



National Aeronautics and  
Space Administration  
Goddard Space Flight Center

# GODDARD NEWS

Greenbelt, Maryland/Wallops Island, Virginia

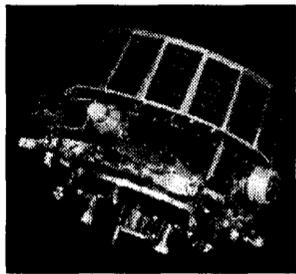
Dec. 1997 Vol. 1 No. 31

The Goddard News is published weekly by the Office of Public Affairs, Goddard Space Flight Center, Greenbelt, MD 20771

## Equator-S Spacecraft Takes Off

By Deanna Adams, Office of Public Affairs

The Equator-S spacecraft launched successfully on December 2 from Kourou, French Guyana on board an Ariane IV launch vehicle. Equator-S is a low-cost, joint mission between NASA, the Max-Planck Institute for Extraterrestrial Physics (MPE) in Munich, Germany, and the German Aerospace Agency (DLR). Equator-S, consisting of a simple spacecraft design combined with a payload of advanced instruments, will orbit Earth along the equator. The spacecraft will serve as a complement and enhancement to the International Terrestrial Solar Physics (ISTP) Program by providing scientific measurements of the Earth's equatorial magnetosphere, out to distances of 6500 km.



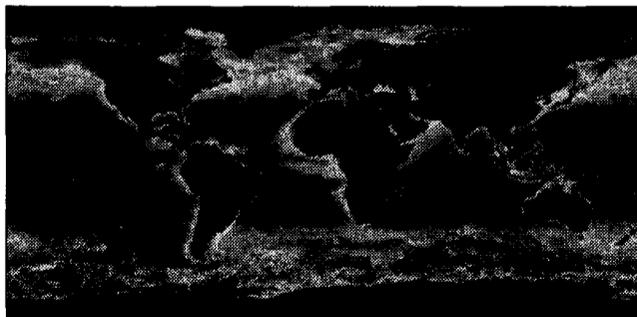
The Equator-S Spacecraft

Equator-S, a two-year mission, was developed and built by MPE with Goddard responsible for managing the development of the following instruments: the Apogee kick motor; the 3D Plasma Instrument, built by the University of Washington; the Time-of-Flight component for the Ion Composition Instrument and the Gun Detector Units for the Electron Drift Instrument, both provided by the University of New Hampshire (UNH). For more information, visit the Equator-S homepage at the following URL: [http://www.mpe-garching.mpg.de/EQS/eqs\\_home.html](http://www.mpe-garching.mpg.de/EQS/eqs_home.html)

## SeaWiFS/CZCS Comparison Images

Pictured below are the first global comparisons between the first Coastal Zone Color Scanner (CZCS) derived phytoplankton pigment concentrations as averaged over the life of the mission and the first months of SeaWiFS data. To view these images in color go to the Pick of the Week Homepage at:

<http://pao.gsfc.nasa.gov/gsf/weekly/weekly.htm> or visit the SeaWiFS Homepage at <http://seawifs.gsfc.nasa.gov/>



Coastal Zone Color Scanner (November 1978 - June 1986)



SeaWiFS (September 4 - November 20, 1997)

## STS-87 Hitchhiker Status

By Nancy Neal, Office of Public Affairs

Goddard's two Hitchhiker payloads aboard STS-87 have been performing well, according to Goddard managers responsible for the payloads. **SOLSE, the Shuttle Ozone Limb Sounding Experiment**, was designed to demonstrate that vertical profiles of ozone can be measured with high resolution from solar ultraviolet (UV) scattering from the Earth's atmospheric limb. **LORE, the Limb Ozone Retrieval Experiment**, is a complementary instrument to SOLSE. It will demonstrate that vertical profiles of ozone can be measured using sunlight. Continual health checks show that the secondary instruments are performing well. According to **Tammy Brown**, the SOLSE payload manager, "Everything has worked according to the timeline and looks great." Downlinked data has been analyzed and the results show normal instrument performance with respect to wavelength registration and sensitivity. Currently, scientists are analyzing data received from the Earth's atmospheric limb. The data should verify the performance of the two primary instruments and that they are performing as expected and designed. Also, it will indicate if the mission has accomplished its minimum science requirements.

The **Loop Heat Pipe (LHP)** and the **Sodium Sulfur Battery Experiment (NASBE)** are "both performing superbly" said **Dr. Ruthan Lewis**, the mission manager. LHP is investigating a unique thermal energy management system using a loop heat pipe. The experiment has completed five of the planned six tests. Additionally, seven unplanned tests were successfully performed on the experiment. To date, approximately 80% of the minimum science objectives have been accomplished. NASBE which is studying the microgravity operation of sodium and sulfur liquid electrodes has currently completed 90% of the experiment's objectives.

With the shuttle landing scheduled for Dec. 5 at 7:19 a.m. EST, it looks like STS-87 will be another successful mission for Goddard's Hitchhiker team.

## Update on TRMM

By Allen Kenitzer, Office of Public Affairs



Operations continue to go according to plan and no problems are reported as the Tropical Rainfall Measuring Mission (TRMM) completes its first week on-orbit.

"The observatory has been operating extremely well," said **Tom LaVigna**, TRMM project manager. "All data indicate we have a very healthy spacecraft. We already have received our initial TRMM Microwave Imager (TMI) instrument data and it looks good."

On Tuesday, Dec. 2, the last instrument to be turned on, CERES, was activated and checkout is continuing. On Wednesday, Dec. 3, the first of several orbit adjust maneuvers was performed as controllers fired the propulsion thrusters. These decent maneuvers will last through Monday, Dec. 8 and culminate with TRMM arriving at a circular orbit of 217 miles (350 kilometers).

