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Goddard News

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Making dreams come true: Peter Shu

Goddard's Tom Huber retires

by Ernie J. Shannon

Photo by: NASA

Tom Huber

Tom Huber occupies the deputy director's office; his schedule reflects one Goddard's deputy director would have; yet, his demeanor, his persona, reminds one of a man who would prefer to be in the trenches.

Huber is retiring March 31 as the Goddard Space Flight Center's deputy director, a position he has held since June 1994. He had intended to leave the Center this summer, but the NASA-sponsored buyout program convinced the life-long engineer to depart early.

"I have very mixed emotions about leaving. I'm looking forward to spending time with my family and renewing acquaintance, you might say, with my large family. But I'll tell ya, I sure love this place. Goddard has been a joy to work at for more than 30 years and it's hard to leave," Huber said. Traveling is also in his plans, but it's easy to wonder if he'll see anything as interesting or as invigorating as his three-decade long voyage with Goddard.

"I spent 30 years in engineering; hands-on engineering that involved the development of some of the most exciting and challenging satellites the world has seen. It's hard to imagine now that in the early 1960s, I knew little about space," Huber reflected. After graduating from Carnegie Mellon University with a degree in electrical engineering, the Pittsburgh native went to work for Goodyear Aerospace in California. During his work on the Subroc missile, Huber met Henry Hoffman (with Goddard) and, before long, was convinced that Goddard was the place to be.

"Henry told me all about the satellites and other projects the Center was going to be developing, and after awhile, I couldn't think of anything more interesting for an engineer like myself to do. So, I came here in 1964."

Huber began his career as a controls engineer for the Orbiting Astronomical Observatory. "It was a beautiful spacecraft. We were doing things fast in those days and I believe we put it in orbit in three and one-half years," Huber said. From there, he moved into increasingly responsible positions including group leader in the Engineering Directorate's Controls Branch and, later, controls manager for the Advanced Technology Satellite-F, an advanced communications satellite launched in May 1974.

"Goddard was an extremely busy place in those days. There were so many projects going at the same time and hardly time to catch your breath, but it was great," Huber said.

Later assignments included serving as associate division chief of the Engineering Directorate's System

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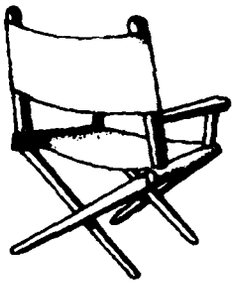
Buy out update

As of press time, 272 Goddard employees had applied for the buy out incentives being offered by NASA. It was not known how many people ultimately applied for the buyout by the deadline or actually accepted it and departed the Center.

During the last month or so, NASA Administrator Dan Goldin has urged qualified employees to consider the buy out option in order to reduce employment levels in the agency. Goldin has said NASA needs to reduce its size as soon as possible to meet goals required by the administration. The reductions are part of an overall effort to meet an expected decline in NASA's budget of $5 billion by the year 2000.

The deadline for accepting the buy out was March 24 with a departure date of March 31.



Director's Dialogue

Q: 1. I would like to know what provisions have been made for those employees who are smokers. Why are they allowed to take several breaks during the working hours to smoke? I constantly notice that people are outside smoking and talking for as much as one hour per day, while non-smokers are inside working. I think this is very unfair and time should be allotted for smoke breaks instead of a person taking them at their own leisure all day long. Is anyone monitoring these people or are they going to get away with it just because they have a smoking habit?

2. Ever since the non-smoking policy was put into place I have noticed disturbing sights around Center. It seems that now people are taking more and more breaks because of this policy. In my building I have noticed that a select group of smokers actually take a break every one or two hours for as long as 20 minutes at a time — this adds up to half a day. Whenever I ride around Center, I also notice people just standing out in front of other buildings smoking and talking. I really think this is unfair to non-smokers who are inside working like we're supposed to be doing. Why should smokers be allowed all these breaks just because they have a bad habit? A couple of breaks a day for a few minutes is understandable, but I think it is getting way out of hand and there should be some kind of limit to how many breaks these people are allowed to take.

A: In May 1992, a Goddard Management Instruction (GMI 1772.1B) was issued which prohibited smoking in all Goddard buildings and facilities. This GMI outlines the provisions and responsibilities relevant to the Center's smoking policy. One of the provisions' states that, "Employees who smoke will be permitted a reasonable opportunity to do so." One of the responsibilities in the policy states: "All levels of GSFC management and supervision shall enforce this provision of the policy within their respective organizations and areas of responsibility."

