Three Successful ELV Launches this Summer!
Latest — Geotail, July 24

NASA
National Aeronautics and Space Administration
Goddard Space Flight Center

Goddard News

Greenbelt, Maryland / Wallops Island, Virginia

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TOPEX/POSEIDON to Unlock Secrets of the Sea

by John J. Loughlin II and Keith Koehler

As part of an international team, Goddard scientists are attempting to unravel the mysteries of the seas using data from the TOPEX/POSEIDON satellite. TOPEX/POSEIDON launched August 10, 1992, aboard an Ariane 42P expendable launch vehicle from the Guiana Space Center, Kourou, French Guiana.

TOPEX/POSEIDON, a joint mission between Centre National d'Etudes Spatiales (CNES), Toulouse, France, and NASA's Jet Propulsion Laboratory, Pasadena, Calif., will make the most accurate measurements ever of the sea surface. In fact, the data supplied by the satellite's radar altimeter will show sea height to within 5 1/2 inches (14 centimeters).

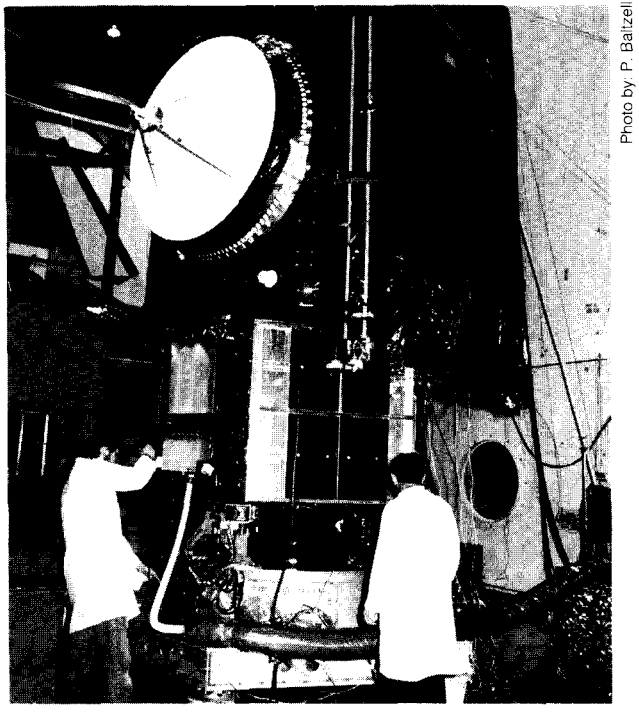

Photo by: P. Baltzell

The TOPEX/POSEIDON spacecraft, in Building 7/10, was at Goddard this spring for environmental testing.

Goddard Scientists Will Work With Data

Dr. Antonio J. Busalacchi, Code 970, chief, Laboratory for Hydrospheric Processes, will study TOPEX/POSEIDON data to learn more about one of the most destructive and dramatic short-term climatological phenomena, El Niño. El Niño, a shifting of ocean and atmospheric circulation patterns in the equatorial Pacific ocean, caused $13 billion in flooding, drought and other damage worldwide during its one-year 1982 stay.

"El Niño, which happens every three to seven years, occurs in conjunction with a weakening of the trade winds," said Busalacchi. "This weakening makes the currents reverse which, in turn, changes weather on a local scale and climate global scale," he said.

Using data from TOPEX/POSEIDON, Busalacchi and his team, which includes scientists from the University of Hawaii, Honolulu, and Orstom, France in Noumea, New Calidonia, hope to predict with greater accuracy the onset of El Niño.

Busalacchi and his team placed two floating buoys out in the south western Pacific ocean to validate the TOPEX/POSEIDON radar altimeter data.

"We placed the buoys directly under the path of multiple passes of the satellite," he said.

"By comparing the satellite's sea height measurements with those of the buoys, we should be able to say how accurately the measurements from space are made," he said.

Busalacchi's team will be among the first to measure sea height and changes out in the open ocean.

"Many measurements close to islands exist, but those data are subject to local effects of the island," he said. "These measurements will help prove TOPEX/POSEIDON's accuracy.

Dr. Braulio V. Sanchez, Code 926, will use TOPEX/POSEIDON data to learn more about the mysteries of the tides.

"We will study the very accurate radar altimeter data to measure the height of the seas over long periods of time," he said. "The data will allow us to create models

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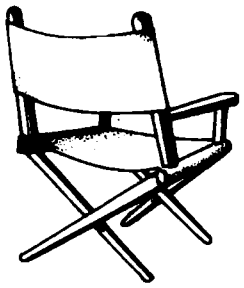


Directors' Dialogue

Q. The April 13 issue of the Bowie Blade reported that the Center has opposed expansion of the Sandy Hill Landfill in the past, but "appears" to be taking a neutral position at present. Is this accurate? If so, why has the position changed?

