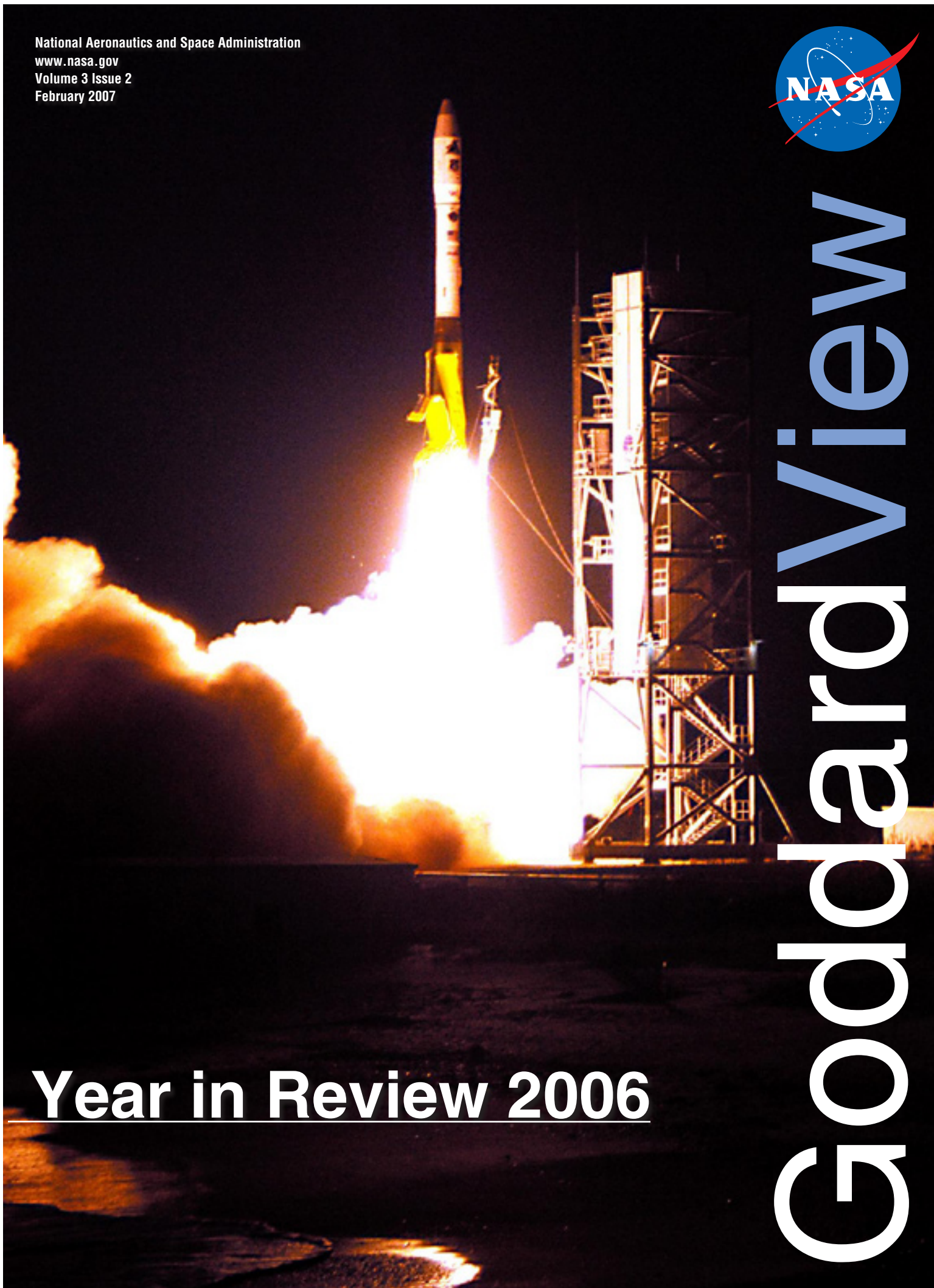


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# GooddardView

Year in Review 2006



## NASA Returns to Hubble

By Susan Hendrix

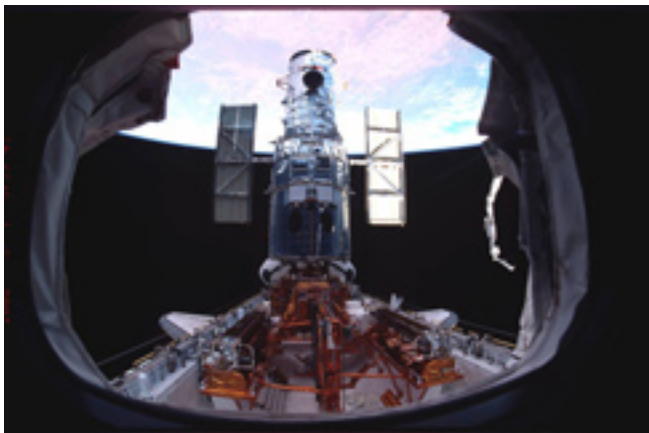


Image credit: NASA

*Caption: Hubble on the payload bay just prior to release with beautiful glowing color of earth in the background.*

On October 31, 2006 NASA Administrator Michael Griffin announced the Agency's decision to service the observatory to an auditorium full of anxious employees at NASA Goddard Space Flight Center.

