



National Aeronautics and
Space Administration
Goddard Space Flight Center

GODDARD news

Greenbelt, Maryland/Wallops Island, Virginia

June 1998 Vol. 2 No. 22

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NOAA-K Spacecraft Looking Good

By Susan Hendrix, Office of Public Affairs

Operations for NOAA-K--renamed NOAA-15--which launched on May 13, continue to go very well as NASA controllers perform the on-orbit checkout of the spacecraft. The spacecraft is operating successfully and most instruments are in various phases of activation and evaluation as part of the 60-day On-Orbit Verification Plan. After initial turn on of the instruments, various modes will be exercised to evaluate and document performance of the spacecraft.

Subsystem evaluation and instrument activation began with the first command contact at NOAA's Fairbanks, Alaska data acquisition site. The first phase of evaluation, Launch and Early Orbit, was completed on May 20 with a performance assessment from the Lockheed Martin East Windsor (NJ) Operations subsystem engineers. The major satellite subsystems including power, thermal, command and control, data handling, communications, reaction control and flight software are performing normally with the exception of one antenna.

Spacecraft controllers report that the VHF Realtime Antenna (VRA) is apparently not fully deployed. This antenna is used to transmit the Automatic Picture Transmission (APT) signal containing two channels of low resolution Advanced Very High Resolution Radiometer imagery data to the ground. Many users report receiving good data at certain look angles to the spacecraft, but controllers say that much of the data is noisy. The Polar Operational Environmental Satellite Project at the Goddard Space Flight Center (Greenbelt, Md.) and Lockheed Martin are evaluating data and working to develop an action plan for possible resolution of the problem.

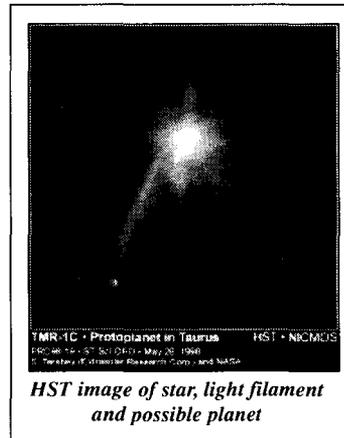
NOAA-15 will collect meteorological and oceanographic data and transmit this information to users around the world to enhance weather and climate forecasting. In the United States, the data will be used primarily by NOAA's National Weather Service for its multi-range weather and climate forecasts.

Hubble Takes First Image of a Possible Planet Around Another Star

By Bill Steigerwald, Office of Public Affairs

NASA's Hubble Space Telescope has given astronomers their first direct look at what is possibly a planet outside our solar system -- one apparently that has been ejected into deep space by its parent stars.

The discovery, made by Susan Terebey of the Extrasolar Research Corporation in Pasadena, CA, and her team using Hubble's Near Infrared Camera and Multi-Object Spectrometer (NICMOS), further challenges conventional theories about the birth and evolution of planets, and offers new insights into the formation of our own Solar System.



Located in the sky within a star-forming region in the constellation Taurus, the object, called TMR-1C, appears to lie at the end of a strange filament of light that suggests it has

apparently been flung away from the vicinity of a newly forming pair of binary stars.

At a distance of 450 light-years, the same distance as the newly formed stars, the candidate protoplanet would be ten thousand times less luminous than the Sun. If the object is a few hundred thousand years old, the same age as the newly formed star system which appears to have ejected it, then it is estimated to be 2-3 times the mass of Jupiter, the largest gas giant planet in our Solar System.

The candidate protoplanet is now 130 billion miles from the parent stars and predicted to be hurtling into interstellar space at speeds up to 20,000 miles per hour (10 kilometers/sec) -- destined to forever drift among the Milky Way's starry population.

Look... Goddard Has a New Homepage!

<http://www.gsfc.nasa.gov>



Goddard's homepage has a brand new look! This layout gives visitors a new and easier way to see the most recent news and images and allows for improved navigation. Take a peek and tell us what you think of the new homepage. Please send your comments to gsfcpaop@pop100.gsfc.nasa.gov

news highlights

Mark your calendars for June 15th, from noon to 1:30 p.m., in the Bldg. 8 Auditorium, to hear a special presentation about a CSRS employee opportunity to transfer to FERS. OPM Director, Janice Lachance, will offer introductory remarks. Senator Sarbanes and Congressman Hoyer are planning to kick off the event as well as other invited guests. This presentation will introduce sources of information for CSRS employees to make decisions. Open season for this will begin in July and last for six months.

STS-91 successfully launched on June 2 at approximately 6:10 p.m. EDT. This shuttle mission marks the final Shuttle/Mir Docking Mission. This Phase I Program is a precursor to the International Space Station maintaining a continuous American presence in space and developing the procedures and hardware required for an international partnership in space. Nine Goddard Get Away Special (GAS) and Space Experiment Module (SEM) payloads are flying on this mission. For more information on GAS or SEM, visit their respective homepages at

<http://sspp.gsfc.nasa.gov/gas/gas.html> and
<http://sspp.gsfc.nasa.gov/sem/sem.html>

Leviton Named Distinguished Young Engineer



Doug Leviton

Doug Leviton, an optical scientist in Goddard's Optics Branch, has been named Distinguished Young Engineer of Maryland for 1998, for his lead role in development of state-of-the-art optical filters for the HST Advanced Camera for Surveys and all-new methods for verifying filter performance.

Leviton (MS Physics from Georgia Tech) came to Goddard in 1983, supporting optical R&D for spaceborne instruments on numerous missions including COBE, SOHO, and each generation of HST. In 1988, he led development of GSFC's Diffraction Grating Evaluation Facility, enabling characterization and calibration of new technology flight optics, detectors, and even full-up instruments in the far ultraviolet.

Leviton has patented new technology, ultra-high sensitivity, optical encoders and authored over 30 technical papers on optical technology for space instrumentation, novel methods for measuring optical performance, and properties of optical materials.

Office of Space Science and Explorer Programs Host Pre-proposal Conference and Technology and Industry Showcase

By Lara Clemence, Office of Commercial Programs

Approximately 100 people attended NASA's MIDEX Pre-proposal Conference and Technology and Industry Showcase at the Washington, National Airport Hilton in Arlington, VA, last month. This conference was organized by the Office of Space Science (OSS), with Goddard's Explorer Project Office (Code 410) acting as lead for this first technology and industry showcase.

OSS announced the most recent opportunity in March, inviting proposals for the third and fourth Medium-class (MIDEX) missions and for participation in non-NASA space missions, identified in this announcement as Missions of Opportunity. MIDEX investigations are complete missions, launched on expendable launch vehicles or the Space Shuttle. Notices of intent are due in June, with proposals due in August. Depending on the availability of proposals of appropriate merit, NASA intends to select two MIDEX missions, one to launch by June 2003 and one to launch by June 2004.

