

Birmingham Wins NASA Scholarship

Another son of Thomas J. Birmingham, a physicist in the Planetary Magnetospheres Branch, Code 695, won a NASA College Scholarship.

Mark J. Birmingham was selected to receive the fund's scholarship honoring previous NASA Administrator, James E. Webb. His brother, John T. Birmingham, was selected in 1985 to receive one of the \$6,000 NASA Scholarships. The award entitles the recipient to \$1,500 a year for four years for studies in science or engineering. These scholarships are awarded under a program endowed by author James A. Michener.

Birmingham graduated in June 1991 from Montgomery Blair High School in Silver Spring where he participated in the Magnet Program for math, science and computer science. He ranked second out of 390 graduating students. Following in the footsteps of his older brother, who is now a graduate student in physics at the University of California, Berkeley, Birmingham is currently an undergraduate at Princeton University in Princeton, N.J., majoring in computer science.



Mark J. Birmingham receives his NASA Scholarship Certificate from Center Director Dr. John Klineberg.

Community College

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Goddard committee members included Wayne Boswell, Code 110; Nancy Goffery, Loral; Angela Ewell-Madison, Code 200; Jay Garvin, Code 303; Dick Kubico, Ogden; Hiram Lopez, Code 541; Manuel Miranda, Paramax; Jerry Padgett, Advanced Computer Systems; Ray Pages, Code 513; John Pyle, Code 710; Joe Sparmo, Code 552; and Dave Wagner, Bendix.

The institute is scheduled to be in full operation by January 1993, according to the director.

IN MEMORIAM

Robert Ball, Jr.



Bob Ball, a financial manager in the Mission Operations and Data Systems Directorate, Code 503, died unexpectedly on Wednesday, October 28. Ball, who came to Goddard in 1966, served many years as a financial manager for Goddard's sounding rocket program before his most recent position. Ball was a popular speaker for the Goddard Speaker's Bureau for more than eight years and served an eight-year term as chairman of the credit committee for the NASA Federal Credit Union. For 30 years, Ball donated his time to several charity organizations including the Shriners and Job's Daughters. His energy for volunteerism at these organizations and for Goddard's Speaker's Bureau earned him a 1989 Goddard Community Service Award.

GI E

On October 7, 1992, the Bloodmobile was held in the Building 8 Auditorium and 155 prospective donors volunteered to donate blood. The following is a list of Goddard employees who were cited by the American Red Cross with gallon pins at the Bloodmobile.

# of Gallons	Name	Code
4	Steven Holt	600
4	William Anselm	406
2	Larry Ryan	663.2
2	Peter Hughes	522
1	Jerome Byrd	750.5
3	Roberto Alman	740.4
3	Steve Jung	235.1
3	Wendy Garner	470
4	David Content	717.1
3	Christine Allen	200.1
4	Donald Lokerson	421
1	Kathryn Scoville	685
6	Rex Elliott	—
3	Jeffery Newcomer	923
5	Leonard Brown	752.3
1	James Lucero	111.2
3	Robert Afzal	924
5	Carol Cranell	682

The next Bloodmobile is scheduled for December 2 in the Building 26 Auditorium. Watch Dateline Goddard for more details.

Celebrating 500 Years of Hispanic Contributions to America

by Katie Brannigan

Discovery and legacy was the prestigious combination celebrated by Hispanic Americans during Hispanic Heritage Month, September 15 - October 15, and, during 1992, as the 500th anniversary of Christopher Columbus' voyage to America. This year's theme, "Five Hundred Years of Hispanic Heritage: 1492 - 1992... Contributing to America's Progress," encompassed the Hispanic culture's laudable contributions to the evolution of our country.

Goddard brought the celebration of the Hispanic culture and American history to the Center with an array of festivities headed by the Hispanic Heritage Month organizing committee — Gilberto Colon, Code 740.4; James Lucero, Code 111.2; Dan Krieger, Code 120; and Roberto Aleman, Code 740.4.

"We wanted to do something special this year to commemorate the quincentennial. It was a real group effort. People banded together to make Hispanic Heritage Month 1992 one to remember," commented Krieger, who also is Goddard's Hispanic Employment Program Coordinator.

A picnic highlighted by Hispanic dishes and a dance kicked off the month's activities followed by a keynote luncheon featuring former New Mexico Governor Jerry Apodaca, who spoke on "The Value of Cultural Diversity." Santiago Rodriguez, director of multi-cultural affairs for Apple Computers, addressed employees from NASA Headquarters and Goddard on business implications of cultural diversity late in the month, and Paquita Vivo, president of the Institute for Puerto Rican Affairs, gave a slide presentation on cultural history of Puerto Rico.