Griffin told the audience, "We have conducted a detailed analysis of the performance and procedures necessary to carry out a successful Hubble repair mission.... What we have learned has convinced us that we are able to conduct a safe and effective servicing mission to Hubble. While there is an inherent risk in all spaceflight activities, the desire to preserve a truly international asset such as the Hubble Space Telescope makes doing this mission the right course of action."

Long time Hubble supporter Senator Barbara Mikulski, in attendance for Griffin's announcement, applauded, saying "This is a great day for Maryland, for America, but most of all, for science. Hubble is a national asset and a national priority. Without question, Hubble has been the most successful NASA program since Apollo. And like Apollo, Hubble has helped America lead the way in discovery and exploration."

The astronaut crew selected for Servicing Mission 4 included Commander Scott D. Altman, and Pilot and Navy Reservist Capt. Gregory C. Johnson. Mission specialists included veteran spacewalkers John M. Grunsfeld and Michael J. Massimino, as well as first-time space fliers Andrew J. Feustel, Michael T. Good, and K. Megan McArthur.

For more information about Hubble, visit:

[http://www.nasa.gov/mission\\_pages/shuttle/shuttlemissions/hst\\_sm4/index.html](http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/hst_sm4/index.html) ■

## Table of Contents

[Goddard Updates](#)

NASA Returns to Hubble - 2

New Horizons - 3

Successful Launch of Space Technology 5 (ST5)- 4

Senator Barbara Mikulski Meets with Dr. Weiler to Get Update on NASA/GSFC and Vows Support for JWST - 4

Science on a Sphere Comes to Goddard - 5

NASA's Twin Solar Terrestrial Relations Observatories Mission, known as STEREO Successfully Launched - 6

NASA Celebrates Discovery Crew Successful Mission! - 7

Goddard Launch Updates - 8

2006 Innovative Partnerships Program Updates - 9

2006 IPP Office Updates - 10

Goddard Prestigious Award Winners - 11

[Goddard Family](#)

[Employee Spotlight: In Memoriam:](#)

Goddard Remembers Yoram Kaufman

*Cover Caption: On December 16, 2006 a rocket was launched carrying the Air Force Research Laboratory's TacSat-2 satellite and NASA's GeneSat-1 microsatellite. The satellites were launched on the four-stage Minotaur I launch vehicle contracted by the Space and Missile Systems Center through Orbital Sciences Corporation's Launch Systems Group. The mission was conducted from the Mid-Atlantic Regional Spaceport's launch pad on the south end of Wallops Island. Photo Credit: NASA/WFF*

## GoddardView Info

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**Managing Editor:** Trusilla Steele

**Editor:** Alana Little

Deadlines: News items and brief announcements for publication in the *Goddard View* must be received by noon of the 1st and 3rd Wednesday of the month. You may submit contributions to the editor via e-mail at [alittle@pop100.gsfc.nasa.gov](mailto:alittle@pop100.gsfc.nasa.gov). Ideas for new stories are welcome, but will be published as space allows. All submissions are subject to editing.

## New Horizons

Edited By Trusilla Steele

The 2006 year began with blasting the New Horizons spacecraft to its journey at the edge of the solar system. Liftoff occurred January 19, 2006 from Florida. As the first spacecraft to visit Pluto and its moon Charon, New Horizons looks to unlock one of the solar system's last, great planetary secrets. The New Horizons spacecraft will cross the entire span of the solar system and conduct flyby studies of Pluto and Charon in 2015. The seven science instruments on the piano-sized probe will shed light on the bodies' surface properties, geology, interior makeup, and atmospheres. ■



Image credit: KSC

*Caption: Great white egrets and a great blue heron in the foreground seem to stand watch as NASA's New Horizons spacecraft leaps off the pad on time at 2 p.m. EST aboard an Atlas V rocket from Complex 41 on Cape Canaveral Air Force Station in Florida. This was the third launch attempt in as many days after scrubs due to weather concerns. The compact, 1,050-pound piano-sized probe will get a boost from a kick-stage solid propellant motor for its journey to Pluto. New Horizons will be the fastest spacecraft ever launched, reaching lunar orbit distance in just nine hours and passing Jupiter 13 months later.*

## Successful Launch of the Space Technology 5 (ST5)

Edited By Trusilla Steele

Goddard celebrated the successful launch of the Space Technology 5 (ST5) spacecraft on Wednesday, March 22 from a Pegasus XL rocket.

Shortly after launch, the three spacecraft were deployed one at a time in a spinning (Frisbee-like) motion. ST5 will test new technologies that will be used in future space science missions. ST5 is the first step in developing missions of tens or hundreds of small spacecraft that would look at phenomena such as the space weather that can interfere with our communications, navigation, and power systems. ST5 will demonstrate this capability by utilizing the Magnetometer carried onboard all three spacecraft. ■



Photo credit: NASA GSFC

*Caption: In the Clean Room at the Goddard Space Flight Center, Thermal Design Engineer Edmonia Caldwell creates blankets to fit on the ST5 spacecraft.*

## Senator Barbara Mikulski Meets With Dr. Weiler to Get Update on NASA/GSFC and Vows Support for JWST

Edited By Trusilla Steele



Photo credit: Chris Guinn

*Caption: Senator Mikulski, Paul Carliner, (Senator Mikulski's office) and Dr. Ed Weiler, along with Murzy Jhabvala (GSFC) viewing the JWST micro shutter demonstration.*

Barbara A. Mikulski, Maryland United States Senator and a long-time Goddard champion visited Goddard on Thursday, March 23.