A. The article in the Bowie Blade states that GSFC is a "past opponent" of the landfill, a statement which is overly general. GSFC does not oppose the Sandy Hill Landfill per se, nor did it oppose the acquisition of additional land for its expansion. GSFC did express general concern about the potential detrimental impacts an expanded landfill might pose to the Center's outlying sites.

GSFC did oppose the county's initiative to acquire the Cafritz property, which was proposed as a solid waste incinerator plant site. In this case, GSFC's opposition stemmed from the proximity of the property to the Magnetic Test and Propulsion Research Facilities. The prospect of heavy truck traffic in the vicinity of these facilities, and the fact that site access would likely require a right-away across a portion of the Propulsion Test Site property, made county acquisition of the Cafritz property unacceptable in GSFC's view. The incinerator site issue was mooted when the Prince George's County Council directed the county executive to cease attempts to acquire the Cafritz property. Simultaneously, the county acquired the expansion site property, with the intent to expand the landfill when it reached saturation in the 1992 time frame.

Currently, the county is seeking a permit from the State to operate the expanded landfill. Recent conversations with a representative from the county's Department of Environmental Resources indicated that the county will begin converting the existing landfill area to a park within the next couple of years. Access to the landfill expansion area will be via the existing Route 197 access.

Based on our understanding of the county's plans for the expansion site, we believe that the landfill expansion will have no significant impact on GSFC activities.

Sherry Foster, Director
Management Operations Directorate
Code 200

Questions for Directors' Dialogue may be sent 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.

TOPEX/POSEIDON Launch to Unlock Secrets of the Sea

(continued from page 1)

to predict sea conditions at any point."

Sanchez points out that the data will mostly model areas far out to sea. He stresses that future investigators could use TOPEX/POSEIDON data to predict the effects of the tides on costal regions.

Barbara H. Putney, Code 926, manages the TOPEX/POSEIDON Orbit Determination Production System.

"In order to have the kind of accuracy needed by the radar altimeter, we need to know the distance from Earth the satellite orbits at any point over the ocean," she said.

Putney's team will determine TOPEX/POSEIDON's orbit to within about 5 inches (13 cms.). That's no small feat for a satellite orbiting some 800 miles (1300 kms.) above the Earth.

To get the kind of accuracy needed, Putney's team will use another Goddard tool. The lasers of the Dynamics of Solid Earth Project, Code 901, will shoot from various locations around the world as TOPEX/POSEIDON reflects them back to Earth. By measuring the reflected laser light, scientists can figure the radial orbit.

Perhaps the most complex tools used by Putney's team are the meticulous Earth gravity models. "The computer models we'll use took over ten years to refine," she said.

"We'll use the TOPEX/POSEIDON data itself to further refine these gravity models," she said.

After her team completes their work, researchers from the University of Texas, Austin, will confirm their orbital calculations.

Dr Chester Koblinsky, Code 971, will use TOPEX/POSEIDON data to make first-of-their-kind high-accuracy global ocean currents maps.

"These kinds of measurements won't be possible until we get this TOPEX/POSEIDON data" he said.

Koblinsky's team, working with researchers from the Massachusetts Institute of Technology, Cambridge, Mass., hope to have the first rough global ocean currents maps prepared by early in 1993.

Dr. Robert S. Nerem, Code 926, using TOPEX/POSEIDON data, will help make a more detailed model of the Earth's gravity fields.

Gravity, the force that holds objects on the Earth, changes depending upon the density of the Earth where it is measured.

The model of the Earth's gravity is known as the geoid.

Goddard scientists, working with TOPEX/POSEIDON data, hope to shed new light on the interaction of sea and atmosphere.

Wallops Researchers Use Tested Technology

The main science instrument on TOPEX/POSEIDON will include more than two decades of experience and tested technology by researchers at Goddard's Wallops Flight Facility, Wallops Island, VA.

(continued on page 8)

UARS Resumes Operations

by Susie Marucci

The flight operations team for NASA's Upper Atmosphere Research Satellite (UARS) resumed full science operations on July 20. One instrument stopped taking scientific measurements July 29 because of a recurrence of a hardware problem. The other nine instruments are operating normally and collecting scientific data.

On June 2, the UARS was placed in a "safe mode" and all of the instruments were turned off. At that time, the solar array had difficulty rotating and was unable to track the Sun properly.

