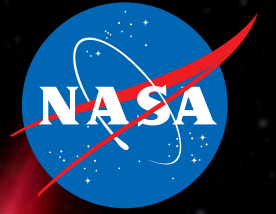


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GoddardView

Goddard-Managed Satellites Discover What Triggers Eruptions of the Northern Lights

Pg 4

**Shake, Bake, and Shout: *Solar Dynamics Observatory*
Completes Endurance Testing**

Pg 6

Academy Inspires Exploration Far Beyond Known Boundaries

Pg 10

LaunchFest is Coming

By John Putman



On Saturday, September 13, 2008, from 10:00 a.m. to 4:30 p.m., NASA Goddard Space Flight Center will be opening its doors to the public for LaunchFest, an open house highlighting Goddard and its major missions.

This event will give the public an inside look at the facilities and culture of the Center, and a glimpse into many current and future NASA missions. The day will include a variety of activities, demonstrations, Center tours, live entertainment, delicious food, and much more.

Day-of volunteers (both Goddard employees and members of the public) are needed to cover half-day shifts, 8:30 a.m. to 12:30 p.m., or 12:30 p.m. to 4:30 p.m. Come help out, then have time to enjoy all that LaunchFest has to offer. To volunteer, please contact Leslee Cork at 301-286-0676 or Leslee.M.Cork@nasa.gov.

LaunchFest is sponsored in part by Ball Aerospace, Honeywell International, Lockheed Martin, Comcast, and other sponsors, and is made possible by a partnership with the National Capital Section of the American Institute of Aeronautics and Astronautics.

Look for more details and information on LaunchFest at:
<http://www.nasa.gov/centers/goddard/events/launchfest.html>. ■

Table of Contents

Goddard Updates

- LaunchFest is Coming – 2
- New Center Director Meets Goddard Employees – 3
- Goddard-Managed Satellites Discover What Triggers Eruptions of the Northern Lights – 4
- James Webb Space Telescope* Model Continues World Tour – 5
- Shake, Bake, and Shout: *Solar Dynamics Observatory* Completes Endurance Testing – 6
- Showcase Held for Code 600 on Goddard's Exploration Sciences Building – 7
- NASA Data Show Some African Drought Linked to Warmer Indian Ocean – 8
- NASA Study Improves Ability to Predict Aerosols' Effect on Cloud Cover – 9

Goddard Family

- Academy Inspires Exploration Far Beyond Known Boundaries – 10
- Select Group of Strangers Leave as Goddard Sisters – 11
- Student Aids in *Lunar Reconnaissance Orbiter* Launch – 12

Cover caption: Artist's conception of a substorm. Substorms produce changes in the auroral displays seen near Earth's northern and southern magnetic poles, causing a burst of light and movement in the Northern and Southern Lights.

Image credit: NASA/Walt Freimer.

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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. Ideas for new stories are welcome but will be published as space allows. All submissions are subject to editing.

New Center Director Meets Goddard Employees

By John Putman

On August 6, Robert Strain was formally introduced to Goddard employees as Goddard's new Center Director. The introduction was made by Chris Scolese, NASA's Associate Administrator, and acting Associate Administrator of the Science Missions Directorate, and former Goddard Center Director, Dr. Ed Weiler.

Dr. Weiler said, "I am truly looking forward to his addition to a superbly talented NASA management team."

The Center All Hands was well attended with some employees having to stand. Besides the Greenbelt employees present in the Building 8 auditorium, Wallops, GISS, and IV&V joined the All Hands via video teleconference.

The new Center Director told the audience, "I will work as hard as I can on your behalf, and I will be a strong advocate for NASA and for Goddard." He went on to say, "I believe the work that you do is vitally important to not only the welfare of this Nation, but for the prosperity of all who inhabit this planet."

Strain also took some questions from the gathered Goddard employees. The questions ranged from thinly veiled invitations to the 2008 Music and Drama Club's fall show to more serious inquiries about ensuring Goddard's leadership position in attracting international scientific talent.

Strain closed the All Hands by saying, "I am truly honored to be here because I believe the work that you do is vitally important to not only the welfare of this Nation, but for the prosperity of all who inhabit this planet. Thank you for welcoming me into your NASA family. It is a privilege to be here, and in the weeks and months to come, I look forward to meeting you, and working with you."

Strain comes to Goddard from the Johns Hopkins University Applied Physics Lab (APL) in Laurel, Md. Strain left APL because, "I was drawn to the challenge and opportunity to lead, what I believe is, one of the crown jewels of the Nation's science and technology institutions. Goddard has a well deserved reputation as a place that inspires bold ideas." ■