Senator Mikulski has been fighting for her state, and for GSFC, for many years. Mikulski was updated on the important activities to ensure, that business thrives at one of the largest concentrations of engineering and high-tech jobs in Maryland.

Senator Mikulski vowed continued support and stated that she feels having a balanced program of science and human space flight is very important and emphasized the necessity for partnerships between the Center and the university community to form strategic alliances that are mutually beneficial. ■

## Science on a Sphere Comes to Goddard

Edited By Trusilla Steele

Spring sprung new technologies at Goddard with the new exhibit at the Visitors Center called Science on the Sphere (SOS). The mesmerizing visualization system developed by the National Oceanic and Atmospheric Administration (NOAA) uses computers and video projectors to display animated data on the outside of a suspended, 6-foot diameter, white sphere.

The first movie titled *Footprints*, consists of a visually rich presentation where “The Earth appears in a variety of guises, from depictions of the biosphere to planetary views of city lights at

night to dramatic examinations about the science of hurricane formation. Other moons and planets make exciting appearances too, with special presentations of Mars and Earth’s moon,” according to Michael Starobin, Senior Media Producer at Goddard.

Built as a vehicle for education and public outreach programs, SOS targets an informal audience of walk in visitors and scheduled event participants. Through the innovative exhibit, the general public is introduced to an innovative perspective of science by way of a new multimedia avenue. ■

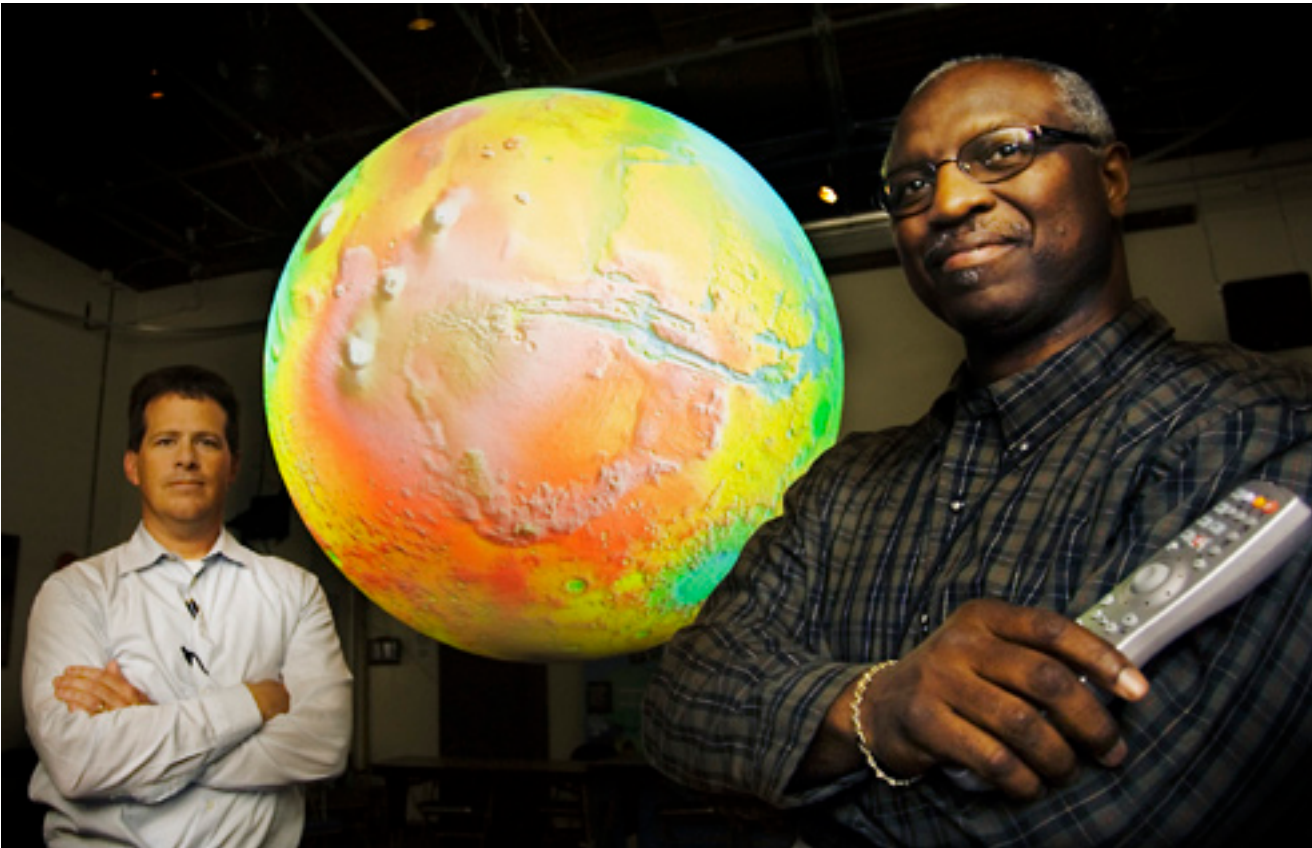


Photo credit: Chris Gunn

Caption: (Left) Dave Himes, NOAA Forecast Systems Software Developer for SOS and (Right) Maurice Henderson, Science Manager of SOS.

