60-Foot Tunnel often focused on stability and control characteristics for military aircraft, and high-lift capability for both civil and military aircraft.

The overall tunnel is 434 feet long and 222 feet wide with a maximum height of 97 feet. The actual test section is an open-jet 30 feet high, 60 feet wide and 56 feet long. Two four-bladed wooden propellers, each 35.5 feet in diameter and powered by a 4,000-horsepower motor, generate the air stream.

The tunnel is a closed-loop design, with two return passages that allow for continuous air flow at speeds up to 120 mph.

"This is a remarkable opportunity for the university."

Dr. Jim Cross, Dean
Old Dominion University
College of Engineering and Technology

PACIFIC

(continued from page 1)

atmosphere to absorb pollution without negative long-term effects."

PEM-Tropics will involve over 100 scientists from NASA, NOAA, and several universities and government agencies. PEM-Tropics is the last of three major NASA studies that are being conducted in the Pacific during a five-year period (1991-1996).

The three PEM studies are providing baseline data to understand the natural chemical processes that take place in the lower portions of the atmosphere, where humans live, and the susceptibility of this vital region to chemical changes due to human activity.

AdVentures

FOR SALE: 1983 Dodge Colt, runs great, clean inside, new tires, new brakes, new exhaust system. $1,500 or best offer. Call 851-1990.

FOR SALE: Brick home on Back River inlet, one story, five minutes to Langley, 4 BR, 2.5 baths, formal living room/dining/foyer, family room with gas fireplace, double-car garage with workshop area, fenced back yard, corner lot on cul-de-sac. Asking $199,000. Call 723-7296.

FOR SALE: Duplex in Coventry section of York County, 144 Seekright Drive, 3BR, 2.5 baths, single-car garage, fenced yard, gas fireplace with custom mantle, gas heat, gas water heater. Appliances negotiable. Community has pool, tennis courts, clubhouse and bike trials. $99,000. Call 867-9041.

FOR SALE: Hunter 25 sloop, main and two jibs, new gelcoat bottom, fresh bottom paint, new cushions, 15-horsepower Evinrude motor. $6,000. Call 623-6778.

FOR SALE: Upright freezer, 9 cubic ft., $50. Call 851-3748.

FOR SALE: Bally's Premier Health Club membership. Cost $1,000, will sell for $350, plus buyer pays $100 transfer fee. Call Anthony at 247-5144 evenings before 9 p.m.

WATCH SALE: Cleo Enterprises comes to the Langley Exchange Gift Shop Sept. 11, 10:30 a.m.-2 p.m., offering a large selection of fun watches for sale, all at $14.99. For more information, call ext. 41585.

TICKET DISCOUNTS: The Exchange Shop is selling discounted tickets to the Virginia State Fair ($10), AMC Movie Theaters, Regal Cinemas, Colonial Williamsburg and Jamestown-Yorktown, Nauticus, Virginia Air & Space Center, Kings Dominion, Busch Gardens, Walt Disney World. For more information, call ext. 41585.

VOLUNTEERS WANTED to staff aerospace exhibits at the Virginia State Fair, Sept. 26-Oct. 6. For more information, call Donna at ext. 42505.

VIRGINIA SYMPHONY presents a Masterworks concert Sept. 7 at Chrysler Hall in Norfolk; Gala concert Sept. 11 with Bobby McFerrin. Symphony season brochures available in the NASA Langley cafeteria. For tickets, call 623-2310.

YOGA CLASS: Meets for four Mondays, 5:30-7 p.m., beginning Sept. 9. Fee is $24 for YMCA members or $30 for nonmembers. To register, call 722-9044.

TAKE A WALK: Now is the time to register for the Sept. 21 American Heart Walk. The five-mile walk to help fight heart disease winds through Sandy Bottom Park in Hampton. Check-in begins at 9 a.m., and the walk starts at 10 a.m. All employees and contractors are invited to join the NASA team. To sign up, call ext. 46387.

ENGINEERS CLUB of the Virginia Peninsula will hold its opening meeting for the 1996-97 season on Sept. 24, 5 p.m., at the executive dining room of Newport News Shipbuilding, 41st St. and Huntington Ave. All are invited to attend this free event. For more information, call Ron Harvey at 249-2322 or Abraham Leiss at 877-2929.

RETIREMENT LUNCHEON for Joseph M. Drozdowski, Information Systems and Services Division, Sept. 30, 11:30 a.m., at the H.J.E. Reid Conference Center. The cost is $9 per person (includes gift). Gift-only contributions are accepted. Call Tricia Smith, ext. 46597, or Shirley Brown, ext. 46543, ro RSVP by Sept. 23.

SECOND INDUSTRY ROUNDTABLE: Hosted by ICASE and NASA Langley, Oct. 7-9, at the Williamsburg Hospitality House. For more information, check out the Web site at http://www.icase.edu/workshops/IR2. To reserve a seat, contact Emily Todd at ext. 42175; e-mail at emily@icase.edu.

TECHNOLOGY 2006 Conference, Oct. 29-31, Anaheim Convention Center, Anaheim, Calif. Sponsored by NASA, the Technology Utilization Foundation and *NASA Tech Briefs* magazine. For more information, call 1-800-944 NASA, or fax to 212-986-7864.

SKI VAIL: The Peninsula Ski Club is sponsoring a ski trip to Vail, Colo., for Jan. 18-25. For information and reservations, call Bill Hunter at 874-0913.

NASA SKI WEEK VI: The sixth annual agency-wide ski trip is scheduled for Jan. 18-25 at Steamboat Springs, Colo. The trip is open to all NASA personnel, contractors, retirees, and their friends and relatives. For more information, call Michael Schooley at ext. 48524 or at 867-8093.

SKI CLUB: The Peninsula Ski Club meets the second Thursday of the month, 7 p.m., at Days Inn of Oyster Point in Newport News. For more information, call 596-4742.

IT'S ELECTRIC! *Electric Space: Bolts, Jolts and Volts from the Sun*, a new hands-on traveling exhibit at the Virginia Air & Space Center, runs Sept. 20 through Jan. 7. The 3,800-square-foot display "examines the effects of space weather on technology." For more information, call 727-0900.

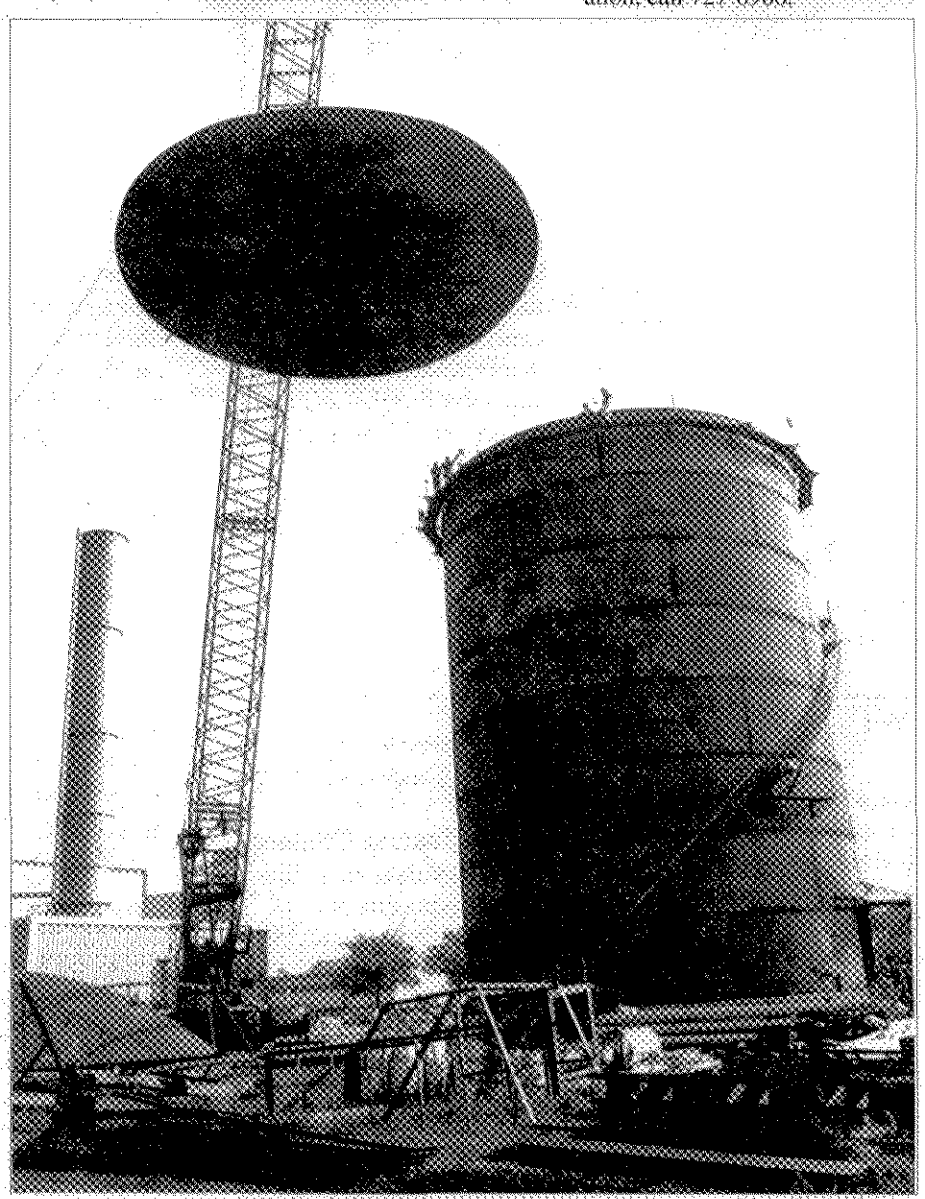


Photo by Fred Jones

TOP 'ER OFF – This 85-foot tall liquid nitrogen storage tank, currently under construction near the Langley main gate, supplies the National Transonic Facility (NTF) with nitrogen for model tests. The tank holds 900,000 gallons and consists of a stainless steel, 47-foot inner tank, and a carbon steel, 53-foot outer tank. Here, workers line the top rim of the tank, ready to maneuver the roof into place and then to weld it closed. The storage tank, designed to increase NTF productivity, is scheduled to be completed by early next summer.

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Researcher News

National Aeronautics and
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Langley Research Center
Hampton, Virginia 23681-0001

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National Aeronautics and Space Administration
Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 19 ❖ September 20, 1996

NASA Rolls Out Award-Winning 'THUNDER'

Langley-developed piezoelectric material may find technology applications

BY KEITH HENRY

A NASA technology that could make everything from speakers to heart pumps smaller and more efficient has been recognized as one of the 100 most significant technological advancements of 1995. "THUNDER" technology will be honored by *Research and Development Magazine* at the annual "R&D 100 Awards" banquet Oct. 14 in Philadelphia.

Langley researchers Richard Hellbaum, Robert Bryant, Robert Fox, Antony Jalink, Wayne Rohrbach and Joycelyn Simpson have taken advantage of a well-known phenomenon exhibited by piezoelectric materials to dramatically advance the potential for mechanical control systems and for sensors.

The phenomenon is observed in certain kinds of ceramic materials which generate mechanical movement when subjected to an electric current and electrical charge in response to mechanical stress.

The multidisciplinary materials integration team from Langley has succeeded in developing and demonstrating a piezoelectric material that is superior to commercially available piezoelectric materials in several significant ways: It is tougher and more durable, allows lower voltage operation, has greater mechanical load capacity, can be easily produced at a relatively low cost, and lends itself well to mass production.

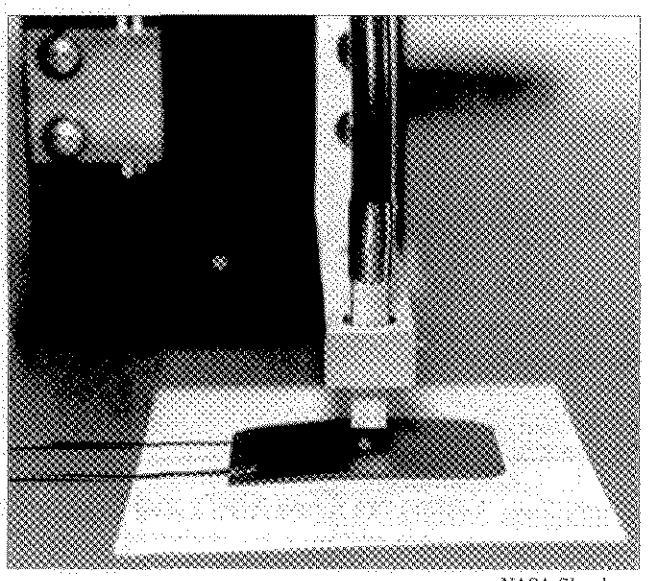
Dubbed THUNDER, the technology has many potential applications. Its low-voltage characteristic could allow this technology to be used for the first time in internal biomedical applications like heart pumps. THUNDER could also be applied in electronics, optics, jitter suppression, noise cancellation, pumps and valves.

The first generation of THUNDER devices is being fabricated in the lab by building up layers of commercially available ceramic wafers. The layers are bonded using a Langley-developed polymer adhesive, and the process results in a prestressed device with significantly improved performance. In addition, the process is controllable and results in highly uniform pieces of hardware.

In the ideal fabrication process – which researchers believe is technically feasible – piezoelectric ceramic materials would be ground to a powder, processed and blended with an adhesive before being pressed, molded or extruded into wafer form. The result would be increased ability to tailor properties, more flexibility in choosing methods of manufacturing and increased amenability toward mass production.

THUNDER wafers could be any practical size, from areas of a few square millimeters to several square meters and thicknesses of fractional millimeters to several millimeters.

Memoranda of Agreement have been signed with six companies to date to develop THUNDER technologies and related commercial products. Approximately 15 to 20 additional companies are negotiating agreements for this technology.



NASA file photo

A fiber-optic displacement sensor measures the displacement of a THUNDER wafer.

The R&D 100 Award, formerly IR-100, is presented annually by *Research and Development Magazine* to the innovators of the 100 most technologically significant new products of the year. A panel of scientists and engineers makes selections after studying new technologies from around the globe.

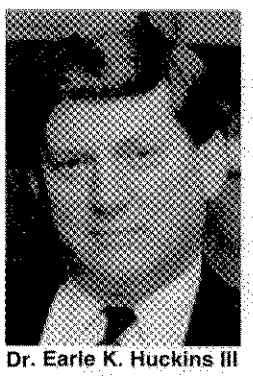
NASA Langley has competed in the program 27 years and has earned 31 R&D awards.

Colloquium Communiqué

'97's Cassini Mission To Run Rings Around Saturn

Dr. Earle K. Huckins III, NASA's deputy associate administrator for space science, will present Langley's October colloquium lecture – "The Cassini Mission to Saturn" – Oct. 1, 2 p.m., at the H.J.E. Reid Conference Center.

Huckins will describe the objectives of the Cassini mission, reviewing the results of previous flyby missions to Saturn and summarizing the spacecraft and probe systems. He will offer a brief summary of recent highlights in space science, including observations by the Hubble space telescope, the Galileo mission to Jupiter and the discovery of possible ancient life on Mars. He will also outline the schedule of space science missions planned for the next six months.



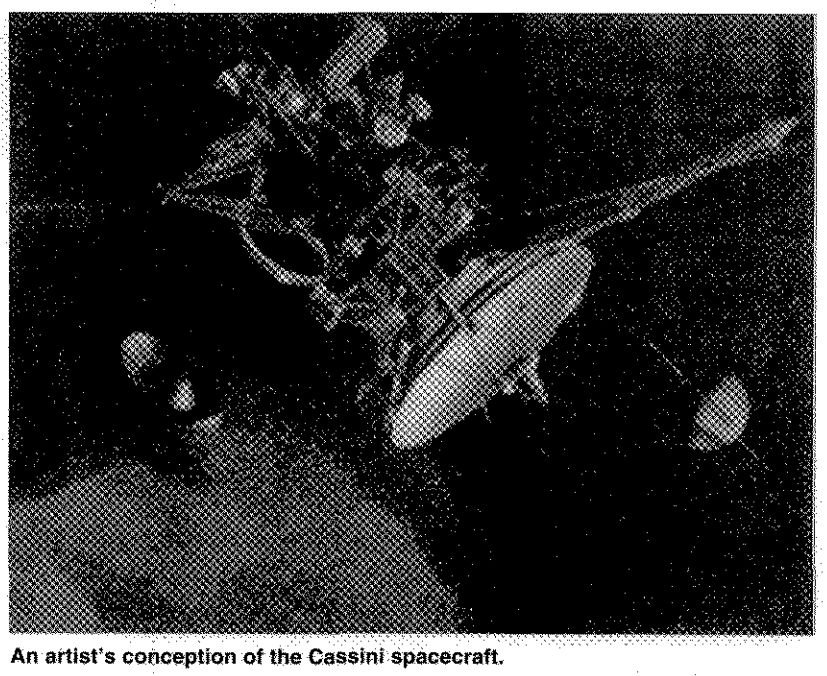
Dr. Earle K. Huckins III

The Cassini Mission to Saturn launch is planned for October 1997. It is a joint undertaking of NASA, the European Space Agency (ESA), the Italian Space Agency (ASI), and other European academic and industrial participants.

Cassini will provide a close-up investigation of the Saturnian system, including Saturn's atmosphere and magnetosphere, its rings and several of its moons – especially its largest moon, Titan. The Huygens probe, which ESA is developing, will descend through the Titan atmosphere and directly sample the atmosphere to determine its composition. The orbiter and the probe carry 18 scientific instruments to conduct 27 scientific investigations.

Following launch, the interplanetary spacecraft will swing by Jupiter in 2000. Cassini will reach the Saturnian system in 2004.

During the first Saturn orbit, the Huygens probe will separate from the Cassini orbiter and descend through Titan's atmosphere. The Cassini orbiter's scheduled four-year tour of the Saturnian system includes multiple orbits of Saturn and flybys of Titan.



An artist's conception of the Cassini spacecraft.

Huckins joined NASA in 1962 as a student trainee at Langley in the field of spacecraft dynamics, stability and control. He has served as mission integration manager for the Long-Duration Exposure Facility project, as head of the Large Space Antenna Systems Technology office, as manager of the Large Space Structures Technology program and as deputy manager of the Space Station Evolutionary Definition office.

In 1986, Huckins came to NASA Headquarters on a temporary assignment as a technical assistant to the associate administrator for space station. Prior to his current assignment, he was chief engineer in the Office of Space Flight; director of space station engineering in the Office of Space Systems Development; and director of the Strategic Plans and Programs Division in the Office of Space Station.

Huckins received a bachelor's degree in aerospace engineering from Virginia Polytechnic Institute and State University (VPI) in 1966; a master's degree in mechanical engineering from North Carolina State University in 1968; and a Ph.D. in aerospace engineering from VPI in 1972.

Notices concerning upcoming and recent past colloquium and Sigma Series lectures are available on the World Wide Web (using a browser such as Mosaic or Netscape) at http://oldtown.larc.nasa.gov/Lectures/lectures.html or from the NASA Langley Home Page at http://www.larc.nasa.gov/larc.html under general information about NASA Langley Research Center.

All colloquium lectures are videotaped and are available from Langley's Library.

News Briefs

Around the Agency

NASA SELECTS 19 INNOVATIVE SPACE PHYSICS MISSION CONCEPTS – NASA has awarded $2.9 million to study 19 proposals for new innovative mission concepts in space physics. The 19 proposals were selected from 70 submitted in response to a February NASA Research Announcement (NRA) which solicited proposals for concept studies for missions that could be ready to begin between 1999 and 2005. Missions were to range from low-cost (up to $20 million) to large (not to exceed $250 million) for the development phase of the project. The NRA sought missions which also promise breakthrough advances in the study of space physics, which offer exploration and discovery, which will use new technologies, and which are low cost. The one-to-two-year studies average about $100,000 each per year. Mission concepts that result from these studies will be considered in the development of NASA's future space science strategic plan.

NASA'S INFORMATION TECHNOLOGIES AID CALIFORNIA FIREFIGHTERS – NASA engineers are working with the California Department of Forestry to make the latest in NASA high-tech information technologies readily available to California firefighters in their efforts to control the state's wildfires. The experimental program uses an ER-2 aircraft to provide firefighters in the field with immediate access to real-time imagery, using only inexpensive, off-the-shelf hardware and the Internet. The aircraft, based at Ames Research Center, Mountain View, Calif., overflies a target fire at a height of about 60,000 feet, equipped with sensors that provide imagery in natural color, color infrared and the thermal region. The imagery yields valuable up-to-the-minute information on fire activity. The high-altitude ER-2 is equipped with a Satellite Telemetry and Return Link system that relays the information in real time back to anyone with Internet access. Firefighters in even the most inaccessible locations can get a precise, up-to-the-minute picture of fire activity, location and spread.

LOPEZ-ALEGRIA TO REPLACE LAWRENCE AS NASA MANAGER IN RUSSIA – U.S. Navy Cmdr. Michael Lopez-Alegria will replace astronaut Navy Cmdr. Wendy B. Lawrence as NASA's Director of Operations, Russia, at the Gagarin Cosmonaut Training Center in Star City, outside Moscow. Lopez-Alegria will be the primary link between NASA and Russian management in Star City, coordinating all training and other operations involving NASA or contractor personnel. Lopez-Alegria, 38, will leave for Russia in early October and will join fellow U.S. astronauts who are training for future stays aboard the Mir space station and the International Space Station.

Disabilities Awareness

NASA Reaches Out to the Disabled

BY GERRY PARDUE

Disabilities awareness has further aided NASA's unity with private industries, as illustrated by the first braille map of solar system produced by NASA.

The map, the first of its kind, is the brainchild of Steve Dwornik, a retired NASA employee working for Ball Aerospace. Dwornik convinced his company to fund the project, NASA to provide the expertise and a University of Maryland professor to put together the solar system map.

Private industry and NASA worked together to turn a "vision" into a reality. The visually impaired can "see" the planets by reading this remarkable braille map.

NASA's industriousness in developing technologies to help the disabled is detailed in the agency's annual *Spinoff* publication.

Since studies show that chances of having a disability increase with age, it's good to know that NASA's brilliant minds are developing ways and means of eliminating many crippling diseases.

Announcements

Aerospace Daily Available by E-Mail

NASA Langley civil servants or contractors who would like to receive *Aerospace Daily* electronically may send an e-mail message requesting it to: majordomo@lists.hq.nasa.gov

Systems Engineering Capability Maturity Model Training Seminar Offered

A seminar on the Systems Engineering Capability Maturity Model (SE-CMM) is scheduled for Sept. 25, 2-3:30 p.m., Building 1212, Room 200. A question-and-answer session will follow.

Developed by an industrial collaboration of systems engineering experts and the Software Engineering Institute, the SE-CMM describes the essential tasks of the systems engineering process, lays out the steps in improving systems engineering processes over time, defines a yardstick for periodic improvement measurement and includes a detailed glossary.

Kerinia Cusick, an author of the SE-CMM, will provide an overview of the model. The seminar will cover how the SE-CMM model can be used to minimize the frustration characteristic of many process improvement programs, to specify the systems engineering activities that need to be performed in any organization, to facilitate ISO compliance and to achieve specific CMM software levels.

To register, send an Application for On-Site Training, (NASA Langley form 24), to DeAnna Wooster at Mail Stop 137, or fax to ext. 48543. For more information, call George Allison at ext. 42594.

October CTAP Events

Langley's Career Transition Assistance Program (CTAP) Office offers the following events through October:

- CTAP Open House, Oct. 4, 11 a.m.-4 p.m.
- "Winning at a Job Fair," Oct. 17, 9-11:30 a.m.
- "Starting Your Own Business," includes franchising, Oct. 22-23, 9 a.m.-3 p.m.
- Virginia Peninsula Chamber of Commerce Job Fair, Oct. 25, 9 a.m.-3 p.m., Holiday Inn Convention Center*
- Halloween Party Haunted House, Oct. 31, 8 a.m.- 4 p.m., Building 1312

* Not a CTAP event, but we can provide information and help you prepare for it.

CTAP events are open to all NASA civil servants and their spouses. NASA civil servants can also schedule a resume critique counseling session. For more information or advance registration, call Susan Costello at ext. 45000.

August, September Speakers Bureau Events

Melvin Ferebee spoke to the Emporia Rotary Club in Lawrenceville, Va., on "The Future of Space."

Bill Grant visited Appalachian State College, Boone, N.C., to discuss "An Epidemiological Study of the Effects of Acid Deposition and Ozone Exposure on Eastern U.S. Forests."

Bruce Little, Don Beasley, James Pike and NASA retiree John Buckley addressed Tenneco employees at Newport News Shipbuilding on "The Accuracy Control Program in the Fabrication Division."

Doreen Neil discussed the atmospheric sciences with members of the Virginia Beach Kiwanis Club.

Dave Shuster talked about space to Ivey League Academy in Virginia Beach.

Cathy Watson addressed members of the U.S. Coast Guard in Elizabeth City, N.C., about the history of women in space.

Alan Wilhite spoke to St. Mark's United Methodist Church in Raleigh, N.C., about high-speed research.

Karen Freidt spoke to Cub Scouts in Grafton about computer applications.

Kelly Wilshire visited the American Bonanza Society in Cherry Hill, N.J., to talk about human factors research.

Tony Trexler spoke to IBM Flight Operations in Wappingers Falls, N.Y., on the topic "Safety Stand-Down: How Langley Keeps Aircraft Safe."

Stuart Pendleton addressed the Society for Logistic Engineers in Prince George, Va., about industry partnerships.

Apprentice Graduation

The 1996 Apprentice Graduation will be held Oct. 4 at 1:30 p.m., in the H.J.E. Reid Conference Center.

CFC Kickoff Ceremony

The annual Combined Federal Campaign Kickoff at Langley will be held Sept. 24, 1 p.m., at the H.J.E. Reid Conference Center. All employees, contractors and retirees are invited to attend.

Free Conference Offered on Aligning Management with Customer Focus

The National Performance Review is sponsoring a free conference for all federal employees to discuss how to align management philosophy and systems to become a customer-focused organization.

"Aligning the Government Performance and Results Act and Other Management Systems with a Customer Focus" will be held Sept. 30, from 9 a.m. to 11 a.m., at the Capital Hilton, 16th and K Street NW, Washington, D.C.

All employees involved in customer service, budget, strategic planning, human resource management and other management systems are invited.

Speakers from the President's Management Council, the Office of Management and Budget, the National Performance Review and Harvard University will address the conference.

For more information, call the National Performance Review Help Desk at 202-632-0150. To register, fax (202-632-0390) or e-mail (candy.kane@npr.gsa.gov) your name, organization, phone number and fax number.

Conference Broadcast

The United Nations Women's Conference, "One Year Later," National Satellite Conference will be broadcast from the Old Dominion University Peninsula Graduate Center, Sept. 28, 2-4 p.m. To reserve a seat, call Patsy Campbell at ext. 43291.

In Memoriam of Frank G. Read

Frank Garvin Read died Aug. 24 at Riverside Regional Medical Center. He retired from NASA Langley in 1973.

In Memoriam of Thomas Kelly

Thomas Charles Kelly, 71, died Aug. 26. He retired from NASA Langley in 1979.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

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Science and Technology Corp.

Photographer . . . . . Fred Jones

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

Women's Equality Day

State Congressional Official Evans Addresses Center's Federal Women's Program Committee

Legislation Discussed, FWPC Awards Presented during Annual Ceremony

BY PATSY CAMPBELL

In her third appearance here, Jeanne Evans, chief of staff to Virginia Congressman Owen Pickett, addressed the Federal Women's Program Committee (FWPC) during its annual awards ceremony Aug. 15 – Women's Equality Day – at the H.J.E. Reid Conference Center. Evans' expertise is in Congressional legislation that affects federal employees.

She discussed the president's and Congress' budget proposals for fiscal year 1997, health care and civil service reform bills and retirement buyout legislation.

One proposal, the Federal Employment Reduction Act, pending in the House of Representatives, would allow one job per buyout for agencies with personnel reductions, Evans said. A $25,000 buyout would be offered in FY '97; a $20,000 buyout in FY '98; a $15,000 buyout in FY '99; and a $10,000 buyout in FY 2000.

Supervisor of the Year

During the awards ceremony that followed Evans' address, **Pamela L. Rinsland**, assistant branch head for Electronic Systems Branch was named Supervisor of the Year.

Rinsland

Rinsland was recognized for attending FWPC-sponsored programs and encouraging her staff to attend, for serving as unofficial counselor to her employees, and for encouraging female technicians to continue their studies.

Employee of the Year

Marny M. Skora, public affairs specialist for the Office of Public Services, was named Employee of the Year.

The first NASA employee to graduate from the Peninsula Leadership Institute, Skora proposed, implemented and reported on a personal community-service project and was a key participant in the 1996 class project.

Skora has mentored student interns and has served as acting head of the Office of Public Services. She has helped the Multi-Cultural Leadership Committee to draft documents, and she is a contributing member of Women in Aerospace, which sponsored the Center's National Engineers Week orientation workshop.

Skora

Outstanding FWPC Representative

The FWPC also recognized **Patricia E.J. Williams** as the first Outstanding FWPC Representative, for outstanding service as secretary and for exemplary participation in special programs and events during the past year.

Williams

The FWPC awards ceremony was cosponsored by the Office of External Affairs, the Hampton Roads Section of the American Institute of Aeronautics and Astronautics, the Langley Chapter of Federally Employed Women, Inc., and the American Federal of Government Employees Local 2755.

Mukhopadhyay Chosen as Floyd L. Thompson Fellowship Recipient

BY DANIELLE BECK

Dr. Vivek Mukhopadhyay, a senior aerospace engineer in the Aeronautical Systems Analysis Division, Airframe Systems Program Office, has received Langley's most prestigious award, the Floyd L. Thompson Fellowship.

The fellowship will allow Mukhopadhyay the opportunity to pursue independent research at both the Massachusetts Institute of Technology (MIT) and Georgia Institute of Technology. He will depart Oct. 1.

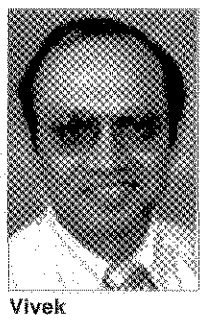
The first six months of Mukhopadhyay's fellowship will be spent at the Georgia Tech Aerospace Systems Design Laboratory. He will then study aerospace systems planning for risk management, lean aircraft manufacturing and cost optimization for advanced aerospace concepts at MIT's Sloan School of Management. He will be working with Prof. Stanley Weiss, a former NASA chief engineer.

"I am extremely indebted for this excellent opportunity to broaden my horizon, to gain invaluable experience by working with aerospace systems integration and management experts and to acquire knowledge about similar research at these world-class institutions," said Mukhopadhyay.

The Floyd Thompson Fellowship was established in 1977 to foster the development of research capability among the Langley professional staff and to infuse the Center with new ideas from other centers of excellence.

Mukhopadhyay hopes to develop structural, aeroelastic and control systems analyses methodologies to provide rapid but reliable answers to the performance, payoff, cost, risk and benefit aspects of an innovative airplane concept.

Mukhopadhyay worked at the Indian Space Research Organization as a senior engineer specializing in launch vehicle aeroelasticity from 1972 to 1975. He was assistant professor of aeronautical engineering at the Indian Institute of Technolgy before coming to Langley in 1979 as a NASA/National Research Council senior research associate.


Vivek Mukhopadhyay

Mukhopadhyay continued his association with NASA Langley as associate research professor at the George Washington University/NASA Joint Institute for Advancement of Flight Sciences and later as a senior engineer at Planning Research Corporation. He joined NASA in 1989, in the Multidisciplinary Analysis and Optimization Branch in the Structural Dynamics Division, and later moved to the Aeroelasticity Branch of the Structures Division.

Mukhopadhyay is presently in the System Analysis Branch, working with the Advanced Aerospace Concepts Group. He also teaches linear systems theory and optimal control theory part time at George Washington University as an adjunct associate professor.

Mukhopadhyay received a bachelor of technology honors degree in aeronautical engineering and was awarded the 1968 Presidential Gold medal at the Indian Institute of Technology. He received master of science and doctor of science degrees in aeronautics and astronautics from MIT in 1970 and 1972, respectively.

Mukhopadhyay has published more than 50 papers and has received several NASA awards – the Langley Structure Division Superior Accomplishment award in 1990, the Active Flexible Wing Group Achievement Award in 1991 and the NASA Tech Brief Award in 1992. He is an associate fellow of the American Institute of Aeronautics and Astronautics, as well as an associate editor of the *Journal of Guidance, Control and Dynamics.*

Committee Offers Workshop Full of Budget-Crunch Solutions

Due to ever-shrinking federal budgets, NASA continues to face the never-ending question: "How can we do more research and produce better systems with fewer resources?"

Langley's Systems Engineering and Analysis Technical Committee will offer some answers at its workshop – "21st-Century Facts ... Better Systems, Fewer Resources" – on Sept. 26, 8:30 a.m. to 4 p.m. The keynote address and panel discussions will be held in the Pearl I. Young Theatre; exhibits will be displayed at the H.J.E. Reid Conference Center.

The free workshop will show NASA employees and contractors how the systems engineering process makes projects and teams better able to achieve their scientific, cost and schedule goals.

Keynote speaker is Jim Ulrich, vice president of engineering for Saturn Automotive Corporation. The first of two panel discussions will deal with the current state and application of systems engineering and analysis; the second will explore the future of the practice. In addition, more than 30 vendors who provide systems engineering and analysis tools or consulting services will present exhibits during the afternoon.

While open to everyone, those who support NASA research initiatives and/or who are interested in systems engineering will benefit from this workshop. Participating organizations are encouraged to bring any interested employees.

Preregistration by Sept. 23 is requested for all participants and is mandatory for non-NASA employees. Electronic registration through the workshop Web site is found at http://ixeab9.larc.nasa.gov/seatc/wkshp/workshop.html.

Langley Senior Scientist Dennis Bushnell chartered the Systems Engineering and Analysis Technical Committee in 1995. Its immediate objectives are:

- To record, classify and publicize in an organized format the systems engineering and analysis efforts currently underway or planned at Langley, including their relationship to agency missions and goals
- To provide a mechanism for the generation of strategic visions for systems engineering and analysis on a 15-year horizon and to chart potential directions to achieve the established goals.

The committee also seeks to depict the present and future of Langley's systems engineering and analysis activities and to present a forum for the exchange of ideas and information between and among engineers and scientists.

'If It Is To Be, It's Up to Me'

Childrens' Hospice Helps Families Stay Together through Terminal Illness

BY NOEL TALCOTT JR. AND KEN JONES

Edmarc Hospice for Children is a unique and little-known agency that provides services to families, like ours, with dying children or children at risk of dying. It is eligible for support through the Combined Federal Campaign.

Langley Family Support

Besides working side by side in the same branch here at Langley during the 1980s and early '90s, we also have in common the loss of our first child to rare fatal illnesses.

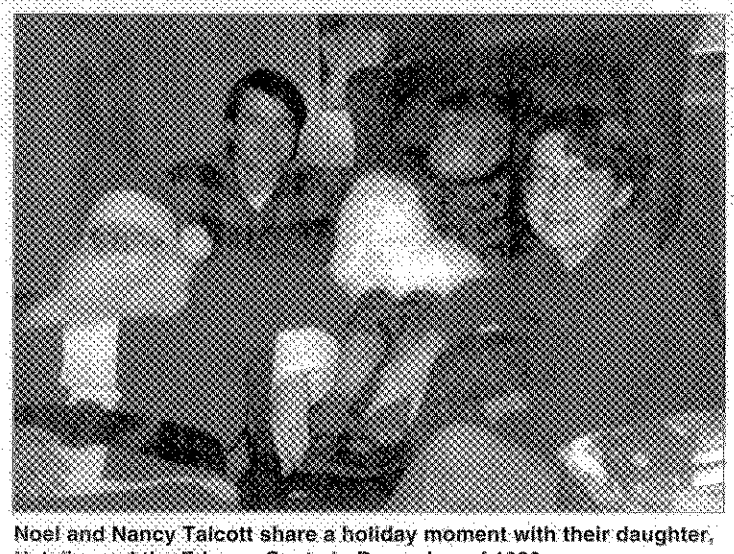
Both of our children's stories are widely known at Langley, and many members of the "Langley family" supported us in every way, even donating annual leave to us under the Center's Voluntary Leave Transfer Program.

Edmarc's Program

Edmarc Hospice for Children provided tremendous support to our children at the critical and final stages of their fight against their fatal illnesses. The hospice program meets the multidimensional needs of the family and the physical and emotional needs of the child.

Families who have a child with a life-threatening illness experience a high level of stress – emotional, social, spiritual and financial – that can become debilitating to the entire family system, often resulting in dysfunctional family dynamics, financial hardship and/or divorce. Children undergoing day-in, day-out medical treatment experience grave physical and emotional discomfort that is often exacerbated by separation from family through hospitalization.

Edmarc's support allowed both our families to keep our child at home and to be a family during those final months. With Edmarc's commitment to our children, we were able to handle these difficult situations and to get through the final months.



Noel and Nancy Talcott share a holiday moment with their daughter, Natalie, and the Edmarc Santa in December of 1992.

Treatment Highs and Lows

The only possible cure offered to Ken's son Timothy and to Noel's daughter Natalie involved experimental bone marrow transplants. Timothy received treatment at the Medical College of Virginia in Richmond, and Natalie was treated at the University of Minnesota in Minneapolis.

Both of our families were encouraged by the initial positive results of treatment. However, setbacks followed, and the diseases ultimately forced us to deal with and to face the death of our children.

These situations placed our families under enormous stress and thus took their toll. Our lives developed a single focus as the days grew into months and then years of treatment, clinic visits and 'round-the-clock care. As the disease progressed, we had the full support of family, friends, coworkers, community and the various medical staffs. But, still, something else was needed to insure the best for us and our children.

Special, Personal Care

Edmarc came to each of our families late in our struggles but at a time when we needed their help to hold our families together and to keep our children at home.

Ken, Sue and Timothy were one of the first Peninsula families to receive support from Edmarc, who, until then, had primarily provided assistance to southside Hampton Roads residents.

Nurse Cindy Beckwith came to help them whenever she was needed, but at least every other day. She provided needed medical support and always brought her trademark smile and cheerful attitude along with her.

As a result of her visits, Timothy did not have to endure any more tiring and traumatic hospital visits and was cared for in the comfort of his own home. Ken and Sue knew that medical care was only a phone call away.

Noel, Nancy and Natalie also benefitted from Edmarc's expanded support to the Peninsula. Nurse Robin Borges even came to their home late on New Year's Eve – bringing her own children along – to care for Natalie.

Edmarc allowed us to remain a family at home through the end.

Far-Reaching Hands

Edmarc Hospice for Children serves families throughout a 2,400-square-mile region, including all of southside Hampton Roads and the Peninsula. The agency provides nursing services to the patient; medical and social work services to the patient, sibling(s) and parents; bereavement services to the survivors of a child's death; and family-oriented special events which enhance family cohesiveness. Edmarc's nursing and social work services are available 24 hours a day to families.

Edmarc has served 451 families – more than 1,800 family members – in the past 17 years. Fifty-one of those hospice families have been from the Peninsula. Five of 31 current Edmarc families are Peninsula residents. Twenty percent of new referrals are from the Peninsula, and 15 percent of the Edmarc families currently enrolled in their bereavement programs are Peninsula residents.

Editor's Note: Talcott remains involved in one of Edmarc's parent bereavement groups and serves as Edmarc family representatives on the Peninsula Council of the Edmarc Hospice for Children.

Courtesy photos

Ken and Sue Jones and their sons Timothy, left, and Christopher celebrate Christmas 1990 with a visit from the Edmarc Santa.

The American Federation of Government Employees and International Association of Machinists encourage their Langley members to support this year's CFC.

Benjamin J. Schlichenmayer
President
American Federation of Government Employees
Local 2755

Tom L. Vranas
President
International Association of Machinists
Local PM 2829

AFGE
POWER TO MAKE AMERICA WORK

CFC Touches One More of Langley's Own

Child Abuse Survivor Thanks CFC, Alpha House for Second Chance

BY A. TERRY MORRIS

Growing up in Chicago's roughest, most violent and most dangerous neighborhoods, I saw gangs, drug lords, pimps and prostitutes as role models. As a victim of child abuse, I wanted to attain their power and recognition, perhaps for no other reason than to escape the hopelessness and despair of my own situation.

My parents finally abandoned me when I was 13. They left me out on the streets in Mississippi, alone to fend for myself. The police picked me up and placed me in the Alpha House, a group home for boys which was partially funded by the Combined Federal Campaign.

In the Alpha House, I learned discipline, integrity, and respect for myself, as well as for others. This boys' home helped me to establish new morals and values for my life.

A. Terry Morris

I also learned the importance of helping others, especially those in need. This is what life is all about to me now. Whereas life used to be a burden, I see it now as an opportunity and a challenge waiting to be explored.

Caring individuals who supported the CFC gave the Alpha House the financial resources to give me and other young boys a new outlook – and a second chance.

I find it difficult to express my gratitude to all the caring people who give to the CFC. As a result of my experiences, I try to do my best to help others in need.

I wish to thank the dedicated individuals at Langley for all they do, both financially and through the Center's Day of Caring. I thank you not only for myself, but also for countless others who are helped by CFC agencies every day.

Editor's Note: Morris' story has been told previously in the Researcher News. We thought it worth repeating because his personal philosophy for dealing with life's challenges, "If it is to be, it's up to me," has been adopted as this year's CFC theme.