The UARS flight operations team issued commands that repositioned the array to a "high noon" position. This allowed the array to receive solar energy for one-half of each orbit. In this condition, there was adequate power to resume limited instrument operations. Two of the instruments, the Cryogenic Limb Array Etalon Spectrometer (CLAES) and the Microwave Limb Sounder (MLS) were turned on again on June 10 and June 14, respectively.

Since then, "the project has been running extensive diagnostic tests and analysis to understand the condition of the array drive and to determine how to resume operations of the solar array," said John Donley, Code 430, UARS deputy project manager.

After carefully studying the situation, the project — working with a failure review team — determined that although the solar array "A" side drive was damaged, engineers could operate the solar array using this drive and allow all instruments to resume operations.

On July 8, the operations team began rotating the solar array in the forward direction. The array responded as expected, and the flight operations team began turning on additional instruments.

The array was stopped and the instruments turned off on July 13 when UARS made its yaw maneuver. The maneuver turned the spacecraft from front to back. This normal procedure, either turning the spacecraft from front to back or back to front, takes place approximately every 36 days.

On July 14, the flight operations team turned on the Halogen Occultation Experiment (HALOE). On July 16, operation of the solar array in the reverse direction was started. Power up of all instruments was initiated on July 17. The instruments were running by July 20.

All 10 instruments were functioning normally until ISAMS stopped collecting data on July 29 when the chopper motor halted. The chopper motor drives the chopper wheel, which breaks up or "chops" the incoming light beam being analyzed. Project management is studying the recurrence of this problem and is hopeful the error can be corrected as it was this spring. The loss of the ISAMS data does not represent a significant reduction of the UARS' science mission during the lifetime of the CLAES instrument, which provides similar measurements to those taken by ISAMS.

What's UP? August 1, 1992

SAMPEX — *Days in Orbit: 29*
Interesting Fact: Science operations on SAMPEX began July 10. Project officials report that the ground system and three of the instruments are performing well. Anomalies with Leica's high voltage were reported July 21-23. The high voltage is disabled until the project and principal investigator identify possible solutions.

EUVE — *Days in Orbit: 55*
Interesting Fact: Final spacecraft calibrations are completed and the EUVE survey phase began July 24. During the checkout period, 22 EUV sources were detected including at least two new EUV sources not previously reported.

UARS — *Days in Orbit: 322*
Interesting Fact: The Upper Atmosphere Research Satellite (UARS) resumed full science operations following the resolution of problems with the observatory's solar array drive. Rotation of the UARS solar array was restarted shortly after 5:00 p.m. EDT on Thursday, July 16, and has been operating nominally since that time. On July 29, the Improved Stratospheric and Mesospheric Sounder (ISAMS) instrument stopped gathering data. (See story this page).

COMPTON — *Days in Orbit: 483*
Interesting Fact: Controllers uplinked software to Compton on July 16, to allow the spacecraft to use more than two Tracking and Data Relay Satellites (TDRSs). To verify the test software and operational procedures, mission management scheduled 20 test events with one of the spare TDRSs. The observatory discovered an unexpected "gamma-ray afterglow" on the Sun for more than five hours after a solar flare explosion. The glow results from a strong emanation of high-energy gamma rays.

HST — *Days in Orbit: 768*
Interesting Fact: Spacecraft controllers analyzed and tested data to develop an appropriate recovery plan from "safe holds" experienced by HST on July 29 and 30. The cause of the "safe holds" are understood and can be fixed promptly. Erroneous data in a standard ephemeris uplink on July 29 caused the first standby condition, known as an "inertial hold mode." While recovering from that condition, another problem occurred that caused HST to enter into a deeper "hardware safe mode." This is caused by an error in one of the macros in the revised software loaded onboard the observatory's flight computer in May 1992. Project officials understand how the problem occurred and are now in the process of returning the spacecraft to normal operations.

Children Reach for the Stars During the ASK Program

by Susie Marucci

Stirring the minds and imaginations of young people is the goal for Goddard's Aerospace for Kids (ASK) program.

The ASK program, now in its third year, is divided into five sessions of twenty students each. Two sessions are held for fourth through sixth graders and three sessions for seventh through ninth graders. Each session lasts three days and is held at Goddard's Visitor Center

Day one the kids learn about communications and environmental issues. By making a telegraph and using it, children learn just how hard it is to send and receive signals, especially in space. The children also use pollution meters in their homes and bring the results to discuss at this session.