## NASA's Twin Solar Terrestrial Relations Observatories Mission, Known as STEREO, Successfully Launched

By Rani Gran

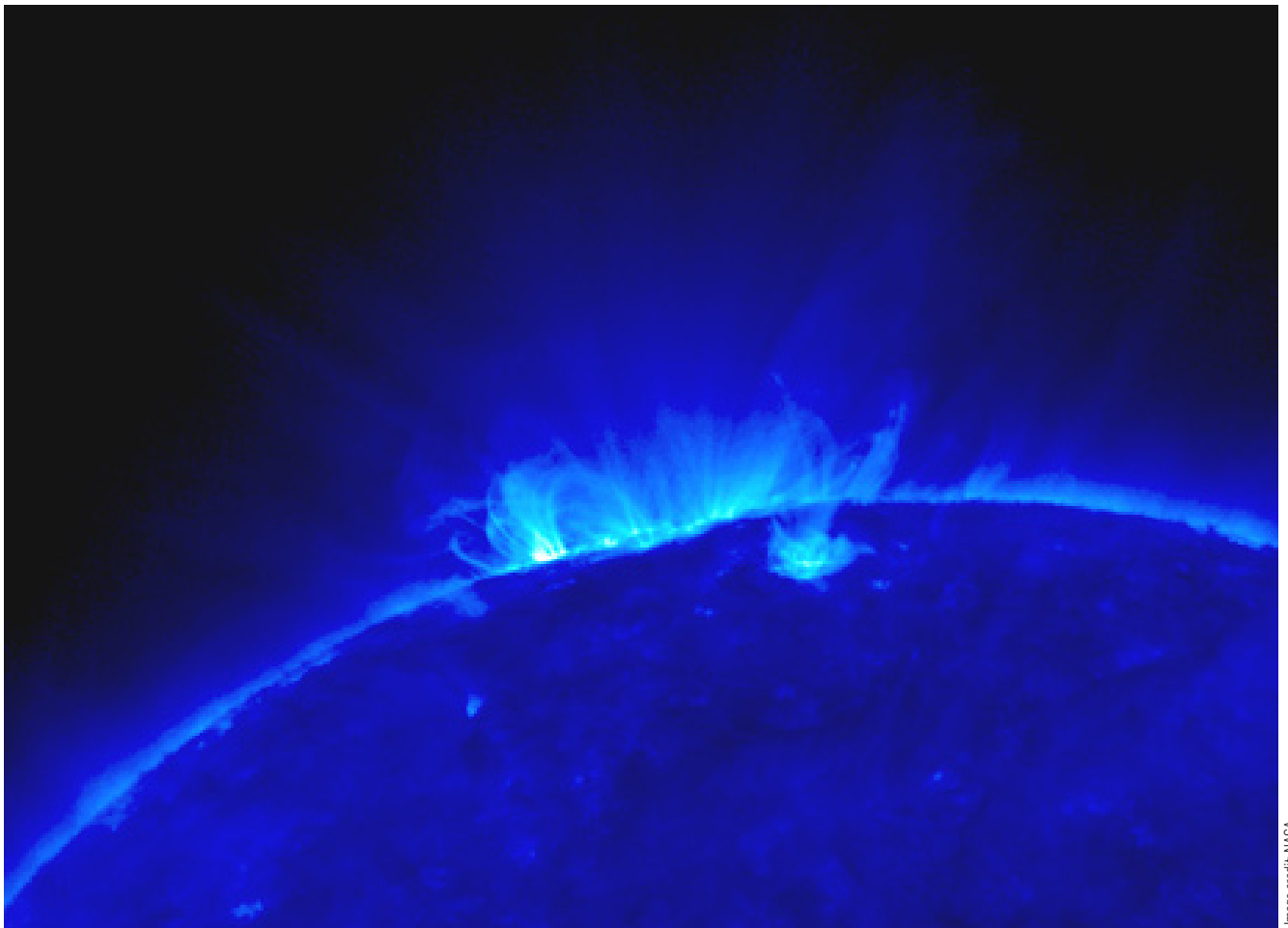


Image credit: NASA

*Caption: A close up of loops in a magnetic active region. These loops, observed by STEREO's SECCHI/EUVI telescope, are at a million degrees Celsius. This powerful active region, AR903, observed here on December 4, produced a series of intense flares over the next few days.*

STEREO's nearly identical twin, golf cart-sized spacecraft will make observations to help researchers construct the first-ever three-dimensional views of the Sun. The images will show the star's stormy environment and its effects on the inner solar system, vital data for understanding how the Sun creates space weather.

"The stunning solar views the two observatories will send back to Earth will help scientists get a better understanding of the Sun and its activity than we've ever been able to obtain from the ground or any of our other missions," said Nick Christotimos, STEREO project manager at Goddard.

