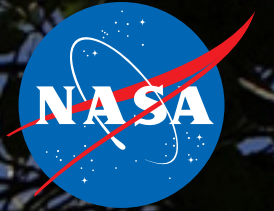


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Goddard Tool Makers Celebrate a Successful Mission

By Rani Chohan



Caption: Jim Bangerter, Network Director

Goddard tool makers are celebrating another successful mission. The STS-121 astronauts took a third spacewalk (or EVA, ExtraVehicular Activity) on July 12, and used Goddard-made crew aids and tools for a pre-planned Shuttle tile repair experiment.

Tool carriers, spatulas and thermal sensors were used to apply a black adhesive called NOAX (Non-Oxidizing Adhesive eXperimental), to a test fixture of deliberately cracked tiles in the Payload Bay. This was the first time the astronauts operated a Langley and Goddard designed infrared camera. "Our hardware was used throughout the spacewalk, says Dan Motto, lead EVA tool development engineer for Swales Aerospace. "The tools worked great."

Back on Earth, day 7 of the Space Shuttle mission appeared to be running smoothly inside Goddard's Network Integration Center (NIC), the communications hub for NASA's Human Space Flight Programs, until a backup in a small sink in the break room forced Network Director Jim Bangerter to order the evacuation of the control center. Ongoing operations were immediately moved to a backup facility located in Building 25.

"This was the first fail over to the Building 25 back up control facility during realtime operations," said Bangerter. "But everything worked very smoothly."

The Building 13 managers took care of the stinky problem immediately and communication managers were back in the NIC 4 hours later. Other than the stinky anomaly, all's been quite in the Goddard control rooms for the STS-121 space shuttle mission, "Just the way we like it," says Bangerter.

Houston's mission control has had no problems communicating with astronauts, monitoring shuttle systems or examining external tank video to make sure no foam fell off during launch.

"When you add it all up, we've been through thousands of hours of simulations since the last shuttle mission," says Bruce Schneck, Human Spaceflight Manager, Honeywell. "We are a well-oiled machine."

NIC managers also tested out the ground communications station located in Santiago, Chile and a modified 11 meter antenna at Wallops. Bangerter says they hope to make full use of the antenna and ground station during the STS-115 shuttle mission slated for launch on August 28, 2006. ■

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Cover Caption: Shooting like a roman candle into Florida's blue sky from Launch Pad 39B, Space Shuttle Discovery kicked off the Fourth of July fireworks with its own fiery display, reflected as well in the nearby water. History was made with the first ever launch on Independence Day. During the 12-day mission, the STS-121 crew will test new equipment and procedures to improve shuttle safety, as well as deliver supplies and make repairs to the International Space Station.

Photo Credit: Nikon/Scott Andrews

GoddardView Info

Goddard View is an official publication of the Goddard Space Flight Center. It is published bi-weekly by the Office of Public Affairs in the interest of Goddard employees, contractors, and retirees. A PDF version is available online at:

<http://www.nasa.gov/centers/goddard/news/index.html>

Managing Editor: Trusilla Steele

Editor: Alana Little

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

International Gravity Meeting Draws Hundred's to Goddard

By Christopher Wanjek

As some 200 scientists from dozens of countries filled Goddard's Building 8 auditorium for the week long 6th International LISA Symposium this June, one message became clear: The era of gravitational astronomy will soon be upon us.

It's a dream a long time in the making, says meeting co-organizer Tuck Stebbins of Goddard. "Ninety years after Einstein produced his general theory of relativity, we're ready to map the universe with it."

Gravitational waves promise to offer an entirely new window to observe the universe, a view based not on light but on pure gravitational energy. Gravitational waves are ripples in space and time that move at light speed, predicted by Einstein in 1916. They are generated by the churning movement of massive objects in space, such as colliding black holes.

There is abundant indirect evidence for their existence, and scientists are building instruments to detect the waves directly. Sophisticated wave detectors are ramping up on three continents; and hopefully soon, LISA, the Laser Interferometer Space Antenna, will be deployed in space.

The symposium marks a coming of age for a field that had only a few dozen disciples as little as a generation ago. International experts in astrophysics, fundamental physics, cosmology and aerospace engineering attended and gave talks.

The field has been energized by three recent developments: Ground-based interferometric detectors in the United States and Germany are now collecting data continuously. A computational breakthrough, achieved by Goddard and other researchers, has enabled realistic numerical simulations of gravitational waves from merging black holes, based entirely on general relativity.

