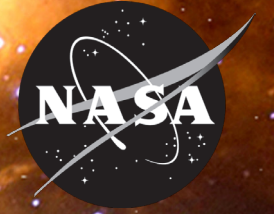


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Hubble's In-Flight Guidance from the Ground

By Robert Garner

The *Hubble Space Telescope* has logged millions of miles and taken thousands of pictures since its launch in 1990, thanks in part to the around-the-clock efforts of a small group of dedicated engineers and technicians at NASA's Goddard Space Flight Center in Greenbelt, Md.

"*Hubble* is a truly amazing telescope, but as sophisticated as it is, it can't function completely on its own," said *Hubble* Operations Manager Mike Prior at Goddard. "That's why technicians provide around-the-clock support in the Mission Operations Room Command Center."

It's up to the Mission Operations staff to upload the commands to *Hubble* that tell it where to point and when, what sensing instruments to use, and when to send data back to Earth. They also troubleshoot any problems that may arise. According to Prior, there are always at least four flight controllers on duty in the Space Telescope Operations Control Center (STOCC), managing *Hubble's* daily operations. During each shift, the flight controllers receive support from at least two data operations technicians. "From the ground, we monitor the health and status of the telescope all the time," Prior says. "Without all the operators here, *Hubble* would be unable to perform science observations because it wouldn't know where to point, and wouldn't be able to send the data back to the ground to the thousands of scientists around the world."

To help the staff stay on top of telescope operations, *Hubble* transmits engineering data back to the command center at Goddard, which contains information on how the telescope is functioning.

Training and Staffing for Servicing Mission 4

With the fourth *Hubble* servicing mission scheduled for late summer 2008, the Command Center's responsibilities will swell far beyond the normal day-to-day operations. Shortly before the next servicing mission, about 50 engineers will begin working full-time in the Servicing Mission Operations Room. The team will work 12-hour shifts supporting mission preparations, tests, and simulations. During the mission, they are responsible for commanding (controlling) *Hubble*.

These extra hands on deck are vital for mission success because of how much more complex operations become during a *Hubble* servicing mission. "You're putting the telescope into modes it's not normally in and turning things off and back on," says Prior. "There's a lot more complexity involved when you do that."

Practice Makes Perfect

Detailed preparation and training for a *Hubble* mission begins years before launch. *Hubble* has only been serviced four times since its launch in April 1990, and the last visit to the telescope was in 2002. The STOCC team truly benefits from refresher training. Many of the engineers have worked on previous servicing missions, but for some, this *Hubble* mission will be their first.

To help the STOCC team prepare for the servicing mission, training simulations, or "sims" as the team calls them, are being conducted in the STOCC. To duplicate

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Cover caption: Artist's rendering of the GLAST spacecraft in orbit above Earth.

Photo Credit: General Dynamics

GoddardView Info

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Editor: John Putman

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Hubble's In-Flight Guidance from the Ground

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the real thing, engineers use a sophisticated software program that is carefully designed to exactly duplicate *Hubble's* behavior. Mechanical simulators would require modifications to mimic problems, but this software allows operators greater freedom to "...play with parameters and make things look like they're not going according to plan without actually doing anything to *Hubble*," Prior says.

"The Goddard sims and joint integrated sims with NASA's Johnson Space Center more than satisfy the training requirement," said *Hubble* Operations Support Team member Pete Pataro at Goddard, who has participated in every *Hubble* servicing mission since Servicing Mission 1 (SM1) in 1993.



Photo credit: NASA

Caption: Engineers at Goddard's Space Telescope Operations Center monitor Hubble operations around the clock.

Throwing Curve Balls

Each simulation is more intense than what is expected during the actual mission. The managers keep secret the emergency scenarios they throw out to the team, which keeps operators on their toes. Types of simulated faults may include difficulty powering *Hubble* back up after an instrument installation, problems closing the telescope's aperture door, or communications errors. These little hiccups better prepare the team for potential real issues with *Hubble* during the mission.

Controllers began conducting sims in August 2007. Twelve sims are scheduled to occur before Space Shuttle *Atlantis* lifts off this summer. Each person scheduled to staff the STOCC command center during the *Hubble* mission must successfully complete a minimum of 35 hours of training.