Many thanks go out to all the Goddard employees who worked hard on Thanksgiving Day to make the TRMM launch a success. To keep abreast of TRMM activities, go to the TRMM homepage at: <http://trmm.gsfc.nasa.gov>

## Remembering A Friend

On Tuesday, November 25, friends and family of Rosalee Price gathered together outside of Building 8 to honor her memory with a tree dedication. Rosalee,



a Resource Analyst with the Hubble Space Telescope Project, passed away in August after a yearlong battle with cancer. Rosalee's friends and colleagues

donated money to purchase two Wye Oaks, Maryland's official state tree, two benches and a plaque. The inscription on the plaque reads "Friendship is a Sheltering Tree. In memory of Rosalee Price, a True Friend."

## Give A Sick Child A Bear Hug

The American Red Cross will accept blood donations in the building 8 auditorium on Dec. 10, from 8:30 a.m. to 2:15 p.m. To schedule a donation appointment, please call Janice Gelder on x6-5025 by the COB on Tuesday, Dec. 9. **Note: This is a change in the normal schedule of the first Wednesday every other month due to scheduling conflicts.**

For each donation the American Red Cross receives during the holidays they will give a hospitalized child a plush teddy bear along with a personal note from you. The donation process takes approximately one hour. Any healthy person at least 17 years of age and 110 lbs. can donate every eight weeks. The process of giving blood is always under the supervision of a Medical Unit Supervisor. The procedure includes a medical check, actual donation and some time for relaxation and refreshments. Please be sure to get sufficient rest the night before and eat a well balanced breakfast and lunch the day you donate. Your blood donation will give a bear hug to a sick child this holiday season!

### ALERT - BUILDING 21 CAFETERIA RENOVATION

Effective Monday, December 22, 1997, the Building 21 Cafeteria will be closed for approximately 4 months for renovation. The Rec Center will open for lunch during the Cafeteria 21 renovation, beginning on Monday, January 5, 1998, with a new upscale menu that hopefully is pleasing to everyone. Hours of operation at the Rec Center will be from 11:30 a.m. to 1:30 p.m. Between Monday December 22 and Friday, January 2, 1998 - Building 1 Cafeteria and the Mobile Catering Truck, will be available to meet your food service needs. For details, check the internal homepage at <http://internal.gsfc.nasa.gov>

### Extra Christmas Holiday!

President Clinton has officially designated December 26 as a paid holiday for federal workers. **NOTE:** Employees who have scheduled use or lose annual leave for that day need to use the leave by January 3, 1998

# EMPLOYEE achievements

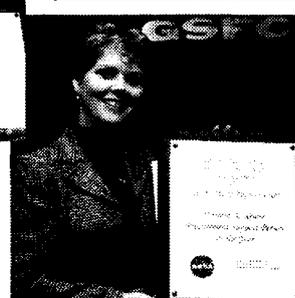
By Deanna Adams, Office of Public Affairs

NASA recently honored some of Goddard's own by choosing three out of seven Goddard nominees to receive FY 1997 Procurement Awards.

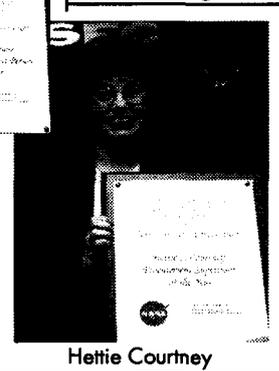
**Ms. Adrian Jefferson** received **Grant Specialist of the Year** for playing a key role in reengineering the Grants office procedures to include the administration of NASA Headquarters grants and also for overseeing the high volume of grants that Goddard awards. **Ms. Theresa Keane** was awarded **Procurement Support Person of the Year** in recognition of her outstanding efforts in



Adrian Jefferson



Theresa Keane



Hettie Courtney

supporting Goddard's Electronic Commerce Team (ECT) and in leading the IFMP procurement team. Also, **Ms. Hettie Courtney** received the **Procurement Supervisor of the Year Award**. This award recognized her outstanding performance during her rotational assignment as Manager of the Earth Science Procurement Office.

In addition, Goddard also recognized each of its seven nominees at a special ceremony on November 24. The remaining nominees were: **Tammy Seidel**, **Contract Specialist of the Year**; **Genia Lyons-Kess**, **Small Purchases Specialist of the Year**; **Sherry Pollock**, **Procurement Analyst of the Year**; and **Corinne Sisneros**, **Contract Manager of the Year**.

Congratulations go out to all seven employees for their nominations and awards and many thanks for everyone's hard work. Goddard is extremely proud of everyone's accomplishments along with the fact that three of the Agency's eight award recipients were Goddard's own. Way to go, Goddard Procurement!!!

Clip-n-Save

Clip-n-Save

Clip-n-Save

### December Calendar of Events

- Engineering Colloquium - Brenda Forman "Space & Virtual Classroom" (3:30 p.m. bldg. 3 aud.) Dec. 8
- Center Director's Colloquia - Dr. Malcolm Longair "Exploring the Universe from Space - Astronomy of the 21st Century" (10:00 a.m. - bldg. 3 aud.) Dec. 9
- Scientific Colloquia - Robert Curl (3:30 p.m. bldg. 3 aud.) "The fullerenes: Discovery and Beyond" Dec. 12
- GSFC Chili Cook-off (Rec. Ctr. 3:30 p.m.) Dec. 12
- Engineering Colloquium - Arthur Moletta "Promoting Creativity - The Independent Inventor" (3:30 p.m. bldg. 3 aud.) Dec. 15

### staff

Executive Editor: Darlene Ahat  
 Managing Editor: Deanna Adams  
 Senior Photographer: Mark DeBora  
 Guest Photographers: Jane Love, Debbie McCauley  
 Submission deadline is Friday each week (submissions subject to editing)  
 For additional information contact Deanna Adams 301•286•0918