The Technology Commercialization Office, Code 750, worked closely with Code 410 to attract Goddard and industry exhibitors to this event introducing prospective MIDEX participants to technologies potentially relevant to MIDEX missions and introducing potential industrial partners to Principal Investigators. A total of 23 organizations exhibited.

For additional information on this event, visit the Explorer Pre-proposal Conference web site at <http://explorer/larc.nasa.gov/explorer/ppconf.html>

Goddard Hosts Events For Small Businesses

By Nancy McLennan and Olivia Gunter

Goddard's Technology Commercialization Office recently sponsored the Center's first Small Business Innovation Research (SBIR) Technology Exhibit. This day-long event was held in conjunction with Goddard's Twenty-Fifth Annual Small and Small Disadvantaged Business Conference which provides counseling opportunities to small firms for doing business with Government and prime contractors.

The SBIR exhibit showcased R&D achievements by selected NASA SBIR companies currently doing business with Goddard. The exhibit provided these small businesses with a forum for pursuing additional opportunities with Goddard, other government agencies and private industry to commercially market their technologies.

Representatives from 18 companies shared information on technologies and innovations developed with funding from the NASA SBIR Program and exhibited 20 NASA/Goddard-developed SBIR technologies. Some of the technologies exhibited have been converted into commercial products, like



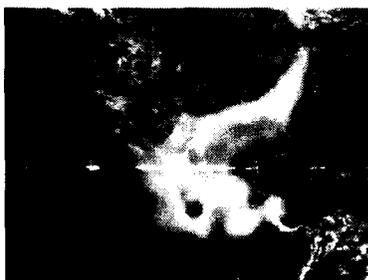
There Was A Good Turnout of Small Business Reps for the Small Business Conference and SBIR Exhibit as evidenced in the photo above

the QwikBoost™, developed by Mainstream Engineering, Rockledge, Fla., which increases performance of air conditioners, heat pumps, refrigerators and freezers.

Also showcased, was a web-based electronic handbook system that manages complex distributed information-intensive processes in an integrated and intuitive environment, developed by REI Systems, Inc., McLean, VA. This system supports the entire NASA SBIR/STTR proposal solicitation and evaluation processes.

On the day prior to the SBIR Exhibit and Small Business Conference, Goddard held its second annual science forum. This event provided a platform for senior agency officials to become aware of the presence of small businesses in critical technical areas. Five firms, including two NASA/Goddard SBIR companies, Composite Optics, Inc. and Illgen Simulation Technologies, Inc., presented their capabilities at this forum.

Smoke/Dust Over North America



Earth Probe Total Ozone Mapping Spectrometer (TOMS) has been detecting smoke from the fires in Central America, smoke from fires in Canada and dust/smoke from Asia over North America, using the TOMS aerosol index.

To the left is a detailed image from TOMS taken on May 16. The image shows the concentration of smoke and aerosol particles emitted from fires in Mexico.

You can view more images of all this activity at the following address: <http://wocky.gsfc.nasa.gov/mexico.html>

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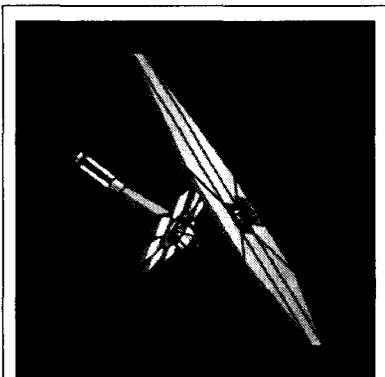
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Next Generation Space Telescope Finds a Home

By Bill Steigerwald, Office of Public Affairs



A Goddard-led team developed this design for the Next Generation Space Telescope

At a recent press conference, NASA Administrator Dan Goldin, announced that the duties of the Space Telescope Science Institute in Baltimore, MD, will be expanded to include the management of science operations for the Next Generation Space Telescope (NGST). Among those attending the press conference was Maryland Senator Barbara Mikulski.

The Space Telescope Science Institute, located at the Johns Hopkins University, has been operating the science program for the Hubble Space Telescope since 1983. "We looked through a microscope to decide who would operate the Next Generation Space Telescope," said Goldin. "NASA and the scientific community had to determine who had the right facilities, who had the right experience, who was the best. The clear choice was Baltimore's Space Telescope Science Institute."

NGST is one of the cornerstone missions of the Astronomical Search for Origins and Planetary Systems, one of the major thrusts of NASA's Space Science program. NGST will provide a critical follow-on to the Hubble Space Telescope, and continue to deliver world-class optical and infrared science well into the second decade of the new millennium.

A goal of the Next Generation Space Telescope is to observe the first stars and galaxies in the Universe to further our understanding of how it formed following the Big Bang. NGST will have capabilities currently unavailable in existing ground-based or space telescopes.

NGST studies are underway and NASA plans to start formal development of the program in 2003, with a projected launch in 2007. NGST has a planned operational lifetime of ten years. The Space Telescope Science Institute is currently operated by the Association of Universities for Research in Astronomy (AURA). For more information on NGST, visit the following url:

<http://www.ngst.nasa.gov>

Tech Showcase on the Hill

On June 10, Goddard participated in a special technology showcase held at the Rayburn Building on Capitol Hill.

In the photo to the left, *Eric Smith*, Next Generation Space Telescope Deputy Project



Scientist, explains the goals for the Next Generation Space Telescope to Congressman Dana Rorhabacher (far right).

Other Goddard exhibits at the showcase included the HST, NANOSAT, DAAC, visualization of earth science data and technologies transferred to industry.

News from the American Astronomical Society Meeting

During the recent National Meeting of the American Astronomical Society (AAS), held during the week of June 9-12, a team of astrophysicists have announced the development of a new theory to account for the source of heavy elements in cosmic rays, high-energy celestial particles that bombard the Earth with velocities near the speed of light. The team proposes that nuclei broken off from high velocity dust freshly formed in exploding stars, called supernovae, are accelerated by shock waves from the blast to become cosmic rays.

"We are currently testing our theory with measurements by cosmic ray detectors on board NASA's Advanced Composition Explorer (ACE) spacecraft," emphasized two of the team's members, *Reuven Ramaty* of Goddard and Richard Lingenfelter of the University of California, San Diego.

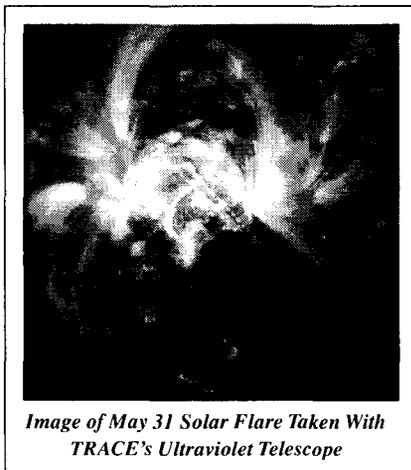


Image of May 31 Solar Flare Taken With TRACE's Ultraviolet Telescope

Also released at the AAS Meeting were images of a recent solar flare taken by the Transition Region and Coronal Explorer (TRACE) spacecraft. The flare, which was about 55,000 miles long, appeared and vanished in only a few minutes, demonstrating that large scale solar events can occur very rapidly.

