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Goddard Space Flight Center

Goddard News

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GIVE TO CFC

Wind spacecraft scheduled to launch Nov. 1 at the Cape

by Michael Finneran

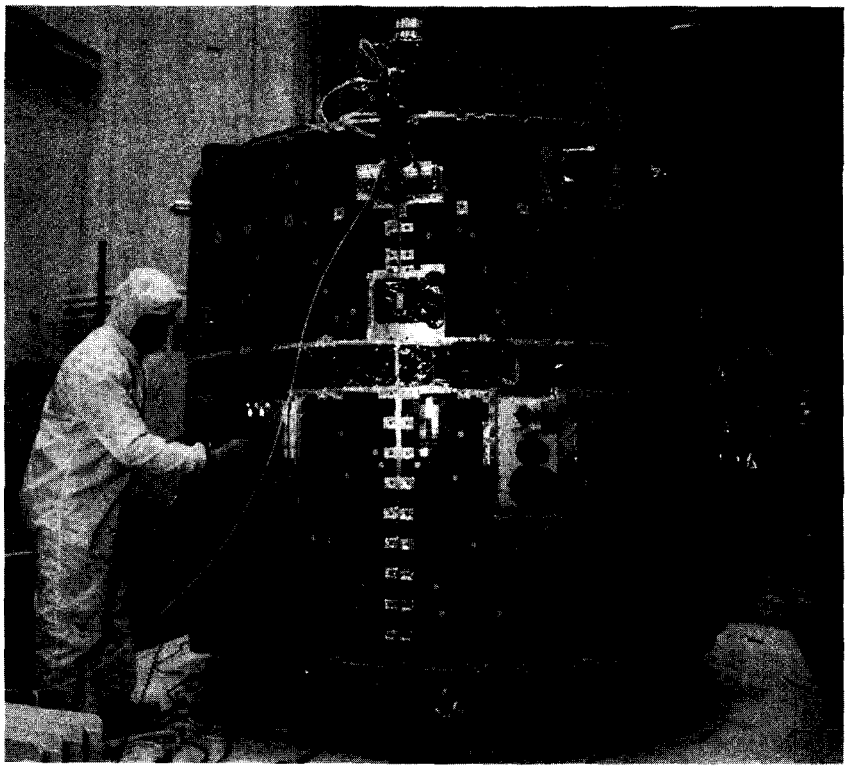

photo by: Debbie McCallum

The Wind spacecraft

A Goddard satellite that will study the solar wind before it reaches the Earth is scheduled for launch Nov. 1 on a Delta rocket from Cape Canaveral Air Force Station in Florida.

The Wind spacecraft will carry four Goddard instruments, two other U.S. instruments, one French instrument and the first Russian instrument ever to fly on an American satellite. The satellite will be put into a figure-eight orbit around the Earth with the assistance of the Moon's gravitational field. Its furthest point from the Earth will be up to 990,000 miles (1,600,000 kilometers), and its closest point will be at least 18,000 miles (29,000 kilometers).

Later, the Wind spacecraft will be inserted into a small circular orbit in the solar wind upstream from the Earth, around the point where the gravity of the Earth and Sun are balanced (930,000 to 1,050,000 miles, or 1,500,000 to 1,690,000 kilometers from the Earth).

What Wind will study

Energy streams out from the Sun toward the Earth in a solar wind of electrified particles. Moving at a million miles per hour, this hot, ionized gas — called plasma — carries particles and magnetic fields from the Sun outward past the planets. The Earth is shielded from the full blast of these particles by its magnetosphere.

The existence of the solar wind first was confirmed in the early 1960s by NASA's Mariner 2 spacecraft. Subsequent exploration of the Earth's geospace has revealed a dynamic and complex system of interacting plasma, magnetic fields and electrical currents.

The Wind mission is designed to measure properties of the solar wind before it reaches the Earth. Wind first will take readings in the turbulent area where particles of the solar wind are reflected from a shock wave that forms when this wind encounters the Earth's magnetic field. This supersonic shock wave, known as the bow shock, occurs in front of the magnetosphere where the outward force of the compressed geomagnetic field is balanced by the force of the solar wind.