Subscription Information:  
 GSFC & WFF Mailing List  
 Offsite/Commercial Subscriptions  
 Retiree Subscriptions

Contact:  
 Gwany Durrah, Code 239  
 Darlene Ahat, Code 130  
 Bob Wilson 301•422•8334



National Aeronautics and  
Space Administration  
Goddard Space Flight Center

# GODDARD news

Greenbelt, Maryland/Wallops Island, Virginia

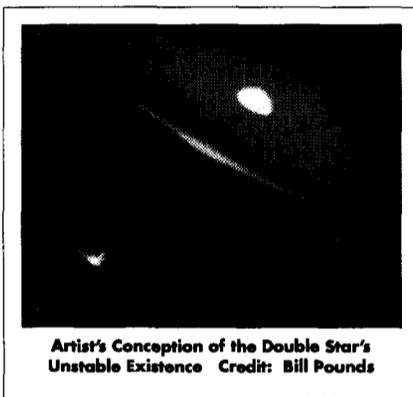
Dec. 1997 Vol. 1 No. 32

The Goddard News is published weekly by the Office of Public Affairs, Goddard Space Flight Center, Greenbelt, MD 20771

## One Star's Loss Is Another's Gain: Hubble Captures Brief Moment In Life of Lively Duo

By Tammy Jones, Office of Public Affairs

Some stars in double-star systems have found a quick way to lose weight by dumping their extra pounds onto their companions. Astronomers using NASA's Hubble Space Telescope have discovered such a case in the double-star system, Phi Persei. A "rapid diet" program has trimmed an aging, once massive star to a lean one-solar mass, while the once mild-mannered, moderate-sized companion has bulked up to a hefty nine-solar masses and is spinning so violently that it's flinging gas from its surface. This



Artist's Conception of the Double Star's  
Unstable Existence Credit: Bill Pounds

observation has allowed astronomers to catch a glimpse of an unusual, fleeting moment in the life of a massive star in a double-star system. After consuming most of its hydrogen, the aging star in the Phi Persei system swelled up and began jettisoning its mass until only its bare core was left.

The companion star cannibalized the discarded material, thereby increasing in size.

Douglas Gies of the Center for High Angular Resolution Astronomy at Georgia State University, Atlanta, calls the stripped-down star a subdwarf, a type of aging star that has passed the expansion phase — by swelling and puffing away its outer layers — and is on its way to becoming a fading white dwarf. Yet this aging, stripped-down star, which has the same mass as the Sun, is nine times hotter than the Sun at 95,000 degrees Fahrenheit and is very bright. If placed at the Sun's distance, it would appear 200 times brighter than the Sun. However, the beefed-up companion is ten times brighter in visible light than the subdwarf, which is lost in its glare, eluding detection for many years.

The Hubble data created a better picture of life in this double-star system, especially how the beefed-up companion gained its extra mass.

## AGU Meeting Gives Unique Insights About Planet Earth

By Deanna Adams, Office of Public Affairs

The 1997 Fall American Geophysical Union (AGU) Meeting was held in San Francisco during the week of December 8. This meeting provided an opportunity for Goddard scientists to present unique findings in the area of Earth sciences with a broad expanse of topics covered. A small sample of the speakers and subjects included the following: **Dr. Ebby Anyamba** - global climatic conditions observed during the current El Niño; **Dr. David E. Smith** - the Mars Global Surveyor's Mars Orbiting Laser Altimeter's (MOLA) test and calibration phase; **Dr. James Hansen** - climate change and global warming; **Dr. Jay Zwally** - the Greenland ice sheet measurements by satellite altimetry; **Dr. Arlin Krueger** - detecting volcanic ash in the wind to prevent damage to aircraft; and **Dr. Jay Herman** - observations of global distribution of aerosols by the Total Ozone Mapping Spectrometer (TOMS).

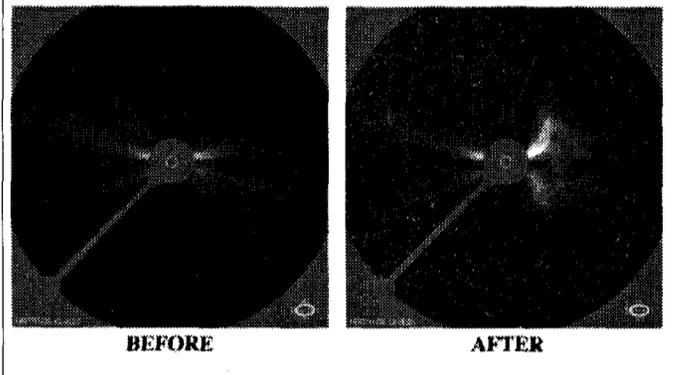
## Scientists Find the Energy That Powers Explosive Coronal Mass Ejections

By Bill Steigerwald, Office of Public Affairs

Using spacecraft and supercomputers, scientists from the International Solar Terrestrial Physics (ISTP) program have developed a new theory for the explosive, high velocity coronal mass ejections (CMEs) that will erupt from the Sun with increasing frequency during the maximum of the new solar cycle. CMEs are eruptions of electrically charged gas from the Sun that can trigger magnetic storms with the potential to disturb spacecraft, navigation and communications systems, and electric power grids.

Coronal mass ejections are the largest structures to erupt from the Sun. Most CME's travel at speeds of 250 miles per second, but

These images depict the corona of the Sun just before and after the release of a fast coronal mass ejection



some may travel so fast that they accelerate atomic particles called protons to the point where they can harm spacecraft. CMEs also produce magnetic clouds that can cause geomagnetic storms and increase the intensity of auroras.

