



National Aeronautics and
Space Administration
Goddard Space Flight Center

Goddard News

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Latest Tracking and Data Relay Satellite launched

by Fred A. Brown

On Thursday, July 13 at 9:41:22 a.m. EDT, Space Shuttle Discovery was successfully launched from the Kennedy Space Center (KSC). The Goddard-managed satellite was then deployed from the Shuttle just a little over six hours after launch. The satellite is the primary payload on Mission STS-70.

Space Shuttle Discovery was originally scheduled for launch in June, but that launch was delayed while engineers repaired damage done to the external tank by woodpeckers. The birds made nearly 200 holes in the foam insulation covering the external tank.

TDRS-G is the final in a series of communications spacecraft that make up the basic Tracking and Data Relay Satellite System (TDRSS) and replaces the second TDRS, which was lost with Space Shuttle Challenger.

The TDRSS has reduced NASA telecommunications costs approximately 60 percent while increasing data acquisition and communications with Earth orbiting satellites by as much as 85 percent for many user spacecraft.

The TDRSS, which is managed by Goddard; serves a host of customers including the Space Shuttle, the Compton Gamma Ray Observatory, the Upper Atmosphere Research Satellite, Hubble Space Telescope, Cosmic Background Explorer, the Extreme Ultraviolet Explorer, TOPEX-Poseidon, both Landsat satellites, and other non-NASA missions according to Charles Vanek, TDRSS Project Manager, Code 405. Soon the International Space Station and Earth Observing System satellites also will rely on the TDRSS for their communications needs.

TDRS-1 was launched in April 1983 on board Space Shuttle Challenger, and the second TDRS was lost in the Challenger disaster in January 1986. TDRS-3 was launched on board Space Shuttle Discovery in September 1988, and TDRS-4 was launched on board Discovery in March 1989. TDRS-5 was launched on board Space Shuttle Atlantis in August 1991. TDRS-6 was launched on board Space Shuttle Endeavour in January 1993. The five orbiting TDRS spacecraft are all functioning, but only three (TDRS-4, TDRS-5, and TDRS-6) are fully operational.

TDRS-G is the last of a generation of seven space-

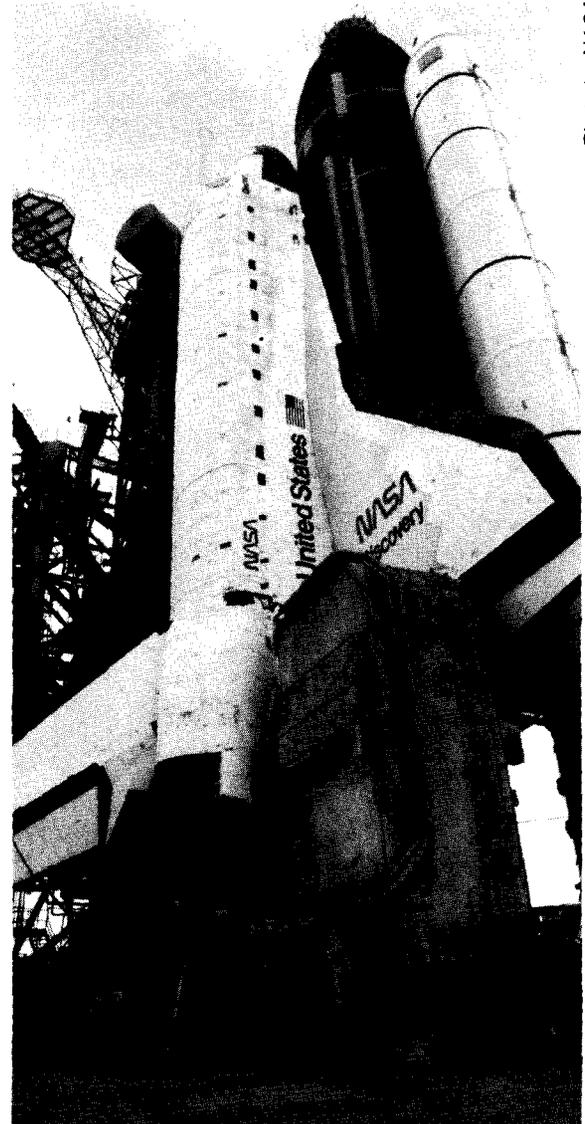
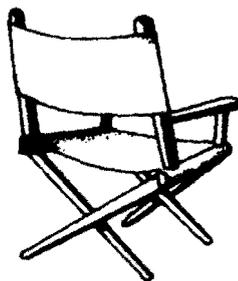


