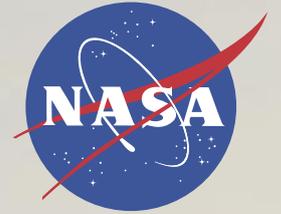


National Aeronautics and Space Administration
Explore. Discover. Understand.
Volume 1 Issue 4
August 2005



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Letter from Houston

By Ed Campion. Tuesday, August 9, 2005, 7:30 a.m. CDT

Dear Friends,

I have been in Houston for the last two weeks supporting the flight of Space Shuttle Discovery on the STS-114 mission that just concluded a few minutes ago with a landing at Edwards Air Force Base in California.

A couple of weeks after the Space Shuttle Columbia accident in February 2003, and after I had returned from mishap support in Houston, I sent out a note entitled "Two 1st and the Unfinished Cup of Coffee" to friends giving an update on what I had been through. Near the end of the note, I wrote the following:

"To watch a Space Shuttle launch is truly a spectacular sight. There is the technical achievement of something that big, that complex, flying off into space; but of equal or greater importance is the symbolic meaning. It represents our willingness to challenge ourselves... to do things that are bold, to seek out new scientific information which has the potential to improve the lives of everyone here on Earth. But mostly it represents our desire to explore. To do anything less would go against the human spirit."

Given the events of the morning, I feel it is only appropriate to once again take pen to paper (or more accurately fingers to keyboard) and give you the following thoughts:

Spirit of Discovery

It may have taken a couple of extra weeks for Space Shuttle Discovery to get off the launch pad and one extra day to bring the crew home, but the fact remains that the first Space Shuttle mission in 2 1/2 years and the first since the Columbia tragedy has been completed.

I will admit having a piece of foam come off during launch was disappointing since we thought we had closed that particular flight issue. And having to add a "repair" task to a planned spacewalk was not our first choice in terms of additional crew activities.

But folks also need to understand that new cameras, new sensors and new procedures allowed us to have unprecedented insight into the performance of the Space Shuttle—something that did not exist before the Columbia accident—and when it was time for Discovery to come home, we knew without a doubt that we had a good and safe ship for the STS-114 crew to make their return trip to Earth.

I have no doubt that with the crew now safely back on the ground, critics and naysayers will be shouting to any and all who will listen how the Space Shuttle is too difficult and too dangerous to operate. Frankly, if their pessimistic perceptions become accepted beliefs, it will indeed be a sad day for the United States.

The human spirit to explore has always been strong. Not every Conestoga wagon that set out for California finished its journey. But hardships and tragedies did not stop the pioneers of the old west and they should not stop our present exploration efforts.

I'm sure the brave explorers of the past that did reach California probably looked in awe and wonder at the mighty Pacific Ocean and the star-filled sky above. And earlier today, individuals in that same part of the U.S. saw a ship returning from a voyage of exploration, having sailed safely through the ocean of space and now blazing a trail across the pre-dawn sky.

For those who got to see the atmospheric streak created by Discovery's trip home, they witnessed more than just a Space Shuttle's re-entry—they saw a beacon of our humanity and a reaffirmation that the spirit to boldly explore is still alive. ■

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Cover: The sun rises on the Space Shuttle Discovery as it rests on the runway at Edwards Air Force Base, California, after a safe landing August 9, 2005.

Photo Credit: NASA

GoddardView Info

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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.

Welcome Home!



Photo Credit: NASA

The crew of mission STS-114 gathered in front of Discovery following landing at Edwards Air Force Base. From left to right: Mission Specialist Stephen Robinson, Commander Eileen Collins, Mission Specialists Andrew Thomas, Wendy Lawrence, Soichi Noguchi and Charles Camarda, and Pilot James Kelly.

Discovery Returns Student Experiments from Space Station

By Keith Koehler

When the crew of the Space Shuttle Discovery returned from their historic mission, they brought back an experiment package eagerly anticipated by students from across the country. The experiments had been on board the International Space Station.

Twenty tiny experiment samples were delivered to the Space Station on December 25, 2004, on board a Russian Progress supply ship. The experiment samples are from 11 schools and organizations representing students in elementary through high school. Eight of these schools and organizations also flew experiments on the Space Shuttle Columbia's last mission in 2003.

The student experiments contained a variety of materials and seeds in 20 clear vials with lids. Each vial was wrapped in two vacuum bags and placed in a Student Experiment Module Satchel carrier. The vials are expected to be returned to the schools and organizations at the beginning of the upcoming school year. After receiving the space-flown samples, the students will be able to compare them to ground samples.