The shortest STOCC sim is 7 hours, with the longest topping out at 39. There are also typically eight joint sims that Goddard conducts with Johnson Space Center, which last from 9 to about 36 hours.

Many Tasks and Only Five Space Walks

The seven astronauts selected for this last service call to the famed telescope have many tasks to accomplish during only five spacewalks that average 6 hours each.

"*Hubble* servicing mission timelines have always been totally subscribed and this mission is no different," said Mike Weiss, *Hubble's* Technical Deputy Program Manager at Goddard. The SM4 astronauts will be called upon to install two new science instruments, repair two existing ones, install a Fine Guidance Sensor, replace the gyroscopes and batteries, and perform other activities, so efficiency is of the utmost importance both in orbit and on the ground.

With the exceptional experience and dedication of the STOCC team, *Hubble* team, and the astronauts, this servicing mission will extend the operational life of the telescope for at least five years or more—possibly offering overlapping observations with a follow-on mission called the *James Webb Space Telescope*. ■

Construction Update #1 on NASA Goddard's New Science Building

By Rob Gutro

This is the first in a recurring series of articles chronicling the construction of Goddard's Exploration Sciences Building.



Photo Credit: NASA/Dave Larsen

Caption: The south side of the Exploration Sciences Building looking west.

There's been a lot of activity on the job site of NASA Goddard's Exploration Sciences Building this winter. Located between Goddard's east and west campus, construction of the new, environmentally friendly sciences building, by the Manhattan Construction Company of Fairfax, Va., is progressing.

The three-story office and laboratory building was designed by EwingCole, an architecture and engineering firm with offices in Philadelphia and Washington, D.C. Ground was broken on the building site on July 16, 2007. The multimillion dollar Exploration Sciences Building is the first building project of the Goddard Space Flight Center's campus master plan, and serves as a "launching pad" for NASA-driven space science research over the next 50 years and anchors a new pedestrian-friendly "science neighborhood."



Photo Credit: NASA/Dave Larsen

Caption: Footings and concrete "slab on grade" (SOG).

Construction of the environmentally conscientious building has begun with the initial pour of the footings and concrete "slab on grade" (SOG) as seen in the above photo taken January 31st. The SOG is reinforced with steel reinforcing bar and wire mesh, and serves as the base for the remaining concrete pours for the upper floors.

David Larsen, Exploration Sciences Building Project Manager at Goddard said, "The building is divided into three areas, A, B, C. The A and B areas comprise the office portion of the building, while the C area serves as the lab portion. To date, the first and second floors of the office portion have been poured and the first floor of the C area is about 66% complete." Larsen said overall the project is 17 percent complete. The completion date is still expected in 2009.



Photo Credit: NASA/Dave Larsen

Caption: Rebar reinforcements.

The next steps in the construction are to complete the building structure and then begin to "dry it in." That means to put on the roof, siding, and windows. This work will continue through the summer and into the fall of 2008.

The Exploration Sciences Building will provide state-of-the-art chemistry, electronics and research laboratories, and technology. The new building will be occupied by personnel from the Astrophysics Science Division, the Solar Systems Exploration Division, as well as the Directorate office itself.

For more information about NASA's Green Building, please visit the Web site: http://www.nasa.gov/centers/goddard/news/green_building.html. ■

Dr. King Ceremony Reflects on Keeping the Dream Alive

By Dewayne Washington

The Goddard community embraced an opportunity to commemorate the life and legacy of Dr. Martin Luther King, Jr., on January 24 in the Building 8 auditorium. For more than 8 months, Tonjua Hines-Watts, chairperson of the African American Advisory Committee, had envisioned a program that would allow all members of the Goddard community to gather and reflect on the ideals for which Dr. King stood.

“Unless you are a person of color who lived through those times [the Civil Rights movement], it is hard to understand the hardships that people endured,” said Dr. Ed Weiler, Center Director. “It is even harder to understand the enormous impact Dr. King had on this country.”

The key note speaker was U.S. Congressman Elijah Cummings, of the 7th Congressional District of Maryland. “Mr. Cummings, we share your vision here at Goddard and in our own way we are inspiring a new generation of explorers, scientists, and engineers,” said Weiler in his introduction. “We are doing our part to create an America closer to the just nation that Dr. King envisioned.”