TRACE, in its operations of the dynamic structure of the solar atmosphere, is operating in conjunction with the NASA/ESA Solar and Heliospheric Observatory spacecraft.

For more information, visit the Goddard Homepage at <http://www.gsfc.nasa.gov> and choose **HOT TOPICS**.

NEWS HIGHLIGHTS

SEAWINDS INSTRUMENT SHIPPED FOR INTEGRATION ON QUIKSCAT

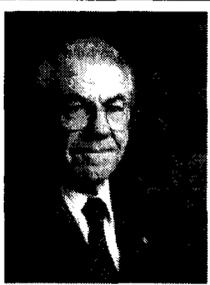
- A major milestone has been reached in NASA's development of "faster, better, cheaper" space missions with the delivery of the SeaWinds instrument. SeaWinds, NASA's next generation El Niño monitoring device that measures wind speed and direction over the world's oceans, was delivered to Ball Aerospace in Boulder, CO, for integration into the Quick Scatterometer (QuikSCAT) satellite.

NASA UNVEILS NEW INTERNET SITE FOR FIRE MONITORING BY SATELLITE

- In an effort to provide up-to-date information about current fire situations around the globe to the public and scientific communities, NASA has unveiled a new presence on the World Wide Web that provides an up-to-date synopsis of current information about fires and their effect on global climate change. This web site features revealing animation depicting wildfires across the globe. Visit the new web site at:

http://modarch.gsfc.nasa.gov/fire_atlas/fires.html

Scialdone Elected Fellow of Institute of Environmental Sciences & Technology



Dr. John Scialdone

Dr. John J. Scialdone recently received the award of Fellow of the IEST by the Institute of Environmental Sciences and Technology. This designation is awarded to employees of unusual professional distinction who have made substantial or vital contributions to the advancement of the environmental sciences and to IEST.

Dr. Scialdone, who has been at Goddard for 34 years, is the Group Leader of the Processes, Environments and Polymers Group of the Materials Engineering Branch (Code 541). In this capacity, he is responsible for coordinating the work of a number of professionals and technicians in the development and application of polymeric systems. He is an expert in the assessment of molecular and particulate contamination of spacecraft, the environment in space resulting from materials outgassing, particulate release, propulsion and venting, and the effects of these environments on spacecraft systems.

Hubble Engineering Competition Award Winners

On Saturday, June 6, Goddard sponsored a Hubble Space Telescope (HST) related engineering competition at the Howard B. Owens Science Center in Greenbelt. Local area middle schools participated in this event.

The winners of the competition are as follows: First Place - Takoma Park Middle School, Donna Mathews, teacher/coach; Second Place - G. Gardner Shugart, Eleanor Smith, teacher/coach; Third Place - Roberto Clemente Middle School. All team coaches received a plaque and each school received a plaque. The students and coaches were given lots of Hubble stuff. Congratulations!!!!

Building 21 Cafeteria Reopened

Goddard recently unveiled the new and improved building 21 cafeteria at a ribbon-cutting ceremony and a week-long grand-opening celebration of events. The ribbon cutters pictured below from left to right are: Tina Frizell Jenkins, Ted Mecum, Sherry Foster, Al Diaz, Marguerite Broadwell, Joan Weddekind and Tom Miller.



Employees may view photos of the construction process and the finished product at <http://internal.gsfc.nasa.gov/cafe/photos.html>, or stop in and see the new cafeteria for yourself.

Congratulations NASA Honor Award Recipients!

On June 16, Goddard will hold an awards ceremony to honor the Center's NASA Honor Award recipients. Individual awards and group achievement awards will be presented to the following employees:

Distinguished Service Medal

Dr. John H. Campbell/440; Dr. Thomas W. Flatley/572;
Dr. Robert D. Price/Posthumously

Distinguished Public Service Medal

Dr. Nobuyoshi Fugono/Tokai University; Donald A. Maclean/Boeing (Retired)

Outstanding Leadership Medal

Donald L. Margolies/410; Martin J. Donohoe/Retired;
Thomas A. LaVigna/490; Dr. Michael G. Ryschkewitsch/700 ;
James G. Watzin/730; Richard D. Barney/740; Dr. Joanne Simpson/900;
Dr. Charles R. McClain/971

Public Service Medal

Mary C. Chiu/Applied Physics Lab; Jose A. Gonzales/Dyncorp;
J. Crane Simmons/Boeing (Retired); Dr. Hervey S. Stockman/Space Telescope Science Institute

Exceptional Achievement Medal

Judith N. Bruner/100; Thomas Paprocki/201; W. James Adams/401.5;
Richard C. Tagler/450; M. Bruce Milam/470; Thomas E. Williams/490;
Bruce T. Pham/543; Giulio Rosanova/546; Daniel B. Worth/549.2;
Dr. Barry E. Jacobs/633; Dr. Randy A. Kimble/681; Dr. John E. Connerney/
695; Dr. Darrell F. Zimbelman/730; Dr. Gene Feldman/902;
Erich F. Stocker/902; Dr. John C. Gerlach/972

Exceptional Service Medal

Sandra A. Buffalano/113; Sandra K. Bowden/151.2; Michael A. Calabrese/
180; Valorie A. Burr/210; Mildred S. Garner/210; Phillip A. Holloway/
220; Pedro I. Colon/221; LuAnn M. Bindschadler/222; Andre D. Jackson/
222; Carlos Lopez/224.3; Richard I. Weiss/410 (Retired); Paula L. Wood/
408; John T. Langmead III/470; Abigail D. Harper/490; Dr. John H. Day,
Jr./500; Nancy B. Patton/500; Benjamin C. Harris, Sr./547.2; Charles A.
Renn, Jr./565; Martin E. Frederick/570; Dr. Richard R. Fisher/682;
Dr. Arthur I. Poland/682; Thomas Keating, Jr./730

Exceptional Scientific Achievement Medal

Dr. Bruce E. Woodgate/681

Exceptional Engineering Achievement Medal

John R. Kolasinski/565

Equal Employment Opportunity Medal

Dr. Theodore R. Gull/681

Meritorius Executive Service

Dr. Robert D. Price (Posthumously); Arthur F. Obenschain/423;
Dr. David E. Smith/920; Dr. James E. Hansen/940

Group Achievement Awards

Bowie State Outreach Team/100; Travel Services Source Evaluation Board (SEB)/200; 30-Day Spacecraft Team and Rapid Spacecraft Source Evaluation Board (SEB)/401; GOES-10 Solar Array Drive Award (SADA) Anomaly and Inverted Operation Group/415; Advanced Composition Explorer (ACE) Team/410; Tropical Rainfall Measuring Mission (TRMM) Team/490; Space Telescope Imaging Spectrograph (STIS) Development Team/681; Global Geospace Science (GGS) Investigations Team/695; Integrated Mission Design Center (IMDC) Development and Operations Team/704; Small Business Innovation Research (SBIR) Program Team/705; Cassini CIRS Instrument Development Team; Comet Hale-Bopp NASA Sounding Rocket Support Team; Wallops Mission 2000 Implementation Plan Development Team/800; Cassini Gas Chromatograph Mass Spectrometer (GHMS) and Ion and Neutral Mass Spectrometer (INMS) Experiment Team/915

Public Service Group Achievement Award

Ogden Logistics Services Mission Support Group/227.5; The Boeing Company - Space Transportation Division/470

Congratulations go out to each and every awardee for their achievements.