Photo Credit: Debora McCallum

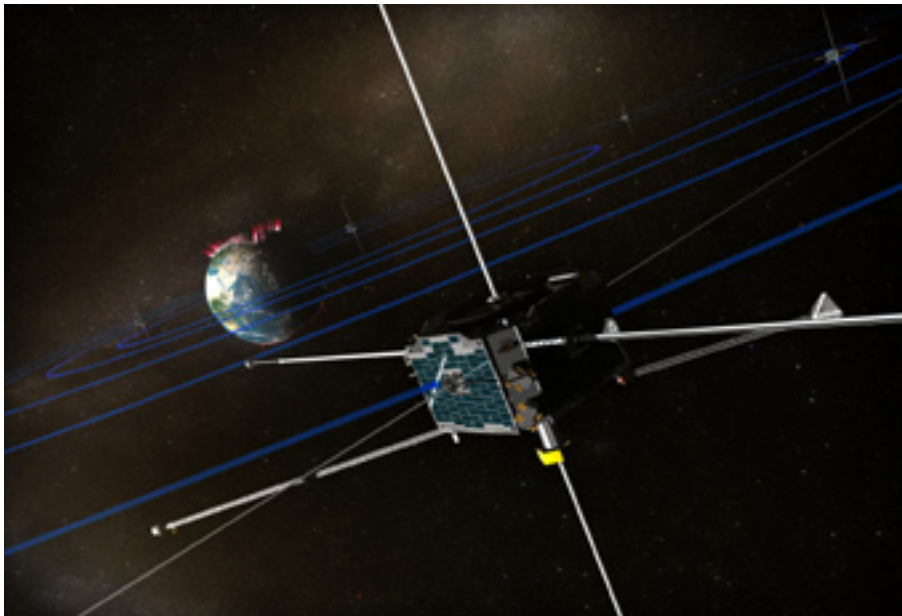
Caption: New Goddard Center Director Rob Strain shares his vision for the Center and its future.

Goddard-Managed Satellites Discover What Triggers Eruptions of the Northern Lights

By Laura Layton

What causes the shimmering, ethereal Northern Lights to suddenly brighten and dance in a spectacular burst of colorful light and rapid movement? To find out, NASA launched a fleet of five satellites called *Time History of Events and Macroscale Interactions during Substorms* (THEMIS).

Researchers have discovered that an explosion of magnetic energy a third of the way to the Moon powers substorms, sudden brightenings and rapid movements of the aurora borealis, called the Northern Lights.



Caption: Artist's concept of one of the THEMIS satellites in Earth's orbit.

The culprit turns out to be magnetic reconnection, a common process that occurs throughout the universe when stressed magnetic field lines suddenly "snap" to a new shape, like a rubber band that's been stretched too far.

"We discovered what makes the Northern Lights dance," said Dr. Vassilis Angelopoulos of the University of California, Los Angeles. Angelopoulos is the Principal Investigator for the THEMIS mission. Substorms produce dynamic changes in the auroral displays seen near Earth's northern and southern magnetic poles, causing a burst of light and movement in the Northern and Southern Lights. These changes transform auroral displays into auroral eruptions.

Substorms often accompany intense space storms that can disrupt radio communications and global positioning system signals, and cause power outages. Solving the mystery of where, when, and how substorms occur will allow scientists to construct more realistic substorm models and better predict a magnetic storm's intensity and effects.

"As they capture and store energy from the solar wind, the Earth's magnetic field lines stretch far out into space. Magnetic reconnection releases the energy stored within these stretched magnetic field lines, flinging charged particles back toward the Earth's atmosphere," said David Sibeck, THEMIS

Project Scientist at NASA's Goddard Space Flight Center in Greenbelt, Md. "They create halos of shimmering aurora circling the northern and southern poles."

Scientists directly observe the beginning of substorms using five THEMIS satellites and a network of 20 ground observatories located throughout Canada and Alaska. Launched in February 2007, the five identical satellites line up once every four days along the equator and take observations synchro-

nized with the ground observatories. Each ground station uses a magnetometer and a camera pointed upward to determine where and when an auroral substorm will begin. Instruments measure the auroral light from particles flowing along Earth's magnetic field and the electrical currents these particles generate.

During each alignment, the satellites capture data that allow scientists to precisely pinpoint where, when, and how substorms measured on the ground develop in space. On Feb. 26, 2008, during one such THEMIS lineup, the satellites observed an isolated substorm begin in space, while the ground-based observatories recorded the intense auroral brightening and space currents over North America.

These observations confirm for the first time that magnetic reconnection triggers the onset of substorms. The discovery supports the reconnection model of substorms, which asserts a substorm starting to occur follows a particular pattern. This pattern consists of a period of reconnection, followed by rapid auroral brightening and rapid expansion of the aurora toward the poles. This culminates in a redistribution of the electrical currents flowing in space around Earth.

THEMIS is the fifth medium-class mission under NASA's Explorer Program. The program, managed by the Explorers Program Office at Goddard, provides frequent flight opportunities for world-class space investigations in heliophysics and astrophysics. The University of California, Berkeley's Space Sciences Laboratory in Berkeley, Calif., managed the project development and is currently operating the THEMIS mission. ATK Space (formerly Swales Aerospace) of Beltsville, Md., built the THEMIS satellites.

The THEMIS team's findings appeared online July 24 in *Science Express* and August 14 in the journal *Science*.