Inspired by CME images collected by the Large Angle Spectrometric Coronagraph on the SOHO spacecraft, Dr. Spiro Antiochos of the U.S. Naval Research Laboratory in Washington, DC, has proposed a new answer to the long-standing question of how the Sun can build up the energy to produce the violent explosions of fast CMEs. Using supercomputers from NASA and the Department of Defense, Antiochos has created a model that simulates the complex, interwoven magnetic structures of the Sun. After observing how magnetic fields abut and interact, Antiochos theorizes that the Sun's magnetic fields tend to restrain each other and force the buildup of tremendous energy. Eventually, through a process known as "magnetic reconnection," where opposing magnetic lines of force merge and cancel, the field is released from its bonds and escapes the Sun at high speed.

## news tidbits

- The Tropical Rainfall Measuring Mission (TRMM) operations continue to go according to plan with no problems reported. All instruments have been turned on and release of the first engineering data is anticipated to occur next week.
- NASA is leading an interagency effort to verify the existence of small water-bearing comets that have been reported by scientists based on data from Goddard's Polar spacecraft.
- NASA's Total Ozone Mapping Spectrometer (TOMS) instrument has been moved to a higher orbit to help scientists monitor ozone globally and to extend the life of the spacecraft until the launch of a replacement TOMS instrument in the year 2000.

To read about these and other exciting stories go to the Goddard Homepage at <http://www.gsfc.nasa.gov> and choose FLASH

## Goddard Scientist Receives Award for Achievements In Remote Sensing Field

By Cynthia O'Carroll, Office of Public Affairs

Dr. Compton J. Tucker, a research scientist in Goddard's Laboratory for Terrestrial Physics, has been awarded the 1997 William T. Pecora Award for his achievements in the field of remote sensing. This award, sponsored jointly by the Department of Interior and NASA, is presented annually to recognize the outstanding contributions of individuals or groups toward the understanding of the Earth by means of remote sensing. The award was established in 1974 to honor the memory of Dr. William T. Pecora, a former director of the U.S. Geological Survey. Dr. Tucker received the award at the Landsat 25th anniversary celebration held at the National Air and Space Museum on Dec. 4.

Tucker is honored specifically for his outstanding leadership in the use of remotely sensed data for ecology, and in recognition of his pioneering applications of meteorological satellite data to study global vegetation dynamics. He has provided sustained, innovative leadership in the study of the Earth's vegetation from space, and his research has focused international attention on global environmental change phenomena.

Tucker began his career at Goddard in 1975 as a National Research Council post-doctoral fellow and subsequently joined NASA in 1977. He has specialized in using satellite observations to study the Earth's vegetation, including the carbon cycle, tropical deforestation and desertification. Some areas of recent and continuing work include quantifying expansion and contraction of the major deserts of Africa and Asia, determining tropical deforestation and habitat fragmentation in the Amazon Forest of South America, and investigating increased length of the growing season at higher northern latitudes.

In addition to this most recent achievement, Tucker received the NASA Exceptional Scientific Achievement Medal in 1986 for his work using satellite data to study Earth's vegetation. In 1992, Tucker was awarded the Henry Shaw medal from the Missouri Botanical Gardens for his contribution to the plant sciences using satellite data. In 1993, he was awarded the National Air and Space Museum Trophy for current achievement, and in 1996, he was awarded the William Nordberg Award for Earth Science. He is the author of more than 80 scientific and technical publications and has been a Goddard Senior Fellow since 1988.

## NASA Plays Large Role in American Indian Science and Engineering Society (AISES) Conference

The American Indian Science and Engineering Society (AISES), the largest technical organization serving American Indian students and professionals, recently held its annual conference in Houston, Texas. Over 2000 American Indian students from around the country participated. NASA was a major sponsor of the conference and 35 employees from across the agency attended. **Dan Krieger** from the Goddard EEO Office presented internship opportunities at GSFC and **Blanche Meeson** from the Global Change Data Center, Code 902 discussed NASA's Earth Science Program functions and goals. The keynote speaker was Astronaut Candidate John Herrington, the Agency's first Native American astronaut candidate, who gave a moving account of his path to becoming an astronaut.

## People have TALL Opinions of NASA

Dear Goddard Flight Center,
When I grow-up I want to work there.
I am in 5 <sup>th</sup> grade and I like space
alot. I am a girl and have blond
hair. Space is neat and all wase is
something to find.
.
.
.
Thank you,
Marcella B.

## Applicants Sought For Galileo "Ambassador to Jupiter" Program

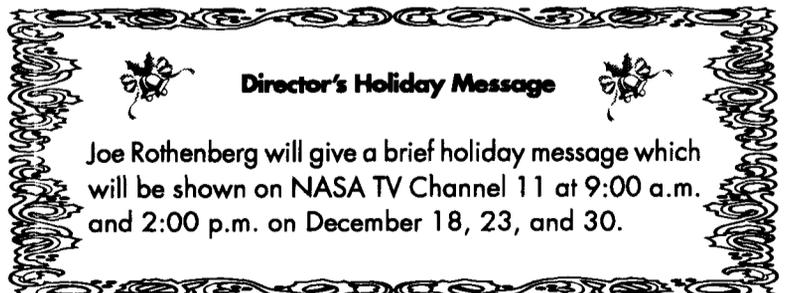
By Robert Gabrys, Office of Public Affairs

Project Galileo is seeking applications from candidates for the 1998 term of the Educational Ambassador to Jupiter Program for kindergarten through grade 12 educators in the US. The role of the educational ambassadors will be to inform their local communities about what's happening with the Galileo mission and the fascinating findings from our tour of the Jovian system.

Two educators from each state in the US will be selected by Project Galileo to be the local representatives for the program. There are currently 41 Ambassadors from 27 different states who are already underway with their great plans and presentations in their communities. Applications are still being sought from all 50 states, so you are encouraged to apply.

In return for their proactive public education about the Galileo mission and its stunning results from Jupiter's system, each ambassador will receive bimonthly direct mailings of the latest Galileo public and educational outreach products (videos, posters, postcards, brochures, slide sets, and educator guides). The term for the ambassadors will be February through December 1998, with renewal possible for the extended Galileo mission.