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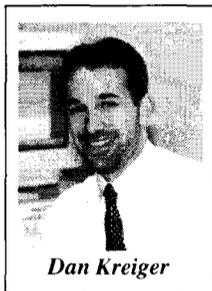
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Krieger Assigned As Special Assistant to the Center Director for Workforce Diversity

Dan Krieger, of the Equal Employment Opportunity (EEO) Programs Office, has been assigned to the Office of the Center Director for a one-year period as a Special Assistant, focusing primarily on issues of workforce diversity. In this capacity, he will be responsible for working with the results of the Goddard Organizational Survey to develop strategies and an action plan for workforce diversity. He will also be conducting benchmarking and an assessment of best practices of other organizations around workforce diversity, and will continue investigations of business implications for workforce diversity at Goddard. Dan began his NASA career in the Office of Human Resources in 1989 and has been with the EEO Office since 1990. Below, Dan responds to some questions concerning his appointment.



Dan Krieger

Why is this action needed? There is no question that Goddard is one of the premier research and development centers in the world. It's an exciting and great place to work. However, it is clear from employee feedback that steps need to be taken to improve the overall work environment. I was part of a task team consisting of members from the Goddard Multi-Cultural Advisory Team (MCAT) and Equal Opportunity Advisory Committees that recommended appointing someone full-time to focus on workforce diversity issues. This was consistent with Center Director Al Diaz's thinking as well, hence my current assignment.

How will your position affect employees at Goddard? Workforce diversity at Goddard is broadly defined, and includes age, gender, race/ethnicity, physical ability, and skill mix, to name several examples. If there are systems and practices that are intentionally or unintentionally prohibiting individuals from participating, there is a need to take corrective action.

Who is involved in this new position? I will report directly to the Center Director, but will be working very closely with the Center Multi-Cultural Advisory Team (MCAT), Equal Opportunity Programs Office, Office of Human Resources, Directors Of and the Project Goddard Leadership Team.

What is your anticipated goal? Quite simply, to make Goddard an even better place to work for everyone by capitalizing on employee diversity as an inherent strength. Based upon responses to parts of the Goddard Organizational Survey, it is clear that we can do better as a Center to ensure that the GSFC workforce is utilized to their fullest potential. Two of Goddard's strategic values are respect and teamwork. An effective workforce diversity program is critical to maintaining and enhancing those values.

All Systems Are "Go" on Backup Weather Satellite

By Cynthia O'Carroll, Office of Public Affairs

NASA and NOAA have recently announced that the nation's newest geostationary weather satellite, GOES-10, has successfully completed testing and is ready to replace one of the country's older weather satellites when needed. Images taken with the GOES satellites are best known to television viewers as the cloud images that are shown on weather forecasts.

GOES-10, which was launched in April 25, 1997, is currently stored in orbit, ready to replace GOES-8 or -9 when one of them fails. GOES-8 overlooks the east coast of North and South America, and well out into the Atlantic Ocean. GOES-9 overlooks the west coast and out into the Pacific Ocean, including Hawaii.

"Having a satellite to back up the GOES system is a major accomplishment," said Gerry Dittberner, NOAA's GOES program manager. "If one of the older GOES satellites fails, GOES-10 can be pressed into service without delay. Previously, if a satellite failed, we might have to wait months to replace it. With GOES-10 stored in orbit, we will be able to receive data within two days of activation."

For the past year GOES-10 has been tested by NASA, NOAA, and contract engineers. It experienced problems several months ago, and was inverted. It has been orbiting in the inverted mode since then, and all systems have been performing well.

NOAA's National Environmental Satellite, Data, and Information Service operates the GOES series of satellites at NOAA's Satellite Operations Control Center in Suitland, Md. Goddard manages the design, development, and launch of the GOES spacecraft for NOAA. Once a satellite is successfully checked out, NASA turns it over to NOAA for operations, including responsibility for command and control, data receipt, and product generation and distribution. NASA turned GOES-10 over to NOAA on June 5.

For more information on the GOES satellites, visit the following URL: <http://rsd.gsfc.nasa.gov/goesb/chesters/web/goesproject.html>

NASA Selects Seven Companies to Provide Information System Resources

NASA has selected seven companies to fulfill a multi-billion dollar contract that will apply a "faster, better, cheaper" approach to the way the Agency obtains desktop computers and local communications services.

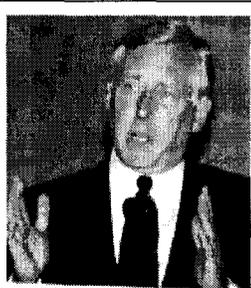
The contract, called the Outsourcing Desktop Initiative for NASA (ODIN), will deliver comprehensive desktop computer, server, and intra-center communications services to NASA and NASA contractors. Other government agencies will be able to buy from the ODIN contractors through the General Services Administration (GSA).

"ODIN provides the most cost effective solution to deliver these services to the Agency," said NASA Chief Information Officer Lee B. Holcomb. "This is probably the boldest move any federal agency has made in an effort to outsource computers."

Under the contract, NASA will define the computer and communications capabilities for each job within the Agency and purchase a particular bundle of hardware, software and communications equipment for each "seat." The price for each type of "seat" will be fixed.

For more information, visit the Goddard Homepage at <http://www.gsfc.nasa.gov> and choose **FLASH**

To Switch or Not to Switch



Congressman Steny Hoyer

Left: Congressman Steny Hoyer, in a special presentation to Goddard employees, talks about the upcoming opportunity for CSRS retirement employees to switch to the FERS system. Among others present at the discussion were Senator Paul Sarbanes and Janice Lachance, OPM Director, who spoke to employees about this important decision. For some helpful FERS links, go to the internal

homepage at <http://internal.gsfc.nasa.gov>

Science in the Air Waves

By Cindy Howell, Office of Public Affairs



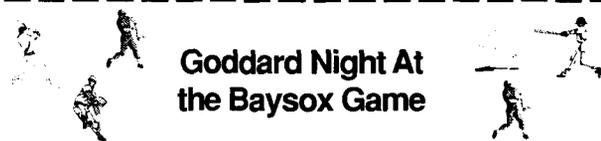
Ms. Beverly Wachtel

You may not have seen her work, but chances are you've heard it. Beverly Wachtel, a free-lance radio producer, is in residence at Goddard this summer under a special Director's Discretionary Fund Program. While she's here, she'll be keeping her ears open for interesting and topical stories to report on Earth System Science.