Later, Wind will be repositioned to a circular orbit between the Sun and the Earth to observe the solar wind before it intercepts the magnetosphere.

The Wind spacecraft is the first of two missions of the Global Geospace Science (GGS) initiative, which is part of a worldwide collaboration called the International Solar-Terrestrial Physics (ISTP) program. The aim of ISTP is to understand the physics of the behavior of the solar-terrestrial system in order to predict how the Earth's atmosphere will respond to changes in solar wind. GGS is managed by Goddard for the Office of Space Science at NASA Headquarters in Washington, D.C.

Another GGS satellite, Polar, is scheduled for launch in November 1995 to measure and study the interaction of the solar wind plasma with the ionosphere.

Both the Wind and Polar missions will perform simultaneous and closely-coordinated measurements of the key regions of Earth's geospace, or space envi-

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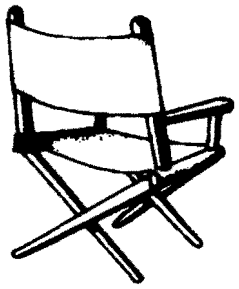

Director's Dialogue

Q: What are the health implications of the roof tarring that is done every few years on the buildings here at Goddard? Our building has been having this done the past few weeks and the smell of tar is everywhere. In addition to the unpleasant odor, people are complaining of headaches and other ills. Isn't there a better way to maintain the roof?

A: The manufacturer's safety data sheet information and the Safety and Health Branch measurements on the chemicals used in tarring operations indicate there are no hazards associated with these odors. The odors from roofing tar are classified as nuisance odors and may pose a productivity impediment but not a health hazard. Certain individuals may have medical conditions that may be aggravated by the smell of tar. These individuals should be relocated during such activities.

Advance notice of roofing activities is given to building occupants. At this time, supervisors should make their employees aware of the roofing work schedule and have a contingency plan in place to deal with employees or activities that may be affected by the odors of roofing tar.

We are aware of no cost-effective alternative to our roof system which offers the reliability of the current one.

Sherry Foster, director, Management Operations Directorate, Code 200

Wind spacecraft

Continued from page 1.

ronment. Data also will be provided from equatorial missions in equatorial orbits. In addition, ground-based and theoretical investigations will be conducted.

Wind Instruments

- Radio and Plasma Waves (Waves), J. Bougeret, Paris Observatory principal investigator: The Radio and Plasma Waves instrument will measure the properties of radio waves and other wave modes of the plasma over a very wide frequency range.
- Solar Wind Experiment (SWE), K. Ogilvie, Goddard principal investigator: SWE will measure ions and electrons in the solar wind and the foreshock regions at a rate of once per minute for ions and 20 times per minute for electrons. Measurements made in the foreshock are important for understanding the structure of the bow shock.
- Magnetic Fields Investigation (MFI), R. Lepping, Goddard principal investigator: MFI will investigate the structure, intensity and fluctuations of the interplanetary magnetic field, which influence the transport of energy and the acceleration of particles in the solar wind. The magnetic field measurements from MFI are especially important to the interpretation of other data from Wind.
- Energetic Particle Acceleration, Composition, and Transport (EPACT): T. von Rosenvinge, Goddard principal investigator: The EPACT investigation will measure properties of high-energy ions in the solar wind. This direct sampling of solar matter is a way to study events on the solar surface and the incorporation of solar material into the solar wind.
- Solar Mass Sensor (SMS), G. Gloeckler, University of Maryland principal investigator: This investigation will determine the abundance, velocity, spectra, temperature and thermal speeds of solar-wind ions.
- Three-Dimensional Plasma Analyzer (3-D Plasma): R. Lin, University of California at Berkeley principal investigator: This investigation will measure ions and electrons with energies above that of the solar wind and into the energetic particle range. It will study particles upstream of the bow shock and in the foreshock region as well as the transient particles emitted by the Sun during solar particle events following solar flares. In addition, this instrument will cover the energy gap between the SWE and EPACT instruments.
- Transient Gamma Ray Spectrometer (TGRS): B. Teegarden, Goddard principal investigator: TGRS will observe transient gamma-ray events. It will make the first high-resolution spectroscopic survey of cosmic gamma-ray transients and measurements of gamma-ray lines in solar flares. The causes of the transient events, which occur at great distances from the Earth, represent one of the intriguing mysteries of present day astrophysics.
- Gamma Ray Spectrometer (Konus): E. Mazets, Ioffe Institute, Russia and T. Cline, Goddard co-principal investigator: Konus will perform gamma-ray burst studies similar to the TGRS studies, but at lower resolution with broader coverage. When their data are combined, they provide coverage of the full sky. Konus also will perform event detection and measure time history. The Konus investigation is the first Russian instrument to fly on an American satellite.

