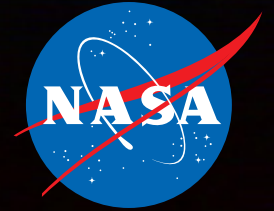


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# Goddard View

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## Gehrels Elected Fellow of American Academy

By Robert Naeye and Rob Gutro



Astrophysicist Dr. Neil Gehrels of NASA's Goddard Space Flight Center in Greenbelt, Md., has just been elected as a Fellow of the American Academy of Arts and Sciences. Founded in 1780 by John Adams, the American Academy honors distinguished scientists and leaders in public affairs, business, administration, and the arts.

Photo credit: NASA

"I am tremendously honored to be elected a member of such a prestigious institution," says Gehrels. "I feel very thankful to be working at a place like Goddard, which gave me the opportunity to be involved in forefront research."

Gehrels serves as Principal Investigator of NASA's *Swift* mission, and Deputy Project Scientist of NASA's *Gamma-ray Large Area Space Telescope* (GLAST) satellite. Since its launch on November 20, 2004, *Swift* has greatly advanced astronomers' understanding of powerful stellar explosions known as gamma-ray bursts. When launched later this year, GLAST will open a new window on some of the most energetic, exotic, and extreme objects in the universe.

Based in Cambridge, Mass., the American Academy has members such as George Washington, Benjamin Franklin, Thomas Jefferson, Alexander Graham Bell, Woodrow Wilson, Ansel Adams, Aaron Copland, and Dr. Martin Luther King, Jr. Gehrels and other newly elected members will be formally inducted at the House of the Academy in Cambridge, Mass., on Saturday, October 11, 2008.

Gehrels joins his wife, Dr. Ellen D. Williams, as a member of the American Academy. Williams is a solid-state physicist at the University of Maryland, College Park. She was elected as an American Academy Fellow in 2003.

"I'm looking forward to joining the same society as B.B. King," says Gehrels, who is a long-time fan of the legendary blues singer and guitarist. King is also being inducted this year. "I used to go to his concerts when I was young, and I'll make a point to meet him if he attends the induction ceremony."

Gehrels earned his Ph.D. in physics from Caltech in 1981, and came to Goddard as a postdoctoral researcher in the same year. He later served as Project Scientist for NASA's Compton Gamma-Ray Observatory, which was the second of NASA's four Great Observatories. Among his many other honors, Gehrels and his *Swift* Science Team won the 2007 Rossi Prize from the American Astronomical Society's High-Energy Astrophysics Division. He is also the 2005 recipient of Goddard's John C. Lindsay Memorial Award for Space Science. Gehrels is a Fellow of the American Physical Society and an adjunct professor of astronomy at the University of Maryland, and of astronomy and astrophysics at The Pennsylvania State University.

For more information on GLAST and Neil Gehrels, visit:  
[http://www.nasa.gov/mission\\_pages/GLAST/team/GEHRELS-bio.html](http://www.nasa.gov/mission_pages/GLAST/team/GEHRELS-bio.html). ■

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Cover caption: One of many coronal loops revealed by the *Transition Region and Coronal Explorer* (TRACE).

Photo Credit: NASA.

## GoddardView Info

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**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 [john.m.putman@nasa.gov](mailto:john.m.putman@nasa.gov). Ideas for new stories are welcome but will be published as space allows. All submissions are subject to editing.

# Goddard Celebrates Earth Day 2008: A Focus on Climate Change

By Darlene Squibb and Sarah Dewitt

At Goddard, one can honestly say that every day is Earth Day. For two weeks, the Center celebrated Earth Day with planet-friendly activities for employees, children, and visitors.

The events kicked off with a Center clean up on April 15. Approximately 15 employees participated, and picked up trash and recyclables from the front of the Center.

April 22, Earth Day, brought beautiful weather and a host of exciting events. The day began with a ceremony honoring the Goddard Earth scientists who contributed to the Intergovernmental Panel on Climate Change (IPCC) reports, and who were awarded the 2007 Nobel Peace Prize along with former Vice President Al Gore. Panelists Bob Cahalan, Rich Stolarski, Lorraine Remer, David Rind, and Cynthia Rosenzweig spoke about their decades of work in climate research and with the IPCC.

The Building 8 lobby was host to a variety of institutional exhibits. From the Safety and Environmental Division, were GSFC's Environmental Management Program, GSFC's recycling programs with composting and a recycling jeopardy game, and the onsite wetland mitigation project that was associated with the rerouting of Soil Conservation Service Road. The Facilities Management Division displayed information on the new Exploration Sciences Building being constructed under the Leadership in Energy and Environmental Design (LEED) rating system developed by the U.S. Green Building Council. The Goddard Child Development Center submitted four recycled art projects for display. Fred Pierce from the Goddard Conservation Club brought his display of the birds of Goddard with data collected over the years.