The two observatories were launched on Wednesday October 25, on a Delta II rocket in a stacked configuration and separated from the launch vehicle approximately 25 minutes after lift-off. After receiving the first signal from the spacecraft approximately 63 minutes after launch, mission control personnel at the Johns Hopkins University Applied Physics Laboratory (APL), confirmed that each observatory's solar arrays were successfully deployed and were providing power. NASA's Deep Space Network antennas in Canberra, Australia received the initial radio signals. Goddard manages the STEREO mission. APL designed and built the spacecraft. The laboratory will maintain command and control of the observatories throughout the mission, while NASA tracks and receives the data, determines the orbit of the satellites, and coordinates the science results. Each observatory has 16 instruments, including imaging telescopes and equipment to measure solar wind particles and to perform radio astronomy.

The STEREO mission includes significant international cooperation with European partners in instrument development, data sharing, and analysis.

For more information about STEREO, visit: <http://www.nasa.gov/stereo> ■

# NASA Celebrates Discovery Crew on a Successful Mission!

Edited By Alana Little



Image credit: NASA

*Caption: The STS-116 crew members gather for a group portrait in the Destiny laboratory of the International Space Station. From the left (front row) are astronauts Bill Oefelein, pilot; Joan Higginbotham, Nicholas Patrick and European Space Agency (ESA) astronaut Thomas Reiter, mission specialist. From the left (back row) are astronauts Mark Polansky, commander; Sunita Williams, Expedition 14 flight engineer; ESA astronaut Christer Fuglesang and Robert Curbeam, mission specialist.*

During Space Shuttle Discovery's mission to the International Space Station, the STS-116 crew continued construction of the outpost adding the P5 spacer truss segment during the first of four spacewalks. The next two spacewalks rewired the Station's power system, preparing it to support the station's final configuration and the arrival of additional science modules. A fourth spacewalk was added to allow the crew to retract solar arrays that had folded improperly.

The flight was the second in a series of missions that are among the most complex in space history. Discovery's crew rewired the station's power system and delivered a key component of the station's structure. The segment will enable future missions to attach a new set of solar arrays.

The mission involved intensive ground commands as the station's power was shut down and rerouted in stages on two spacewalks.

As systems were then powered up for the first time on their new channels, the Station's power system was in its final configuration, ready for further expansion with more solar arrays and laboratories to be launched in 2007.

As part of the Station power reconfiguration and assembly process, the station flight control team up-linked a total of 17,901 computer commands, averaging about 2,000 commands per day. During a typical day on the station, flight controllers give approximately 800 commands. Curbeam, Fuglesang, and Williams, with the help of crewmates, made four spacewalks that completed the construction tasks, reconfigured power and cooling systems, and retracted a snagged solar array. The astronauts also replaced a failed camera, cleared a worksite essential to the next shuttle mission, reconfigured power to station's Russian segment, and installed panels to provide additional protection from space debris.

The fourth spacewalk was added to the mission to retract a solar array that only partially folded into its box on flight day 5. The solar wings were retracted far enough so that the new arrays installed in September could begin to fully rotate and track the Sun to provide power. Mission managers decided, however, to address the problem of the partially retracted arrays while the shuttle crew was on the station. With only several days notice, mission engineers in both the shuttle and station programs developed a spacewalk plan for Curbeam and Fuglesang that resulted in the arrays' successful retraction on flight day 10.

Discovery's launch was the first night liftoff of a shuttle since Nov. 2002. Several inspections in orbit revealed no critical damage, and Discovery's thermal protection system was declared safe for re-entry on the flight's thirteenth day.

*Discovery* also delivered a new crew member and more than two tons of equipment and supplies to the station, most of which were located in the SPACEHAB cargo module. Almost two tons of items no longer needed on the station returned to Earth with STS-116. ■

## Goddard Launch Updates

Edited by Howard Ottenstein and the Critical Path Team

- Goddard learned that it had been slated to manage the Vesper and Osiris missions. The Vesper mission is a Venus chemistry and dynamics orbiter that would advance our knowledge of that planet's atmospheric composition and dynamics. The Origins Spectral Interpretation, Resources Identification and Security (OSIRIS) mission would survey an asteroid and provide the first return of asteroid surface material samples to Earth.
- NASA's Earth Observing System (EOS) Program, the world's most advanced and comprehensive capability to measure global climate change, received the American Institute of Aeronautics and Astronautics Space Systems Award on September 20, 2006. EOS is composed of a series of Earth-observing satellites, an advanced data system, and teams of scientists who study the data. Goddard's Terra, launched in late 1999, was the first of a series of EOS dedicated satellites already launched in this program.
- In late May, the first images from NASA's new CloudSat satellite were revealing never-before-seen 3-D details about clouds. CloudSat obtained images of a slice of the atmosphere from top to bottom showing a warm storm front over the North Sea in the North Atlantic approaching Greenland. Unlike other satellite observations, the CloudSat radar image showed the storm's clouds and precipitation simultaneously. The front's warm air could be seen rising over colder air, with precipitation below. The CloudSat observations also provided new views of sloping, frontal clouds, and thunderstorms over Africa, both as individual storms and as part of larger tropical storm systems.
- The month of May concluded with the National Oceanic and Atmospheric Administration's (NOAA) spacecraft, Geostationary Operational Environmental Satellites (GOES)-N launching on May 24 from Florida. The nation's most advanced environmental satellite safely orbited on June 4 and was renamed "GOES-13." GOES-N is the latest in a series of Earth monitoring satellites. The GOES system provides the kind of continuous monitoring necessary for data analysis and forecasting. ■