Wind Spacecraft

The Wind spacecraft is a spin-stabilized cylinder-shaped spacecraft measuring 7.87 feet (2.4 meters) in diameter and 5.91 feet (1.8 meters) in height. The dry weight of the spacecraft is 1,973 pounds (895 kilograms), with an additional 662 pounds (300 kilograms) of hydrazine propellant for orbit and attitude control. The minimum design life of Wind is three years.

Several NASA and NASA/Goddard facilities will play key roles in the collection and dissemination of Wind science data. The NASA Deep Space Network will be used to command the spacecraft and collect Wind data via radio link.

At Goddard, raw data will be processed, organized and stored. The Central Data Handling Facility will produce "key parameters" that will serve as a guide to the much larger volume of raw data. Detailed analysis of the data will be performed by investigators using their own computers at their sites, sharing the data through NASA Science Internet connections in the United States, Japan and Europe.

New generation instrument for XTE arrives

photo by: Pat Izzo

A new generation of space guidance subsystems, known as an Interferometric Fiber Optic Gyroscope (IFOG) Inertial Reference Unit (IRU), has arrived at Goddard for installation on the X-Ray Timing Explorer (XTE), scheduled for launch in July, 1995. Made by Honeywell Space Systems, of Clearwater, Fla., the IFOG IRU will mark the first time such a system has flown on a NASA satellite. The IFOG IRU, shown on the table, is smaller than existing guidance technologies and is expected to provide greater precision, more reliability and longer life than other subsystems. The system determines spacecraft orientation for all three axes. On hand for the arrival of the instrument at Goddard are, left to right, Glenn Unger, Code 715, IFOG experiment manager; Richard Day, Code 701.2, head Spacecraft Programs Office, Engineering Directorate ; Tom Huber, Code 100, deputy director GSFC; Ken Coleman, Code 700, director of engineering, Honeywell, and Bill Taylor, technical manager for the Honeywell XTE program. In the background, the XTE is undergoing integration.

What's Up?

October 1994

International Ultraviolet Explorer (IUE)
Days in orbit: 6,124

One of IUE's September observing programs concentrated on observing young stars that have substantial disks of gas and dust around them. These disks are believed to be similar to the protoplanetary disk out of which our own solar system formed, and it is possible that planets are currently forming in these other disks as well.

The stars which IUE observed are ones in which the disk is believed to be seen edge on, blocking some of the light from the central star. By studying how the ultraviolet light is absorbed at different wavelengths, it is possible to infer the sizes of dust grains in the disks. Previous observations of similar objects have shown that the grains are much larger than those typically found in interstellar space. Learning more about these disks should teach us more about how our own solar system formed, and about what other kinds of stars might be expected to have planets.

Hubble Space Telescope (HST)
Days in orbit: 1,529

HST operations were nominal during September with a full schedule of scientific observations carried out. The Wide Field Planetary Camera-2 that was installed during the First Servicing Mission in December 1993 has obtained more than 10,000 on-orbit exposures since its commissioning.