'96 for '97 CFC Campaign

It's Up to Langley Employees

In 1996, employees of Langley Research Center have an opportunity to act upon the belief that "if it is to be, it's up to me."

Along with thousands of federal employees from all over the United States, you are invited to show just how much you care, as you have so generously in the past, by contributing to the 1996 for 1997 Combined Federal Campaign.

This annual solicitation enables the agencies who serve others to make a big difference in peoples' lives. Your contributions help provide housing for the homeless, feed hungry children, counsel families, find cures for diseases, dig wells for clean water, comfort the dying, save the environment and improve the lives of millions of people.

This year, more than 1,313 local, regional, national and international agencies will benefit from your generosity.

Langley's solicitation begins Sept. 30, when employees can give their gift – a donation or payroll deduction pledge to the worthy cause of their choice.

If it is to be, it's up to me.

If you choose, your contributions will be distributed among the federations listed in the Index of Agencies and Codes. Each of these organizations gives funds directly to their subsidiary agencies.

You may also contribute to local and national agencies not affiliated with one of these federations.

For complete information, see the brochure listing the recipients of your gifts and describing their programs.

The Hows and Whys of the CFC

How does the Combined Federal Campaign rate as a charitable campaign?

The CFC continues to be the largest and most successful workplace fund-raising model in the world.

How will new regulations affect this year's campaign?

Contractor personnel, credit union employees and other persons employed on federal premises, as well as retired federal employees, may make single contributions to the CFC through check, cash or money orders.

These nonfederal employees may not be solicited but are to be provided the opportunity to participate in the CFC. Upon request, individuals will receive One-Time Gift packet of brochure, pledge card and CFC lapel pin.

How does an agency become eligible for CFC donations?

This year, 1,313 agencies are listed; 1,106 have been appraised by the OPM. The 207 local agencies have been reviewed and qualified by the members of the Local Federal Coordinating Committee, composed of senior representatives from the Peninsula's largest federal facilities.

In each case, applicant agencies have met 15 tests, have a voluntary board of directors and have a CPA audit.

What if I prefer to give directly to my selected charity?

You can. Most agencies prefer donations through workplace and payroll deduction because it is more productive. Donors are more likely to give more through periodic allocation and the prompting of the CFC campaign.

How accountable are the CFC-funded agencies?

The two qualifying entities of our CFC – the Office of Personnel Management and the Local Federal Coordinating Committee – look closely at applicant agency IRS 990 tax returns, audits and annual reports, all good indicators for assessing vitality and integrity. Agencies must apply every year to the CFC and must furnish current documents.

Finally, the giver can request an annual report and a review of the audit of any agency. Note, too, the certified percentage figure at the end of each agency's listing and description. This represents the ratio of fund-raising and administrative costs to agency total revenue.

Typical Peninsula CFC agencies have overhead costs of 8.2 percent, better than the 10 percent guidelines set by OPM.

What are the benefits of contributing through payroll deduction?

Payroll deduction is painless and doesn't begin until January. Most Peninsula CFC contributors – 86 percent – fulfill their pledges this way.

Why do people give to the Peninsula CFC?

People give sacrificially to others, via our CFC, mostly out of compassionate feelings. Compassion means shared passion or shared suffering.

CFC PENINSULA CAMPAIGN KICKOFF – Center Director Jeremiah F. Creedon, right, presents a plaque to Combined Federal Campaign keynote speaker U.S. Army Sgt. Dana Bowman at the Peninsula Campaign Kickoff, Sept. 5 in Hampton. As CFC general chair, Creedon leads the 65 federal organizations and commands that employ 39,000 government workers on the Virginia Peninsula.

Photo by Hubert Lloyd

CFC Goes On-Line

BY ROBIN K. LAND

An electronic pledge card joins the Combined Federal Campaign brochure on-line via the World Wide Web, thanks to the efforts of a Langley development team. Use of the electronic version is expected to significantly reduce the cost of the Langley camapign.

The National United Way Agency has recognized NASA Langley as the first organization in the country to distribute CFC information and collect pledges *electronically*.

From the home page, potential contributors can learn how their contribution helps those in need, view CFC facts and figures or consult the list of approved CFC agencies. Langley civil servants can also access the on-line pledge card from the link titled "Contribution Form On-Line."

Advantages of using the electronic pledge card include calculation of the total annual pledge amount, validation of all entered agency codes, assurance that all required information has been entered and a display of the names of the receiving agencies, instead of only their code numbers.

Beyond the convenience, using the electronic version significantly reduces the manpower and cost of processing contributions. It also eliminates the need to keypunch the contribution information into both the Langley payroll system and the Virginia Peninsula CFC pledge system.

The CFC agency link has two search capabilities: key word and alphabetical listing of agencies. Each search displays the agency code, name, phone number, affiliation, text description and overhead percentage. The brochure also links to the agency's home page, where one exists.

The CFC brochure is available now. The on-line pledge card begins Sept. 30 and will be available through Oct. 11. Both can be accessed at this Internet address: http://cfc-vapen.larc.nasa.gov/CFC

Langley Director Endorses Combined Federal Campaign

BY DR. JEREMIAH F. CREEDON

As federal employees, our mission is to serve others, and we here at Langley take that mission seriously. Each of us has made a strong commitment to our country, and we honor that commitment every day.

As individuals, our commitment is broader. We are committed to our community, to meeting the needs of our neighbors and friends and to making things better for people we don't even know.

Modern technology continues to shrink our world. As communication capabilities increase, our vision widens. We see what our future can be. We also see that there are problems.

As one federal worker to another, I am asking you to consider helping those who desperately need help. While we may not be able personally to travel to a troubled area, we can ensure that help is available. That help is provided through the Combined Federal Campaign.

The CFC, through its more than 1,000 agencies worldwide, provides relief – food for the hungry, shelter for the homeless, education for the illiterate and much, much more. The CFC relies on us to make that relief possible.

I am pleased to serve as the Peninsula's CFC Chair this year. In that role, I am asking our 39,000 federal coworkers to join in this once-a-year campaign that helps people all year.

This year, the Center's CFC Committee has set a Langley goal of $285,000. That is an increase of $5,000 more than last year's effort, but I am confident that we can make it. This Center has long been a leader on the Peninsula and throughout the agency. I am counting on your help to keep that tradition alive.

I am convinced of the truth of this year's CFC theme: *If it is to be, it's up to me.* It's up to each one of us.

When your CFC key worker approaches you, I urge you to remember this year's theme. You may permit the CFC to distribute your gift to many worthwhile causes, or you may designate that your favorite charitable organization receive your gift.

1996 Day of Caring

All-Out Effort Shows NASA Folks Really Care

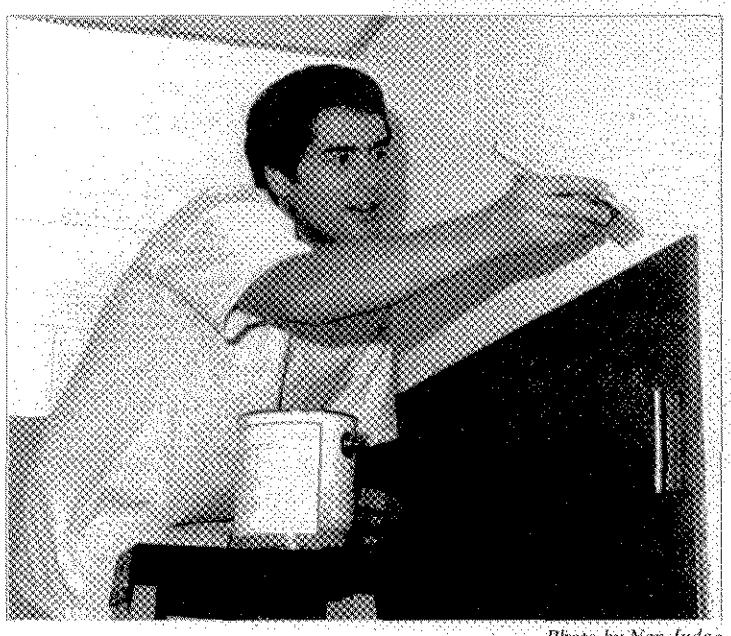


Photo by Nan Judge

Dana Gould puts the finishing touches on the kitchen that volunteers repainted at the Peninsula Metropolitan YMCA.

BY MARNY SKORA

Even the threat of approaching Hurricane Fran could not dissuade 154 Langley volunteers from participating in the community's fifth annual Day of Caring, Sept. 5.

These NASA employees joined a volunteer workforce 680 strong to benefit the community.

Steve Kast of the Boys and Girls Club of the Virginia Peninsula estimated that his volunteers saved their organization more than $2,000 in landscaping costs.

"Those funds now go directly into our program," Kast reported. Likewise, all over the Peninsula, nonprofit agencies got a much needed face-lift.

"The Day of Caring volunteers helped with projects that often go to the bottom of the list when it's a budget choice between people being helped and facilities that need maintenance," said Elyse Brown, director of The Volunteer Center. Brown coordinates the massive effort, matching willing volunteers with community needs.

Whether they painted, pruned, plumbed or planted; sided, spackled, sorted or sawed; mowed, manicured or mended; cleaned, counted or cooked, the 1996 Day of Caring volunteers made the Peninsula a better place.

By the end of the day, two Habitat for Humanity houses were closer to occupancy. Residents at the Veterans Administration hospital enjoyed a change of pace and talked to willing listeners. Girl Scout Camp Skimino and Boy Scout Headquarters became more ready than ever for a productive program. Nursing home residents in Denbigh and Suffolk were treated to a cookout that turned into a cook-in. But not even threatening weather dampened Day of Caring spirits.

Myra Walton collected school supplies from local businesses. She and her fellow volunteers sorted and packaged pencils, pens, notebooks and other stuff. They delivered the bundles to social service agencies to be distributed to needy students.

As he put up siding at a Habitat house, **Kenny Green** put the Day of Caring effort into perspective.

"Which is better, what we get out of life or what we put into it?" he asked.

"I like to think that my time and talents are contributing to something that just might not get accomplished otherwise," said **Larry Huebner**.

He and Green were pleased by comments from the staffs at their respective locations who marveled at the improvements made in just a day.

Ed Yarrington admits he worked hard at the Salvation Army Peninsula Command.

"But I had a great partner," he said of **Wes Goodman**. "Even better, at the end of the day, we saw that a great deal was accomplished for a good cause. That is really a refreshing and rewarding feeling."

More than 50 volunteers worked at the Foodbank. Those 100 extra pairs of hands helped package 21,000 pounds of donated food.

"That would have taken the Foodbank staff more than a month to process," said Steve Barth, operations manager. "The Day of Caring effort will supply 20,000 meals to Peninsula residents who would otherwise go hungry."

At Child Development Resources in Williamsburg, volunteers built an observation deck so that physically challenged children could experience the outdoors without leaving their classroom. In downtown Newport News, volunteers labored inside and outside to improve the living conditions of two elderly women. At 50 sites in between, volunteers did whatever needed to be done.

All the while, Hurricane Fran cooperated, holding off her eventual downpour until tasks were completed and volunteers delivered home – physically tired but emotionally refreshed.

Photo by Sandie Gibbs

Carolyn Eby, left, and JoAnn Woodcock accompany VA hospital resident Donald Pittman to the day's outdoor activities.

Photo by Nan Judge

Working with Newport News Social Services, Betsy Kennedy, right, prepares the bathroom for painting at this downtown Newport News home of a senior citizen.

Scott Bartram, below right, readies a Habitat for Humanity house in Hampton for inspection by installing insulation between the first and second floors.

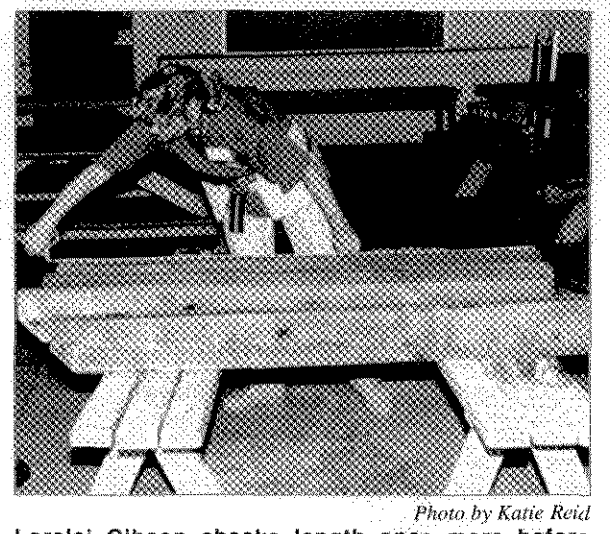


Photo by Katie Reid

Lorelei Gibson checks length once more before assembling a picnic table at Girl Scout Camp Skimino.

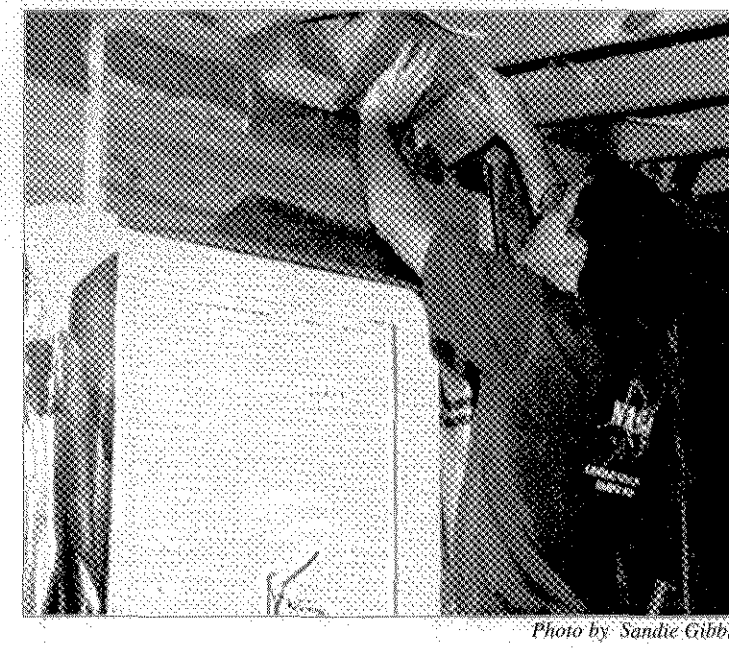


Photo by Sandie Gibbs

1996 Langley Caregivers

American Cancer Society
Heide Ellis, Colin M. Mah
American Heart Association
Lisa Allen, G. Sharon Fairheart
American Red Cross
Yvonne Dellapenta, Brenda Sullivan
Big Brothers/Big Sisters
Helen Terrell, Ladwa Akanni
Boys & Girls Club of the Va. Peninsula
Robin Hardy, Jane Yates, John Teter, Ronald Joslin
BSA, Colonial Virginia Council
Lin Chambers, Carol Fowler, Connie Smith, Kimberly Stefan, Geraldine Tucker, Mac Jackson
Center for Child and Family Services
Octavia Judge, Velma Clark
Child Development Center
Richard Bolle, Carolyn Helmerac
Child Development Resources
Richard Chase, Allen Langford, Barry Lazos, Sherwin Moore, Herman Moore, James Thomas, Mac Price
Downtown Hampton Child Care Center
Cheryl Bradley, Robin Land, Larry Huebner, Brian Cheshire
LDMARC Hospice for Children
Betty Campbell, Jim Dillon, Pam Schmidt, Tom Yager, Gerri Rankin, Kelly Hayhurst, Julie Johnson, Sherry Richardson, Gale Poulson
Foodbank of the Va. Peninsula
Angela Davis, Cynthia Dee, Kathy Dezern, Cathy Dunn, Gregory Jones, Linda Jones, Sandra Keyes, Peggy Langford, Velma Martin, Anita Rankel, Gail Temple, Carolyn Thomas, Lucy Watkins, Patricia Williams, Sandra Zimbrun
Galaxy of Gifts
Tahani Amer, Keshia Bumpers, Ramona Cousins, Lee Lillard, Rose Williams Ramsey
Girl Scout Council
Cheryl Batten, Lorrie Gibson, Barry Price, Willard Bauserman, Henri Fulmann, John Lamar
Hampton Family Resources
Charlene Farquharson, Robert McKinley, Penny Murphy, David Sheldon
Langley Child Daycare Center
Cheryl Allen, Dianne Check, Stella Harrison, Dorcace Hines, Gloria Jenkins Moody, Cynthia Lach, Dollie McCown, Rose Mustain, Dan Olesy, Jeff Seaton, Matt Seystone, Shannon York
Maryview Nursing Home
Larry Cooper, Debbie Garrett Cook, Carl Gerhold, Betty Lane, Tracey Patterson
Newport News Department of Social Services
Pete Hoge, Betsy Kennedy, Jeffrey Lavell, Susan Onisumbing, Earl Freeman, Janice McCollum, Jon Thompson
Peninsula Agency on Aging
Susan Hoban
Peninsula Crisis Pregnancy Center
Gwen Leach, Alberta Reid
Peninsula Habitat for Humanity
Scott Bartram, Russell DeOuind, Robert Wallis, Kenny Green, Carlos Lucero
Peninsula Metropolitan YMCA
Dana Gould, Clifford Ottaro, Henry Russell, Michael Scott, Joni Williams
Peninsula YMCA
David Duxbury, Yolanda Hinton, Patricia Redwood, Joycelyn Simpson
Planned Parenthood
Tom Queenville
Safehaven
Susie Henriksen, Anshie Lancaster, Reid
St. Francis Nursing Center
Michelle Calloway, Francine Garner, Janice Harris, Sandy Hurst, Trevor Johnson, Donna McIntosh, Sandra Strickland, Donna Martin
The Salvation Army
Velma Clark, Ginger Freeman, Wes Goodman, Ed Yarrington, Tracey Miller
The Volunteer Center
Jeanette George, Connie Jones, Jo Legette, Laura Smith, Louise Sykes, Myra Walton, Sheri Bias
United Way
Ruth Amundsen, Vivian Merritt, Pamela Davis
USO of Hampton Roads
Katrina Bernstein, Angela Brown, Carolyn Eby, Sandra Foley, Tracey Miller, Bessie Nicholson, Carmen Torres-Nisbet, Eta Washington, Shenetta Wilburn, Belle Lynn Wood, JoAnn Woodcock, Weldon Staton
Va. Peninsula Council on Domestic Violence
George Cowley
Yorktown Arts Foundation
Robert Holt, Donna Roper

NASA Dryden Marks 50 Years of Flight Research

NASA NEWS RELEASE

This month marks the 50th anniversary of the NASA Dryden Flight Research Center, Edwards, Calif. The center celebrates a half century of exploration, discovery, and contributions to the nation's aerospace industry.

Dryden was founded in 1946 as a support unit for the X-1 rocket plane supersonic research flights. A place of unique resources and capabilities, Dryden has evolved over the years from a small desert outpost into a premier flight research facility.

This year also marks the 50th anniversary of the "X-planes," specifically designed as flight research tools to provide data not available from wind tunnels or simulators. The X-1 was followed by other "X-series" research aircraft, and that tradition continues today with the X-36 Tailless Fighter Agility Research Aircraft, scheduled to fly this fall.

Dryden History

The center originated when a small group of engineers from the National Advisory Committee for Aeronautics' (NACA) Langley Memorial Aeronautical Laboratory – now NASA Langley – arrived in Muroc, Calif., to research the "sound barrier" with the X-1, a joint effort with Bell Aircraft and the U.S. Army Air Forces.

The remote Mojave Desert location offered nearly unlimited visibility most of the year. The desert landscape and surrounding sparse population also made it ideal for high-speed and classified operations. Moreover, the Army airfield at Muroc had a 10,000-foot runway and access to Rogers Dry Lake – a 44-square-mile natural landing site.

Space Program Roles

The Mach-6 X-15 researched and developed technologies implemented in the Mercury, Gemini and Apollo spacecraft. The X-15 also provided the pioneering work which eventually developed into the space shuttle.

The space shuttle design also was influenced by lifting-body research conducted at Dryden in the 1960s. Lifting bodies were small, wingless vehicles that proved a spacecraft could land safely without power.

In addition, the Lunar Landing Research/Training Vehicles, designed and researched at Dryden, taught the Apollo astronauts how to land on the moon.

Aircraft Contributions

Dryden flight-researched the supercritical wing and winglets concepts – designs to improve a wing's aerodynamic efficiency, now used by most airliners and corporate jet aircraft. Dryden also researched military applications of a supercritical wing with the Transonic Aircraft Technology program and a variable camber wing concept called the Mission-Adaptive Wing, both flown on the F-111 aircraft.

The center flew the world's first purely digital fly-by-wire aircraft in 1972, transferring both important technology components and a critical level of confidence in the concept to industry.

Dryden conducted extensive flight research with advanced aircraft technology demonstrators, including the Highly Maneuverable Aircraft Technology vehicle, the forward-swept-wing X-29 and the thrust-vectored X-31.

Computer Revolution

Dryden researchers also helped manufacturers explore new engine designs and integrated engine and flight control systems made possible by computer technology. The Digital Electronic Engine Control flight research project at Dryden led Pratt & Whitney to a digitally controlled production engine, which has been integrated into the McDonnell Douglas F-15, the MD-11 and the Boeing 757.

A Dryden researcher adapted an integrated flight control and engine concept into a potential Propulsion Controlled Aircraft system, which would provide a pilot with a computerized system to land an aircraft with only engine controls in the event of a hydraulic system failure.

Dryden researchers discovered the cause and a cost-effective fix for a potentially dangerous pilot-induced oscillation problem discovered on the shuttle orbiter's final test flight before its first space mission. Dryden's high-speed research aircraft have served as testbeds for side-control sticks for the F-16 fighter and shuttle thermal protection tiles. Its B-52 "mothership" has provided the launch platform to test scale models, F-111 escape pod parachute systems and the Pegasus rocket booster.

Dryden's Convair 990 researched ways to improve the safety and performance of the space shuttle's landing gear, and the center's B-52 tested the drag chute now used on shuttle landings.

Current Projects

Technology developed from the F-16XL supersonic laminar flow project aims to make a High-Speed Civil Transport more aerodynamically and cost efficient. The F-15 Advanced Control Technology for Integrated Vehicles may improve the performance and maneuverability of aircraft and help industry capitalize on thrust-vectoring engine technology.

The Environmental Research Aircraft and Sensor Technology program is developing remotely controlled aircraft capable of sustained, slow flight at high altitudes to gather currently unavailable information about our atmosphere.

NASA FY 1997 Budget Awaits Final Action

BY LEE RICH

With few legislative days left to complete the 13 appropriations measures needed to fund federal departments, agencies and programs for the 1997 fiscal year, which begins Oct. 1, members of Congress are putting on a full-court press. The Veterans Administration, Department of Housing and Urban Development and Independent Agencies Appropriations Bill (HR-3666), under which NASA receives funding, has been marked up and passed by both the House of Representatives and the Senate. The differences between House and Senate numbers are being worked out in conference. Once House and Senate conferees have produced a final bill, both chambers will vote on the measure and, if it passes, will send it to the president for his signature or veto.

The Office of Management and Budget announced in July that, because of Congressional cuts in funding for the Environmental Protection Agency, the National Science Foundation and other programs in the bill, the president would likely veto HR-3666. However, some restoration of funding has increased the chances that the president will sign the bill before Oct. 1.

A preemptive continuing resolution (or an omnibus appropriations bill) is expected to pass in both chambers should it appear that any of the 13 appropriations bills, including VA-HUD-IA, will not be signed into law before Oct. 1. Since Congressional members are eager to leave Washington to campaign before the November elections (435 House seats, 33 Senate seats), no prolonged debates or government shutdowns will occur.

NASA FY 1997 BUDGET SUMMARY
(MILLIONS OF DOLLARS)

	1996 ACTUAL	1997 REQUEST	CHG FY 96/97	%	HOUSE Passed	SENATE Passed
HUMAN SPACE FLIGHT	**5,456.6**	**5,362.9**	**-93.7**	**-1.7%**	**5,362.9**	**5,362.9**
(% OF TOTAL)	**39.3%**	**38.8%**				
Space Station	1,863.6	1,802.0	-61.6	-3.3%	1,802.0	1,802.0
US/Russian Cooperative Program	129.2	138.2	9.0	7.0%	138.2	138.2
Space Shuttle	3,148.8	3,150.9	2.1	0.1%	3,150.9	3,150.9
Payload and Utilization Operations	315.0	271.8	-43.2	-13.7%	271.8	271.8
SCIENCE, AERONAUTICS AND TECHNOLOGY	**5,928.9**	**5,862.1**	**-66.8**	**1.1%**	**5,639.5**	**5,762.1**
(% OF TOTAL)	**42.7%**	**42.5%**				
Space Science	2,032.6	1,857.3	-175.3	-8.6%	1,857.3	1,857.3
Life and Microgravity Sciences and Applications	488.5	498.5	10.0	2.0%	502.5	502.5
Mission to Planet Earth	1,289.4	1,402.1	112.7	8.7%	1,182.1	1,282.1
Aeronautical Research and Technology	845.9	857.8	11.9	1.4%	859.8	859.8
National Aeronautical Facilities						
Space Access and Technology	641.3	725.0	83.7	13.1%	729.0	729.0
Mission Communication Servicies	441.3	420.6	-20.7	-4.7%	420.6	420.6
Academic Programs	106.9	100.8	-6.1	-5.7%	110.8	110.8
Science, Aeronautics and Technology Addition	83.0		-83.0			
MISSION SUPPORT	**2,483.1**	**2,562.2**	**79.1**	**3.2%**	**2,552.0**	**2,562.2**
(% OF TOTAL)	**17.9%**	**18.6%**				
Safety, Reliability and Quality Assurance	37.6	36.7	-0.9	-2.4%	36.7	36.7
Space Communication Services	269.4	291.4	22.0	8.2%	291.4	291.4
Research and Program Management	2,052.8	2,078.8	26.0	1.3%	2,078.8	2,078.8
Construction of Facilities	142.4	155.3	12.9	9.1%	155.3	155.3
General Administrative Reduction	-19.9		19.1			
INSPECTOR GENERAL	**16.0**	**17.0**	**1.0**	**6.3%**	**16.9**	**17.0**
(% OF TOTAL)	**0.1%**	**0.1%**				
TOTAL BUDGET AUTHORITY	**13,884.6**	**13,804.2**	**-80.4**	**-0.6%**	**13,549.0**	**13,709.0**

A comparison of House and Senate allocations for NASA, as well as the president's FY '97 request compared with FY '96 appropriations.

AdVentures

FOR SALE: Poquoson brick rancher; 1,725 sq. ft.; 3BR; 2 baths; family room with fireplace; eat-in-kitchen; central air and gas heat; workshop; large wooded lot; rear deck. $121,900. Call 868-8817.

FOR SALE: Fleetwood Trailer in Gloucester Point; 14-by-80 feet; 3BR; 2 baths; new carpets; master bedroom has walk-in closet, bath with twin sinks, garden tub and shower; kitchen has pantry, lots of cabinets and bay window; front and back decks; storage area; appliances convey. $12,800. Call 642-6417.

FOR SALE: 2-story Denbigh house, 5BR; 2.5 baths; 2-car attached garage; lots of trees, creek that runs into Warwick River. Neighborhood has swimming pool, tennis courts, club house; boat dock, fishing pier nearby. $132,500. Call Faye Boston at 874-3569.

FOR SALE: Bally's Premier Health Club membership. Market cost $1,000, will sell for $450; seller pays $100 transfer fee and one year's dues. Call Anthony at 247-5144 evenings before 9 p.m.

FOR SALE: Shore Park Dutch colonial home in Newport News; 3 BR; 1,900 sq.ft.; 2.5 baths; large living room, dining, family room with fireplace; eat-in kitchen; screened porch; central air; 2-car garage; chair and crown moldings; hardwood floors; large lot. Call owner at 874-1370.

VOLUNTEERS WANTED to serve as hosts for a bus tour of Langley east and west areas, during the agency-wide NACA Reunion VII, Oct. 4. Prepared script and tour route. Contact Olin Jarrett, Office of Public Services, by e-mail (o.jarrett@larc.nasa.gov) or by phone at ext. 46320.

HELP WANTED: The Office of Equal Opportunity Programs is seeking colateral counselors to help resolve employee problems/concerns. Contact Dollie McCown, Mail Stop 178, ext. 43561, e-mail d.m.mccown@larc.nasa.gov.

EAT, DRINK, BE MERRY: Hampton Bay Days Wine & Food Festival, Sept. 22, noon-6 p.m., Mill Point Park, downtown Hampton. Wine-tasting from 12 Virginia wineries, live entertainment, Chesapeake cuisine. $10 advance, $12 at the gate. For more information, call 727-6122.

ENGINEERS CLUB of the Virginia Peninsula will hold its first 1996 meeting on Sept. 24, 5 p.m., at the executive dining room of Newport News Shipbuilding. Free and open to the public. For more information, call Ron Harvey at 249-2322 or Abraham Leiss at 877-2929.

RETIREMENT LUNCH for Joseph M. Drozdowski, Information Systems and Services Division, Sept. 30, 11:30 a.m., at the H.J.E. Reid Conference Center. The cost is $9 per person (includes gift). Gift-only contributions are accepted. Call ext. 46597 or 46543, to R.S.V.P. by Sept. 23.

GOLFING NEWS: In the NASA Mixed-Doubles Golf Tournament held Aug. 29 at Langley's Eaglewood Blue Course, Anna Hamel and Tommy Winn won Flight 1 with a net score of 61 (-11); Betty Pauls and Bobby Huffman won Flight 2 with a net score of 57 (-15). Sign up now for the golf trip to Myrtle Beach, S.C., Oct. 3-6, organized by the NASA Golf Association but open to all. For more information, call Tom Yager at ext.41304.

RETIREMENT SOCIAL for Warren Nichols, Oct. 7, 4:30-6 p.m., Activities Building, Langley Room. Stop by for this informal send-off. Refreshments and snacks provided.

SECOND INDUSTRY ROUNDTABLE: Hosted by ICASE and NASA Langley, Oct. 7-9, at the Williamsburg Hospitality House. For more information, check out the Web site at http://www.icase.edu/workshops/IR2. To reserve a seat, contact Emily Todd at ext. 42175; e-mail at emily@icase.edu.

TECHNOLOGY 2006 Conference, Oct. 29-31, Anaheim Convention Center, Anaheim, Calif. Sponsored by NASA, the Technology Utilization Foundation and *NASA Tech Briefs* magazine. For more information, call 1-800-944 NASA, or fax to 212-986-7864.

SKI VAIL: The Peninsula Ski Club is sponsoring a ski trip to Vail, Colo., for Jan. 18-25. For information or reservations, call Bill Hunter at 874-0913.

NASA SKI WEEK VI: The sixth annual agency-wide ski trip is scheduled for Jan. 18-25 at Steamboat Springs, Colo. The trip is open to all NASA personnel, contractors, retirees, and their friends and relatives. For more information, call Michael Schooley at ext. 48524 or at 867-8093.

IT'S ELECTRIC! *Electric Space: Bolts, Jolts and Volts from the Sun,* a new hands-on traveling exhibit at the Virginia Air & Space Center, runs Sept. 20 through Jan. 7. For more information, call 727-0900.

LANGLEY KARATE CLUB's classes in Cuong-Nhu oriental martial arts, Mondays and Wednesdays, 5-7 p.m., at the Langley gym. NASA employees, co-ops, contractors, and their immediate family (ages 12 and up) welcomed. New students accepted through this month for the beginner class. For more information, call Roy Albang at ext. 46160 or at 596-7736, 7-10 p.m.

Photo by Hubert Lloyd

HELPING HANDS – NASA Langley employees Sandra Keyes, left, Kathy Dezern, Patricia Williams, Lucy Watkins, Angela Davis, Cynthia Dea, Sandra Zumbrun and Velma Martin helped package 20,000 pounds of donated food at the Peninsula Foodbank during the Day of Caring, Sept. 5. Their efforts will provide more than 20,000 meals for needy area residents. More than 150 NASA volunteers participated in the fifth annual community event, joining a workforce 680 strong to work on projects at 52 sites.

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Center Undergoes Changes in Personnel, Organizations

Several personnel and organizational changes have been announced at NASA Langley.

"The organizational changes are a response to shifting needs within NASA and Langley," said Center Director Dr. Jeremiah F. Creedon. "We believe they will put Langley in a better position to serve its customers and stakeholders."

"The personnel changes," he added, "are largely the result of two changes in the senior staff that have the cascade effect of requiring new appointments down the line."

The following personnel changes have been made:

Dr. Kristin Hessenius will be named the center's associate director, the third most senior management position. The 17-year NASA veteran had served as director of the Internal Operations Group since 1993.

Hessenius

After graduating from Virginia Polytechnic Institute and State University (VPI) in 1979, Hessenius joined NASA at Ames Research Center in Mountain View, Calif. There she served as a researcher and manager in applied computational fluid dynamics, as deputy director of aerophysics and as acting associate director.

Ming Tang, whom Hessenius will replace, has been named chief engineer for the High-Speed Research Program Office.

Sammie D. Joplin will replace Hessenius as director of the Internal Operations Group. Joplin has been the group's deputy director since 1994.

Joplin has worked at NASA Langley since 1963. He has served as technical project engineer, deputy project manager, vehicle development manager and branch head. He became assistant chief of the Facilities Engineering Division in 1988 and was named chief in 1991.

Joplin

Dr. Darrel R. Tenney has been named director of the Airframe Systems Program Office, which had been lead by Creedon until his appointment as the center's director in August. Tenney had been chief of the Materials Division since 1987.

After serving as an assistant professor of materials engineering at VPI, Tenney joined NASA in 1974 as a senior researcher. He subsequently held positions as group leader, branch head and assistant division chief. He holds a doctorate in materials engineering from VPI.

Tenney

The following organizational changes have been made:

The Hypersonics Vehicle Office has been abolished. In its place, the larger and more comprehensive Aerospace Transportation Technology Office has been created, with Delma C. Freeman Jr. as director and Lana M. Couch as deputy. The new office encompasses hypersonics and related areas, including the X-33, X-34, Hyper-X, and future space transportation activities.

Couch formerly was director of the Hypersonics Vehicle Office. She began her NASA career at Langley in 1963 as a research engineer and holds a bachelor of science degree in aeronautical engineering from Purdue University.

Freeman formerly was chief of the Space Systems and Concepts Division. The University of Virginia graduate has served NASA Langley since 1960, when he started as an instrument calibrator in the Instrument Research Division.

Freeman

Freeman went on to be named an assistant branch head twice and assistant division chief once. He became leader of the space transportation thrust in the Space and Atmospheric Sciences Program Group in 1994.

Transferred into the new Aerospace Transportation Technology Office will be the Space Transportation Thrust Office and the newly created Hyper-X I Program Office, which replaces the Hypersonics Vehicle Office. To be transferred into the Hyper-X I Program Office are the Systems Analysis Office, the Numerical Applications Office and the Technology Development Office. Vincent J. Rausch is the new program manager for the Hyper-X I Program Office. Rausch formerly worked at NASA Headquarters in Washington, D.C., as director of the Inter-Enterprise operation for the Office of Aeronautics.

Photo by Fred Jones

COSMIC SALUTE—NASA's new "American Aboard Mir" flag is raised on the morning of Sept. 19 at the NASA Langley Headquarters Building by Walter Bailey, left, and Ron Strahle. The flag will fly whenever a U.S. astronaut is serving aboard the Russian space station Mir. The flag was raised following the docking of the space shutle Atlantis (STS-79) and Mir at 11:13 p.m. EDT Sept. 18. Astronaut John Blaha relieved astronaut Shannon Lucid aboard the Mir after she had spent a record-setting 184 days in orbit. Blaha will remain aboard Mir until early January, when he will be relieved by astronaut Jerry Linenger.

STS-79 Carries Langley's MIDAS Payload

BY CATHERINE E. WATSON

When the Atlantis (STS-79) astronauts undocked from the Mir space station last month, they left behind more than several tons of supplies and astronaut John Blaha. Tucked away in the Mir Priroda science module is a NASA Langley experiment called MIDAS.

The Materials In Devices As Superconductors (MIDAS) experiment will measure the electrical properties of high-temperature superconductor (HTS) materials during a long-duration spaceflight on Mir. MIDAS will test HTS samples from NASA Langley, the Moscow Institute of Electronic Equipment, and the Eaton Corp., Milwaukee, Wisc.

Superconductors are materials with two fundamental properties – zero electrical resistance and magnetic levitation. Ordinarily, these two properties are obtained at temperatures close to minus 269 degrees Celsius, which make them difficult to control. In 1986, however, high-temperature superconductors were discovered which exhibited superconductor properties at temperatures above minus 196 degrees Celsius, making them relatively more practical to use.

Using high-temperature superconductors can reduce power and thermal requirements for future spacecraft systems, thus reducing the size of the spacecraft. There is also a significant potential for transfer of this technology to industry for improved cryogenic refrigeration systems (which would benefit the medical industry), communications technology, and energy transmission and storage systems.

Additionally, high-temperature superconductors currently are being incorporated into communications equipment, such as cellular phone base stations.

Since the discovery of HTS materials in 1986, no data has supported their use in space. For about 90 days, however, MIDAS will collect this needed data using multiple superconductor specimens. The MIDAS-Mir results will then be compared to those obtained during a similar ground-based experiment. MIDAS is scheduled to be returned to Earth aboard STS-81 (Atlantis) in early 1997.

Cheryl Tyler, former MIDAS project manager, said, "Mir provided us with an opportunity to evaluate the electrical properties [of HTS materials] over a long duration. Seven days [on a shuttle flight] wouldn't tell us as much as 90 days [aboard Mir]. MIDAS will be a first look at what these superconductors can do."

Dr. Stephanie Wise, MIDAS principal investigator, said they hope to be able to track how much the HTS samples degrade over time, if at all – a chance to see what space does to the materials.

Other Langley Experiments on Mir

Almost daily while on board Mir, Blaha will use another Langley experiment, the Enhanced Dynamic Load Sensors (EDLS). EDLS measures the forces imposed on the space station Mir by the movements of the crew. EDLS consists of two instrumented foot loops, a handhold and a push-off plate that Blaha will use to hold his position at the Priroda glove box science station. EDLS will be retrieved from Mir late next year.

In addition, attached to the outside of the Russian space station is Langley's Mir Environmental Effects Payload (MEEP). Attached to the outside of Mir in March, MEEP will remain on Mir until late 1997.

News Briefs

Around the Agency

BROWN TO COMMAND MISSION TO STUDY EARTH'S ATMOSPHERE – Three-time shuttle veteran U.S. Air Force Lt. Col. Curtis L. Brown Jr. will command the crew of STS-85 during Discovery's 11-day mission to study changes in the Earth's atmosphere. STS-85 is targeted for a July 1997 launch. The pilot for this mission will be U.S. Navy Cmdr. Jeffrey S. Ashby. Mission specialists are N. Jan Davis, Ph.D., Navy Lt. Cmdr. Robert L. Curbeam Jr. and Stephen K. Robinson, Ph.D. Robinson, 41, was a research scientist in Langley's Fluid Mechanics and Acoustics Division from 1990 to 1995. Robinson, Ashby and Curbeam are members of the 1995 class of astronauts and will be making their first trips to space. Davis is a veteran of two previous shuttle missions. During the flight, Davis will use Discovery's robot arm to deploy and retrieve the CRISTA-SPAS payload (Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere - Shuttle Pallet Satellite) for about 48 hours of free-flight. Two other instruments mounted on the Shuttle Pallet Satellite also will study the Earth's atmosphere. The Middle Atmosphere High Resolution Spectrograph Instrument (MAHRSI) will measure hydroxyl and nitric oxide by sensing ultra-violet radiation emitted and scattered by the atmosphere, while the Surface Effects Sample Monitor (SESAM) will evaluate the effects of atomic oxygen on optical materials. STS-85 will mark the fourth in a series of missions to study the Earth's atmosphere.

NASA ANNOUNCES MINORITY CONTRACTORS OF THE YEAR – NASA has named Scientific and Commercial Systems (SCSC) Corp., Falls Church, Va., Minority Contractor of the Year and Software Maintenance Specialists (SMS), Inc., Santa Ana, Calif., Minority Subcontractor of the Year. The two companies were honored by NASA Administrator Daniel S. Goldin at an awards ceremony during National Minority Enterprise Development Week, Sept. 23-27. SCSC was nominated by NASA's Dryden Flight Research Center, Edwards, Calif. The company, a prime contractor for Dryden that provides technical and logistics services, has 400 employees and is a graduate of the Small Business Administration's 8(a) program. SMS was nominated by Rockwell Aerospace – Space Systems Division, Downey, Calif., which is under contract to NASA's Johnson Space Center, Houston, Texas. SMS, with a staff of 256, provides mainframe computer processing for Rockwell's engineering requirements associated with space shuttle orbiter support and manages mainframe network communication links to other Rockwell facilities and NASA centers.

Disabilities Awareness

Cancer Can Happen to Anyone

BY GERRY PARDUE

More than 500,000 women will die this year from breast cancer – far fewer than in 1980, when more than 1,500,000 women died. Medical technology and especially *awareness* has reduced the number of deaths by early detection.

But even one death from breast cancer is still too many if it could have been prevented. Most women never think about having breast cancer. I didn't. It always happens to someone else.

Then I found out that the little lump in my breast, no bigger than the end of my smallest fingertip, was cancerous. My first reaction was to deny that this could be. I felt fine. A little lump – big deal. I honestly did not think there was anything to worry about.