Photo credit: Debora McCallum

*Caption: Fred Pierce shows off pictures of Goddard bird life.*

Goddard's Environmentally Friendly Transportation Show took place in the Building 8 parking lot. Employees showed off their personal alternative fuel vehicles, or other fuel efficient vehicles, alongside the GSFC fleet. The Center held an Alternative Fuel Vehicle logo contest with 33 employee-designed logos. The Logistics and Transportation Management Branch presented commuting alternatives with local community leaders. Cyclists around Center gathered at noon for the first-ever Earth Day Bike Rally to share information and make plans for Bike to Work Day on May 15.



Photo credit: Debora McCallum

*Caption: Goddard employees check out a fuel efficient Smart car at the Environmentally Friendly Transportation Show.*

Later that day, special guest Dr. James Hansen, Director of the Goddard Institute for Space Studies (GISS), gave a keynote presentation, "The Dark and Bright Sides of Global Warming" to a packed house of Goddard employees. The NASA Federal Credit Union provided refreshments and two 3D Earth puzzles.



Photo credit: Debora McCallum

*Caption: Dr. James Hansen addresses Goddard employees.*

April 24 was "Take Your Child to Work Day," and the Visitor Center was full of GSFC employees and their children. Several hundred visitors enjoyed Earth science activities and presentations throughout the day. Goddard's Peter Hildebrand led an informal "science café" discussion about climate change at the Building 21 cafeteria picnic area. A few dozen employees and their families listened and asked important questions about climate change and the human footprint on our planet.

The final Earth Day activity was on April 29 with storm drain stenciling. You can now see the words "Chesapeake Bay Drainage" on most Goddard storm drains thanks to employee participation over the last three years.

Goddard's 2008 Earth Day celebration was a huge success, thanks in large part to the active participation of many Goddard employees and their families. The Center is already looking forward to Earth Day 2009! ■



## NASA Makes Space Day a Hit at Two Museums at Once

By Rob Gutro

NASA Goddard scientists and public affairs officers were joined by outreach staff from the Space Telescope Science Institute (STScI) to bring space to the general public in two places at the same time on Saturday, May 3, 2008.

Several NASA space scientists were at the Maryland Science Center (MSC) in Baltimore, Maryland's Inner Harbor, and the National Air and Space Museum (NASM) on the National Mall in Washington, D.C., to educate the general public about NASA space science missions.

The appearances at both institutions were coordinated through Rob Gutro in the Goddard Public Affairs Office. Gutro worked with Amy Wood, SpaceLink Exhibit Manager at the MSC, and Mychalene Giampoli at NASM, to coordinate both events. Public affairs officers from Baltimore's STScI also came to both venues to represent the *Hubble Space Telescope* and the *James Webb Space Telescope*.

Space Day was established in 1997 to promote science, technology, math, and engineering to inspire young people and get them excited and enthusiastic about the wonders of the universe. It takes place once a year on the first Friday in May.

At the Maryland Science Center, the scientists were set up at tables in the second floor SpaceLink area of the museum. They were equipped with backdrops, props, posters, movies on laptops, and even an astronaut suit. Each table had handouts with information about various missions, and giveaways like lithographs, stickers, pins, and pens. "It was a perfect weather day, and a lot of people were out at Baltimore's Inner Harbor, so we had a steady stream of visitors over the 5 hour period," Gutro said.

"Interest in NASA missions seemed high," said David Thompson, Deputy Project Scientist for the *Gamma-ray Large Area Space Telescope* (GLAST), who was at MSC. "The most frequent question was about GLAST's launch date, but also where this mission was going. Exploration was clearly on people's minds."

Dean Pesnell, the Project Scientist on the *Solar Dynamics Observatory* (SDO), was also at MSC and had a popular kids' activity on magnetism at his busy table. Both Thompson and Pesnell gave 10–15 minute presentations on GLAST and SDO, respectively, in the SpaceLink area.

Rani Gran and Laura Layton of the NASA Goddard Public Affairs Office helped promote SDO and STEREO, and Bonnie Eisenhammer and Linda Knisely of STScI brought *Hubble* and solar system information.

"I definitely think Space Day was a success," said Amy Wood, SpaceLink Exhibit Manager at MSC. "I really appreciate you guys attending and representing Goddard."

The National Air and Space Museum in Washington, D.C. was bustling with activity on Space Day. Present from Goddard were Mark Clampin and Nobel Prize winner John Mather.



Image Credit: Lucy Albert  
Caption: JWST exhibit setup in the National Air and Space Museum (NASM) gallery containing the full-scale HST engineering model.