Operations personnel have started implementing procedures and testing preparatory to transition of the Tracking and Data Relay Satellite System support from the White Sands Ground Terminal to the Second Tracking and Data Relay Ground Terminal. Full switch currently is scheduled for December 1994.

Weather satellite to launch in December

by Jim Elliott

Launch of the NOAA-J meteorological satellite is now planned for no earlier than December 4, according to Charles Thienel, associate director of Flight Projects for Meteorological Satellites (METSAT), Code 480.

The 10-minute launch window opens at 3:02 p.m. EST. The satellite, to be NOAA-14 in orbit, will be launched on an Atlas-E rocket from Vandenberg Air Force Base, Calif., into a 541-mile (870-km) orbit with an inclination angle of 98.86 degrees, Thienel explained. Orbital period will be 102 minutes.

NOAA-J will be launched so it will cross the Equator at about 1:40 p.m. northbound and 1:40 a.m. southbound, local solar time, according to Larry Draper, Code 480, METSAT project manager.

Draper said the spacecraft will carry seven scientific instruments and two for search and rescue (SAR).

The scientific instruments include the Advanced Very High Resolution Radiometer (AVHRR), the Solar Backscatter Ultraviolet Spectral Radiometer Mod 2 (SBUV/2), the Stratospheric Sounding Unit (SSU), the High Resolution Infrared Radiation Sounder (HIRS/21), the Microwave Sounding Unit (MSU), the Space Environment Monitor (SEM) and the Data Collection System (DCS).

NOAA-J will join four other NOAA satellites in polar orbit. They are NOAA-9, launched in December 1984; NOAA-10, launched in September 1986; NOAA-11, launched in September 1988, and NOAA-12, launched in May 1991. NOAA-11 is the primary operational afternoon satellite, and NOAA-12 is the primary operational morning satellite. NOAA-J is scheduled to replace NOAA-11 as the primary afternoon satellite, according to project officials.

NOAA-13, launched in August 1993, suffered a power failure 12 days after launch, and all attempts to command the spacecraft since then have been unsuccessful.

The NOAA-J spacecraft is built by Martin Marietta/Astro Space, Princeton, NJ.

NASA

This is an artist conception of NOAA-I which was launched in August 1993. (See story on page 5)

Earth radiation budget satellite marks tenth year

On October 5, 1984, astronaut Sally Ride flying mission STS-41G on the Space Shuttle Challenger assisted in the deployment of the Earth Radiation Budget Satellite (ERBS). The satellite, operated by NASA contractor AlliedSignal Technical Services Corporation and managed by Goddard, completed ten years of operation this month.

The ERBS supports the Earth Radiation Budget Experiment (ERBE) and the Stratospheric Aerosols and Gases Experiment (SAGE-II) with three instruments. During its ten years in orbit, the SAGE-II instrument has provided scientists with the first ever, long-term, global monitoring of stratospheric aerosols, including critical ozone data. This data has been used in the study of atmospheric dynamics, ozone chemistry, and ozone depletion. The ERBE instruments have provided scientists with quantitative estimates of the global distributions of cloud-radiative forcing, an important factor in climate prediction, and monthly averages of the Earth's longwave and shortwave radiation fields.

The ERBS is a pioneer of sorts for NASA. It was one of the first users of the Tracking and Data Relay Satellite System (TDRSS), and it is now ready to utilize the second TDRSS ground terminal. The ERBS also was the first satellite designed to hard-

Continued on page 5

Wallops supports LITE mission

Lidars on the P-3B aircraft at Wallops were tested prior to supporting the Lidar In-Space Technology Experiment (LITE), that flew on the Space Shuttle Discovery in September. The Wallops P-3B and Electra aircraft, carrying lidars and a variety of other science instruments, flew under Discovery at approximately 20,000 feet (6,096 meters) over North and South America, Africa and the Atlantic Ocean taking measurements to validate the LITE measurements. Lidars work like radars but use short pulses of light. In this photograph, the upward looking laser is from an aerosol lidar from the Langley Research Center, Hampton, Va., and the downward looking laser is from the Large Aperture Scanning Array Lidar from Goddard.

photo by: Rick Huey

Investigation panel releases report on NOAA-13 failure

by Jim Elliott

The probable cause of the failure of the National Oceanic and Atmospheric Administration-13 (NOAA-13) meteorological satellite in August 1993 was a short circuit that prevented the solar array current from powering the spacecraft and recharging the batteries, according to a 12-member investigating board, whose report was released in September.