Once a day, more than half a million people in the US tune in to the Earth and Sky syndicated radio program to learn about the world and the universe around them. Beverly has produced more than 200 90-second radio programs for a weekly audience of more than 3.5 million listeners around the globe. The program tracks timely and topical research investigations, and uses the science news stories of the day as a jumping off point for promoting informal science education. These audio reports offer a window into the conduct of science, and are frequently used to illustrate the science in our every day lives from the unique perspectives of space and Earth studies. You can learn more about the program by visiting the following web site: <http://www.earthsky.com>.

During her stay Beverly plans to gather enough material for twenty 90-second programs on Earth Science topics to be aired over the next year. Sponsoring this radio intern program are *Jim Garvin*, *Claire Parkinson* and *Cindy Howell*.

So, stop for a minute to think about the interesting connections between Earth System Science research and the simple laws of nature we experience in our daily lives. How is studying the role of oceans in climate change by measuring sea surface temperature and CO₂ like the fizz from a cold can of Pepsi? What would Newton's apple look like if you exposed it to the hostile atmosphere of Mars? What does rainfall's influence on heat transport and global atmospheric circulation have in common with condensation on a glass of iced tea? And... hey, do you have an interesting Earth science story to tell? If so, pls. e-mail Cindy Howell at Cynthia.A.Howell.1@gssc.nasa.gov



Goddard Night At the Baysox Game

Bring your family and friends and join Center Director, *Al Diaz*, at the Bowie Baysox Game and a pre-game picnic on Friday, June 26. The picnic begins at 4:00 p.m. at the Goddard Rec. Center and ends promptly at 5:30 p.m. The game begins at 7:05 p.m. at the Baysox Stadium, off Route 301. Mr. Diaz will throw out the first pitch of the night. Tickets are available at the GEWA store and the prices are: children under 5 years are free, children 6-12 years old wearing a little league jersey (baseball, football, etc.) are free, children 6-12 without jersey, price is \$5.00 and 12 years old to adult are \$5.00. This price includes the picnic and game. Only 200 picnic/game tickets are available so hurry and purchase your ticket for an evening of fun for the entire family. If you prefer not to attend the picnic, tickets must be purchased directly through the Baysox Ticket Operations, 301/805-6000. Ticket pricing will be different. Goddard's group is requested to sit together on the 1st base side of General Admission (upper level orange seating).

High Quality Hurricane Wind Fields Obtained from New Rapid-Scan Satellite Movies

Wind-fields have been measured from satellite data for a strong hurricane with unprecedented resolution in time and space. These wind-fields, at high levels in the inner core, and at low levels inside the eye, allow the evolution of storm features to be observed.

Previously, winds in and near hurricanes have been determined by satellite and aircraft with much worse time and space resolution. With the advent of one-minute interval rapid scan movies, and big improvements in picture quality from NOAA's current generation of GOES weather satellites, scientists have a new capability to measure inner-core hurricane wind-fields near the top of the storm and within the eye. This enables small scale storm feature development to be inferred.

These measurements give insights into the general magnitude and structure of the hurricane vortex, along with exquisitely detailed measurements of the cloud-top wind's variations in response to thunderstorm-like outbursts in the eye wall. It is hoped that these

measurements will help us predict whether a hurricane will become stronger or weaker.

The source of data for this study is a unique time-lapse movie made from a nearly continuous twelve-hour sequence of one-minute interval pictures from NOAA GOES-9 on September 6, 1995. These pictures are centered on Hurricane Luis with maximum winds of 145 mph (Category 4) when it was 150 miles northeast of Puerto Rico.

The new techniques used to take advantage of the GOES satellite improvements are described in a paper authored by *Fritz Hasler*, *Kannappan Palaniappan*, *Eric Uhlhorn*, and *Dennis Chesters*. This paper will be published in the Bulletin of the American Meteorological Society

The authors of the paper would like to encourage the government to make this kind of data available for all storms. With this data available for many storms it is felt that scientists could understand hurricanes better and learn how to make better hurricane forecasts.

SEWP Computer Technology Seminar Series

HP: Charting the Future

As part of Goddard's SEWP Computer Technology Seminar Series, there will be a seminar on June 23 on the future of high performance computing particularly as it relates to 64-bit Intel-based systems. Come explore The Road to IA-64 Systems and discover the benefits of an integrated computing strategy. Industry experts from Hewlett-Packard and Intel will chart complete agency computing solutions that encompass today's business needs and provide a path to high performance computing environments into the next millennium. The sessions will be held in building 28, room E210 and are as follows:

- 8:15 - 8:45 Refreshments / Registration
- 8:45 - 9:15 Introductions / Charting Your Future
Ted Buis, Hewlett-Packard Company
- 9:15 - 10:00 The Unifying Architecture for Enterprise Computing
Rick Jones, Intel Corporation
- 10:00 - 10:15 Break
- 10:15 - 11:30 EPIC Technology Concepts
Michael Mahon, Hewlett-Packard Company
- 11:30 - 11:45 HP-UX Roadmap
Ted Buis, Hewlett-Packard Company
- 11:45 - 12:00 Wrap-Up / Q & A

For more information on the SEWP Seminar Series contact Joanne Woytek, at (301) 286-7695. The next seminar will be held in August.

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Hubble Space Telescope Helps Find Evidence That Neptune's Largest Moon is Warming Up

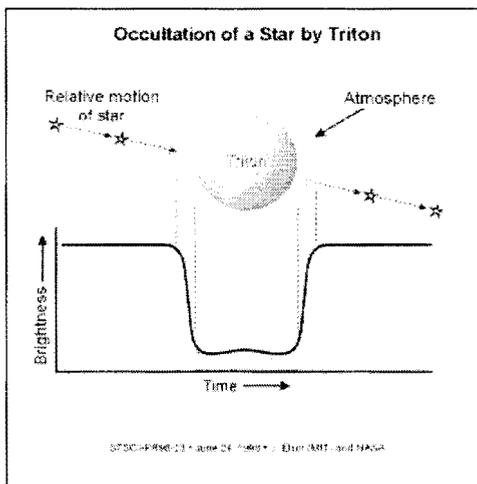
Observations obtained by NASA's Hubble Space Telescope and ground-based instruments reveal that Neptune's largest moon, Triton, seems to have heated up significantly since the Voyager spacecraft visited it in 1989. According to Jim Elliot, an astronomer at MIT, this warming trend is causing part of Triton's frozen nitrogen surface to turn into gas, thus making its thin atmosphere denser.

The temperature has risen from about -392 degrees Fahrenheit to about -389 degrees Fahrenheit. If Earth experienced a similar change in global temperature over a comparable period, it could lead to significant climatic changes.