Julie McEnery, a Deputy Project Scientist on GLAST said, "The NASA tables were set just inside the museum doors, so they were the first thing people saw coming in." She said there were hundreds of people, continually at the booth.

In addition to GLAST, Terry Kucera and Jenny Rumburg were promoting the STEREO mission. Terry said "I enjoyed it. We got a lot of people—kids and families, lots of tourists—many international ones. I'd do it again."

David Sibek was educating people about the Time History of Events and Macroscale Interactions during Substorms (THEMIS) mission. Dave said, "I had a great time—lots of visitors, and many were surprisingly knowledgeable. I especially liked talking to budding scientists who were just so incredibly curious. It was also fun talking to people who had seen aurora and asking them to give their impressions. Both kids and senior citizens came by and they all loved seeing our launch video."

John Stoke, the manager of STScI's Informal Education Branch and Outreach Lead on the *James Webb Space Telescope*, who set up an exhibit on the *Webb* telescope and *Hubble* said, "We had a pleasant time at the Smithsonian's NASM discussing the *Webb* telescope with visitors as part of Space Day." In addition to Stoke, from STScI were Vanessa Thomas and Lucy Albert. "Numerous people engaged us in discussions, and lots of kids had fun experiencing the 'magic' of infrared camera vision," Stoke said.

Steele Hill, a *Solar and Heliospheric Observatory* (SOHO) mission Media Specialist and author, had a book signing at NASM. He is the co-author of a photo book on the Sun called "The Sun."

Reflecting on the Space Day events, David Thompson noted, "Space Day is a good opportunity to interact with a wide range of people who are interested in science but not active in the field." ■

## Hubble Astronauts Fit Education Event into Their Training Schedule

By Susan Hendrix

*Hubble* astronauts were at NASA Goddard Space Flight Center in Greenbelt, Md., the week of April 28 practicing hands-on procedures for the last Shuttle trip to the famed telescope later this year.

In addition to their daily briefings and hands-on training inside the world's largest clean room at Goddard, several crew members took part in a virtual education event. STS-125 commander Scott Altman, pilot Gregory C. Johnson, and mission specialists John Grunsfeld, Mike Massimino, Michael Good, and Andrew Feustel came to the Goddard TV studio to participate in a NASA Digital Learning Network (DLN) session. The DLN connect students from across the country with educators and other special guests via videoconferencing, where students and NASA presenters can see and hear one another.

Hundreds of students from five middle schools located in Pennsylvania, New York, Texas, and Washington listened eagerly as each astronaut gave a brief autobiography. Then, pre-selected students took turns asking their favorite astronaut a question.

In a thank-you note to the crew, Jim Stofan, NASA's Deputy Assistant Administrator for Education Programs Integration, said, "On behalf of the entire education team at NASA, I would like to thank each of you for participating in the NASA Digital Learning Network session. We're receiving tremendous feedback on how inspiring you were and that you've sparked the imagination of hundreds of 5th graders."

Servicing Mission 4 marks the last time Shuttle astronauts will visit *Hubble*. For more information about *Hubble* and Servicing Mission 4 preparations, visit: <http://www.nasa.gov/hubble>. For more information about NASA's Digital Learning Network and events, visit: <http://dln.nasa.gov/dln/content/about>. ■



Photo Credit: Michael Weiss

*SM4* spacewalkers John Grunsfeld and Andrew Feustel observe the Wide Field Camera 3, Goddard's in-house built instrument, during Crew Familiarization 4 at Goddard Space Flight Center.



Photo Credit: Ed Campion

NASA education specialist Tara Clopper introduces the STS-125 crew (left to right: Michael Good, Andrew Feustel, John Grunsfeld, Gregory C. Johnson, Scott Altman, and Mike Massimino) at the Distance Learning Network event at Goddard.

## CINDI Hunts Giant, Radio-Busting Plasma Bubbles

By William Steigerwald

They come out at night over the equator—giant bubbles of plasma, a gas of electrically charged particles, silently rise in the upper atmosphere. While invisible to human eyes, they can disrupt crucial radio communication and navigation signals, like the Global Positioning System (GPS). NASA is collaborating with the Air Force on a unique investigation that will study how these bubbles form, by conducting the Coupled Ion Neutral Dynamic Investigation (CINDI) as part of the payload for the Air Force *Communication/Navigation Outage Forecast System* (C/NOFS) satellite.