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

James Webb Space Telescope Model Continues World Tour

By Lynn Chandler

On its worldwide tour, the latest stop for the full-scale model of the *James Webb Space Telescope* (JWST) was Montreal, Canada. The telescope was displayed on a wide-open field near the waterfront in Old Town Montreal by their science center. The model was on display from July 11 through the 20th. Canada marks the fourth country on the tour and the tenth stop.



Photo Credit: Lynn Chandler

Caption: Full scale model of the James Webb Space Telescope in Montreal, Canada.

This venue was chosen because the 37th Committee on Space Research Scientific Assembly was held in Montreal, and the Canadian Space Agency (CSA) is one of JWST's international partners. CSA's role in JWST is to provide the fine guidance sensor and the tunable filter imager.

The model made its debut appearance at the 2005 National Space Symposium in Colorado Springs, Colo. Since then, the model has been displayed in Paris, France; Rochester, N.Y.; Greenbelt, Md.; Orlando, Fla.; Redondo Beach, Calif.; Seattle, Wash.; Washington, D.C.; and Dublin, Ireland.

In addition to being on display for the public, an outdoor press conference took place in front of the model on Monday, July 14. The JWST Observatory Project Scientist, Mark Clampin, along with six other partners, participated in the press conference that was attended by at least a dozen media outlets and resulted in stories with *Discovery Canada*, The Canadian Press, and the Canadian Broadcasting Corporation.

The *James Webb Space Telescope* is a successor to the *Hubble Space Telescope* and will be NASA's premier space observatory following its launch in 2013. It will orbit 940,000 miles from Earth capturing infrared images of every phase of our cosmic history—from the first luminous objects to assembly of galaxies, the birth of stars, and formation of planetary systems. The mission is a joint project of NASA, the European Space Agency, and the Canadian Space Agency.

For more information on the *James Webb Space Telescope*, visit: <http://jwst.gsfc.nasa.gov>. ■



Photo Credit: Lynn Chandler

Caption: JWST Observatory Project Scientist Mark Clampin participates in the press conference.

Shake, Bake, and Shout: *Solar Dynamics Observatory* Completes Endurance Testing

By Laura Layton

NASA's *Solar Dynamics Observatory* (SDO) passed another milestone August 14, when the spacecraft finished its latest round of endurance testing.

"SDO has successfully completed the critical 'shake, bake, and shout' phases of testing," said SDO Project Scientist Dr. Dean Pesnell, of the testing procedures begun in February.

Building 7 at NASA's Goddard Space Flight Center in Greenbelt, Md., where SDO's endurance was put to the test, has been likened to a chamber of horrors for spacecraft. The 'horrors' of SDO's dynamic testing included a barrage of vibrations, electrical and mechanical shocks, and sounds.

"We want to test all the conditions that SDO will see during its launch," said SDO Observatory Manager Brent Robertson. During launch, SDO will have to withstand rattling vibrations, jarring shocks, and blasts of noise. Once in orbit, the spacecraft will have to withstand intense heat and cold.

"We vibrated the spacecraft, then we subjected it to mechanical shock to make sure it can tolerate the shock of firing the pyros that separate SDO from the launch vehicle and allow us to deploy our solar arrays and high-gain antennas," said Robertson. SDO also underwent a one-minute acoustical test in which it was blasted with sound to ensure that the spacecraft can survive and operate within the launch environment.

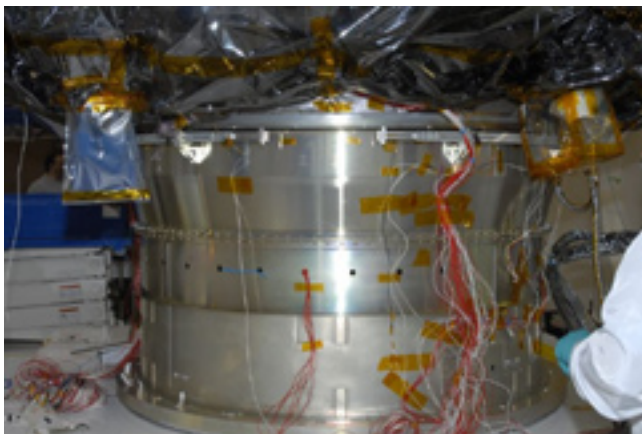


Photo Credit: Barbara Lambert

Caption: This close-up image shows SDO after shock testing, during which pyros were fired to ensure the spacecraft will survive pyro firing during launch.

After dynamics testing, SDO returned to the clean room in Building 7 for a post-test check-out. Called CPT #2, this follow-up round of comprehensive performance testing concluded this phase of SDO's dynamic testing.

The next big test for SDO came in July, when the spacecraft underwent thermal-vac testing. What is thermal vac—thermal for heat, and vac, meaning vacuum. "We put the spacecraft in a vacuum chamber and changed the temperature to test the spacecraft in extreme temperatures," said Robertson.

SDO spent about seven days in what SDO Integration and Test Manager David Amason calls thermal balance. This test subjected SDO first to heat and then to extreme cold to see how it affected the spacecraft's temperature. When SDO settles into geosynchronous orbit around Earth, the observatory will most often be in direct sunlight, but occasionally will lie in the coldness of Earth's shadow. After testing the Sun-focused spacecraft at these temperature extremes to see how hot or cold it gets, "We ran SDO through four cycles of hot and cold to see how the spacecraft performs," said Amason.