Photo Credit: Debora McCallum

Caption: U.S. Congressman Elijah Cummings.

During an inspiring presentation of reflection, encouragement, and challenge, Cummings stated, “The things that concern the people for whom I represent the most are that most of our children are not being properly parented, and they are not getting an education. What do we do now that he [Dr. King] is gone to fulfill his dream?”

Congressman Cummings insisted throughout his presentation that we must combine a sense of excellence with a sense of urgency and a sense of determination. “I love Dr. King’s dream of economics...but you must also have the education to take advantage of those opportunities.”

Cummings reflected on Dr. King’s appreciation for education and excellence: “Did you know that Dr. King often spent 15 hours on a 20 minute speech? 15 hours?” Cummings believed that Dr. King had a thirst for knowledge, for excellence, and for making sure that each generation was

prepared. According to Cummings, throughout his journey, Dr. King had a sense of urgency and a realization that his actions would have an impact on others. “All of us are on this Earth to help somebody, to be the bridge to help them get from point-to-point,” said Cummings. “If it hasn’t happened to you yet, just keep on living, it will.”

To illustrate Dr. King’s determination, Cummings spoke of how he was able to overcome challenges with determination, “My entrance scores for grad school were lower than a footprint.” Cummings graduated from the University of Maryland with honors and insists it was through sheer determination. “You have to understand, I had been dreaming of being a lawyer since I was seven years old. I knew my life depended upon my getting through law school.”

In his final remarks, Cummings told the standing-room-only crowd that they must be determined and disciplined because, “There are people out there who don’t want you to get to where you want to go.” Cummings said that Dr. King understood this, “. . .but he knew how to be determined and how to bring them along.” The Congressman closed by reciting words to ‘We Shall be Free,’ a song written by his friend, Garth Brooks.

Lori Simmons, chief of Goddard’s Equal Opportunity Programs Office, thanked the Congressman for his inspiring words and presented him with a glass etching of the *Hubble Space Telescope*. “Your words of excellence and education certainly are inspiring, important, and compelling for us and remind us that it is the responsibility of all of us to keep Dr. King’s dream alive.”

There was also a 20 minute Goddard video of music, portions of Dr. King’s speeches, and Goddard community members expressing how Dr. King had affected their lives. “His movement opened up opportunities for us in a much faster way than ever before,” remembered Walter Flournoy.

Lori Moore, of the Goddard Human Capital Office, presented detailed information about the building of the MLK National Memorial on the Mall in Washington, D.C. There was also recognition given to the Kenmore Middle School Concert Choir and Angela Conway for providing musical selections during the program. Other Goddard committees also participated by contributing food samples for the event.

“I want to thank Goddard’s leadership for their support; you looked good today,” said Hines-Watts in her concluding remarks. As Goddard community members returned to their work spaces, many could be heard talking about what they had just experienced. “Today for me it was about greatness,” remarked LaShawn Davis. Others could be heard saying, “This was the best celebration we have ever had at Goddard.” ■

46th Goddard Symposium—Premiere AAS Event

By Dewayne Washington

What began as a meeting of stakeholders for a pioneering industry has evolved to become a premiere event in the Washington, D.C. area sponsored by the American Astronautical Society (AAS). Forty-seven years later, the annual Robert H. Goddard Memorial Symposium continues to attract NASA, aerospace, and academic leaders, as well as members of Congress to present and discuss space exploration.

The first Goddard Symposium was held in 1961 in conjunction with the National Space Club's annual Goddard Dinner. The theme that year was "Interaction of Space Vehicles with an Ionized Atmosphere." That first meeting was enthusiastically supported by Mrs. Robert Goddard.



Caption: Nobel Laureate Dr. John C. Mather.

"Today the goal is to continue bringing together leaders in government, industry, academia, and entrepreneurs to consider the history and current state of space exploration and commercialization," said James Kirkpatrick, Executive Director of AAS. "Collectively there will be discussion about new plans and prospects for the future of humanity in space. It is also an excellent opportunity for anyone in the industry to gain a better understanding about what is evolving within the aerospace industry."