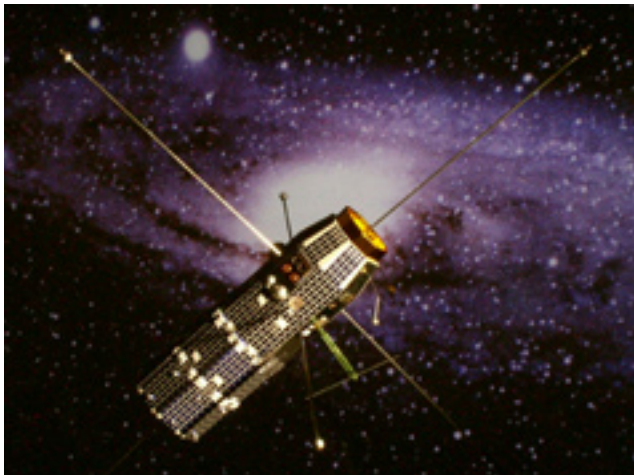


Photo Credit: U.S. Air Force

*Caption: A scale model of the C/NOFS probe. NASA's CINDI instrument is installed on C/NOFS.*

"Understanding when and where plasma bubbles occur, how severe they will be, and how long they will last is vitally important since interference from plasma bubbles affects GPS signals and other radio signals that can travel around the globe by reflection from layers in Earth's upper atmosphere, called the thermosphere and the ionosphere," said CINDI Principal Investigator, Rod Heelis of the University of Texas at Dallas. "These signals are used for communication and navigation by a wide variety of commercial and Government entities, including the Federal Aviation Administration, and search and rescue operations. Most of us are directly or indirectly dependent on the proper function of these space-based systems, and it is imperative that we attempt to predict the times when such systems may not be reliable."

Plasma bubbles form at night because the thermosphere and ionosphere have a mix of plasma and electrically neutral gas, which becomes unstable after sunset. During daylight hours, radiation from the Sun creates plasma by tearing electrons from atoms and molecules in the thermosphere and ionosphere. The solar radiation maintains relatively constant levels of plasma in these regions, so they are quite smooth and well behaved. During the nighttime, however, there is no solar radiation to prevent the charged particles from recombining back into electrically neutral atoms or molecules.

The recombination happens faster at lower altitudes, because there are more heavy charged particles (molecular ions), and they recombine more quickly than charged particles made from single atoms. More rapid recombination makes the plasma less dense at lower altitudes. The region then becomes

unstable because the less dense plasma below, which is trapped in the neutral gas, wants to rise above the higher density plasma above it.

This nighttime instability actually happens at all latitudes, but the equatorial regions become especially turbulent because the plasma bubbles are suspended on Earth's magnetic field, which is horizontal over the equator.

When the overturning starts, the low-density plasma rises to the top of the region, much like air bubbles in water. Scientists use the term "equatorial plasma bubbles" to describe these regions of low-density charged particles. The boundaries of these equatorial plasma bubbles are where the communication and navigation signals are interrupted. At the present time, however, we do not know when these plasma bubbles will appear or how large a region they will occupy.

Scientists aren't sure exactly what triggers the rise of the plasma bubbles. One theory is that winds in the upper atmosphere play a role. CINDI is designed to fly through these regions and determine the conditions that exist just prior to the onset of plasma bubbles, and how their evolution is related to these conditions.

The CINDI mission will simultaneously explore the motions of the charged and neutral gases for the first time, and will discover the differences in their behavior when plasma bubbles form and when they do not. This information will help explain the fundamental relationships between charged and neutral particles, allowing scientists to build a better forecast model for plasma bubbles for use in the Earth's environment and in other planetary environments.

The CINDI investigation is a critical part of the science objectives of the C/NOFS satellite undertaken by the Air Force Research Laboratory and the Space and Missile Command Test and Evaluation Directorate. CINDI consists of two instruments onboard the satellite—the Ion Velocity Meter (IVM) and the Neutral Wind Meter (NWM)—that separately measure the ionized (electrically charged) and neutral particles that exist in the ionosphere.

The C/NOFS satellite was successfully launched on April 16, 2008, on a Pegasus XL rocket carried aboard Orbital Sciences Corporation's L-1011 "Stargazer" jet. The Pegasus starts its mission secured to the belly of the L-1011, where it's carried to the planned launch altitude. C/NOFS was launched into an equatorial orbit that ranges from 250 to 530 miles (400 to 850 kilometers) in altitude, and it is scheduled to collect data for two years.

CINDI is a NASA-sponsored Mission of Opportunity conducted by the University of Texas at Dallas (UTD). NASA's Explorers Program at Goddard Space Flight Center, Greenbelt, Md., manages the CINDI mission. Goddard's Dr. Robert Pfaff is the Project Scientist. The Explorers Program provides frequent flight opportunities for world-class scientific investigations from space within heliophysics and astrophysics. ■



## Saturn Does the Wave in Its Atmosphere

By Diya Chacko

Two decades of scrutinizing Saturn are finally paying off, as scientists have discovered a wave pattern, or oscillation, in Saturn's atmosphere.