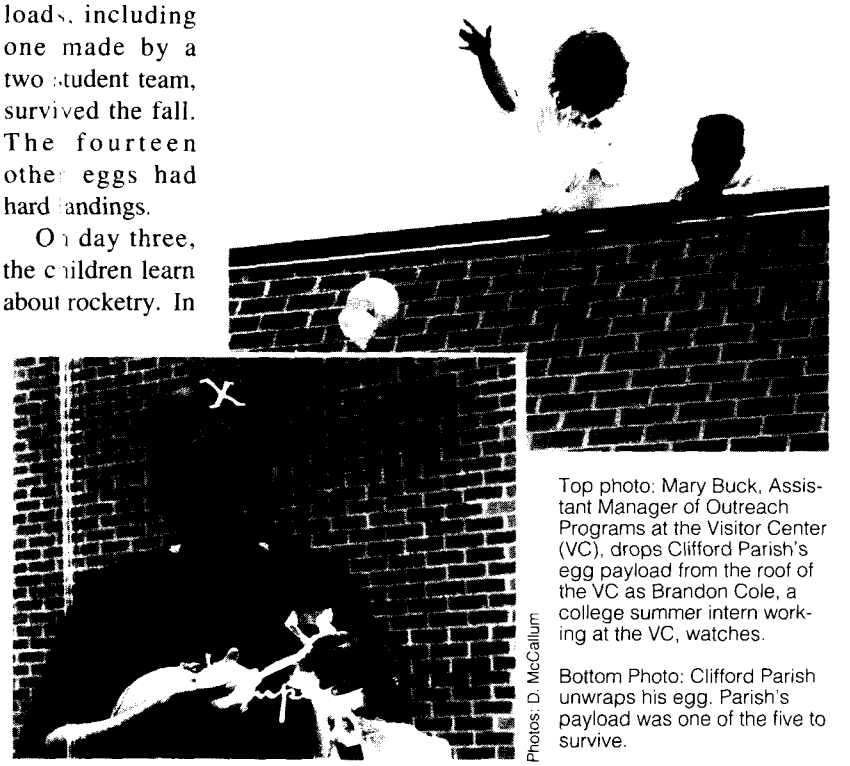
Day two focuses on crewed spaceflight. The ASK students receive a tour of Goddard's Flight Dynamics Facility, where they run simulations. Later that day, the children learn about protecting payloads from gravity by packaging eggs in protective containers.

One recent summer day, twenty children looked up and watched as Mary Buck, Assistant Manager of Outreach Programs at the Visitor Center, took egg payloads and dropped them from the roof of the Visitor Center. Each payload was accorded its own countdown.

Derek Silver used a straw raft to protect his egg. Inside the raft, the egg was wrapped with packing material and plastic bags. "I think it's gonna survive," he said. He was right. His egg was the first one dropped and the first to survive. Five egg payloads, including one made by a two student team, survived the fall. The fourteen other eggs had hard landings.

On day three, the children learn about rocketry. In the morning, there are classes on propulsion, and model rockets are assembled. Later in the day, the rockets are launched

The ASK program teaches science in a fun way. Many children want to participate in ASK. More than sixty children were placed on the waiting list for the program this year.



Photos: D. McCallum

Top photo: Mary Buck, Assistant Manager of Outreach Programs at the Visitor Center (VC), drops Clifford Parish's egg payload from the roof of the VC as Brandon Cole, a college summer intern working at the VC, watches.

Bottom Photo: Clifford Parish unwraps his egg. Parish's payload was one of the five to survive.

Jackson and Tull Nominated for Minority Contractor of the Year

by Susie Marucci

Goddard nominated Jackson and Tull, Chartered Engineers, Seabrook, Md., as the minority contractor of the year. This nomination was sent to NASA Headquarters Friday, July 31, for the NASA Minority Contractor of the Year Award to be awarded during the Minority Enterprise Development Week Sept. 28 - Oct. 2.

Jackson and Tull has provided major support to Goddard for more than five years through engineering support services in the areas of design, fabrication, assembly, integration and testing of flight and ground support electrical, mechanical and thermal components subsystems and systems. It also supports Goddard through applications software design and development to support automation, robotics and data systems and operations and maintenance of systems developed.

"Jackson and Tull has done an excellent job in providing outstanding technical support in meeting demanding requirements and schedules that are part of a high visibility mission such as the HST [Hubble Space Telescope]," said Joseph Ryan, Hubble Space Telescope Operations Manager.

In addition to this nomination, Jackson and Tull received the Small Business Administration "Administrator's Award for Excellence" certificate for work done at Goddard. Jackson and Tull also received several group awards from Goddard and one Jackson and Tull employee received the NASA Headquarters Public Service medal for his work.

Goddard Announces Breakthrough Detector for Gamma Ray Astonomy

by John J. Loughlin II

Goddard's Dr. Neil Gehrels, Code 661, project scientist for the Goddard-managed Compton Gamma Ray Observatory, announced last month the development of a new type of detector that will improve the sensitivity of future gamma-ray astronomy instruments by a factor of two.