For the 46th Robert H. Goddard Memorial Symposium, to be held March 4–6, 2008 at the Greenbelt Marriott Hotel, the theme will be "Exploration to Commercialization: Going to Work in Space." On the eve of NASA turning 50, NASA Administrator Dr. Michael Griffin will talk about NASA's current vision of returning to the Moon while preparing to journey to Mars and beyond. Other presentations will include humans working in space, the emerging space adventure industry, and spaceports and commercial space launches. You can view the complete 2008 program at <http://www.astronautical.org>.

The Symposium soon became an annual event and themes gradually evolved from strictly technical to more general topics of interest to the civil space community. NASA Goddard Space Flight Center began officially supporting the Symposium in 1997 with prepaid registration for Center personnel to attend.



Caption: Dr. James Garvin.

New for this year, the Symposium has also scheduled a Young Professionals Networking Reception, as the kick-off event on the evening of March 4. All receptions and the two-day Symposium are open to the Goddard civil servant community. You do not need to register, but you will need to bring your employee badge and sign in. Tickets are available for purchase if you would like to attend the luncheons.

The Goddard Symposium also recognizes major anniversaries such as Robert Goddard's first liquid rocket flight, the launch of Sputnik, the establishment of NASA, and the Goddard Space Flight Center. This year's recognitions will include the Vanguard mission and Goddard's support work of the Intergovernmental Panel on Climate Change, which earned Vice President Al Gore the 2007 Nobel Peace Prize. ■



Caption: Dr. Laurie Leshin.

The Innovative Partnerships Program Quiz: Headquarter's IPP Seed Fund

By Nicole Quenelle

While the Headquarter's Seed Fund Call for Proposals is still months away, Goddard's Innovative Partnerships Program (IPP) Office is working to educate innovators now about the ins and outs of Seed Fund proposals and partnerships. These efforts complement a variety of IPP Office communication vehicles including quarterly training sessions (next scheduled for March 27), Goddard Tech Transfer News (the Office's quarterly publication), events, and more.

This issue's quiz helps civil servants and contractor personnel test their own knowledge about the HQ IPP Seed Fund process. Read on to test your knowledge, and find out how you can learn more. Decide whether the following HQ IPP Seed Fund-specific statements are true or false.

- The HQ IPP Seed Fund Call for Proposals isn't until late spring/summer, but now is a good time to start thinking about partnerships that would result in a good proposal.
 - **True.** It's always best to begin planning far in advance of the Call for Proposals to put together viable partnerships. If you have a research proposal in mind, it's best to begin discussions with interested parties now so that you already have an established relationship in place by the time the Call is issued.
- Establishing a relationship with a non-NASA partner is something I need to handle on my own.
 - **False.** The IPP Office has skilled personnel that can help you identify potential partners for possible HQ IPP Seed Fund proposals, as well as a number of other collaboration opportunities. Contact the IPP Office to let them know about the research you have in mind so that they can help put in place a Memorandum of Understanding (MOU), Space Act Agreement (SAA), or other agreement so that you can firmly establish relationships in preparation for the Headquarters IPP Seed Fund Call for Proposals.
- I need to line up an external partner that will contribute dollar for dollar in actual funding to match the requested Seed Fund contribution.
 - **False.** Your external partner from any non-NASA organization—from industry, academia, or other Government agency—must match the Seed Fund contribution dollar for dollar, but this cost sharing may take multiple forms (e.g., in-kind) such as equipment, work-year equivalents, access to facilities and materials, etc.
- I need to have a NASA program lined up that will contribute dollar for dollar to the research in order for my proposal to be competitive.
 - **False.** In order for your proposal to be considered for Seed Funding, you must have a NASA program or project interested enough to contribute some resources to the research, but unlike the external partner's contribution, the NASA program need not match the funding dollar for dollar. In addition, this contribution can be in the form of actual funding or in-kind contributions.
- In choosing a NASA program to align with for my proposal, it is best to stick with Goddard programs and projects.
 - **False.** Cross-Center collaboration is becoming highly valued to help find solutions to NASA mission needs. Collaborating with other Centers may, in fact, increase the value of your proposal and make it more competitive.
- I have an idea for research that would boost my Technology's Readiness Level (TRL) to level 5 or 6, which is a good level for a Seed Fund proposal.
 - **True.** Proposals featuring technologies that could realistically be infused into mission planning within the next year or so (i.e., those at TRL level 5 or 6) are ideal candidates for Seed Funding. Technologies with lower TRL levels are not considered as competitive because it would take much longer for them to be ready for use by a NASA mission.