Triton, with its thinner atmosphere, surface of frozen nitrogen and absence of oceans is a very different world from Earth. However, the two share some contributing factors to global warming, such as changes to the Sun's heat output, how much sunlight is absorbed and reflected by their surfaces and the amount of methane and carbon monoxide in the atmosphere. "With Triton, we can more easily study environmental changes because of its simple, thin atmosphere," Elliot explained. By studying

these changes on Triton, scientists hope to gain new insight into Earth's more complicated environment.

Scientists believe that Triton's warming



trend may be driven by seasonal changes in its polar ice caps. Triton is approaching an extreme southern summer, a season that occurs every few hundred years. During this time, the moon's southern hemisphere receives more direct sunlight, which heats the polar ice caps.

Scientists are basing a rise in Triton's surface temperature on the Hubble

telescope's detection of an increase in the moon's atmospheric pressure, which has at least doubled in bulk since the time of the Voyager encounter. Any nitrogen ice on Triton that warms up a little results in a considerable leap in atmospheric pressure as the vaporized nitrogen gas joins the atmosphere. Because of the unusually strong link between Triton's surface ice temperature and its atmospheric pressure, Scientists can infer a temperature rise of three degrees Fahrenheit over nine years.

Scientists used one of Hubble's three Fine Guidance Sensors (used to keep the telescope pointed at a celestial target by monitoring the brightness of guide stars) in November 1997 to measure Triton's atmospheric pressure. When Triton passed in front of a star known as "Tr180" in the constellation Sagittarius, the guidance sensor measured the star's gradual decrease in brightness as Triton passed in front of it. The starlight became fainter as it traveled through Triton's thicker atmosphere.

For more information, visit the Goddard Homepage at <http://www.gsfc.nasa.gov> and choose **Hot Topics**.

SOHO Spacecraft Observations Interrupted

By Bill Steigerwald, Office of Public Affairs

Ground controllers lost contact with the NASA/European Space Agency (ESA) Solar and Heliospheric Observatory (SOHO) spacecraft June 24 during maintenance operations when SOHO went into emergency sun reacquisition mode. This mode is activated when an anomaly occurs and the spacecraft loses its orientation toward the Sun. When this happens, the spacecraft automatically tries to point itself toward the Sun by firing its attitude control thrusters under the guidance of an onboard Sun sensor.

Efforts to re-establish contact with SOHO did not succeed and telemetry was lost. Subsequent attempts using the full NASA Deep Space Network capabilities have so far also not been successful. Engineers from NASA and ESA are attempting to reestablish contact with the spacecraft.

SOHO is a joint mission of the European Space Agency and NASA. It was launched aboard an Atlas IIAS rocket from Cape Canaveral Air Station, FL, on Dec. 2, 1995, and mission operations are directed from NASA's Goddard Space Flight Center, Greenbelt, Md.

In April 1998, SOHO successfully completed its nominal two-year mission to study the Sun's atmosphere, surface and interior. Major science highlights include the detection of rivers of plasma beneath the surface of the Sun; the discovery of a magnetic "carpet" on the solar surface, the Sun's outermost layer; the first detection of flare-induced solar quakes; the discovery of more than 50 sungrazing comets; the most detailed view to date of the solar atmosphere; and spectacular images and movies of coronal mass ejections. More information and images from SOHO can be found on the Internet at: <http://sohowww.nascom.nasa.gov/>

Institute Issues First Call for Proposals

By Nancy Neal, Office of Public Affairs

The NASA Institute for Advanced Concepts (NIAC) has issued its first Call for Proposals, seeking innovative ideas and concepts to tackle the most challenging technological issues facing aeronautics and space in the coming decades.

"The NIAC Science, Exploration and Technology Council and other members of the aerospace research community, along with NASA, formulated "Grand Challenges" which are designed to give guidance for revolutionary concepts to potential proposers," said Dr. Robert Cassanova, the Institute's director. "These concepts can be the framework for future NASA missions and programs. Although the challenges pertain to focused areas, they are not meant to be comprehensive," he added. "We are seeking concepts which stretch the imagination."

Some examples of these Grand Challenges are: solve the mysteries of the universe; search for life beyond Earth; develop revolutionary cost effective means for understanding the Earth system beyond the current capability; transport humans comfortably between habitats throughout our solar system; enable human settlement beyond Earth; expand the use of aviation; and revolutionize access to space.

The NIAC was formed for the explicit purpose of being an independent institute focused on the development of aeronautical and space concepts which could become NASA programs 10-40 years in the future. The Universities Space Research Association established the Institute in Atlanta, under a contract from NASA Headquarters through Goddard. For more details, visit the NIAC Homepage at: <http://www.niac.usra.edu>

The LISTS System: Critical for the Center's Operation

By Lois Ryno, Institutional Support Office

The Locator and Information Services Tracking System (LISTS) plays a vital role in keeping Center activities running smoothly. For example, GSFC telephone directory information is based on LISTS data. Also, the Automated System for Acquisition Processing (ASAP) pulls data from LISTS; if the LISTS data is inaccurate, supplies will be delivered to the wrong location. Mailing List and Label Subsystem (MLLS) uses LISTS data to generate mailing labels. Mail that has no mail code or an invalid mail code in the mailing address is diverted to the Mail Service Center (MSC) research section for reconciliation with LISTS. This diversion can often result in mail delivery delays of 4-5 days.

Because of the importance of LISTS, employees should notify their LISTS monitors whenever they change mail codes, telephone numbers, physical locations, etc. Never assume that your LISTS monitor is aware of every change that occurs or that the changes have been effected in LISTS.

Also, contact your LISTS monitor if:

- You are not getting telephone calls
- You always get someone else's telephone calls
- You are not receiving your mail
- You receive word that your mail is being returned to sender "addressee unknown"
- You have changed your place of residence

LISTS monitors can be found at <http://skynet.gsfc.nasa.gov/phonebook/LISTS.html> For the most current information on personnel, check the X.500 via Eudora (updated weekly), the on-line directory at <http://internal.gsfc.nasa.gov> or LISTS.

Help us to help you by submitting timely updates to your LISTS monitor. Direct questions to the LISTS Administrator at x6-2306.

Ask Us About the Upcoming ASK Program

By Bill Robinson Parks

Goddard's Visitor Center is sponsoring the 1998 AeroSpace for Kids (ASK) Program, a three-day summer program, for kids in grade groups 4th through 6th, and 7th through 9th. The program will be held at the Visitor Center. Each participant will attend one 3-day session conducted on Wednesday, Thursday, and Friday, from 10:00 a.m. to 4:00 p.m., starting July 8th with one grade group per week to August 14th. A brief essay expressing an interest in the space program, along with the application package, is required to be submitted on a first come basis.

Each session will cover the areas of Space Science, Earth Science, Technology, Communication(s), Spacecraft Design and Model Rocketry. There are no fees for the program. Accommodations will be made, upon request, for participants with disabilities.