The discovery of the wave pattern is the result of a 22-year campaign of observing Saturn from Earth (the longest study of temperature outside Earth ever recorded), and the *Cassini* spacecraft's observations of temperature changes in the planet's atmosphere over time.

The *Cassini* infrared results indicate that Saturn's wave pattern is similar to a wave pattern found in Earth's upper atmosphere. The earthly oscillation takes about two years. A similar pattern on Jupiter takes more than four Earth years. The new Saturn findings create a link to the three planets.

Just as scientists have been studying climate changes in Earth's atmosphere for long periods of time, NASA scientists have been studying changes in Saturn's atmosphere. Glenn Orton of NASA's Jet Propulsion Laboratory in Pasadena, Calif., says patience is the key to studying changes over the course of a Saturnian year, the equivalent of about 30 Earth years.

"You could only make this discovery by observing Saturn over a long period of time," said Orton, lead author of the ground-based study. "It's like putting together 22 years worth of puzzle pieces, collected by a hugely rewarding collaboration of students and scientists from around the world on various telescopes."

The wave pattern is called an atmospheric oscillation. It ripples back and forth like a wave within Saturn's upper atmosphere. In this region, temperatures switch from one altitude to the next in a striped hot-cold pattern. These varying temperatures force the wind in the region to keep changing direction from east to west, jumping back and forth. As a result, the entire region oscillates like a wave.

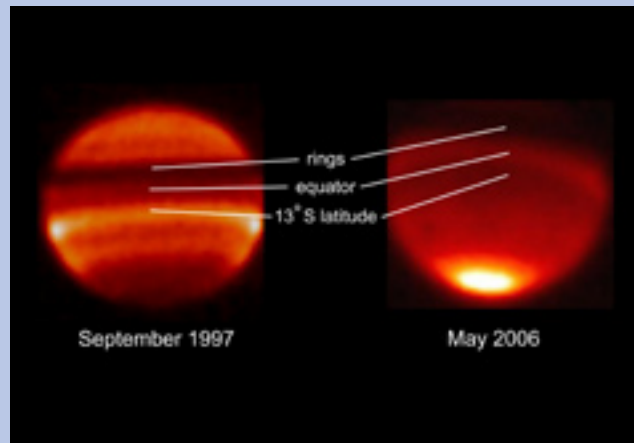
A snapshot of the hot-cold temperature patterns in Saturn's atmosphere was captured by the *Cassini* Composite Infrared Spectrometer (CIRS). Along with Earth-based data, the snapshot also uncovered other interesting phenomena. Among them: the temperature at Saturn's equator switches from hot to cold, and temperatures on either side of the equator switch from cold to hot every Saturn half-year.

Mike Flasar, co-author on the *Cassini* paper, and Principal Investigator for *Cassini*'s CIRS at NASA's Goddard Space Flight Center, said that *Cassini* helped define this oscillation in combination with the ground observation campaign.

"It's this great synergy of using ground-based data over time, and then getting up close and personal with the oscillation in Saturn's atmosphere

through *Cassini*," said Flasar. "Without *Cassini*, we might never have seen the structure of the oscillation in detail."

"CIRS has mapped the vertical structure of Jupiter (from the swingby in 2000) and now Saturn. In both cases, CIRS saw evidence of an equatorial oscillation from the vertical structure in temperature: an alternating stacking of warm and cold anomalies with height. Being in orbit about Saturn, CIRS was much closer to its atmosphere and could directly point at Saturn's limb. This provided both better vertical resolution and a much broader range of altitudes observed than on Jupiter," added Flasar.



Caption: The image on the left was taken in 1997 and shows the temperature at the equator is colder than the temperature at 13 degrees south latitude. Conversely, the image on the right taken in 2006 shows the temperature at the equator is warmer.

"The other partners in this are the ground-based telescopic observations in the infrared, which generally have lower spatial resolution, and so they don't provide very good information on vertical structure. However, they have continued to observe Saturn and Jupiter for more than two decades, and they show the temporal behavior of the equatorial oscillation, with temperatures at the equator oscillating between warm and cold, relative to adjacent latitudes. On Jupiter, the cycle is about 4 to 5 years, and it seems to be about 15 years for Saturn," said Flasar.

*Cassini* scientists hope to find out why this phenomenon on Saturn changes with the seasons, and why the temperature switchover happens when the Sun is directly over Saturn's equator.