Photo by NASA

The Space Shuttle Discovery back at Launch Pad 39B at the Kennedy Space Center after undergoing repairs to its external tank.

craft, built by TRW of Redondo Beach, Calif., that make-up the initial series of communication satellites for NASA. Future system needs will be supported by the TDRS-H,I,J spacecraft that are to be built by the Hughes Aircraft Corporation of El Segundo, Calif. Hughes has been selected to build these spacecraft.

Director's Dialogue



Q : Recently the Baltimore telephone tie-line was discontinued. As a result, Goddard personnel can no longer call the local Baltimore area by

dialing nine plus the phone number. An employee can call anywhere in the United States using FTS by dialing eight plus the area code and phone number. However, these calls, if personal, must be paid for as is noted on Branch phone usage and payment charts.

I agree people shouldn't be calling all

over the United States on company time, however, local area (Washington-Virginia Beltway vicinity) telephone calls can be made enabling those employees who live in these areas to get in touch with their families. The Baltimore tie-line allowed employees who live north of Goddard to communicate with their families. It also promoted a little bit of employee morale by allowing single parents, members of two-job families, and shift workers to contact their loved ones.

Why can't those employees who live in the 410 area code have the same convenience as their co-workers who live within the 202, 301 and 703 area codes. Please bring back the Baltimore tie-line.

A: In the April 1994 budget review, it was determined that the Baltimore tie-lines were no longer cost effective. They were costing the Center \$4,000 per-month and could not handle all the traffic to Baltimore. Overflow traffic automatically was routed to FTS. The question was raised whether or not to install additional tie-lines or convert Baltimore dialing to FTS. Research found FTS to be less costly per-month than message unit charges on the tie-lines.

**Vaughn Turner,
Code 540,
Chief, NASA Communications
Division**

Schumacher, Whitehead appointed associate administrators

NASA Administrator Daniel S. Goldin has appointed John D. Schumacher as the Associate Administrator for the Office of External Relations and Dr. Robert E. Whitehead as the Associate Administrator for NASA's Office of Aeronautics, NASA Headquarters, Washington, D.C., effective immediately.

The Office of External Relations provides international policy formulation, coordination and implementation. The Office of Aeronautics is responsible for directing NASA's aeronautics research and development programs.

"Bob Whitehead and John Schumacher are talented managers with extensive experience in their fields," Goldin said. "Our aeronautics program and our work in developing partnerships with other nations are central elements of NASA's vision for the future, so we are indeed fortunate to have Bob and John heading up those key areas."

Schumacher came to NASA from the law firm of Rogers & Wells, New York, in June 1989 and served as Advisor to the NASA Administrator until January 1991, when he became the Deputy Associate Administrator for External Relations. He

was appointed Acting Associate Administrator for External Relations in September 1994.

Earlier in his career, Schumacher served as a Naval officer with tours of duty aboard the USS Guadalcanal, at the Organization of the Joint Chiefs of Staff, and as Aide to the Director, Navy Command and Control. He graduated with distinction from the United States Naval Academy, earning a bachelor of science degree in oceanography/general engineering in 1976. He earned a master of arts degree in government, with a certificate in national security studies, from Georgetown University in 1984. Schumacher also earned a doctor of law degree from the Columbia University School of Law, and a certificate with honors in international law from Columbia's Parker School of International and Foreign Law in 1987. He is a member of the New York Bar, the American Bar Association (International Law Section) and the U.S. Naval Institute.

Whitehead, who joined NASA in 1989, has been the Deputy Associate Administrator for Aeronautics, NASA Headquarters, Washington, D.C., since February 1994. He played a key role in

advising and working closely with the Associate Administrator in developing strategic plans and direction for NASA's aeronautics research programs and in institutional management of NASA's Ames, Dryden, Langley and Lewis Research Centers.