"The new detector represents a technological breakthrough for gamma-ray astronomy," according to Gehrels, leader of the detector development project.

The new detector is made from isotopically enriched germanium. Current detectors use an unenriched form of the element germanium (Ge).

Isotopically enriched germanium differs from natural germanium in that it has been highly purified, eliminating isotopes of the element that have less desirable characteristics.

"Most of the background noise in germanium detectors used for gamma-ray astronomy comes from the 74Ge isotope," Gehrels said. "By virtually eliminating this isotope from the new detectors, we improved them by the factor of two."

The germanium was isotopically enriched in Russia under the direction of Dr. Valentine Lebedev of the Kurchatov Institute, Moscow. Russia has unique capabilities for isotopically enriching materials for scientific research not possible in the United States.

Recent flights on high-altitude research balloons demonstrate the detectors have significantly lower background noise than detectors made from standard germanium.

Unwanted signals seen by gamma-ray detectors are called background noise. This noise comes from sources other than the stars and galaxies. It limits the ability to detect faint astronomical sources. The lower noise levels exhibited by the new detector enable scientists to separate fainter astronomical objects from background noise.

This development is the result of a four-year international collaboration involving scientists from United States, France, Germany and Russia.

The Spacelab Data Processing Facility Keeps Data Flowing

by John J. Loughlin II

NASA's U.S. Microgravity Laboratory-1 (USML-1) mission, aboard the Space Shuttle Columbia, which launched June 25 and landed July 8, featured around-the-clock scientific investigations of the effects of weightlessness on plants, humans and materials.

The stream of data produced by the 31 Spacelab experiments flying aboard the shuttle was transmitted to the Spacelab Data Processing Facility (SLDPF) at Goddard.

Since 1982, the Goddard-managed SLDPF has provided the scientific community with data gathered during Spacelab and other attached payload missions. The SLDPF captures the data, accounts for all data and monitors the quality of data during the mission. After the mission, the SLDPF transmits the data to the end users in the scientific community.

For this particular flight, the data network began with the Spacelab High-Rate Multiplexer onboard Columbia. The shuttle experiments, ranging from manufacturing crystals for possible semiconductor use to the behavior of weightless fluids, produced data which was transmitted through the shuttle's K-band signal processor to Goddard's Tracking and Data Relay Satellite System (TDRSS). TDRSS then transmitted the data to Goddard's SLDPF where it was captured, or electronically stored, and processed before distribution to users.

The SLDPF also has the capability to provide scientific users with audio tapes on common cassettes. The cassettes contain audio transmissions from the shuttle's two air-to-ground radio channels as well as tapes made from the shuttle intercom. Often the astronauts will talk about the progress of experiments as they conduct them. When scientists listen to the tapes during data analysis, they gain new perspectives on their experiments.

Photo by D. McCallum

Amy Fedorchak, Code 752.2, a manufacturing engineer for the Hubble Space Telescope, made her mark in history recently by being the first civil servant to earn the "Excellent Performance Award" from Ball Aerospace Systems Group (BASG), Boulder, Colo. Wally Meyer, from BASG, presented the award to Fedorchak on July 9, for demonstration of excellent team work and outstanding contribution to BASG's goals and objectives. Fedorchak recognized the efforts of her manufacturing team, all civil servants, who made significant contributions throughout the manufacturing process of more than 100 assemblies for the COSTAR/HST servicing mission.

Sally Heap: Lindsay Award Winner

by Jessie Katz

"I'm fronting for a group...and that's fine with me." That's how Astronomer Dr. Sara R. (Sally) Heap, Code 681, feels about receiving Goddard's 1992 John C. Lindsay Memorial Award for Science. The award is given annually to a Goddard employee for an outstanding contribution to space science or technology.