Photo Credit: Barbara Lambert

Caption: SDO undergoes a second round of comprehensive performance testing (CPT #2) following dynamic testing that included vibrations, shocks, and acoustics.

Thermal vac testing was the last major step for SDO before it ships to Florida. There, the spacecraft will undergo another CPT run, have its flight batteries installed, get fueled up for launch, and meet up with the launch vehicle.

For more information about the SDO mission, visit: <http://sdo.gsfc.nasa.gov>.



Showcase Held for Code 600 on Goddard's Exploration Sciences Building

By Rob Gutro and Dave Larsen

Employees in Code 600 received a sneak preview of coming attractions during the Exploration Sciences Building (ESB) Open House July 23rd. There's also a brand new Web site devoted to the ESB where employees can get answers to many questions.

The special event was hosted by the Code 200 Management Operations Directorate and was considered a huge success. The purpose of the event was to highlight the Code 200 service providers that will help the scientists, engineers, and administrators during their move into the new building.

The Building 21 Library was transformed for the event and included exhibits from various codes highlighting their roles before, during, and after the move into the ESB. The event was spearheaded by Fran Teel, Code 271's Branch Head of Technical Information and Management Services (TIMS) and Luly Carson, NASA ESB Outfitting Project Manager.



Photo Credit: Debora McCallum

Caption: Dave Larsen pointing out the location of the tour group in relation to the Exploration Sciences Building.

future café and collaboration areas. The groups were impressed with the full height windows in the offices, the five-stall shower facility, and the bike storage area. The conference facility on the first floor also drew favorable attention. Many questions were asked and the answers will be posted on the ESB Web site.



Photo Credit: Debora McCallum

Caption: Employees look at moving information in the Goddard Library.

A special DVD animation was shown, illustrating the features of the building. In addition, five group building tours were given by the NASA Project Manager, Dave Larsen. The tour took a behind-the-scenes visit of the first floor of the new building. The groups were given an overview of the building's history, an explanation of the layout and design philosophy of the building, and a walk through of the lab and office spaces. Highlights of the tour included a walk through of a typical electronics lab, and the

To make information about the ESB easier to find, an internal Goddard Web site was just launched in August. It can be found at <http://new34>. This Web site is only available if you are on the Goddard campus, and it contains video clips, facts, ESB coordinators, and even provides a live Web cam to see what the building looks like right now. It will continue to be populated with FAQs, resources, and information for those moving to the building.

Additional tours are anticipated as the building nears completion in July 2009. The building was designed by EwingCole Architects, based in Philadelphia, Pa., and Washington, D.C.

To find the internal Web page on the status of the ESB, (accessible only on campus) visit: <http://new34>. For more information about the NASA Exploration Sciences Building, visit: http://www.nasa.gov/centers/goddard/news/green_building.html. ■

NASA Data Show Some African Drought Linked to Warmer Indian Ocean

By Kathryn Hansen

A new study, co-funded by NASA, has identified a link between a warming Indian Ocean and less rainfall in eastern and southern Africa. Computer models and observations show a decline in rainfall, with implications for the region's food security.

Rainfall in eastern Africa during the rainy season, which runs from March through May, has declined about 15 percent since the 1980s, according to records from ground stations and satellites. Statistical analyses show that this decline is due to irregularities in the transport of moisture between the ocean and land, brought about by rising Indian Ocean temperatures, according to research published today in *Proceedings of the National Academy of Sciences*. This interdisciplinary study was organized to support the U.S. Agency for International Development's Famine Early Warning Systems Network.

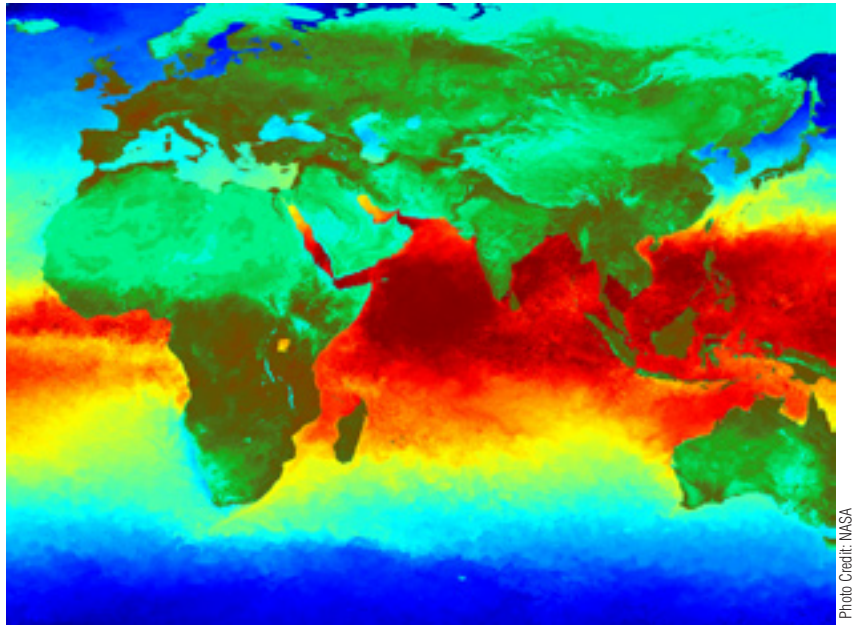
"The last 10 to 15 years have seen particularly dangerous declines in rainfall in sensitive ecosystems in East Africa, such as Somalia and eastern Ethiopia," said Molly Brown of NASA's Goddard Space Flight Center, Greenbelt, Md., a co-author of the study. "We wanted to know if the trend would continue or if it would start getting wetter."