In a 36-page report, the board indicated that the failure most likely occurred in a battery charge assembly on the spacecraft. Based on telemetry from the satellite, the board indicated the most probable cause was a 1.25-inch screw that extended too far below an aluminum plate designed to dissipate heat. The screw end penetrated the insulation and made contact with a radiator plate, causing the short circuit.

The short circuit effectively prevented the solar arrays from powering the spacecraft, forcing the spacecraft to rely on its batteries, according to the board's findings. Without power from the solar arrays, the batteries could not recharge and exhausted their power, leaving the satellite with no power to operate its instruments or to communicate with the ground.

"The board concluded that the design of the charge assembly is prone to a failure of this type," said Jeremiah Madden, Code 400, who chaired the board. "The design requires meticulous construction procedures, and there are many areas where a short could occur."

The board termed the design of the battery charge assembly "unforgiving," indicating that "it cannot be checked once it is assembled since the heat sink cannot be removed or easily X-rayed."

Launched into a 540-mile (870-kilometer) near polar orbit on an Atlas rocket from Vandenberg Air Force Base, Calif., on August 9, 1993, the $77 million spacecraft operated normally until August 21. During orbit 175, 12 minutes after the satellite's last communication with the NOAA Command and Data Acquisition site at Wallops, Va., the short circuit occurred, the board found.

In reaching its conclusion as to probable cause, the board looked at hardware being used to build NOAA-J, the next spacecraft in the NOAA series, targeted for launch in December.

To correct the NOAA-13 deficiencies on the NOAA-J spacecraft, modifications in the area where the failure most probably occurred have been made, according to Charles Thienel, associate director of Flight Projects for Meteorological Satellites, Code 480.

The modifications addressed all of the potential failure causes mentioned in the report. Most importantly, the radiator plate in the charge assembly is no longer "hot," or carrying electric current. Even if a screw were to touch the plate, as may have happened on NOAA-13, there would be no short circuit.

Moreover, he said, additional inspections and tests were implemented on NOAA-J. The project team also has developed flight software that will allow ground controllers more time to deal with a power-system problem by isolating a short circuit, effectively removing the affected subsystem from the spacecraft's power system.

Budget satellite

Continued from page 4.

mount in the shuttle's payload bay, and it was the first mission to use color coded mnemonics and touch screen command panels.

Despite the loss of five of its six gyros, one ERBE instrument, and one of two batteries, the satellite continues to gather science data at early mission levels. As of September 25, 1994, the ERBS completed 54,333 orbits, 100 maneuvers, 108,666 SAGE science events and 3,638 days on orbit.

Supporting the system

by Karen W. Davis

"As technology changes, more emphasis is placed on developing technical skills in the workplace, in addition to the traditional communications, interpersonal, and management skills," says Kathleen Williams (Kathi), an employee development specialist in the Office of Human Resources, Code 114.1. In this position, she is responsible for assessing the training needs of employees, determining appropriate training sources and methods, negotiating with training vendors, advertising classes, and administering programs and activities, such as communications training, the upward mobility program, undergraduate academic programs, and secretarial/clerical training.

Williams began her career at Goddard in the Office of Public Affairs as a summer intern. Her work there inspired her to major in Journalism at the University of Maryland in College Park, where she received a B.S. degree in 1967 from the College of Business and Public Administration.