Applicants must have electronic mail access to participate since all correspondence will be handled through this means, including applications for the program. To obtain an application form, send an e-mail message to [ambassadors@galileo.jpl.nasa.gov](mailto:ambassadors@galileo.jpl.nasa.gov) and in the body of the message specify the following: "Please send Ambassador to Jupiter application form." Instructions on how to apply are included with the application. The application deadline is January 19, 1998. For more information, visit the Galileo Home Page at <http://www.jpl.nasa.gov/galileo>



### staff

Executive Editor: Darlene Ahalt  
Managing Editor: Deanna Adams  
Senior Photographer: Mark DeBord  
Submission deadline is Friday each week  
(submissions subject to editing)  
For additional information contact:  
Deanna Adams 301•286•0918

Subscription Information:  
GSFC & WFF Mailing List  
Offsite/Commercial Subscriptions  
Retiree Subscriptions

Contact:  
Gwene Durrant, Code 239  
Darlene Ahalt, Code 130  
Bob Wilson 301•422•8334



National Aeronautics and  
Space Administration  
Goddard Space Flight Center

# GODDARD NEWS

Greenbelt, Maryland/Wallops Island, Virginia

Dec. 1997 Vol. 1 No. 33

The Goddard News is published weekly by the Office of Public Affairs, Goddard Space Flight Center, Greenbelt, MD 20771

## Santa Going High Tech?

By Keith Koehler, Office of Public Affairs

The big guy at the North Pole is completing preparations for his annual journey visiting children around the world and rumor has it that he has customized his sleigh using NASA and industry developed technologies.

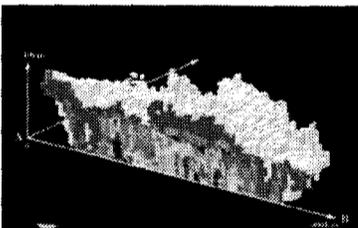
Good old Saint Nick has integrated several safety and communication features that will greatly enhance his ability to maintain a schedule so he'll complete his rounds in one night.

With the increase in air traffic around large cities, he has installed a collision avoidance system to detect and warn of nearby aircraft. Windshear and thunderstorm detection systems will enable him to steer clear of inclement weather.

For those foggy destinations, he has installed a low visibility approach and landing system which uses computer graphics to outline house landing points on a glass visor. Displaying updates in real-time, the system also indicates items on roofs to avoid, such as chimneys and antennas.

The jolly one has made great use of Global Positioning System (GPS) technology. With GPS and computer generated maps, Santa and the North Pole Operations Center (NPOC) always know exactly where he is. In addition, his autopilot system enables him to maintain a course within one-foot of his flight plan.

The final enhancement, while great for parents, spells bad news for kids. The elves at NPOC can now continue to keep watch to see who is naughty and nice while Santa is on his journey. Any changes to the list can be forwarded to Santa on his mobile laptop computer prior to his journey down the chimney. Now Santa can keep tabs on the youngsters up to moment of delivery. With these enhancements by Santa, it looks like the toys will definitely get through again this year -- and on time.



PR Image of a tropical cyclone

great," said **Tom LaVigna**, TRMM project manager at Goddard.

The first instrument data from the Visible Infrared Scanner (VIRS) has been processed, and the initial instrument data from the TRMM Microwave Imager (TMI) was made available. Detailed checkout of the Precipitation Radar (PR) instrument has been going well and the release of the first instrument data also is now available. The PR data and TMI images are available in color at <http://trmm.gsfc.nasa.gov>

## TRMM Update

By Allen Kenitzer, Office of Public Affairs

Tropical Rainfall Measuring Mission (TRMM) operations continue to go smoothly, with no problems reported after 22 days on-orbit. "The preliminary data from the rain instruments looks

## Hubble Images Reveal Dazzling Views

By Tammy Jones, Office of Public Affairs

Astronomers using NASA's Hubble Space Telescope have discovered some dazzling, surprisingly intricate patterns spun into space by aging stars. Scientists once believed that the end of a sun-like star's life was simple with the star gracefully casting off a shell of glowing gas and then settling into a long retirement as a burned-out white dwarf. Now, a dazzling collection of detailed Hubble images reveal glowing pinwheels, lawn sprinkler style jets, elegant goblet shapes, and even some that look like a rocket engine's exhaust.

These eerie fireworks offer a preview of the final stage of our own Sun's life," says Bruce Balick of the University of Washington in Seattle. More than simply a stellar "light-show", these outbursts

provide a way for heavier elements, predominantly carbon, cooked in the star's core, to be ejected into interstellar space as raw material for successive generations of stars, planets and, potentially, life.



Image of M2-9, a bi-polar planetary nebula

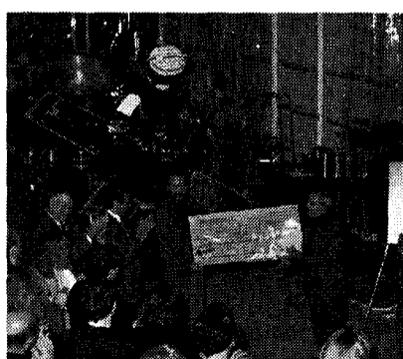
The astronomers say the incandescent sculptures are forcing a re-thinking of stellar evolution. In particular, the patterns may be woven by an aging star's interaction with unseen companions: planets, brown dwarfs, or smaller stars.

"The first time we looked at the Hubble's breathtaking pictures, we knew that our older and simpler ideas of how these objects are formed had to be overhauled," says Howard Bond of the Space Telescope Science Institute (STScI), Baltimore, MD. "The basic question is: how do these nebulae shape themselves?"

"Hubble's colorful views are a feast for the eyes," says Mario Livio, also of the STScI. "Their beauty is matched only by the mystery."