The *Cassini-Huygens* mission is a cooperative project of NASA, the European Space Agency, and the Italian Space Agency. JPL, a division of the California Institute of Technology in Pasadena, manages the *Cassini* mission for NASA's Science Mission Directorate in Washington, D.C. The *Cassini* orbiter was designed, developed, and assembled at JPL. The Composite Infrared Spectrometer team is based at NASA's Goddard Space Flight Center, Greenbelt, Md. ■

## TRACE Spacecraft Marks 10 Years of Smooth Sailing

By Laura Layton

After a decade of exploring the Sun's upper atmosphere, the *Transition Region and Coronal Explorer* (TRACE) is still going strong. Launched on April 1, 1998, TRACE has far surpassed its initial one-year science mission goal. Since achieving orbit, the spacecraft's instrument has captured images, in both visible and ultraviolet light, of features in the Sun's active regions.

TRACE has revealed solar eruptions that hang above the surface of the Sun like fiery fountains; coronal loops that rise and then twist back upon themselves, held captive within the bonds of the Sun's magnetic field; and solar "moss," a solar feature with a sponge-like, mossy appearance.

The secret to TRACE's success and longevity stems from a convergence of careful planning, coordination of effort, and a bit of good luck. "What comes to mind when I think about the TRACE mission is how smooth everything went," says TRACE Mission Manager Gerry Daelemans. Not only has TRACE been in operation nine years longer than originally planned, but it's also been a remarkably problem-free mission.

One indication of how successful TRACE has been is the number of papers written based on the cache of solar data it has gathered. To date, more than

800 papers have been published using TRACE data. An open-access data policy has allowed the scientific community at large to benefit from TRACE's good fortune.

Along with fascinating discoveries, like finding the Sun's atmosphere is filled with ultrasound-like waves that scientists have dubbed "solar ultrasound," come challenges. "TRACE has raised as many questions as it has answered," says Jim Klimchuk, a solar scientist at NASA's Goddard Space Flight Center in Greenbelt, Md.

What's next for TRACE? Building on its already considerable success, the spacecraft will continue to do what it does best—explore the intricate magnetic structures of the Sun's upper atmosphere.

GSFC manages the TRACE mission and developed the spacecraft in-house in the former Special Payloads Division. The TRACE instrument was built by Lockheed-Martin. GSFC performed all the integration and qualification testing here. TRACE is a NASA Small Explorer mission to image the solar corona and transition region at high angular and temporal resolution. ■



Caption: TRACE GSFC team members celebrate the mission's 10-year milestone.

Photo Credit: Pat Izzo



# Fun Run Promotes Healthy Community Involvement

By Dewayne Washington

After a long winter, a bright sky and comfortable temperatures made perfect weather for runners participating in the 65th NASA Inter-Center Fun Run on April 16.

More than 300 Goddard community members left their work areas to enjoy the weather and fellowship, along with some exercise, during the 2-mile



Image Credit: Bill Hrybyk

*Caption: Pre-run stretching.*

run. “The purpose of the Fun Run is to promote health and well being. It is a great morale booster, and it is just a fun thing to do,” said Kent McCullough, Race Director and President of the Goddard Running and Orienteering Club (GROC).

Alvin Yew (Code 596) finished first in the open men’s category with a time of 10 minutes, 52 seconds.

For the women, Andrea Bennett (Code 660) was the first to cross the finish line with a time of 14 minutes, 19 seconds. There were 183 men and 135 women who participated in the spring event.

“I think the Fun Run is a great opportunity for the Center community to get excited about exercise,” said Wayne Phillips, the volunteer responsible for ensuring the split times are correct. “I see participants laughing and talking. It is a good chance to build friendships. It also promotes healthy

competition among the Directorates to see who can encourage the most participation.”

According to McCullough, the idea of Fun Runs at Goddard began in the mid-1970s. “There were only 12 people to show up for the first run,” he said. In time, the event would swell to more than 700 participants, but now averages about 300 participants. Four trophies are awarded, one each to the top male and female overall, and the top male and female in the master’s (over age 40) category.



Image Credit: Bill Hrybyk

*Caption: Participants enjoy post-run refreshments.*

This is actually two races in one. The names and times from the Goddard race are combined with the times and names of the Langley Research Center and the Ames Research Center Fun Run participants. From this list, the top runner in several age categories is awarded a medal as the top finisher.

“We actually have four such events each year,” said McCullough. Several days following the Fun Run, there is a 10 kilometer run around nearby Greenbelt Lake. The next Goddard Fun Run is scheduled for Oct. 8 and the 10k will follow on Oct. 15.

For more information, call the Goddard Fitness Center at 301-286-8404 or visit the GROC Web site at <http://gewa.gsfc.nasa.gov/clubs/groc>. ■



Photo credit: Bill Hrybyk

*Caption: Goddard runners jump off the line.*

## Meet the Faces at Goddard Behind GLAST: Dr. Steven Ritz

By Rob Gutro



Photo Credit: NASA

*Caption: Dr. Steven Ritz.*

NASA's *Gamma-ray Large Area Space Telescope* (GLAST) is scheduled to launch from Cape Canaveral later this summer. There are many people on the GLAST team, and one familiar face is that of Dr. Steven Ritz.