To learn more about the HQ IPP Seed Fund, to get started forming a partnership in preparation for the Call for Proposals, or for information about the March 27 training session, please contact Goddard's IPP Office today: 301.286.5810, techtransfer@gsfc.nasa.gov. ■

NASA Calls for Suggestions to Rename Future Telescope Mission

By Grey Hautaluoma, Lynn Cominsky, and Rob Gutro

NASA announced Thursday, February 7, that members of the general public from around the world will have a chance to suggest a new name for the cutting edge *Gamma-ray Large Area Space Telescope* (GLAST) observatory before it launches in mid-2008. The satellite will observe some of the most powerful forces known in the universe.

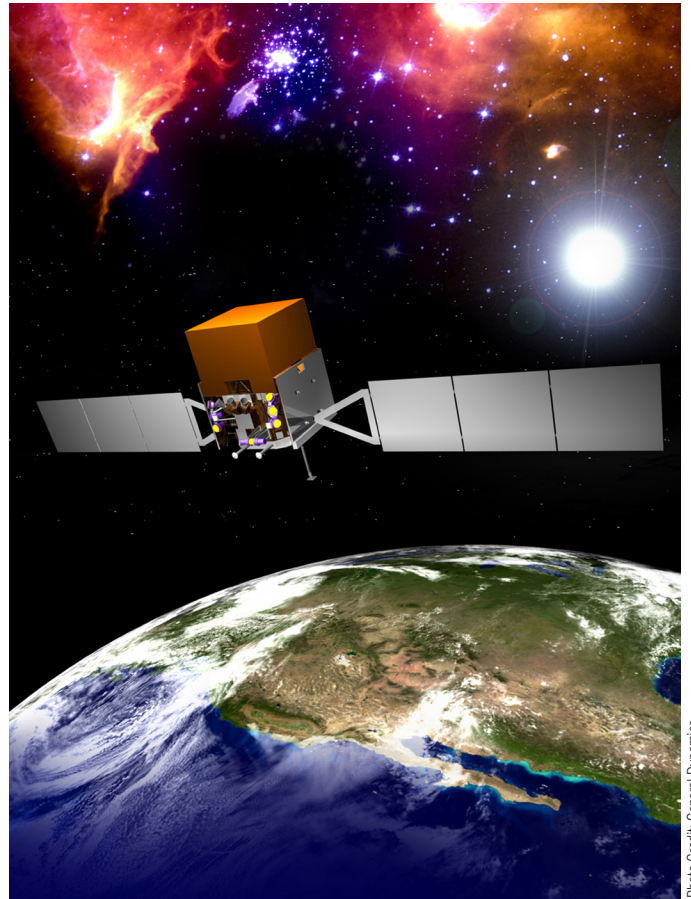
“The idea is to give people a chance to come up with a name that will fully engage the public in the GLAST mission,” said Steve Ritz, the mission’s Project Scientist at NASA’s Goddard Space Flight Center, Greenbelt, Md.

“We’re looking for name suggestions that will capture the excitement of GLAST’s mission and call attention to gamma-ray and high-energy astronomy. We are looking for something memorable to commemorate this spectacular new astronomy mission,” said Alan Stern, Associate Administrator for Science at NASA Headquarters in Washington. “We hope someone will come up with a name that is catchy, easy to say, and will help make the satellite and its mission a topic of dinner table and classroom discussion.”

Suggestions for the mission’s new name can be an acronym, but it is not a requirement. Any suggestions for naming the telescope after a scientist may only include names of deceased scientists whose names are not already used for other NASA missions. All suggestions will be considered. The period for accepting names closes on March 31, 2008. Participants must include a statement of 25 words or less about why their suggestion would be a strong name for the mission. Multiple suggestions are encouraged.

To submit a suggestion for the mission name, visit:
<http://glast.sonoma.edu/glastname>.

Anyone who drops a name into the “Name That Satellite!” suggestion box on the Web page can choose to receive a “Certificate of Participation” via



Caption: Artist's rendering of the GLAST spacecraft in orbit above Earth.

Photo Credit: General Dynamics

return e-mail. Participants also may choose to receive the NASA press release announcing the new mission name. The announcement is expected approximately 60 days after launch of the telescope.