Whitehead began his career in 1970 as a postdoctoral research associate at NASA's Ames Research Center, Mountain View, Calif. From 1971-1976, he was a research engineer at the Department of the Navy's David Taylor Research Center, Potomac, Md.

In 1976, he joined the Office of Naval Research as scientific officer for aerodynamics and later held positions as program manager for fluid dynamics (1981-1985) and Director, Mechanics Division (1985-1989).

Whitehead received a bachelor of science degree (1967), a master of science degree (1969) and a doctor of philosophy (1971) degree in engineering mechanics from the Virginia Polytechnic Institute and State University. He is a member of the American Institute of Aeronautics and Astronautics and the American Helicopter Society.

Pegasus study underway

by Ernie J. Shannon

The second attempt by the Orbital Sciences Corporation (OSC) to launch a Pegasus XL rocket ended in failure June 22 when the U. S. Air Force range safety technicians at Vandenberg Air Force Base, Calif., were forced to destroy the rocket and its Air Force STEP 3 payload.

This marks the second consecutive time that technicians at Vandenberg had to destroy a Pegasus XL launcher. The first time occurred in June 1994 when a rocket veered off course during its first stage burn. This time, officials believe the problem may have occurred during the first and second stage separation about 90 seconds into the launch. The vehicle eventually veered off course and was destroyed by the range safety officer approximately 150 seconds after launch.

The Pegasus XL, which is carried aloft

by an OSC L-1011 aircraft and then released, was scheduled to carry Goddard's Total Ozone Mapping Spectrometer/Earth Probe satellite into orbit July 27. That launch has been postponed indefinitely, as have four other Goddard missions scheduled for Pegasus XL launchers later this year: the Fast Auroral Snapshot Explorer, the Submillimeter-Wave Astronomy Satellite, the Satellite De Aplicaciones Cientificas and the Sea-viewing Wide Field Sensor.

Also, as a result of the Pegasus failures, Dr. John Mansfield, Associate Administrator for Space Access and Technology, said that NASA is preparing to issue a Request for Information. The request seeks interest from industry in providing alternative sources of small expendable and reusable launch vehicle services in

both the near and long term.

"NASA sees a serious shortage over the next few years of small launch vehicle support for its scientific missions," Mansfield said. "At the moment, there is a significant backlog of these important missions, a situation NASA cannot allow to continue. These missions must have assured launch support."

In addition, several task teams, including one being chaired at Goddard, are reviewing launch options for the next several years.

What's Up?

July 1995

International Ultraviolet Explorer (IUE)

July 1, marked IUE's 6,366th day in orbit

During June, International Ultraviolet Explorer (IUE) took advantage of the rare ring-plane crossing of Saturn in order to investigate Saturn's aurorae and seasonal variations.

Saturn orbits the Sun once every 29.5 years. For half that time, roughly 14.7 years, we see the top (northern part) of the ring plane, and we see the bottom of the ring plane the other half of the time.

On May 22, Saturn's rings appeared edge-on, as viewed from Earth as Saturn transitioned to showing us the bottom (southern part) of the rings for the next 14.7 years. The rings circle the planet in its equatorial plane and can achieve a maximum tilt of about 30 degrees as viewed from Earth.

This ring-plane crossing provided an opportunity to simultaneously study variability in both the northern and southern

polar aurorae, since both are in view.

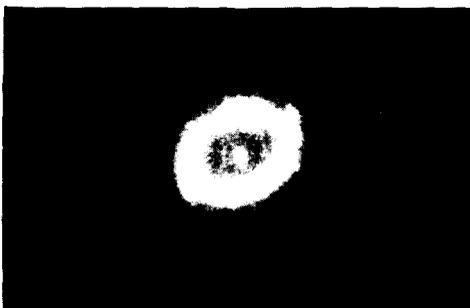
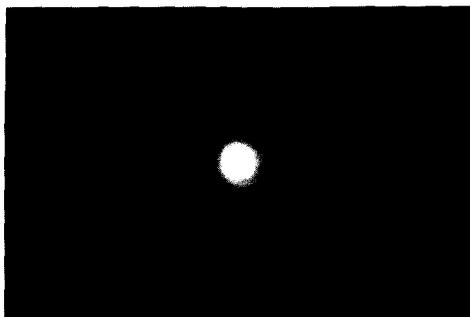
The new data will be compared with the well-studied aurorae of Jupiter. This is also the only time of Saturn's year that both hemispheres can be studied without interference from the rings. Saturn's rings largely obscure its winter hemisphere, enhancing seasonal variations in atmospheric photochemistry and making it a unique laboratory for testing photochemical modeling techniques for all the outer planets.