## TRACE Project Saves Tax Dollars

By Deanna Adams, Office of Public Affairs



Employees look on as Jim Watson and Joe Rothenberg proudly give money back to the U.S.

Through various cost-saving techniques, the TRACE Project was able to save nearly ten million dollars in building the TRACE Spacecraft. In the photo to the left, **Jim Watson** presents a "check" representing the savings to **Joe Rothenberg**. The check is made payable to John Q. Taxpayer.

The Transition Region and Coronal Explorer (TRACE) was developed under NASA's Small Explorer's (SMEX) Program. The SMEX Program provides frequent flight opportunities for highly-focused, relatively inexpensive science missions. TRACE, which is scheduled to launch in March 1998 will study the connection between the Sun's magnetic field and corona.

## news tidbits

• The Galileo mission, the first mission to orbit an outer planet, concluded its primary mission on Dec. 7. The spacecraft is now on a 2-year extension to study Jupiter's moon Europa, Callisto, and Io. Galileo made its first flyby of Europa on Tuesday, Dec. 16.

• The total for Goddard's CFC contributions was \$430,251. This amount was just 1 percent shy of the goal of \$435,000. Many thanks to everyone who made a donation.

• NASA and the FAA have developed a new airport system, called the Surface Movement System, that is helping holiday airline travelers miss fewer connections and wait less time for flights.

To read more about these and other exciting stories, go to the Goddard Homepage at <http://www.nasa.gov> and choose FLASH.

## Goddard Is Key Part of Maryland Technology Showcase

By Lynn Jenner, Office of Public Affairs

The State of Maryland recently held its third annual Maryland Technology Showcase at the Baltimore Convention Center. As Maryland Governor Parris Glendening wrote in the cover letter for the technology showcase brochure, "Maryland is poised to become the nation's technology hub. It is home to some of the world's leading academic institutions and the nation's most technologically advanced school system providing an unprecedented opportunity for students, citizens and professionals alike to receive the education needed to excel in the twenty-first century workplace." For those very reasons, Goddard felt it was crucial to



"NASA Mike" explains "Weather in the Classroom" to interested onlookers

strengthen its position as a technology leader in Maryland and the United States.

Goddard's Office of Commercial Programs, headed by *Nona Minnifield*, set up an impressive exhibit at the showcase housing such interesting and exciting innovations as "Weather in the Classroom" which allows students across the state the capability of accessing weather satellite information via computer terminals located in their classrooms. *Mike Comberiate* also known as "NASA Mike," of the EOS PM Project, was on hand to explain this stimulating technology to the throngs who stopped by to find out more about it. Along with teachers and students who had worked with this technology, NASA Mike

explained how they were using Goddard-unique real-time broadcasts from GOES and NOAA satellites to learn skills such as electronic access of information, electronic communications, image enhancements of data from satellites and some science of meteorology.

Other noteworthy technologies showcased by Goddard were the Extended Rice algorithm used in scientific images and

data such as seismic instruments and MRI's; Conically Scanned Holographic Telescope used in laser probes and scanners; low-cost Global Positioning System Receiver which has many potential uses in the transportation industry; and the Autonomous Micro-Pulse Lidar System for use in meteorological and environmental monitoring.

The Maryland Technology Showcase was launched in 1995 by Governor Glendening as a venue to promote Maryland as one of the nation's leading "tech-friendly" states, as well as an innovative promoter of electronic government. The showcase has grown exponentially in both interest and size over the years it has been held, drawing more than 8,000 participants and 300 exhibitors. The next Maryland Technology Showcase will be held on December 8 and 9, 1998. For more information, please contact the Office of Commercial Programs at 301-286-5810.

## 1997 Gordon Bell Prize Awarded to Donald Becker/ CESDIS and Team

Goddard's *Donald J. Becker* of the Center of Excellence in Space Data and Information Sciences (CESDIS), Code 930.5, was one of a team awarded the 1997 Gordon Bell Prize for Price/Performance "in recognition of their superior effort in practical parallel-processing research." The award was announced and presented at SC97, the premier conference in high performance computing and networking.

A Beowulf cluster of Pentium Pro's assembled a year earlier at SC96 achieved 2.1 Gigaflop/s (billions of floating point operations per second) on an n-body code, the equivalent of \$50,000 per Gigaflop/s. The code simulates gravitational attraction among particles, such as dark matter in cosmology models. Beowulf is a Linux-based cluster of pc's linked with fast Ethernet. It was developed at Goddard Space Flight Center over the past four years by CESDIS. Goddard-developed software has enabled Beowulf-class clusters to be built at institutions worldwide.

The Gordon Bell Prize was established to reward practical use of parallel processors by giving monetary awards for the best performance and best price/performance on an application, and for automatic compiler parallelization. The award is sponsored by the IEEE Computer Society and IEEE Computer magazine. For more information on the paper presented by the team, go to the following URL:

<http://sc97.tc.cornell.edu/sc97/proceedings/BELL/WARREN/INDEX.HTM>

## BWI Mural Traces Aviation and Space Exploration

By Deanna Adams, Office of Public Affairs



The Baltimore Washington Airport recently expanded with a new International wing. On December 1, the wing along with the above photo mural was unveiled. This mural depicts Maryland's contribution to aviation and space exploration through a timeline. The timeline begins with Peter Carne's first recorded manned balloon ascension in the U.S. in 1784 in Baltimore, MD. Other events depicted in the mural include the Wright Type A Military flier at College Park Airfield, the Glenn L. Martin Factory, and continue through to Goddard Space Flight Center. To the left of the mural is the Hubble Space Telescope and towards the bottom are individual photographs. One is of the Greenbelt campus and one is of the Bldg. 29 cleanroom. The mural was created by Adler Display, Inc. in Baltimore.