To find out, the team analyzed historical seasonal rainfall data over the Indian Ocean and the eastern seaboard of Africa from 1950 to 2005. The NASA Global Precipitation Climatology Project's rainfall data set provided a series of data covering both the land and the oceans. They found that declines in rainfall in Ethiopia, Kenya, Tanzania, Zambia, Malawi, and Zimbabwe were linked to increases in rainfall over the ocean.

The team used computer models that describe the atmosphere and historical climate data to identify and validate the source of this link. Lead author Chris Funk of the University of California, Santa Barbara, and colleagues showed that the movement of moisture onshore was disrupted by increased rainfall over the ocean.

Funk and colleagues used a computer model from the National Center for Atmospheric Research (NCAR) to confirm their findings. The combination of evidence from models and historical data strongly suggest that warming of the Indian Ocean leads to an increase of rainfall over the ocean, which in turn adds energy to the atmosphere. Models showed that indeed, the added energy could create a weather pattern that reduces the flow of moisture onshore and bring dry air down over the African continent, reducing rainfall.

Next, the team investigated whether or not the decline in rainfall over eastern Africa would continue. Under guidance from researchers at the U.S. Geological Survey (USGS), which co-funded the study, the team looked at 11 climate models to simulate rainfall



Caption: Sea surface temperatures and land vegetation over the Indian Ocean created with data from 1994 to 2005 from the Pathfinder satellite data set.

changes in the future. Ten of the 11 models agreed that through 2050, rainfall over the Indian Ocean would continue to increase—depriving Africa's eastern seaboard of rainfall.

"We can be quite certain that the decline in rainfall has been substantial and will continue to be," Funk said. "This 15 percent decrease every 20–25 years is likely to continue."

The trend toward drier rainy seasons in eastern and southern Africa directly impacts agricultural productivity. To evaluate how potential future rainfall scenarios and shifts in agriculture could affect undernourishment, the team came up with a "food-balance indicator" model. The model considers factors such as growing-season rainfall, fertilizer, seed use, crop area, and population to estimate the number of undernourished people a region can anticipate.

Continuing along the present scenario—with current trends in declining rainfall and agricultural capacity continuing as it is currently to 2030—the team found that the number of undernourished people will increase by more than 50 percent in eastern Africa.

Still, the food-balance indicator also showed that in the face of a continuation of the current downward trend in rainfall, even modest increases in agricultural capacity could reduce the number of undernourished people by 40 percent.

"A strong commitment to agricultural development by both African nations and the international community could lead fairly quickly to a more food-secure Africa," Funk said. ■

NASA Study Improves Ability to Predict Aerosols' Effect on Cloud Cover

By Lynn Chandler

Using a novel theoretical approach, researchers from NASA and other institutions have identified the common thread that determines how aerosols—tiny particles that make up smoke, dust, and ocean spray—from human activity, like the particles from burning of vegetation and forests, influence cloud cover and ultimately affect climate. The study improves researchers' ability to predict whether aerosols will increase or decrease cloud cover.

"We connected the dots to draw a critical conclusion, and found evidence over the Amazon that traces the direct path of the effect of human activity on climate change by way of human-caused aerosols," said study co-author Lorraine Remer, a physical scientist at NASA's Goddard Space Flight Center in Greenbelt, Md. "During the dry season in the Amazon, the only aerosols of any magnitude are from smoke emerging from human-initiated fires."

It is well documented from previous studies that aerosols play an essential role in how clouds develop. With this knowledge, a team composed of Remer; Ilan Koren of the Weizmann Institute in Rehovot, Israel; and J. Vanderlei Martins of the University of Maryland, Baltimore County set out to explore one of the least understood but most significant aspects of climate change caused by human activity: the connection between a change in the amount of human-caused aerosols and change in the structure of clouds. Findings from their study will be published tomorrow in the journal *Science*.

"Scientists have observed instances where increases or decreases in the amount of these tiny particles have increased and decreased cloud cover in different places and times," said Remer. "We saw an example of this ourselves: increased aerosols over the Amazon produced less cloud cover. Over the Atlantic Ocean, however, increased aerosols actually produced more cloud cover. We wanted to know what the link was between these different outcomes from varying amounts and types of aerosols. This paper gives us a clear picture of what is occurring."