The schools and organizations participating in the Space Station experiments include:

- Central Park Middle School, Scotia, N.Y.
- J.M. Bailey School, Bayonne, N.J.
- The Mott Hall School, New York
- American Museum of Natural History, New York
- Shoshone-Bannack High School, Pocatello, Idaho
- Bishop Borgess High School, Dearborne Heights, Mich.
- Ogdensburg Public School, Ogdensburg, N. J.
- East Norriton Middle School, Norristown, Pa.
- Shady Side Elementary School, West River, Md.
- Columbus High School, Columbus, Ga.
- Walkersville Christian Family School, Stockton, Md.

For information about the student experiments, visit:
<http://www.wff.nasa.gov/efpo/satchel/experiments.html>

For information about NASA education programs, visit:
<http://education.nasa.gov> ■



Students from Walkersville Christian School, Stockton, Md., prepare an experiment vial for flight on the SEM-Satchel carrier at the Wallops Flight Facility.

Photo Credit: NASA

Viewing the Heavens

By Elizabeth Flowers

A video camera that allows anyone with an Internet connection to remotely view the stars and planets was successfully tested on a 29.47 million cubic-foot NASA scientific balloon that was launched from Palestine, Texas, on July 28.

The primary payload for the flight was the Absolute Radiometer for Cosmology, Astrophysics and Diffuse Emission (ARCADE) instrument. The 5,066 pound instrument will study the early universe by measuring heat from the first stars. Researchers using ARCADE hope to discover when the first stars formed after the Big Bang, the primordial explosion of space believed by some to have created all matter and energy in the Universe. The principal investigator for ARCADE is Dr. Alan Kogut, NASA Goddard Space Flight Center, Greenbelt, Md.

A secondary instrument, called the CosmoCam, has two video cameras. One is a general observing camera with pan, tilt, and zoom capability. The other is a CCD camera built for use in amateur astronomy and can be mounted on a Meade telescope during longer flights.

For this trial flight, which lasted 9 hours and 11 minutes, several astronomy enthusiasts were recruited to test the camera via the Internet. With longer flights, the CosmoCam could be accessible to more members of the general public as well as students.

"We have placed this Internet-controlled camera system at the brink of space, the ultimate mountaintop," said Scott Murphy of Rocket Science, Inc. "People who log on can point it anywhere they like, up toward the stars or back towards earth. We believe this is a great opportunity to bring people closer to space and the space program."

Future missions for CosmoCam, which is being developed by Rocket Science, Inc. in collaboration with NASA Goddard, will allow for observing prime targets such as the Moon, Jupiter, Mars, Saturn, and perhaps bright galaxies. CosmoCam has a solar filter to allow solar observing during the day.

Wallops Flight Facility, Wallops Island, Va., manages NASA's Scientific Balloon Program for the Science Mission Directorate, NASA Headquarters. Launch support is provided by the National Scientific Balloon Facility, Palestine, Texas.

For information about NASA's Scientific Balloon Program, visit:
<http://www.wff.nasa.gov/~code820/>

For more information about CosmoCam, visit:
<http://www.cosmocam.com>

For more information about ARCADE, visit:
<http://arcade.gsfc.nasa.gov> ■

Mission Updates

GOES-N Mission

By Nancy Pekar

GOES-N is the latest in a series of Earth monitoring satellites. The GOES-N launch has been postponed to a later date. A new launch date will be set for no earlier than August 30. Geostationary Operational Environmental Satellites (GOES) provide the kind of continuous monitoring necessary for intensive data analysis. Geostationary describes an orbit in which a satellite is always in the same position with respect to the rotating Earth. This allows GOES to hover continuously over one position on the Earth's surface, appearing stationary. As a result, GOES provide a constant vigil for the atmospheric "triggers" for severe weather conditions such as tornadoes, flash floods, hail storms, and hurricanes.

Mars Reconnaissance Orbiter

By Guy Webster

NASA's Mars Reconnaissance Orbiter, launched on August 12, has completed one of the first tasks of its seven-month cruise to Mars, a calibration activity for the spacecraft's Mars Color Imager instrument.

"We have transitioned from launch mode to cruise mode, and the spacecraft continues to perform extremely well," said Dan Johnston, Mars Reconnaissance Orbiter deputy mission manager at NASA's Jet Propulsion Laboratory, Pasadena, Calif. The first and largest of four trajectory correction maneuvers scheduled before the orbiter reaches Mars is planned for August 27.



Image Credit: NASA/JPL

The Mars Reconnaissance Orbiter as it orbits over the martian poles.