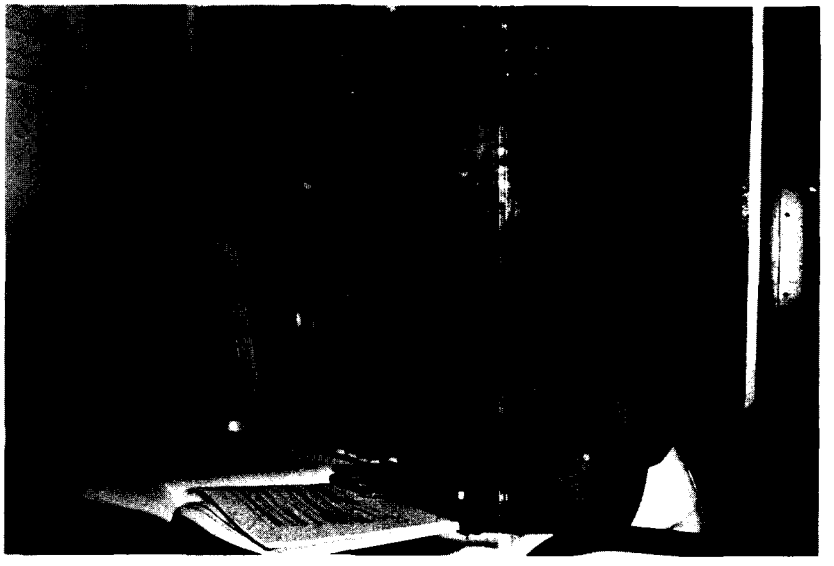


Photo: P. Baltzell

Astronomer Dr. Sara (Sally) Heap, Code 681, analyzes data from several Goddard-managed satellites. She has been working on NASA's Hubble Space Telescope for the past 15 years.

Although Heap's award states, "She is recognized for her major leadership role in the design, development and use of the Goddard High Resolution Spectrograph (GHRS) on the Hubble Space Telescope (HST)...," she insists it wasn't a one person effort. "I think it should be a group award...it was very much a team kind of thing," Heap insists. She is especially appreciative of the design work done for GHRS by the late Murc Bottema, a Ball Aerospace, Boulder, Colo., employee. He not only designed the GHRS, he also designed the Space Telescope Imaging Spectrograph (STIS) replacement spectrograph that will be installed on HST during a service mission, and he took part in the investigation of the cause and plans for repair of the HST spherical aberration.

Presentation of the award is followed by the Lindsay Memorial Lecture. "[Center Director Dr.] John Klineberg says its the best award to get at Goddard because you don't have to do anything. You get up, accept the award, you smile, and someone else does the speaking," she says.

"It's You"

Heap's long-time Goddard associate and friend, the recently retired Dr. Jaylee Mead, Code 930, former associate chief for the Space Data and Computing Division, broke the news. "Jaylee came to me and said.. I'm having a dinner party for the Lindsay Award nominee and I want to check to see if you'll be in town.' I asked, who is the awardee? Jaylee responded, 'You don't know?...'It's you!'" A few days later, she got the official notice from Dr. Stephen S. Holt, Code 600, Director of the Space Sciences Directorate, who brought the papers over to her office in a driving rainstorm.

Heap, co-principal investigator for GHRS, has worked on the project since 1976. The fact that HST launched six and one half years later than planned didn't discourage her. She also was busy working on the International Ultraviolet Explorer (IUE), launched in January 1978.

More Than a Picture

The GHRS produces the spectrum of an object, not its picture. "When you get a picture...you can see where the object is and how bright it is. A spectrum gives you a lot more information. It tells you what the object is made of, how hot, dense or bright it is and if it is moving toward or away from the Earth," explains the 23-year Goddard veteran.

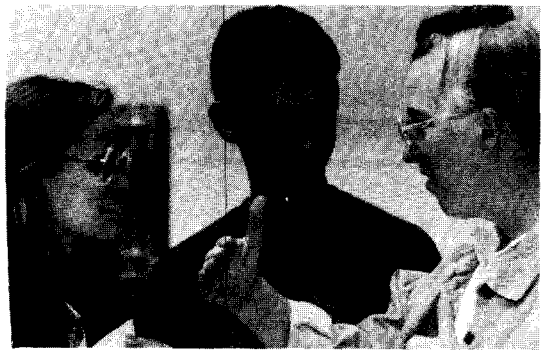
Working with the GHRS hasn't been without its surprises. "The first GHRS spectrum of a nearby quasar showed us there were intergalactic clouds between us and that object. We expected that those clouds had dissipated during the early life of the universe and shouldn't be around any more, but they're still there," Heap says.

Although GHRS occupies most of her time these days and she can't participate in many of the sports she loves, Heap still finds time to bicycle to Potomac, Md., on most weekends.

Heap came to Goddard right after receiving her Ph.D. from the University of California at Los Angeles in 1969. Since then she has worked on four major astronomical satellites dealing with the ultraviolet and the optical region of the spectrum: the Orbiting Astronomical Observatory, Copernicus, IUE, and HST.

An astronomy professor whose class Heap took during her undergraduate days at Wellesley College, Wellesley, Mass., made the subject so interesting, it inspired Heap to enter the field. She began her college career as a European history major, but Professor Sarah Hill changed all that. "I would suspect that probably half the female research astronomers my age or older came out of Wellesley College because of her," the Bethesda native says.

Professor Hill showed Heap the way to a career in astronomy. And, working with the GHRS is particularly satisfying to Heap. "The quality of our results are second to no other instrument on the Space Telescope.