This is the second time that IUE has been able to simultaneously study stratospheric processes in both of Saturn's hemispheres and is the first chance to observe both hemispheres since the Voyager spacecraft flyby.

The IUE data could not have been obtained from Earth-orbiting spacecraft or ground-based observatories.

Preliminary inspection of the spectra indicates that the continuum and Lyman-alpha hydrogen emission will provide important new clues for understanding the aurorae and seasons of Saturn.

UIT provides ground-based imaging of the starburst galaxy NGC4736



A remarkable giant ring of hot young stars appears in the ultraviolet image (top) of the spiral galaxy Messier 94 (M94, also called NGC 4736), as photographed by the Ultraviolet Imaging Telescope (UIT) on March 12, 1995 during the Astro-2 mission of the Space Shuttle Endeavour.

M94, called a starburst galaxy because of the large number of new hot stars that are present, is located about 15 million light years from Earth and has an apparent diameter equal to about 1/3 that of the full moon.

In red light (bottom), M94 shows three distinct zones: an extremely bright central bulge, composed mostly of old, cool stars; the main disk showing many short spiral arms; and an extensive, faint outer ring.

In striking contrast to its visual appearance, the UIT image (top) shows a com-

pletely different structure. The familiar spiral pattern is replaced by a well-defined ring of massive stars bracketing the nucleus. The central bulge is not observed. The stars in this ring formed within the past 10 million years, marking the ring a site of intense, recent (in astronomical terms) star formation. A mystery, which UIT astronomers will explore, is why almost all massive star formation in M94 is concentrated in a very narrow zone and has not occurred in other parts of the galaxy. Study of the young stars in this ring will add to astronomer's understanding of galaxy evolution.

UIT is a 15-inch (0.38-m) telescope, which was designed and built at Goddard. This UIT photo was presented to the American Astronomical Society meeting in Pittsburgh, Pa., June 12, 1995.

Spacewalkers selected for second Hubble servicing mission

NASA has selected four astronauts to conduct spacewalks for the second flight to service the Hubble Space Telescope in early 1997.

Astronauts Mark C. Lee, Gregory J. Harbaugh, Steven L. Smith and Joseph R. Tanner will be the extravehicular activity crew for Space Shuttle Mission STS-82.

According to Dr. John Campbell, associate director for HST, Code 440 the selection means a reunion for astronauts Lee and Harbaugh. Campbell, said "We are pleased with the choice of the crew for our second Hubble Space Telescope Servicing Mission. We worked with Greg Harbaugh during the many years that he trained for the first Servicing Mission, and he helped in preparing for the second. Mark Lee has also been helping us prepare for the next mission and has participated in the water tank tests. We look forward to working with all the astronauts as preparations continue."

The mission plan, scheduled to include at least three spacewalks, currently includes changeout of two science instruments and a data interface unit. The instruments are the Space Telescope Imaging Spectrograph and

the Near Infrared Camera Multi-Object Spectrometer.

Lee, 42, (Colonel, USAF) has flown on three Shuttle missions — STS-30 in May 1989, STS-47 in September 1992 and STS-64 in September 1994. He conducted the first untethered spacewalk in 10 years during his last mission. Lee will be Payload Commander for this servicing mission. He earned a master of science degree in mechanical engineering from the Massachusetts Institute of Technology in 1980. He was born in Veroqua, West Indies.