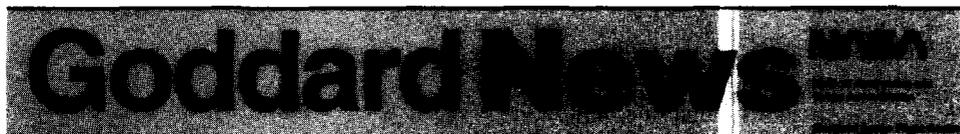


PHOTO: P. IZZO

Center Director Dr. John Klineberg and Goddard's Advisory Committee on Hispanic Employees met former New Mexico Governor Jerry Apodaca during Hispanic Heritage Month. Pictured from left to right are: Ronald Brandon, Code 290.1; Carlos Gomez, Code 745.1; James Lucero, Code 111; Corinne Martinez, Code 247; Dr. Klineberg, Governor Apodaca, Eduardo Torres, Code 738.2; Otilia Rodriguez-Alvarez, Code 712.1; and Patrick Coronado, Code 930.8.

A Word From The Administrator...

The following are key personnel appointments at NASA Headquarters, Washington, D.C., announced by NASA Administrator Daniel S. Goldin on November 3: Dr. Charles Pellerin as Associate Deputy Administrator for Strategic Planning, John R. Dailey as Associate Deputy Administrator and Ralph C. Thomas as Assistant Administrator for Small and Disadvantaged Business Utilization. Pellerin will be responsible for creating a strategic plan to implement the agency's vision, mission and values. He also will direct and oversee key elements of the strategic plan. Dailey, formerly Assistant Commandant of the Marine Corps, will plan, direct and manage the institutional operations required to accomplish NASA's roles and missions. Thomas, formerly Executive Director of the National Association of Minority Contractors, will become the first Assistant Administrator for Small and Disadvantaged Business Utilization — a division recently elevated in stature to ensure NASA reflects the full diversity of America, according to Goldin.



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Season's Greetings



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Goddard Team Demonstrates Excellence in 1992



Pictured are some of Goddard's 1992 highlights: The Extreme Ultraviolet Explorer launched aboard a Delta II rocket in June (left). The support provided by the Space Telescope Operations Control Center allowed scientists to make significant discoveries this year (bottom). Data from the Cosmic Background Explorer's Differential Microwave Radiometer revealed temperature variations in the Milky Way Galaxy that showed 15-billion-year-old conditions of the early Universe (top). See story on page two.

Goddard Team Demonstrates Excellence in 1992

by Randee Exler

Goddard's role as a leader in technology and science is as alive today as it was in 1959 when Explorer VI, under Goddard project management provided the world with its first image of Earth from space.

Since then, Goddard has grown from 157 employees to a culturally-diverse team of approximately 12,000 civil servants and contract employees pursuing a single mission — to expand knowledge of the Earth and its environment, the solar system and the Universe through observations from space.

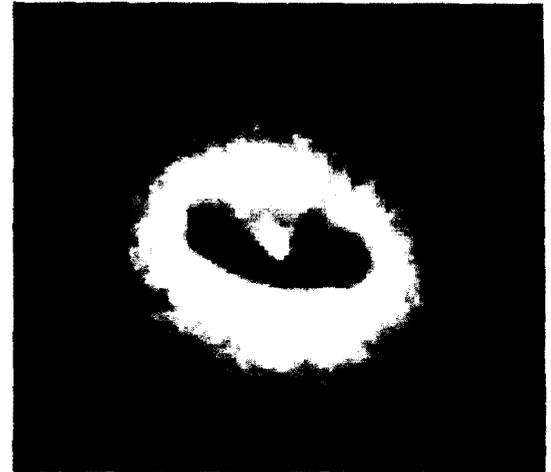
The Goddard team's commitment to excellence is evidenced by its varied accomplishments in 1992. Following is a sampling of these achievements:

Space Science

Goddard's Compton Gamma Ray Observatory found this year what

has been called a "monster" quasar. This emitter of high energy gamma rays, powered by a 300,000-year-old neutron star, is the brightest source of its kind ever observed. Goddard's Energetic Gamma Ray Experiment Telescope, a Compton instrument, appears to have made the first detection of BL Lacertae objects. These objects, once thought to be variable stars, are now believed to be active galaxies similar to quasars. Compton celebrated its one-year anniversary in space in April.