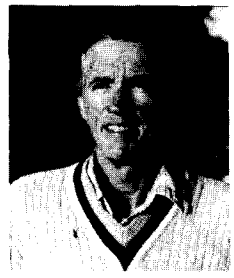
Before the XXV Summer Olympiad in Barcelona, Spain began, Goddard Space Flight Center caught the "spirit of the games" when the 1992 United States Physics Team visited the Center. The team came to Goddard while training at the University of Maryland, College Park, for the 23rd International Physics Olympiad, Helsinki, Finland. Dr. Carol Jo Crannell, Code 682, principal investigator for the Goddard-managed High Energy Imaging Device (HEIDI) balloon project, hosted the team on a tour of the HEIDI Hangar located in Building 21. Early in July, 177 stellar physics students from 37 countries contended for three possible gold medals. The five United States' representatives earned not one but two gold medals, a feat never before accomplished by a U.S. team. They also earned one silver medal and two honorable mentions. Shown here, Crannell, right, talks about HEIDI to two of the physics team members.

RETIREES

Congratulations to the following employees who recently retired!

Name	Code	Years
Albert Arking	910	33
Robert L. Appler	717.3	15
Robert E. Davis	408	34
Louis R. Dod	975	33
Burdett De Vaul	291.1	26
Albert J. Fleig	900	30
Shirley W. Jester	830	30
James T. Johnson	551.1	36
George Keller	415	44
Virginia Kendall	253.1	32
Jaylee Mead	930	34
Kenneth J. Muse	683	43
Harvey Ostrow	925	30
Bruce R. Pincus	740.2	30
Roger Ratliff	727	35
Frank G. Rawlinson	534.2	34
Robert J. Sullivan	970	30
Robert E. Sutton	303	33
James L. Wall	313.2	38
Jack Van Zant	685	26

In Memoriam



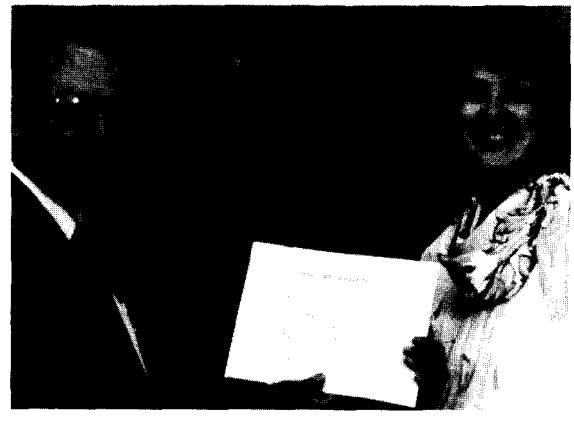
John J. Sweeney
1925 - 1992

John "Jack" Sweeney, a retired Technical Information Specialist, Code 302, who continued to work at Goddard as a contractor after retirement, died June 7 from a lung infection and complications from leukemia. Sweeney came to Goddard in the late 1960s from the National Bureau of Standards and *The Johnstown Tribune Democrat*, where he was a staff reporter.

Sweeney retired from Goddard's Assurance Requirements Office in September 1984. After retirement he was employed by Hernandez Engineering, Inc, as a consultant. An avid painter, Sweeney was a member of the Goddard Art Club. Several of his paintings hang in the Code 300 conference room in Building 6.

Sweeney's career at Goddard included work in the old Test and Evaluation Division as a technical writer and editor. He later managed the editing and publication effort for the early Assurance Requirements documents which have become an Agency model. According to long-time associate Bill Bangs, Code 302, chief, Assurance Requirements Office, "Jack will be remembered by many technologists for his unrelenting crusade to instill an appreciation for the arts into the daily pursuit of space technology. He did this with great sensitivity and gusto."