# 2006 Innovative Partnerships Program (IPP) Updates

By Nancy Pekar

What had previously been known as the Office of Technology Transfer is now officially renamed the Innovative Partnerships Program (IPP) Office. Goddard's IPP Office will have the same two-part goal as before: (1) forming partnerships with industry, academia, and other government agencies to support NASA programs and (2) transferring space-program technology to new applications to enhance NASA's technology and commercial objectives. However, an even greater emphasis will be placed on partnerships that directly benefit NASA missions.

So the IPP Office encourages all Goddard scientists and technologists to make a New Year's Resolution to:

- Report innovations—be they new or improved techniques, methods, systems, and processes as well as new or improved products, devices, machines, materials, chemical compositions, apparatuses, articles, fixtures, tools, or software—using the eNTRe online system (<http://entre.nasa.gov>) before disclosing them publicly. Remember: It's never too early to file an NTRI! For more information, contact Deandra Raymond (6-7960; [draymond@pop500.gsfc.nasa.gov](mailto:draymond@pop500.gsfc.nasa.gov)).
- Be on the lookout for external technology, capabilities, and facilities that would help accelerate mission-related R&D efforts. If you are interested in learning more about forming partnerships, contact Darryl Mitchell (6-5169; [Darryl.R.Mitchell@nasa.gov](mailto:Darryl.R.Mitchell@nasa.gov)) or Ted Mecum (6-2198; [Ted.Mecum@nasa.gov](mailto:Ted.Mecum@nasa.gov)).
- Learn more about the IPP Office and how to participate in technology transfer by attending the next training workshop. For more information, contact Dale Hithon (6-2691 or [Dale.L.Hithon@nasa.gov](mailto:Dale.L.Hithon@nasa.gov)).

## A Year of Significant Accomplishments

In looking back on the past year, Goddard's technology transfer team is proud of its many accomplishments, a few of which are presented below.

### Four Projects Receive HQ's Partnership Seed Funding:

The Innovative Partnerships Program (IPP) at HQ established the Partnership Seed Fund to address barriers and initiate cost-shared, joint-development partnerships, providing "bridge funding" to enable larger partnerships and development efforts to occur.

Goddard's IPP Office managed the submission process for the Center, reviewing more than 50 preliminary proposals and then selecting and aiding the development of eight proposals for submission to HQ. "I was amazed at the magnitude of Goddard's response to the Call given the tight timeframe," said Darryl Mitchell, who led the effort for Goddard's IPP Office. "So many innovators had some very impressive collaborations, and we'll be working with them to further develop these partnerships."

### New Applications of the Hilbert-Huang Transform (HHT) Technology:

Among its many accomplishments, the award-winning HHT technology was (1) used in analyzing traffic flow and highway design performance for the Turner-Fairbank Highway Research Center (part of the U.S. DOT's Federal Highway Administration); (2) applied to research that is expected to enhance the monitoring of patients at risk for sudden cardiac failure and stroke as well as the diagnosis and treatment of depression and other neurological disorders; and (3) licensed by BCG Wireless to help improve signal reception capability in radio frequency (RF) communications, such as cell phone systems and RF identification chips.

### Advancing Use of SpaceWire:

In the foreseeable future, projects such as the James Webb Space Telescope (JWST), Magnetospheric MultiScale (MMS) missions, and other satellite operations will have access to application-specific integrated circuits (ASICs) that use SpaceWire. This advance is made possible through a partnership agreement with Aeroflex, Inc. Goddard's SpaceWire expert Glenn Rakow will be providing Aeroflex with guidance as it develops a SpaceWire router. A similar agreement will enable Harris Corporation to build its knowledge of and skill with the SpaceWire standard and router, positioning itself to be able to respond to future needs for SpaceWire-based communication devices at NASA and within the rest of the aerospace market.

### Partnership with a Leading Robotics Institute:

The IPP Office was pleased to work closely with Assistant Chief for Information Systems Technology and Goddard's Exploration Technology Lead Julia Loftis and team to build a partnership with Carnegie Mellon University (CMU). Under this partnership, Goddard's Adaptive Sensor Fleet software, which manages fleets of independent platforms to collaboratively accomplish a scientific measurement goal, will be joined with CMU's innovative techniques for "telesupervision," which allows adaptive levels of autonomy in managing such a fleet. Under an Applied Information System Technology (AIST) project, the two systems will be used to drive a fleet of autonomous boats to study harmful algae blooms in the Chesapeake Bay estuary, advancing the technology readiness level (TRL). Within the context of the Vision for Space Exploration, this system will have applications for lunar, orbital, or planetary construction and inspection; lunar and planetary *in situ* resource utilization; and prospecting, mining, transport, and construction.