I went to the surgeon, and he used an aspirator to take a sample of tissue from this little lump. Then I found out what fear is.

This little lump had probably been there for

(see CANCER, page 4)

Announcements

AIAA Nominations Sought

The American Institute of Aeronautics and Astronautics Ground Testing Technical Committee invites nominations for the AIAA Ground Testing and Simulation award for 1997. The award is presented "for outstanding achievement in the development or effective utilization of technology, procedures, facilities or modeling techniques for flight simulation, space simulation, propulsion testing, aerodynamic testing or other ground testing associated with aeronautics and astronautics."

Completed nominations must reach AIAA Headquarters by Nov. 15.

To submit a nomination, contact Prof. Colin P. Britcher (britcher@aero.odu.edu) or other local members of the technical committee: Dr. Jim Yu of Langley's Experimental Testing Technology Division or Don Harvey of Tao Systems.

AIAA Headquarters also announces nominations for national awards in *Aerospace America* occasionally. For more information or for applications, contact Paresh Parikh at ext. 42244 or at p.c.parikh@larc.nasa.gov.

ICASE Course Offered

A course on nonlinear systems and control, hosted by ICASE and NASA Langley, is offered Nov. 4-8 and Feb. 10-14 at the Pearl Young Theater, Building 1202A. Course instructor is Prof. Alberto Isidori, Universita di Roma La Sapienza. Enrollment is limited. For more information, check out the Web site at http://www.icase.edu/workshops/control, or contact Emily Todd at ext. 42175 or at emily@icase.edu.

Space Mission Cost Reduction Seminar Offered

The first systematic review of alternative methods for reducing space mission cost will comprise a seminar offered Oct. 29-30, 8:30 a.m.-4 p.m., Building 1229, Room 120.

Dr. Wiley J. Larson and Dr. James R. Wertz, co-editors of Space Mission Analysis and Design (SMAD) and presenters of the successful SMAD short courses given throughout the world, will present the October seminar.

Topics will include background, technology for reduced cost, implementation strategies, and process changes to reduce space mission cost.

The seminar will compare and contrast strategies, ranging from requirements trades and use of nonspace equipment common in small satellites to concurrent engineering and other techniques applicable to major programs.

The seminar developers spent more than four years creating the first and second editions of Space Mission Analysis and Design, as well as one-day and four-day courses based on it. They have now initiated a follow-on project to develop a test and reference book in reducing space mission cost.

This seminar presents the initial findings of the project in the framework of the mission analysis and design process. The course is highly interactive, with participants invited to contribute their own experiences on what works and what doesn't in driving down cost.

To register, send an Application for On-Site Training (NASA Langley form 24), to DeAnna Wooster at Mail Stop 137, or fax to ext. 48543. For more information, call George Allison at ext. 42594.

Astronomy Club Looks Skyward

The Skywatchers Astronomy Club will host a free evening of telescopic viewing of the heavens, Oct. 18, from 8 p.m. until midnight at the club's observatory, Building 1231A. A variety of telescopes will be set up for this event, and no reservations are required. Skywatchers older than age 16 must show a civil service, military or government contractor (with after-hours authorization) photo identification at the main NASA gate. In case of cloudy skies, the event will be postponed until the following evening. For more information, call Marilyn Ogburn at ext. 41175.

Nominations Sought for Public Service Excellence Awards

The Public Employees Roundtable is seeking nominations for its 1997 Public Service Excellence Awards, which pay tribute to government programs whose achievements exhibit the highest standard of dedication, excellence and accomplishment.

The federal, state, city, county, international and intergovernmental awards are granted to units of government at each level that have made outstanding contributions to public service, either on a sustained basis or through a single exceptional deed. Programs should demonstrate either outstanding improvement over previous performance or outstanding achievement in comparison to other existing programs with the same mandate. The awards aim to demonstrate the importance of teamwork in public service.

In addition, a new Customer Service Award this year will honor a significant program or project that is a volunteer effort by current public employees, by a nonprofit group composed of public employees or by a group of retired public employees.

Eligible agencies may nominate themselves or be nominated by others. Nominations must be postmarked by Jan. 15. For more information, contact Public Employees Roundtable, P.O. Box 14270, Washington, D.C. 20044-4270, (202) 927-5000.

SAIC Wins Award for Mentor-Protege Program

Science Applications International Corp. (SAIC) received the first Goldin-Stokes Mentor-Protege Award for "outstanding efforts in establishing and implementing a successful mentor-protege program" under its Atmospheric Science Research and Technology Support Services contract with NASA Langley.

In Memoriam of Thomas H. Brady Sr.

Thomas H. Brady Sr., 75, of Hampton, died Sept. 5. He retired from NASA Langley in 1979 after 38 years of service.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (757) 864-8810, telephone 1 (757) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor . . . . . Keith Henry

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Science and Technology Corp.

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Science and Technology Corp.

Photographer . . . . . Fred Jones

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

NASA Langley's Aeronautical Oddities

From the "roaring '20s" to the present, Langley researchers and engineers have aimed to perfect the best aerodynamic designs conceivable. In the process, many strange designs have passed through the Center's research and flight test facilities.

Some of these aeronautical oddities have made significant contributions to the development of flight, illustrating the importance of the imagination, innovation and skill of industry and NASA Langley researchers.

1950s' 'Flying Platform' Offbeat NACA Venture

Innovative Flight Research Projects Challenged Conventional Minds, Ideas

BY MEGHAN WOODCOCK

It's the early 1950s – in the days before NASA – and researchers at the Langley Aeronautical Laboratory work for the National Advisory Committee for Aeronautics (NACA).

"Space" is considered Buck Rogers stuff; the real business of the NACA is airplanes. So, on the morning of Feb. 2, 1951, Langley employees must have been alarmed to see a round disc hovering in the air. Was it a UFO? No, it was just Charles Zimmerman on his flying platform, one of the most unusual aircraft ever built.

Soaring Imaginations

The '50s were exploratory years for aeronautical research at NACA. A wide variety of vehicles were researched, no matter how unusual the idea. The goal was to explore as many new avenues of flight research as possible. Offbeat projects were intended to stretch the boundaries of conventional thinking about aviation.

NACA Langley researcher Charles Zimmerman, of the Stability and Control Division, first came up with the novel idea for portable, individual air transportation – the flying platform.

Government Uses

This simple flying board was designed with military applications in mind. The jet platform was to have provided air mobility to the individual soldier, allowing for easier travel over rough terrain. The platform was also considered suitable for assisting in enemy lookouts or land-mine spotting.

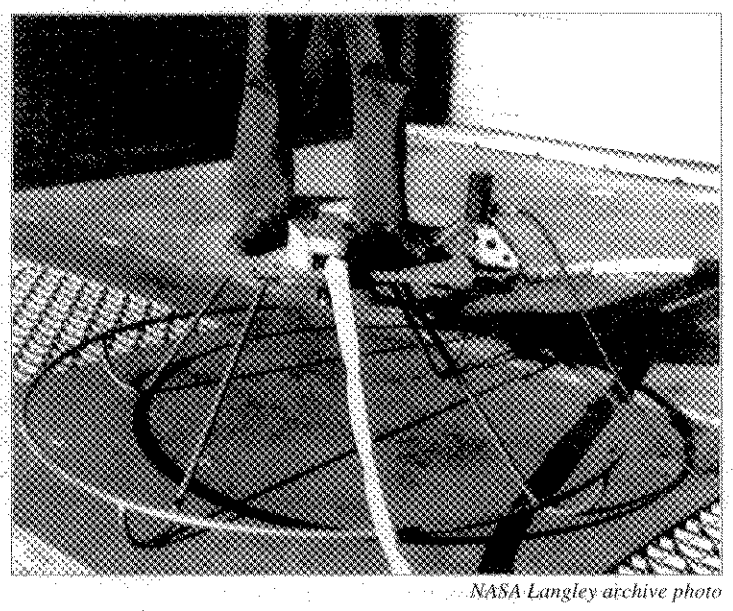
This concept of personal transport is not as far-fetched as it seems. According to Zimmerman's colleague at NACA, Paul Hill, in his book *Unconventional Flying Objects*, the Manned Spaceflight Center briefly considered using a jet platform for lunar exploration at Hill's suggestion.

'Advanced' Technology

The jet platform was a spinoff from the short-takeoff-and-landing technology Zimmerman had previously studied. Lack of government funds for NACA research during the early 1950s was one reason for the platform's scaled-down design.

The original platform tested was simply a piece of plywood with a compressed-air jet nozzle attached to the bottom. Later versions were controlled with ducted fans and rotors.

According to Hill, the Langley Fire Department donated the old fire hose that was used to supply air from a 200-per-square-inch compressed-air tank. Cleats and rollerskate straps were fitted onto the board to secure the flyer's feet. Test pilots also wore a parachute harness attached to shock-cords and carried by an overhead crane for emergency use.



NASA Langley archive photo

A Langley researcher stands on the original flying platform, a small piece of plywood with metal landing gear attached.

Flight Tests

Excited about Zimmerman's concept, Hill designed his own training program to get ready for the first test flights of the platform.

"I placed a bowling ball on the floor with a piece of plywood on the ball, and stood on it...," Hill said. "Although it was difficult to balance, I practiced nights...until I could watch a TV program while on the ball. I knew I was ready for a serious test."

Even without previous training, Hill soon discovered how easily the platform performed.

One selling point for the jet platform, aside from its portability, was its ease of control. Zimmerman's platform was controlled kinesthetically, using only the body's natural reflexes to control and stabilize it. The platform moved when the pilot leaned slightly in the desired direction. The platform flew easily when the pilots – without thinking about balance – trusted their body's natural instincts to correct to an upright position. Subsequent research later proved that a stick control method was also possible.

Zimmerman himself piloted the first official test, flying at 5 to 7 mph at altitudes from 4 to 6 feet. Later NACA tests – some at the Langley Pilotless Aircraft Research Station at Wallops Island – achieved flight speeds up to 17 knots and proved stable in gusts up to 25 knots at up to 12 feet in the air.

After years of testing, the platform's speed improved only slightly and never matched that of ground transportation. The platform's inherent tendency to right itself kept it at low speeds. Its ability to hover steadily – once considered an asset – proved to be a hindrance to increasing the platform's performance speeds.

Getting In on the Act

After Zimmerman proved that the flying jet platform was feasible, other parties became interested. According to *Aircraft of the National Air and Space Museum*, both the U.S. Army and the U.S. Navy went to Hiller Helicopters of Palo Alto, Calif., to test a version of this flying platform. Tests of the Hiller Flying Platform were completed at Moffett Field, Calif.

Photo reprinted from Aircraft of the National Air and Space Museum

The Hiller flying platform, an enhanced version of NASA Langley's early design, was flight tested in the late 1950s for the Office of Naval Research by Hiller Helicopters in California.

In the late 1950s, the Soviet Union also started its own jet platform research program. The original Soviet platform was much larger than the first U.S. platform and used a gas lever to control motion. The Soviets seemed to be motivated to investigate the jet platform by economic factors rather than by military strategy.

The vertical liftoff capabilities of the platform captured researchers' interest. Citing the cost of landing strips and the inefficiency of their own air system, Soviet researchers continued studies on the jet platform. The Russians looked forward to applying the new technology to more cost-efficient vertical-takeoff-and-landing (VTOL) airplanes.

Alternative Approach

The U.S. also was concerned about its commercial aviation industry. Although the jet platform concept did not contribute significantly to new VTOL research, it did contribute to a new open-minded approach regarding other new and unusual aircraft.

Zimmerman's atypical approach to studying stability characteristics in unusual flight vehicles also helped in providing fresh answers to other NACA problems; he was asked to analyze NACA's hypersonics research program – a topic of study outside his field of expertise.

Change for the Future

NASA leadership recently has called upon its researchers and engineers to look beyond "near-term profitability" to come up with fresh, innovative ideas for unusual vehicles that could carry us into the 21st century. Despite the budget cuts back in the early 1950s, research on new types of vehicles was still carried out. Perhaps, despite our own critical budgets, we can look to that simpler time in an effort to revive the spirit of dauntless invention.

Langley's CFC Kickoff Ceremony Gives Center Green Light To Give

BY CATHARINE G. SCHAUER AND WOODROW WHITLOW

All NASA Langley civil servants, contractors and retirees were invited to the Combined Federal Campaign kickoff Sept. 24 at the H.J.E. Reid Conference Center.

Keynote speaker was Lt. Jerry Hackney of the Newport News Fire Department, who assisted with rescue efforts after the bombing of the Alfred P. Murrah Federal Building in Oklahoma City on April 19, 1995.

Hackney, a Hampton native, is a 13-year veteran with the fire department and has spent much of his career in special operations and technical rescue.

Langley employee Allan "Terry" Morris also presented a talk entitled "Change Involves Personal Responsibility."

Morris, an 11-year NASA Langley veteran, is an electrical engineer in the Systems Integration Branch of the Flight Electronics Technology Division. He is a national CFC spokesperson and has spoken on the campaign's behalf to the White House and the Pentagon.

Langley's 1996-97 CFC goal is to raise $285,000. The campaign runs through Oct. 11, and the CFC office – Building 1218, room 209, Mail Stop 950 – is open 8 a.m. to noon throughout the campaign.

"Langley had the highest participation rate of any major federal group, with 73.4 percent," said Jack Clough, the United Way Program Manager for the CFC, Combined Virginia Campaign and the inaugural Combined Public Service Campaign (local governments and schools).

All civil servants, contractors and NASA retirees may support this year's Combined Federal Campaign. Retirees may call Clough at the Peninsula CFC office, 873-9328, ext. 23, for the required materials. Contractors and retirees may contribute to the Langley campaign with a one-time contribution only, while civil servants may also elect to use payroll deduction.

Photo by Fred Jones

A. Terry Morris, left, Lt. Jerry Hackney, Langley CFC Chair Woodrow Whitlow and Center Director Jerry Creedon gather for the cutting of the cake bearing this year's CFC logo and theme, "If it is to be, it's up to me." The Langley Combined Federal Campaign kickoff ceremony was held Sept. 24 in the H.J.E. Reid Conference Center.

NEW AGE GIRLS – Volunteer Joe Drewry, a retired NASA Langley engineer, left, assists Alex Drewry, 6, and Alexis Smith, 13, with computer programming at a Girls Incorporated of the Greater Peninsula classroom facility, located in the Sarah Bonwell Hudgins Regional Center in Hampton. The girls are part of the organization's Operation SMART (Science, Math and Relevant Technology). Through programs that meet the specific needs of girls and young women, Girls Inc. strives to help all girls become "strong, smart and bold" for the 21st century. Partially funded by the Combined Federal Campaign, Girls Inc. is celebrating 50 years of promoting excellence, computer literacy, leadership/career development and fitness.

CFC

Virginia Peninsula

It's not just a form anymore.

http://cfc-vapen.larc.nasa.gov/CFC

Pledge electronically.

Help Langley save time and money.

Strict Regulations, Procedures Govern Leave Scheduling

The current leave year ends Jan. 4. Supervisors and employees are jointly responsible for planning and scheduling annual leave throughout the leave year.

Supervisors must approve annual leave if work load permits. However, if the leave must be denied, the supervisor and the employee should work together to reschedule the leave to the satisfaction of the employee, while still meeting mission requirements.

Approval of an exigency of the public business must be obtained prior to cancellation or denial of leave if the leave is subject to forfeiture. "Use-or-lose" annual leave may be restored only when the leave is forfeited due to an exigency of the public business – not for the employee's convenience.

For such leave to be considered for restoration, it must be scheduled and approved before the beginning of the third pay period prior to the end of the leave year (Nov. 24). A properly executed Standard Form (SF) 71, Application for Leave, satisfies this requirement.

A key element in the leave restoration process is line management's determination that a sufficiently critical problem or situation exists to declare an exigency.

Such exigencies should be rare events having significant program cost or schedule impact or involving safety considerations. Approval of an exigency of the public business must be obtained prior to canceling or denying leave in the "use-or-lose" category.

For *individual* employees who are requesting an exigency that is not affiliated with a project or team, the request for exigency must be processed through organizational channels to group level and must include the following:

1. A complete description of the exigency
2. The reason why the employee cannot use scheduled annual leave, and why the leave cannot be rescheduled prior to the end of the leave year
3. The proposed beginning and ending dates of the exigency
4. A completed SF 71 for the employee affected by the exigency dated before Nov. 24.

Employees who are *members of a project or team* should check with their line management to ensure that their project or team has been submitted as a group by the group director. The procedure for projects/teams follows:

1. Employees associated with a project/team execute an SF 71 requesting leave use of "use-or-lose" annual leave.
2. Group directors respond to request from the Employee Relations Office, Office of Human Resources (OHR), to identify project(s)/team(s) for consideration of an exigency.
3. Deputy director line-item vetoes or approves requests for project/team exigencies.
4. Employee Relations Office notifies group directors of approved project(s)/team(s).
5. Supervisors deny use of "use-or-lose" annual leave for the employees associated with the approved projects/teams.
6. Employees must hold properly executed SF 71s until the end of the leave year.
7. Employees forward *copies* of properly executed SF 71s to the Employee Relations Office at Mail Stop 129 by Jan. 31.

Employees affiliated with an approved project or team must include the following additional information on the SF 71 in order for it to be considered properly executed:

a. Name of project/team with which employee is associated

b. Number of hours *actually* lost, as well as number of hours scheduled

c. Employee's and supervisor's signatures dated *before* Nov. 24.

"Use-or-lose" annual leave which has been scheduled before Nov. 24 may be denied or canceled only if the deputy director determines that an exigency of the public business of major importance exists.

Exigency requests should be addressed to the deputy director and routed through appropriate organizational channels to the Employee Relations Office, OHR, Mail Stop 129.

"Use-or-lose" annual leave which cannot be used by the end of the leave year may be donated to approved leave recipients in the Voluntary Leave Transfer Program, which permits federal employees to donate annual leave to other federal employees who are experiencing personal or family medical emergencies.

For more information, call ext. 42612.

CANCER

(continued from page 2)

years, never growing and never bothering me in any way. When disturbed, however, it took a giant leap at life.

In the two weeks following the aspirator, I could feel and see this little tiny lump growing, although it was not painful. By the time I had my surgery, two weeks later, the lump itself had grown to two-and-a-half centimeters and had sprouted fingers that had reached into my lymph channels. Once cancer gets into the lymph nodes via the lymph channels, it is carried throughout the body quickly.

If I had been injured in some way that would have disturbed this tiny little lump, the cancer would have spread throughout my body quickly. And I would not have known until too late. I am grateful to be one of the lucky survivors – only because someone loved me enough to insist I see a doctor.

If you know anyone – man or woman – who has a lump in their breast, insist that they see a doctor. Women, have mammograms regularly. Don't wait.

Cancer doesn't just happen to the other person. I know. It happened to me.

Engineering Technician Apprentice Program Graduates Leave Langley Their Contributions to Center's Research

Former Thomas Nelson Co-ops Advance in Engineering Careers

BY DORIANN BRITTON

The 1996 graduating class of Langley's Engineering Technician Apprentice Program officially completed its course of work/study at a graduation ceremony today, Oct. 4, at the H.J.E. Reid Conference Center.

David H. Mullins, president and chief executive officer of Dynamic Engineering Inc. in Newport News, addressed the graduates. Dynamic Engineering Inc. is an aerospace and marine prototype development company which serves aerospace companies, the U.S. Department of Defense and government laboratories. Mullins is also chairman of the Peninsula Advanced Technology Center.

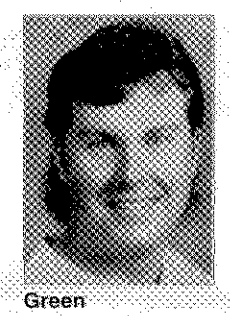
Each of this year's seven apprentice graduates entered the apprenticeship as co-op students from Thomas Nelson Community College in Hampton, where they earned associate of applied science degrees in their fields of expertise.

DoriAnn B. Britton is an electrical engineering technician in the Electrical Support Branch. She is working on the maintenance and calibration of protective relays across the field and is assisting the Reliability-Centered Maintenance Team. She graduates *summa cum laude*.

Britton

Britton received a superior achievement award for excellent technical support to structure research at Facility 1267. She also received an On-the-Spot award for dedication and initiative in learning and performing the process of calibrating protective relays. In addition, she received two outstanding performance awards for 1992-1993 and 1994-1995.

Kenneth A. Green is an engineering technician in the Metals Application Technology Branch. He is working on making scaled-down metal models to be tested in the wind tunnels. He is also producing flight hardware for space and other flight missions.


Green

Green received an Exceptional Performance award for the Mir Environment Effects Payload project and in support of the development of a piezoelectric measuring research instrument. He graduates *magna cum laude*.

James W. High is an electronics technician in the Electronics Technology Branch. He is working on the fabrication of thick film hybrid circuits and Thin Layer Unimorph Ferroelectric Driver and Sensor.

High

High received two superior achievement awards for his outstanding contributions both to project reliance and to the development of thick film processing in microelectronics fabrication. He is a member of the International Society of Hybrid Microelectronics and the Surface Mount Technology Association.

Vincent E. Houston is an electronics technician in the Operations Engineering Branch. He is involved in the upgrade of the 757 research aircraft. He is also working on the Aeronautical Radio Incorporated 429 isolation system.

Houston also worked on the ScramJet Data Communication Link System. He plans to graduate from Old Dominion University with a bachelor of science degree in computer engineering in the spring of 1998.

Anna M. Noe is an electronics technician in the Electro-Optics and Control Branch. She is working in electro-optics, on the Photogrammetric Appendage Structural Dynamics Experiment and the Lidar Atmospheric Sensing Experiment projects.

Noe received a superior achievement award for exemplary performance and contributions to the development of silicon carbide ultraviolet photodetectors for use in the atmospheric lidar systems. In addition, she received a Group Achievement award for Lidar In-Space Technology Experiment Development Team.

Noe

Noe also worked on optical damage testing, Fly-by-Light, Large Gap Magnetic Suspension System, F-16XL wing modification measurements, Materials and Devices As Super-conductors, and Sage III. She is pursuing a bachelor of science degree in computer engineering.

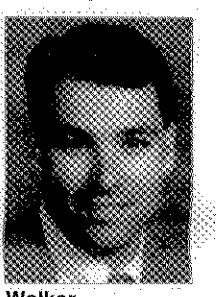
William B. Simmonds is an engineering technician designer in the Process Systems Branch. He is involved in the relocation of the 30-by-60 air stations. He is also working on Combined Load Test Systems.

Simmonds

Simmonds worked on the upgrade for the 14-by-22 air stations and received three outstanding performance awards. He is pursuing a bachelor of science degree in mechanical engineering at Old Dominion University.

Richard A. Walker, class speaker for this year's apprentice graduates, is an engineering technician designer in the Electrical and Electronic Systems Branch. He is working on the Heavy Gas Conversion Project for the Transonic Dynamics Tunnel (TDT).

Walker received three performance awards for his work on the 20-Inch Supersonic Wind Tunnel, on Heavy Gas System Design (TDT) and on controls and data acquisition (TDT). In addition, he has received two outstanding performance awards for 1993-1994 and 1995-1996.


Walker

Walker has volunteered his time for National Engineers Week and Career Day at Langley. He is pursuing a bachelor of science degree in electrical engineering.

Throckmorton Takes Next Step with Harvard Fellowship

BY MEGHAN WOODCOCK

David Throckmorton, Manager of the Space Transportation Technology program in the Space and Atmospheric Sciences Program Group, is the 1996 winner of a NASA fellowship to the Harvard University Senior Executive Fellows (SEF) program. He left Sept. 30 to begin this eight-week executive training course at Harvard's John F. Kennedy School of Government in Cambridge, Mass.

The SEF program helps technically proficient managers improve their management skills by studying broad-ranging policy issues.

"I have direct experience as a first-line supervisor and in the planning and implementation of technology development programs at the Center," said Throckmorton. "But I have limited direct experience dealing with strategic policy issues. I believe this program will allow me to take that next step in developing and improving my management skills."

Throckmorton

During his stay, Throckmorton will live in graduate student housing along with the other participants in the SEF program. He described the program as "a very intensive, 24-hour-a-day experience."

The Kennedy School uses case studies as its method of instruction. Students study real-life past events and analyze the policy decision made in those cases.

"There are no right or wrong answers," he said. 'The whole learning experience comes from being immersed in the kind of management problems faced by high-level governmental or industrial organizations."

The preparation materials he received from Harvard included the first case study with a step-by-step breakdown for analyzing different aspects of the case.

"I'm already impressed with how involved the process can be and with the potential for learning," he said. "I think it's going to be a lot of fun. I'm looking forward to it."

In his current position at Langley, Throckmorton is responsible for the planning, advocacy, coordination and oversight of the center's space transportation technology development activities. Specifically, he manages the technology development work supporting NASA's Reusable Launch Vehicles program, as well as planetary entry technology work, which supports the agency's space science program. Current areas of technology development activity include aerothermodynamics, metallic thermal protection systems, reusable cryogenic tanks and composite primary structures.

> **"I believe this program will allow me to take that next step in developing and improving my management skills."**
>
> *David Throckmorton, Harvard Fellowship Awardee*

Throckmorton has been in management at Langley for the past 10 years and has 26 years' experience in aerospace research and development. He received a bachelor of science degree in aerospace engineering from Virginia Polytechnic Institute and State University in 1970 and a master of science degree in the same field from George Washington University in 1975.

Throckmorton is author or co-author of some 50 technical publications and serves on the board of directors for the American Institute of Aeronautics and Astronautics.

AdVentures

FOR SALE: Glass table plus four chairs upholstered with hunter green fabric. Will bargain. Call 826-1456.

FOR SALE: 1987 Baylner Capri boat, 17.5 feet, inboard/outboard, good condition, OMC motor, 120 horsepower, AM/FM stereo cassette, $3,500 negotiable. Call Alan at 875-0281.

FOR SALE: Williamsburg home in Berkeley's Green, 4 BR, 2.5 baths, 2-story, 2-car garage, deck, gas heat, central air, located on cul-de-sac, pool, clubhouse, tennis courts. $149,900. Call 229-5662.

FOR SALE: Poquoson brick rancher; 1,725 sq. ft.; 3 BR, 2 baths; family room with fireplace; eat-in-kitchen; central air and gas heat; workshop; large wooded lot; rear deck. $121,900. Call 868-8817.

FOR SALE: 1989 Volkswagon Cabriolet convertible, white with red interior, well-maintained. Call 229-5434.

FOR SALE: 1972 Super Beetle Volkswagon, rebuilt engine must be installed, interior like new, needs painting, all parts new, complete the restoration. $850. Call 229-5662.

FOR SALE: Brand-new Technics SA-EX700 Dolby Pro Logic Surround Sound A/V receiver; 100 watts x 5 channel (left, center, right, surround, subwoofer) or 120 watts x 2 in stereo; original box, instructions, manufacturer's warranty. Retails for $499; will sell for $400. Contact Adam Friedman at 253-5865 or at friedman@as.wm.edu

HOUSEMATE WANTED to share home at 555 Chesapeake Ave; 4-room suite (bedroom, bath, office, dressing room); $450/month; includes all utilities plus deck, jacuzzi, security; 15-minute interstate drive to NASA; must tolerate cats. Call Michael Nelson at 245-8319.

FOR SALE: Two Hawaiian Airlines tickets for one-way travel between any of the islands any time before Nov. 30. $50 each, or best offer. Call 827-4857.

RETIREMENT SOCIAL for Warren Nichols, Oct. 7, 4:30-6 p.m., Activities Building, Langley Room. Stop by for this informal send-off. Refreshments and snacks provided.

SECOND INDUSTRY ROUNDTABLE: Hosted by ICASE and NASA Langley, Oct. 7-9, at the Williamsburg Hospitality House. For more information, check out the Web site at http://www.icase.edu/workshops/IR2. To reserve a seat, contact Emily Todd at ext. 42175; e-mail at emily@icase.edu.

FEDERAL EMPLOYEES, current and retired, are invited to attend the monthly meeting of the National Association of Retired Federal Employees, Peninsula Chapter 682, Oct. 14, 11 a.m., at the Knights of Columbus Meeting Hall, 12742 Nettles Drive, Newport News. Guest speaker is Sen. John Warner (R-Va.). For more information, call 249-1216 or 825-4974.

OYSTER ROAST: The American Institute of Aeronautics and Astronautics' annual oyster roast – this year honoring Paul Holloway – is Oct. 15, 4:30-8 p.m., at the NASA Langley Activities Center Picnic Grounds. Cost is $7.50 for AIAA members and family; $4.50 for AIAA student members; $10 for nonmembers; $3 for children under age 10; free for children under age 3. Reservations by Oct. 10. For reservations or more information, contact Lynda Foernsler at ext. 48146 or at l.j.foernsler@larc.nasa.gov; or Tom Gates at ext. 43400 or at t.s.gates@larc.nasa.gov.

TECHNOLOGY 2006 Conference, Oct. 29-31, Anaheim Convention Center, Anaheim, Calif. Sponsored by NASA, the Technology Utilization Foundation and *NASA Tech Briefs* magazine. For more information, call 1-800-944 NASA, or fax to 212-986-7864.

SKI CLUB: The Peninsula Ski Club meets the second Thursday of the month, 7 p.m., at Days Inn of Oyster Point in Newport News. For more information, call 596-4742.

SKI VAIL: The Peninsula Ski Club is sponsoring a ski trip to Vail, Colo., for Jan. 18-25. For information or reservations, call Bill Hunter at 874-0913.

NASA SKI WEEK VI: The sixth annual agency-wide ski trip is scheduled for Jan. 18-25 at Steamboat Springs, Colo. The trip is open to all NASA personnel, contractors, retirees, and their friends and relatives. For more information, call Michael Schooley at ext. 48524 or at 867-8093.

IT'S ELECTRIC! *Electric Space: Bolts, Jolts and Volts from the Sun*, a new hands-on traveling exhibit at the Virginia Air & Space Center, runs through Jan. 7. For more information, call 727-0900.

LANGLEY KARATE CLUB's classes in Cuong-Nhu oriental martial arts, Mondays and Wednesdays, 5-7 p.m., at the Langley gym. NASA employees, co-ops, contractors, and their immediate family (ages 12 and up) welcomed. New students accepted through this month for the beginner class. For more information, call Roy Albang at ext. 46160 or at 596-7736, 7-10 p.m.

ULTIMATE FRISBEE twice a week, coed, all levels of players, possibly for local tournaments. For more information, e-mail to jrrjr@icase.edu.

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Researcher News

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Photo by Fred Jones

NASA AT THE VIRGINIA STATE FAIR – Langley's Bill Fogle, left, of the Numerical Control and Integrated Structures Section, shows State Fair-goer Danny Franz, of Lynchburg, the blended-wing aircraft concept as he sets up a NASA exhibit on opening day, Sept. 26. The fair runs through Oct. 6 at the Strawberry Hill fairgrounds in Richmond.

National Aeronautics and
Space Administration
Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

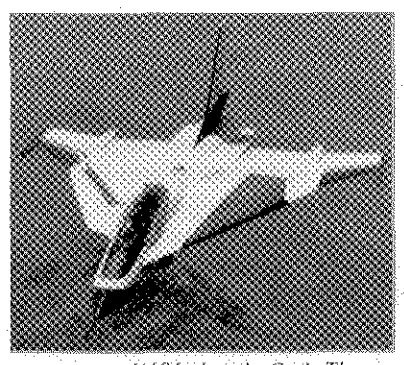
Volume 10 ❖ Issue 21 ❖ October 18, 1996

Flight Experiment Smoothes Flow Over Supersonic Wings

BY CATHERINE E.WATSON

In a series of flight tests, NASA engineers have smoothed the flow over the surface of an F-16XL wing flying at supersonic speeds (faster than sound), bringing to a successful conclusion a historic achievement in high-speed aerodynamics.

"Supersonic laminar flow control has been called the 'holy grail' of aerodynamics because it's the last frontier that can offer significant drag reductions and save airlines – and eventually the flying public – a great amount of money," said Jeffrey Lavell, project manager of Langley's F-16XL Supersonic Laminar Flow Control (SLFC) experiment.



NASA photo by Carla Thomas

As an aircraft flies, the friction between the air and the wing creates drag, or resistance, called "skin friction drag." Skin friction drag accounts for about half of the total drag on an aircraft. When airflow over the wing becomes turbulent and separates from the wing, skin friction drag increases.

Laminar flow, a condition where the airflow over the wings remains smooth and close to the wing, greatly reduces skin friction drag. Smooth, or laminar, flow over a wing can reduce drag and contribute to reduced operating costs by improving fuel consumption.

The objective of the flight tests, part of NASA's High-Speed Research (HSR) program, was to demonstrate that laminar flow could be achieved over a significant portion of a supersonic wing.

"We've had terrific results," Lavell said. "We've obtained a large amount of data that can be used to refine our design codes and provide the U.S. aircraft industry with the means to design SLFC wings."

Lavell said that the project's objectives were met, although exact details of the amount of laminar flow achieved and with what amount of suction is restricted information. The U.S. aircraft manufacturers may compete with aircraft manufacturers from other countries someday, and SLFC technology could create a considerable competitive advantage.

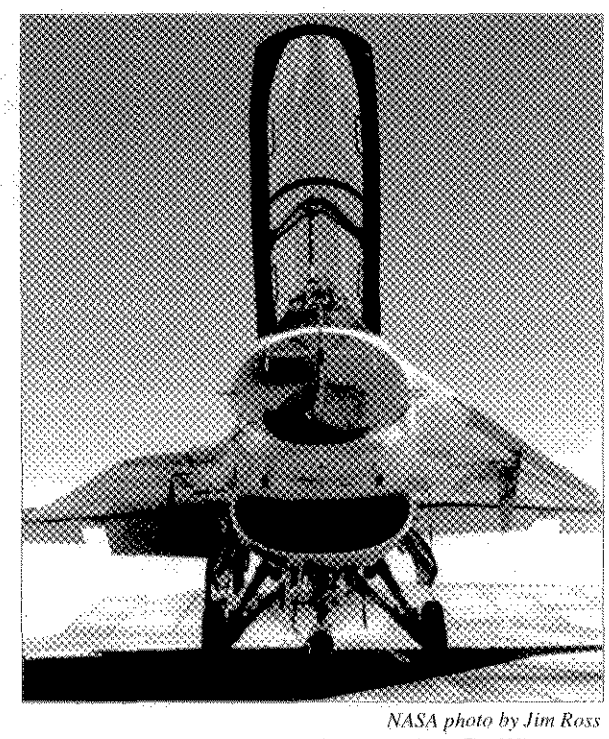
This successful method of maintaining laminar flow could be incorporated into the design of a future High-Speed Civil Transport (HSCT), a conceptual supersonic airliner of the future that would carry 300 passengers at 2.4 times the speed of sound.

Flights with the SLFC experiment at NASA Dryden Flight Research Center, Edwards, Calif., used an F-16XL, which has a large delta wing. The wing's shape is similar to the design that likely will be used on the HSCT, making the F-16XL an excellent testbed for the laminar flow research project.

A large, titanium panel, perforated with more than 10 million laser-cut holes, was attached to the upper surface of the F-16XL's left wing. Natural aerodynamic drag on an aircraft wing is caused by the friction of a thin turbulent layer of air moving across the wing's surface. During research flights, a suction system pulled a portion of that thin layer of air through the glove's porous surface to keep the airflow over the wing from becoming turbulent.

NASA flew approximately 40 flights over a 12-month time span, and achieved "a significant amount of laminar flow," according to Lavell. Most of the research flights were at speeds of Mach 2 (approximately 1,400 mph) and altitudes of 35,000 to 55,000 feet, which is close to the proposed range for the future HSCT.

The high-speed research SLFC experiment represents a collaborative effort between NASA and the U.S. aerospace industry. A team composed of Boeing, Rockwell and McDonnell Douglas designed the wing panel and suction system.



NASA photo by Jim Ross

The leading edge on the left wing of NASA's F-16XL sports a new look following installation of the laminar flow control experiment panel.

NASA Seeks 'Hyper-X' Proposals

BY KEITH HENRY

NASA is poised to begin a multiyear hypersonic flight-test program by requesting proposals from industry for the fabrication of four unpiloted research aircraft that will fly up to 10 times the speed of sound. The contract award is scheduled for early 1997.

The selected contractor will be responsible for fabrication and flight-test support of the hypersonic experimental research vehicles to be called "Hyper-X." Each of four vehicles will be approximately 12 feet long with a wing span of about five feet. Hypersonic speed is defined as above Mach 5, which is equivalent to about one mile per second, or approximately 3,600 miles per hour at sea level.

The Hyper-X Phase I program – an agency-wide effort to address one of the greatest aeronautical research challenges – is conducted jointly by Langley and Dryden Flight Research Center, Edwards, Calif. Program managers hope to demonstrate technology that could ultimately be applied in vehicle types from hypersonic aircraft to reusable space launchers.

"It's time to fly. This exciting, challenging ground and flight research program will significantly expand the boundaries of air-breathing flight for the first time ever, by flying a scramjet-powered aircraft at hypersonic speeds," said Langley's Vince Rausch, the Hyper-X Phase I program manager.

(see HYPER-X, page 3)

State of the Center Address

Langley Center Director Jeremiah F. Creedon will deliver his first State-of-the-Center address, Nov. 18 and 19, at the H.J.E. Reid Conference Center.

Four sessions are scheduled so that as many employees, retirees and contractors as possible may attend. The sessions are based alphabetically on last names, but anyone may attend any session.

Nov. 18 – 1:30-2:30 p.m. (A-E)
3-4 p.m. (F-K)
Nov. 19 – 8:30-9:30 a.m. (L-R)
10-11 a.m. (S-Z)

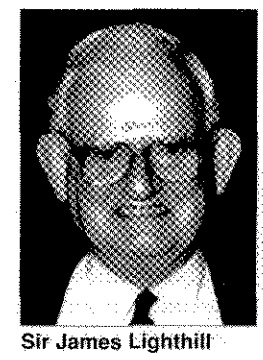
ICASE Colloquium Resonates Theory of Sound

Sir James Lighthill, distinguished aeronautics researcher and educator, will deliver a lecture entitled "Recent Advances in Interpreting Hearing Sensitivity" to commemorate the 125th anniversary of 19th-century British mathematician and physicist Lord Rayleigh's publication of his famous treatise, "The Theory of Sound." The lecture will be presented Nov. 12 at 10 a.m. in the Pearl Young Theater, preceded by an informal reception.

In a prelude presentation in 1989, Lighthill delivered the American Society of Mechanical Engineers (ASME) Rayleigh Lecture entitled "Biomechanics of Hearing Sensitivity." The lecture was a comprehensive account of what was known then about the initial capture of sound in a mammal's cochlea – the spiral tube of the inner ear. The fine sensitivity of the cochlea, it was determined, is a result of an amplification process centered in the ear's outer hair cells. The amplification mechanism, however, remained completely unsolved.

This two-part, follow-up lecture at Langley first leads up to where the Rayleigh Lecture left off and then delves into the new discoveries made in the seven years since, including an amplification mechanism.

Lighthill's research topics include marine science, fluid mechanics and hurricane dynamics. He has published articles on Fourier analysis, waves in fluids, theoretical fluid mechanics and aeroacoustics. He also initiated the science of aerodynamic sound generation.



Sir James Lighthill

After serving as director of the Royal Aircraft Establishment in Farnborough, England, Lighthill was the Royal Society Research Professor at Imperial College. He moved to Cambridge in 1969 and, for 10 years, occupied the Lucasian Chair of Applied Mathematics, a position once held by Sir Isaac Newton. He then served as provost of the University College London, where he is currently an honorary research fellow in the mathematics department.

News Briefs

Around the Agency

NASA SELECTS PHASE II SMALL BUSINESS PROJECTS – NASA has selected 170 research proposals for negotiation of Phase II contract awards for NASA's Small Business Innovation Research (SBIR) program. The selected projects will be conducted by 144 small, high-technology firms located in 30 states. The SBIR program aims to stimulate technological innovation, to increase the use of small business in meeting federal research and development needs, and to increase private sector commercialization of federally funded research results. Phase II continues development of the most promising Phase I projects. Selection criteria include technical merit and innovation, Phase I results, value to NASA, commercial potential and company capabilities. A total of 277 proposals were submitted by SBIR contractors completing Phase I projects initiated in 1995. NASA's Office of Aeronautics, NASA Headquarters, Washington, D.C., manages the SBIR program, and NASA field centers and the Jet Propulsion Laboratory, Pasadena, Calif., manage individual SBIR projects.

Three Langley Employees Receive Tibbetts Award

Robert Pegg and James Larry Hunt, both of Langley's Systems Analysis Office, and Richard Culpepper, permanently assigned to Wright-Patterson Air Force Base's Propulsion Directorate, were selected as winners of the first annual U.S. Small Business Administration's Tibbetts Award, presented for their contributions as "Small Business Innovation Research (SBIR) Program Models of Excellence."

They were three of five awardees, including Bob Pap, of Accurate Automation Corporation, Chattanooga, Tenn., and Dr. Kervyn Mach, also of the Propulsion Directorate at Wright-Patterson.

Pegg and Hunt were nominated for their work as technical program monitors on the Low-Observable Flight Test Experiment (LoFLYTE) aircraft program. The jet-powered model aircraft is equipped with state-of-the-art flight control technologies and will be used to explore new flight control techniques.