NASA and the European Space Agency are beginning to construct the flight hardware for LISA's technology demonstration flight in 2009.

The first day of the symposium focused on overviews of the astrophysics and fundamental physics that LISA and other gravitational wave detectors might do. The following days explored the astrophysics behind LISA and the implementation and data analysis necessary for wave detection. The LISA mission is challenging but very much possible given the strong support from the scientific community.

LISA comprises three spacecraft "floating" in space like buoys on an ocean tethered by lasers. A passing gravitational wave will alter the distances between spacecraft by far less than the width of an atom. Goddard is NASA's lead center for the LISA mission, with labs supporting laser development and metrology. LISA is planned for launch in the middle of the next decade.

As announced at the meeting, Goddard's John Baker, along with LISA team members elsewhere, is organizing a LISA data challenge, in which scientists interpret mock LISA data. The exercise is intended to attract astronomers to the new gravitational wave field and also to identify problems in LISA data processing early on. The data challenge runs from June 30 to December 1.

The symposium generated some media buzz, with a lengthy article in The Economist. Newspapers and magazine carried reports about gravitational wave astronomy in general.

Did You Know?

Structural Fabrics:

Lightweight, durable fabrics made of Teflon-coated fiberglass came from materials formulated by NASA in 1967 to make space suits. The fabrics are now used for roofing in structures like shopping malls, stadiums and airports. ■

A group photograph of symposium attendees, a veritable who's who of gravitational astronomy, is available at:

<http://lisa6.gsfc.nasa.gov/conf/lisa6>

For more information about LISA please visit: <http://lisa.jpl.nasa.gov> ■

SAP Version Update

By Felicia White

The SAP Version Update (SVU) Project, aimed at updating the current version of the Core Financial software and improving our business processes, wrapped up its second month of Realization activities at the end of June.

Despite encountering several obstacles along the way, the Project has managed to stay on schedule. Below are highlights of the key project milestones completed by the Agency Project teams in support of the SVU implementation on October 30, 2006.

SVU Agency Accomplishments:

- Entered "Realization Phase" of the project in April 2006
- Finalized SVU Scope in April 2006
- Conducted the Critical Design Review (CDR) on April 26, 2006
- Completed the Conference Room Pilot (CRP) 1 & 2 testing on May 12, 2006.

The purpose of CRP was to prototype the SAP configuration and perform end-to-end testing through listed linked test business scenarios.

- Conducted the Test Readiness Review (TRR) on May 10, 2006. The TRR focused on the readiness to begin the test of the FY06 year-end-close process, Contract Management Module (CMM) conversion, the SVU technical update and the overall technical landscape
- Integrated the SVU and CMM implementation activities
- Completed the Training Strategy, Training Needs Assessment and delivered the initial Training Curriculum to the Centers
- Completed the delta TRR and delta CDR on June 12-13, 2006
- Received approval to begin SAP data migration activities and System Integration Testing (SIT)
- Began SIT Pass 1 testing in Huntsville on June 26, 2006. SIT Pass 1 is scheduled to be completed on July 14th, 2006

Center Happenings:

To date, Goddard's SVU Project Management and Core and Extended Process Team members have participated in several of the Realization activities conducted in Huntsville. As SIT gets underway this month, the Process Team will continue making several trips to Huntsville to assist with testing activities.

To keep Goddard's end user community informed of the latest project status, the Change Management team has been hosting a series of Dialogue Sessions. The sessions are targeted to end users within the RFO and the Center Resources communities that will be most impacted by the update. The team provided the audience an overview of the SVU Project and key changes that will impact them.

Participants were given the opportunity to engage in dialogue with the Project team about the changes and were encouraged to ask questions. Round two of the Dialogue Sessions, which began in early May, were completed at the end of June. This fall, more sessions will be scheduled to update these communities on the latest project status. Communication events are also being planned to discuss SVU changes impacting the general SAP user community, including PR Requisitioners and Bankcard holders. Stay tuned for more information on these events.