This issue is properly handled with good communication between the unit supervisor and the people who smoke. Supervisors are responsible for employees attendance at the work place and to determine "reasonable opportunity" with the employees. Goddard management does not intend to outline any provisions or policy regarding "smoke breaks." Rather, management encourages employees to communicate their concerns within the work unit. This approach is part of the Center's desire to have these questions resolved at the lowest practical level.

Roger Jenkin, director, Human Resources, Code 110

Ultraviolet Imaging Telescope on Endeavour

by Jim Sahli

The Goddard Ultraviolet Imaging Telescope has gathered some unique views of the universe as part of the STS-67/Astro-2 Spacelab mission.

The Space Shuttle Endeavour launched March 2 at 1:38 a.m. from Launch Pad 39A at the Kennedy Space Center carrying the Goddard-built Ultraviolet Imaging Telescope (UIT) on its second flight.

Principal Investigator Theodore Stecher, Code 680, and his team of approximately 30 scientists and engineers worked on the mission from the Spacelab Mission Operations Control Center at the Marshall Space Flight Center in Huntsville.

"We were excited about flying the UIT a second time and we are particularly excited that one of our team members was on the Shuttle," said Stecher.

The Astro-2 observatory was housed inside the Shuttle's payload bay, while astronomers serving as payload specialists operated the telescopes from the Shuttle's aft flight deck. Dr. Ron Parise, Code 684.9, flew on the Shuttle as part of the Goddard UIT team. As the Shuttle Endeavour orbited 220 miles above Earth, the UIT contingent of scientists and engineers were guiding their instrument from Huntsville.

The Astro-2 mission investigated a variety of basic properties of the universe, with the intention of building on the experience and scientific data obtained with the same telescopes used on the 1990 Astro-1 flight. This second mission significantly increased the available library of wide-angle, deep exposure ultraviolet images of the universe, with each UIT exposure capturing a field of view larger than the apparent size of the full Moon.

The UIT scientists, with team members and guest investigators from Goddard and cooperating institutions, surveyed fundamental astrophysical objects such as galaxies, nebulae, and star clusters, in ultraviolet light.

According to Stecher, this energetic radiation, which is invisible to the human eye, cannot be received on the ground, because it is blocked by the ozone layer and other elements of the Earth's atmosphere.

The Astro Observatory is a package of three instruments, mounted on the Spacelab Instrument Pointing System. Goddard's UIT takes wide-field photographs of objects in ultraviolet light. The other two instruments are the Hopkins Ultraviolet Telescope (HUT), developed at The Johns Hopkins University in Balti-

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Goddard's Get Away Special continues with STS-67

The STS-67 flight saw the continuation of NASA's Get Away Special (GAS) experiments program that is managed by Goddard's Shuttle Small Payloads Project Office, Code 740. The program gives individuals and organizations an opportunity to perform experiments in space on a Shuttle mission. Two GAS cans were carried in the cargo bay of the Space Shuttle Endeavour in support of a payload from the Australian Space Office.

The payload, coincidentally also named Endeavour, is an Australian space telescope that takes images in the ultraviolet spectrum of violent events in nearby exploding galaxies. The telescope previously flew on the Shuttle in January 1992.

Endeavour is the most significant space payload built by the Australian space industry for more than two decades. Through this program many Australian engineers have learned their space skills. This is particularly true for Auspace, the prime contractor for this project. More than 200 Australian companies also contributed to this pioneering space project. The Australian Space Office of the Department of Industry Science and Technology, which administers the Australian space program, provided the funds for the Endeavour program.

Goddard astronomer part of STS-67 crew

photo by: NASA

Goddard's Dr. Ron Parise, Code 684.9 (right), and Dr. Samuel Durrance, test out a slidewire basket during Terminal Countdown Demonstration Test activities at Launch Pad 39A at the Kennedy Space Center. The testing was part of preparation for Mission STS-67. This was the second Shuttle flight for Parise and Durrance who served as payload specialists.

Huber

Continued from page 1.

Division and head of the System and Operation Office for seven years. In 1981, Huber became chief of the Space Technology Division and was appointed deputy director of Engineering in 1988. He became director of Engineering in March 1990.

"All of those assignments represent work that I very much enjoyed. I've never had a job here I didn't like. But you know what I liked the most? The opportunity to see the young people develop," Huber said. "In the 1970s we weren't hiring too many people here, but in the early 1980s we really brought on a lot of good young people. Now, ten years later, those young people form the foundation of a strong and stable workforce. It's been my privilege to watch them grow."