Thayer Sheets, as manager of Langley's SBIR office, helped provide the primary funding for the program's preliminary design reviews and key technology.

The Tibbetts Award is an initiative of the Office of Advocacy, in conjunction with the Office of Technology, U.S. Small Business Administration, to recognize the work of individuals, support organizations, universities, state agencies and SBIR companies in the success of the SBIR program.

Virginia Air & Space Center Embarks on 'Cosmic Voyage'

The Virginia Air & Space Center presents a new IMAX film, *Cosmic Voyage*, which presents the latest scientific information on the formation and structure of the universe.

Narrated by actor Morgan Freeman, the film features a "cosmic zoom" through space and time to the ends of the known universe and then back to the smallest known particles of Earth. This technique results in the two longest continuous computer-generated zooms in the history of filmmaking.

Viewers begin their journey in Venice, Italy, where Galileo developed the telescope more than 400 years ago. From there, a unique shift in focus and point-of-view allows the audience to witness extraordinary events in the formation of the universe.

After reaching the "outer limits," the view zooms back to Earth to children studying a drop of water from a Dutch canal, to the protozoa living in the water, to the smallest subatomic particle – quarks.

Advanced computer-generated imagery comprises almost half of the 35-minute film – more than in any other IMAX film. On-location sites included Italy, Greece, Holland, Hawaii and Utah.

Take a *Cosmic Voyage* now through June 12. Showtimes vary throughout the film's run. Ticket prices are $5.50 for adults and $4.50 for NASA and military personnel, seniors and children ages 3-11.

For more information, call 727-0900.

Announcements

CTAP Center Offers Fall Career Training

The Career Transition Assistance Program Center offers the following seminars during October and November. Advance registration is required.

- "Starting Your Own Business," Oct. 22-23, 9 a.m.-3 p.m.
- Halloween Party – Career Tricks and Treats, Oct. 31, 1-2:30 p.m.
- "How To Evaluate Career Alternatives and Manage a Successful Career Campaign," Nov. 6-7, 9 a.m.-4 p.m.
- "Stress Management," Nov. 14, 9 a.m.-noon
- "So, You Want To Be a Consultant," Nov. 21, 9 a.m.-noon

All NASA civil service employees and their spouses are eligible for this authorized training. CTAP welcomes suggestions for training and seminars. For more information or to register, call Susan Costello at ext. 45000.

Aerospace Research and Technology Receives SEB Award

NASA Headquarters has established a yearly monetary awards program to recognize Source Evaluation Boards (SEB) who have used streamlined techniques in the performance of the SEB's evaluation process. This year, Langley has received an award for the Aerospace Research and Technology (ART) SEB, which evaluated proposals to provide contract support for the Research and Technology Group (RTG). The ART SEB received and evaluated two proposals, and their evaluation activities were completed in just 83 days.

William R. Kivett, Langley's procurement officer, presented the award Oct. 10 to the following team members: Wilbur B. Fichter, Jerome T. Foughner Jr., David H. Jones, Klaus P. Zaepfel, Annie P. Wright, William H. Sleigher, Frederick L. Staggs, Randy A. Manning, Richard K. Bird, Melvin C. Gilreath, Dr. Jeffrey A. Hinkley, Dr. Peiman G. Maghami, William L. Sellers, Dr. James H. Starnes Jr., James L. Thomas.

SpaceZone Brings NASA Events to the Net

SpaceZone (www.spacezone.com) announces live online audio broadcasts of space shuttle missions, NASA press conferences, mission summaries and other NASA-related events as they happen.

Count down to take-off with mission controllers live as it happens, direct from your computer, from SpaceZone's live space audio center. Listen to shuttle astronauts live from space as they work together to accomplish mission goals.

SpaceZone is an interactive Internet site designed around the excitement and adventure of real and imagined space exploration. It brings together current and historical information from more than 30 years of manned and unmanned space exploration, including film and video footage from NASA archives, current space exploration news and a glimpse into the future of space exploration.

For more information, e-mail John Hay, Director of Services, SpaceZone, at johnh@spacezone.com.

LAA Board Positions Open

The Langley Activities Association (LAA) is now accepting nominations for the elective, two-year positions of social, arts and crafts chairperson and secretary/treasurer to the executive board.

The LAA Board meets formally twice a month and typically meets informally or in committees weekly to conduct business and operations of the LAA and its organizations. Nomination forms and position descriptions are available at the LAA office in the H.J.E. Reid Conference Center.

Nominations must be returned to the LAA office no later than Nov. 8. Ballots will be mailed to all employees on Nov. 25. Election results will be announced on or near Dec.13.

Speakers Bureau September Activities

Kelly Wilshire visited the American Bonanza Society in Cherry Hill, N.J., to discuss "Human Factors Research."

Tony Trexler spoke to IBM Flight Operations in Wappingers Falls, N.Y., regarding safety stand-down, "How Langley Keeps Aircraft Safe."

Stuart Pendleton addressed the Society for Logistic Engineers in Prince George, Va., about industry partnerships.

Karen Freidt spoke to the Cub Scouts in Grafton about computer applications.

FirstSearch Now Available

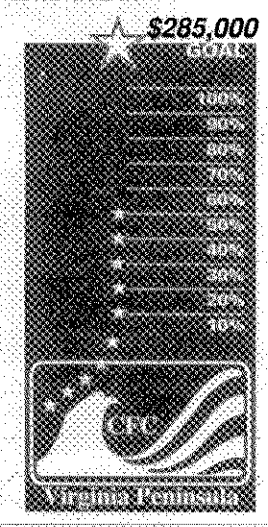
The Technical Library announces the availability of FirstSearch, a World Wide Web-based collection of more than 30 commercial informational databases that is available at your desktop. For search tips and a list of databases, or to register for access to FirstSearch, see the Web site at http://library-www.larc.nasa.gov/firstsea.html; or call the library reference desk at ext. 42356.

More CFC Support Available from Langley

All civil servants, contractors and NASA retirees may support this year's Combined Federal Campaign. Retirees may call Jack Clough at the Peninsula CFC office, 873-9328, ext. 23, for the required materials. Contractors and retirees may contribute to the Langley campaign with a one-time contribution, while civil servants may also elect to use payroll deduction.

CFC Status Report

As of Oct. 9:



Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (757) 864-8810, telephone 1 (757) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

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Science and Technology Corp.

Assistant Editor. . . . . Jeane Shanks
Science and Technology Corp.

Photographer . . . . . Fred Jones

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

Hispanic Heritage Month Offers Cultural Educational Opportunity

BY RAYMOND BERRIOS

The nation celebrates its Hispanic heritage each year during Hispanic Heritage Month, Sept. 15 to Oct. 15.

U.S. Hispanics represent some two dozen countries of origin and live all throughout the country. Individual communities celebrate their diverse Hispanic roots and customs in their own ways. Our strength lies precisely in our diversity.

We have made many contributions to society. In the entertainment industry, we have Paul Rodríguez and Gloria Estefan. In the world of politics, we have Henry Cisneros and Federico Peña.

During National Hispanic Heritage Month, we try to show what Hispanics are all about. Hispanic Heritage Month is not for Latinos alone, any more than Black History Month is for African Americans alone. Hispanic Heritage Month is an opportunity for others to learn more about us.

To learn about more Hispanics who have made significant contributions to society, visit the web site: http://www.clark.net/pub/jgbustam/heritage/heritage.html.

• **Carlos Finlay** (1833-1915)

Finlay, a Cuban, is known for his work in identifying the mosquito as a carrier of the deadly yellow fever germ. His theory was followed by the recommendation to control the mosquito population as a way to control the spread of yellow fever. His work, carried out during the 1860s, finally came to prominence in 1900.

• **Luis Federico Leloir** (1906-)

Luis Leloir of Argentina was awarded the Nobel Prize for chemistry in 1970 for his discovery of sugar nucleotides and their role in the biosynthesis of carbohydrates. He also worked with the synthesis mechanism of starch. Leloir's discoveries led to further research in carbohydrate metabolism and on the medical implications of those discoveries.

• **César Milstein** (1927-)

Argentinian César Milstein shared the Nobel Prize for medicine and physiology in 1980 for pioneering contributions to the theory and techniques of immunology, which laid the basis for advances in cancer treatment and the detection of acquired immune deficiency syndrome (AIDS). In work with his colaureate Georges J. F. Koehler, Milstein developed the techniques for producing antibodies with a specific affinity for certain sites in the body and that may find diseased cells but leave healthy cells intact.

• **Ellen Ochoa** (1959-)

Ochoa is the United States' first Hispanic female astronaut. Selected by NASA in 1990, she is in training at the Johnson Space Center in Houston, Texas. She previously served as Chief of the Intelligent System Technology Branch at the NASA Ames Research Center.

Submitted by the Office of Equal Opportunity Programs.

NASA Langley Celebrates Hispanic Heritage Month

NASA Langley celebrated Hispanic Heritage Month on Oct. 17 at the H.J.E. Reid Conference Center with a program featuring guest speaker Angel Morales. Morales is director, producer and announcer of five Spanish/English radio programs broadcast locally.

Morales spoke to Langley employees about the organization he founded called "Interes Hispano" (Hispanic interest) with the purpose of promoting positive communications and relations among and between Hispanics and all U.S. citizens.

The Office of Equal Opportunity Programs sponsored the program.

HYPER-X

(continued from page 1)

A scramjet (supersonic-combustion ramjet) is a ramjet engine in which the airflow through the whole engine remains supersonic.

A ramjet operates by subsonic combustion of fuel in a stream of air compressed by the forward speed of the aircraft itself, as opposed to a normal jet engine, in which the compressor section (the fan blades) compresses the air.

The first Hyper-X unpiloted hypersonic flight research vehicle, fueled by hydrogen, is scheduled to fly at Mach 7 in 1998. This is far faster than any air-breathing aircraft has ever flown. The world's fastest air-breathing aircraft, the SR-71, cruises slightly above Mach 3. The highest speed attained by NASA's rocket-powered X-15 was Mach 6.7.

A rocket carries its own oxygen for combustion; an air-breathing aircraft burns oxygen in air scooped from the atmosphere. Thus, air-breathing hypersonic vehicles should carry more cargo/payload than equivalent rocket-powered systems.

The Hyper-X program aims to flight-validate key propulsion and related technologies for air-breathing hypersonic aircraft. Heading the list is demonstration of a ramjet/scramjet engine, followed by demonstration of design tools and methods for air-breathing hypersonic vehicles.

Scramjet technology is challenging because only limited testing can be performed in ground facilities. Long duration, full-scale testing requires flight test speeds above Mach 8. Hyper-X will build knowledge, confidence and a technology bridge to very high Mach-number flight.

Hyper-X will ride on the first stage of a Pegasus booster rocket, which will be launched by the Dryden B-52 at about 40,000 feet. For each flight, the booster will accelerate the Hyper-X research vehicle to the test conditions (Mach 5, 7 or 10) at approximately 100,000 feet, where it will separate from the booster and fly under its own power.

Four flights are planned – one each at Mach 5 and 7 and two at Mach 10. The flight tests will be conducted within the Western Test Range off the coast of southern California.

Vehicle and engine ground tests and analyses will be performed prior to each flight in order to compare flight and ground test results.

In addition, the Hyper-X Mach 7 vehicle will first be tested in Langley's 8-Foot High Temperature Wind Tunnel. The vehicle, with a fully operating ramjet/scramjet propulsion system, will be put through tests in the tunnel simulating many, but not all, Mach 7 flight conditions.

A Langley-Dryden team manages the program. As the lead center, Langley develops hypersonic technology; Dryden handles flight research.

Presidential Proclamation Honors Nation's Hispanics

BY WILLIAM J. CLINTON

America draws strength from the extraordinary diversity of its people. Our national character is enhanced by citizens who maintain and honor cultural customs brought from other lands.

Hispanics, who have long been part of this tradition, were the earliest European settlers of this great nation, with the Spanish founding cities in Florida in the 1500s, and Mexicans establishing homesteads in the Southwest in the 1600s. Puerto Ricans became U.S. citizens in 1917, and other Latinos over the years, including Cubans and Central Americans, came to the United States in search of democracy, freedom and a better way of life.

Hispanics, who are of all races, distinguish themselves as a community by fostering connections rooted in the Spanish language. Their diverse and vibrant culture includes elements originating in Spain, North America, Central America, South America and the Caribbean.

Hispanics share deep family values, recognize their obligations to the less fortunate of our society, protect their children, cherish freedom and fulfill their patriotic duty to defend their country.

Earlier this month, I awarded our nation's highest civilian honor, the Presidential Medal of Freedom, to Dr. Antonia Pantoja, who has inspired generations of Latino youth "to dare to dream."

Believing that hard work can overcome any obstacle, Pantoja went from factory worker to college professor and has dedicated her life to bringing educational and economic opportunities to the Puerto Rican community.

Sadly, we recently lost one of our great countrymen, Dr. Hector P. Garcia of Corpus Christi, Texas. A member of the U.S. Commission on Civil Rights and a recipient of the Presidential Medal of Freedom, he is best remembered for his service to the Latino community, founding the American GI Forum to defend the civil rights of Hispanic veterans and organizing one of the first civil rights marches in the 1940s.

Many other Hispanic sons and daughters have served our country with distinction, making important contributions in the arts and sciences, the business world, academia, government, agriculture and the Armed Forces. Helping to preserve the democracy and freedom all Americans enjoy, Hispanics have served in the United States Armed Forces in proportions much larger than their percentage of the population.

Since World War I, our nation has awarded the Medal of Honor, our highest military honor, to more Latinos than to any other ethnic group.

Today, let us honor Hispanics for their example of community and patriotism, and for the richness of their contribution to this great land.

Now, therefore, I, William J. Clinton, President of the United States of America, do hereby proclaim Sept. 15 through Oct. 15, as National Hispanic Heritage Month. I call upon all government officials, educators, and people of the United States to honor this observance with appropriate programs, ceremonies and activities, and I encourage all Americans to rededicate themselves to the pursuit of equality.

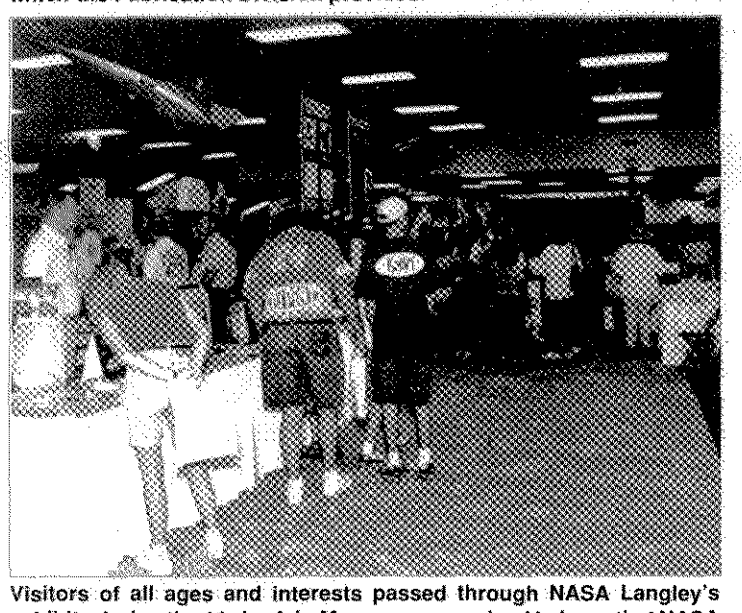
AIAA Outreach Fair Set for November

The American Institute of Aeronautics and Astronautics (AIAA) Hampton Roads Section Pre-College Education Committee, in cooperation with the Office of Education, will present an Outreach Fair, Nov. 4, 2-6 p.m., in the H.J.E. Reid Conference Center. The fair will present opportunities for volunteers to get involved in a single event or in ongoing activities. The fair will also feature demonstrations of lessons that can be adapted by volunteers, as well as outreach materials and props that can be checked out from the AIAA Education Library and the Public Mail Center.

For more information, contact Geoff Tennille at ext. 45786 or at g.m.tennille@larc.nasa.gov.

Photos by Fred Jones

Virginia State Fair-goers Linda Clow, left, and Larry Cooper check out the model aircraft hanging above the NASA exhibit in the Commonwealth Technology Building. Directly overhead are, clockwise, the F-16XL, a hypersonic research concept and the RAH-66 Comanche Helicopter, which the Fabrication Division provided.



Visitors of all ages and interests passed through NASA Langley's exhibits during the 11-day fair. Many were surprised to learn that NASA has a research facility in Virginia.

Virginians Become Acquainted with NASA Langley at State Fair

BY MARY GRAVES

Under a huge canopy of five hanging model aircraft – some measuring nine feet wide – four-year-old Tyler Eastland, of Mechanicsville, Va., put his little hand over the large red button that would bring the small, suspended model airplane crashing down.

After a warning buzzer sounded high atop the 1/70 scale A-frame, the tiny crash-test pilot began his countdown.

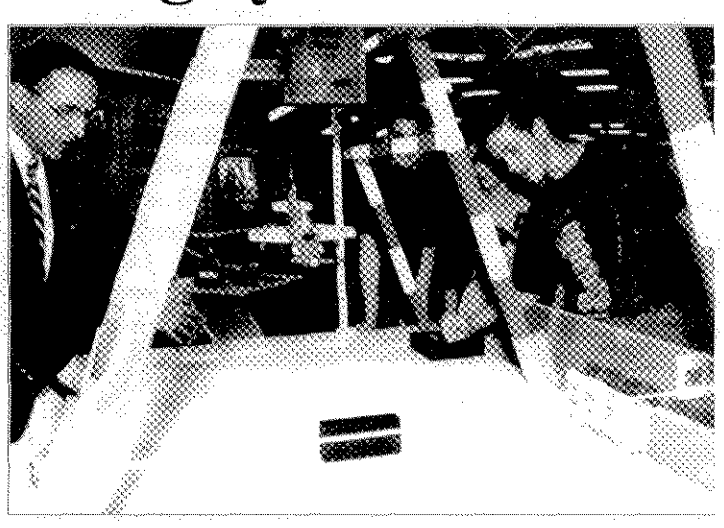
"Five, four, three, two, one – wow! It crashed!"

Tyler was one of thousands of young visitors to crash-test model airplanes at NASA Langley's hands-on Impact Dynamic Research Facility exhibit, part of the center's display at the Virginia State Fair, held at the Strawberry Hill fairgrounds in Richmond, Sept. 26-Oct. 6. NASA's 18 exhibits occupied much of the fair's Commonwealth Technology Building, stretching from the front to the rear of the cavernous hall.

"Welcome to the 21st Century" proclaimed a marquis outside the building, as visitors inside entered the space age.

At one end of the NASA exhibit, next to the model-size A-frame display, sat a life-size crash-test dummy in an extracted airplane seat. An unoccupied, larger-than-life astronaut's space suit stood on a simulated moon surface in the building's far end, as if to watch over the entire NASA exhibit.

As kids enjoyed crashing planes, Virginians of all ages lined up to take a whirling spin in the Virginia Air & Space Center's Spaceball – a popular attraction that simulates weightlessness.



As his buddies look on, young crash-test pilot Bill Skelton hits the button to bring down the model airplane at the Impact Dynamic Research Facility exhibit. Retired Langley engineer Bob Miserentino tells the boys all about the facility.

Adults and school-age youngsters – some computer experts, some novices – settled into four computer stations to "get caught in NASA's web," surfing the Internet of NASA sites and beyond.

As schoolteachers and parents scooped up free literature from the Teacher Resource Center information booth, the kids feverishly collected airplane glider kits and searched for a spot to cover with one or more colorful NASA stickers.

"You're the one studying all this in school," said one young boy's mother as she gathered fact sheets and brochures on wind tunnels, the Earth's atmosphere, the space shuttle and Mars. "And here I am, getting the materials for you. Come over here!"

From the enthusiastic to the curious, more than 200,000 visitors – including 8,000 4th-graders as well as 8,000 middle and high school students – passed through Langley's information smorgasbord. NASA technology lined every inch of the 180-square-foot exhibit: carbon-carbon engine parts, high-speed research, designs for HL-20 and X-33 space flight vehicles, model construction, technology transfer. Spinoffs displayed included the fetal heart monitor, digital mammography, LaRC-SI and THUNDER.

As a strong breeze blew from a fan inside a wind tunnel model, the Atmospheric Sciences display offered a recent look back at Windstar's constant updates on the storm-force winds of 1995's Hurricane Sally, one demonstration of how NASA uses space to study the Earth.

A tall, three-panel display of the Highways in the Sky project, implemented during the Centennial Olympic Games in Atlanta, stretched almost as high as the hovering aircraft above NASA's entire area.

A new multi-media exhibit, which included a touch-screen and a digital video, allowed the more than 561,000 state fair visitors to see photos and video clips and to hear narration about much of the work done at Langley – now and into the 21st century.

Technical Forum Makes Comeback

The Langley Technical Forum will return to the center the third Wednesday morning of each month, beginning Nov. 20. The first of the two-hour forums will begin at 10 a.m. in Building 1212, Room 200.

The presentation-and-discussion format is a reincarnation of the technical segment of previous years' Senior Management Research Review sessions. The forum will provide for technical discussions of ongoing research with Langley senior managers and will showcase outstanding research contributions to senior staff, division chiefs, thrust leaders and all other interested employees.

A Technical Forum agenda team will review and balance the abstracts among Langley's six core competencies: Mission and Systems Analysis; Aerodynamics; Aerothermodynamics and Hypersonic Propulsion; Structures and Materials; Airborne Systems and Crew Station; Atmospheric Science and Remote Sensing.

This team will receive abstracts from the divisions and will organize the forums several months in advance. Subsequent calls for abstracts from the divisions will be based on presentation backlog. Civil service employees will make conference-type presentations of 15 minutes, plus five minutes for discussion.

The forum agenda will be posted a week in advance via electronic mail and the "LaRC This Week" web site. Employees may contact their divisions with candidate presentations.

Center Testing Recycled Paper Products

The Electronics Technology Branch (ETB) is testing and evaluating office products with recovered content. The products are evaluated for durability, performance, appearance and cost, compared to similar products made with virgin material. The tested products are listed in the *Boise Cascade Office Products Catalog* through the Just-In-Time (JIT) procurement system.

Once determined to be reliable, the environmentally preferred products will be available to all Langley employees through the on-line procurement system, and a list will be published periodically in the *Researcher News*. The list can be found through the JIT website (http://quikserv.larc.nasa.gov:10004/) and the Office of Environmental Engineering website under Pollution Prevention (http://sky.larc.nasa.gov/P2/office.htm).

All Langley employees and support contractors must purchase these products, which have a 20 percent post-consumer content, as directed by Executive Order 12873 and the Resource Conservation and Recovery Act. NASA reports annually to the Environmental Protection Agency on its progress towards meeting the requirements of this executive order. NASA's goal is to purchase recovered-content items for 75 percent of its paper products purchases.

For more information, call the Office of Environmental Engineering at ext. 43500.

NASA Langley's Dr. Robert Berry, right, and Elliott Jordan, conservator of the Association for the Preservation of Virginia Antiquities, examine x-rays of artifacts. The x-rays were taken by Langley's Nondestructive Evaluation Section.

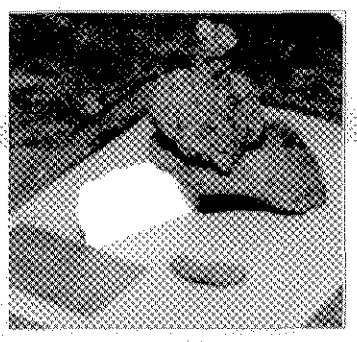
NASA Langley Helps James Fort To Uncover Archaeological Mystery

The Association for the Preservation of Virginia Antiquities ran into something of a snag when it began unearthing artifacts from the James Fort site it had been excavating.

More than 300 years below the ground had left some of the discoveries encrusted with dirt and corrosion, which could not be removed without risking damage to the artifacts.

Association researchers turned to NASA Langley for a way to peer beneath the surface and distinguish the 17th-century artifacts from what surrounded them.

So far, the Nondestructive Evaluation Section of the Internal Operations Group has x-rayed, or radiographed, 50 to 75 of the 100,000 artifacts dug up from the James Fort site in Jamestown over the past three years.



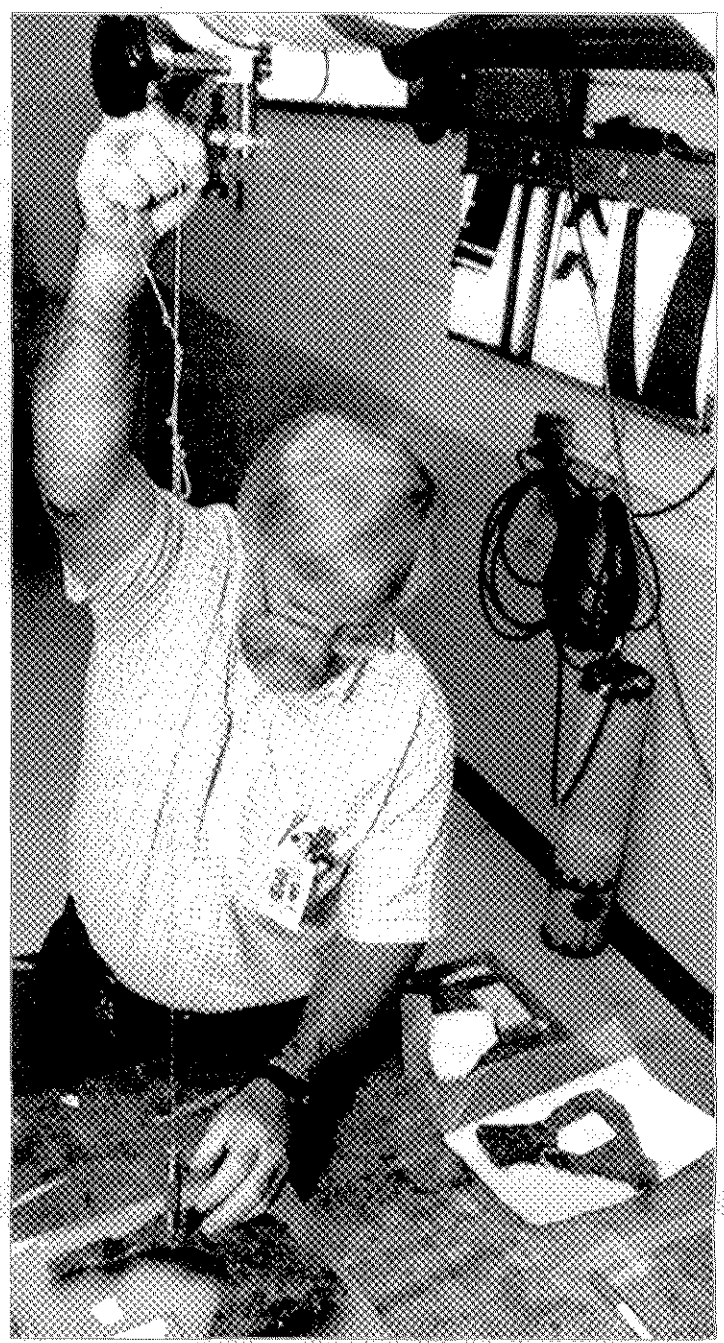
Nearly half of the objects date to the first years of English settlement.

"In many cases, they don't know what they've got," said Robert Berry, engineering technician in the Nondestructive Evaluation Section, Fabrication Division. "We're using very sensitive film, much more so than medical film, and that's what allows us to get very detailed x-rays."

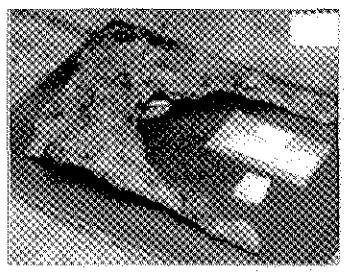
The section where Berry works normally uses its radiographic laboratory to assess the integrity of structures such as research aircraft, composite specimens, shuttle payloads and "literally everything that NASA Langley has done," he said.

The antiquities association in August captured national headlines when it announced discovery of the 1607 fort site. According to the association, the fort was not washed into the James River as had been speculated.

Photos by Fred Jones

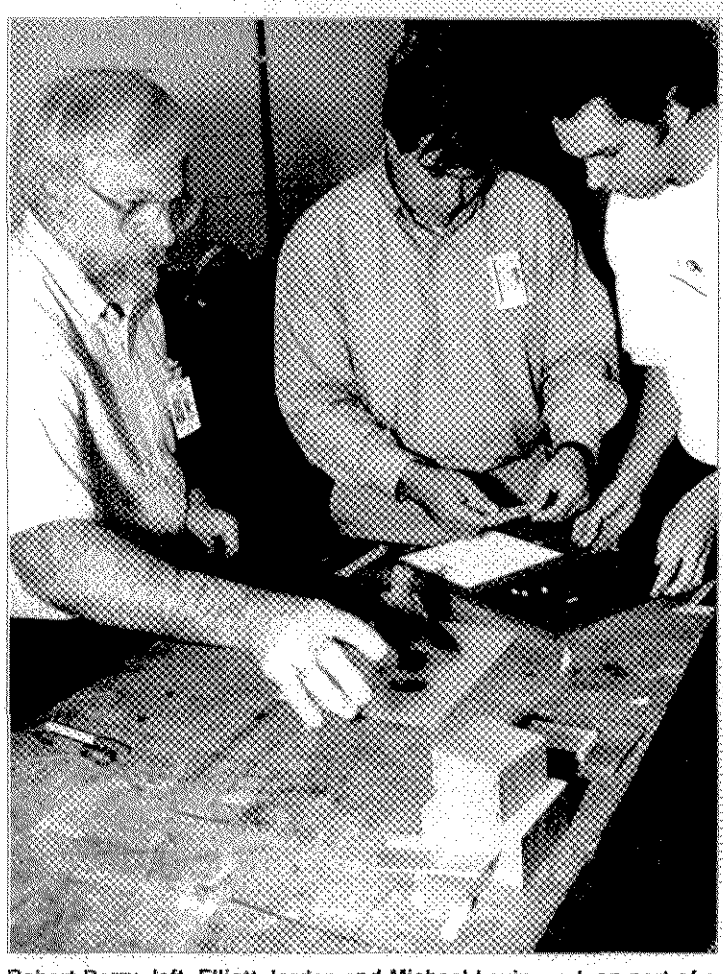


Robert Berry prepares a James Fort artifact for analysis; below, a close-up view.



The group uncovered more than 170 feet of palisade line, a bastion and a moat outside the bastion. The remains of James Fort are still on the land around the 1639 church tower on Jamestown Island.

Two other institutions are interpretting Jamestown: the National Park Service and Jamestown Settlement. The archaeolgists dig from April through October, and the laboratory can be observed year-round.



Robert Berry, left, Elliott Jordan and Michael Lavin work on part of a shield (by Berry's hand) unearthed at James Fort.

Antcliff Leaves for Penn State Fellowship

BY MEGHAN WOODCOCK

Dr. Richard Antcliff, head of the Measurement Science and Technology Branch (MSTB) in the Fluid Mechanics and Acoustics Division, is the winner of a fellowship to Penn State University, State College, Pa.

Antcliff will participate in the school's "Engineer/Scientist as Manager Program." The program will help engineers and scientists gain skills as managers by studying organizational strategy, project management and managerial communication. Antcliff will reside at the university's dorm housing during his two-week stay, beginning Oct. 20.

As head of MSTB, Antcliff coordinates efforts for the development of advanced measurement technologies to be applied to wind tunnel testing.

Richard Antcliff

One of the latest and most exciting technologies to come out of the MSTB is a measurement system known as Doppler Global Velocimetry (DGV). The DGV system uses a laser to take an instantaneous "snapshot" measurement of speeds at all points along a test surface area. The system offers an increase in productivity over previous techniques that used a laser to measure speeds point-by-point.

The DGV system is a success, according to Antcliff. "It is now being prototyped by a lot of different facilities both on-center and off-center," he said.

Antcliff received a Ph.D. degree in physical chemistry from the University of Georgia in 1981. He has worked at Langley for more than 14 years.

AdVentures

FOR SALE/RENT/ LEASE-OPTION: House in Old Hampton, 3BR, 2 baths; 9 miles to Langley; blocks from public library, marinas, city offices. Rent: $650/ month. Call collect (301) 595-5841, any time.

FOR SALE: Waterfront home in Hampton, located on cul-de-sac with panoramic bay and river views, concrete bulkhead, deck, fireplace, jacuzzi, hardwood and ceramic tile floors, cedar paneling, detached garage. $149,900. Call 851-4126.

FOR SALE: Poquoson brick rancher; 1,725 sq. ft.; 3 BR; 2 baths; family room with fireplace; eat-in-kitchen; central air and gas heat; workshop; large wooded lot; rear deck. $121,900. Call 868-8817.

FOR SALE: 1993 Yamaha 535 motorcycle; 3,000 miles; with two helmets, rainsuit, saddle-bags. $3,000. Call 851-1990.

FOR SALE: Membership to Indian Cove Campground; Virginia Beach waterfront; family atmosphere with fishing, pools, recreational vehicle hook-up, planned activities, long-term storage. $250. Call 865-0586.

FOR RENT: New Yorktown/ Grafton townhouse, 3 BR, 2-1/2 baths, living room with gas fireplace, dining room, eat-in kitchen, upstairs laundry room, oversized garage, fenced back yard, 15 minutes to NASA and Langley Air Force Base, close to Grafton middle and high schools. $825/month. Call 874-3741 after 5 p.m.

FOR RENT: Beachfront 2BR condo, with panoramic bay views from living room and master bedroom; deck; 1-1/2 baths; living room has fireplace and hardwood floors; eat-in kitchen; full-size washer/dryer; dishwasher; central air/heat; refrigerator. Located on Willoughby Spit, 20 minutes to Langley. $650/month plus utilities. Call Lance at 595-3923.

INTERNS WANTED: Science Applications International Corporation (SAIC), Hampton, seeks upper-level undergraduate and graduate students for 1997 Summer Intern Program in affiliation with ongoing contract at NASA Langley. Fields include earth sciences, physics, engineering, math, computer programming. For applications or more information, call 825-0001, fax 825-4968 or e-mail at saic+intern@larc.nasa.gov.

THE SKY'S THE LIMIT: The Skywatchers Astronomy Club will host a free evening of telescopic viewing of the heavens tonight, Oct. 18, 8 p.m.-midnight, at the club's observatory, Building 1231A. A variety of telescopes will be set up for this event, and no reservations are required. Skywatchers older than age 16 must show a civil service, military or government contractor (with after-hours authorization) photo identification at the main NASA gate. In case of cloudy skies, the event will be postponed until the following evening. For more information, call Marilyn Ogburn at ext. 41175.

WHAT'S THE BUZZ? The NASA-Langley Apiculture Club (Honeybunch) will hold its monthly meeting Oct. 21, 7-9 p.m., at the Regency Health Care Center, 112 North Constitution Drive, Yorktown. Colony preparation for winter will be discussed. Free and open to the public. For more information, call Henk at ext. 47226 or Harvey at ext. 46742.

MONSTER BASH: The Virginia Air & Space Center hosts its fifth annual Sci-Fi Halloween Bash, Oct. 26, 5-8 p.m., including a haunted house and a costume contest. For more information, call 727-0900.

TECHNOLOGY 2006 Conference, Oct. 29-31, Anaheim Convention Center, Anaheim, Calif. Sponsored by NASA, the Technology Utilization Foundation and *NASA Tech Briefs* magazine. For more information, call 1-800-944 NASA, or fax to 212-986-7864.

SKI VAIL: The Peninsula Ski Club is sponsoring a ski trip to Vail, Colo., for Jan. 18-25. For information or reservations, call Bill Hunter at 874-0913.

NASA SKI WEEK VI: The sixth annual agency-wide ski trip is scheduled for Jan. 18-25 at Steamboat Springs, Colo. The trip is open to all NASA personnel, contractors, retirees, and their friends and relatives. For more information, call Michael Schooley at ext. 48524 or at 867-8093.

LANGLEY KARATE CLUB's classes in Cuong-Nhu oriental martial arts, Mondays and Wednesdays, 5-7 p.m., at the Langley gym. NASA employees, co-ops, contractors, and their immediate family (ages 12 and up) welcomed. New students accepted through this month for the beginner class. For more information, call Roy Albang at ext. 46160 or at 596-7736, 7-10 p.m.

SKI CLUB: The Peninsula Ski Club meets the second Thursday of the month, 7 p.m., at Days Inn of Oyster Point in Newport News. For more information, call 596-4742.

ULTIMATE FRISBEE games held twice a week, coed, all levels of players, possibly for local tournaments. For more information, e-mail to jrrjr@icase.edu.

IT'S ELECTRIC! *Electric Space: Bolts, Jolts and Volts from the Sun*, a hands-on traveling exhibit at the Virginia Air & Space Center, runs through Jan. 7. For more information, call 727-0900.

SUPER SPACE: The Virginia Air & Space Center presents *Sunspots and Weather*, *Magnetic Magic* and *A Magnetic Wonder Box* – "super space demonstrations" in conjunction with the hands-on exhibit *Electric Space: Bolts, Jolts & Volts from the Sun* and the new IMAX film *Cosmic Voyage*. These educational activities are available every Saturday and Sunday, 11 a.m.-4 p.m. For more information, call 727-0900.

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Researcher News

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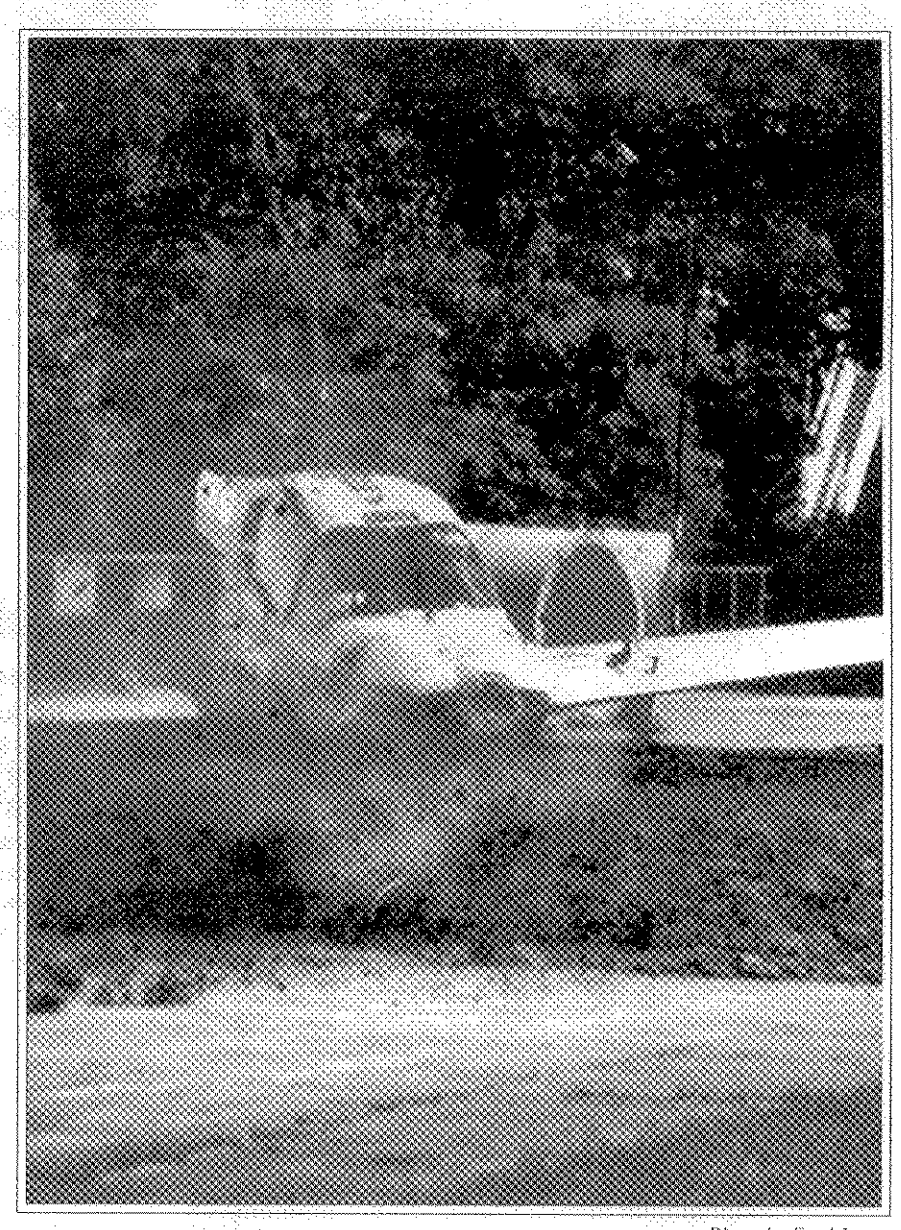


Photo by Fred Jones

SPLASH CRASH – A composite general aviation experimental airframe was crash-tested at NASA Langley's Impact Dynamic Research Facility on Sept. 20. This was the second of four such airframes to be tested under a Small Business Innovation Research contract with Terry Engineering.

National Aeronautics and
Space Administration
Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 22 ❖ November 1, 1996

NASA Tests X-33 Cryogenic Fuel Tank Concepts

BY ANN C. GAUDREAUX

Researchers at Langley conducted thermal-mechanical tests toward the development of a durable, lightweight cryogenic insulation system for possible use on future reusable launch vehicles (RLVs).

The tests were conducted in Langley's Thermal Structures lab for Lockheed Martin, winner of NASA's Phase II contract, to develop the X-33 Flight Demonstrator Vehicle.