After graduation, she worked as a writer-editor for the Navy Department's Recruiting Aids Division in Washington, D.C. In 1969, she transferred to Goddard as a Contract Specialist in the Procurement Division. When she became legally blind in 1971 as a result of diabetes, she transferred to the Office of Human Resources as the Center's Retirement Counselor. "I enjoyed that position because I met many people who had a wealth of experience and told lots of good stories about NASA's past," Williams said.

Williams transferred to her present position in 1982. One of her first assignments was to evaluate and revise the Professional Intern Program (PIP), which is designed to ease the transition of entry-level professionals from school to work or from clerical to professional administrative positions. "As the PIP Coordinator, I learned a great deal about what was going on at the Center by interacting with new employees and their managers," Williams said.

"Goddard places a great emphasis on education and offers various programs to encourage employees to continue their education at the undergraduate, graduate, and post-graduate levels," Williams said. She returned to the University of Maryland through Goddard's Part-time Graduate Study Program and received a Master's degree in Community (Adult) Counseling in 1983.

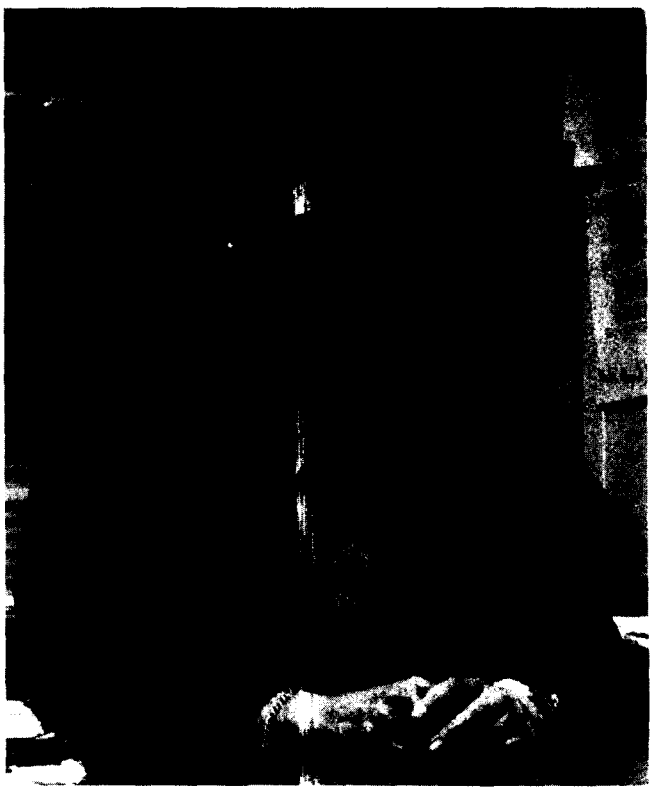

photo by: Ron Moltere

Kathi Williams

In 1992 Williams started the Administrative Support Colloquium (ASC) which is held annually. Each directorate is allocated spaces for one-third of its support staff to attend this day-long activity. "The ASC consists of several sessions, each with a guest speaker. This year, the sessions discussed building esteem in yourself and others, creativity, balancing career and family, managing change, and the effect of attitude on life and career. Another benefit of the ASC is networking." Participants have an opportunity to talk with people from outside their organization, from all Center directorates including Wallops, Williams said.

Williams knows first hand the impact that training can have on employees and on the organization. When her eyesight deteriorated, Goddard sent her to the Guild for the Blind in Pittsburgh for three months in 1972. "That experience changed my life. I learned how to function with low vision and changed my attitude from fairly hopeless to quite positive about the future, and returning to work as a useful employee," Williams said. As a journalism major who loved to read, it was particularly distressing not to be able to see well enough to read most written material. However, she has access to a wealth of written information through the Library of Congress' Talking Book Program and the Washington Ear, a radio reading service that broadcasts newspapers, magazines, and books 24 hours a day.

Today, Williams has become computer literate and has a personal computer with special software that enlarges the image on her display screen, and a voice mechanism that "talks" to her. As technology changes, everybody's job changes.