Harbaugh, 39, is a member of the STS-71 flight crew which docked with the Russian Space Station Mir this month. He has flown on two previous Shuttle missions — STS-39 in April 1991 and STS-54 in January 1993. In addition to conducting a spacewalk on STS-54, Harbaugh also served as the backup spacewalking astronaut on the first Hubble Servicing Mission in December 1993 and was the spacecraft communicator in Mission Control for the five spacewalks during the flight.

He graduated from Purdue University with a bachelor of science degree in astro-

nautical engineering in 1978 and received a master of science degree in physical science from the University of Houston-Clear Lake in 1986. Originally from Cleveland, Ohio, Harbaugh considers Willoughby, Ohio state his hometown.

Smith, 36, flew on STS-68 in September/October 1994. He served as a payloads officer in Mission Control prior to becoming an astronaut. Smith earned a master of science degree in electrical engineering in 1982 and a master of science degree in business administration in 1987, both from Stanford University. He considers San Jose, Calif., his hometown.

Tanner, 45, flew on STS-66 in November 1994. Prior to becoming an astronaut, he was a research and instructor pilot, specializing in Shuttle landing techniques in the Gulfstream Shuttle Training Aircraft and T-38 trainers. Tanner earned a bachelor of science degree in mechanical engineering from the University of Illinois in 1973. He is from Danville, Ill.