The Mars Reconnaissance Orbiter will reach Mars and enter orbit on about March 10, 2006. After gradually adjusting the shape of its orbit for half a year, it will begin its primary science phase in November 2006. The mission will examine Mars in unprecedented detail from low orbit, returning several times more data than all previous Mars missions combined. Scientists will use its instruments to gain a better understanding of the history and current distribution of Mars' water. ■

Robotics Internship Program Ends Amid Kudos

By Lori Keesey

High school students interested in learning more about robotics can always participate in the NASA-supported FIRST and BotBall competitions, but they won't find much in the way of hands-on programs once they graduate from high school. The dearth of opportunity is what motivated two University Program officers to fill the void with a pilot program that debuted this summer.

On August 12, David Rosage and Lubna Rana of the NASA Academy watched 26 undergraduate and graduate students from across the country give final presentations and formally graduate from NASA's new Robotics Internship Program (RIP). RIP was fashioned after the NASA Academy and was created with funding from the Mars Project Office at NASA Headquarters, the Hubble Space Telescope Project at Goddard, and the Director's Discretionary Fund.

"We wanted to give these students an experience of a lifetime," Rosage said, referring to the 10-week resident internship program.

To do that, Rosage and Rana began planning and organizing the program more than a year ago. They invited researchers at Goddard and area companies and universities to propose robotics projects that would be conducive to teamwork and provide real, hands-on apprenticeship experiences for students. Making sure that the student projects made a genuine contribution to robotics research was a major program objective. Seven projects responded to the call — four from Goddard and one each from the University of Maryland, John Hopkins University Applied Physics Lab, and Lanham-based Anthrotronix, Inc.

The two then invited college students with outstanding academic records and demonstrated prior interest in robotics to apply for the internships. From a pool of 130 applicants, Rosage and Rana selected 19 high-achieving freshmen and sophomores to participate as research assistants and seven advanced undergraduate and graduate students to serve as team leads.

Between Monday and Thursday, the students worked on their team projects and on Fridays, they toured labs, worked on a group project, or took field trips, including overnight trips to the Johnson Space Center's Robonaut Lab, the Carnegie Mellon Robotics Institute, and the MIT Artificial Intelligence Lab. Students also attended public lectures by world-class robotics experts, including Paul Schenker (JPL), Butler Hines (Ames), and Vijay Kumar (University of Pennsylvania). "The goal is to expose our students to the best of the best in robotics and inspire them to become future leaders in the field," Rana said.

A few weeks before the end of their internships, the students appeared as enthusiastic as ever about what they were experiencing. "The intensity is what makes it so interesting," said Christopher Edmonds, an electrical engineering major at Oregon State University, who worked on Code 588's adaptive sensor fleet technology. David Schneider, a PhD candidate from Cornell University, was impressed by the high caliber of the projects and the students chosen to participate in the program. Bryan Gaither, a physics major who attends Austin Peay State University, vowed to start a robotics competition for students in his hometown in Tennessee.

Rosage and Rana have high hopes for the program. Run as a pilot this year by the Goddard Office of University Programs, they expect it to expand to other NASA centers in 2006. "Robotics is a fledgling industry right now,"



Photo Credit: Larry Gilbert

From left—Timothy Montague, Nicholas Kingsbury, Caitlin Johnson, and Brandon Philips of the AnthroTronix Vision and Speech Team.

Rosage said. "What we're trying to do is educate the next generation of robotics scientists and engineers, fill the pipeline of qualified employees to help carry out NASA's Vision for Space Exploration, and at the same time, give the students an experience they'll never forget," he said.

"This was the best summer, ever," said Melissa Jensen-Morgan, an engineering major at Oregon State University, and one of the recipients of the Outstanding Participant Award. ■

2005 Robotics Team Projects

Visual Obstacle Identification Robotics

Johns Hopkins University Applied Physics Lab

Adaptive Sensor Fleet

Goddard Space Flight Center

Human-Robotic Interfaces

Anthrotronix, Inc.

Robotic Rover Prototypes

University of Maryland

"Virtual Feel" Robotic Servicing

Goddard Space Flight Center

Computer Vision for ANTS Tetwalker

Goddard Space Flight Center

Modeling of Tetrahedral-Based Robotics Structures

Goddard Space Flight Center

Engineers Organize With A Desire To Inspire

By Dewayne A. Washington

August 31 will mark the one year anniversary when Goddard engineers Brian Harris and Damon Bradley chartered an Alumni Extension chapter of the National Society of Black Engineers-Goddard Professional Chapter (NSBE-GPC).

Currently, NSBE is recognized as the largest student-managed technical professional nonprofit organization in the world. For the local chapter, NSBE-GPC, the vision is two-fold. Their first priority is to unite the Black Science, Technology, Engineering, and Mathematic (STEM) communities within NASA to engage the Black community in space industry. Their second, to create valuable programs that benefit both NSBE and NASA communities.



Photo Credit: Chris Gunn

La Vida Cooper, current president of the Goddard chapter of NSBE.