For example, the secretary's role has changed dramatically, and a major task is to keep up with the rapidly changing personal computer software and hardware used for wordprocessing, graphics, and data storage. We have Fax machines, phonemail, LAN's electronic mail, and duplicating machines. "Sometimes I think that a support person also needs to be a computer specialist and an electronics technician just to use routine office equipment. It is important to remember that the final product in most offices involves a support person," Williams said.

Williams has had to balance her career and personal life with health problems stemming from the complications of diabetes. She has had two successful organ transplants—a kidney, donated by her uncle in 1985, and in 1993, a pancreas transplant. "Although my health, particularly my low vision, could have been a major obstacle, I have been able to continue working with the support of the Center, especially its training office and the Office of Equal Opportunity Programs, Code 120, which provides a part-time reader 9 to 12 hours a week," Williams said. Based on her experience, Williams believes that "training is a crucial motivational tool both for employees and the organization they support."

3500 visitors attend community day

Visitors came to Goddard's Community Day, September 25, for a variety of reasons. Some were employees who took the opportunity to show Goddard to their families and friends. Others saw it as a chance to educate their children and themselves about aerospace research and technology. Whatever the reasons, several thousand people took advantage of delightful Fall weather to enjoy a day at Goddard.

Goddard scientists, Dr. Drake Deming of the Laboratory for Extraterrestrial Physics, Code 690, and Dr. George Sonneborn of the Laboratory for Astronomy and Solar Physics, Code 680 delighted capacity crowds with their presentations. Dr. Deming talked about the "Great Jupiter Comet Crash" involving this summer's Comet Shoemaker/Levy 9 impact with the planet Jupiter. Supernova explosions were the exciting topic of Dr. Sonneborn's lecture. In order to accommodate everyone, both scientists agreed to do their presentations several times throughout the day.

Several other popular activities included: the "living in space" demonstrations, where kids could find out what a space suit feels like or what astronauts eat; the model rocket club displayed a wonderful assortment of rockets in the Visitor Center and then thrilled hundreds of on-lookers with their model rocket launches; and Goddard's amateur radio club set up radio systems and invited the public to participate in the fun.

"A community event of this magnitude couldn't succeed without the help of Goddard's many dedicated volunteers," said Dale Hemke, Visitor Center manager. "Our sincere thanks go to more than 60 men and women who volunteered their time to act as tour bus guides, demonstrators, greeters, rocket launchers, radio operators, and tour facility hosts."

Give hope through the Combined Federal Campaign

Every year a group of dedicated people donate their time to the Combined Federal Campaign (CFC). The CFC is an opportunity for Goddard employees to make a difference in the local community, nation and the world.

According to Don Wolford, Code 114; the 1994 Goddard CFC coordinator, Goddard kicked-off the CFC on October 17. The campaign ends November 11. The Center's goal this year is to raise $410,000, an increase of nine percent over last year's goal. The year theme for this year's drive is "Give Hope Through Your CFC."

The easiest way to make your tax deductible contribution is through payroll deduction. Whether you donate the minimum deduction of $1 per pay period or $50 a month, a payroll deduction pledge is a convenient way to translate a small amount from each paycheck into a year-round gift to those in need. One-time donations also can be made by cash or check.

Exercise your ability to make life better for someone else today. Give through the CFC.

Lively performance

photo by: Pete Baltzell

Musician-singer Ana Castrello-Vasquez, entertains an audience in the Building 3 Auditorium during a recent performance as part of the commemoration of Hispanic Heritage Month.

Goddard engineering colloquia

During November, four engineering colloquiums will be held in the Building 3 Auditorium. The sessions begin at 3:30 p.m.

November 7: Dr. William Kay, Dept. of Political Science, Northeastern University presents "Can Democracies Fly in Space? The Challenge of Revitalizing the U.S. Space Program."

November 14: Dr. Jeffrey Sniegowski, Sandia National Laboratories presents "MICROMACHINES."

November 21: Harry Robin, author/filmmaker presents "The Scientific Image: from Cave to Computer."