XTE is prepared for launch

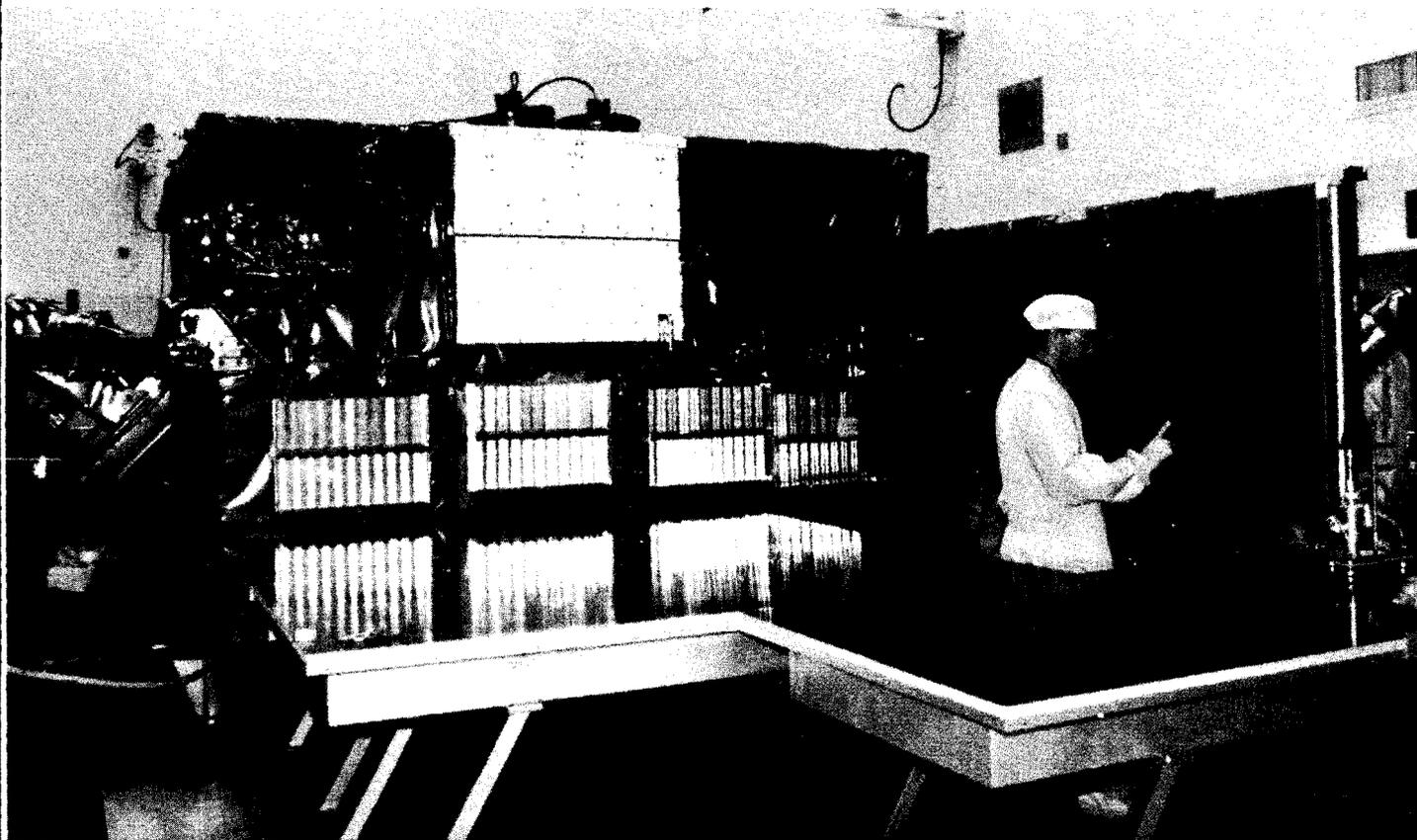


Photo by NASA

Goddard technician Rodger Farley, Code 722.2; inspects the Goddard-managed X-ray Timing Explorer (XTE), which just arrived at Hanger AO, Cape Canaveral Air Station from Goddard. The spacecraft will undergo about two months of checkout, tests and preparations for launch. The XTE will gather data on X-ray sources in the galaxy and beyond. Launch is scheduled for August, on a Delta II rocket from complex 17 at Cape Canaveral.

Christensen to head new NASA headquarters operations office

As part of an effort to dramatically reduce staffing at its headquarters, NASA is merging a variety of staff functions within an Office of Operations to be headed by former Goddard employee Michael D. "Chris" Christensen, effective immediately.

The new Headquarters Operations Office will consolidate institutional functions from seven organizations. Those functions, involving areas such as procurement and finance, relate to the daily running and operations of NASA Headquarters.

"This consolidation is one more step in a process that will result in a 50 percent reduction in staffing at NASA Headquarters

by Fiscal Year 1999," said Acting Deputy Administrator John R. Dailey. "The new Operations Office under Chris Christensen will allow us to achieve the maximum amount of efficiency in the daily running of our organization here in Washington."

Christensen began his NASA career as a federal personnel intern in 1967. During his tenure at NASA, he has worked at the Kennedy Space Center, Johnson Space Center, and Goddard, as well as NASA Headquarters. In 1975, he became Deputy Chief of the Manpower Utilization Division at Goddard.

In 1979, Christensen joined the

Agricultural Research Service, Department of Agriculture, as Director of Personnel. He subsequently served as Associate Deputy Administrator for Management.

In 1988, Christensen rejoined NASA in his current capacity as Deputy Associate Administrator for Management Systems and Facilities. He has been the recipient of the Secretary of Agriculture's Distinguished Service Award, NASA's Exceptional Service Award, and a Presidential Meritorious Rank Award. He and his wife, Jan, reside in Columbia, Md.

Trying to make a difference by staying "home"



Dan Krieger (right) counsels a summer intern.

by Terri Patterson

Some people leave home at an early age. Dan Krieger, an Equal Employment Opportunity (EEO) Specialist in the Equal Opportunity Programs Office, Code 120, never really left home.

Krieger, who was born and raised in Greenbelt, graduated from Eleanor Roosevelt High School. He later attended the University of Maryland and graduated cum laude in 1991 with a dual bachelor's degree in psychology and Spanish. Krieger also attended Johns Hopkins University, where he received a master of science degree in applied behavioral science in 1993.

"I never imagined that I would end up working at Goddard — it was so close to home that I always took it for granted. As a child, I would often pass the Center and wonder what in the world took place behind the gate. I know that I am extremely fortunate to have ended up here because of the importance of the work that we do at

the Center and the many positive activities.

In 1989, Krieger began his Goddard career at the Office of Human Resources, Code 114. In January 1990, he entered the Cooperative Education Program and moved to his current position in Code 120 in August of that year.

For Krieger, each day brings a variety of new challenges. He is the Center's Hispanic Employment Program Manager, and in his role as an EEO Specialist, he works with discrimination complaints, workforce diversity issues, and summer internship and community outreach programs.

He also is an avid sports fan, and often can be found in the Goddard Fitness Center.