### Director's Holiday Message

Joe Rothenberg will give a brief holiday message which will be shown on NASA TV Channel 11 at 9:00 a.m. and 2:00 p.m. on December 18, 23, and 30.

### staff

Executive Editor: Darlene Ahalt  
 Managing Editor: Deanna Adams  
 Senior Photographer: Mark DeBard  
 Submission deadline: Friday each week  
 (submissions subject to editing)  
 For additional information contact:  
 Deanna Adams 301-286-0918

Subscription Information:  
 GSFC & WFF Mailing List  
 Offsite/Commercial Subscriptions  
 Retiree Subscriptions

Contact:  
 Gwony Durrah, Code 239  
 Darlene Ahalt, Code 130  
 Bob Wilson 301-422-8334



National Aeronautics and  
Space Administration  
Goddard Space Flight Center

# GODDARD news

Greenbelt, Maryland/Wallops Island, Virginia

Dec. 1997 Vol. 1 No. 34

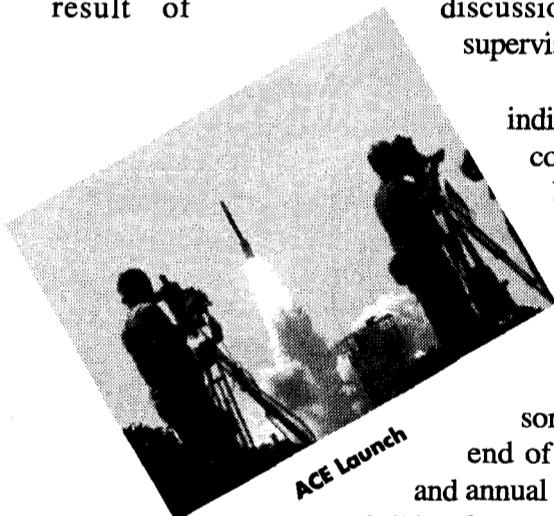
The Goddard News is published weekly by the Office of Public Affairs, Goddard Space Flight Center, Greenbelt, MD 20771

## Happy Holidays



Hello everyone! On Sunday, December 21st, the Center implemented the planned reorganization that had been previously targeted for November 9.

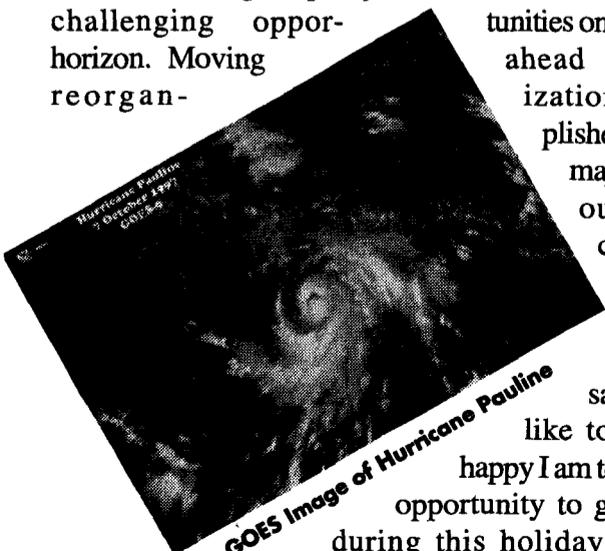
With few exceptions, organizations to which employees have been assigned are those that were indicated in the October 1 communication to all individuals affected by the reorganization. In the few cases where there have been changes subsequent to October 1, those individuals have been made aware of the change as a result of discussions with their supervisors.



ACE Launch

All affected individuals will be contacted shortly by their supervisors, although timeliness may be impacted somewhat by the end of year holidays and annual leave. A series of all hands meetings of the new organizations will be announced the week of January 5.

I am confident that the Goddard Space Flight Center has a bright future. I have said so on numerous public occasions during the past year, as I cited the many challenging opportunities on Goddard's horizon. Moving ahead with the reorganization accomplishes one major step on our path to continued success.



GOES Image of Hurricane Pauline

That being said, I would like to say how happy I am to have this opportunity to greet you during this holiday season. We've had many, many exciting things happen over the past year, and together we enjoyed many successes. I don't mind saying: You



HST Image of Mars

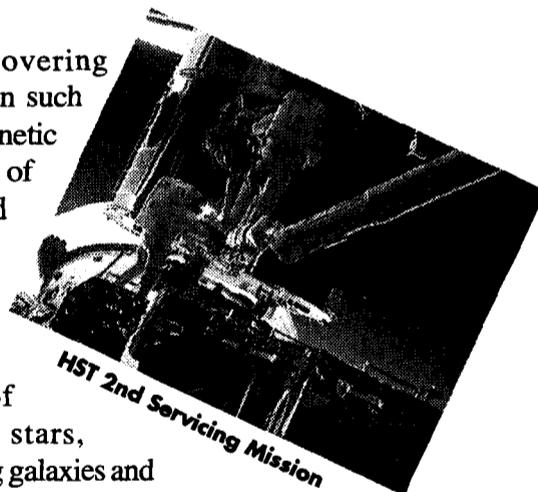
include Hitchhikers.

We've produced some of the most intriguing science results.

Because of your hard work, we marked these achievements over the past year:

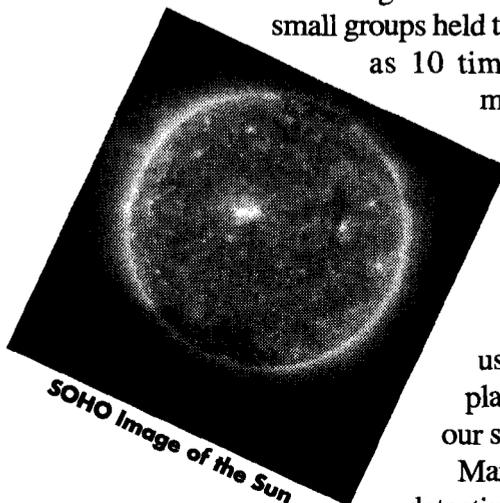
SOHO, uncovering mysteries of the sun such as blasts at our magnetic field and the "rivers of plasma" tucked inside the sun.