Because of his people-oriented philosophy, Huber has been an aggressive advocate for employee development, particularly encouraging young people in the field of engineering and, a strong supporter of education.

"I always have felt that Goddard was a big family. When you, as a manager, approach an employee, they need to know that you care about them as a person. There must be a two-way agreement here. If I give you an assignment, I expect your best. By the same token, I, as a manager, will give you my best. Any manager, I don't care at what level he's at, who doesn't remember that rule, will fail."

While Huber regrets leaving the engineering challenges and the people with whom he's been associated for all these many years, he looks foward to watching Goddard play a key role in the nation's space program in the future.

"This is a most difficult time. I wish it were different, but I have great faith that Goddard will come out of this a better Center. There will be streamlining. There will be some changes, but we can survive this and actually benefit from it," Huber emphasized. "Goddard people have much to look forward to in the future. We were doing smaller, better, cheaper long before those words became popular and we are doing even more so today. We have a number of small spacecraft that we'll be launching in the years ahead and the Earth Observation System will provide us with very meaningful work for years to come."

Huber sees a great investment of his life in the buildings and people that make up the Goddard Space Flight Center. And it's with a big sigh that he says good-bye.

"I'll tell ya again, I love this place. Always have and always will."

Hubble finds oxygen atmosphere on Jupiter's moon Europa

by Tammy Jones

Astronomers using NASA's Hubble Space Telescope (HST) have identified the presence of an extremely tenuous atmosphere of molecular oxygen around Jupiter's second moon, Europa. The planets Mars and Venus are the only two other solar system objects beyond Earth known to have traces of molecular oxygen in their atmospheres.

This detection was made by a team of researchers at the Johns Hopkins University and the Space Telescope Science Institute, both in Baltimore, and is reported in the Feb. 23 issue of the journal "Nature."

"Europa's oxygen atmosphere is so tenuous that its surface pressure is barely one hundred billionth that of the Earth," said Principal Investigator Doyle Hall, of Johns Hopkins. "If all the oxygen on Europa were compressed to the surface pressure of Earth's atmosphere, it would fill only about a dozen Houston Astrodomes. It is truly amazing that the Hubble Space Telescope can detect such a tenuous trace of gas so far away."

Image by: Walt Feimer, STSCI/NASA

Europa

Scientists had predicted previously that Europa might have an atmosphere containing gaseous oxygen, but had to wait for Hubble's sensitive instruments for confirmation. The HST researchers caution that the detection should not be misinterpreted as evidence for the presence of life on the small, frigid moon. Located 490 million miles (780 million kilometers) from the Sun, Europa's surface is too cold, measured at -230 degrees Fahrenheit (-145 degrees Celsius), to support life as we know it.

The Hubble observations will be invaluable for scientists who are planning close-up observations of Europa as part of NASA's Galileo mission, which will arrive at Jupiter in December 1995. During its initial entry into the Jovian system on Dec. 7, Galileo will fly by Europa at a distance of less than 22,000 miles (35,000 kilometers).

Goddard led team creates supernova model

by Jarrett S. Cohen

Working with a team of astrophysicists from the University of Arizona, Bruce Fryxell, Code 934, has developed a supercomputer model that confirms recent observational evidence for why a supernova occurs. The best understood type of supernova is a massive star (eight or more times the mass of our sun) that after exhausting its nuclear fuel collapses its core into a hyperdense ball and then ejects its shell in a brilliant explosion. Likely the most violent phenomenon in the universe for a short time, the supernova outshines an entire galaxy.

These latest, two-dimensional calculations point to a decisive role for neutrinos — subatomic, massless (or nearly massless, as some recent experiments support) particles of neutral charge — in causing this stellar eruption.

The work is a collaboration between Fryxell, of the High Performance Computing Branch, Code 934; George Mason University, and Adam Burrows and John Hayes of the University's departments of physics and astronomy.

A newly formed star burns hydrogen in its core. As the star evolves, its core converts to elements higher on the Periodic Table, reaching iron just before a supernova. "Burning all the elements up to iron releases energy, but no energy can be released by burning iron," said Fryxell. At this stage "the core can't create any pressure support for the star, and the core collapses very rapidly—in about 200 milliseconds."

This collapse forms a neutron star, which after cooling is extremely dense; "it is like having the mass of the sun in an area the size of a city," said Fryxell.