Continued on Page 10

## 2006 Innovative Partnerships Program (IPP) Updates

Continued from Page 9

### **Carbon Nanotubes Based on Goddard Technology Enter the Marketplace:**

This year the IPP Office negotiated a license for Goddard's patented technique for manufacturing high-quality single-walled carbon nanotubes (CNTs) to Idaho Space Materials (ISM) in Boise. Now the CNTs based on this process are being sold to and used by researchers and companies that are working on the next generation of composite polymers, metals, and ceramics that will impact almost every facet of life. "Licensing NASA's technology allowed us to begin operations and rapidly commercialize an innovative product without the traditional R&D costs and time," said Wayne Whitt, who founded the company. ISM vice president Roger Smith noted, "ISM believes that carbon nanotubes will be a building block for a better world.... Getting single-walled CNTs into the hands of researchers will help accelerate their transition from a conceptual idea to a practical product, and that's why we offer our product at a reduced price for researchers."

### **Successful Agreement and Showcase with TEDCO:**

The mission of the Maryland Technology Development Corp. (TEDCO), which signed a partnership agreement with Goddard this year, is to facilitate the creation of businesses and foster their growth in all regions of the state through the commercialization of technology. "TEDCO's mission is closely aligned with our own," said Nona Cheeks, chief of Goddard's IPP Office. "This agreement allows us to leverage the state's investment in technology-based economic development for the benefit of NASA as well as the state of Maryland." The October 12th "NASA Goddard Space Flight Center Technology Partnering Opportunities" showcase embodied that partnership, with more than a dozen technologies and two state-of-the-art facilities presented by leading Goddard researchers to more than 200 representatives of companies, universities, and government organizations.

### **Soldiers at Walter Reed Use Goddard-Developed PT Device:**

In 2003, Enduro Medical Technology introduced the Secure Ambulation Mode (SAM). Based on Goddard's cable-compliant joint technology and compliant walker, SAM is a revolutionary rehabilitative walker enabling patients to stand and ambulate without the aid of a physical therapist. This year, the company donated a SAM unit to Walter Reed Army Medical Center to help soldiers and other patients with a variety of injuries gain strength to stand and walk on their own. "I think there's a change in confidence and almost like a change in hope for someone who hasn't been able to walk for a long time and—with the assistance of SAM—is actually able to get up and ambulate and propel themselves on their own," said Walter Reed licensed physical therapist Anne Moore. ■

## IPP Office Prestigious Awards

By Nancy Pekar

### **Prestigious Awards:**

Two Goddard innovators received prominent awards, for which Goddard's IPP Office had prepared and submitted the nominations.

- In September, Norden Huang received the Service to America Medal in the Science and Environmental category for his work related to the HHT technology.
- John Vranish won an R&D100 Award for his conformal gripper technology.

Goddard's IPP Office offers its sincere thanks to the many innovators who dedicated time to these successful efforts.

Supporting research in science and technology is an important part of NASA's overall mission. NASA solicits this research through the release of various research announcements in a wide range of science and technology disciplines. NASA uses a peer-review process to evaluate and select research proposals submitted in response to these research announcements. Researchers can help NASA achieve national research objectives by submitting research proposals and conducting awarded research. This site facilitates the search for NASA research opportunities.

■



## Goddard Prestigious Award Winners

Edited by Alana Little

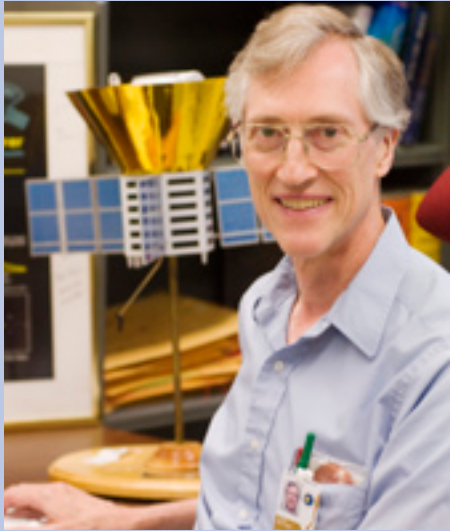


Photo credit: Chris Gunn

Goddard scientist John C. Mather won the 2006 Nobel Prize for Physics for producing the first intangible evidence that the universe began billions of years ago with the long theorized Big Bang. John was the Principal Instigator for the groundbreaking Cosmic Background Explorer (COBE) satellite and experiments in 1989. He shared the prize with George F. Smoot of the Lawrence Berkeley National Laboratory.

The 2006 Gruber Cosmology Prize was also awarded to John Mather (shown left) and the Cosmic Background Explorer (COBE) Science Team for their ground-breaking studies confirming that our universe was born in a hot Big Bang. A gold medal and \$250,000 prize was presented to Dr. Mather of NASA Goddard Space Flight Center in Greenbelt, Md., who represented the COBE team at the opening ceremony of the International Astronomical Union's General Assembly in Prague on August 15.

*Caption: Dr. John Mather*



Photo credit: Jay Friedlander

*Caption: Attendees raise their glasses in the Building 8 Auditorium in honor of Dr. Mather and the COBE Team's achievement.*

A 2006 Presidential Rank Award for Distinguished Senior Professionals went to Goddard's Dolly Perkins, former Director of Flight Projects and now Center Deputy Director-Technical.