During its second year in space, the Hubble Space Telescope (HST) continued performing first-class science. Among the 1992 HST highlights are strong evidence of a black hole 2.6 billion times the mass of the

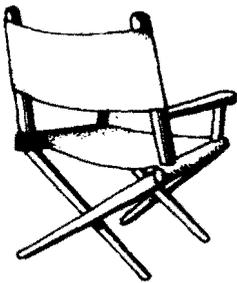


Among the Hubble Space Telescope's highlights of 1992 is this picture of a disk at the core of galaxy NGC 4261 fueling a suspected black hole.

Sun, the discovery of the hottest star ever recorded — 33 times hotter than our Sun — and the detection a new class of object — a gigantic star-forming cluster created from two colliding galaxies.

Goddard's 14-year-old International Ultraviolet Explorer con-

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Directors' Dialogue

Q. I am curious if it is Goddard's policy that contractor personnel be treated as second-class citizens, or if this is unique to the Goddard Child Development Center (GCDC). I have been a contractor for over eight years, and have been on the GCDC waiting list for about three years. When I recently called the registrar to check on my waiting list status, I was told that it was virtually hopeless that my children would ever be admitted to GCDC because all civil servants have priority over all contractors. I feel cheated and would like to hear the rationale for this policy.

A. The Goddard Child Development Center was formed as a GEWA club. Like all clubs, GCDC

follows guidelines established by GEWA, including the civil servant priority initiated June 1, 1987.

There have been several expansions since the GCDC opened its doors in June 1973, the last one, in 1990 more than doubled the number of children GCDC serves. The current enrollment is 122 students. Expansions play havoc with demographics. In the summer of 1990, GCDC offered placement to all parents of three- or four-year-olds who were on the waiting list (both civil servant and contractor). Most of these children remained enrolled in 1991. With fewer vacancies in 1991, GCDC offered placement to all civil servants with three- or four-year-olds on the waiting list and approximately one-third of contrac-

tors. In 1992, the large number of three-year-olds who entered in the expansion year are moving into kindergarten necessitating two kindergarten classes. This means cutting back one three- and four-year-old class which creates few vacancies this year. For 1992, GCDC was not able to offer placement to all eligible civil servants. In the summer of 1993, the large number of children who entered in 1990 will be leaving school. Many vacancies will be created. Hopefully, this will alleviate the crunch.

Frann Bolster
President
GEWA

Questions for Directors' Dialogue may be sent in to Directors' Dialogue, Code 130, without identification. Questions are sent to the appropriate directorate office as written but may be edited for space and clarity before being printed.

Excellence in 1992

(Continued from page 2)



Pictured here is the International Ultraviolet Explorer's confirmation of a ground-based observance of the first supernova in 1992.

firmed a ground-based observance of the first supernova of 1992 in January. The importance of this discovery is the fact that the supernova is a Type 1A. This class of supernovae are key objects for measuring distances in the Universe.

The IUE also confirmed a ground-based discovery of the

brightest nova since 1975. Intensive observations began only three hours after notification of the nova. Compton also was repositioned to study this stellar phenomenon.

Scientists from the Cosmic Background Explorer team announced in April what members of the scientific community have called one of the most significant findings of the decade. Using COBE data they observed 15-billion-year-old cosmic fossils left over from the Big Bang — the primeval explosion that began the Universe. This finding represents a major milestone in a 25-year search and support theories explaining the initial expansion of the Universe.

In May, scientists announced that the power plant in Geminga, one of the brightest emitters of high-energy gamma rays in the sky, is a rotating 300,000-year-old neutron star. This discovery was made using data from the German/American Roentgen Satellite (ROSAT). Goddard man-

ages the U.S. participation in the ROSAT program.

This past summer was very busy for Goddard's Orbital Launch Services team who managed successful launch operations for three Goddard payloads — the Extreme Ultraviolet Explorer (EUVE) aboard a Delta rocket in June, the Solar Anomalous and Magnetospheric Particle Explorer (SAMPEX) aboard a Scout rocket in July, and the Geotail spacecraft, a joint U.S./Japanese project, aboard a Delta rocket in July.

Since its launch, EUVE has observed a tremendously energetic galaxy two billion light years beyond the Milky Way. The spacecraft was not expected to have the capability to see such a far distance — two billion light years beyond the Milky Way.

SAMPEX, the first in a series of small explorers, is providing data on energetic particles arriving at Earth from our galaxy and the Sun. SAMPEX exemplifies a unique

(Continued on page 4)

What's UP?