The team developed an analytical model, or line of thinking, that combined knowledge of cloud development, satellite observations, and mathematical calculations of aerosol concentration and cloud properties in an effort to explain how the two opposing effects of aerosols on clouds can influence cloud coverage and life cycle.

"This result helps us understand aerosols' effect on a cloud's mass and lifetime—how long it will provide cloud cover, how deep the clouds will be, and when and where it will rain," said Remer. "This improved understanding leads to prediction, and prediction can help us plan and perhaps prevent some of the potential consequences of putting aerosols from human activity into the atmosphere."

To test their model, Remer's team used aerosol and cloud observations of the Amazon from NASA's *Terra* satellite during the 2005 dry season. The season offers stable weather conditions and an abundance of human-caused aerosols from fires that were set to clear new land or to burn through old pastures to prepare the land for the next crop season.



Photo Credit: Ilan Koren/Weizmann Institute

Caption: During the dry season, smoke covers wide swaths of the Amazon. Isolated towers of cumulus clouds poke through the dense layer of smoke in this photograph taken from an airplane in 2005.

Traveling on wind currents, aerosols move from their source and into the atmosphere, where they become individually encased by water and turn into the droplets that combine to create clouds. Cloud microphysics makes clear that the larger the number of aerosol particles suspended in air the less water in the atmosphere is available for condensation on each individual particle. Under these conditions, a cloud will have a much larger number of small droplets. The smaller the droplets, the longer it will take for a cloud to rain. Aerosol-rich clouds like this spread out by winds, produce less rainfall, and last longer, creating more cloud cover.

Aerosols also influence clouds through their ability to absorb heat from the Sun. The trapped heat causes the atmospheric layer to warm up, and changes the environment in which the cloud develops. The overall result is to make the environment less hospitable for cloud growth. Even the smallest resulting changes in cloud cover can significantly warm or cool the atmosphere and change when and where fresh water will be available in the region.

"As we'd expected in applying our model, increased smoke from the fires created clouds rife with a more pronounced radiative effect—rich with human-caused aerosols that absorbed sunlight, warmed the local atmosphere, and blocked evaporation. This led to reduced cloud cover over the Amazon," said co-author Martins. "And it's encouraging to know the science behind our model should stand no matter the region." ■

Academy Inspires Exploration Far Beyond Known Boundaries

By Dewayne Washington

To be selected from among this country's best and brightest for an elite program is considered a unique honor and privilege. To be chosen to return as Operations Manager of the same program is considered reaching the stratosphere of educational achievement for an undergraduate student.

Sherrica Newsome has been asked to return to the 2008 NASA Academy—this time as Operations Manager—at the Goddard Space Flight Center in Greenbelt, Md. The Operations Manager is considered the glue that holds the program together. They are responsible for ensuring that everything and everyone is where they are supposed to be during the 10-week program.

"Sherrica is as professional as they come, kind and considerate, yet effective," says David Rosage, NASA Academy Program Manager. "When it comes to staffing the academy, she is among the best." In addition to coordinating activities, the Operations Manager is also expected to be a role model and mentor for participating students.

A Franklin, Va. native, Sherrica has been interested in astronautics and space science for as long as she can remember. "I first became fascinated about space because of the stories my dad use to tell me," Newsome says. "It was definitely a dream of his and I guess I inherited it." She was also inspired while participating in the Summer High School Apprenticeship Research Program (SHARP), a high school internship program at NASA's Langley Research Center in Hampton, Va.

Her first recognition as being among the best was realized at Franklin High School in 2003 where she graduated as the valedictorian with a grade point average of 4.0. She studied at Virginia Polytechnic Institute and State University, receiving a bachelor's degree last year in aerospace engineering with a minor in mathematics. As an undergraduate, Newsome and her research team won first place for their scientific research at the International Laser Radar Conference Matera in 2004. She was also honored throughout those four years as a National Action Council for Minorities in Engineering (NACME) Scholar.

Newsome was singled out as a future leader in space exploration last summer when she was selected for the NASA Academy. When asked about the opportunity to be an academy participant Newsome says, "It was an opportunity of a lifetime. The program, coined 'NASA's boot camp,' had us working until midnight or later daily, however, I wouldn't change a thing. By the end of the program it became clear that I was on the right path."

The NASA Academy, a residential internship, was created in 1993 to identify and cultivate future leaders for the United States Space Program. It has provided an opportunity for some of this Nation's best and brightest students to interact with some of the world's premier space scientists and engineers within NASA. Participants visit other NASA centers, talk with movers and shakers within the aerospace industry, develop a group project, and are

expected to conduct an independent research project. As a participant last year, Newsome's research focused on a new method for autonomous rendezvous and space docking.

Returning to lend coordinating support to the program has provided Newsome another unique vantage point for learning. "It is a completely different perspective," she says. "As a student, you're 1 of about 20 leaders all trying to soak up as much as you can from the experience. But as a manager, I am the person under the spotlight and it's my job to help plan the summer, then make sure the summer runs smoothly for the benefit of the students. It's a completely different experience."



Caption: Sherrica Newsome talks with 2008 participants Jennifer Founds and Andrew McDonald.