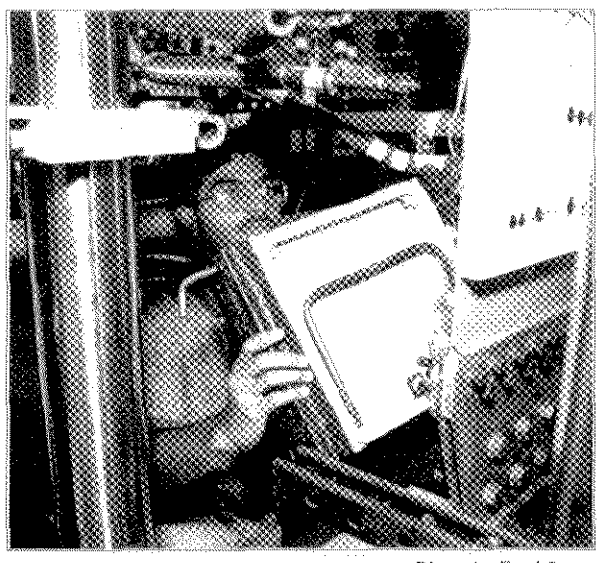


Photo by Fred Jones

Ashish Purekar, a co-op student in the Thermal Structures Branch, installs a heater cover over the cryogenic insulation panel prior to testing.

The objective of the X-33 is to demonstrate technologies that will be a trademark of a future reusable launch vehicle. The RLVs of the future will be single-stage-to-orbit vehicles that are intended to be cheaper and easier to operate than current space vehicles for space exploration payloads into the next century.

"These tests will give us the ability to verify, on a small scale, the operability of various cryogenic insulation systems," said Kevin Rivers, who conducted the tests for Lockheed. "We are able to verify that these systems will withstand combined thermal and mechanical loads in simulated mission of launch, orbit and reentry.

"We are also able to verify both the manufacturing techniques and health monitoring techniques, and we can study the life cycle of the structure by repeating the tests simulating the projected number of missions the vehicle will fly."

Cryogenic refers to the production and effects of very low temperatures.

The tests will allow researchers to demonstrate the viability of new and innovative cryogenic tank concepts at relatively low costs.

The tests consisted of 25 cycles in which a one-foot-by-two-foot aluminum alloy panel, covered with cryogenic foam insulation, was cooled to -296 degrees Fahrenheit with liquid nitrogen. To simulate the heat of reentry, the panel and outer surface of the insulation was heated to temperatures greater than those expected during a reentry.

Twenty-five thermal-mechanical tests followed the 25 thermal cycles. The panel was subjected to design loads that simulated the launch-to-orbit and a reentry at the same time the simulated cooling/heating cycles are applied. Data from the results will be used in analyses for sizing the cryogenic insulation system on the X-33.

"We hope to give Lockheed Martin the data that will assist in determining the reusability and thermal-mechanical performance of the baseline cryogenic insulation system for the X-33," Rivers said. "One of the greatest challenges we face is finding the right material to withstand the extremes of temperature that this panel will have to endure. If results are positive, Lockheed is well on its way to having the material necessary to insulate fuel tanks for the RLV."

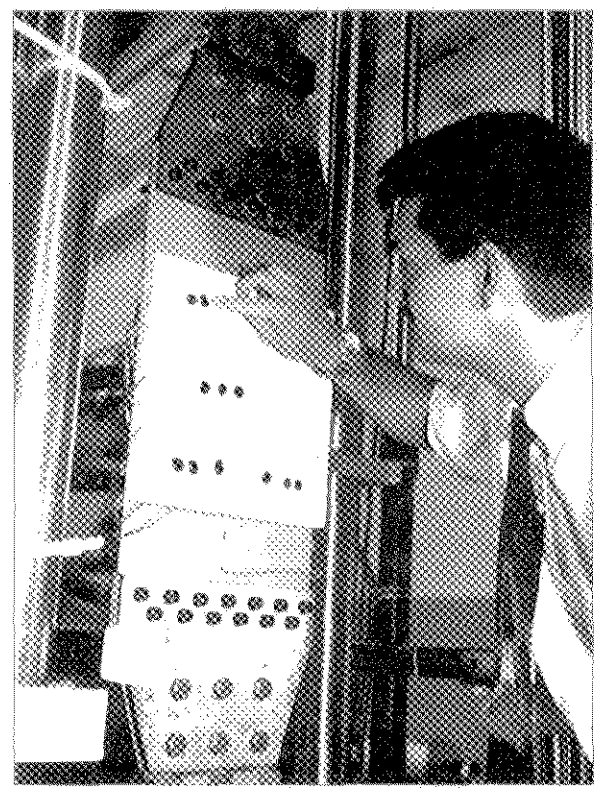


Photo by Fred Jones

Kevin Rivers of the Thermal Structures Branch checks the instrumentation on a test panel for a cryogenic insulation system. The thermal-mechanical testing was done for Lockheed Martin as part of NASA's X-33 Reusable Launch Vehicle program.

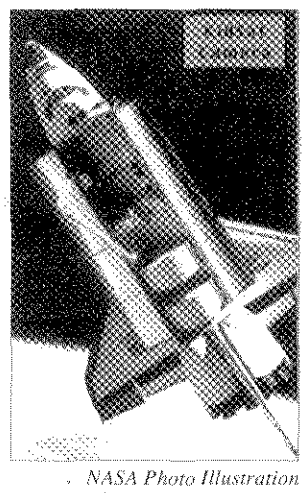
The testing was completed in early October. More X-33 Phase II testing will begin in the near future.

Local Middle Schools To Work with NASA on Shuttle Mission

'KIDSAT' Program Gives Kids a Shot at Atlantis photos via Internet

Two Peninsula middle schools will take part in a NASA mission in which students using the Internet can call down photos shot by the space shuttle Atlantis as it orbits Earth in a flight planned for January.

Crittenden Middle School in Newport News and Yorktown Middle School in York County have been selected to participate in the KidSat program, which involves 15 schools around the country that are near agency field centers.



NASA Photo Illustration

The KidSat camera, which takes images digitally, will be located in the crew cabin of the space shuttle Atlantis, shooting from the window just below the cabin windows near the top of the photo.

"It's an exciting way to learn because KidSat combines classroom work with an actual NASA mission in real time," said Dr. Shelley Canright, Langley's precollege officer.

"Students will choose a subject they want to study, such as rain forest burning or river pollution, and analyze shuttle photos of that region as part of their research," said Canright, who is coordinating the project with the Peninsula schools.

Students already are setting up Student Mission

(see KIDSAT, page 4)

Colloquium Communiqué

Perpetual Mystery of Mars Finds New Life

Meteorites from Mars May Hold Clues to Possible Ancient Life on Red Planet

Dr. Marilyn Lindstrom, a planetary scientist at the NASA Johnson Space Center, curator of the U.S. Antarctic Meteorite Collection and manager of the Meteorite Processing Laboratory, will present Langley's November colloquium lecture, Nov. 12, 2 p.m., at the H. J.E. Reid Conference Center. She will repeat the lecture – titled "Meteorites from Mars and Antarctica: Life on Mars?" – the same evening at 7:30 p.m. at the Virginia Air & Space Center in Hampton.

Lindstrom

In August, NASA Administrator Dan Goldin announced that a meteorite – found in the Antarctic and believed to have come from Mars – exhibited traces of primitive life that may have existed on Mars billions of years ago. This was the first evidence that life may have existed outside the Earth.

This announcement made television, radio, newspaper, and magazine headlines worldwide. As a result of this discovery, President Clinton has organized a world summit this month to consider the possibility of life on Mars and its future exploration.

Lindstrom will discuss the connection between Mars and the Antarctic, the evidence that the meteorite contains traces of early life on Mars and whether we can answer the question, "Is there life on Mars?"

Lindstrom was featured on the recent Discovery Channel special, "Life on Mars?" She received a bachelor's degree in chemistry from the University of California at San Diego and a Ph.D. degree in geochemistry from the University of Oregon.

FYI	
What:	Sigma Series Lecture
When:	Nov. 12, 7:30 p.m.
Where:	Virginia Air & Space Center 600 Settlers Landing Rd. Downtown Hampton
Cost:	Free
Info:	727-0900

Prior to her present position at NASA Johnson Space Center, Lindstrom was a researcher at the University of Maryland and at Washington University in St. Louis. She is editor of the *Antarctic Meteorite Newsletter* and has authored more than 70 scientific papers.

News Briefs

Around the Agency

CASSINI SPACECRAFT READIED FOR "SHAKE AND BAKE" TESTS – NASA's Cassini spacecraft, scheduled for launch to Saturn on Oct. 6, 1997, is being prepared at the Jet Propulsion Laboratory (JPL), Pasadena, Calif., for a series of "shake and bake" tests that imitate the vibration forces and extreme temperatures the spacecraft will have to withstand during its upcoming launch and space flight. The 35-foot-tall Cassini will face enormous speakers that blast the spacecraft with acoustic vibrations like those it will encounter during launch. Engineers will then test the spacecraft's response to random vibrations it may experience during flight. Finally, the spacecraft will be fitted with custom-made thermal blankets and subjected to the extreme hot and cold temperatures it will experience in space. Cassini will reach Saturn in July 2004. An international effort of NASA, the European Space Agency and the Italian Space Agency, the Cassini Program is managed by JPL for NASA's Office of Space Science, Washington, D.C.

NASA TECHNOLOGY TO HELP PILOTS TAXI MORE EFFICIENTLY – Faced with a projected 32 percent increase in air traffic in the United States over the next decade, NASA and the Federal Aviation Administration (FAA) are developing advanced technologies to increase traffic-handling capacity at existing airports. One of those technologies is called the Taxiway Navigation And Situation Awareness (T-NASA) system that will help pilots taxi safely — particularly in low visibility weather conditions. The integrated system was developed as part of NASA's $100 million Terminal Area Productivity (TAP) program and is being tested at NASA's Ames Research Center, Mountain View, CA. T-NASA is a combination of software and navigational devices designed to operate on the aircraft's flight deck. Unlike some of the other air traffic management tools now being tested by NASA and the FAA, T-NASA is not automated, so pilots will continue to manually control taxi maneuvers.

Announcements

Expressions of Thanks

From Patricia Turgeon: "To all my friends in the Acquisition Division: Thanks so much for the lovely, thoughtful cards, notes, phone calls and so many prayers during my recent illness. My outlook has improved a great deal since I've heard from so many friends. God bless you all."

From Wendy Lessard: "My sincere thanks and gratitude go to those who donated leave to me while I was absent from work due to the birth of my daughter."

Blood Drive Reports

Langley's Red Cross Blood Drive reports 249 total donors for September, including 15 first-time donors, according to Karen Ridlon and Joann Schiffer.

Gallon donors and total amounts donated include: 13 gallons – Robert A. Bruce; 12 gallons – Robert S. Davis; 10 gallons – Robert M. Connell Jr., Barry L. Price; 9 gallons – Bruce A. Conway, Edward R. Medford, Ben Wilson Jr., Dennis R. Holloway, Robert J. Wallis; 8 gallons – Raymond C. Scholz; 7 gallons – Jennifer C. Allen, Russell B. Tatum Jr.; 6 gallons – Lee H. Jordan, Gregory M. Buck; 4 gallons – Larry C. Dickinson, Karl I. Maddox; 3 gallons – Marla R. Jackson, Netti A. Orie; 2 gallons – Susan N. McMillin, Harry E. Kyzer; 1 gallon – Charles A. Monroe Jr., Crystal D. Chamberlain, Dewey L. Clemmons.

First-time donors included: Charles B. Johnson, Walter M. Parran, Vaughan D. Behun, Michael R. Sorokach Jr., Yolanda L. Hinton, Yolanda T. Matthews, Daniel L. Barney, David Hutchinson, John W. Lasley, Robert Holt, George E. Hunt II, Erik Vedeler, James T. Berry, Dianne DeTurris, Lawrence J. Brown.

The Office of Occupational Health Services thanks all NASA employees, retirees and contractors who participated in this year's blood drives.

The next blood drive is Nov. 27, 9 a.m. to 3 p.m., in the H. J. E. Reid Conference Center and includes a drawing for free turkeys provided by the American Red Cross. Scheduled 1997 blood drives are scheduled for Jan. 22, March 26, May 28, July 23, Sept. 24 and Nov. 26. For more information, call Karen Ridlon at ext. 43194.

Voluntary Leave Transfer Program

Langley employees donated 7,877 hours of their annual leave last year to help coworkers who were experiencing personal or family emergencies. This year, 2,718 hours of annual leave have been donated.

The Voluntary Leave Transfer program allows employees and their families to handle medical emergencies without experiencing a substantial loss of income due to the unavailability of paid leave. Without the program, many employees could not afford to be with family members when they need to be.

To qualify as a leave recipient, employees must submit an in-house application with medical documentation to the Office of Occupational Health Services (OOHS). Employees experiencing their own medical emergency must have exhausted all of their earned leave and sick leave, and expect to be out for 24 hours or more. If an employee's family member is experiencing a medical emergency, the employee must have exhausted all of their earned annual leave and expect to be out for 24 hours or more. In the latter case, the employee does not have to be out of sick leave.

Once approved, employees can begin receiving donated leave.

To donate leave, fill out an in-house computer leave donation form, found on Informed Manager, which specifies the number of hours to be transferred and the leave recipient.

Only annual leave may be donated. Employees cannot donate leave to their immediate supervisor or donate more than half of the total annual leave that they accrue during the leave year. They also cannot donate more "use-or-lose" annual leave than there are hours left in the leave year. On the last day of the leave year, for example, employees may donate only eight hours.

The following Langley employees are approved recipients: **Marilyn K. Aldrich, Jane I. Druen, Patricia G. Reagon, Debra P. Shimek, Janice Y. Smith, Cassandra Stevens, Charles S. Washington.**

Although donations come in throughout the year, many employees donate "use-or-lose" leave from October through December.

For more information, call OOHS at ext. 43191.

In Memoriam
Collis P. Moore Jr.

Collis P. Moore Jr. died Aug. 30. He retired from NASA Langley in 1986 with more than 40 years of service, including 11 years with NACA.

Disabilities Awareness

Hearing Test, Audio Browsers Only a Telephone Call Away

• An automated hearing exam allows callers to evaluate their hearing over the phone. **Dial-A-Hearing Screening Hearing Test (1-800-222-3277)** connects callers to a computer-operated hearing test. A caller will hear four faint tones, then switch ears to hear the same four tones again. If the caller does not hear all eight tones, he may have a hearing problem and should get a complete examination.

• The Metropolitan Washington Ear offers visually impaired and blind people a touchtone telephone service for browsing through *The Washington Post*, *Time Magazine* and selections from *The Wall Street Journal*. This is a free service to qualified applicants, and MCI provides the toll-free lines. You do not need to be an MCI subscriber to access these lines.

Simple telephone key strokes allow a caller to speed up or slow down the reader's voices, skip and scan from article to article and from paper to paper.

To apply for this service, call the Metropolitan Washington Ear at **301-681-6636**.

Reprinted from the 1996 summer issue of the Hampton Mayor's Committee for People with Disabilities Newsletter.

Announcements

Technical Forum To Begin This Month

A Langley Technical Forum is set for the third Wednesday morning of each month, beginning Nov. 20. The first of the two-hour forums will begin at 10 a.m. in Building 1212, Room 200.

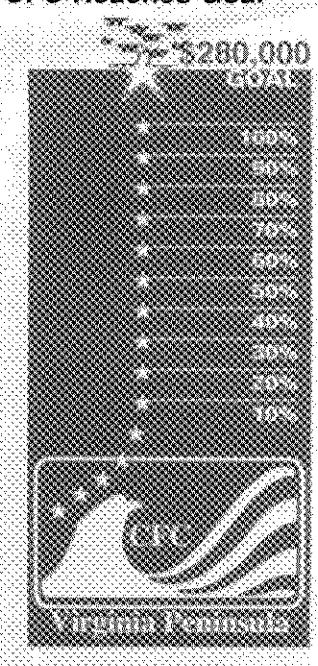
The forum will provide for technical discussions of ongoing research with Langley senior managers and will showcase outstanding research contributions to senior staff, division chiefs, thrust leaders and all other interested employees.

AIAA Outreach Fair Targets Volunteers

The American Institute of Aeronautics and Astronautics (AIAA) Hampton Roads Section Pre-College Education Committee, in cooperation with the Office of Education, will present an Outreach Fair, Nov. 4, 2-6 p.m., in the H.J.E. Reid Conference Center. The fair will present opportunities for volunteers to get involved in a single event or in ongoing activities. It will also feature demonstrations of lessons that can be adapted by volunteers, and outreach materials that can be checked out from the AIAA Education Library and the Public Mail Center.

For more information, contact Geoff Tennille at ext. 45786 or at g.m.tennille@larc.nasa.gov.

CFC Reaches Goal



Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (757) 864-8810, telephone 1 (757) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor. . . . . Keith Henry

Editor. . . . . Mary Graves
Science and Technology Corp.

Assistant Editor. . . . . Jeane Shanks
Science and Technology Corp.

Photographer . . . . . Fred Jones

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

Langley Team Receives 1996 Software of the Year Award

TetrUSS, the Langley-developed Tetrahedral Unstructured Software System, has been selected from among 14 NASA-wide semifinalists as the co-winner of the third NASA Software of the Year Award competition.

The TetrUSS team was presented the award at the Technology 2006 Conference in Anaheim, Calif., Oct. 30. The team members are Dr. Neal Frink from the Transonic/Supersonic Aerodynamics Branch; Dr. Shahyar Pirzadeh of ViGYAN, Inc.; Dr. Paresh Parikh of Paragon Research, Inc. and Dr. Jamshid Samareh of Computer Science Corporation/ GEOLAB.

This award is granted through the Space Act awards program "to individual(s) who develop software to enhance NASA's mission and assist the U.S. aerospace industry in maintaining world-class technology." The other co-winner was LinkWinds from the Jet Propulsion Laboratory.

TetrUSS is an aerodynamic analysis and design system that is widely used throughout U.S. industry, government and universities to study aerodynamics of aircraft, spacecraft, rotorcraft, automobiles, turbomachinery and biomedical applications. The computer codes are based on the innovative tetrahedral unstructured-grid (USG) approach in computational fluid dynamics (CFD) that provides a cost-effective alternative to the widely used structured-grid methodology.

Although the USG technology requires additional computer resources, the primary factors driving its rapid acceptance are its ease of use, and a demonstrated and established reduction in aerodynamic analysis and design cycle time for complex configurations from months to days.

Such capability is critical for today's dwindling workforce, where a decreasing number of engineers are often required to perform a broader range of advanced computational tasks previously relegated to highly skilled specialists.

The primary codes in TetrUSS include:

- the GridTool graphical user interface
- the VGRID tetrahedral grid generator
- the USM3D Euler and Navier-Stokes flow solver
- the VPLOT3D graphical postprocessing code.

Samareh developed GridTool to bridge the gap between computer-aided design geometries and the surface definitions required by VGRID. It has provided many spinoff benefits to the structured grid generation community.

Both VGRID and VPLOT3D grew out of a Small Business Innovation Research (SBIR) effort by ViGYAN, Inc., completed in 1990, with early contributions also from Prof. Rainald Lohner of George Mason University and Clyde R. Gumbert of the Multidisciplinary Optimization Branch.

Pirzadeh developed several breakthrough extensions to VGRID, resulting in a rapid and user-friendly code that has become the leading tetrahedral grid generator in the U.S., as well as the first ever to generate thin-layered tetrahedra suitable for solving viscous flows.

USM3D began as a doctoral research topic for Frink and has become a primary unstructured flow solver used throughout industry and government.

Parikh has provided several important extensions to VPLOT3D, has implemented various strategies to improve the USM3D flow solver efficiency, and is responsible for a wide variety of "first-of-a-kind" applications of the TetrUSS system. All code development was coordinated from the onset to provide a unified system that is relatively easy to learn and use by non-experts.

TetrUSS is used in the NASA High-Speed Research (HSR) and Advance Subsonic Transport (AST) programs. The system has made a significant impact on two other highly visible problems through direct NASA/Industry interaction: the McDonnell Douglas MD-11 Pylon Redesign effort, and the Pegasus "Return to Flight" program.

This 20-foot wall mural of the Boeing 747-400, designed with TetrUSS software, is part of the new "How Things Fly" exhibit at the Smithsonian National Air and Space Museum in Washington, D.C.

For the MD-11 project, a "Tiger Team" was formed to resolve an outboard pylon flow separation problem on the MD-11 aircraft. A pylon fairing had to be designed, lofted and fabricated to meet a three-month flight-test deadline.

The fairing redesign was completed on time and flight-tested on an MD-11 aircraft. The measured drag reduction that was achieved will provide a considerable savings to the airlines in reduced fuel costs.

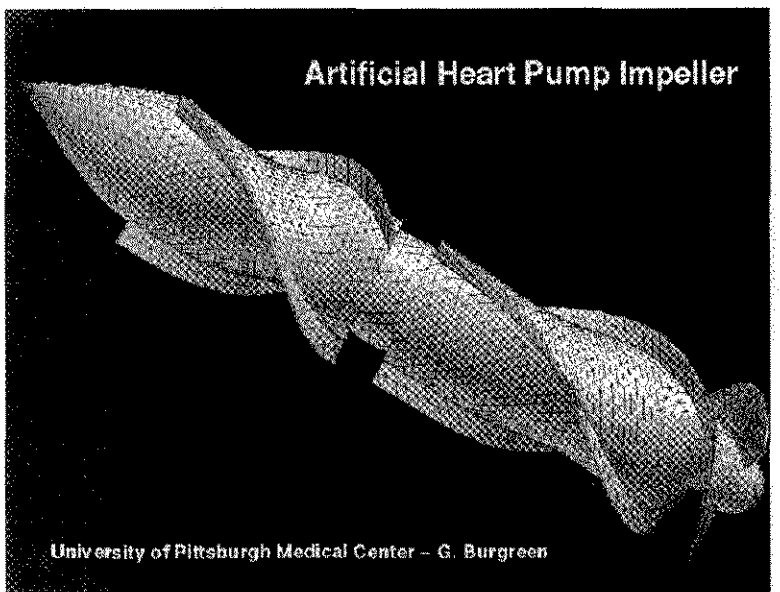
Critical computational analysis was provided to the Pegasus XL "Return to Flight" Team following failure of the first XL vehicle during an attempted launch of an Air Force satellite.

The Pegasus manufacturer, Orbital Sciences Corporation, and NASA sought Langley's help in determining the cause(s) of the failure and in recommending solutions to the Pegasus XL system which would provide a robust launch vehicle for future NASA payloads.

After the cause of the accident was determined and corrected, the improved Pegasus XL system has had three successful launches.

The TetrUSS team has responded to more than 100 formal requests for the software since 1991 from major and minor airframe companies, as well as from their support companies, the automotive industry, NASA and non-NASA government installations and universities. The team has transferred the technology by providing hands-on training for more than 100 users, many of whom have trained others upon returning to their respective companies and organizations.

The team has received NASA Group Achievement Awards, the NASA Exceptional Achievement Medal and the NASA Medal for Public Service. It also contributed to a 20-foot wall mural of the Boeing 747-400 in the new "How Things Fly" exhibit of the Smithsonian National Air and Space Museum in Washington, D.C. (See photo above.)



TetrUSS software was used to analyze the flow around the artificial heart pump impeller by researchers at the University of Pittsburgh Medical Center.

Fitness Classes, Services Strive for Ship-Shape Center

Seven years ago, Langley employees Dr. Michele Macaraeg and Dr. Craig Streett, both nationally certified in personal training and aerobics, began an aerobics class which met in the Center cafeteria. Since then, they have taught more than 500 employees, contractors and their families about the benefits of low-impact exercise.

Many participants in the Langley Activities Association have significantly lowered body fat levels, with improvement in blood pressure, blood sugar, and – most valuable to many of us – lowered stress.

Classes now meet in the Langley Activities Association (LAA) gym every Tuesday and Thursday, from 5 to 6 p.m., and Saturday, from 9:30 to 10:30 a.m. Sessions include step aerobics, circuit training with free weights and elastic tubing, as well as personal training and nutrition counseling.

Macaraeg and Streett have been producing "Shape Up!!" television aerobics classes for Continental Cablevision since 1990. Macaraeg answers calls and letters from viewers about exercise and general fitness.

For more information, call ext. 42295.

On-Site Mammography at Langley

The Riverside mobile mammography unit will be at Langley on the following dates: Nov. 4, 6, 7, 8, 13, 14, 15, 18, 22, 25 and 26. The van will be in the parking area behind the health clinic. Riverside will accept cash, check or credit card for the $75 fee. For any patient wanting billing processed by Riverside (insurance coverage), the price is $97. Insurance carriers will only pay for mammography every 365 days. To schedule an appointment please call 594-2773.

The American Cancer Society guidelines are:

- Baseline mammography to be performed once between ages 35-40.
- Mammography to be done every one to two years from ages 40-50.
- A yearly mammogram is recommended for women age 50 and over.

Mammography at Langley is available to all civil service employees, contractors, retirees and their family members.

Titanica — Back by Popular Demand

Beginning Nov. 21, the powerful 90-minute IMAX film *Titanica* will surface at the center's IMAX theater for an eight-week limited engagement.

The Titanic, the largest and most luxurious ocean-liner ever built, was described as unsinkable. On April 10, 1912, the Titanic left England and traveled to France to pick up additional passengers. The following day, the ship set sail for the Atlantic Ocean. Four days into her maiden voyage, she collided with an iceberg, and sank on April 15; 1,502 people lost their lives. In 1991, a Canadian-American-Russian expedition set out to explore the shipwreck and conduct scientific research. Filmmaker Stephen Lowe wove the modern-day expedition into a dramatic story in what he calls the "first well-lit deep ocean film."

Titanica will be shown Thursday through Sunday at 7:30 p.m. from Nov. 21 through Jan. 23, 1997. Seating is limited. To reserve tickets, call (757) 727-0090, ext. 746.

It's Electric!

Electric Space: Bolts, Jolts and Volts from the Sun, a hands-on traveling exhibit at the Virginia Air & Space Center, runs through Jan. 7. For more information, call 727-0900.

Get IMAXed

Encounter the ultimate film experience presented daily at the VASC.

IMAX, short for image maximum, gives viewers an unparalleled sense of realism and motion as images of awesome power project on a giant five-story screen, enhanced by 16,000 watts of wraparound sound.

IMAX uses the largest film frame in motion picture history — 10 times the size of a conventional 35mm frame and three times larger than the normal 70mm movie frame. Now showing at the center's IMAX theater:

• ***Cosmic Voyage*** — Travel through time and space on a trip of cosmic proportions. This newly-released film takes viewers to the outer limits of the known universe, and then hurls them back to Earth to explore the smallest particles of matter, quarks. Shown Monday through Sunday at 10 and 11 a.m., noon, 2 and 3 p.m.

• ***Fires of Kuwait*** — Feel the heat as viewers witness the victory of the largest international, nonmilitary effort in history. At the end of the Gulf War in 1991, 27 teams from 10 countries battle Earth's worst man-made inferno — 607 blazing oil wells that were set afire as an act of vengeance. Showings are Monday through Friday at 1 p.m. and Saturday and Sunday at 1 and 4 p.m.

• ***Speed*** — Shown only in conjunction with Cosmic Voyage in the double feature. Take a look at the role of speed in man's life from the dawn of time to the farthest reaches of the conceivable future. Learn about the power of imagination with the men who live and breathe speed on the frontier of human capabilities. Presented Thursday through Sunday at 7:30 p.m. through Nov. 20.

Admission prices are $5.50 for adults and $4.50 for NASA, military, seniors and children ages 3 to 11.

The Virginia Air and Space Center is located at 600 Settler's Landing Rd. in downtown Hampton, and is open Monday through Sunday from 10 a.m. to 5 p.m. An evening double feature is presented Thursday through Sunday at 7:30 p.m.

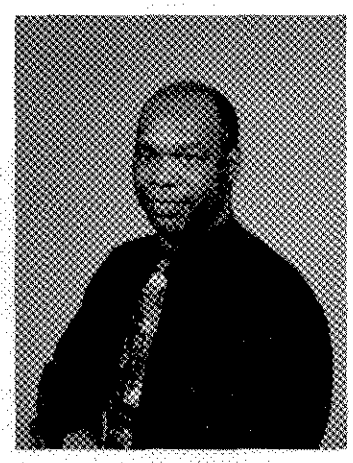
For more information, call 727-0900.

Super Space

The Virginia Air & Space Center presents *Sunspots and Weather*, *Magnetic Magic* and *A Magnetic Wonder Box* – "super space demonstrations" in conjunction with the hands-on exhibit *Electric Space: Bolts, Jolts & Volts from the Sun* and the new IMAX film *Cosmic Voyage*. These educational activities are available every Saturday and Sunday, 11 a.m. to 4 p.m. For more information, call 727-0900.

Army Research Laboratory Gives Langston Technical Support Award

BY ANN C. GAUDREAUX



Chester W. Langston

The U.S. Army Research Laboratory Vehicle Structures Directorate has given Chester W. Langston the 1996 Electronics Technical Support Award for his work in Langley's Transonic Dynamics Tunnel (TDT). Langston is an Army employee assigned to the Loads and Dynamics Division and the Aeroelasticity Branch at Langley.

Nominated by Danny Hoad, Vehicle Structures Directorate, Langston is cited for being "directly responsible for the successful operation of the electronic systems supporting the highly productive rotorcraft testbeds in Langley's TDT over the past 15 years, but most recently in a series of successful tests of the Wing and Rotor Testing System and the Aeroelastic Rotor Experimental System in the TDT."

Present Day Duties

Langston currently supports two research teams in the TDT, the Tiltrotor Aeroelasticity and Loads Program and the Helicopter Rotor Loads Program. He assists research personnel with technical, electronic and operational support for the rotorcraft dynamics research that is conducted in both the Helicopter Hover Facility and the TDT. He maintains two major research systems, the Aeroelastic Rotor Experimental System, a helicopter system testbed, and the Wing and Rotor Aeroelastic testing system, a tiltrotor system testbed. Langston is also responsible for the design, fabrication, documentation and implementation of special purpose electronic/digital systems to meet the unique needs for dynamic testing in the TDT.

Past and Future Accomplishments

Langston began his service with the Army at Langley in September 1981. He earned a degree in electrical engineering technology from Old Dominion University, and is currently pursuing a bachelor of science degree in electrical engineering from Hampton University. He will graduate in May 1997.

His past awards include the 1996 Director's Technical Support Award for exceptional achievement in support of the Army/NASA mission and goals and the Army Special Commendation for ARES II Electronic Control System in 1992. Langston has been a co-author on three formal publications as part of the research team in the TDT during the past 15 years.

KIDSAT

(continued from page 1)

Operations Centers that will be linked with STS-81, the 81st shuttle flight. The nine-day mission is scheduled for launch Jan. 12 from NASA Kennedy Space Center in Florida and will include a docking with the Russian space station Mir.

KidSat Point of View

KidSat's primary objective is to give middle school students a chance to observe Earth from space while conducting scientific inquiries based on their classroom studies. NASA is providing $1 million annually to the three-year pilot project. The project is run by the University of California-San Diego, the Johns Hopkins University Institute for the Academic Advancement of Youth in Baltimore and the Jet Propulsion Laboratory in Pasadena, Calif.

The program aims to inspire children to pursue careers in math, engineering, science and liberal arts. Engineers are expected to be in particular demand, with a predicted 26-percent increase in the need for professionals in that field by 2005.

Mission Control

Students will receive preliminary mission information about three months before launch. Using that information and a special curriculum provided by program sponsors, students will perform the mission planning needed to prepare photo requests.

The images will be taken by a KidSat camera in the Atlantis crew cabin and made available only if students correctly follow mission protocols and issue the proper commands over the Internet.

Student planning involves determining the longitude and latitude of the area they want photographed, as well as the exact time the shuttle flies over it.

Before and during the mission, evaluations, verifications, orbital updates, weather information and other data will be provided to the students over the Internet. The information will help students not only plan their project but also adjust to the changes that inevitably occur in shuttle missions.

Commanding the Camera

During the shuttle flight, students' image requests for each orbit segment will be compiled into a single camera control file, and uplinked to a laptop computer on the spacecraft. The computer will be connected to a digital camera, that will automatically be commanded by the laptop to snap the photos at times predetermined by students. After the images are taken, they will be downlinked and sent to students over the Internet.

Each step in the process is critical because, without the proper protocols, NASA will not allow the uplink or downlink of the control file. The students will not be given special privileges and must meet NASA's mission operations standards.

STS-81 is the second KidSat mission. The first, in March, involved one middle school in South Carolina and two in California. In that mission, STS-76, the space shuttle Atlantis, took more than 300 photos during 10 days.

Teachers should note that space in the KidSat program is extremely limited and that various technical requirements must be met before a school can be considered for participation in the program.

Three Langley Employees Share in American Helicopter Society Award

Casey L. Burley

Dr. Thomas F. Brooks

John S. Preisser

Three members of Langley's Aeroacoustics Branch shared in an international award granted by the American Helicopter Society (AHS) at its Annual Forum and Technology Display in Washington, D.C., this past summer.

John S. Preisser, Dr. Thomas F. Brooks and Casey L. Burley were co-recipients of the AHS Gruppo Augusta International Fellowship Award, along with personnel of the German DLR, the French ONERA (the French and German government aerospace agencies), German-Dutch Wind Tunnel (DNW) and the U.S. Army Aeroflightdynamics Directorate.

The award was given "For the significant contributions, and for the international collaboration to meet the basic technology needs of the Higher Harmonic Control Aeroacoustic Rotor Test (HART)."

What is HART?

HART was an analytical and experimental effort aimed at gaining a more fundamental understanding of blade/vortex interaction (BVI) noise to guide code development; and quantifying the noise and vibration reduction benefits of rotor higher harmonic control.

BVI is perceived as highly annoying and occurs when rotor blades encounter wakes shed by previous blades. HHC places higher order blade pitch variations on the normal one-per-revolution blade pitch cycle, thereby affecting wake strength and path, and altering the BVI encounter and the noise produced.

The HART Test

The centerpiece of the HART program was a 22-day test in Spring 1994 in the DNW Wind Tunnel, Netherlands. The test rotor was a 40 percent geometrically- and aeroacoustically-scaled model of a BO-105 main rotor. Simultaneous acoustic and blade surface pressure measurements were made.

Flow visualization measurements included laser light sheet to determine wake vortex trajectories; laser doppler velocimetry to measure vortex strength and core size; and a target attitude system in real time to measure blade tip position.

Prior to the test, DLR, ONERA, the U.S. Army and NASA performed BVI noise predictions using each organizations' internal codes. Post-test predictions were also made using, in some cases, modified codes based on test results.

HART Results

Overall program accomplishments and new insights created were: Leveraged resources in a cooperative program provide the most cost-effective way to advance technology; the physical understanding of the BVI phenomena was greatly improved; and the comprehensive database provides the most complete set of data to date for guiding development of BVI noise prediction.

During the HART program, Preisser served on the management team; Brooks and Burley served on the noise prediction team. The three brought 60 years of combined experience to the project. A follow-on HART-2 test, aimed at improving rotor airload prediction and hence, noise prediction, through detailed wake geometry and structure measurements, is under consideration by the same international team.

TOPEX/POSEIDON Helps Marine Biologists Study Whales

Marine biologists aboard a ship in the Gulf of Mexico are using maps of ocean currents produced with data from the ocean-observing satellite TOPEX/POSEIDON to help them locate and count sperm whales and dolphins.

The TOPEX/POSEIDON altimeter data, combined with information from the European Space Agency's ERS-2 satellite, are being used in near-real-time to generate circulation feature maps that will be faxed to scientists aboard the research ship R/V Gyre. These maps provide scientists with timely information about rapidly changing ocean features so that scientists can direct the ship toward those areas to determine if whales and dolphins are there.

The University of Colorado is generating the ocean maps and sending them directly to the scientists in the Gulf. "The data from TOPEX/POSEIDON and ERS-2 greatly enhances our ability to identify and map circulation features as they occur in the Gulf," said Dr. Robert Leben, a co-principal investigator from the university.

The R/V Gyre surveyed the northeastern Gulf of Mexico until Oct. 28. The goal of the cruise is to make a visual and acoustic census of marine mammals, and to define their biological habitat in the northeastern Gulf.

The TOPEX/POSEIDON satellite was developed to study global ocean circulation but it is providing unexpected benefits for marine biologists.

The TOPEX/POSEIDON satellite uses an altimeter to bounce radar signals off the ocean's surface to get precise measurements of the distance between the satellite and the sea surface. Using data from the satellites combined with measurements from other instruments, scientists can produce a complete map of global ocean topography every 10 days.

TOPEX/POSEIDON is a joint mission of NASA and the French Space Agency, Centre National d'Etudes Spatiales.

From the NASA Administrator:

NASA Administrator Daniel Goldin recently released the following statement of agency policy on nondiscrimination and nonharassment in the workplace.

I am personally committed to achieving and ensuring a workplace that is free of discriminatory treatment and harassment on the basis of race, sex, ethnicity, sexual orientation, color, religion, age, disability or any other nonmerit-based factor. My personal commitment to diversity, equality and nondiscrimination is long-standing and nonnegotiable.

All NASA managers and employees have a responsibility to uphold this policy. Each employee must be personally accountable for his or her performance in ensuring and promoting equal opportunity principles and in recognizing diversity as a source of strength for NASA. Moreover, managers and employees alike must work together to ensure a workplace free from any form of discrimination or sexual harassment.

Both discrimination and harassment are violations of the law as well as the policies of this Agency. If you feel you have been the victim of discrimination or harassment, there are a variety of remedies available for redress, based upon the specific facts of the particular incident. Contact your supervisor, local equal employment opportunity office, local union representative or servicing personnel office for assistance.

To assist with compliance, the personnel, equal employment opportunity and legal staffs will continue to educate employees about NASA's nondiscrimination policy and inform them about the various procedures available to safeguard their rights.

However, our commitment must go far beyond mere compliance with the law. I am requesting the support of all managers in welcoming responsibility for nurturing and capitalizing on the very best that every employee has to give. I am also asking all employees to understand that a diverse workplace means a better NASA.

Langley Receives 1996 Employer of the Year Award from PCIL

NASA Langley Research Center was selected to receive Insight Enterprises, Inc., Peninsula Center for Independent Living's Employer of the Year Award, given for the Center's outstanding efforts in the employment of persons with disabilities.

The citation reads: "NASA Langley Research Center — Given in recognition of efforts to increase the employment of persons with disabilities and the establishment of a positive interface between the business and disability communities."

In a letter to Diane Forrest, Langley's program coordinator for individuals with disabilities and disabled veterans, Executive Director Ralph Shelman wrote, "It is our feeling that NASA Langley is one of the leaders in the employment of people with disabilities."

Forrest attended the Oct. 21 awards ceremony at the Radisson Hotel, Hampton, where she accepted a plaque on behalf of the Center.

Discounted Tickets Available to Area Attractions at Exchange Shop

The NASA Langley Exchange Shop sells discounted tickets to AMC movie theaters, Regal Cinemas (Kiln Creek), Colonial Williamsburg, Jamestown-Yorktown, NAUTICUS, the Virginia Air & Space Center (VASC) and the VASC's IMAX theater.

The shop also sells Magic Kingdom Club cards and Universal Studios Fan Club cards for those venturing to Orlando, Florida.

Shop hours are 7:30 a.m. to 2 p.m., Monday through Friday. For information, call ext. 41585.

AdVentures

FOR SALE: Denbigh home, 2 BR, 1.5 baths, all appliances, ceiling fans, carport. $6,000 down, assume at 7.5 percent, $505/mo with 12.5 years left. Call 874-6697.

FOR SALE: Two vouchers for Hawaiian Airlines (reservations not mandatory) before Dec. 31. Good for one-way travel between any of the islands. $50 each or best offer. Call 827-4857.

FOR SALE: 1993 Yamaha 535 motorcycle; 3,000 miles; two helmets, rainsuit, saddlebags. $3,000. Call 851-1990.

FOR SALE: Poquoson brick rancher; 3 BR; 2 baths; family room with fireplace; eat-in-kitchen; central air/gas heat; workshop; large wooded lot; deck. $121,900. Call 868-8817.

FOR SALE: Oriental wool rug, 11' x 17', cream with blue and pink floral pattern. $500. Call 247-5144 before 9 p.m.

FOR SALE: Waterfront home, Hampton; concrete bulkhead; deck; fireplace; jacuzzi; hardwood and ceramic tile floors; cedar paneling; detached garage. $149,900. Call 851-4126.

VOLUNTEERS NEEDED for Response Peninsula, a sexual assault crisis center, to answer hotline; to accompany victims to area hospitals, police, courts; to educate community. Training provided. Call Carolyn at 838-1829.

THE VIRGINIA CHORAL SOCIETY invites you to "Swing into the 30s and 40s" with Opus II and special guest Dick Crist and the Sounds of Swing. The concert will include music of Duke Ellington, George Gershwin, and Glenn Miller. The concert will be performed in Hampton on Friday, Nov. 1 at 8 p.m. in Ogden Hall, Hampton Univ.; in Portsmouth on Saturday, Nov. 2 at 8 p.m. in Willet Hall; and in Williamsburg on Sunday, Nov. 3 at 3 p.m. in James Blair Middle School. Tickets are $7 for adults, $5 for students and seniors. For more information call (757) 851-9114.