HST, detecting baby stars in a neighborhood of senior citizen stars, showing us colliding galaxies and Martian weather. We started the year by installing two new instruments to the telescope, giving us significantly increased spectrographic capability as well as adding infrared to the HST spectrum.



HST 2nd Servicing Mission

We can see galaxies clustered in small groups held together by as much as 10 times as much dark matter as normal matter and better understand the physics of black holes.



SOHO Image of the Sun

Our scientists are using SeaWiFs, playing a major role in our study of El Nino.

Mars Global Surveyor, detecting a magnetic field

have made us all proud to be Goddard employees.

We've watched missions begin, mature into science results and provide knowledge for the world.

We've witnessed the launches of GOES, ACE, TRMM, SeaWiFs, Cassini, Equator S, three Pegasus launches and a number of space shuttles that Spartan, GAS payloads and



# Happy Holidays



around Mars that caused Vice President Gore to say: "In (Martian) orbit only a few days, yet it already has returned an important discovery about the Red Planet."

We discovered x-rays from comets.

We watched Comet Hale Bopp and measured ozone holes.

We reboosted Compton Gamma Ray Observer and TOMS - Earth Probe.

We launched balloons and sounding rockets from locations around the world.

We opened the Integrated Mission Design Center to support mission development for internal and external principle investigators.

We put in place a Rapid Spacecraft Acquisition Capability which provides a spacecraft, contractor to investigators, in 30 days - this is a major resource to enable the science community.

We achieved a significant milestone by successfully demonstrating EOSDIS to the science community.

We completed integration of EOS AM and Landsat 7 which are currently undergoing environmental test in preparation for launch in mid '98.

In technology, we shared with the world a new gamma ray detector array capable of locating gamma ray bursts with unprecedented clarity; we've made an impact on medical applications in the detection of breast cancer; we've designed a new internet tool for electronic handbooks.

A testimony to our people ingenuity is the GOES 10 spacecraft: we suffered a solar array drive problem and you figured out how to invert the spacecraft and reverse the direction of that mechanism so we continue to perform. That was nothing short of "genius"!

Our people continue to be recognized in national and international circles, such as: Aviation Week and Space Technology Laureate Hall of Fame, Discover Award for STIS, the Pecora Award, 2 Goddard scientists are now members of the National Academy of Sciences, R&D Magazine, and in professional societies and associations.

Goddard also received a President's Quality Achievement Award for outstanding quality of management implementation.

I was very proud of that and so many other moments in Goddard's year.

Goddard people are genuine champions.

We trounced Headquarters at our annual softball game; celebrated Fun Run, Community Days, Wallops 2000, Education Showcase and return visits by space shuttle crews. Next year I vow to try to knock 5 minutes off my fun run time. Unfortunately we lost 3 of 3 sailing races to the HQ team. This may be a good reason for me to buy a new boat.

Behind the curtain are many, many people working hard to make our jobs easier.

Did you know we successfully accepted and are managing the accounting operations from HQ?

That we successfully integrated HQ's and Goddard's procurement, grants and logistics functions? This was no small feat. Just ask anyone on those teams.

For example, did you know that our folks shipped 260 tons of cargo to Japan to support the TRMM launch?

NASA also faced some disappointments: loss of the Japanese ADEOS spacecraft. We lost TOMS ozone measurements and scatterometer data, and the TRW Lewis spacecraft. We are about to begin our look into the Spartan anomaly from the recent shuttle mission to understand why it did not begin its duties in orbit. But the clever and persevering Goddard Way is not to give up easily. New ways are sought to acquire the same science information needed by our communities.

Our past year was marked by changes. The reorganization of the Center will be a major milestone in our history. We will be better positioned to take on the new ways of doing business. I can't wait until 1998 to experience this change first hand; I know how anxious people are about change; I am too. But I am also convinced that what we have designed is important to our collective future. We also need to evaluate the process and organization changes we are making and correct unforeseen problems in an expeditious manner.

Our relationships with the outside world is also changing. And for the better! My holiday card list is the longest it's ever been. We've engaged in collaborations, partnerships, and outreach efforts to engage the best of individuals, teams, and entire organizations.

For example: we've initiated a telementoring program with the Stevens Institute in New Jersey; developed a control center at Bowie State; we've partnered with NOAA to bring their people here to work with our scientists; and our property folks have been busy providing millions of dollars in excess material to schools throughout the region. We signed a special MOU with the National Park Service. We now have 14 partnerships between our scientists and major universities.

These and other efforts enhance our credibility and strengthen our country's engineering, technological and scientific capabilities. This looks like magic, but at the center of these accomplishments is your hard work, thoughtful planning, willing attitudes and dedication to succeed.

I want to wish each of you and your families a wonderful holiday season. Look over your shoulders at 1997 with pride and join me in looking forward to an exciting 1998; with more launches, more science results, more El Nino, more creative energies at state of the art technologies, building more friendships and bridges with the world. Have the best of the season!

Joseph Rothenberg  
Director

**Editor's Note:**  
There will be no Goddard News issued during the week of December 29.

**staff**

Executive Editor: Darlene Ahalt  
 Managing Editor: Deanna Adams  
 Senior Photographer: Mark DeBard  
 Submission deadline: Friday each week  
 (submissions subject to editing)  
 For additional information contact  
 Deanna Adams 301•266•0918

Subscription Information:  
 GSFC & WFF Mailing List  
 Offsite/Commercial Subscriptions  
 Retiree Subscriptions

Contact:  
 Gwenny Durrah, Code 239  
 Darlene Ahalt, Code 30  
 Bob Wilson 301•422•8334