Photo Credit: Pat Izzo

Newsome confessed with a big smile that she has enjoyed every minute of working with this year's students. She also admits to a few challenges, a few of which were program challenges. Her biggest test, however, has been separating herself from the student role to become the authoritative figure required for her position. "I can easily relate to them and feel like I'm one of them, but I must remind myself that I am not the student this time. I am in charge of them."

In just a few weeks, Newsome will begin studies to complete a master's degree in science, technology, and policy at the Massachusetts Institute of Technology (MIT). She believes this background will position her as a key player to plan and influence future space exploration efforts. Her ultimate educational goal is to receive a doctorate degree and become a college professor. With her talent and passion, another of this Nation's best and brightest is preparing for a career to lead future explorations far beyond the boundaries of Earth.

For more information about the Academy go to:

<http://www.nasa-academy.nasa.gov>. ■

Select Group of Strangers Leave as Goddard SISTERS

By Dewayne Washington

The room was so quiet you could hear a pin drop as 23 middle school girls nervously introduced themselves on a Monday morning. By Friday, the noise level had quadrupled as they enthusiastically talked about a week of fun, excitement, and inspiration. They spoke about being inspired to do even better in school and feeling connected with the other SISTERS of Goddard.

Summer Institute in Science, Technology, Engineering, and Research (SISTER) is a hands-on program created at Goddard in 1978. It is designed to give a competitively selected group of talented 12- and 13-year-old girls the opportunity to experience science up close and personal. The SISTER program allows middle school girls to spend a week engaging Goddard women engineers, mathematicians, scientists, technicians, and researchers.

Through presentations, hands-on activity, and interactions with fellow participants, the girls are provided an environment to excite, inspire, and encourage them. "We want to give the girls a week of fun, inspiration, and a feeling that someone cares about their future," said Terri Patterson, coordinator for the SISTER program. "We also wanted the girls to spend time with successful women in a variety of career fields. Hopefully, the time together encourages the girls that they can do it too."

SISTER participants are selected from a pool of seventh and eighth grade girls. Any girl can apply, but most participants come from the surrounding communities because the program does not fund transportation or lodging. These are girls who have been recognized for their aptitude in math, science, and technology.

"I am glad my mom found this program," says participant Asya Smith. "It was one of the best camps I've ever been to." Another objective of the program is to show the girls current mission work that is being accomplished at Goddard. This group was afforded the unique opportunity to see spacecraft currently being built at Goddard. "My favorite part was when I got to see the real LRO [Lunar Reconnaissance Orbiter]," says participant Emma Johnson. "I thought it was really cool that we got to see a satellite before it went into space."

The girls were also given several opportunities to spontaneously engage other members of the Goddard community during their week. For Smith, it was a most inspiring moment to be able to talk with someone who had

been working on a spacecraft. "I was so happy to know that the man was willing to talk to us and give us information about LRO."

The week of activities included time spent talking with summer interns at Goddard. "It was valuable to be able to talk to them," says participant Trudel Pare. It was easier to connect because they are closer to our age. It really encouraged me to work hard at my interests so that someday I could be where they are now."



Photo Credit: Debra McCallum

Caption: Middle school girls become sisters in the Summer Institute in Science, Technology, Engineering, and Research (SISTER).

The girls learned how to design a Web page, build a replica of the *Hubble Space Telescope*, and build and launch model rockets. They were challenged academically in oral and written communication skills, and by building upon their interpersonal and human relations skills. "The program inspired me," Smith says. "They [Goddard community members] inspired me to continue in school to be the best I can be and to never, ever give up."

The final hands-on activity provided each girl the opportunity to display her experience during a poster board session. They spoke about what they had learned, how it had influenced them, and their future expectations. "I would recommend this program for other girls who enjoy learning about space, science, and math," says participant Nadine Hudson. "Even if you don't like either, I learned that NASA can use just about every profession there is."

The SISTER program is another example of Goddard's continuing efforts to forge a path to enlighten and inspire future men and women. "Although we were exploring NASA and its facilities; we were exploring future career possibilities," says participant Sunny Zhou. "After going to SISTER, I am surer of what I want to do with my life." ■

Student Aids in *Lunar Reconnaissance Orbiter* Launch

By Andrea Noble, *Bowie Star* Newspaper

Like an artist or writer, 20-year-old Bowie, Md. native Cassandra Alberding expects a great swell of pride when her latest project is unveiled after two summers of work. The focus of her work, however, has not been a painting or book, but a NASA rocket expected to launch in March 2009.

In August, Alberding will complete her second summer internship at the NASA Goddard Space Flight Center in Greenbelt, Md. She is working to calculate launch times for a rocket carrying the *Lunar Reconnaissance Orbiter* (LRO), which will orbit the Moon to collect topography, temperature, and lighting data used to select safe landing sites for future manned missions to the Moon.

"She's the youngest [intern] I've ever had," said her supervisor Mark Beckman, the Associate Head of the Flight Dynamics Analysis Branch at Goddard. "She tends to intimidate the new interns, even the seniors, because she walked in on day one and knew where everything was."