NASA's GLAST mission is an astrophysics and particle physics partnership, developed in collaboration with the U.S. Department of Energy, along with important contributions from academic institutions and partners in France, Germany, Italy, Japan, Sweden, and the U.S. ■

NASA's Deep Impact Begins Hunt for Alien Worlds

By Nancy Neal-Jones and Bill Steigerwald

NASA's *Deep Impact* spacecraft is aiming its largest telescope at five stars in a search for alien (exosolar) planets as it enters its extended mission, called EPOXI.

Deep Impact made history when the mission team directed an impactor from the spacecraft into comet Tempel 1 on July 4, 2005. NASA recently extended the mission, redirecting the spacecraft for a flyby of comet Hartley 2 on Oct. 11, 2010.

As it cruises toward the comet, *Deep Impact* will observe five nearby stars with "transiting exosolar planets," so named because the planet transits, or passes in front of, its star. The EPOXI team, led by University of Maryland astronomer Dr. Michael A'Hearn, directed the spacecraft to begin these observations January 22. The planets were discovered earlier and are giant planets with massive atmospheres, like Jupiter in our solar system. They orbit their stars much closer than Earth does the Sun, so they are hot and belong to the class of exosolar planets nicknamed "Hot Jupiters."

However, these giant planets may not be alone. If there are other worlds around these stars, they might also transit the star and be discovered by the spacecraft. *Deep Impact* can even find planets that don't transit, using a timing technique. Gravity from the unseen planets will pull on the transiting planets, altering their orbits and the timing of their transits.

"We're on the hunt for planets down to the size of Earth, orbiting some of our closest neighboring stars," said EPOXI Deputy Principal Investigator Dr. Drake Deming of NASA's Goddard Space Flight Center in Greenbelt, Md. EPOXI is a combination of the names for the two extended mission components: the exosolar planet observations, called Extrasolar Planet Observations and Characterization (EPOCh), and the flyby of comet Hartley 2, called the Deep Impact eXtended Investigation (DIXI). Goddard leads the EPOCh component.

More than 200 exosolar planets have been discovered to date. Most of these are detected indirectly by the gravitational pull they exert on their parent star. Directly observing exosolar planets by detecting the light reflected from them is very difficult, because a star's brilliance obscures light coming from any planets orbiting it.

Sometimes, however, the orbit of an exosolar world is aligned so that it eclipses its star as seen from Earth. In these rare cases, called transits, light from that planet can be seen directly.

"When the planet appears next to its star, your telescope captures their combined light. When the planet passes behind its star, your telescope only sees light from the star. By subtracting light from just the star from the combined light, you are left with light from the planet," said Deming, who is leading the search for exosolar worlds with *Deep Impact*. "We can analyze this light to discover what the atmospheres of these planets are like."

Deep Impact will also look back to observe the Earth in visible and infrared wavelengths, allowing comparisons with future discoveries of Earth-like planets around other stars.

The University of Maryland is the Principal Investigator institution, leading the overall EPOXI mission. NASA Goddard leads the exosolar planet observations, EPOCh. NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages EPOXI for NASA's Science Mission Directorate, Washington, D.C. The spacecraft was built for NASA by Ball Aerospace & Technologies Corp., Boulder, Colo. ■



Caption: Image of comet Tempel 1 taken 67 seconds after it obliterated Deep Impact's impactor spacecraft. The image reveals topographic features, including ridges, scalloped edges, and possibly impact craters formed long ago

Photo Credit: NASA/JPL-Caltech/UMD

GLAST's Delta II Rocket's First Stage Arrives in Cape Canaveral

By Rob Gutro and Jeanne Ryba

The first stage of the Delta II rocket that will be used to launch the Gamma-ray Large Area Space Telescope (GLAST) into space in May has arrived at Hangar M on the Cape Canaveral Air Force Station (CCAFS) in Florida. It joins the second stage, which is already at CCAFS.

"This first stage, along with the second stage and the solid rocket motors, will provide the ride that the GLAST observatory needs to reach its mission orbit," said Kevin Grady, the GLAST Project Manager at Goddard Space Flight Center, Greenbelt, Md. "With the arrival of this launch vehicle hardware at the Cape, the beginning of this extraordinary high energy physics era in space is just a handful of months away."