December 1, 1992

COMPTON — *Days in orbit: 605*
Interesting fact: Battery performance continues to be monitored very closely, with power configurations adjusted as necessary. The observatory is functioning normally with primary systems powered from modular power subsystem 2, which is performing very well. Modular power subsystem 1 continues to support a reduced load of mainly heaters.

UARS — *Days in orbit: 444*
Interesting fact: Attempts to restart the Improved Stratospheric and Mesospheric Sounder have continued and were rewarded November 13, by a significant sudden change in the thermal behavior of the chopper system. The cause of this change is not clear, but the restart attempts are continuing more optimistically and the telemetry is being closely monitored for any signs of chopper rotation.

HST — *Days in orbit: 890*
Interesting fact: Controllers are still investigating an anomaly involving a

gyro, which occurred November 18. The spacecraft continues to operate and perform routine science operations. Initial telemetry indicated that the gyro lost synchronization and motor current. A later review of all monitors points to an interruption of power to Gyro 1. Safemode will protect HST in the near term should another gyro failure or other anomaly occur

EUVE — *Days in orbit: 177*
Interesting fact: The first official list of bright EUVE sources was released internally to the EUVE project at the University of California, Berkeley. The list contains 49 definite sources that have been compiled into the first EUVE bright source list. Classes of sources in this first list include hot white dwarfs, planetary nebula, flare stars and cool star coronae

Meteor-3/TOMS: *Days in orbit: 472*
Interesting fact: To date, this joint U.S./Russian effort has been entirely

successful and both sides have been receiving and processing daily data of ozone and sulphur dioxide amounts from Aug. 25, 1991 to the present. The data set is proving to be a useful extension of the Nimbus-7/TOMS ozone data. Near real-time data production is expected to start this month. Current studies include the effect of non-sun-synchronous Meteor-3 orbits on ozone trend determination and the effect of Mt. Pinatubo aerosols on near-twilight ozone retrievals.

IMP-8: *Days in orbit: 7,335*
Interesting fact: October 26 marked the start of the 20th year of in-space operation of this spacecraft. IMP-8 continues the measurements begun with the 1963-launched IMP-1 spacecraft of cosmic rays and of other energetic particles, magnetic fields, and plasmas populating the Earth's magnetosphere and the nearby solar wind. IMP-8 will provide key data in support of the passage of the Jupiter-bound Galileo spacecraft through the geomagnetotail this month.

Excellence in 1992

(Continued from page 3)

partnership between government, industry and education called the Cooperative Satellite Learning Project. As a result of this effort, students from Laurel High School are monitoring the spacecraft from a control center at their school.

Geotail, part of the International Solar Terrestrial Physics Project at Goddard, is studying the interaction of the Sun, the Earth's Magnetic Field, and the Van Allen Radiation Belts.

Earth Science

The main science instrument on TOPEX/POSEIDEON, a joint French/U.S. mission launched in August is the result of more than two decades of experience and tested technology by researchers at Goddard's Wallops Island facility. This dual-frequency radar altimeter will measure sea level to within an accuracy of less than an inch (a few centimeters).



This Get Away Special (GAS) Bridge consisting of nine canisters flew on STS-52 in September.

In October, the Space Shuttle Columbia deployed an Italian satellite dedicated exclusively to laser ranging. Goddard provided materials, background information and optical measurements for the Laser Geodynamics Satellite II and Goddard scientists are among those studying the results as a means of better understanding the movement of the Earth's crustal plates.

The Wallops Flight Facility successfully launched the first student managed and built payload flown on a NASA sounding rocket in September. The project, known as the Colorado Student Ozone Atmospheric Rocket, demonstrated the use of sounding rocket flight as

a valuable educational tool for undergraduate and graduate students. The payload was designed to measure ozone density in the atmosphere.

Data acquired by the Upper Atmosphere Research Satellite (UARS), launched last year, indicate that much of the chemical and physical environment related to the formation of the Antarctic ozone hole were in place in the early southern winter, as opposed to being formed late in the winter, as previously thought.

Goddard's "frequent flyer," the Shuttle Solar Backscatter Ultraviolet (SSBUV) instrument, flew on its fourth space shuttle mission in two and a half years in late-March. SSBUV helps scientists solve the problem of data accuracy caused by the calibration drift of Solar Backscatter Ultraviolet (SBUV) instruments that collect ozone data from several spacecraft. Simultaneous measurements by SSBUV and UARS provide a unique opportunity to tie in detailed physics and chemistry observations of the stratosphere by UARS and regular on-going SBUV ozone observations made by other observatories.