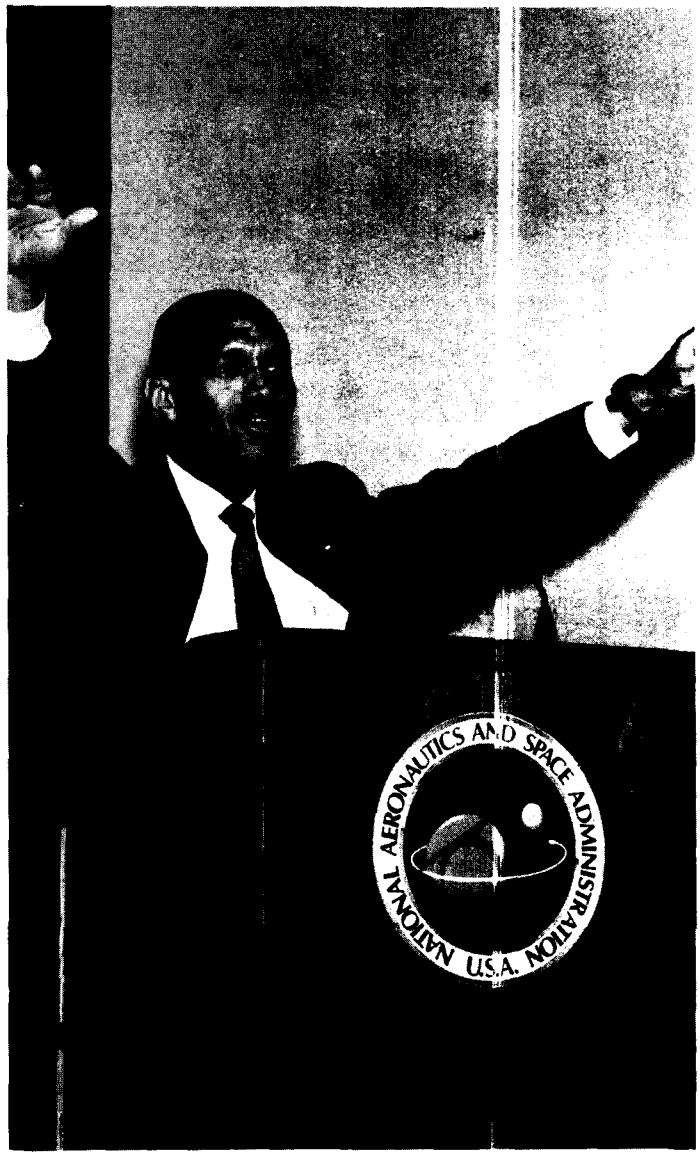
An Internship for the Future



Moniesha Jackson, center, receives a certificate from Elmer Travis, executive vice president, left, and Pamela Butziger, manager of benefits administration, both from Swales & Associates.

Each year Swales & Associates, Inc., Beltsville, Md., College Intern Program names a graduating senior from Eleanor Roosevelt High School in Greenbelt as the Swales College Intern. This year the intern is Moniesha Jackson. Interns must be pursuing a degree in mechanical or aerospace engineering. This program pays for in-state tuition, fees and books at the University of Maryland and gives the intern the opportunity to earn money to pay for room and board. Jackson is working in the Structural Dynamics group at Swales. Swales is a member of Goddard's Contractor Association.

An animated Colonel Charles Bolden, veteran of three space flights and Assistant Deputy Administrator, NASA Headquarters, spoke to employees July 29, in the Building 3 auditorium. Bolden was pilot on STS-61C in 1986 and STS-31 in 1990, which deployed the Hubble Space Telescope. Bolden was commander on STS-45 this year. STS-45 carried Goddard's Shuttle Solar Backscatter Ultraviolet (SSBUV) instrument. Bolden's visit was sponsored by the Black History Club.



TOPEX/POSEIDON to Unlock Secrets of the Sea

(continued from page 2)

The principal science instrument is a NASA dual-frequency radar altimeter. The goal of the altimeter is to measure mean sea level to within an accuracy of a few centimeters (less than an inch).

The NASA altimeter, one of six instruments on the spacecraft, is state-of-the-art but uses tested technology. Beginning with an experimental altimeter in 1973 on Skylab, "Wallops has been involved in all NASA ocean altimeter projects," said Laurence Rossi, Code 972, administrative manager of the NASA TOPEX/POSEIDON Radar Altimeter.

Altimeters measure the ocean surface by producing a radar signal which reflects off the water surface and returns to the spacecraft.

Wallops researchers have been working on the $39.2 million NASA TOPEX/POSEIDON altimeter since the early 1980s.

Two through six months after launch, the science data quality will be monitored and compared to ground truth data collected off the coast of California and in the Mediterranean Sea. Wallops personnel will work jointly with scientists to make any needed adjustments to the software algorithms which are used to reduce the radar altimeter data acquired from orbit prior to its distribution to the science community.

Throughout the life of the altimeter, Wallops personnel will keep track of the altimeter's state of health. The spacecraft is a three year mission with a goal of five years.

Goddard News

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Visitor Center Now Open Seven Days a Week

Goddard's Visitor Center is now open seven days a week on a permanent basis. In the past, the Visitor Center extended its hours from five days a week to seven during the summer, then reverted back to five days a week once school started. The Visitor Center is host to many students on field trips during the year. By being open the two additional days, the Visitor Center will be able to welcome more people weekly. The Visitor Center hosts model rocket launches, demonstrations, videos, lectures, star watches and daily tours. The hours are still 10:00 a.m. to 4:00 p.m. If you have never made it to the Visitor Center, drop by.