As the core becomes stiffer and stiffer, it reaches the point where it cannot further compress. "When that happens, a shock forms, quickly spreads out from the center, and ejects the envelope, creating the magnificent display that we see," Fryxell explained. Previous supernova models, which were one-dimensional, produced explosions but were later found to have incomplete physics. When the correct physics was added, the simulations did not explode. As the shock wave moves through the iron core, it gives its energy to the iron and converts it to helium. Because the core collapsed quickly and the outer layers just rained upon it, a black hole resulted.

The new two-dimensional model shows that earlier efforts failed because they could not take all the multidimensional effects into account. During neutron star formation, protons and electrons combine into neutrons, releasing a neutrino after each merger. With the neutrinos come a tremendous amount of energy, 10^{53} ergs, which would take our sun 793 billion years to produce. The new model discovered that this energy surge drives a process called convection, or uneven heating, which Fryxell likened to boiling water.

These results were presented at the January meeting of the American Astronomical Society. Color figures and an mpeg-format movie are available on the World Wide Web at <http://lepton.physics.arizona.edu:8000/graphics.html>. Another team made up of the University of Arizona and Los Alamos National Laboratory researchers reported similar conclusions from a different set of calculations.

Local students chat with astronauts in space

Space Shuttle Mission STS-67 proved an extra thrill for hundreds of students fortunate enough to chat with the Endeavour astronauts during its 16-day mission in early March. Students from 26 schools in the U.S., South Africa, India and Australia spoke to the astronauts through amateur radio as part of the Shuttle Amateur Radio EXperiment (SAREX).

Several schools from the local Maryland area participated in SAREX during mission STS-67. They were the U.S. Naval Academy in Annapolis, Lutherville Elementary and Ridgely Middle Schools of Lutherville, and Silver Spring and Burtonsville schools.

STS-67 was the 16th Shuttle mission for SAREX. The first flight for SAREX took place in 1983 when Owen Garriott, W5IFL, carried a hand-held ham radio aboard Space Shuttle Columbia on STS-9. Astronauts who are licensed ham radio operators participate in SAREX during their free-time on missions; making contact with students around the world.

Of Endeavour's crew of seven, six astronauts were licensed ham radio operators, including Goddard's Ron Parise, WA4SIR, Code 684.9.

During the mission students spent 4-8 minutes asking astronauts' questions during SAREX sessions. Some questions directly related to the ASTRO-2 ultraviolet observatory that was the mission's primary payload. Others concerned supernova remnants, and the physics and properties of blackholes.

Photo by: NASA

Jim Gass, Code 631, of the Goddard Amateur Radio Club, works with Porsche Matthews as Genevieve Monty looks on. The students from the Eisenhower Middle School, Laurel participated in the Shuttle Amateur Radio EXperiment during a recent mission.

SAREX is an effective way for students and others in the community to communicate between the Shuttle and low-cost ground stations using amateur radio voice and digital techniques. It is designed to encourage public participation in the space program and to pique students' interest in science and technology.

SAREX is a joint effort between NASA, the American Radio Relay League (ARRL) and the Radio Amateur Satellite Corp. (AMSAT). AMSAT heads the technical operations and receives support from hundreds of amateur radio operators who work behind the scenes in NASA's amateur radio clubs at Goddard, Marshall and Johnson. Schools interested in SAREX can contact ARRL's Educational Activities Department for lesson materials, and a list of local ham radio clubs. The clubs will be able to assist schools interested in setting up their own programs.

Key appointment in Flight Projects

Joseph Dezio

Joseph Dezio recently was appointed project manager of the Global Sciences (GGS) Project, Code 406. As project manager Dezio is responsible for project-wide planning, systems engineering, scheduling, budget and financial planning and management reporting. Also, Dezio will organize and control all elements of planning, specifying and implementing the GGS project.

In June 1993 Dezio was appointed deputy project manager for GGS. Before to that assignment, he was deputy project manager for the Geostationary Operational Environmental Satellite (GOES) Project from February 1989 to June 1993. He held the position platforms project manager from June 1986 to February 1989. He served as attached payloads segment manager for the Work Package-3 project on the Space Station Freedom Project from February 1985 to June 1986. Dezio began his career at Goddard in June 1969. He received a bachelor of science degree in Engineering Science from Oakland University in 1967.