"What I enjoy most about what I do, is the interaction with people. In the type of work that we do in EEO, we have the opportunity to meet with students, employees and members of the local community.

You can often see the impact that you've had on someone, whether it's when someone gets hired, resolution of an EEO issue, or just the facial expression of a young person when they hear of NASA. It's extremely rewarding whenever you can make a difference, however small, in someone's life," said Krieger.

Krieger also serves on the Center Multi-Cultural Advisory Team (MCAT) and Hispanic Advisory Committee for Employees (HACE) and coordinates and teaches free conversational Spanish classes for Goddard employees at lunch time.

"When someone asks me what I do on a normal day at Goddard, I tell them that I don't have normal days. I love the variety of my job — I'm always kept challenged and on my toes."

Besides athletics, Krieger's hobbies include traveling, learning about other cultures, reading, and helping to plan his upcoming wedding in December.

Goddard scientist earns prestigious award

by Ernie J. Shannon

Dr. Piers J. Sellers, an Earth scientist at Goddard, recently received an Arthur S. Flemming Award for his achievements in three separate areas of research. The Arthur S. Flemming Awards recognize "outstanding young (under 40) federal workers for scientific, technical and administrative achievements."

Sellers, Code 923, was honored for his research in the areas of biosphere-atmosphere interaction modeling, the design, implementation and conduct of large scale field experiments and remote sensing science. He has been a key scientist in the

conception and design of several major, international field experiments related to land-atmosphere interactions. His pioneering work in the use of radiative transfer theory shows that small scale biospheric processes can be measured by satellite. He has also played a major role in the planning and execution of NASA's Earth Observing System project.

Two Goddard employees receive honor

by Barbara Veres



Carol Bleile

Carol Bleile, Code 287, and Rex Elliott, Code 242, recently achieved the class of Fellow in the National Contract Management Association (NCMA). This high honor is given only to a small percentage of NCMA members.

Bleile and Elliott made significant and outstanding contributions to the field of contract management and to the association. Both possess excellent credentials in academic training and work experience.

The Free State (Maryland) chapter of the NCMA has grown in a few short years from approximately 35 members to more than 175 due in part to the efforts of Bleile and Elliott.

Bleile is currently a contracting officer in the Engineering Procurement Branch. She has a bachelor of science degree in

business administration from California State University and a master of science degree in contract and acquisition management from the Florida Institute of Technology. Bleile has been a member of the NCMA since November, 1986.

In the past Bleile served as chapter newsletter editor, secretary, vice president, and treasurer. She also was chairperson of various committees such as publicity, scholarship, certification, national education seminar, and helped out with hospitality.

She joined Goddard and became a part of the Management Operations Procurement Branch, Code 242, in September 1986. Bleile has been an associate contracts manager since May, 1992.

Elliott is a senior contract specialist/contracting officer in the Management Operations Procurement Branch. He has a bachelor of arts degree in public administration from Seattle University, where he graduated magna cum laude, and a master of arts from Rutgers University's Eagleton Institute of Politics, New Brunswick, N.J.

Elliott has been a member of NCMA

Marathon training group forming

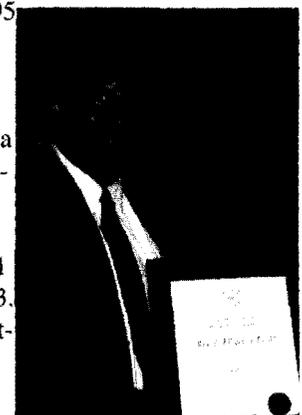
On Sunday Oct. 29, the United States Marine Corps will hold its 20th annual 26.2 mile (42 kilometers) marathon. An informal training group is being formed at Goddard to help prepare Goddard employees who want to participate. The group will meet three days a week in the District of Columbia. Wednesday and Friday at 7 a.m. and Sunday at 8 a.m., at the Thompson's Boat House Parking Lot, which is located at the intersection of Rock Creek Parkway and Virginia Ave., N.W., near the Kennedy Center.