For any additional information about the ASK Program please call (301) 286-8981, Monday through Friday, from 10:00 a.m. to 4:00 p.m.

Snow Reflections Used to Measure Density of Vegetation

By Lynn Chandler, Office of Public Affairs

When the ground is completely snow covered, surface reflectance can be used as a surrogate measure of vegetation-cover density. This is because the darker-colored vegetation typically consists of very dense spruce trees which obscure the view of the snow-covered ground below. Lighter-colored vegetation typically consists of less-dense stands of trees and/or shorter ground cover such as muskeg or tundra which allow much of the snow-covered ground below to be visible from space.

This relationship between vegetation density and reflectance, can be useful for determining the errors inherent in snow-cover mapping from space. Previous work has shown that the density of vegetation is more important than is the type of vegetation in influencing our ability to map snow cover from space.

In a recent study by *Dorothy Hall, Jim Foster, D.L. Verbyla,*

Andrew Klein, and C.S. Benson, a vegetation-density map, derived from reflectances measured by aircraft sensors, is compared with a carefully-mapped, independently-produced vegetation type and density map. These maps compare to within 13%. Snow cover was then mapped using a Moderate Resolution Imaging Spectroradiometer (MODIS) Airborne Simulator (MAS) image with the at-launch snow-mapping algorithm.

Results show that 99.33% of the snow cover in the less-dense vegetation (<50% density) category was mapped, and 97.73% of the snow cover was mapped in the denser vegetation category ("50% density). Errors in snow-cover mapping in different surface covers can thus be assessed by using satellite data to estimate vegetation-cover density from space.

What's Happening

(Right) Posing for the camera at the Asian-Indian-American luncheon last month, are *Harmohindar Singh*, President of Goddard's Asian-Indian Association, *Sherry Foster*, Director of Management Operations, and Center Director, *Al Diaz*. About 130 people attended this event which was held in honor of Asian/Pacific American Heritage Month.



(Left) Flanked by his father, Jim, and teacher, Christine Colli, Kevin Unterreiner, a 6th grader at Woodmore Elementary visits Goddard's SOHO Experiment Operations Facility. Kevin was a recent first place science fair winner both at his school and in Prince

George's County. For his project, he used SOHO images of sunspots available on the internet to determine the Sun's rotation. Also pictured in the photo is *Jim Gurman*, SOHO Project Scientist, who gave the tour. *Don Carson* of the Spartan Project, a friend of the Unterreiner's, arranged for Kevin's visit to Goddard.



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Engineers are concentrating on gaining a full understanding of the events which led to the loss of signal, information which might help them devise procedures which may recover contact with SOHO. Commands are being sent to SOHO about once per minute through the DSN's 34-meter antennas instructing the spacecraft to activate its transmitters.

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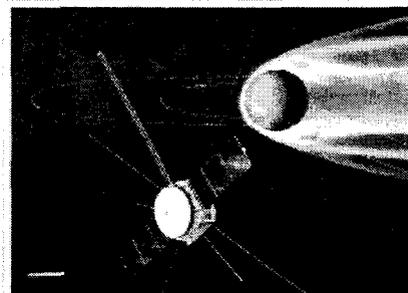
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Planet B to Launch on July 4 Carrying Goddard Neutral Mass Spectrometer

By Cynthia O'Carroll, Office of Public Affairs

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"The Neutral Mass Spectrometer will enable us to measure the chemical composition of the upper atmosphere of Mars on a global scale, which has never been done before," said Goddard's **Dr. Hasso B. Niemann**, the NMS principal investigator. Previous



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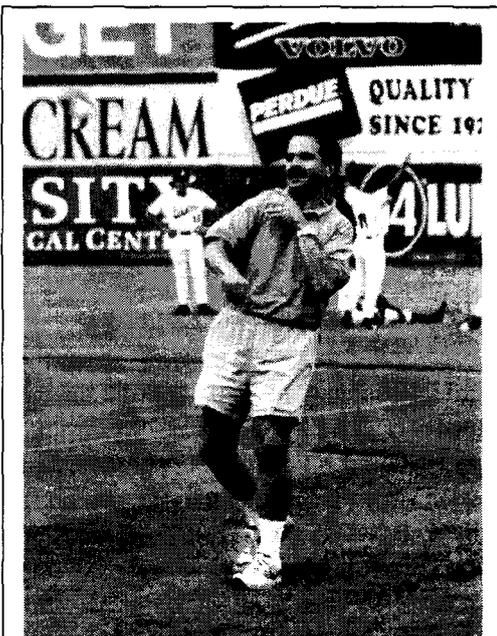
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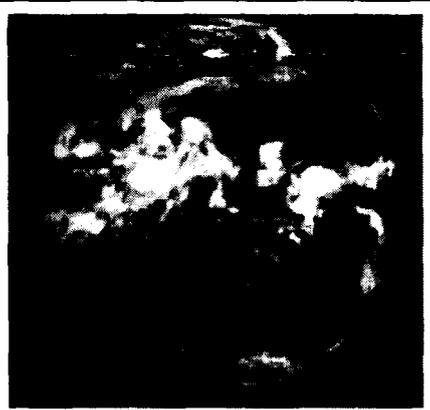
Goddard recently hosted a mathematics workshop in which seven coaches from the MATHCOUNTS Competition attended. The coaches were as follows: Claudia Allums, Louisiana; Joe Hay, Texas; Bob Fischer, Indiana; Sarah Manchester, Maryland; Rita Sheridan, Illinois; Alan Silverston, Michigan; and Rhonda Wagner, Colorado. During this workshop, Goddard scientists and engineers demonstrated state-of-the-art mathematics applications and aerospace education specialists presented mathematics-oriented activities.

MATHCOUNTS is a national math coaching and student competition program that promotes 7th and 8th grade math achievement in every state within the United States. It is designed to stimulate student interest in math by making math achievement exciting and challenging.

Each Fall, MATHCOUNTS distributes its free School Handbook and other coaching material to schools across the country. Using these materials, both teachers and volunteers coach the student 'mathletes.' After several months of coaching, the participating schools select four students to compete as teams and individuals in written and oral competitions. The students competed first in one of more than 500 local meets held in February. The winners of these local contests then progress to the state competitions in March. At the March event, the top four scorers in each state competition and the top coach earn an all-expense paid trip to Washington, DC to represent their state in the national finals in May. At all levels, the participating MATHCOUNTS students win prizes.

New Earth Science Exhibit Unveiled at National Air & Space Museum

On July 2, a new exhibit featuring 10-foot high images of Earth opened at the Smithsonian National Air and Space Museum. This exhibit, called "Earth Today" will provide a digital view of our dynamic planet to the museum's visitors, giving them some of the latest information on Earth's atmosphere, geosphere, hydrosphere and biosphere. This project was developed with cutting-edge technology in science visualization and information technology by Goddard's Science Visualization Studio through funding from the Goddard Director's Discretionary Fund.