In other ozone news, data from the Total Ozone Mapping Spectrometer (TOMS) onboard Goddard's Nimbus-7 spacecraft and confirmed by a TOMS onboard the Russian Meteor-3 spacecraft showed that the area of the 1992 Antarctic Ozone hole is the largest to date — approximately 15 times larger than last year.

Shuttle Small Payloads

The Get-Away Special experiments that flew in 1992 brought the total to 87 to date since the program



Among the special guests at Goddard in 1992 were Her Royal Highness Princess Maha Chakri Sirindhorn of Thailand and her entourage who visited the center in November. Engineering Director Tom Huber, Code 700 (left) accompanied the princess on a tour of the Testing and Evaluation facilities.

began in 1982. This program allows individuals and organizations of all countries the opportunity to send experiments on board a space shuttle on a space-available basis.

Goddard managed two secondary payloads on board STS-46 in July, the Consortium for Materials Development in Space Complex Autonomous Payloads and the Limited Duration Space Environment Candidate Materials Exposure experiments. These small, self-contained payloads were housed in GAS canisters.

Several Hitchhiker payloads flew in 1992. During the STS-52 mission in October, students from DuVal High School in Greenbelt worked alongside the Hitchhiker team in the Hitchhiker Payload Operations Control Center monitoring thermal controls for the mission. Twenty students are expected to return in January to work another Hitchhiker mission.

Planetary Studies

When the Mars Observer blasted off from the Kennedy Space Center, Fla., this fall, it carried three instruments with a strong Goddard connection — the Mars Observer Laser Altimeter (MOLA) and the Mars Observer Magnetometer and Electron Reflectometer — both built and managed at GSFC — and the Mars Observer Gamma-Ray Spectrometer managed by GSFC. The Mars Observer scientists hope to observe

the red planet for a full Martian year, approximately 687 Earth days.

Mission Support

GSFC's Spacelab Data Processing Facility kept data flowing for six missions this year. Since 1982, this facility has provided the scientific community with data gathered during Spacelab and other attached payload missions.

Goddard's Tracking and Data Relay Satellite System (TDRSS) and ground network supported eight space shuttle missions this year with air-to-ground communication capability.

Special Guests

Crowds gathered early outside Building 3, waiting for the helicopter that carried President George Bush on his first visit to Goddard in June. Following a tour, the president addressed a crowd of 400 employees where he praised Goddard for work being done to keep the environmental quality of the entire world.

Among the international visitors that came to Goddard this year was a special visit by Her Royal Highness Princess Maha Chakri Sirindhorn of Thailand. The princess met with many Earth scientists and toured several facilities.

Commitment to Education

Among Goddard's many educational initiatives was a fall conference co-sponsored with the Maryland State Department of Education to explore the possibility of using Mission to Planet Earth resources for enhancing Maryland's secondary school Earth and environmental science education programs. The conference included panel discussions and speakers on topics such as ozone, plate tectonics and the monitoring of Earth weather patterns and concentrated on the need to raise environmental awareness in students and to plan educational strategies for implementing Mission to Planet Earth resources in schools.

Team Effort

The Goddard Contractors'

Association (GCA) celebrated their first anniversary this year. In a year-end report this initiative was labelled as an unqualified success. The GCA was a major participant in two total quality symposiums run by Goddard this year.

In addition, a collaborative effort by Prince Georges Community College (PGCC), Goddard and the GCA — the PGCC/Goddard Space Technology Institute — was inaugurated at the college in October to help qualify students to enter or advance careers in space technology. Maryland Senator Barbara Mikulski encouraged the development of this program.

Institutional Efforts

Goddard's policy to promote good health and provide an environment reasonably free from pollutants was demonstrated in May as a new policy restricting smoking in all building and facilities went into effect.

A contemporary two-story building, the Data Operations Facility (DOF), better known as Building 28, was completed in August. The DOF provides more than 50,000 square-foot (4,645 square-meters) of usable office space.

Goddard's Spacecraft Systems Development and Integration Facility (SSDIF) received the Presidential Design Achievement Award, given every four years by the National Endowment for the Arts. The SSDIF, the largest laminar-flow clean room in the free world, can accommodate two full-size shuttle payloads simultaneously and currently houses hardware that will be used for the HST Servicing Mission in late 1993.