After she graduates from college, Alberding said working at NASA would be her dream job. "I wanted to work for NASA since I was 11," she said. "I got really into space after the movie 'Apollo 13' came out."

Alberding just received her bachelor's degree in math from St. Vincent College in Latrobe, Pa., and will continue her studies in aerospace engineering at the University of Maryland, College Park in the fall.

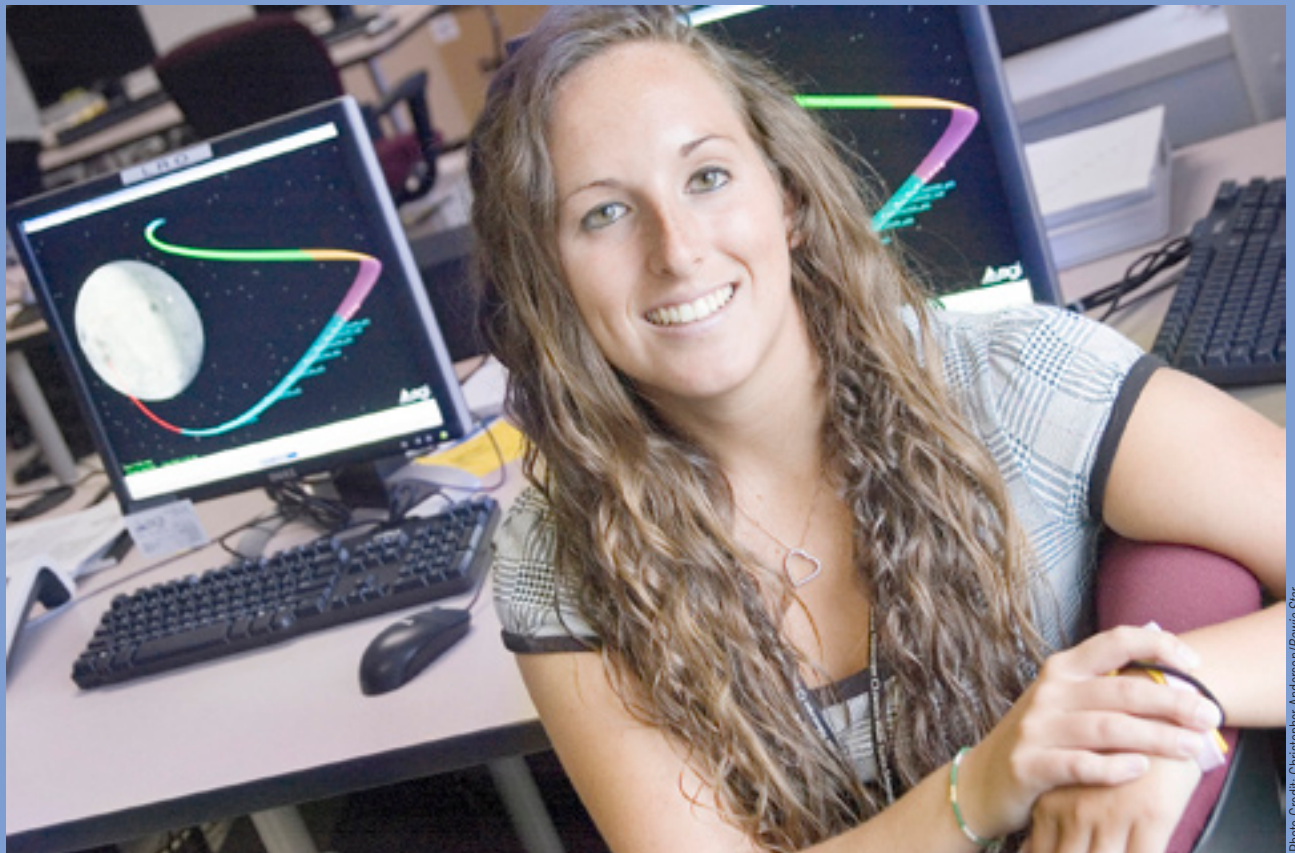
To calculate potential launch times, Alberding uses software that takes variables like the rocket's speed and Earth's orbit into account. "The hardest part [when I started] was that I don't have a lot of experience with the type of software they were using," she said. "When I first got there, it was a hard adjustment to learn it, but now I've pretty much mastered it."

Alberding is 1 of 38 interns chosen from approximately 800 applicants, working in all aspects of Goddard's operations this summer.

"The interns are very involved. They are brought in to complete the piece in a short amount of time," said Goddard spokesman Dewayne Washington of the 10-week internship. "Some students come in to actually finish a project."

The highlight of the program for Alberding will be to see the rocket finally launched. She hopes to return to Goddard on the date of the launch to watch the rocket take off from Kennedy Space Center, Fla. So far, she's calculated 19 possible launch dates in March 2009.

When asked about the optimal day to see her summer's work reach outer space, Alberding said, "March 2 at 12:13 in morning." ■



Cassandra Alberding calculating launch dates for a future lunar mission for NASA during her internship at Goddard.

Photo Credit: Christopher Anderson/Bowie Star