ULTIMATE FRISBEE games held twice weekly, coed, all levels of players, possibly for local tournaments. For more information, send e-mail to jrrjr@icase.edu.

CLASSICAL GUITAR: The Tidewater Classical Guitar Society will open the season with a concert by the Cavalier Consort on Nov. 2, at the Williamsburg Regional Library Arts Center, 515 Scotland St. A "Meet the Artist" reception will follow the concert. Tickets are $12, $8 student/senior, available at the door. For information or reservations, call 566-3304, or visit our web site at <http://www.widomaker.com/tcgs>.

PENINSULA AREA WRITERS' LUNCHEON and Book Sale will be Sat., Nov. 16 at the Christopher's, Christopher Newport University Student Center, 50 Shoe Lane, Newport News. Book sales by local authors are 10 a.m. until noon, followed by lunch. Featured speaker is Mary Ann Gleason, local mystery writer. For reservations, send a check for $15 made out to "AAUW-Newport News Branch" to AAUW Writers' Luncheon, 200 Harwood Dr., Yorktown, Va. 23692. Fee includes lunch and $5 tax-deductible contribution to American Association of University Women Education Foundation). For information call 898-3556.

FOR SALE: Like new black bunkbed futon. The top is twin, bottom is full, mattresses included, $300. For information call 766-9663 after 7:30 p.m.

TENNIS CLUB: Langley's Tennis Club will hold its annual awards party at the McCormack-Nagelsen Tennis Center in Williamsburg on Sat., Nov. 16 from 7 to 11:30 p.m. Want to participate in a great social and some good doubles tennis play? Call Tom Yager, ext. 41304 or Marco Egoavil, ext. 47247 before Nov. 13.

NASA SKI WEEK VI: The sixth annual agency-wide ski trip will be Jan. 18-25 at Steamboat Springs, Colo. The trip is open to NASA personnel, contractors, retirees and friends and relatives. For information, call Michael Schooley at ext. 48524 or 867-8093.

SKI CLUB: The Peninsula Ski Club meets the second Thursday of the month, 7 p.m., at Days Inn of Oyster Point in Newport News. For more information, call 596-4742.

SKI VAIL: The Peninsula Ski Club is sponsoring a ski trip to Vail, Colo., for Jan. 18-25. For information or reservations, call Bill Hunter at 874-0913.

LANGLEY ACTIVITIES ASSOCIATION will host a Post-Halloween party on Friday, Nov. 1, from 4 to 8 p.m. in the H.J.E. Reid Conference Center. Danny and the Del-Notes will perform.

CRAFT SHOW/SALE: The Junior Women's Club of York is holding its Sixth Annual Craft Show and Sale at Tabb High School Nov. 2 from 9:30 a.m. to 4 p.m. Admission is a monetary donation or canned goods. Proceeds from the event will benefit the York County Food Pantry and other local charities. For more information, call 867-7011.

AIAA YOUNG MEMBERS COMMITTEE is holding an after-work meeting presented by Dr. Charles E. Harris, chief engineer, Materials Division, Nov. 18 at the H.J.E. Reid Conference Center. The topic of this meeting is: Career Path Choices and Opportunities: A Perspective from Someone Who's "Been There, Done That!" Refreshments will be served from 4:30-5 p.m. with the presentation from 5 to 6 p.m. Everyone is invited. For more information, contact Robin Hardy, ext. 47159, r.c.hardy@larc.nasa.gov

LANGLEY KARATE CLUB's classes in Cuong-Nhu martial arts, Mondays and Wednesdays, 5 to 7 p.m., at the Langley gym. All Langley employees and their families (ages 12 and up) welcomed. New students accepted through November for beginner class. For information, call Roy Albang at ext. 46160 or 596-7736, 7 to 10 p.m.

Researcher News

BULK RATE
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Hampton, Virginia 23681-0001
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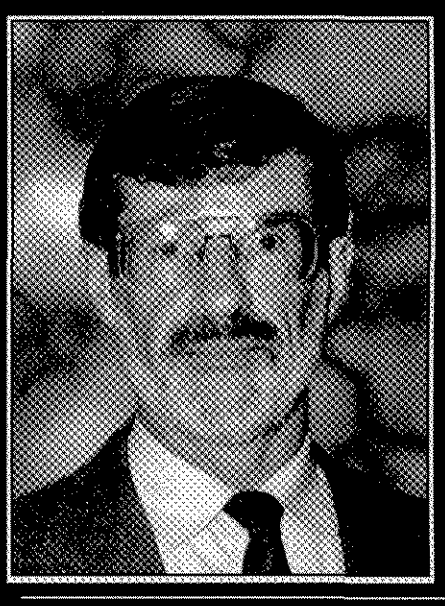


Dr. Jeremiah Creedon

Four sessions have been scheduled to permit as many employees, retirees and contractors as possible to attend. You are invited to come to a specific session based on your last name. If that conflicts with another activity, you are welcome to attend one of the other sessions.*

State of the Center
Shaping the Future

H.J.E. Reid Conference Center • 14 Langley Boulevard

Monday, Nov. 18

1:30 p.m.
A to E

3:00 p.m.
F to K

Tuesday, Nov. 19

8:30 a.m.
L to R

10:00 a.m.
S to Z

**possibility of adding evening session for second shift*

National Aeronautics and
Space Administration
Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 22 ❖ November 15, 1996

NASA Team Finds Urban-Like Pollution in Tropical South Atlantic

A NASA research team has found high concentrations of ozone, comparable to urban pollution levels, in a region of traditionally clean air. The pollution in the tropical South Atlantic has been linked to intense, seasonal biomass burning in South America and Africa, providing convincing evidence that human activities are extending their impact in more diverse ways.

"Most people don't realize that more than 100,000 square miles of vegetation are burned each year in southern Africa, an area larger than that burned in South America," said Dr. Jack Fishman of NASA Langley.

The new research findings are reported today in a special issue of the *Journal of Geophysical Research*. The Transport and Chemistry near the Equator over the Atlantic (TRACE-A) experiment was spearheaded by NASA, the Brazilian Space Agency (INPE) and scientists in South Africa.

"The purpose of our mission," said Fishman, the TRACE-A mission scientist, "was to understand how much each continent contributed to the observed pollution pool and to gain an understanding of the unusual chemistry taking place in the atmosphere so far removed from the origin of the pollution."

According to Fishman, the biomass burning pollutants drift over the tropical South Atlantic Ocean, where the wind pattern traps them. Chemical processes, driven by bright sunlight, then produce a smog similar to what is found in industrialized areas of the world. Eventually, the plumes of ozone and other pollutants produced by those chemical processes extend to the far reaches of the Indian Ocean, with some evidence that traces are seen as far away as Australia.

"As a result of TRACE-A, our understanding of the atmospheric chemistry of the entire Southern Hemisphere is greatly improved," Fishman added. "And we now realize that the composition of the atmosphere in what was once thought to be one of the cleanest regions in the world has also been greatly altered by human activity."

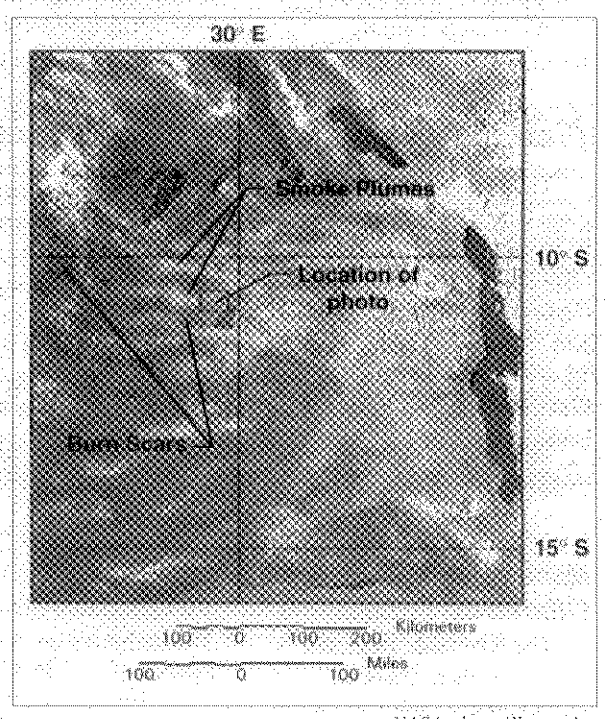
Most of the earth's ozone is found in a layer in the stratosphere, which begins about 20 miles above the surface. It is produced by the interaction of sunlight with oxygen and other gases that occur naturally in the upper atmosphere. The stratospheric ozone layer provides a shield from harmful ultraviolet radiation from the sun. In the lower atmosphere, however, ozone is a toxic gas that has long been known to exist in harmful amounts over highly populated, heavily industrialized regions. Its occurrence in large amounts in remote parts of the atmosphere has been much rarer, however.

More than 300 scientists from 14 nations participated in TRACE-A and its concurrent counterpart, the Southern African Fire-Atmosphere Research Initiative (SAFARI). Their work has shed new light on the impact and extent of human activities on the atmosphere and has provided data that will help to understand the links that may exist between the chemical makeup of the atmosphere and the earth's climate.

The major element of the NASA contribution to TRACE-A was a DC-8 aircraft specially instrumented for sensitive measurements of ozone and the gases that produce it in the atmosphere. The DC-8 could measure a wide variety of trace gases down to the parts per trillion level (one-millionth of a part per million). During TRACE-A, the DC-8 flew more than 70,000 miles, probing the air over South America, southern Africa and the vast expanses of the South Atlantic and Indian oceans. On board the DC-8, a dozen scientists and their support crews from several NASA centers and U.S. universities operated sophisticated instruments, inlcuding airborne lasers to measure ozone and smoke particles above and below the aircraft.

TRACE-A also used an operational satellite to map the large-scale distribution of ozone and biomass burning patterns. In addition, a series of ozonesonde (ozone sensors launched aboard weather balloons) and enhanced weather measurements provided information about the transport of the various trace gases and the physical processes responsible for their observed distributions in the atmosphere. Computer models also were used to integrate the results and to help to interpret them.

Additional information and figures for TRACE-A and NASA's Global Tropospheric Experiment are accessible through the internet at http://asd-www.larc.nasa.gov/lidar/lidar.html.



NASA photo illustration

Langley scientists used a variety of satellites to study the biomass burning that occurs in southern Africa during the dry season. In the above figure, old burn scars are evident, as are smoke plumes from current fires. The data in this figure came from the Advanced Very High Resolution Radiometer (AVHRR) instrument aboard the NOAA 11 satellite.

NASA's Dailey, Whitehead Visit Langley To Discuss Agency's 'Strategic Management System'

NASA's acting deputy administrator, Gen. John R. Dailey, has been visiting each center during October and November to discuss the NASA Strategic Plan and the Strategic Management System of which it is a part.

Dailey and the associate administrator of aeronautics, Dr. Robert Whitehead, will address center employees Nov. 21, 10 a.m. to noon, in the H.J.E. Reid Conference Center. The briefing also will be broadcast here on Channel 9. Employees may call in questions at ext. 46380 and 46364.

The Dailey/Whitehead visit aims to encourage each employee to read the NASA Strategic Plan and to understand his specific contributions to agency and enterprise goals.

In addition, Langley Center Director Jeremiah F. Creedon will describe how each Langley employee is tied to agency and enterprise goals through Langley's Strategic and Quality Framework (SQF). Creedon will introduce the center's SQF as part of his State of the Center address Nov. 18 and 19.

Colloquium Communiqué

U.S. Air Force Aircraft To Meet Challenges of 21st Century

Dr. Richard G. Bradley, development deputy for Lockheed Martin Systems Development Center, will deliver Langley's December colloquium lecture, Dec. 3, 2 p.m., at the H.J.E. Reid Conference Center. He will repeat the lecture – titled "New World Vistas; U.S. Air Force Aircraft Vision for the 21st Century" – the same evening at 7:30 p.m. at the Virginia Air & Space Center in Hampton.

Dr. Richard G. Bradley

Bradley will present the findings of the Aircraft and Propulsion Panel of the U.S. Scientific Advisory Board, chartered to identify technologies that will guarantee U.S. air and space superiority in the 21st century. The U.S. secretary of the Air Force and the chief of staff directed the board to conduct the review as part of the New World Vistas Study. The research produced 15 volumes that probe the technological future of the Air Force. Bradley will discuss envisioned air vehicle concepts and a survey of the required technologies.

Bradley earned bachelor's, master's and Ph.D. degrees in aerospace engineering from the Georgia Institute of Technology. He has been associated with Lockheed Martin Tactical Aircraft Systems since 1954.

Bradley's technical experience encompasses a broad range of flight-related aeronautical disciplines, especially design applications.

Bradley has served as director of General Dynamics' Flight Sciences Department, which encompasses aerodynamics, flight mechanics, stability and control, flight control systems, propulsion, thermodynamics, computational fluid dynamics, signature integration, wind tunnel model testing and flight testing.

Bradley is a fellow in the American Institute of Aeronautics and Astronautics (AIAA) and serves on the editorial board for the Progress in Astronautics and Aeronautics Series. He has served on the AIAA Fluid Dynamics and Applied Aerodynamics technical committees, as an AIAA Distinguished Lecturer and as members of NASA's Aeronautics Advisory Committee and of the Advisory Group for Aerospace Research and Development (AGARD) Fluid Dynamics Panel.

FYI

What: Sigma Series Lecture "New World Vistas: U.S. Air Force Aircraft Vision for the 21st Century" Followed by IMAX film *To Fly*

When: Dec. 3, 7:30 p.m.

Where: Virginia Air & Space Center 600 Settlers Landing Rd. Downtown Hampton

Cost: (for film) NASA and contractor employees and family, with ID, $4.50

Info: 727-0900

News Briefs

Astronauts To Sign Donor Cards in Space

The urgent need for organ and tissue donation will receive international attention as STS-80 astronauts sign donor cards in orbit aboard space shuttle Columbia scheduled to launch today.

Astronauts Tammy Jernigan and Tom Jones are signing the cards to underscore the continuing shortage of solid organs and tissue in this country. More than 49,000 people are on the national waiting list to receive organs. Some 3,000 will die every year because suitable organs are not available to them.

The donor card signing will be broadcast live via NASA-TV. The exact time of the signing was not available at press time but will be available via the Internet on the shuttle web site at URL: http://shuttle.nasa.gov/

(see DONOR, page 5)

Family Channel To Air 'Apollo 11' TV Movie

The Family Channel, a Virginia Beach-based cable television network, will present "Apollo 11" as a "FAM Sunday Night Movie Event," Nov. 17, 7 p.m., Nov. 30, 8 p.m., and Dec. 15, 9 p.m. This new dramatic film relates America's first moon landing and the lives of the space mission's three astronauts.

"Apollo 11" journeys step-by-step to the lunar landing of July 20, 1969, starting with the project's go-ahead from NASA. Apollo11 astronaut Edwin E. "Buzz" Aldrin Jr. served as a technical consultant for the production. Aldrin and fellow astronauts Neil Armstrong and Michael Collins guided the historic mission to the moon.

In an unprecedented move for film or television, NASA allowed the "Apollo 11" cast and crew to film at the original Mission Control Center at the Johnson Space Center in Houston, Texas.

Virginia Air & Space Center Offers Holiday Science Camps

During the December holiday hustle and bustle, parents can take a breather as their kids learn the marvels of air, space and technology at one of the Virginia Air & Space Center's Holiday Science Camps. Camps are appropriate for ages 7 to 12 and include one or more IMAX films and tours of the museum.

VIRGINIA AIR & SPACE CENTER

• ***Aliens 'R' Awesome*** – Dec. 7 or 21, 9 a.m.-3 p.m. Covers the space environment and the effects of extremely cold temperatures in outer space.

• ***Chilly Willy Space Camp*** – Dec. 14 or 28, 10 a.m.-3 p.m. Covers microgravity, super-cold temperatures, low atmospheric pressures and liquid nitrogen demonstrations.

• ***Astroblast Science Camp*** – Dec. 26 and 27; 30 and 31, 9 a.m.-3 p.m. Covers the Apollo 12 command capsule, living and working in the space environment and a model space colony.

For more information, call 727-0990, ext. 780.

Announcements

Mammography Services Offered on Center

The Riverside Regional Medical Center's mobile mammography unit will visit NASA Langley on Nov. 15, 18, 22, 25 and 26. To schedule an appointment, call 594-2773. Mammography at the center is available to all civil service, contractors, retirees and their family members. For more information, call ext. 43191.

Technical Forum Agenda Set

The Langley Technical Forums are scheduled for the third Wednesday of each month. The November and December forums will be held 10 a.m.-noon, in Building 1212, Room 200.

The presentations for the Nov. 20 session include:

• Mars Pathfinder Entry Analysis – R.D. Braun, R.W. Powell, E.C. Engelund, P.A. Gnoffo, K. J. Weilmuenster, and R. A. Mitcheltree

• Planetary Entry Aerothermodynamics – R.A. Mitcheltree

• Active Vertical Tail Buffeting Alleviation on an F-18 Wind-Tunnel Model – R.W. Moses

• NASA Langley's Formal Methods Program – R.W. Butler

• Contrail Effects on the Earth Radiation Budget – P. Minnis

The Dec.18 sessions include:

• ANSER Flight Tests – D.G. Murri

• Uninhabited Combat Air Vehicles (UCAV): A Revolution in Military Aircraft – T.M. Moul

• Laser Frequency Control Using an Optical Resonator Locked to an Electronic Oscillator – S.P. Sandford, C.W. Antill

• Boundary Layer Transition Detection at NTF Using Temperature Sensitive Paint – M. Mitchell, L.R. Owens

• Integrated Materials Technologies for Advanced Spacecraft – E.R. Long Jr.

LAA To Offer 1997 Employees Almanac

The LAA office is accepting orders for the 1997 Federal Employees Almanac. This complete guide to the current rules that govern your rights, benefits and pay includes hundreds of tables, statistics and explanations vital to the worklife and future of federal employees.

To receive a discount off the $11.95 regular price per book, order the almanac through the Langley Activities Association for $8.65 before Jan. 6. To order, call ext. 46369, leaving your name (with spelling), mail stop and ext. number; come to the LAA office in Building 1222; order by e-mail at r.s.welty@larc.nasa.gov; or write to LAA, Mail Stop 496. Make checks payable to NASA Langley Activities Association.

Great American Smokeout

Sponsored by the American Cancer Society, the annual Great American Smokeout – Nov. 21 – aims to encourage smokers to quit smoking for just 24 hours.

The Langley clinic will provide "Survival Kits" for those smokers trying to quit. Look for information and clinic personnel during lunch times in the center cafeteria on Nov. 20 and 21. For more information, call ext. 43193.

New Area Code for JSC

Johnson Space Center's area code has changed from 713 to 281. A transitional period began Nov. 2 and will extend through May 2, 1997. During this time, long distance calls to JSC numbers can be made using either the 713 or 281 area code. Beginning May 3, calls to JSC must use the new 281 area code.

Blood Drives Set

The next Langley blood drive is Nov. 27, 9 a.m. to 3 p.m., in the H.J.E. Reid Conference Center and includes a drawing for free turkeys provided by the American Red Cross.

Blood drives scheduled for 1997 include Jan. 22, March 26, May 28, July 23, Sept. 24 and Nov. 26. For more information, call the Office of Occupational Health at ext. 43191.

Learning Center Offers Networking Series

The Learning Center will broadcast the "Networking" series over Langley TV's Channel 16. Seating for the broadcast is also available in Building 1194A, Room 203/204, and tapes will be available in the Learning Center after the broadcasts.

The final two installments of the six-part series follow:

• **Internetworking and Transport Services**, Nov. 18, 1-2 p.m.

This program explains the working mechanisms and the relationships between the transport, internetworking and subnetwork layers in a network architecture.

• **Applications**, Nov. 19, 1-2 p.m.

This program imparts a basic introduction to commonly used applications.

Mason Receives Award

Angela Mason, of Langley's Structural Dynamics Branch, was named overall Professional Woman of the Year by the Hampton campus of Commonwealth College and Alpha Beta Gamma at an awards ceremony in October. The award is presented for "superior leadership abilities and commitment to community service."

Relocation Form 41 Means Accurate Information, Services

Employees who are relocating from one building to another, or from one room to another within the same building, need to fill out Langley Form 41, located on page 142 in the Langley Telephone Directory. Completion of this form is necessary to ensure current information for the Langley telephone directory, personnel and emergency locator files, mail service, space utilization, security and communications systems. Submit the completed form to Mail Stop 446.

Clarification

The KidSat project (*Researcher News*, Nov. 1) is coordinated through NASA Langley's Office of Education with support from the Virginia Space Grant Consortium.

In Memory of Harry M. Webb Jr.

NASA Langley employee Harry Mansfield Webb Jr., 41, of Newport News, died Oct. 20 at Riverside Regional Medical Center.

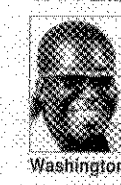
Webb served Langley as a computer specialist for 18 years. He began his NASA career in the Management Support Division and transferred to the Information Systems and Services Division.

Webb received this year's NASA Equal Employment Opportunity Medal for outstanding achievement in the application of advanced information technologies in support of NASA's Equal Employment Opportunity Program. He also received numerous superior achievement awards at NASA.

In Memory of Charles S. Washington

Charles S. "Chuck" Washington, 35, a NASA Langley electronics technician in the Electronics Technology Branch, died Nov. 4 at Sentara Norfolk General Hospital.

The Hampton native was a 1994 Langley apprentice graduate and held an associate's degree in electronics. He had worked at the center for seven years.


Washington

"Chuck was highly regarded by those with whom he worked. He provided excellent technical support during the design, development, fabrication and installation of electronic instrumentation and hardware for the center's research facilities," said Washington's supervisor, Peggy Harmon, head of the Electronic Instrumentation Development Section.

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (757) 864-8810, telephone 1 (757) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor ..... Keith Henry

Editor ..... Mary Graves
Science and Technology Corp.

Assistant Editor ..... Jeane Shanks
Science and Technology Corp.

Photographer ..... Fred Jones

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

LoFLYTE Wins 'Best of What's New'

NASA Langley's "LoFLYTE," an experimental aircraft flight control system that learns as it flies, has been honored as one of the best technology developments of 1996.

Developed for NASA and the U.S. Air Force, the computerized flight control system has been installed on an 8-foot-4-inch unpiloted aircraft called LoFLYTE being prepared for flight demonstrations with the support of NASA Dryden Flight Research Center in Edwards, Calif.

The "LoFLYTE hypersonic waverider aircraft" was named as one of the 100 "Best of What's New" in the annual *Popular Science* magazine competition of the same name.

Winners were announced Nov. 12 at an exhibition in New York City's Central Park and will be featured in the magazine's December issue.

Individuals and organizations cited for their work with LoFLYTE are Langley's James L. Hunt, Dr. Kervyn Mach of Wright Laboratory and Bob Pap of Accurate Automation.

Accurate Automation Corporation in Chatanooga, Tenn., developed the jet-powered aircraft for NASA and the Air Force. Technologies being implemented in the program could eventually find their way into commercial, general aviation and military aircraft.

The experimental LoFLYTE aircraft will explore new flight control techniques involving neural networks, which allow the aircraft control system to learn by mimicking the pilot, as reported in the Aug. 9 issue of the *Researcher News*.

The remotely piloted aircraft has been designed to demonstrate that neural network flight controls are superior to conventional flight controls. Neural networks are computer systems that actually learn by doing. The computer network consists of many interconnected control systems, or nodes, similar to neurons in the brain. Each node assigns a value to the input from each of its counterparts. As these values are changed, the network can adjust the way it responds.

The LoFLYTE aircraft's flight controller is a network of multiple-instruction, multiple-data neural chips. The network will continually alter the aircraft's control laws in order to optimize flight performance. Neural networks would help pilots fly in quick-decision situations and would help damaged aircraft land safely.

The program contracts are administered through NASA Langley and the Air Force Wright Laboratory in Dayton, Ohio, under the Small Business Innovative Research program.

Boeing's Washington Representative Visits Center To Discuss '96 Election

BY LEE RICH

Robert Vilhauer, Boeing's senior Washington lobbyist for aeronautics, will visit Langley on Nov. 22, 1 p.m., in the Pearl Young Theater, to present an analysis of the likely effects of the 1996 election on NASA and the aerospace industry.

Changes in Washington that Vilhauer may discuss include: Sen. Larry Pressler (R-SD) – chairman of the Commerce, Science and Transportation Committee, member of the Science, Technology and Space Subcommittee and staunch supporter of NASA's Mission to Planet Earth – was defeated; House Science Committee Chairman Robert S. Walker did not seek re-election.

NASA Langley and the Hampton Roads Section of American Institute of Aeronautics and Astronautics are sponsoring Vilhauer's visit. Employees may charge time to JO A5266. For more information, call Lee Rich at ext. 46529.

Occupational Health Services Office Offers Varied Employee Programs

The Office of Occupational Health Services (OOHS) administers several leave programs for Langley civil service employees. Listed below are overviews and points of contact for these programs, as well as for other OOHS services.

▲ Federal Employees Family-Friendly Leave Act

The FEFFLA expands the use of sick leave by permitting all full-time and part-time employees to use a portion of their sick leave per leave year for family care and bereavement, in addition to personal sick leave.

Full-time employees may use up to 40 hours (five days) of sick leave each leave year for family care, to make arrangements necessitated by the death of a family member or to attend the funeral of a family member.

Full-time employees may use an additional 64 hours (eight days), as long as a balance of 80 hours of sick leave remains in the sick leave account.

This brings the total amount of sick leave available for family care and bereavement to a maximum of 104 hours or 13 work days per year for full-time employees. Part-time employees and employees with uncommon tours of duty are also covered, and the amount of sick leave they may use for these purposes is pro-rated.

At the end of each pay period for every employee that uses sick leave for one of the expanded purposes, time-and-attendance clerks will forward a Sick Leave Use Form (Langley Form 13) to OOHS, Mail Stop 293.

▲ Optical Dispensary

For dispensing of safety glasses, call Elaine Bartnikowski at ext. 43211, Tuesdays, 8 a.m. until noon.

▲ Family and Medical Leave Act

The FMLA provides federal employees with entitlement to 12 administrative workweeks of unpaid leave during any 12-month period for the following purposes:

- The birth and care of a child of the employee
- The placement of a child with the employee for adoption or foster care
- The care of a spouse, child or parent of the employee who has a serious health condition
- A serious health condition of the employee that makes him unable to perform the essential functions of his position.

▲ Advance Sick Leave Requests

Sick leave may be advanced for an employee's serious disability or illness when he has exhausted available sick leave. Requests for advanced sick leave are to be made to the head of the Office of Occupational Health Services, Mail Stop 293, on NASA Langley Form 54, and must be substantiated in every case by a medical certificate.

▲ Voluntary Leave Transfer Program:

This program, available to civil services employees who are experiencing personal or family medical emergencies, allows the transfer of an employee's accrued annual leave to another employee who is experiencing a medical emergency.

Leave transfer restrictions follow:

- Employees may not donate annual leave to an immediate supervisor.
- Employees may not donate more than one-half of total annual leave accrued during the leave year in which the donation is made.
- Employees may not donate more "use-or-lose" than there are number of hours left in leave year to work.
- All approved Langley leave recipients are listed in "LaRC This Week."

▲ Langley Health Clinic

For information regarding health maintenance exams and other services provided at the clinic, call ext. 43193 or 43191.

▲ Reach Employee Assistance Program

For confidential assistance or for information about the EAP, call OOHS at ext. 43191 or call the EAP directly at 826-8565 during working hours or at 1-800-950-3434 anytime. The EAP is located in Hampton at Colony Square Office Complex, 2210 Executive Drive, Suite C.

▲ Fitness Center

Located behind the H.J.E. Reid Conference Center, the Fitness Center is open from 6 a.m. to 7 p.m. To become a member, call ext. 46387.

▲ Elder Care and Child Care

The Office of Occupational Health offers a handbook containing elderly care information, tips on finding quality child care and information referrals. To view the handbook, visit Building 1149, 9 a.m. to 3 p.m.

For more information on Workers' Compensation, blood drives, or any of the programs listed above, call the OOHS at ext. 43191/43194/43189, or check the Langley Home Page under "Langley Organizations On-Line."

Disabilities Awareness

Handling Cookware Can Be Hazardous

For those people who suffer reduced grip strength, arthritis or muscle control disorders, cooking can be hazardous. New products designed to make cooking safer and easier for those with impaired grip strength are now available. Soft-handled utensils, wide-rimmed bakeware, and kettles designed for stability are just a few of the helpful new products appearing on the market.

Good Grips, the kitchen utensil line of OXO International in New York, has improved its products' handles. Constructed of a rubber and plastic alloy, the handles are soft, plump and oval-shaped to prevent turning and slipping. They require less effort to grip and spread the pressure evenly over the entire hand. The soft ribbing flexes with finger pressure, adjusting to the user's specific grips further eliminating slippage. The rounded end fits snugly into the palm for an extra power boost.

A flat edge replaces the old thumbhole of the Good Grips kitchen shears. One can lay this flat edge against the countertop and apply pressure from on top, no squeezing required. The joint is spring-loaded to reopen when pressure is released for effortless cutting.

Wilton Industries of Woodridge, Illinois, famous for its cake decorating supplies, offers a new line of insulated muffin tins, baking sheets and pie pans. All items have wide ledges that provide a larger handle area.

Commercial Aluminum Cookware Company of Toledo, Ohio, has devised a round griddle with two loop handles. Cast aluminum construction makes it a bit heavy, but the opposing handle arrangement redistributes the weight and alleviates much of the lifting difficulty inherent with a single-handled skillet.

Excerpted from The Saturday Evening Post, *March/April 1994.*

1996 Combined Federal Campaign Ends; Center Exceeds Goal

Center Director Praises Langley's Generosity

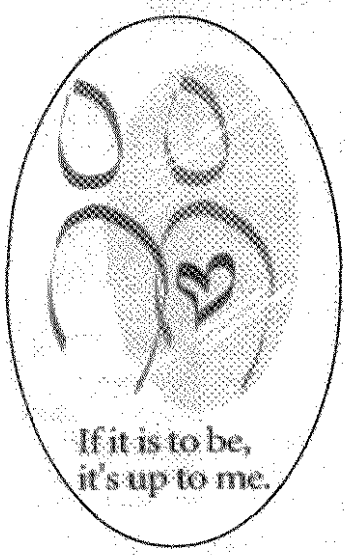
Langley Research Center has done it again. Thanks to your generosity, the center has once again exceeded its goal for the annual Combined Federal Campaign. As of publication time, Langley employees have contributed $302,698.82 for 106.21 percent of goal. Chairman Woodrow Whitlow and his committee deserve our thanks for their efforts on behalf of the CFC.

In addition, I applaud those who contributed electronically for the first time, saving the campaign both money and staff hours. Special thanks go to the Langley team that put our campaign "on the map" by making the brochure and, this year, the pledge card available via the Internet.

Each year, through the CFC, government employees are asked to help those less fortunate than we. Each year, so many of you contribute — in many different ways. You have responded to the theme: *If it is to be, it's up to me.*

Again, I thank you for generously giving your resources and your talents.

Dr. Jeremiah F. Creedon
Director



Langley's CFC Chair Offers Thanks

On behalf of the CFC Committee, I thank the Langley community for your generosity in supporting this year's campaign.

With the help of the CFC Committee, Key Persons and Organizational Coordinators, the campaign to date has received contributions totaling $302,698.82. The average gift this year increased by 15 percent.

This year, we introduced an electronic pledge system, and your response to it has been positive. We appreciate your comments and already are looking at ways to improve the system.

Your response to the campaign shows the generous spirit of the Langley family. Thank you for your generous donations and for your continued leadership in supporting those who are less fortunate.

Woodrow Whitlow Jr.
CFC Chairperson

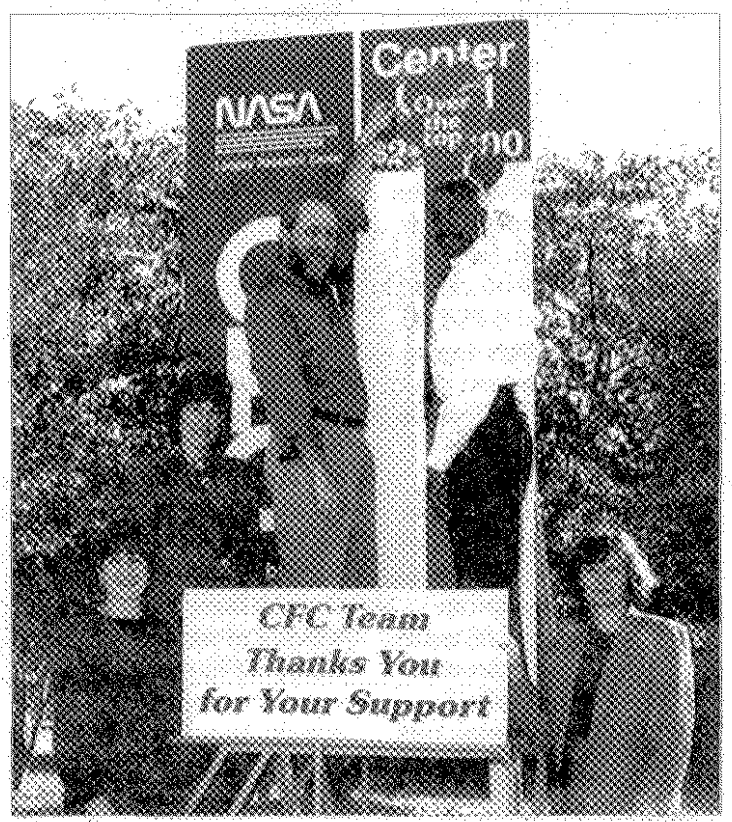


Photo by Peggy Hopkins

OVER THE TOP! The Combined Federal Campaign "thermometer" posted at the NASA Langley front gate provides the proof that this year's CFC campaign at the center was a huge success. Clockwise, CFC committee members Susie Henriksen, Catharine Schauer, Bill Fogle, Chairman Woodrow Whitlow, and Susan Price rally 'round the sign to celebrate the final pledge figure of $302,698.82.

Combined Federal Campaign – NASA Langley Goal $285,000

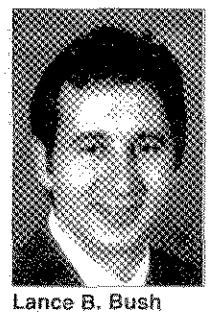
Org. Code	Organization Title	Org. Goal	Total Contribution	Organization Complement	Number of Contributors	Percentage Contributors	Percentage Org. Goal	Percentage Center Goal
	Office of Inspector General	$1,300	$1,317	14	8	57.14	101.31	.46
	U.S. Army Research Lab	$5,400	$6,432.24	68	33	48.53	119.12	2.26
A	Office of the Director	$11,000	$12,204	128	88	68.75	110.95	4.28
B	Airframe Systems Program Office	$11,600	$12,744	55	44	80.00	110.12	4.48
C	Space and Atmospheric Science Program Group	$36,000	$40,308.02	190	142	74.74	111.97	14.14
D	Research and Technology Group	$100,100	$105,455.20	679	444	65.39	105.35	37.00
E	Technology Applications Group	$2,800	$3,368	30	17	56.67	120.29	1.18
G	Internal Operations Group	$104,100	$106,657.70	1,284	769	59.89	102.46	37.42
H	Office of Chief Financial Officer	$5,500	$6,206.66	66	40	60.61	112.85	2.18
I	High-Speed Research Project Office	$2,500	$2,860	18	15	83.33	114.40	1.00
J	Hypersonics Vehicles Office	$2,400	$2,766	15	14	93.33	115.25	.97
K	Advanced Subsonic Technology Program Office	$2,300	$2,350	17	16	94.12	102.17	.82
	Grand Totals	$285,000	$302,698.82	2,564	1,630	63.57	106.21	106.21

Workers Earn Graduate Degrees with Center's Study Program

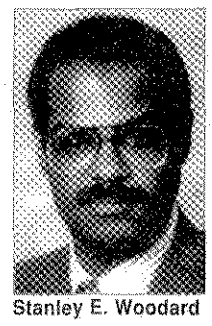
Nine Langley staff members have earned advanced degrees through Langley's Graduate Study Program during the past fiscal year.

The program, established in the 1940s, provides Langley engineers, scientists and administrators an opportunity to improve their proficiency in aeronautical and space research and to earn advanced degrees while at the center. Approximately 1,533 employees have earned master's or doctorate degrees through the program.

Robert D. Braun


Lance B. Bush

Three employees received doctorate degrees: **Robert D. Braun**, Space Systems and Concepts Division, in aeronautics and astronautics from Stanford University; **Lance B. Bush**, Technology Application Group, in technology policy and manangement from Pennsylvania State University; **Stanley E. Woodard**, Structures Division, in mechanical engineering from Duke University.

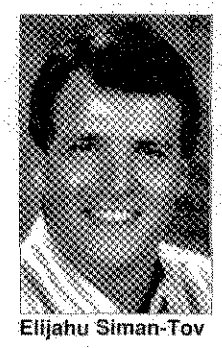

Stanley E. Woodard

The following employees received master's degrees: **Paul C. Davidson**, Information Systems and Service Division, a master of science degree in physics from Old Dominion University; **Karen E. Fischer**, Gas Dynamics Division, a master of engineering in mechanical and aerospace engineeering from the University of Virginia; **Lindy A. Fleck**, Facility Systems Engineering Division, a master of science degree in engineering management from George Washington University;

Karen E. Fischer

Michelle L. Morris

Michelle L. Morris, Facility Systems Engineering Division, a masters of science degree in environmental engineering from Johns Hopkins University; **Elijahu Siman-Tov**, Information Systems and Services Division, a master of science degree in electrical and computer engineering from Old Dominion University; **Matthew L. Wilbur**, Structures Division, a master of science degree in civil and environmental engineeering from George Washington University.


Elijahu Siman-Tov

Matthew L. Wilbur

For information on the Graduate Study Program, call George Allison at ext. 42594.

Hampton Engineering Student Drawn to NASA Langley's Electromagnetics Research

Hampton University senior and electrical engineering major Lariena Adams volunteered this summer to participate in NASA Langley's analytical electromagnetics (EM) research. Dr. G.A. Hanidu, one of her professors at HU, had told her about Langley's EM research efforts.

Dr. C.J. Reddy, a research associate professor at Hampton University who is working on a joint NASA-HU program for computational electromagnetics, introduced Adams to the design and analysis of automobile and aerospace antennas.

Langley's Fred Beck, of the Electromagnetics Research Branch, and Reddy allowed Adams to volunteer to apply existing computational electromagnetics computer codes to several complex applications.

A quick and eager learner, Adams recognized that cavity-backed aperture antennas work well for automobile and aerospace applications because of their conformal nature and affordability. She applied existing analytical codes to future designs, such as automobile antennas and resulting applications, including the cellular telephone and the Global Positioning Satellite.

Such antennas should be extremely thin, lightweight, economical and easily integrated within the automobile. Since the location of the antenna and the shape and size of the vehicle affect the electrical performance of the antenna, the model antenna should employ a simulation of the actual vehicle.

Adams investigated several antennas, using a commercial computer-aided design package.She presented the results of her studies during a briefing at Langley before returning to HU for the fall. She expects to graduate in the spring of 1997.

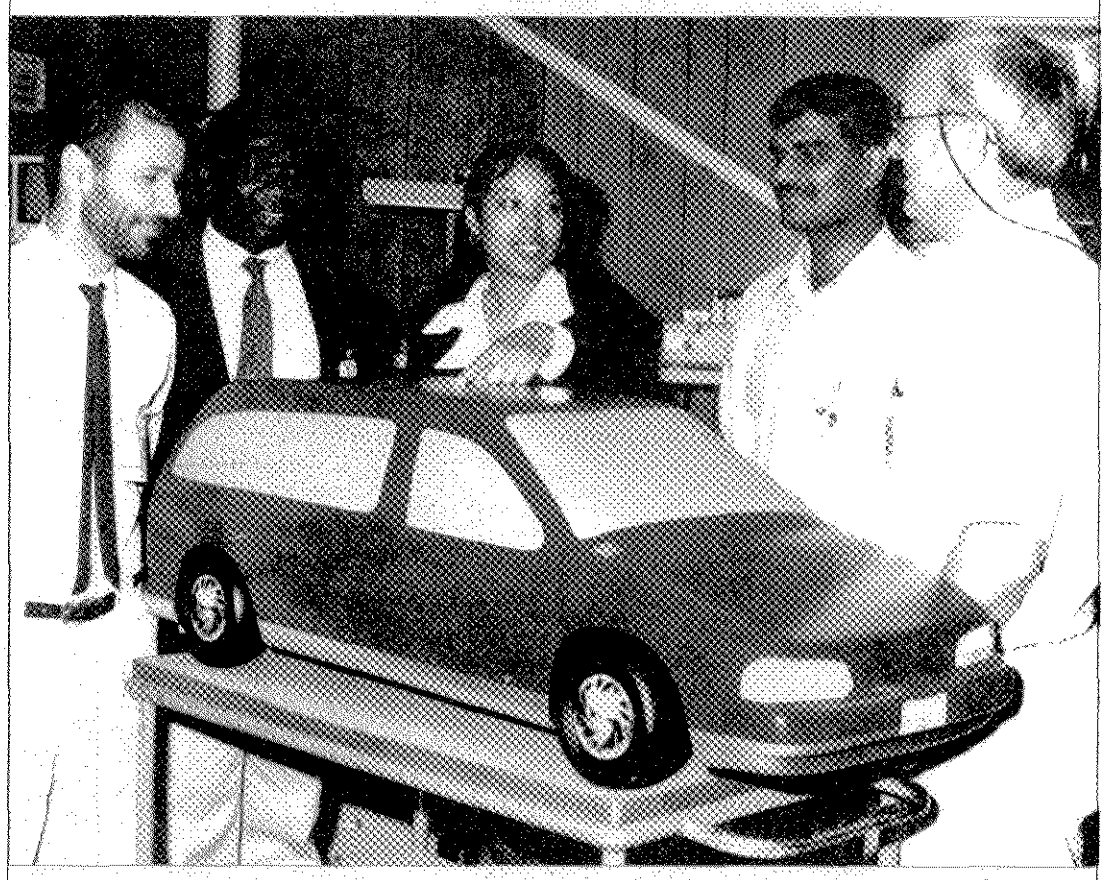


Photo by Sandie Gibbs

Hampton University student Lariena Adams, center, consults with, from left, Dr. Mohammed Radredine, Dr. G.A. Hanidu, Dr. C.J. Reddy and Fred Beck on her research project involving automobile antenna designs. Adams conducted her study using a one-sixth-scale automobile model.