Goddard employees demonstrated a commitment to our environment by implementing new recycling efforts this year. The Plant Operations and Maintenance Division in Greenbelt and in Wallops are now supplying toilet tissue and hand towels that are made from recycled paper. An active office paper recycling program is also in place. More than 250 items available from stores stock now contain recycled material.

During a September ceremony a new computer information system

was unveiled in the main gate house where visitors can access information on topics including Center services, building directions, upcoming events, Federal employment and general information with the touch of a finger.

Good Neighbor

The Goddard team is a proven good neighbor. The Center learned this year of the tremendous economic impact we have on our community and the state of Maryland. In June, Maryland Governor William Donald Schaefer visited Goddard and presented Director Dr. John Klineberg with an economic impact study which states that Goddard has an annual economic impact in Maryland of \$2.1 billion in gross sales, \$904 million in employee income and 26,690 full-time equivalent jobs in businesses throughout the state.

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Many contractors were recognized for their commitment to excellence in 1992. Above: Center Director Dr. John Klineberg (center), presents the Goddard Excellence Award for Quality and Productivity Trophy to Leonard Schuchman, Senior Vice President and General Manager of Stanford Telecommunication Inc., Systems Engineering Division, Seabrook, Md., (left) and Jack Schwartz the group's Vice President for NASA Programs (right). Below: Dr. Klineberg (right) presents the 1992 Goddard Excellence Award for Quality and Productivity Trophy for large business contractors to Napoleon Hornbuckle, Vice President and General Manager, Motorola Government Electronics Group's Strategic Electronics Division, Phoenix, Ariz., (left).



Spacemobilers: NASA's Education Gypsies

By Dolores Beasley

They are on the road 10 months out of 12. They travel across the northeastern United States, sleeping in strange cities, eating at unfamiliar restaurants and unloading and loading their large white vans laden with equipment and materials.



Goddard's Spacemobilers from left to right: Vern Smith, Dennis Christopher, Michael Caterina, Ellen Hardwick, Bonita Rowell, Ron Ernst.

Who are they and what keeps them going?

They are members of the Goddard's Aerospace Education Services Program, (also known as "spacemobilers"), NASA's oldest, most continuous program. The nationwide program, established in 1961, is designed to increase awareness and understanding of scientific research and technological development.

The six spacemobilers at Goddard are all professional educators knowledgeable in aeronautics and the space sciences. They communicate NASA's activities past, present and future in a variety of workshops, assemblies and special programs.

Each year, five of the six member team travels more than 20,000 miles to visit approximately 250,000 students and teachers. Thirty-nine spacemobilers across the country see 4.5 million individuals nationwide.

The Goddard spacemobilers and their specialties are Michael Caterina, biology and living in space; Dennis Christopher, rocketry, physics; Ronald Ernst, aero-

nautics; Ellen Hardwick, planetary geology; Vern Smith, astronomy and computers, and Bonita Rowell, office manager/administrative assistant.

The amount of time in the program ranges from Caterina, who has been doing this for 10 years, to Hardwick, who is the newcomer at six months. Some in other parts of the country have been with the Aerospace Education Services Program for close to 30 years.

The Goddard group's area encompasses 12 states including all the New England states, Pennsylvania, New York and of course, Maryland. Christopher and Rowell, who are responsible for scheduling, say that the schedule revolves around special commitments, and the weather. "For example, we don't want to go to New Hampshire, Vermont or Rhode Island in January or February," Christopher said.

Individuals usually visit one school per day. While there, they conduct one or two assemblies and then spend the rest of the day doing classroom visits and meeting informally with teachers.

The worst part of the job for many is dinner, which means eating alone in a strange restaurant, in a strange place. Also, so much traveling makes for a practically nonexistent home and social life. Hardwick moved to Maryland from Tennessee six months ago and in the past month has spent a total of six days in her new home.

So why do they do it?

"This is all the best part of teaching with the worst part taken out," Smith said. "I call it a science teacher's dream job."

"I love the hobby," said Ernst. "By doing this I prove to kids they don't have to be an astronaut to do something important."

Last year, the team received Goddard's Public Service Achievement Award.

General science concepts, such

as what is gravity, what holds the planets in space, why does an airplane come off the ground, are explained in elementary schools, Smith said.

Elementary schools are often where they get the most interesting questions. "Little kids always want to go to Pluto," said one.

"Or land on the Sun" said another.

Hardwick said her favorite question occurred after a discussion on the space shuttle when an earnest, little girl raised her hand and asked, "How do you make a space shovel?"

The most often asked question, all agree is, how do astronauts go to the bathroom in space.