GLAST is a powerful space observatory that will explore the most extreme environments in the universe, where nature harnesses energies far beyond

anything possible on Earth. It will search for signs of new laws of physics and what comprises the mysterious Dark Matter, explain how black holes accelerate immense jets of material to nearly light speed, and help crack the mysteries of the powerful explosions known as gamma-ray bursts.

GLAST is scheduled to be launched on May 16 from Launch Pad 17-B on CCAFS. After on-orbit checkout, NASA is planning to rename the observatory. A suggestion box that is now open to the public has been established. To submit a suggestion, fill out the information at: <http://glast.sonoma.edu/glastname>. The closing date for suggestions is March 31.

NASA's GLAST mission is an astrophysics and particle physics partnership, developed in collaboration with the U.S. Department of Energy, along with important contributions from academic institutions and partners in France, Germany, Italy, Japan, Sweden, and the United States.

For more GLAST news, see the article on Page 8 of this issue. For more information about the GLAST mission, please visit: <http://www.nasa.gov/GLAST>. ■



Caption: The United Launch Alliance Delta II rocket's first stage was revealed after the cover was removed from the truck that delivered it. It was delivered during the week of Feb. 4.

Photo Credit: NASA

NASA Astrophysicist Wins Arctowski Medal

By Bill Steigerwald

The National Academy of Sciences will award the 2008 Arctowski Medal to Dr. Leonard Burlaga, an Astrophysicist at NASA's Goddard Space Flight Center in Greenbelt, Md.

The award will be presented at an awards ceremony on Sunday, April 27, 2008, in Washington, D.C., in conjunction with the Academy's annual meeting. The Arctowski Medal is presented to honor outstanding contributions to the study of solar physics and solar-terrestrial relationships. The award cites Burlaga "...for pioneering studies of the magnetized solar wind plasma from 0.3 to 102 AU, including the recent crossings of the Voyagers of the heliospheric termination shock and their entry in the heliosheath."

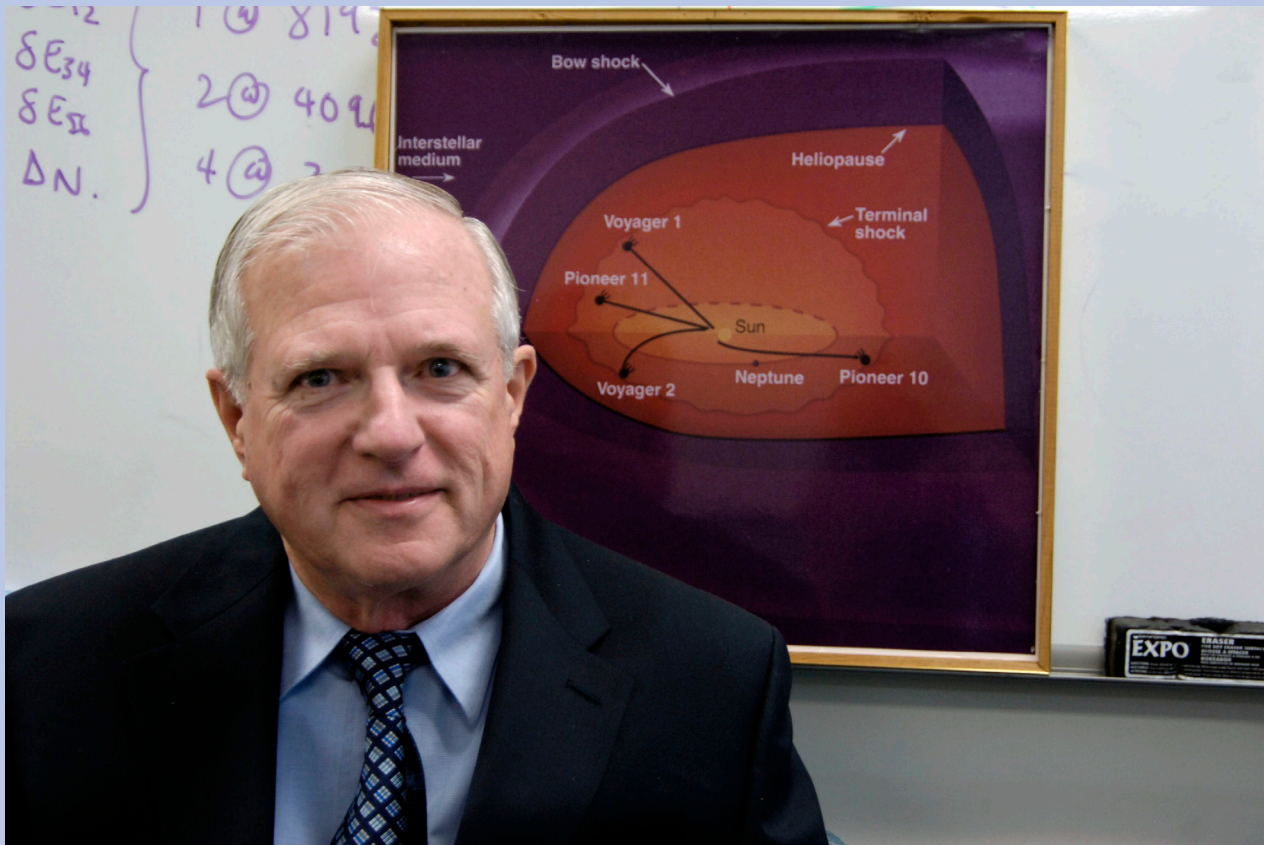
The award carries with it a medal and a prize of \$20,000. In addition, it carries a \$60,000 award to an institution of the recipient's choice to further research in solar physics and solar terrestrial relationships.