The road taken

by Karen W. Davis

Born in Taiwan, Republic of China, Peter Shu, Code 718, has journeyed down many roads and traveled half way around the world, before finding his way to Goddard. Shu was 12 years old when he arrived in the United States with his family; brought here by a father searching for greater career opportunities and a stable environment in which to raise a family.

Shu took accelerated English language classes offered by the University of Hawaii where his father was part of the library's staff. "I wanted to adjust as quickly as possible to the American lifestyle. Luckily I discovered sports as a way to ease the transition," said Shu. Later motivation and athletic skills helped him become captain of his high school's tennis team. According to Shu, this experience earned him acceptance, and taught him invaluable lessons about accomplishment through hard work and team work.

Shu attended the Michigan State University where he earned a bachelor's degree in electrical engineering. From there it was on to the University of Michigan for further study.

Shu was introduced to Goddard while working as a research assistant at the University of Michigan' Space Physics Research Lab from 1973-1975. He provided support for Goddard missions and studied the effects of atmospheric aerosol pollutants caused by space missions. After completing graduate studies, Shu had misgivings about a career in engineering. So while waiting for job offers, he enrolled in the School of Architecture at Michigan and later took a full-time job with an architectural firm in Detroit.

Soon after, a job offer came from McDonnell Douglas in California; he accepted a position and stayed with the company for 10 months. "I accepted the job at McDonnell Douglas because I hadn't heard from Goddard. I was on my way to California when I got the news that I had received a job offer from NASA. It may seem funny now, but back then I thought the timing was pretty lousy. I believe everything has a reason for happening. I think my experiences gave me a wider perspective on career options and an appreciation for NASA," Shu said.

Photo by: Jane Semeraro

Peter Shu

Shu began his Goddard career in February 1979 as a microwave engineer with the Microwave Technology Branch, Code 737. In 1986, he became a systems engineer, working on the Broad Banned X-Ray Telescope project. He monitored the project and handled outstanding issues before launch, such as cabling and environmental testing. In 1988, Shu was promoted to head, Detector Systems Section, Code 718.2. There Shu led a project team that developed the Change Coupler Device Detector for the Modis-T instrument.

In 1990, Shu was promoted to head, Solid State Development Branch, Code 718. This branch designs and develops sensors based on solid state physics. These sensors cover the spectrum from infrared to visible, X-ray, and cosmic energy. "The work done in this branch and my role in it are very important to me. All scientific instruments require a sensor in some form. The sensor is the key data collecting medium; it converts energy from scientific sources into electrical signals that can be scientifically processed," Shu said.

Shu is proud of the detector development labs that were completed in 1993. Built to exacting specifications, its cleanroom's house multimillion dollar state-of-the-art equipment, including the High Energy Ion Implanter.

"Everything we do here is constantly challenging, but the end results outweigh the obstacles. There are always risks with any project, but it's worth it to see your hard work pay off in the end with a successful flight mission. I am looking towards higher levels of accomplishments, like the day when our branch will become the sole detector branch for all of NASA," Shu concluded.

Retirees

Congratulations to the following employees who recently retired!

Name	Code	Years	Name	Code	Years
Maurice Dubin	914	45	Thomas Karras	402	33
Jeremiah Madden	400	41	James Cookro	801	33
McLean Grant	406	38	Theodore Felsenstreger	926	32
Arnold Abbott	715.1	36	Raymond Mazur	543	32
Daniel Spintman	530	36	Maurice Beazley	663.2	30
Warren Adams	535.3	35	Sterling Hammond	291.4	29
Christine Alexandre	500	35	James Elliot	130	23
Joseph McGoogan	800	35	Barbara Ryan	224	22
Billy Marshall	303	34	Wanda McDermond	480	20
John Johnson Jr.	722.4	34	Betty Dumas	933	15

Correction

In the February Goddard News article, *UARS Confirms ozone loss theory*, in discussing the natural sources of hydrogen fluoride, the article refers to hydrogen fluoride in the stratosphere and was omitted from the article.

It is well known that volcanoes emit tiny amounts of hydrogen fluoride into the lower atmosphere. Tropospheric chemistry and dynamics prevent highly reactive hydrogen fluoride from being transported from the lower to the upper atmosphere. The global presence of hydrogen fluoride in the stratosphere, distributed in ways that are inconsistent with volcanically emitted hydrogen fluoride, underscore scientists' conclusions that hydrogen fluoride in stratosphere must come from CFCs. We regret this omission.

NASA's best

Photo by: NASA

Center Director Dr. John Klineberg presents Corinne Hardy, Code 263.3 with a plaque commemorating her selection as NASA's Procurement Support Person of the Year.