All of them see their biggest job as motivator for students to be interested in science or education.

"We see ourselves as teachers," Smith said. "Our job is to get kids excited about science so they can go on.

"We're out there to stimulate them, and motivate them," said Caterina.

And in one notable example, they have proof it worked. One student who watched Goddard spacemobilers is current astronaut Jay Apt.

"A lot of astronauts say they remember seeing this program in school," Christopher said.

The spacemobilers are under contract to Oklahoma State University in Stillwater. The Goddard group was all together on a rare occasion for the Lunar Sample Education Project Briefing at Goddard, Dec. 4.

The program is free to schools and has a waiting list of one to three years. People wanting to request the Aerospace Education Services Program, can contact the Public Affairs Education Office, (301) 286-7205 or (301) 286-4495.



Simulated Martian Soil Fuels LAMB

by Sheila Stanford

A long-duration balloon Goddard project that will evaluate and cross calibrate United States and Russian instruments gets underway this month. Planetary Scientist Dr. Jacob "Jack" Trombka, Code 691, principal investigator for the Long-Duration Antarctic Mars Calibration Balloon (LAMB) project, has prepared for this mission for one and one-half years.

LAMB will evaluate and cross calibrate United States and Russian remote-sensing gamma-ray and neutron detectors identical to those flown on the 1988 Soviet Phobos mission around Mars and those flying on the recently launched U.S. Mars Observer mission. The cross calibration should greatly facilitate data analysis from both past and future planetary missions and play a role in U.S.-Russia cooperation.

"The U.S. and Russians have included remote-sensing spectrometers on a number of planetary exploration missions," Trombka explained. "These spectrometer systems can be calibrated by exposing soil samples of a known composition to cosmic-rays and measuring the emission spectra."

The instruments will measure gamma-ray and neutron emissions from about one-half ton of simulated Mars soil, from a region

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Getting a Handle on Moon Rocks

by Katie Brannigan

What does it take to handle a moon rock? It is no ordinary procedure. Lunar samples contain materials that are irreplaceable, and although the samples have no cash value, they are a national treasure. Recently, Goddard hosted the Sixteenth Annual Lunar Sample Education Project Briefing, a unique event which helps local and regional teachers raise student's awareness of space science and certifies the teachers on security measures and how to handle the samples.

Throughout the briefings, teachers studied lunar discs with the assistance of Goddard scientists, learned how to use the lunar samples in the classroom and received an update on Goddard projects.

One of the conference coordinators, Dave Stevens, a Glenelg, Md., teacher working in the Office of Public Affairs through the Intergovernmental Personnel Act program, said that the loan program "is a great tool for translating a very ethereal topic like space or the Moon into a tangible and fascinating subject to perk students' interest in space and Earth sciences."

On July 20, 1969, Astronaut Neil Armstrong was the first of only 12 astronauts to explore the surface of the Moon. From these voyages, the astronauts brought back more than 842 pounds (382 kg) of lunar material. These are the lunar samples used in NASA's program.

Johnson Space Center in Houston, Texas, began the Lunar Sample Loan Program in 1978. In 1985, the program was decentralized and Goddard began loaning lunar samples to educators in the northeastern region of the U.S.

RETIREES

Congratulations to the following employees who recently retired!

Name	Code	Years
Fredreda Aklers	564	35
Hans Bremer	930.6	44
Richard Pinamonti	415	37



Goddard prepares for the future with the first graduating class of the Flight Project Directorate's (FPD) Project Management Development Emprise (PMDE) program. PMDE is a developmental program established by Center management to provide work experiences, training, guidance, and direction necessary to assume key management positions in the Center's FPD. It was created to serve a future need: the near-term retirement of a significant percentage of senior and middle managers in the FPD. The graduates come from technical and professional administrative positions and are pictured with Flight Project Director Vernon Weyers, Code 400, from left to right: Thomas Yi, Code 734.2; Peg Luce, Code 424; Jonathan Bryson, Code 406; Weyers; Ken Schwer, Code 442; and Greg Smith, Code 424.