For more information on the SVU implementation at GSFC, including upcoming project activities, please visit: <https://iview.ifmp.nasa.gov>. Click on "My Center" tab, scroll down and click on "SVU". If you do not have i-View you can visit the site directly at <http://svu.gsfc.nasa.gov> ■

NASA Earth Observatory Receives Third Webby Award

By Lynn Chandler

NASA's Earth Observatory is the winner of the 2006 Webby People's Voice Award in Education. Nominations are made, and winners selected by, the International Academy of the Digital Arts and Sciences. This award honors over a hundred Web sites with the prestigious title of the best on the Web. The winning Webby sites were selected from over 5,500 entries.

The 10th Annual Webby Awards Gala, hosted by Rob Corddry of "The Daily Show" with Jon Stewart, was held earlier this week in New York City.

"It is an honor just to be nominated for a Webby Award, but to win our third People's Voice is a thrill," said David Herring, Earth Observatory Program Manager at NASA's Goddard Space Flight Center, in Greenbelt, Md.

"The Earth Observatory is an agency-wide team effort. Receiving our third nomination over a 5-year period is a testament to the outstanding people across NASA's Earth Sciences Division - including scientists, data visualizers, science writers, and Web designers - all working together to share NASA's space-based perspective on Earth in ways that are easy to access and understand."

The recipients of NASA's Earth Observatory award were joined by Thomas Friedeman, Pulitzer Prize-winning author and celebrated New York Times columnist; Mark Cuban, noted online entrepreneur and owner of the Dallas Mavericks; the Gorillaz, the platinum record selling and Grammy-performing music and animation pioneers; Chris DeWolfe and Tom Anderson, co-founders of MYSpace.com; and Bill Simmons, aka The Sports Guy, noted ESPN.com personality.

NASA's Earth Observatory is a free publication on the Internet where the public can obtain new satellite imagery and scientific information about our home planet. Topics include Earth's climate and environmental change as well as stories about innovative new ways in which scientists are using satellite data to benefit society.

For more information about NASA's Earth Observatory, visit:

<http://earthobservatory.nasa.gov>

For more information about NASA and agency programs on the Web, visit:

<http://www.nasa.gov/home> ■

Research Opportunities in Space and Earth Science (ROSES)

For more information please visit <https://nspires.nasaprs.com>

Solicitations

Near-Earth Object Detection, Characterization, and Threat Mitigation

Released: 2006-05-12

Proposal Due: 2006-07-07

Mars Scout 2006 and Missions of Opportunity

Released: 2006-05-01

Proposal Due: 2006-08-01

NASA ARMD Research Opportunities in Aeronautics (ROA) NRA

Released: 2006-05-24

Proposal Due: See Announcement.

Observing at the NASA Infrared Telescope Facility - Call for Proposals

Released: 2006-02-03

Proposal Due: 2006-10-02

Research Opportunities in Space and Earth Sciences - ROSES 2006

Released: 2006-01-03

Proposal Due: See Announcement

NESC Academy Delivers Course on Satellite Attitude Control Systems

By Shannon Verstynen

The NASA Engineering and Safety Center (NESC) Academy offered its fourth knowledge-sharing course this week. Thirty students gathered at the Jeong H. Kim Engineering Building at the University of Maryland at College Park to participate June 27-29, 2006 in the course, "Satellite Attitude Control Systems: Learning from the Past and Looking to the Future with Cornelius Dennehy and Colleagues."

Cornelius Dennehy served as the NESC Discipline Expert (NDE) for this course and assembled a team to combine their expertise in the field of satellite attitude control systems. The other instructors were Frank Bauer and Rich Burns (NASA Goddard Space Flight Center), Dr. Sanjay Garg (NASA Glenn Research Center), Henry Hoffman (Swales Aerospace, Inc.) and Keith Hoffer (ViGYAN). Topics such as system engineering processes, applying global positioning to satellite navigation, ACS system integration and multivariable control systems were addressed.

Students were given insight into satellite attitude control systems (SACS) and the engineering process by Neil Dennehy, six decades of sea and space stories and lessons learned by Henry Hoffman, space-born global positioning system (GPS) design by Frank Bauer, automated rendezvous and docking (AR&D) by Rich Burns and implementation of multivariable control systems (MCV) by Dr. Sanjay Garg to name just a few of the topics.

Mr. Dennehy's SACS course will be available in late August as an online web-based course for those interested in taking it in a self-paced mode. The three previous courses given by Hank Rotter (Space Life Support Systems), George Hopson (Space Propulsion Systems) and Robert Kichak (Power and Avionics) are currently available online. Students can register for these courses on the NESC Academy website, <http://www.nescacademy.org>.