Blood Drive

The Red Cross Bloodmobile blood drive was held on Feb. 1. One hundred and thirty-six pints of blood were collected. Following is a list of donors who reached the gallon mark:

Name	No. of Gallons
Thomas Bascom	2
Rory Casey	3
David Cleveland	4
David Content	5
James Corbo	1
Christopher Field	3
Sheron Fowler	4
Edwin Fung	5
Mark Goldman	5
David Peters	5
Judy Rupp	1
Patric Ryan	3
Delores Shaut	1
Rebecca Short	1
John Unger	21
Vicki Vanduyl	10
Barbara Vargo	6
Edwin Vaughan	9
Charlotte Verkouw	1
Stephen Volz	8
Bruce Wagner	3

The next Bloodmobile visit will be held on April 5. To schedule a donation appointment, call Nancy Rinker at x6-6422.

Engineering Colloquia schedule for April

On tap for April are four engineering colloquiums. Each begins at 3:30 p.m. and will be held in the Building 3 auditorium.

April 3: Prof. Henry Melosh, Department of Geosciences and Lunar and Planetary Laboratory, University of Arizona, Tucson, presents "The New Catastrophism: Origin and Evolution of the Moon and Earth."

April 10: Nano Seeber, resident associate, Lamont Earth Observatory, presents "The 1994 Northridge Earthquake."

April 17: David Freedman, editor, Inc Technology Magazine, presents "Brainmakers: How Scientists are Moving Beyond Computers to Rival the Brain."

April 24: Dr. Louis Walter, associate director, Earth Sciences Directorate, Code 900, presents "Natural Disasters: How Satellites Can and Do Help."

Goddard engineers share experiences

Any idea — what's the second largest career? It happens to be engineering. Teaching is the first.

According to the Bureau of Labor Statistics, there are more than 1.8 million engineers in the U.S. Approximately 35,000 of those engineers were expected to visit local schools and sponsor extra-curricular programs as part of the 1995 National Engineers Week Discover "E" program, from Feb.19 through 25.

Goddard has a large number of engineers, and they were excited about participating in the national event. More than 100 Goddard engineers visited secondary students in Maryland public schools.

Engineers took the time to visit more than 70 Maryland schools to share their career stories. They used the opportunity to encourage students to pursue their dreams, whether it be in space flight or working for a automobile manufacturer. Also, the school visits gave students a chance to interact with the people who actually do the work.

Each engineer presented a school with educational materials on NASA's missions. Some of the schools visited are located in the city of Baltimore, and Anne Arundel, Baltimore, Charles, Howard, Montgomery and Prince George's counties.

Many space and Earth science instruments that fly aboard NASA spacecraft are developed in-house by Goddard engineers. They develop hardware and software for astronomical telescopes and Earth observing satellites. GSFC engineers have worked on instruments for the Hubble Space Telescope, the Geostationary Operational Environmental Satellite and the Wind spacecraft, designed to study changes in solar wind. Spacecraft launched by NASA are put into orbit by the Space Shuttle and expendable launch vehicles such as Atlas rockets.

The idea behind Engineers Week is to raise public awareness of engineers and appreciation for their work. Thousands of engineers throughout the U.S. sponsored a variety of public activities from technology exhibits to student competitions.

Virgil Franklin Gardner 1931–1995

Virgil Gardner, Code 920.1, died on Tuesday, March 7. Gardner suffered a massive heart attack while at work. He was 64 years old. Gardner celebrated his 40th year of federal service in August 1994. He joined the Goddard Space Flight Center workforce in 1961. Gardner contributed to telemetry systems used in the Mercury, Gemini, Apollo and Skylab missions, and he received individual and group awards from NASA for his efforts.

Endeavor

Continued from page 2.

more, conducts spectroscopy in the far ultraviolet portion of the electromagnetic spectrum. The Wisconsin Ultraviolet Photo-Polarimeter Experiment (WUPPE), developed at the University of Wisconsin at Madison, measures the intensity and spectrum of ultraviolet light and its degree of polarization.

UIT is a powerful combination of telescope, image intensifier and camera. Unlike data from the other Astro instruments, which can be electronically transmitted to the ground, UIT images are recorded on very sensitive astronomical film. The images will be processed at Goddard after Endeavour returns to Earth. Then, the image data will be digitized and scanned into a computer for analysis at GSFC, cooperating institutions, and elsewhere in the academic community.

NASA

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