Steven Ritz is the GLAST Project Scientist and an astrophysicist in the Astroparticle Physics Laboratory, Astrophysics Science Division of NASA's Goddard Space Flight Center in Greenbelt, Md.

Ritz has been involved with GLAST since 1996. In 1998, he was a GLAST Large Area Telescope (LAT) instrument scientist. His involvement in GLAST deepened in 2000, when he was named the GLAST Deputy Project Scientist. In 2003, Ritz was promoted to the position of GLAST Project Scientist and since 2004 he has been the LAT Deputy Principal Investigator.

He is also an adjunct professor of physics at the University of Maryland's College Park campus.

Before coming to NASA Goddard, Dr. Ritz worked at Columbia University in New York City. From 1988 to 1990 he worked as a postdoctoral research scientist at Columbia University's Nevis Laboratories. From 1990 to 1996, he was an assistant professor of physics, and was an associate professor of physics until 1998.

He also taught college courses at Columbia University from 1990 to 1998. It was there that he taught "Physics for Poets" and "Accelerated Physics." From 1990 to 1993, he was an instructor in general physics.

He has worked as a co-investigator or collaboration member on several experiments since 1984. From 1988 to 1998, he worked on the Zeus experiment at the Deutsches Elektronen-Synchrotron (DESY) in Hamburg, Germany. The Zeus detector is a sophisticated tool for studying the particle reactions provided by the high-energy beams of the Hadron Electron Ring Accelerator (HERA). From 1986 to 1988, he worked on the Apparatus for Lep Physics (ALEPH) high-energy experiment at the European Organization for Nuclear Research (CERN), the world's leading laboratory for particle physics in Geneva, Switzerland.

Ritz received a Bachelor of Arts in physics and music from Wesleyan University in Middletown, Conn. He received his master's degree in physics from the University of Wisconsin-Madison, and his Ph.D. in physics from the University of Wisconsin-Madison.

His interests are accelerated physics including mechanics, thermodynamics and optics, relativity, and quantum mechanics.

He is a fellow of the American Physical Society and was a Fellow in Physics of the Sloan Foundation from 1993 to 1997. He also won the Bertman Prize in Physics from Wesleyan University in 1981.

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

## Goddard Engineer Creates Instrument for Mars Mission

By Cynthia O'Carroll

Jesse Lewis may be young but he plays a significant role in the success of the Mars Science Lab (MSL) mission. At only 25 years of age, he has designed and built an intricate tool to process soil samples for the Sample Analysis at Mars (SAM) instrument suite that will head to Mars aboard the MSL in the fall of 2009.

Led by NASA's Jet Propulsion Laboratory in Pasadena, Calif., MSL is the next step in NASA's Mars Exploration Program, a long-term effort of robotic exploration of the red planet. The MSL rover will comb the surface of the planet looking for clues that Mars once supported microbial life and may still today.

The SAM instrument suite is being assembled at NASA's Goddard Space Flight Center in Greenbelt, Md. Paul Mahaffy is the Principal Investigator for SAM, and is also the Chief of Goddard's Atmospheric Experiment Laboratory. The science team hopes that SAM will identify carbon compounds, search for water, and detect molecules relevant to terrestrial life.

As a child, Lewis was enthralled by all things "space and NASA," and knew he wanted to contribute to the field somehow as an adult. "I was in awe of NASA and those that accomplished great, almost magical feats. I have always wanted to be a part of that magic," stated Lewis.

During the last three years, Lewis has been dedicated to completing the design and build of the Solid Sample Inlet Tube (SSIT). The SSIT is a funnel system that will deliver a freshly gathered soil sample to 1 of 74 tiny cups for testing. Once a sample is dropped into the funnel, it begins to vibrate at various frequencies to shake off different sized particles for further evaluation.

The funnel system has a heater that will come in handy for processing any soil that might contain ice, preventing it from becoming a muddy clog in the narrow tube, then delivering it as dry loose particles to the testing cups below. Once in the tiny cups, each soil sample is heated in a helium carrier gas flow to drive off gasses that are then analyzed by SAM's Quadruple Mass Spectrometer.

The design phase of the SSIT started late in SAM development, and the SSIT interfaces were already completed. Lewis was then faced with the task of crafting a funnel system that would fit in the allotted space. He met the challenge by designing a funnel system that uses a canted shape, meaning each of the funnels are flat on one side and are set at an angle. A piezoelectric actuator is in place to violently shake the SSIT to help prevent clogs in the funnel. His design is a redundant system with two funnels in case one becomes blocked or damaged during the mission.