### **A 2006 Presidential Rank Award for Meritorious Senior Professional went to:**

- Krista Paquin, former Deputy Director for Resources of flight Projects and now Center Associate Director. Effective November 27, 2006 Krista has accepted a new position as Deputy Director, Office of Program and Institutional Integration (OPII), Executive Office of the Assistant Administrator at NASA headquarters.
- Goddard's Michael King also won a Meritorious Senior Professional Award. Nancy Abell was in receipt of a 2006 Presidential Rank Award for Meritorious Executive. ■

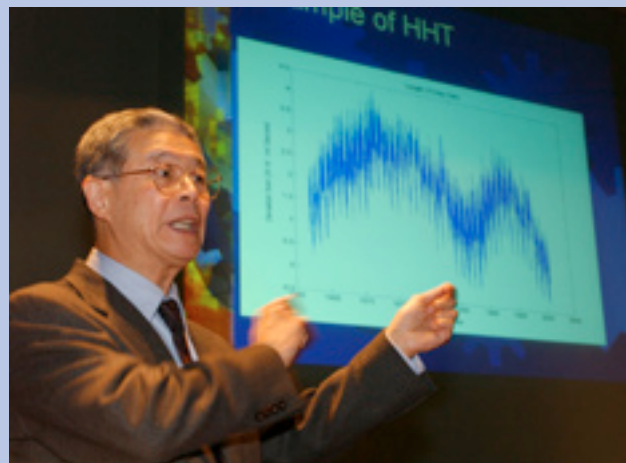


Photo courtesy of: The IPP Office

*Caption: Norden E. Huang (above), a Goddard scientist won one of 10 annual Service to America Awards, the Science and Environmental Medal, for pioneering research to test and improve NASA spacecraft, medicines, and submarines, earthquake-proof buildings and bridges.*

## In Memoriam:

### Yoram Kaufman

Edited by Alana Little



Photo credit: Chris Gunn

Caption: Yoram Kaufman

Teams for the MISR and CERES instruments did not record data for a full minute on Sunday, June 4, as NASA's Terra and Aqua satellites flew over Goddard Space Flight Center in Greenbelt, MD. Likewise, the POLDER instrument aboard the European Space Agency's PARASOL satellite and a global network of upward-looking sensors (called sun photometers) within NASA's Aerosol Robotic Network (AERONET) remained inactive during that same span. Each of these instruments observed a moment of data "silence" in honor of Dr. Yoram J. Kaufman. A senior atmospheric scientist at Goddard Space Flight Center, Kaufman died on May 31, from injuries he received in a collision with a car while biking near the GSFC campus on May 26.

Kaufman was a highly regarded Senior Fellow in the Earth-Sun Exploration Division. Kaufman worked on a number of high-profile Earth Science missions developed by NASA or its international partners, especially CNES (French Space Agency) and ISA (Israel Space Agency).

"We lost Yoram Kaufman, a superstar," said Dr. Franco Einaudi, Director of the Earth-Sun Exploration Division at NASA's Goddard Space Flight Center, Greenbelt, Md. "His colleagues at NASA mourn the loss of an exceptional scientist, a compassionate man, a charismatic leader. I mourn the loss of a friend. Our sympathy goes out to Yoram's family during their time of grief."

Among his many accomplishments, he served as the Project Scientist for NASA's very successful Terra mission for four years, carrying this leadership role through its launch in December 1999 and into its first year of Earth observations. He developed methods for remote sensing of fires and aerosols, and he conducted field research on how emissions from fires play a major role in Earth's climate system. Kaufman wrote or co-authored over 200 scientific papers published in refereed journals, including several papers in *Science*, *Nature*, and the *Proceedings of the National Academy of Sciences*.

Kaufman served as Program Manager for NASA's Earth Observatory Web site ([earthobservatory.nasa.gov](http://earthobservatory.nasa.gov)) from its original publication date of April 29, 1999, through January 2006. Today, the Earth Observatory's readership is almost 700,000 unique visitors per month with about 45,000 subscribers worldwide. It was his creative genius and leadership that led to the site's conception and establishment.

In the days before his untimely death, Kaufman was not yet aware that he had been selected by the American Meteorological Society to receive its prestigious Verner E. Suomi Award, which is granted to one individual each year in recognition of highly significant technological achievement in the atmospheric (or related) sciences. He was also a recipient of the NASA/GSFC William Nordberg Award for Earth Science, and received the NASA Medal for Exceptional Scientific Achievement. In 2005, Kaufman was presented with the NASA/GSFC Special Act Award, and he was elected a Fellow of the American Meteorological Society bestowed on less than 0.5% of the 11,000 members of this society. Additionally, during his career at NASA, he received six meritorious awards, including the Peer Award, Exceptional Achievement, Exceptional Performance, and Best Mentor Awards.

His colleagues at NASA and the worldwide Earth science community mourn the loss of an exceptional scientist, a compassionate man, a charismatic leader, and a true visionary with a passion for protecting our home planet.

Kaufman was born on June 1, 1948, in Wroclaw, Poland. He is survived by his wife Jean, his son Nadav, and his daughter Daphne. ■