Mr. Dennehy currently serves as the NDE for guidance, navigation and control (GN&C). He has been the assistant chief for technology in the GN&C division at Goddard Space Flight Center for six years. His principal areas of expertise includes spacecraft attitude determination and control system design.

The NESC Academy was established to capture, share and preserve the lifetimes of experience and knowledge of NASA's senior scientists and engineers; guide the next generation of NASA scientists and engineers as they develop expertise in technical problem solving; and foster interest in NASA careers. NESC, the National Institute of Aerospace (NIA) and CIBER partner to design, develop and deliver the three-day classroom experiences led by selected NDEs.

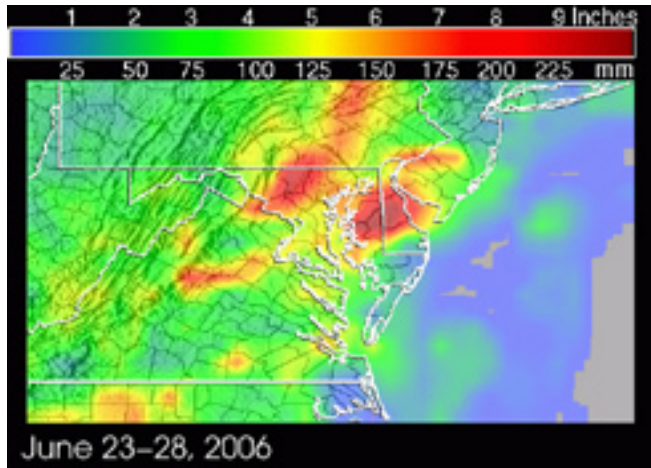


Caption: NESC Participants

The Academy will offer 15 courses in total, each focusing on a specific SPRT discipline area such as flight sciences, propulsion, robotic operations and human factors. The next course is scheduled for December 5-7, 2006 and features Cynthia Null and colleagues on the topic of Human Factors. For more information on the NESC Academy, please visit <http://www.nescacademy.org>. ■

NASA's TRMM Satellite Captures Deluge in the U.S. Mid-Atlantic

By Rob Gutro



Caption: Tropical Rainfall Measuring Mission (TRMM)

From June 23 through June 27, a stationary front draped itself up and down the Atlantic seaboard dropping as much as 10 inches of rain in isolated locations. The stalled-out front provided the focus for the abundant showers and thunderstorms as a steady stream of moist tropical air was channeled northward up the East Coast between a trough of low pressure over the eastern half of the country and the Bermuda High in the western Atlantic.

TRMM was launched in November 1997 to measure rainfall over the global Tropics. The satellite uses a combination of passive microwave and active radar sensors.

As of the 26th, the heaviest rainfall totals for the period (in red) are on the order of 6 inches over Maryland's eastern shore (east of the Chesapeake Bay) and central Delaware. Locally, 10 to 12 inches of rain was reported in Federalsburg, Md. Other areas of heavy rain are seen northwest of Baltimore between the city and eastern slopes of the Appalachians, north-central North Carolina, and parts of Virginia and southern New Jersey.

At one point Washington's Capital Beltway, the highway that circles the Nation's capital, was closed due to a mudslide. Other roads in the region were closed as well as a result of widespread flash flooding. On June 27th, Reagan National Airport reported 0.93" of rain bringing the June total to 13.85 inches, which is 11.05 inches above normal for the month of June! At the Thurgood Marshall Baltimore Washington International Airport, 1.17 inches of rain fell, bringing June's total to 6.73 inches, which is 3.66 inches over the monthly average. At Dulles Airport in northern Virginia, 1.47 inches of rain fell on the 27th, bringing the monthly total to 11.71 inches, which is 8.02 inches greater than the average monthly total.

In Millersville, Pennsylvania, located in the south central part of the state, flooding was reported near rivers, streams and creeks. On the June 25, in Harrisburg, Penn. 65 inches of rain fell, bringing June's monthly total to 8.37" or 3.63" above normal. Many rivers were over their banks. The Susquehanna River overflowed its banks in many locations. The Conestoga River at Lancaster was reported at 14.7 feet, and flood stage was 11.0 feet. Many creeks and streams also overflowed. Major flooding was reported on June 28th for Swatara Creek near Hershey, Penn., and it was also affecting Dauphin and Lebanon Counties. ■



Caption Above: These are pictures of flooding when the Swatara Creek in Middletown, Pennsylvania, reached flood stage on Wed. June 28th. The creek crested at 11 feet (flood stage) and flooded low lying areas of the town. Several roads were closed and homes experienced flood damage. The flooding rains occurred as a result of a stalled cold front over the area and tropical moisture contributed to developing thunderstorms.