Center's Holiday Projects To Encourage Good Will

The Langley Community Service Program's 1996 holiday projects to help feed and clothe the needy include:

'Cookie Power'

Help sweeten the holidays by baking an extra batch of cookies or a favorite holiday treat for someone less fortunate.

The Langley cafeteria is again sponsoring "Cookie Power." Last year, the center collected more than 170 dozen cookies and other treats for the Salvation Army's mobile feeding van that feeds 75 to 100 homeless people.

To help the 1996 effort:

- Pick up a plastic container at the cafeteria display, and fill it with holiday baked goods
- Freeze the filled container or bring it to the cafeteria for storage there
- Return all containers to the cafeteria by Dec. 13, when the Salvation Army will receive delivery of the packages.

'Angel Tree' Program

Langley's Acquisition Division challenges other center organizations and all personnel to "earn their wings" through the Salvation Army's "Angel Tree" program here at Langley.

Acquisition Division traditionally has "adopted" angel tree kids, chosen from displays in local stores, malls and churches. This year, a Langley Angel Tree, set up in the cafeteria, will be decorated with angel-shaped tags noting age and size information about needy children.

Since the Salvation Army guarantees a toy for every child, Angel Tree gifts tend toward children's warm clothing.

To participate:

- Choose an angel tag from the tree in the cafeteria
- Pick up a clear plastic bag from under the tree
- Purchase one or more gifts of new clothing, and do not remove price tags
- Put the unwrapped purchase in the clear bag, and affix the angel tag
- Place the gift under the Langley Angel Tree by Dec. 13.

For more information, call Marny Skora at ext. 43315.

DONOR

(continued from page 2)

In conjunction with the signing, donor cards will be available on center at the clinic, the cafeteria, the H.J.E. Reid Conference Center and the Pearl Young Theater. Cards and organ donor information will also be available at the Virginia Air & Space Center.

To become a donor, fill out the donor card, carry it in your wallet, and let family members know about your choice. A donor card does not guarantee your wishes will be carried out unless your family is aware of your plans and concurs.

For more information on organ, tissue and eye donation, call 464-4761.

AdVentures

FOR SALE: Condo in Denbigh's Sonoma Woods, 2 BR, 1.5 baths, 1,100 sq. ft.; all appliances; ceiling fans; carport. $6,000 down and assume at 7.5 percent. $505/month with 12.5 years left on mortgage. Call 874-6697.

FOR SALE: Oriental wool rug, 11 feet by 17 feet, cream with blue-and-pink floral pattern. $400. Call 247-5144 before 9 p.m.

FOR SALE: 1988 Toyota Celica ST; 5-speed; cruise control; sunroof; new tires/brakes/inspection; 92,000 miles. $3800. Call 249-3461 evenings, 6-9 p.m.

FOR SALE: Williamsburg home in Berkeley's Green, 4 BR, 2.5 baths, 2-story, 2-car garage, deck, gas heat, central air, located on cul-de-sac, pool, clubhouse, tennis courts. $149,900. Call 229-5662.

FOR SALE: Poquoson brick rancher; 3 BR; 2 baths; family room with fireplace; eat-in kitchen; central air/gas heat; workshop; large wooded lot, deck, $121,900. Call 868-8817.

FOR SALE: 1993 Yamaha 535 motorcycle; 2,000 miles; two helmets, rainsuit, saddlebags. $3,000. Call 851-1990.

ROOMMATE WANTED: Male, no smoking, no drugs, no guns. For spacious, 2,450-sq.-ft. house, 2 BR, 2.5 baths, one-half block from Chesapeake Avenue, with washer/dryer/dishwasher, water view from yard, activity room opening onto yard. Call 722-8147.

AWARDS, ANYONE? The Langley Tennis Club's awards party is Nov. 16, 7-11:30 p.m., at the McCormack-Nagelsen Tennis Center in Williamsburg. For more information, call Tom Yager, ext. 41304, or Marco Egoavil, ext. 47247.

CHOOSING CAREER PATHS: The American Institute for Aeronautics and Astronautics (AIAA) Young Members Committee presents an open after-work meeting, Nov. 18, 4:30-6 p.m., at the H.J.E. Reid Conference Center, Langley Room. Dr. Charles E. Harris, chief engineer, Materials Division, will discuss "Career Path Choices and Opportunities: A Perspective from Someone Who's 'Been There, Done That!'" For more information, contact Robin Hardy at ext. 47159; or e-mail to r.c.hardy@larc.nasa.gov

TWO-STEPPIN' TIME: The NASA Country & Western Dance resumes Nov. 23, 6:30 p.m., in the H.J.E. Reid Conference Center auditorium; food contributions accepted for the community food table. Admission is $3.50 per person. For more information, call ext. 48100.

SPLATTT!!! Paintball season is here. Action Town Sports, Suffolk's largest paintball retailer, has reserved a paintball field for NASA civil service and contractors, for the entire day of Nov. 25. For more information, call Paul McClung at ext 44005.

HOOP DREAMS: The NASA Basketball Association's preseason games begin Dec. 2; the season runs through early March. Games are played in the Langley gym Mondays through Thursdays, 7 p.m. and 8 p.m., and Saturdays, 9 a.m.-4 p.m. Leagues for all skill levels are open to NASA employees, co-ops and contractors. For more information, contact Dana Gould at ext. 47747, or e-mail at d.c.gould@larc.

LAA'S HAPPY NEW YEAR: A New Year's Eve Country & Western Dance, Dec. 31, 9 p.m.-1 a.m; doors open at 8 p.m. Tickets available at LAA country & western dances or at the LAA office, Building 1222. Cost per person is $12.50. For more information, call ext. 48100.

NASA SKI WEEK VI: The sixth annual agency-wide ski trip is scheduled for Jan. 18-25 at Steamboat Springs, Colo. The trip is open to all NASA personnel, contractors, retirees, and their friends and relatives. For more information, call Michael Schooley at ext. 48524 or at 867-8093.

LANGLEY KARATE CLUB's classes in Cuong-Nhu oriental martial arts, Mondays and Wednesdays, 5-7 p.m., at the Langley gym. NASA employees, co-ops, contractors, and their immediate family (ages 12 and up) welcome. For more information, call Roy Albang at ext. 46160 or at 596-7736, 7-10 p.m.

ULTIMATE FRISBEE games held twice a week, coed, all levels of players, possibly for local tournaments. For more information, call ext. 42197 or e-mail to jrrjr@icase.edu.

IT'S ELECTRIC! *Electric Space: Bolts, Jolts and Volts from the Sun*, a hands-on traveling exhibit at the Virginia Air & Space Center, runs through Jan. 7. For more information, call 727-0900.

SUPER SPACE: The Virginia Air & Space Center presents *Sunspots and Weather*, *Magnetic Magic* and *A Magnetic Wonder Box* – "super space demonstrations" in conjunction with the hands-on exhibit *Electric Space: Bolts, Jolts & Volts from the Sun* and the new IMAX film *Cosmic Voyage*. These educational activities are available every Saturday and Sunday, 11 a.m.-4 p.m. For more information, call 727-0900.

BOOKWORM'S FAIR: American Book Display will offer books for sale at the Langley cafeteria, Nov. 20-22, 9:30 a.m.-2 p.m. Book samples available Nov. 18-19 outside the Exchange Shop. Prices up to 70 percent off retail. For more information, call the shop at ext. 41585.

SEASON'S GREETINGS! Langley employees may receive 40 percent off published prices on wedding, stationary and personalized Christmas/seasonal greeting cards at the Langley Exchange Shop. Samples are available for checkout at the shop. For more information, call ext. 41585.

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Researcher News

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23681-0001

Official Business, Penalty for Private Use $300.

Dr. Jeremiah Creedon

Five sessions have been scheduled to permit as many employees, retirees and contractors as possible to attend. You are invited to come to a specific session based on your last name. If that conflicts with another activity, you are welcome to attend one of the other sessions.

Monday, Nov. 18

1:30 p.m.
A to E

3:00 p.m.
F to K

Tuesday, Nov. 19

5:00 a.m.
Third shift employees

8:30 a.m.
L to R

10:00 a.m.
S to Z

State of the Center
Shaping the Future

H.J.E. Reid Conference Center • 14 Langley Boulevard

National Aeronautics and
Space Administration
Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 24 ❖ November 29, 1996

NASA's Acting Deputy Administrator Visits Langley To Discuss Strategic Plan, Agency Management Reforms

Dailey, Whitehead Spread the Word for NASA's 'New Way of Doing Business'

Gen. John R. Dailey, NASA's acting deputy administrator, came to Langley last week to talk to center employees about the agency's Strategic Plan and the Strategic Management System of which it is a part (*NASA Strategic Plan*, February 1996). He discussed a number of agency management reforms and the "Centers of Excellence" concept, where each center strives to be the best in its primary mission.

As NASA continues to become more customer-oriented, its focus on and commitment to external customers forms the underlying concept of the agency's new Strategic Plan. Success in meeting customers' needs constitutes NASA's overall success as an agency.

The NASA Strategic Plan establishes a framework for making manangement decisions by separating the agency's programs into four externally focused "Strategic Enterprises for a Single NASA":

- **Mission to Planet Earth**
- **Aeronautics**
- **Human Exploration and Development of Space**
- **Space Science.**

These enterprises identify what NASA does and for whom. Each enterprise has a unique set of goals and strategies that address the needs of its own external customers. Together, the strategies of all four enterprises work to support NASA's overall goals.

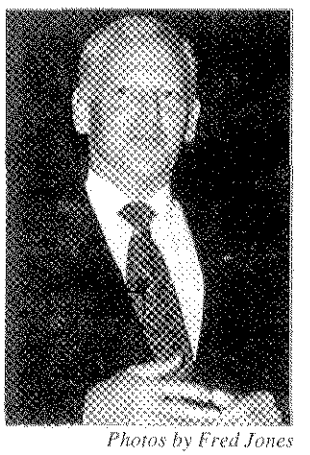
The goals of the **Mission to Planet Earth Enterprise** include the expansion of scientific knowledge of Earth; dissemination of information about Earth; technology transfer to the public and private sectors.

Dr. Robert Whitehead, the associate administrator of aeronautics, outlined the goals of the **Aeronautics Enterprise**. They include technology development in the areas of subsonic aircraft and a global air transportation system; preparation for a high-speed civil transport and for new capabilities in high-performance aircraft; technology development for hypersonic flight and for advanced aerospace systems; and development, maintenance and operation of national facilities for aeronautical research. In addition, the Aeronautics Enterprise now includes space transportation technology – with the single-stage-to-orbit X-33 – and commercialization and technology transfer.

The **Human Exploration and Development of Space Enterprise** sets its sights on exploration and settlement of the solar system and achievement of routine space travel.

In the coming decade, the **Space Science Enterprise** aims to complete observation across the electromagnetic spectrum; to survey cosmic rays and interstellar gas; to conduct new tests of gravitational theory; to understand solar variability; to complete exploration of the heliosphere; to survey and begin surface exploration of planetary bodies; and to identify places in the solar system where conditions conducive to life have existed.

In the Nov. 21 address, Dailey, along with Whitehead, encouraged all Langley employees to read the Strategic Plan and to understand their specific contributions to NASA and enterprise goals.



Photos by Fred Jones
Gen. John R. Dailey

In his remarks, Langley Director Jeremiah F. Creedon used the Dailey/Whitehead visit to reiterate his support of the agency's Strategic Plan. He emphasized that Langley will accomplish its interface through the Strategic and Quality Framework (SQF). Creedon had introduced the SQF to center employees in his State of the Center address earlier in the week. At that time, he described how the SQF ties each Langley employee to the NASA Strategic Plan and thus to agency and enterprise goals.

Dr. Robert Whitehead

(See Related Stories, Pages 4-5)

Inside:

▲ State of the Center Address
▲ Strategic & Quality Framework
See Pages 4 and 5.

Director Emphasizes Center's Intolerance of Sex Harassment

"A few weeks ago, NASA's Administrator, Daniel Goldin, issued an agency policy statement on nondiscrimination and nonharassment in the workplace. In light of the recent widespread allegations of sexual harassment in the military, I reaffirm Langley's commitment to *zero* tolerance.

An updated Langley policy statement is being prepared and will be distributed for official bulletin board posting by the end of the month.

Discrimination of any kind, including sexual harassment, is disruptive to the workplace and unlawful. Harassment on the basis of sex is in violation of Section 703 of Title VII of the Civil Rights Act of 1964, as amended. Personnel who violate this policy will be subject to appropriate disciplinary action.

In January 1997, the Office of Equal Opportunity Programs has scheduled sexual harassment prevention training for all employees. An announcement will be issued at the beginning of the new year. I encourage all employees to attend."

Jeremiah F. Creedon, Director

Shuttle Technology Leads to Better Bridge Resurfacing

NASA NEWS RELEASE

Two-to-three day bridge resurfacing projects – completed as commuters crawl and sit in heavy traffic – may be a thing of the past, thanks to NASA, the Alabama Department of Transportation and USBI Co., Huntsville, Ala.

An environmentally friendly spray system developed from space shuttle technology was used to quickly apply a nonskid surface to a bridge south of Huntsville. Four hours after the surface was applied, traffic was again crossing the bridge.

Using the spray process, researchers completed the resurfacing job in a fraction of the time that conventional methods take.

NASA's Marshall Space Flight Center in Huntsville and USBI designed the resurfacing tool, which uses a USBI-developed convergent spray technologies spray process and nozzle. The Convergent Spray Technologies process is used to apply a heat-resistant coating to the shuttle's solid rocket boosters.

"We wanted to take existing NASA technology and develop it for use in other NASA and commercial applications, then demonstrate that its use affords a 'cheaper, better and faster' product," said Vernotto McMillan, a technical manager at Marshall.

The bridge resurfacing project is a product of a 1994 agreement between Marshall and the Federal Highway Administration's Region 4 office for the Southeastern United States. Marshall and its contractors agreed to provide innovative technology derived from the space program and put it to use for a variety of highway applications, including corrosion resistant coatings for metal bridges and nonskid surface treatment for pavements.

This multi-use time and money-saving process could have many applications. So far, investigators are evaluating applications of low-solvent coatings on low-slope roofs for commercial buildings and are working with a food company to spray toppings on snack foods.

"The successful commercial adaptation of this space program technology is yet another example that shows America's space program is paying off for American business and industry," said Harry G. Craft Jr., manager of the technology transfer office at Marshall.

"Technologies developed for the nation's space program by NASA and its contractors are now at work in thousands of American firms, benefiting millions of Americans," he said.

News Briefs

Around the Agency

VETERAN SHUTTLE COMMANDER RETIRES – NASA astronaut and retired U.S. Navy Capt. Robert L. "Hoot" Gibson left NASA in mid-November to pursue private business interests. Selected as an astronaut in 1978, Gibson first flew as pilot on STS-41B in 1984. He subsequently commanded four shuttle missions: STS-61C in January 1986, STS-27 in December 1988, STS-47 in September 1992 and the first shuttle/Mir docking mission, STS-71, in June-July 1995.

CREW NAMED TO FOURTH MICROGRAVITY INVESTIGATION FLIGHT – Astronaut Kevin Kregel will command the crew of the fourth U.S. Microgravity Payload flight on board Columbia mission STS-87 scheduled for an October 1997 launch. Kregel will be joined by U.S. Air Force Maj. Steven W. Lindsey, pilot, U.S. Navy Capt. Winston E. Scott and Kalpana Chawla, Ph.D. Takao Doi, Ph.D., of the National Space Development Agency of Japan, is the remaining crew member. STS-87 will mark Kregel's third spaceflight and his first as commander; he was the pilot for Columbia's STS-78 flight. Scott will be making his second flight; Lindsey, Chawla and Doi will be making their first journey to space during STS-87. Scott and Doi will perform a spacewalk during the flight; Doi will be the first Japanese astronaut to conduct a spacewalk. During the 16 days in orbit, the astronauts will support fundamental science investigations and studies on the effects of microgravity upon a variety of materials. The studies will focus on how materials, including metal and crystals, solidify when removed from the distorting effects of earth's gravity.

SHUTTLE EXPERIMENT TO STUDY HIGH BLOOD PRESSURE – Rats with high blood pressure flying on the next space shuttle mission, STS-80, may help scientists better understand how calcium helps supports human health maintenance. An experiment by Drs. David McCarron and Daniel Hatton, hypertension specialists from the Oregon Health Sciences University in Portland, will examine calcium's role in blood pressure regulation. Calcium has long been recognized as a critical mineral in the normal development and function of bone and muscle. Dietary calcium appears to have its greatest effect on blood pressure when calcium demands on the body are highest. McCarron and Hatton were among the first to propose that adequate dietary calcium is essential for normal cardiovascular function. The model for their studies is called the Spontaneously Hypertensive Rat, which is genetically predisposed to calcium-related high blood pressure. Study of this animal model will enable the investigators to determine how the changes occurring in dietary calcium absorption affect blood pressure control. NASA is interested in how changes in gravity affect the metabolism of calcium, since loss of bone mass during space flight may cause osteoporosis in astronauts earlier than in non-space travelers. Because bones are not stressed in space, they shed calcium into the blood and then out of the body. The process begins immediately upon leaving Earth's gravity and appears to continue for the entire time in microgravity. After just a few months in space, an astronaut's mass in supporting bones will drop eight to 10 times faster than corresponding loss of bone mass for aging people on Earth. This is NASA's first study on calcium and blood pressure in space. NASA's Ames Research Center, Mountain View, Calif., is the experiment developer.

Disabilities Awareness

News Items Helpful to Disabled

▲ Researchers report that a drug, magnesium sulfate, administered to women in preterm labor, might have the added benefit of reducing the risk of cerebral palsy.

▲ Information about community organizations that provide meals, transportation, housing, home care, legal and other community services is available by calling the Eldercare Locator, 1-800-677-1116.

▲ Aprex Corp. of California has developed a "Smart Cap," a tiny computer inside a drug bottle cap, which helps patients with chronic diseases remember when to take their medication. Average cost is $75 a month. Medical studies have shown that patients' failure to take drugs costs the health care system tens of billions of dollars a year.

▲ Researchers experimenting with mice have created a "Smart Bomb" that attacks and kills leukemia cells without harming normal cells.

▲ Choice Magazine Listening is a free service for those who are unable to read standard print, offering eight hours of unabridged selections of articles, short stories and poetry from leading publications. The special cassette player required to listen to the four-track tape is also free. To receive a free subscription, call 516-883-8280.

▲ A sugar-free cookbook designed especially for diabetic and special diet family members was written and marketed by Donna Greene of Lancaster, Ohio. To order, send a check or money order for $9.95 plus $2 postage and handling to: Donna Greene's Sugar Free Cookbook, P.O. Box 1443, Lancaster, OH 43130.

Excerpted from Hampton Mayor's Committee for People with Disabilities Newsletter, Spring 1995.

Announcements

SHARP Reunion Planned

The NASA Summer High School Apprenticeship Research Program (SHARP) is sponsoring a reunion luncheon for former SHARP students, mentors and staff on Dec. 27, beginning at noon, in the H.J.E. Reid Conference Center.

The SHARP program has been operating at NASA Langley since 1980 and has provided mentorship opportunities for 340 local high school students who expressed strong career interests in the high-tech industries.

The staff invites all Langley employees who have been instrumental in the development of any of these students to participate in this event. Returning students may wish to acknowledge their mentor's contribution to their successful career.

The cost is $2.50 per person, payable in advance. For more information, call Walt Darden at ext. 44848.

Technology, Computer Expo Comes to Center

Tech Expo '96, a free technology and computer exposition, will be held Dec. 10, 10 a.m.-2 p.m., in the H.J.E. Reid Conference Center. All personnel are invited, and a complimentary light buffet will be served.

The latest in current and developing technologies will be represented. Exhibitors will display project scheduling software, data acquisition boards, signal conditioning modules, SPARC & UNIX workstations, digital data storage, networking products, training, real-time interfaces, digital and analog recorders, database software, notebooks, test and measurement equipment and computer hardware and software.

Consortium To Offer Scholarships/Fellowships

Students pursuing studies in fields related to aerospace may qualify for scholarships and fellowships offered by the Virginia Space Grant Consortium for the 1997-98 academic year.

Nearly $170,000 is awarded annually to qualifying undergraduate and graduate students in aerospace-related disciplines at the five Virginia Space Grant colleges: Hampton University, The College of William and Mary, Old Dominion University, The University of Virginia and Virginia Polytechnic Institute and State University.

The awards require that a student participate in an active, identified research experience with a faculty advisor. NASA, the Commonwealth of Virginia and the Bionetics Corporation have provided funding. For more information, call 865-0726.

STILAS Enters New GALAXIE

The Langley STILAS Online Information System is now the NASA GALAXIE Online Information System. At the request of the NASA Scientific and Technical Information Program Office, the STILAS system is expanded to include the holdings of all 13 NASA libraries. The name change to GALAXIE reflects the broadening of scope and content of the database. GALAXIE still provides the same powerful search engine provided by STILAS, but now you can search all NASA libraries simultaneously or one specific center library.

To access GALAXIE through the World Wide Web, use http://stilas.larc.nasa.gov or http://galaxie.larc.nasa.gov

Although a password is not required, log in using the word 'langley.' For more information, call the Langley Technical Library at ex. 42356 or access http://library- www.larc.nasa.gov/galaxie.html.

Voluntary Leave Transfer Program

The Voluntary Leave Transfer Program permits employees to donate annual leave to other employees who are experiencing personal or family medical emergencies.

The following Langley employees are approved leave recipients: **Jane I. Druen, Patricia G. Reagon, Debra P. Shimek, Janice Y. Smith, Cassandra Stevens.**

The following limitations apply for transferring annual leave to approved recipients:

▲ Employees may not donate to their immediate supervisor.

▲ Employees may not donate more than one-half of the total annual leave accrued during the leave year.

▲ Employees may not donate more "use-or-lose" leave than there are number of hours left in the leave year to work.

To donate leave to recipients in the program, send donations on a "Request To Donate Annual Leave to Leave Recipient Under the Leave Transfer Program" form via computer in Informed Manager to Mail Stop 293, Office of Occupational Health Services, or fax the form to ext. 49114. For more information, call Karen Ridlon at ext. 43194.

Bradley To Present December Colloquium

Dr. Richard G. Bradley, development deputy for Lockheed Martin Systems Development Center, will deliver a colloquium lecture on Dec. 3, 2 p.m., at the H.J.E. Reid Conference Center, titled "New World Vistas: U.S. Air Force Aircraft Vision for the 21st Century."

Researcher News

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor. . . . . Keith Henry

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Science and Technology Corp.

Assistant Editor. . . . . Jeane Shanks
Science and Technology Corp.

Photographer . . . . . Fred Jones

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

Technical Forum Flashes

Presentation Topics Range From Mars to Contrails

In his State of the Center address, Langley Center Jeremiah F. Creedon called the newly reinstituted Technical Forum presentations "something that makes you feel good about working at the center" and said that they are "always well prepared and well delivered." He encouraged employees to attend the technical talks, which resumed Nov. 20 and will continue Dec. 18, 10 a.m. to noon, Building 1212, Room 200.

The first five presentations offered the following topics:

Mars Pathfinder Entry Analysis

Mars Pathfinder, launching on Dec. 2 and landing on Mars on July 4, 1997, will demonstrate the low-cost delivery of science instruments to the surface of Mars.

Langley's Pathfinder team has been involved in the design, test, and operations phases of the mission. Langley's efforts have impacted the design of the Pathfinder flight software, structure, and thermal protection system. LaRC has also been responsible for defining the entry and parachute deployment events.

As a member of the Pathfinder operations navigation team, Robert Braun will support the day-of-entry flight by providing updated parachute deployment parameters to the spacecraft prior to entry.

According to Anthony J. Spear, Pathfinder project manager at Jet Propulsion Laboratory, Langley's contributions have resulted in "significant schedule and cost savings."

– Robert D. Braun (Presenter), Richard W. Powell, Walter C. Engelund, Space Systems and Concepts Division; *Peter A. Gnoffo, K. James Weilmuenster, Robert A. Mitcheltree,* Aero and Gas Dynamics Division

Planetary Entry Aerothermodynamics

Langley is meeting new challenges in aerodynamics and aeroheating with its role in the **Mars Pathfinder** (Dec. 1996), **Mars Microprobe** (1998) and **Stardust Sample Return** (Feb. 1999) missions.

Mars Microprobe is a New Millenium Program project that will deliver two soil penetrators to the surface of Mars after an interplanetary transit as ballast on board the Mars 98 Surveyor spacecraft. With a quick response to a short timeline, Langley helped Jet Propulsion Laboratory design the unique aeroshell enclosures which house the penetrators. Advanced computational techniques were employed to construct an aerodynamic database, which is now being used to perform detailed flight dynamics simulations. Predictions of the expected aero-heating were also generated to facilitate heatshield design.

Similar support is being supplied to Lockheed-Martin as it designs the sample return capsule for the upcoming **Stardust** mission. Scheduled for launch in February 1999, this fourth Discovery-class mission will collect interstellar dust, and will fly near comet "Wild 2" to collect cometary material. Both samples will be returned to Earth for submicron-level analysis.

– Presented by Robert A. Mitcheltree, Gas Dynamics Division

Active Vertical Tail Buffeting Alleviation on an F-18 Wind-Tunnel Model

Buffet loads on vertical tails cause structural fatigue and damage to twin-tailed aircraft. Langley led a project to apply active controls to demonstrate buffet load alleviation, using an F-18 model in the Transonic Dynamics Tunnel (TDT). The work is part of the Actively Controlled Response of Buffet-Affected Tails (ACROBAT) umbrella program.

Wind tunnel tests revealed that buffet load alleviation of vertical tails may be accomplished with mathematical flight control laws – or instructions – with either rudder surface or piezoelectric actuators. Of the two, piezoelectric actuators showed better performance at angles of attack higher than 34 degrees.

Future research will include tests at the Aeronautical and Maritime Research Laboratory in Australia and in tunnels at McDonnell Douglas, Wright Laboratory and Langley's TDT.

– Presented by Robert W. Moses, Structures Division

Formal Methods Program

As our dependence on computer systems grows, so does the necessity of insuring that these systems are free of design errors that may compromise safety. Testing alone cannot provide the necessary assurance. For efficient and safe verification of computer software, an applied mathematics approach ("formal methods") is needed to handle these potential design errors.

Beginning in 1991, Langley initiated several aggressive projects designed to move formal methods into industry practice. In a successful technology transfer effort, Langley's formal methods team worked with Rockwell Collins to verify part of one of the corporation's digital flight-control computers and uncovered errors prior to public release. As a result, Rockwell Collins is beginning to inject formal methods technology into their product lines.

– Presented by Rick Butler, Flight Electronics Technology Division

Contrail Effects on the Earth Radiation Budget

By 2015, aircraft fuel use is expected to double. Increased aircraft exhaust leads to condensation trails (contrails), a type of high, thin cloud. Since they can reflect solar radiation and absorb and emit longwave radiation, much like any other kind of clouds, contrails may have an impact on the Earth's radiation balance and climate, including the possibility of some surface warming.

Langley has participated in a study of that impact, as part of NASA's Subsonic Assessment (SASS) Program.

Extensive satellite data analysis is necessary to resolve outstanding uncertainties.

– Presented by Patrick Minnis, Atmospheric Sciences Division

Army Awards Honor Individual Achievement, Teamwork

BY HENRY RUSSELL

The U.S. Army Research Laboratory (ARL) Vehicle Technology Center (VTC) hosted its fourth annual Army Office Awards banquet at the Fort Eustis Officers Club on Nov. 8. Some 50 Army/NASA employees attended the event.

Paul Mirick (ARL), **Ruth Martin** (NASA) and **Susan Gorton**, **Deane Reis**, and **Henry Kelley** of the U.S. Army Aviation and Troop Command (ATCOM) received Team Spirit Awards "for outstanding and exceptional leadership in promoting and demonstrating the ideas of team-building and integrated multidisciplinary research."

Mirick received recognition for his role as team leader for the Helicopter Loads Research Team and for initiating, planning and defending a new activity in active control technology.

Martin won recognition for her leadership in the Langley Rotorcraft Community and for establishing critical technology issues for NASA support. She ensured that the Langley Rotorcraft Program was recognized as a joint Army/NASA program, and she took the lead in expanding the Rotorcraft focus to include composite damage tolerance and durability.

Gorton, Reis and Kelley teamed up on the Isolated Rotor Test System (IRTS), a unique approach to model rotorcraft testing in the area of interactional aerodynamics. They applied their multidisciplinary approach to problem-solving to critical vibration challenges of the IRTS.

John Gleason (ATCOM) received the Technology Transfer Award "for individual achievement in providing timely and meaningful technology support to outside organizations and customers." He took initiative to provide new vacuum pump technology to Old Dominion University during a period of transitional need for the university customer, thereby accelerating the use of advanced vacuum physics hardware in the university environment.

Customer Service Awards went to **Drs. Richard Boitnott** and **Carlos Davila**, to **Jocelyn Pritchard** and **Joseph Zalameda** (all ARL) and to **Dr. John Berry** and **Kevin Noonan** (both ATCOM) "for special and selfless contributions in working with customers to meet their expectations and to enhance the competencies of the Army."

Boitnott defined the required test characteristics for the Early Entry Lethality and Survivability System Robot Drop Test Evaluation. He supported the U.S. Army Tank and Automotive Command Composite Armored Vehicle (CAV) Programs and the U.S. Army Missile Command container tests during the past year.

Davila provided finite element solutions for the CAV integrated armor/structure design. He documented all work and briefed the customer on all aspects of his efforts.

Pritchard supported the U.S. Army Picatinney Arsenal Container Program, including the Robot Armor and drop test programs. She used the Dynamics Analysis Design System to respond to customer needs and worked with NASA support organizations.

Zalameda demonstrated the capabilities of thermographic Nondestructive Evaluations (NDE) on CAV test articles and found flaws that the other NDE systems could not identify. His efforts convinced the ground vehicle community of the value of having the VTC as part of the Team CAV. He contributed to the working relationship with the Combined Arms Support Command.

Berry worked with a diverse team to provide computational fluid dynamics predictions of a complex fuselage geometry. He received recognition for his initiative in bringing together the perspectives of ATCOM engineering, McDonnell Douglas Helicopter Systems and the ATCOM labs towards a high-fidelity flow model application.

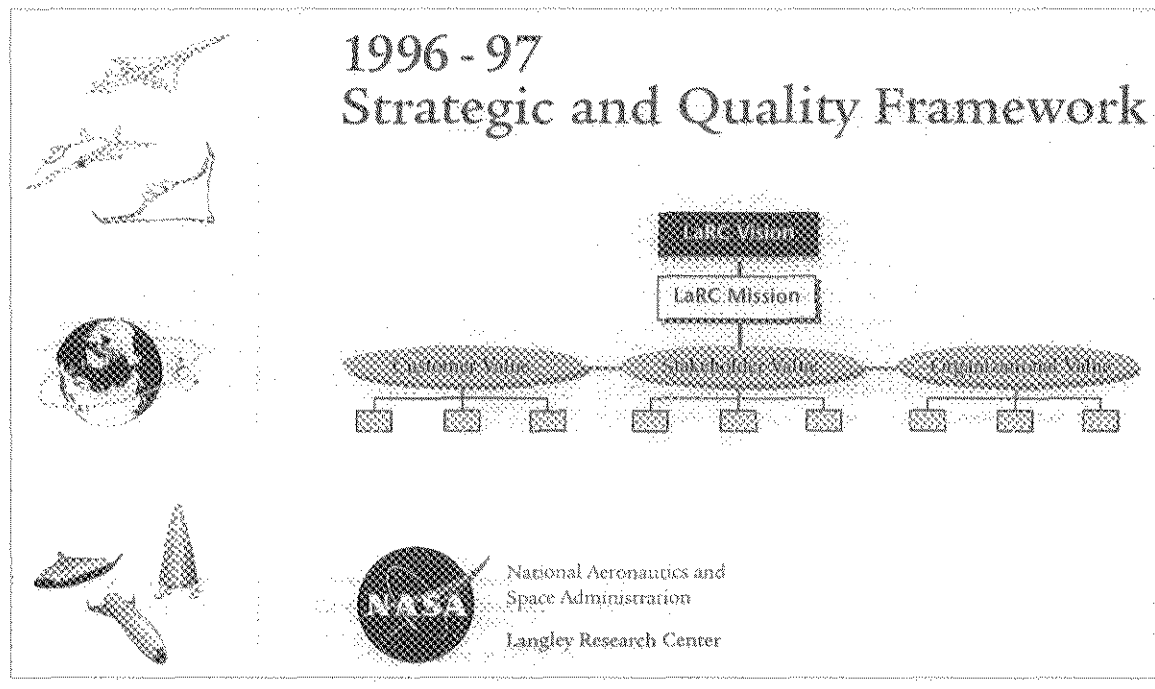
The VTC Director's Scientific Achievement Award went to **Dr. Karen Jackson** (ARL) "for exceptional individual or team achievement in contributing to the scientific advancement of technology for the Army, NASA and the customer community."

ATCOM recognized her technical expertise in establishing and refining crashworthy structures modeling and simulation tools. Her paper, entitled "A Comparative Analysis of Three Composite Fuselage Concepts for Crash Performance," won "Best of the Session" honors from the Crash Safety Technical Session.

Henry Russell (ARL) received the VTC Directors' Administrative Support Award "for exceptional individual or team achievement in support of the Army/NASA mission and goals." He lead the business office team in rearranging work assignments to absorb larger workloads.

Langley Pulls into Shop for SQF Service

Strategic & Quality Framework Helps Move NASA Langley Toward Common Vision



The Strategic and Quality Framework booklet, pictured above, will be distributed to all employees through line management. Employees should receive their personal copies in the near future.

NASA Langley is getting a tune-up and an alignment.

The vehicle that will take us into the 21st century – the center itself – is getting its timing adjusted, its spark plugs changed and even its wheels balanced and aligned. The mechanic's guide and tools, known collectively as the Strategic and Quality Framework (SQF), have been assisting Langley's senior management for several months.

The center may not need a major engine overhaul, but the SQF will improve Langley's performance greatly – with the help of all Langley employees, of each specialist in every corner of the center. Every employee can help the Langley vehicle run more efficiently and effectively, and the SQF provides the tools to make that happen.

Unique to Langley, the framework is a plan to integrate all the center's independent efforts....

What is the Strategic and Quality Framework?

Formally introduced to Langley employees last week in the center director's State of the Center address, the SQF is a comprehensive and enduring guide for the center's overall management.

Unique to Langley, the framework is a plan to integrate all the center's independent efforts, to help the center work more effectively toward a common vision. The SQF focuses Langley's efforts on meeting customer needs, on improving the organization's effectiveness and on communicating these successes to national decision-makers.

Vision and Mission

Employees from throughout the agency developed the NASA "vision." Langley's vision, established several years ago, coordinates well with NASA's vision.

▲ NASA's Vision:

"NASA is an investment in America's future. As explorers, pioneers, and innovators, we boldly expand frontiers in air and space to inspire and serve America and to benefit the quality of life on Earth."

▲ Langley's Vision:

Langley Research Center aims "to be the world leader in pioneering science and innovative technology to ensure U.S. aeronautical and space preeminence."

Langley's "mission" is consistent with NASA's mission but goes further to describe the center's unique role, emphasizing Langley's customer focus and use of alliances.

▲ Langley's Mission:

"In alliance with industry, other agencies and academia, we develop airframe and synergistic spaceframe systems technologies to assure preeminence of the U.S. civil and military aeronautics and space industries; in alliance with the global research community, we pioneer the scientific understanding of the Earth's atmosphere to preserve the environment."

The center aims to accomplish its mission through a new emphasis on working alliances with industry, other agencies and universities; to conduct the study of atmospheric science in cooperation with researchers worldwide.

Langley contributes to NASA's mission and vision through its "technical competencies" – our expertise and facilities. The Strategic and Quality Framework will channel those competencies into "better, faster, cheaper" support of the agency's mission. Through the SQF, Langley can stay closely attuned to customers' self-defined needs and can ensure that national decision-makers recognize those customers' satisfaction.

Langley Research Center aims "to be the world leader in pioneering science and innovative technology to ensure U.S. aeronautical and space preeminence."

SQF's 'Critical Success Factors'

The SQF provides Langley with three "outcomes," called "critical success factors," that are essential to achieve the center's vision. Langley's success depends on *customer, stakeholder* and *organizational values*.

▲ Customer Value

In addition to continuing the technical excellence that has always been a NASA Langley trademark, we must renew our focus on our contributions to customers' current and future plans. Customers must feel that our products and services meet their needs, and they must value our partnership.

▲ Stakeholder Value

Those who make policy and provide financial resources to conduct Langley's programs are our "stakeholders" – NASA Headquarters, the administration of the U.S. president and the U.S. Congress, representing the people. Those in power need to know that Langley's customers are satisfied, that they value our products and our working relationships. Our customer value translates to our contribution to NASA, and thus to the nation. We must ensure that our stakeholders understand that contribution.

▲ Organizational Value

The center's most valuable assets – its employees – each possess a key component that makes the Langley vehicle run. The center wants to recognize and reward employees' contributions to the Langley mission, while encouraging them to continue to improve the way they do their jobs. "Better, cheaper, faster" applies not only to NASA as a whole but also to every employee's job at every center. Langley folks need to know that the center values them and their work, and they need to know how their specific jobs contribute to Langley's mission.

How Does My Job Fit the SQF?

The individual employee's role is the most important part of the SQF. Everyone should know how they fit into the plan, how their specific job is part of the great scheme of things, how they help to keep the Langley vehicle moving.

Langley's success depends on *customer, stakeholder* and *organizational values.*

As it is cascaded down through the center's organizations, management will define each organization's contributions to the critical success factors, to "strategic goals" – the unchanging objectives of Langley's work – to "annual goals" – yearly objectives – and to specific projects.

Ultimately, each employee will work with his own supervisor to determine how he fits into the SQF. The personal "action plan" they come up with – the employee's contribution to Langley's mission – will become part of the employee's annual performance plan.

Since the Strategic and Quality Framework encompasses all the center's activities, each employee should be able to link his specific duties to one or more of Langley's "strategic goals." Everyday tasks, as well as long-term projects, are pieces of the puzzle and should fit into Langley's overall picture – whether the piece fits directly into the puzzle or whether it fits into another piece ... that fits directly into the puzzle picture.

Once the link is clear in the employee's mind, he might keep it visually in front of him as a daily reminder of how his job fits into the framework. On his copy of the SQF poster, he might use a highlighter to trace the path from his work activities (which he may have written in at the bottom of the chart) to the strategic or annual goals under the appropriate critical success factors.

Although not everyone can identify with an annual goal or a current project, everyone will fit under one or more of the strategic goals.

'Featured Flavor of the Year'?

The Strategic and Quality Framework is here to stay. It is not a trend; it is an assistant that will help Langley move toward its vision.

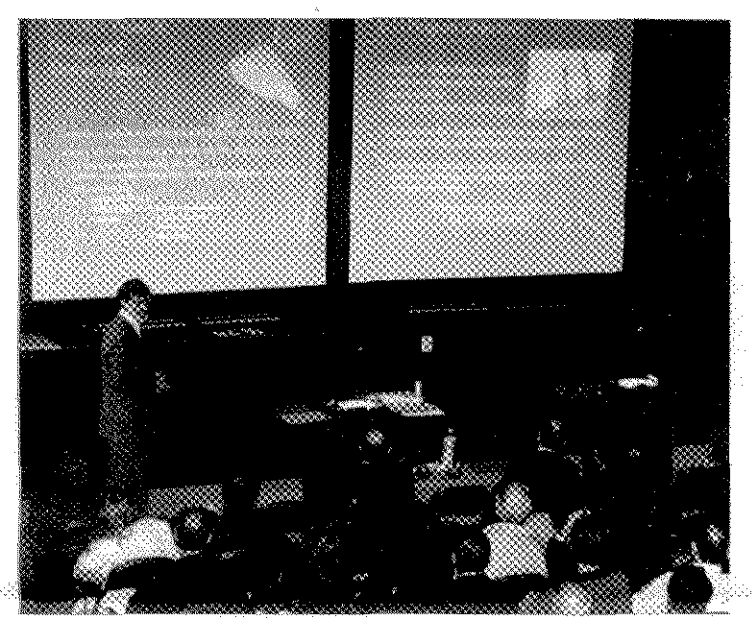
NASA's "new way of doing business" necessitated the same type of adjustment here at the center. Whereas technical excellence has always been the mainstay of Langley's success, national budget reductions and downsizing have forced us to refine our focus: How can Langley's technical excellence be most valuable to our customers? How can we ensure that our stakeholders understand our value to the nation? How can we use our assets efficiently and effectively?