Excellence in 1992

(Continued from page 5)

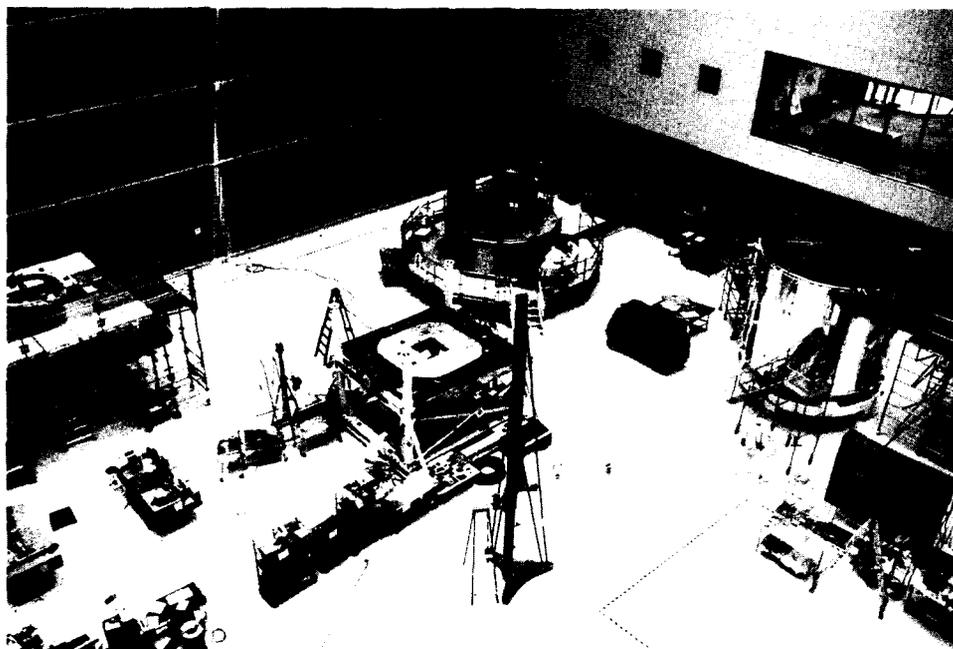
Goddard's Health and Safety Branch oversaw an effort to assist Hurricane Andrew victims. Nearly a thousands cases of emergency food supplies no longer required by Goddard were loaded onto trucks and transported to the Federal Emergency Management Association for distribution.

The Aerospace for Kids (ASK) program completed its third season this summer at the Visitor Center. One hundred elementary and junior high school students spent three summer days learning about topics such as crewed spaceflight, propulsion and model rockets. As a community service, Goddard's Visitor Center began operating seven days a week this fall.

The Office of Public Affairs sponsored two community days this year and all directorates got a chance to show their facilities and work to visitors. Special activities included an Earth science fair, sponsored by Code 900, in the spring and an engineering fair, sponsored by Code 700, in the fall. This fall's community day had a record-breaking crowd — more than 4,000 visitors attended.

Promising Year

Great optimism exists for the future as Goddard looks ahead to next year's Hubble Space Telescope Servicing mission. As part of this mission, space-walking astronauts will replace the solar



The Spacecraft Systems Development and Integration Facility in Building 29, is a virtually dust-free environment housing instruments for the Hubble Space Telescope Servicing mission slated for 1993. The SSDIF won a Presidential Design Award this year.

arrays, the Wide Field/Planetary Camera (WF/PC) I with the WF/PC II, the High Speed Photometer with a new instrument called the Corrective Optics Space Telescope Axial Replacement (COSTAR) and several gyros. COSTAR is expected to improve Hubble's imaging quality to about 80 percent of what the telescope was intended to provide.

Other missions that will get off the ground next year include the launch of a fifth Tracking and Data Relay Satellite, an

additional flight for SSBUV, STS-57 with Goddard's Superfluid On-Orbit Transfer (SHOOT) experiment on board, the commercial launch of Seastar which will collect data for the Sea-Viewing Wide Field Sensor project, the launch of WIND — a Global Geospace Science satellite, several GAS and Hitchhiker complements and two meteorological satellites for the National Oceanic and Atmospheric Administration satellite.

LAMB

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near McMurdo Station, carried aloft on the gondola—the payload suspended beneath the balloon.

At Antarctica, cosmic rays are less affected by the Earth's magnetic field. From the balloon's height of about 19 miles (31 kilometers) the detectors will be above most of Earth's atmosphere, in a region similar to the rarefied or "less dense" atmosphere at Mars' surface.

"Antarctica is an excellent locale for performing this long-duration balloon flights," said Trombka. The soil and geomagnetic conditions are suitable, and international agreements are in place that simplify political and safety issues because of the lack of national boundaries and populations centers. Also, the wind currents in the polar region are expected to return the balloon to the vicinity of the launch site at the conclusion of the mission one to two weeks after launch. The first launch date was December 7, 1992.



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