The actual SAM SSIT flight model is 90% complete and will be delivered in May. The flight-like qualification unit has safely completed vibration testing that simulates the level of stress encountered during launch. The qualification unit is currently preparing for thermal vacuum testing and is expected to be flight qualified soon.

Lewis started working at GSFC when he was 17 years old, while a freshman at the University of Maryland, College Park. He is a skilled electro-mechanical systems engineer, providing engineering support for his employer, Stinger Graffarian Technologies (SGT). Lewis is also working on his masters degree in mechanical engineering at the University of Maryland, College Park.

For more information about SAM, visit: <http://ael.gsfc.nasa.gov/marsSAM.shtml>. For more information about MSL, visit: <http://mars.jpl.nasa.gov/msl>. ■

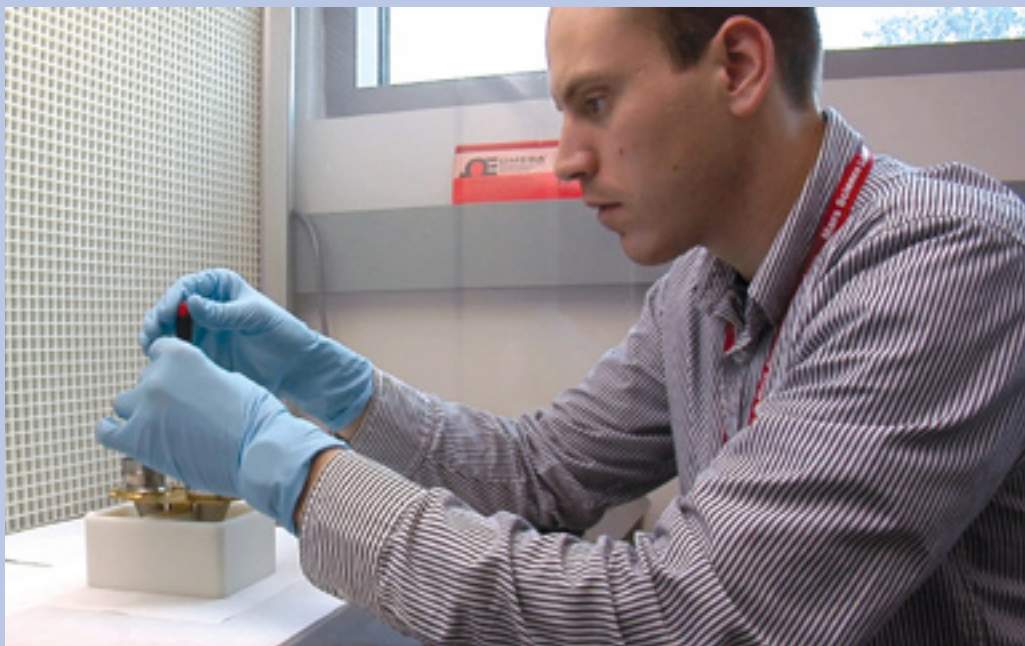


Photo Credit: Debora McCallum

*Caption: Jesse Lewis working on the Solid Sample Inlet Tube (SSIT).*



## New Faces:

A monthly feature spotlighting new members of the Goddard community.

By John Putman



Photo credit: Pat Izzo

*Caption: Matthew Johnston*

Matthew Johnston is a Patent Attorney in the Office of Patent Counsel, Code 140.1.

After several years in private practice, Matt decided to come to NASA Goddard because he was, "Attracted to the technology emerging from Goddard and the constructive environment of NASA."

For Matt, the most rewarding element of working at Goddard is the, "Face-to-face interaction with inventors while learning about their valuable technological contributions to the Agency, coupled with the very nature of NASA's mission."

Matt is an active person. He enjoys a wide range of activities and hobbies, some of which include skiing, sailing, playing rugby, traveling, wood-working and home improvement projects, cooking, home brewing, and spending quality time with family and friends. ■



Photo credit: Debora McCallum

*Caption: Craig Keish*

Craig Keish is a Contract Specialist in Code 210.

Craig has always been intrigued by cutting-edge modes of transportation. "Coming from the airline industry, I've always been interested in air travel. The only thing cooler than air travel is space travel, and I love being a part of an organization that promotes space exploration."

Craig's favorite element of working at NASA Goddard is the people. Since he began just over a month ago, everyone has "been fantastic."

Craig sums up his outside interests in two words—sports and travel. Of all the sports he loves watching, college football is his favorite, especially the Buckeyes of the Ohio State University. Since moving to the area, Craig has also come to cheer on the Washington Capitals, the Washington Wizards, and the Baltimore Ravens.

Craig also likes playing sports. Craig grew up in New Mexico, where he learned to ski and play golf. He also enjoys traveling. Craig, his wife, and their 2-year-old son get away whenever they can. ■