Photo credit: Joel Farr

Intern Spotlight: Matt Berger

By Debbie Jensen



Caption: Matt Berger

Many people think of NASA as being solely responsible for launching the Space Shuttle, but studying Earth science, is another equally important part of the research done at NASA.

Photo credit: Deborah McCallum

Goddard Space Flight Center undertakes a major role with Earth science work by conducting vast Hurricane research.

This summer, one of Goddard's interns, Matt Berger in Code 613.1 is helping to compile hurricane data that may be used for an upcoming educational book that will teach blind and visually impaired children about Earth Science.

Burger, a summer intern in the Excellence through Challenging Exploration and Leadership (EXCEL) program, collects data about hurricanes to help NASA scientists analyze current and previous research. Burger creates data sets, mapping where past hurricanes developed, traveled and eventually deteriorated. He then uses the information to figure out if storm systems are possibly linked.

Burger, a sophomore studying meteorology at Ohio University, said pop-up thunderstorms are his favorite weather phenomenon. He is intrigued by how quickly a thunderstorm can develop and how powerful they can become. Because hurricanes are basically large complexes of thunderstorms, he said this research tailors to his interests. "If you can understand a hurricane, you can probably understand any weather," Burger said.

As a part of the internship program, Burger traveled to Dallas, Texas and worked with two other Goddard interns at the National Federation of the Blind's (NFB) annual convention July 3-7 where they helped staff a NASA exhibit. The exhibit included displays of Braille and large print books about the universe and the stars, tactile maps of Mars' surface, astronaut gloves and a tactile model of a NASA satellite.

A collaborative effort between NASA, the NFB and the American Association for the Advancement of Science formed the EXCEL program. The eleven week program provides blind students interested in science, technology, engineering and mathematics with one week of training at the NFB Headquarters, a week at the NFB's National Convention, and on-the-job experience, such as Burger's work with hurricanes, at either Goddard or NASA's Jet Propulsion Laboratory. ■

Spotlight: Dr. Herbert Frey

By Amy Pruett



Caption: Dr. Herbert Frey

Goddard's Planetary Geodynamics Laboratory (PGL) and its chief, Dr. Herbert Frey, prove through their revolutionary research on the planets' structure, dynamics and evolution from Space that they are a unique team.

Photo credit: Deborah McCallum

Part of the team in the Solar System Exploration Division and the Lab conduct both research and mission support for studying the solid and fluid Earth, moon, planets and planetary satellites.

The team first tracks many of the changing, influential aspects of Earth. For example, the PGL's researchers study sea level variations and the tidal effects on the Earth, our planet's crustal magnetism. In addition, they uncover previously unknown faults on Earth using laser altimeter data. The system works much like radar, emitting and receiving a laser beam and recording the time it takes to return. They also study the impact of glaciers such as their ability to trigger earthquakes.

Second, they study Earth and space, examining small bodies such as Europa, Triton and Pluto and the effects they feel from rotational-orbital interactions. "It's important to remember that the Earth is a planet. You can learn a lot about the Earth by studying other planets, and visa versa," says Frey, "And we study both."

The Laboratory has supported many spaceflight missions since its conception. The Lab has "science team" and other roles in GRACE, ICESat, Jason, the European Oersted and CHAMP magnetic field missions, and the forthcoming ESA SWARM mission. On the planetary side, Lab members are closely tied to the very successful MOLA experiment on MGS, to Messenger (on its way to Mercury), to LRO, and MRO (now in orbit around Mars).

In addition, Dr. Herbert Frey's history of excellence matches that of his lab. A Goddard civil servant for almost 30 years and an author or co-author of over 58 publications, he is an expert in planetary geology and geophysics, overland altimetry/topography, crustal magnetic anomalies, early planetary crustal evolution and comparative planetology.

Frey says, "I can't think of a better place for NASA and Goddard to go for "one-stop" expertise on the geology and geophysics of the Earth and planets. ■