Not solely for management's use, SQF will assist *all* employees in our goal to get the Langley vehicle running smoothly. Since each employee's pinpointed

(see SQF, page 5)

Photos by Fred Jones

Center Director Jeremiah F. Creedon discusses Langley's role in the agency's Aeronautics Enterprise during the State of the Center address Nov. 18.



Creedon cites the X-33/RLV program as one in which industry made significant use of Langley's capabilities.

'Langley Is in Good Shape' Says Creedon in State of the Center Address to Employees

Center Director Introduces Strategic and Quality Framework

BY MARNY SKORA

Center Director Jeremiah F. Creedon stated emphatically that Langley Research Center is in good shape. He then outlined a strategy to maintain and even to increase the vitality of the center's position.

Speaking to employees, retirees and contractors at the annual State of the Center presentation Nov. 18 and 19, Creedon elaborated on the center's prime position within the agency.

"We have leadership roles in Aeronautics and Mission to Planet Earth. We are also making important contributions in a reduced Space Technology budget and in Non-Aerospace Applications," said Creedon. "In addition, we can meet our Zero Base workforce goals without a reduction in force."

Creedon emphasized that Langley is committed to these four product lines.

"We have been given important roles," he repeated, "roles which rank high in the priority of the agency."

Status of Langley's Product Lines

Langley leads the Aeronautics program and conducts nearly 40 percent of the aeronautics research activities.

Langley has a lead role in Atmospheric Sciences, heading world-class efforts in radiation, middle atmosphere and tropospheric sciences and active remote sensing.

The center is taking a prime role in Space Technology, notably on the X-33 program, where each of the industry proposers made significant use of Langley capabilities. The center is now actively involved with Lockheed Martin on the design and demonstration phase of the project.

Re-emphasizing Langley's priority on Non-Aerospace Applications, Creedon noted the dramatic increase in memoranda of understanding, licenses and royalties as the result of the efforts of the Technology Applications Group.

External Influences

"External forces – some of which we can influence – are always impinging on the center," noted Creedon.

These influences cover a wide spectrum. They include Congressional and administration decisions, the administrator's leadership responses, NASA Headquarters' actions, the needs of our customers, the perspective of other centers, even our own attitudes.

Do we have what we need to succeed?

"Absolutely," said Creedon. "We have extremely capable people and world-class facilities. We work in areas important for the nation's future, have the opportunity to contribute in high-payoff areas and can generally choose how we want to accomplish our tasks. Finally, we have a rich tradition of accomplishment."

However, Creedon stressed the importance of a general strategy to maintain the center's position of strength amidst the changing and challenging external influences.

General Strategy

"First and foremost, we must align with the NASA strategic plan and maintain our core competencies," noted Creedon as he introduced the Langley "logo."

Langley employees align themselves with NASA's strategic plan through the enterprises we support. Spreading our resources – people and dollars – over our core areas ensures that Langley will remain a strong and vital part of the one NASA.

"We must also identify, vigorously seek and execute meaningful programs in our mission area," advised Creedon. Langley has the agency lead in many areas. We must act on behalf of the entire agency, putting aside parochial concerns.

"Finally, we must concentrate on the three critical success factors as embodied in the Strategic and Quality Framework (SQF)," Creedon concluded. He introduced the SQF as a tool to keep the center focused, on track and away from activities that do not contribute to the bottom line.

Desired Attitudes and Behaviors

To keep Langley healthy, Creedon enumerated several ways center employees can best help ensure success. Leading the list of "desired attitudes and behaviors" was the need for *teamwork*. Within the team context, *lead*, devote energies to the *important* things, work efficiently, do what we do with *excellence*, *finish* what we start, have and project a *positive attitude*.

On a more personal note, Creedon asked three things from each employee – *leadership*, *quality* and *flexibility*. Every organization needs people at every level who see what needs to be done, who are willing to do it and who bring others along, he said.

"Above all," he emphasized, "commit to do what the organization needs and do it well.

"Langley has everything we need to succeed," reiterated Creedon.

State of the Center at a Glance

- ▲ Langley is in good shape.
- ▲ We face external forces and uncertainties.
- ▲ We have a strategy for the future.
- ▲ The Strategic and Quality Framework outlines our organizational goals.
- ▲ We need leadership, quality and flexibility from each of you.

Creedon answers a question from Larry Bement of the Analysis and Test Engineering Branch.

SQF

(continued from page 4)

contribution to the SQF will be integrated into his annual performance plan, he will have an ongoing relationship with the framework. The part of the Langley vehicle that he is fine-tuning will get his constant attention throughout the year.

In addition, in a few weeks, all center employees will be able to monitor the status of projects and annual goals through the Internet, the *Researcher News* and displays of trend charts. Employees will be able to easily track the Langley vehicle's progress.

Open to Suggestions

By no means is the Strategic and Quality Framework a closed book. The group who developed the SQF – volunteers from the senior staff and the presidents of the American Federation of Government Employees, Local 2755, and of the International Association of Machinists, Local PM 2829 —expects little change to the framework itself. However, the accompanying SQF Action Plan (the poster) will require annual updates, which will include lessons learned and employee ideas for improvement of the plan.

AdVentures

FOR SALE: 1989 Volkswagon Cabriolet convertible, white, red interior. Call 229-5434.

FOR SALE: National show horse (Arab/Saddlebred cross); gelding; registered with International Arabian Horse Association; 14.3hh; 9 years old; chestnut with flaxen mane, tail, white star; healthy/easy keeper (barefoot); shown and marched in parades; good on trail; knows all basics; beginning lateral work and jumping; good for 4-H-er. $1,500 firm. Call 564-9156.

WEBMASTER NEEDED: For home business; terms and hours flexible; some clerical work required; the possibility of developing home pages and websites is open if interested. Good opportunity for high school student or others with a little or a lot of free time. Call 722-2861.

FOR SALE: Gas logs, Peterson Real-Fyre Golden Oak, vented, 24 inches, glowing embers and vermiculite, natural gas or propane. $100. Call 874-3121.

FOUND: Pair of women's eyeglasses in Building 1267, Room 145. Call B. Sheets at 49393 to identify.

MODEL TRAINS: The Peninsula Model Railroad Club will hold an open house Nov. 30 and Dec. 1, 10 a.m.-4 p.m., in the historic Lee Hall train station, one mile north of Ft. Eustis Blvd. on route 60. Admission is free.

HANDEL'S 'MESSIAH': The Williamsburg Symphonia and Christopher Newport University Masterworks Chorale present George Frederick Handel's "Messiah," Dec. 1, 8:30 p.m., at the John W. Gaines Theater at Christopher Newport University in Newport News. Tickets are $18 and $12; $8 for children and full-time students. For more information, call 229-9857.

HOOP DREAMS: The NASA Basketball Association's preseason games begin Dec. 2; the season runs through early March. Games are played in the Langley gym Mondays through Thursdays, 7 p.m. and 8 p.m., and Saturdays, 9 a.m.-4 p.m. Leagues for all skill levels are open to NASA employees, co-ops and contractors. For more information, contact Dana Gould at ext. 47747, or e-mail at d.c.gould@larc.

SOCIAL OCCASION: The next LAA Social will be Dec. 6, 4-8 p.m., in the H.J.E. Reid Conference Center. Disc jockey Lanny Scott will provide music for the occasion.

MUSIC MASTERS: The Virginia Symphony Masterworks concert, Dec. 7-8 at Chrysler Hall in Norfolk. Student tickets $6. Symphony season brochures available in the NASA Langley cafeteria. For tickets, call 623-2310.

VISIONS OF SUGAR-PLUMS: The annual LAA Children's Holiday party is Dec. 14, 1-3 p.m., in the H.J.E. Reid Conference Center. Rainbow Productions will present "The Rainbow Christmas Show" with "Hansel and Gretel" and "'Twas the Night Before Christmas." Santa Claus will check everyone's wish list. Open to all children of NASA employees and contractors. Free tickets are available until Dec. 11 at the LAA office, Building 1222, Room 112. For more information, call Rita Welty at ext. 46369.

DEGREES OFFERED: George Washington University's School of Engineering and Applied Science's Joint Institute for Advancement of Flight Sciences at NASA Langley offers these degrees: Master of Science; Professional and Doctor of Science Degrees in Aeroacoustics, Aeronautics, Astronautics, Fluid Mechanics and Thermal Sciences, Structural Engineering and Structural Dynamics; Master of Engineering Management. Registration for the spring semester is Dec. 16-20 and Jan. 6-10. For more information, call ext. 41982, fax to ext. 45894, or e-mail to gwu+jiafs@larc.nasa.gov.

HAPPY NEW YEAR: LAA's New Year's Eve Country & Western Dance, Dec. 31, 9 p.m.-1 a.m; doors open at 8 p.m. Tickets available at LAA country & western dances or at the LAA office, Building 1222. Cost per person is $12.50. For more information, call ext. 48100.

NASA SKI WEEK VI: The sixth annual agency-wide ski trip is scheduled for Jan. 18-25 at Steamboat Springs, Colo. The trip is open to all NASA personnel, contractors, retirees, and their friends and relatives. For more information, call Michael Schooley at ext. 48524 or at 867-8093.

LANGLEY KARATE CLUB: Classes in Cuong-Nhu oriental martial arts, Mondays and Wednesdays, 5-7 p.m., at the Langley gym. NASA employees, co-ops, contractors, and their immediate family (ages 12 and up) welcome. For more information, call Roy Albang at ext. 46160 or at 596-7736, 7-10 p.m.

ULTIMATE FRISBEE: Games held twice a week, coed, all levels of players, possibly for local tournaments. For more information, call ext. 42197 or e-mail to jrrjr@icase.edu.

SEASON'S GREETINGS! Langley employees may receive 40 percent off published prices on wedding, stationary and personalized Christmas/seasonal greeting cards at the Langley Exchange Shop. Samples are available for checkout at the shop. For more information, call ext. 41585.

IT'S ELECTRIC! *Electric Space: Bolts, Jolts and Volts from the Sun*, a hands-on exhibit at the Virginia Air & Space Center, runs through Jan. 7. For more information, call 727-0900.

ACROSS THE FINISH LINE: In the fall NASA Intercenter Running Competition, 16 Langley employees and contractors ran in the 10-K race and 40 in the 2-mile race. Top Langley runners in the 10-K: **Men** – Scott Bartram (41:09), John Hoppe (41:12), Don Brown (43:56); **Women** – Lauretta Payne (92:33), Pat Parker (93:31). Top runners in the 2-mile run: **Men** – Scott Bartram (11:42), John Hoppe (12:20), David Witte (12:22); **Women** – Valerie Plyler (11:50), Jonay Campbell (16:04), Dianne DeTurris (17:37).

In celebration of the holiday season,
the Director of Langley Research Center,
Dr. Jeremiah F. Creedon,
cordially invites
all NASA civil service employees,
retirees and contractors
to attend a reception at the
H.J.E. Reid Conference Center
on the afternoon of December 20, 1996
from one to three o'clock

Sponsored by
the Langley Activities Association
and the Office of Public Services

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Researcher News

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National Aeronautics and
Space Administration
Langley Research Center

News Researcher

Biweekly Employee and Contractor Publication

Volume 10 ❖ Issue 25 ❖ December 13, 1996

Mars Pathfinder Aims for July 4th Landing

When the Mars Pathfinder probe was launched from Kennedy Space Center on Dec. 4, it began a 310-million-mile journey whose final leg seven months from now was determined in part by NASA Langley researchers.

The entry portion of the flight will last fewer than five minutes. But they're a critical five minutes that will determine if the spacecraft burns up in the Martian atmosphere or survives the fiery entry.

Langley researchers helped determine how the spacecraft will traverse the Martian atmosphere as it decelerates from more than 17,000 miles an hour toward a safe landing.

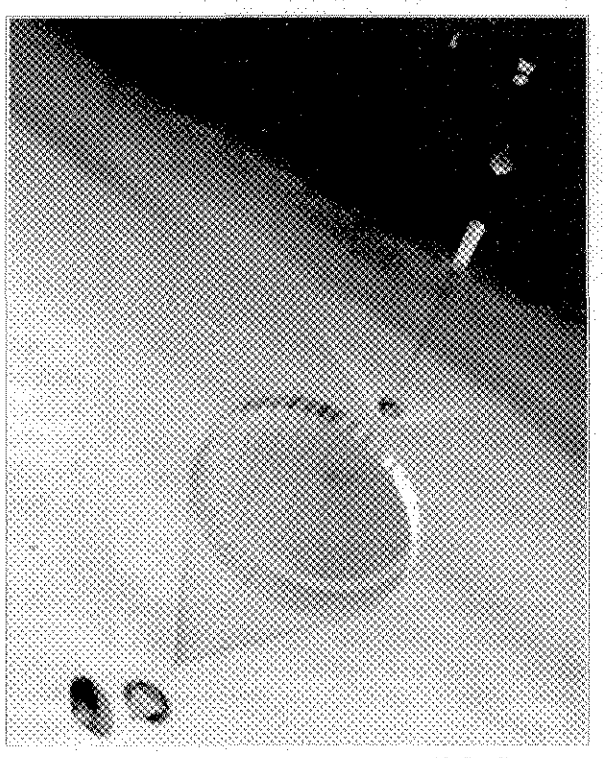
They also contributed to the development of Pathfinder's flight software and heat shield. The shield will protect the spacecraft from excessive heat buildup during its journey through the Martian atmosphere.

In addition, Langley researchers calculated where the Pathfinder probe would land on Mars, based on its entry point into the atmosphere.

"To survive that entry, you must accurately know how the vehicle will fly as it passes through the atmosphere, its aerodynamics as well as how hot it will get – the aeroheating," said Dr. Robert Mitcheltree of the Aerothermodynamics Branch and a member of the Pathfinder team. "So it was those two aspects and the whole entry descent and landing which we worked on here at Langley."

"We're happy that the launch went so well," he added. "We're looking forward to Pathfinder's actual entry into Mars, and we're excitedly awaiting the Fourth of July."

The Jet Propulsion Laboratory (JPL) in Pasadena, Calif., asked Langley to help with the mission because of its expertise in atmospheric entry, which began during the Mars Viking missions in the late 1970s.



NASA illustration

This artist's concept shows Pathfinder entering the atmosphere of Mars and deploying a parachute to slow its descent.

"Once we started generating results, we became an integral part of the project," said Dr. Robert Braun of the Vehicle Analysis Branch, "and we were able to assist JPL in answering questions pertaining to the entry portion of the flight."

As a member of the operations-navigation team, Braun will be in the control room at JPL on July 4 when Pathfinder is scheduled to land on Mars. He also was attended the launch at Cape Canaveral in Florida.

Solar-Powered Pathfinder Resumes Research Duties

NASA NEWS RELEASE

The record-setting Pathfinder solar-powered research aircraft has resumed flight testing at NASA's Dryden Flight Research Center, Edwards, Calif.

This was the first flight for Pathfinder since Sept. 11, 1995, when it set an altitude record of more than 50,500 feet on a flight from Dryden which lasted nearly 12 hours.

The uncrewed ultralight craft, developed and operated by AeroVironment, Inc., of Simi Valley, Calif., flew for approximately two hours earlier last week during a low-altitude checkout flight over the northern portion of Rogers Dry Lake at Edwards Air Force Base.

The remotely piloted craft was operated by two pilots in both stationary and mobile ground-control stations during the flight. Pathfinder flew in a racetrack pattern in the Unmanned Aerial Vehicle area at altitudes ranging from about 300 to 1,000 feet, while engineers checked out various aircraft systems.

A wealth of data was obtained on the operation of the solar-cell arrays (which cover more than 72 percent of the Pathfinder's upper wing surface), structural integrity and aircraft control systems.

John Del Frate, Dryden's project manager for Pathfinder, said NASA is pleased with the progress of the program, despite a setback a year ago when the craft was extensively damaged in a ground accident inside a hangar.

"It had been damaged following a static display

(see SOLAR POWERED, page 3)

Center Director Offers 1996 Holiday Message

The holidays are traditionally a time of joy and reflection. We, at Langley, can certainly look back on this year's accomplishments with a great deal of pride.

We have exciting, high-payoff programs in

(see MESSAGE, page 3)

In celebration of the holiday season,
the Director of Langley Research Center,
Dr. Jeremiah F. Creedon,
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Colloquium Communiqué

General Aviation Leads to Future 'Highways in the Sky'

Dr. Bruce J. Holmes, manager of the NASA General Aviation Program Office and director of the Advanced General Aviation Transport Experiments (AGATE) Consortium, will deliver Langley's January colloquium lecture, Jan. 7, 2 p.m., at the H.J.E. Reid Conference Center.

He will repeat the lecture – titled "Highways in the Sky: Reinventing Personal Air Transportation for the 21st Century" – the same evening as a Sigma Series Lecture at 7:30 p.m., at the Virginia Air & Space Center in Hampton.

Holmes will discuss the potential future of the "highways in the sky" air traffic system which debuted during this year's summer Olympic Games in Atlanta. The concept was a result of a partnership among NASA, the Federal Aviation Administration and the AGATE consortium.

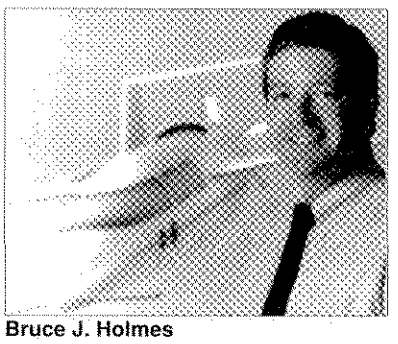
General aviation, the nation's other "airline," has the potential to increase the effective use of the rest of the nation's airspace system to serve smaller communities that are too small to justify scheduled air carrier service.

FYI

What:	Sigma Series Lecture
When:	Jan. 7, 7:30 p.m.
Where:	Virginia Air & Space Center 600 Settlers Landing Rd. Downtown Hampton
Info:	727-0900

What role will general aviation play in the U.S. air transportation into the next century? Today, U.S. general aviation (GA) plays a vital role in the nation's air transportation system and has potential for future expansion in utility and safety – due to emerging navigation, communications, computer, and display technologies. Expanded use of safe, high-utility, lower-cost general aviation could bring the nation's smaller "off-airways" communities more fully into the mainstream of the nation's business, commerce, trade and tourism.

In his presentation, Holmes will explain this vision and the existing General Aviation/Commuter Element plan contained in NASA's FY 1994 Advanced Subsonic Transportation Program. The implementation plan includes formation of a consortium – composed of U.S. general aviation companies, universities, NASA and the FAA – to conduct the research. The technology development plan focuses on revitalization of the U.S. industry through affordability, safety and utility and environmental compatibility.



Bruce J. Holmes

During his more than 20 years with NASA, Holmes has served in several research engineering and senior management positions at Langley and at NASA Headquarters in Washington, D.C.

His aeronautical engineering research accomplishments include drag reduction, flight testing methods and aircraft design concepts.

News Briefs

Around the Agency

VENNERI NAMED NASA CHIEF TECHNOLOGY OFFICER – Effective immediately, Samuel L. Venneri has been named chief technologist at NASA Headquarters, Washington, D.C. Venneri will report directly to Administrator Daniel S. Goldin and will serve as the principal advisor and advocate on matters concerning agencywide technology policy and programs. As chief technologist, Venneri also will chair NASA's Technology Leadership Council. Venneri had served as director of the Spacecraft Systems Division in the former Office of Space Access and Technology. He began his career at NASA in 1981 as a program manager in the Materials and Structures Office, Office of Aeronautics and Space Technology.

NASA LIVE INTERNET COURSE OFFERED – NASA and the University of North Dakota are collaborating to offer a computerized course in "telerobotics" – enabling students to attend virtual classrooms on the Internet and to earn college credit. Telerobotics is the operation and control of a robot at some distance from the workplace. The experimental course, offered by the university's Department of Space Studies, will run from Jan. 22 through March 26. More than 100 students from various countries will hear lectures on "Robotic Vision" and "Automating a Dexterous Robotic Arm" during the course. The project is part of a three-year, $170,000 NASA grant to the university that is funded until 1998. Students who wish to receive college credit must register with the university. Students outside North Dakota must pay an enrollment fee of $294.95. Enrollment deadline is Jan. 22. For registration information, look on the Internet at http://www.space.edu.

MARS GLOBAL SURVEYOR SOLAR PANEL WILL NOT HINDER MISSION GOALS – Mission engineers studying a solar array on NASA's Mars Global Surveyor that did not fully deploy during the spacecraft's first day in space have concluded that the situation will not significantly impair Surveyor's ability to aerobrake into its mapping orbit, or affect its performance during the cruise and science portions of the mission. The solar panel under analysis is one of two 11-foot wings that were unfolded shortly after the Nov. 7 launch and are used to power Global Surveyor. Diagnosis of the solar array position emerged from two weeks of spacecraft telemetry and Global Surveyor's picture-perfect performance during the first trajectory maneuver, conducted Nov. 21. The 43-second burn achieved a change in spacecraft velocity of about 60 miles per hour, just as expected. The burn was performed to move the spacecraft on a track more directly aimed toward Mars, since it was launched at a slight angle to prevent a collision with the planet. Engineers at NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., and at Lockheed Martin Astronautics, Denver, Colo., are working to develop a process to clear the obstruction by gently moving the solar panel. Mars Global Surveyor is the first mission in a sustained program of robotic exploration of Mars, managed by JPL for NASA's Office of Space Science, Washington, D.C.

Labor Group's Proclamation Supports NASA, Apprentices

NASA Langley hosted a VIP group from the National Association of State and Territorial Apprenticeship Directors (NASTAD) from Albany, N.Y. After the tour, the group sent a proclamation to the U.S. Department of Labor and the U.S. Congress, supporting NASA's research and use of registered apprentices.

The center also received a copy of the proclamation, called NASTAD '96 Resolution #4, which appears below:

Whereas, aerospace research has resulted in many benefits to both the American and global societies through the discovery and invention of valuable consumer products, such as microchips, lightweight and sturdy plastics and metals, velcro and hose systems; and

Whereas, the use of these products has produced greater efficiencies in our society, to include the building, construction and manufacturing industries; and

Whereas, the NASA research portion of the industry uses registered apprentices to meet its highly technical workforce needs; and

Whereas, the federal budget, which supports continued NASA research, has been continuously reduced in the past and is slated to receive further reductions; and

Whereas, these reductions will continue to limit the progress of NASA research, which will contribute, in turn, to the weakening of our global economic position; now therefore, be it

Resolved, that the National Association of State and Territorial Apprenticeship Directors (NASTAD) recommends the United States Congress address this significant issue in the hope that it will realize the importance of maintaining NASA's research budget at least at current levels; and

Resolved, that the NASTAD will contact each state's congressional delegation to urge support of NASA and its invaluable research.

Submitted by the executive committee, Sept. 20, 1996; Adopted by NASTAD president Sandra R. Powell, Oct. 24, 1996.

Announcements

SHARP Reunion Planned

The NASA Summer High School Apprenticeship Research Program (SHARP) is sponsoring a reunion luncheon for its former students, mentors and staff on Dec. 27, at noon, in the H.J.E. Reid Conference Center.

All Langley employees who have been instrumental in the development of any of these students are invited to participate in this event. Returning students may wish to acknowledge their mentor's contribution to their successful career.

The cost is $2.50 per person, payable in advance. For more information, call Walt Darden at ext. 44848.

Connors Family Sends Thanks

"To all of our friends and colleagues who sent flowers, cards, and food to our home during the funeral services for our son, Matt Connors, thank you. To all of you who offerred your shoulders and gave us your hugs to support us in our grief, thank you. To those of you who took special time with our son, David, thank you. The support of the NASA community, our friends, and family helps us each day to get on with the business of living.

Thank you for your support, warm thoughts and kind prayers." Vickie, Kevin and David Connors.

LAA To Offer 1997 Employees Almanac

The LAA office is accepting orders for the 1997 Federal Employees Almanac. This complete guide to the current rules that govern your rights, benefits and pay includes hundreds of tables, statistics and explanations vital to the worklife and future of federal employees.

Order the almanac through the Langley Activities Association for the discounted price of $8.65 before Jan. 6 by calling ext. 46369, leaving your name (with spelling), mail stop and extension number; come to the LAA office in Building 1222; order by e-mail at r.s.welty@larc.nasa.gov; or write to LAA, Mail Stop 496. Make checks payable to NASA Langley Activities Association.

Speakers Bureau October Activities

Jack Fishman spoke to Old Dominion University's Beta Beta Beta Biological Honor Society about ozone's effects on the environment.

Stan Ward visited Poquoson Elementary School's 4th-grade Talented and Gifted science class to talk about NASA spinoffs from the space program.

Greg Mekkes traveled to Shenzhen, China, to speak to Shenzhen Huawei Technologies Co. about computational fluid dynamics. While there, he also presented an overview of NASA to the Buckland International School of Language and Business in Yangshuo and spoke about "Western Leadership Principles for Career Enhancement" at the Guilin Workers College in Guilin.

William Kimard addressed the Western Tidewater Radio Association, Inc., in Smithfield, about the space station.

LaMont Poole spoke to the Old Dominion University Institute for Learning Retirement on "Stratospheric Aerosols: Their Role in Global Change." Cary Spitzer visited the same group to discuss planetary exploration; Delma Freeman talked to them about future space transportation systems; and Don Monell discussed the space station.

Jane Hogge spoke to students at Colrain Elementary School in Colrain, Mass., about living and working in space.

Michael Uenking visited Williams Elementary School's CHROME Club in Virginia Beach to discuss NASA Langley and simulated astronaut communications with Mission Control.

Robert Braun spoke at Virginia Polytechnic Institute and State University about "Launch and Entry Vehicle Design at NASA Langley Research Center."

Karen Freidt spoke to the Peninsula Cub Scouts about software used by the Media Concepts Team.

Mike Chapman discussed NASA careers with students in Jenkens Elementary School's CHROME Club in Radford.

Scott Asbury was a guest speaker at Belle Heth Elementary School's career day.

In Memory of Joseph C. Moorman

Joseph C. Moorman, manager of Langley's Utilization Branch, died Dec. 3 after a long illness. He was 54.

Moorman was responsible for the microgravity educational outreach program implemented by Hampton University.

"Joe Moorman was a fine and decent human being," said Dr. Roger Breckenridge, Moorman's supervisor. "We are appreciative for the efforts he put forth in starting and maintaining an analysis effort for the microgravity sciences and applications program. He will be sorely missed, and our prayers are with his wife and sons."

In Memory of Kenneth G. Carroll Sr.

Dr. Kenneth G. Carroll Sr., 82, died Oct. 21 in Arlington, Va. He worked in Langley's Thermodynamics Branch from 1940 to 1942; at Lewis Research Center in Cleveland, Ohio, from 1942 to 1944; and at the NASA Electronics Research Center in Cambridge, Mass., from 1967 to 1970.

In Memory of Marion B. Seyffert

Marion B. Seyffert, 88, died Sept. 19 in Hampton. Seyffert retired from Langley in 1972 as chief of the Fabrication Division after 32 years of service.

News Researcher

The *Researcher News* is an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees. Submit contributions to the editor via e-mail (researcher-news@larc.nasa.gov), QuickMail (Mary Graves), fax 1 (804) 864-8810, telephone 1 (804) 864-6126 or Mail Stop 146. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor . . . . . Keith Henry

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Science and Technology Corp.

Assistant Editor . . . . . Jeane Shanks
Science and Technology Corp.

Photographer . . . . . Fred Jones

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

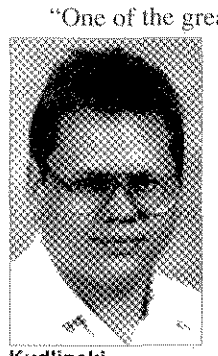
Kudlinski To Represent NASA in Maxwell Fellowship Program

BY DANIELLE BECK

Robert Kudlinski, the assistant chief of the Information Systems and Services Division, has been selected for the Maxwell Mid-Career Executive Education Program fellowship at Syracuse University in Syracuse, N.Y.

Kudlinski will represent NASA as the sole fellowship recipient at the Maxwell School of Citizenship and Public Affairs starting in January.

This 15-week program focuses on developing an understanding of public organizations and their management; the social, economic and political forces that work upon those organizations; and effective business decision-making and strategy formulation.


Kudlinski

"One of the greatest benefits I expect is intense interaction with a diverse group of dedicated colleagues from other agencies and industry by which I can benchmark and improve Langley business practices," Kudlinski said.

Here at Langley, Kudlinski leads a division that includes the center's communications systems, computing systems and applications for scientific and business functions, flight simulation systems and scientific and technical information systems and services.

TheYork High School graduate received a bachelor's degree in electrical engineering from the Massachusetts Institute of Technology. He has completed graduate courses at Old Dominion University, the College of William and Mary and George Washington University.

Photo by Fred Jones

'IF IT IS TO BE ...' The Combined Federal Campaign held its recognition awards ceremony Dec. 2, honoring outstanding contributing agencies and military bases for their support. NASA Langley chaired this year's campaign. Above, Langley Center Director Jeremiah F. Creedon accepts an award from Jack Clough, the Peninsula campaign manager, in appreciation of Creedon's service as general chair of the Peninsula CFC. Awards also went to Karen Credeur, deputy head of the Office of External Affairs, in appreciation of her service as Peninsula executive chair; for the center's outstanding support of the CFC (accepted by center CFC chair Woodrow Whitlow); to Kelly Hayhurst, Langley's loaned executive, and to her supervisor, Raymond Calloway, for their support; to Catharine Schauer for "extraordinary service, support and caring of the Virginia Peninsula's CFC."

Langley Awards Contracts for Test Models, Hardware

NASA Langley Research Center is awarding three five-year contracts potentially totalling $90 million to companies that will design and/or fabricate aerospace test hardware and aircraft models.

The required work to be performed is a consolidation of several contracts from NASA's Ames, Langley and Lewis research centers.

▲ Advanced Technologies Inc. of Newport News is the prime contractor, teaming with West Tool and Manufacturing Inc. of Cleveland, Ohio; ADF Corp. of Brook Park, Ohio; and Tri-Models Inc. of Huntington Beach, Calif.

▲ Dynamic Engineering Inc. of Newport News is the prime contractor teaming with Modern Machine and Tool Co. Inc. of Newport News.

▲ A third prime contractor, Micro Craft Inc., of Tullahoma, Tenn., is not teamed with another company.

The contract provides for the design and/or fabrication of aerospace model systems and developmental test hardware used for space flight, air flight, and ground-based tests.

Each of the three contracts provides a minimum of $200,000 for the five-year performance period, not to exceed $90 million total.

No Hampton Roads companies were among the unsuccessful bidders.

MESSAGE

(continued from page 1)

atmospheric sciences, airframe systems, high-speed research and advanced subsonics. We are the agency focal point for wind tunnels, aerothermodynamic and structural test facilities. We are the agency lead in structures and materials, in airborne systems, in aerodynamics, in mission and systems analysis, in crew station design and integration and in hypersonic technologies.

In addition, we can look to 1997 with confidence. Our aeronautics mission and Mission to Planet Earth areas are vital to the agency. We are making important contributions in space technology and in nonaerospace applications. We have been able to assume these leadership roles because of you – Langley's outstanding civil servants and contractors.

On behalf of the entire senior staff, I want to thank each of you for your exceptional effort and outstanding accomplishments. Further, we extend to you and your family a sincere wish for a blessed holiday season and a new year marked by joy and fulfillment.

Jeremiah F. Creedon
Director

Former Fighter Pilot To Present Wright Brothers Memorial Lecture

Quinton C. Aanenson, World War II pilot and the author/producer of a 1995 PBS film entitled "A Fighter Pilot's Story," will present the Wright Brothers Memorial Lecture on Dec. 17, 1 p.m., in the H.J.E. Reid Conference Center.

Aanenson was a University of Washington student working for Boeing when he entered military service in 1942. He trained as a P-47 pilot and flew combat missions over Europe during World War II.

Aanenson's appearance at Langley commemorates the Wright Brothers' first flight on Dec. 17, 1903, near Kitty Hawk, N.C. Nearly 93 years ago, Wilbur and Orville Wright achieved the first controlled and sustained power flight in a heavier-than-air flying machine.

Aanenson as a WWII flight trainee.

NASA Langley Research Center, the American Institute of Aeronautics and Astronautics, the Air Force Association, the National Security Industrial Association and the Virginia Aerospace Business Roundtable sponsor the event. Time may be charged to Job Order A5266.

SOLAR-POWERED

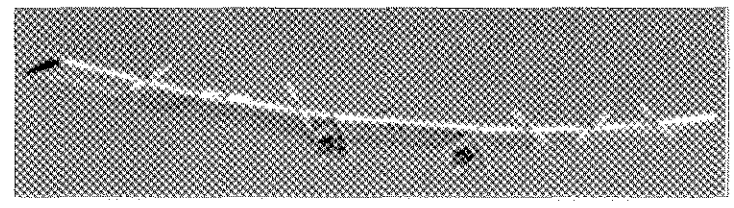
(continued from page 1)

last October," he said. "NASA is quite pleased that AeroVironment has been able to repair it and get it back in the air in just a little over a year."

In addition to repairing the damage, AeroVironment made several structural and systems improvements, including installation of stronger, lighter composite rib structures and higher-efficiency solar cells on the wing sections that had been damaged.

Pathfinder's flights are intended to check out systems prior to moving flight operations to the Navy's Pacific Missile Range Facility (PMRF) in Hawaii early next year for further tests. One or more flights at both low and high altitudes may be flown from Dryden within the next couple of months to check out Pathfinder's systems in a much colder environment.

Low sun angle and limited hours of sunlight during the winter will limit Pathfinder's altitude capability to about



20,000 feet. That limitation is one of the reasons that the project will be transferred to the PMRF on the island of Kauai, which lies at a lower latitude. Kauai's latitude and more favorable prevailing northerly winds will allow more opportunity for high-altitude solar-powered flying during a five-month flight test program.

Pathfinder is one of several remotely piloted aircraft being evaluated under NASA's Environmental Research Aircraft and Sensor Technology (ERAST) program. The joint NASA-industry alliance is seeking to develop technologies required to operate slow-flying unpiloted aircraft at altitudes up to 100,000 feet on environmental-sampling missions lasting up to a week or longer.

Originally designed for a classified military program in the early 1980s, Pathfinder went through several modifications before being adopted into the ERAST program in 1993. With a span of 99 feet, Pathfinder is basically a flying wing. Only two small pods extend below the wing's center section to carry a variety of scientific sensors and support the craft's landing gear. The solar arrays on the wing can provide as much as 7,200 watts of power at high noon on a summer day to power the craft's six electric motors and other electronic systems. A backup battery system can provide power for up to two hours to fly the craft after the sun is down.

Built primarily of lightweight composite structure, plastic foam and a thin plastic covering, Pathfinder weighs about 500 pounds.

AdVentures

FOR SALE: Oriental wool rug, 11 feet by 17 feet, cream with blue-and-pink floral pattern. $400. Call 247-5144 before 9 p.m.

FOR SALE: Stereo system, 8 years old, excellent condition. Includes: (1) Technics receiver, 50 watts per channel, 16 presets, hookups for TV, CD player or VCR, and turntable; will drive up to four speakers; and (2) Pioneer speakers, 3-way, 75 watts per channel maximum, 12-inch woofer. Willing to demonstrate before sale. $185. Call Scott at 566-8346.

FOR SALE: 1989 Nissan 4X4, red with shell, $8,000. Call 820-8066 (digital pager).

O SPACE TREE, O SPACE TREE: The Virginia Air & Space Center features "Holiday Demonstrations" every Saturday and Sunday, 11 a.m.-4 p.m., now through Dec. 29. Help make ornaments for the museum's four "Space Trees," using *Things That Fly, Space Ships, Planets,* and *Holly Day in Space* decorations. For more information, call 727-0900.

SPIRIT OF HAMPTON ROADS PARADE: North Hampton Roads' only illuminated, nighttime, televised street parade, Dec. 14, 6:30 p.m., downtown Hampton. Featuring the arrival of Santa Claus. For more information, call 728-3200.

I HEAR A SYMPHONY: The Williamsburg Symphonia will perform Dec. 16, 8:15 p.m., at Phi Beta Kappa Hall in Williamsburg, with a pre-concert discussion at 7:15 p.m. The performance will feature acclaimed area guitarist and College of William and Mary faculty member, Timothy Olbrych. For more information, call 229-9857.

DEGREES OFFERED: George Washington University's School of Engineering and Applied Science's Joint Institute for Advancement of Flight Sciences at NASA Langley offers these degrees: master of science; professional and doctor of science in aeroacoustics, aeronautics, astronautics, fluid mechanics and thermal sciences, structural engineering and structural dynamics; master of engineering management. Registration for the spring semester is Dec. 16-20 and Jan. 6-10. For more information, call ext. 41982, fax to ext. 45894, or e-mail to gwu+jiafs@larc.nasa.gov.

TECHNICAL FORUM AGENDA: Scheduled for the third Wednesday of each month, the Dec. 18 Langley Technical Forum will be held 10 a.m.-noon, in Building 1212, Room 200. The sessions include:

- ANSER Flight Tests – D.G. Murri
- Uninhabited Combat Air Vehicles (UCAV): A Revolution in Military Aircraft – T.M. Moul
- Laser Frequency Control Using an Optical Resonator Locked to an Electronic Oscillator – S.P. Sandford, C.W. Antill
- Boundary Layer Transition Detection at NTF Using Temperature Sensitive Paint – M. Mitchell, L.R. Owens
- Integrated Materials Technologies for Advanced Spacecraft – E.R. Long Jr.

LAA HOLIDAY SOCIAL: Dec. 20, 4-8 p.m., in the H.J.E. Reid Conference Center.

WHAT'S BREWIN'? Annual "Old-Timers' Coffee," Dec. 21, 9 a.m.-noon, Building 1244, Room 121. For more information, call ext. 43876.

HAPPY NEW YEAR: LAA's New Year's Eve Country & Western Dance, Dec. 31, 9 p.m.-1 a.m; doors open at 8 p.m. Tickets available at LAA country & western dances or at the LAA office, Building 1222. Cost per person is $12.50. For more information, call ext. 48100.

NEW YORK WIND SOLOISTS: Flute, bassoon, clarinet and French horn combine in a program of French masterpieces. Jan. 8, 8 p.m., Ogden Hall, Hampton University. Tickets $10-$17.50. For more information, call 727-2787.

AIAA FIELD TRIP: To the Smithsonian Institute's National Air & Space Museum and Garber Restoration Facility, Jan. 18, leaving Tabb at 6 a.m., returning at 9 p.m. Cost for transportation is $14 for AIAA members and guests; $12 for student members and juniors, 14-18 years old. Reservations are limited to 46 people and must be made by Jan. 10. For more information, contact Odilyn Santa Maria at ext. 45104 (o.l.santamaria@larc.nasa.gov) or Atherton Carty at ext. 46240 (a.a.carty@larc.nasa.gov).

NASA SKI WEEK VI: The sixth annual agency-wide ski trip is scheduled for Jan. 18-25 at Steamboat Springs, Colo. The trip is open to all NASA personnel, contractors, retirees, and their friends and relatives. For more information, call Michael Schooley at ext. 48524 or at 867-8093.

LANGLEY KARATE CLUB: Classes in Cuong-Nhu oriental martial arts, Mondays and Wednesdays, 5-7 p.m., at the Langley gym. NASA employees, co-ops, contractors, and their immediate family (ages 12 and up) welcome. For more information, call Roy Albang at ext. 46160 or at 596-7736, 7-10 p.m.

ULTIMATE FRISBEE: Games held twice a week, coed, all levels of players, possibly for local tournaments. For more information, call ext. 42197 or e-mail to jrrjr@icase.edu.

SEASON'S GREETINGS! Langley employees may receive 40 percent off published prices on wedding, stationary and personalized Christmas/seasonal greeting cards at the Langley Exchange Shop. Samples are available for checkout at the shop. For more information, call ext. 41585.

IT'S ELECTRIC! *Electric Space: Bolts, Jolts and Volts from the Sun*, a hands-on exhibit at the Virginia Air & Space Center, runs through Jan. 7. For more information, call 727-0900.

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Joint Operations

Joe Zalameda, left, of Langley's Nondestructive Evaluation Sciences Branch, describes the application of thermographics for the Composite Armored Vehicle's upper-hull structure to visiting Army Materiel Commander Gen. Johnnie Wilson, far right. Wilson visited the center's Army Research Laboratory (ARL) Vehicle Technology Center (VTC) Nov. 12. One of several trips the commander has made to the various ARL locations, the Langley visit marked the first time in some 15 years that an AMC commander and four-star general has visited a NASA site. After an overview briefing of the VTC mission at Langley, Wilson toured the Impact Dynamics Research Facility and the 14-by-22-Foot Subsonic Wind Tunnel. During a VTC technology poster session conducted in the Langley hangar, he also toured the NASA Boeing 757 research aircraft housed there at that time.

Photo by Fred Jones