The award has been given to one person every three years since 1969. It was established by a bequest of Jane Arctowski in honor of her husband, Henryk Arctowski, a Polish scientist, oceanographer, and Antarctic explorer. He was in charge of physical observations on the Belgian Antarctic Expedition of 1897-1899. This was the first expedition to spend the winter

in the Antarctic. His name has been given to a phenomenon in which a halo resembling a rainbow, with two other partial arcs symmetrical to the main one, forms around the Sun as light is refracted through ice crystals in the atmosphere.

"It is a very special honor for me, as a scientist at NASA, to be associated with the name of the great explorer and scientist, Henryk Arctowski," said Burlaga. "This Award, to me, recognizes achievements of NASA and the citizens of the United States in the exploration of the solar system."

The National Academy of Sciences (NAS) is an honorific society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. The NAS was signed into being by President Abraham Lincoln on March 3, 1863, at the height of the Civil War. Since then, the Nation's leaders have often turned to the National Academies for advice on scientific and technological issues. ■



Caption: Dr. Leonard Burlaga.

Photo Credit: Debora McCallum

New Faces:

This is the first installment of a monthly feature spotlighting new members of the Goddard community.

By John Putman



Photo credit: Pat Izzo

Caption: Kelly Jonas.

Kelly is a Contract Specialist in the Mission Enabling Procurement Office. She started at Goddard on January 7, 2008.

NASA Goddard was a perfect fit for Kelly. She came from the purchasing and procurement field and a position with a national communications company.

At a friend's recommendation, she used <http://www.usajobs.gov>, the job site of the Federal Government, to find a Government job suitable to her expertise. She was drawn to NASA because, in Kelly's words, NASA has, "A lot to offer employees."

Kelly currently lives in Laurel, Md., and based her decision to come to Goddard partly on its proximity to her home and family. Speaking of family, Kelly has two children—a preteen and a teenager.

Kelly's outside interests revolve around the activities of her kids. She stays busy with her children and all of their extra-curricular activities. ■



Photo credit: Pat Izzo

Caption: Tamra Goldstein.

Tamra is a Systems Engineer for Business Operations in Systems Management (Code 730). She started at Goddard on January 6, 2008.

With 20 years of Federal service dedicated to IT process improvement, Tamra had been drawn to NASA for a while because she was, "Interested in its rigor, processes, and system engineering" approach.

Even in her short tenure, Tamra already likes the structure of NASA Goddard and enjoys being part of NASA's, "...unique mission."

Tamra is currently involved with two projects: the IT Investment work and Code 730 Operations Support.

When not at Goddard, Tamra's two children keep her busy with soccer and gymnastics. She also supports her local contractor (her husband) by getting her hands dirty completing varied home improvement projects. ■