Earth Today visitors are greeted by the familiar voice of James Earl Jones as he takes visitors on a 7-minute tour of our dynamic planet

Earth science data collected by a variety of satellites and Earth-monitoring networks will be sent to the museum and shown on a screen at high-resolution. "Earth Today" will provide a rotating image of the entire earth and six separate sets of data collected in near real-time. These data sets, some of which will be updated several times each day, include: sea surface temperatures & sea surface temperature anomalies (El Niño), global cloud cover, global atmospheric water vapor, global biosphere and earthquake locations.

For more information, visit the SVS Homepage at <http://outside.gsfc.nasa.gov/SAVB/SVS/Gallery> or the Earth Today Homepage at <http://www.nasm.si.edu/earthtoday/planet.htm>

STS-95 Crew Visits Goddard in Preparation for Shuttle Mission



STS-95 Mission Specialist, Pedro Dugue

Pictured above is STS-95 Mission Specialist, Pedro Dugue, with the International Extreme Ultraviolet Hitchhiker (IEH) payload that will fly on STS-95 this fall.

As part of a process to familiarize crew members with the requirements of the upcoming mission, the STS-95 crew recently visited Goddard where they observed some classroom demonstrations and examined the payloads to fly on the mission. Besides the IEH, the mission will carry the HOST instrument (HST Orbital Systems Test), the Spartan 201, the Cryo ISU and various GasCan experiments.

For the latest information concerning Center events, new and helpful websites and announcements, visit your employee homepage at <http://internal.gsfc.nasa.gov>

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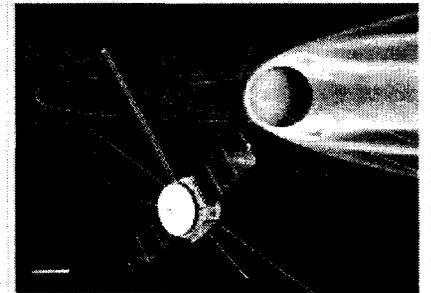
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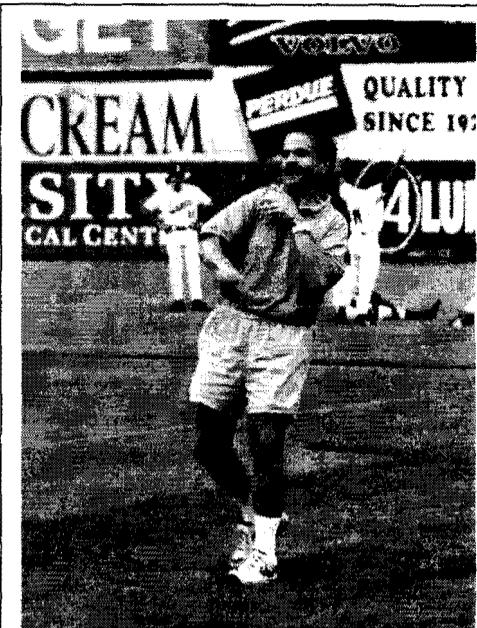
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By Nancy Neal, Office of Public Affairs

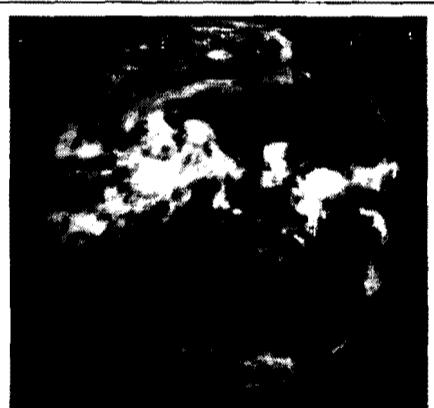
Goddard recently hosted a mathematics workshop in which seven coaches from the MATHCOUNTS Competition attended. The coaches were as follows: Claudia Allums, Louisiana; Joe Hay, Texas; Bob Fischer, Indiana; Sarah Manchester, Maryland; Rita Sheridan, Illinois; Alan Silverston, Michigan; and Rhonda Wagner, Colorado. During this workshop, Goddard scientists and engineers demonstrated state-of-the-art mathematics applications and aerospace education specialists presented mathematics-oriented activities.

MATHCOUNTS is a national math coaching and student competition program that promotes 7th and 8th grade math achievement in every state within the United States. It is designed to stimulate student interest in math by making math achievement exciting and challenging.

Each Fall, MATHCOUNTS distributes its free School Handbook and other coaching material to schools across the country. Using these materials, both teachers and volunteers coach the student 'mathletes.' After several months of coaching, the participating schools select four students to compete as teams and individuals in written and oral competitions. The students competed first in one of more than 500 local meets held in February. The winners of these local contests then progress to the state competitions in March. At the March event, the top four scorers in each state competition and the top coach earn an all-expense paid trip to Washington, DC to represent their state in the national finals in May. At all levels, the participating MATHCOUNTS students win prizes.

New Earth Science Exhibit Unveiled at National Air & Space Museum

On July 2, a new exhibit featuring 10-foot high images of Earth opened at the Smithsonian National Air and Space Museum. This exhibit, called "Earth Today" will provide a digital view of our dynamic planet to the museum's visitors, giving them some of the latest information on Earth's atmosphere, geosphere, hydrosphere and biosphere. This project was developed with cutting-edge technology in science visualization and information technology by Goddard's Science Visualization Studio through funding from the Goddard Director's Discretionary Fund.



Earth Today visitors are greeted by the familiar voice of James Earl Jones as he takes visitors on a 7-minute tour of our dynamic planet

Earth science data collected by a variety of satellites and Earth-monitoring networks will be sent to the museum and shown on a screen at high-resolution. "Earth Today" will provide a rotating image of the entire earth and six separate sets of data collected in near real-time. These data sets, some of which will be updated several times each day, include: sea surface temperatures & sea surface temperature anomalies (El Niño), global cloud cover, global atmospheric water vapor, global biosphere and earthquake locations.

For more information, visit the SVS Homepage at: <http://outside.gsfc.nasa.gov/SAVB/SVS/Gallery> or the Earth Today Homepage at <http://www.nasm.si.edu/earthtoday/planet.htm>

STS-95 Crew Visits Goddard in Preparation for Shuttle Mission



STS-95 Mission Specialist, Pedro Dugue

Pictured above is STS-95 Mission Specialist, Pedro Dugue, with the International Extreme Ultraviolet Hitchhiker (IEH) payload that will fly on STS-95 this fall.

As part of a process to familiarize crew members with the requirements of the upcoming mission, the STS-95 crew recently visited Goddard where they observed some classroom demonstrations and examined the payloads to fly on the mission. Besides the IEH, the mission will carry the HOST instrument (HST Orbital Systems Test), the Spartan 201, the Cryo ISU and various GasCan experiments.

For the latest information concerning Center events, new and helpful websites and announcements, visit your employee homepage at <http://internal.gsfc.nasa.gov>

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