The pace will be conversational and the group friendly and supportive, not competitive. The focus is on distance, rather than speed. The runs on Sunday will be about 10 miles (16 kilometers), building to 22-24 miles (35-38 kilometers) by early October; the weekday runs will be 5-6 miles (8 kilometers), building to 10-12 miles (16-19 kilometers). For additional information contact Robert Afzal, Code 924, X6-5669.

since 1987 and has served as chapter program chair, treasurer, vice-president, conference chair for the national education seminar, certification chair, and is currently the President of the Free State Chapter in Greenbelt. He also has actively participated in the NCMA's Mid-Atlantic Region by hosting the 1995 Leadership Conference.

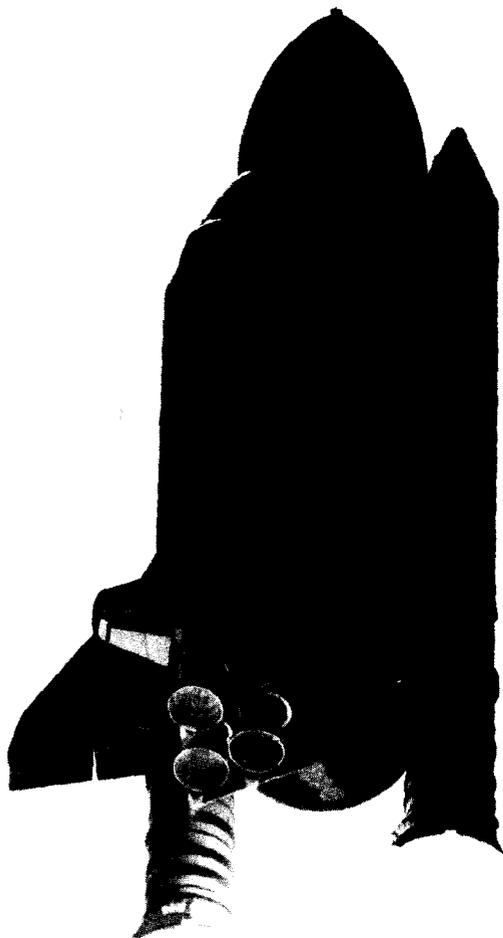
In 1992, Elliott became a certified professional contract manager. He joined Goddard in August, 1983. He has completed various assignments involving personnel, financial

analysis, program analysis, and procurement since then. Elliott has received numerous awards at Goddard, including the NASA Exception Service Medal for work on the Geostationary Operational Environmental Satellite.



Rex Elliott

Historic Shuttle mission



This photo shows the 100th U.S. human space launch as it occurred at 3:32 p.m. EDT, June 27, from Launch Pad 39A, at the Kennedy Space Center. The flight of the Space Shuttle Atlantis on Mission STS-71 was historic for another reason as well: it featured the first docking between the U.S. Shuttle and the Russian Space Station MIR.

After successfully docking the crew of the two spacecraft conducted joint scientific investigations and completed changeout of the MIR crew before undocking.

Photo by NASA

Goddard News

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Goddard/ Maryland joint education program

The second annual Goddard/Maryland Earth and Environmental Science Teacher Ambassador Program began June 21 and ends July 21. The program's goal is to enhance classroom instruction in Earth and environmental science programs in Maryland secondary schools.

Twenty secondary school educators, who represent 18 of the Maryland educational jurisdictions participated. Each educator was assigned a mentor from Code 900 who helped to familiarize them with current science and technology, while serving as a resource for the teachers.

The program objectives follow:

- Understand how Earth systems can be studied from space and how data gathered in this manner can be used to enhance Earth and environmental science teaching.
- Identify how to use computers and computer networks to enhance Earth and environmental science teaching.
- Understand how to access and use available NASA resources to enhance Earth and environmental science teaching.
- Understand how to gather and use ground based Earth systems data to enhance Earth and environmental science teaching.
- Implement knowledge and skills acquired through the Ambassador Program to enhance Earth and environmental science teaching.
- Share teaching materials and strategies along with scientific data with other teachers through electronic means, seminars, and workshops.
- Understand how to gather and use information about the Maryland environment, to enhance Earth and environmental science teaching.

Deadline to submit material is the first of each month. For additional information contact Fred Brown (301) 286-8955.

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