November 28: Dr. Dennis Good, Dept. of Zoology, University of Maryland presents "Evolution: From Bacteria to Multicelled Animals."

A Maryland initiative gets teachers studying the Earth

by Tammy Jones

When it comes to learning about the Earth, what better way to do it than by working with experts on the subject. That precept was the impetus for a pilot project that gives teachers an opportunity to roam environments conducive to learning about Earth and its environment. Those environments being the high-tech laboratories at Goddard and the classrooms of scholarly practitioners at the University of Maryland in College Park.

Twenty-four Maryland teachers are being trained at Goddard and the University of Maryland to serve as Earth and Environmental Science Teacher Ambassadors. The teachers represent most of Maryland's districts. They will use the knowledge they gain in this program to improve instruction in their area schools and to help students achieve state requirements for Earth science in secondary schools.

The Earth and Environmental Science Teacher Ambassador Program, otherwise known as the Maryland Initiative because it has statewide cooperation, was kicked off this summer. Its participating partners include: Goddard's Mission to Planet Earth Program, the High Performance Computing and Communications Program, the Educational Programs Office, NASA Headquarters, the Maryland State Department of Education, local Maryland school systems, the University of Maryland, and the Department of Energy.

James W. Latham, principal investigator, and Richard Crone, Code 130, project director of the Educational Programs Office, are architects of the program. Crone said a lot of people have worked on the program and shown great enthusiasm but Latham has been extremely dedicated and is working to ensure its success.

The teachers are enrolled in a graduate-level geology course at the University of Maryland and will earn six credits for successfully completing the program. Participants will learn how Earth systems are studied both from the ground and from space. They will design and conduct ground station Earth monitoring projects and ozone measurements and continue them during the school year with their students.

The first Earth science curriculum training session was held June 26 - July 22 at Goddard and the University of Maryland. It was an intensive training program in which teachers were introduced to electronic mail, Internet, CD ROM programs, liquid crystal displays and laser disk players.

As Ambassadors, the teachers will take the knowledge they gain back to their school districts to train other teachers. They also will share the results of their classroom experiments over the Internet with teachers across the state. Each participant's school has received a Macintosh computer system with Point to Point Protocol software loaded on each system, allowing easy access with just a local call. Goddard scientists will serve as mentors to the teachers while they are participating in the program and continue working with them throughout the school year.

Eight one-day seminars have been scheduled for the participants during the school year. The first seminar was held at Goddard on September 30. Teachers got a chance to discuss their experiences with the program thus far. Also at that seminar, Dr. Robert Ridky of the University of Maryland discussed the National Science Standards and the implications they hold for Earth and environmental science instruction. Ridky talked about how important it is to have Goddard as a partner in the Maryland Initiative because under the new science standards there will be a strong emphasis on instruction in Earth and space science, physical science and life science. Since Goddard has been named the lead Center for NASA's Mission to Planet Earth (MTPE) project, local teachers and students are truly in the "right place at the right time." MTPE is NASA's long term, coordinated research effort to study the Earth as a global environment.

Anticipating the success of this year's program, 48 additional teachers will receive similar training in the summers of 1995 and 1996. The following teachers were involved in this year's program: John Doherty, Queen Anne's County; Laura Jerome, Caroline County; Howard Guth, Talbot County; Karen Cifranick, Hartford County; Ann Sullivan, Michael Anikis and Allen Campbell, Howard County; Doug Romano, Dorchester County; Donald Allen, Washington County; Andrew Witko, Springfield, VA.; George Wright, Anne Arundel County; Michael Gooch, Frederick County; Robena Robinett, Caroline County; Richard Farrar, Garrett County; Anthony Marcino, St. Mary's County; David Kistler, Calvert County; Karen Gurley, Carroll County; Richard Wood and Carol Eichenmiller, Wicomico County; Joan Johnson and Barbara Stancil, Baltimore County; Kathleen Fulcomer, Montgomery County; Kevin Connelly, Cecil County; and Lois Ann Collins, Somerset County.

Goddard News

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