Newly elected President, La Vida Cooper, is a great example of what someone can achieve by taking advantage of the various student programs offered at Goddard. Cooper began her NASA career as a NASA Academy Research Associate, then she became a co-op student while pursuing her Master's degree, and recently she was converted to a full-time Electronics Engineer becoming the newest member of the Microelectronics and Signal Processing Branch.

Her philosophy for success is quite simple, "Pursue your passion and the energy and creativity needed to achieve it will follow; share your passion (with others) and opportunities will follow."

On June 15, NSBE-GPC held its inaugural Graduate School Fair. The Chapter partnered with other Goddard offices including Equal Employment, University Programs, and Human Resources. More than 100 Goddard summer interns from across the country and Puerto Rico were in attendance.

The fair provided each intern an opportunity to talk with local school representatives about science, technology, engineering, and math curriculum opportunities at their school. Eight local area colleges and universities were represented including John Hopkins University, the University of Maryland,

Howard University, and Bowie State University.

Carl Mack, National Director of NSBE, provided words of insight into the NSBE mission. Chris Scolese, Deputy Director for Goddard, also spoke, providing a comprehensive view of Goddard and its mission along with Dan Krieger, from the Office of External Relations at NASA Headquarters, who reflected on the importance of an advanced degree.

Marcellus Proctor, Programs Chair, said the students found the fair to be very beneficial and would like to see it again including schools outside the local area.

Some High School students also attended in small numbers, and came primarily from C.H. Flowers High School. Andrea Young, NSBE Jr. Advisor for C.H.Flowers High School and PCI Chair for NASA-GPC brought four of Flowers' NSBE Jr. officers to the event to gain continued NASA exposure and to learn more about preparing for graduate school. NSBE Jr. officers, Christopher Williams, President; Christen Johnson, Vice President; Leon White, Senator; and Kendrick Williams, Assistant Programs Chair were in attendance. Christopher Williams and Leon White were recently accepted into the NASA SHARP program this summer at California State and NASA Goddard, respectively.



Photo Credit: Chris Gunn

High school and graduate students were eager to talk to school representatives at the NSBE school fair.

Though just celebrating one year in existence, the NSBE-GPC chapter has made great strides in fulfilling the NSBE mission to, "increase the number of culturally responsible Black engineers who excel academically, succeed professionally, and positively impact the community," and the NASA mission "to inspire the next generation of explorers." With the new membership year beginning, this progressive professional development organization promises to deliver yet another year of inspiring programs and activities to benefit the Goddard community. ■

History's Greatest Comet Hunter

By Bill Steigerwald

One thousand comets have been discovered to date using the Solar and Heliospheric Observatory (SOHO) spacecraft. The SOHO spacecraft, a joint effort between NASA and the European Space Agency, has accounted for approximately one-half of all comet discoveries with computed orbits in the history of astronomy.

Many SOHO comet discoveries have been made by amateurs using SOHO images on the internet, and SOHO comet hunters come from all over the world. Toni Scarmato, a high school teacher from Italy, discovered SOHO's 999th and 1000th comet August 5 when two comets appeared in the same SOHO image.



An illustration of SOHO and its comet discovery milestones.

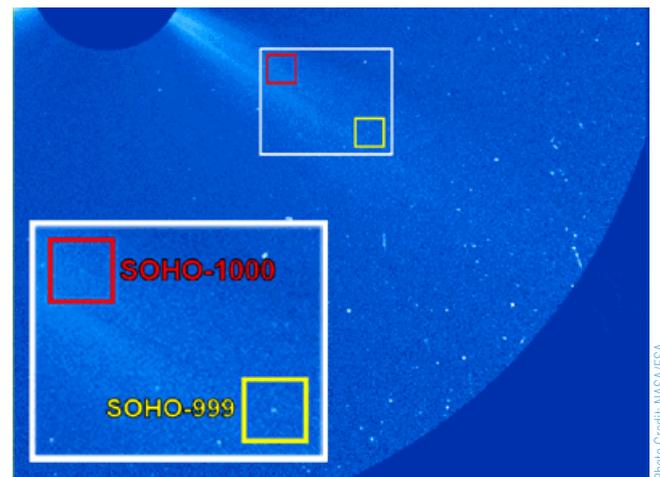
Scarmato, an astrophysics graduate of Bologna University, said "I am very happy for this special experience that is possible thanks to the SOHO satellite and NASA-ESA collaboration. I want to dedicate the SOHO 1000th comet to my wife Rosy and my son Kevin to compensate for the time that I have taken from them to search for SOHO comets."

The SOHO team also held a contest over the internet to guess the time when the 1,000th comet would be discovered. The contest winner is Andrew Dolgoplov of Dublin, Ireland, who guessed the time of the comet's closest approach to the Sun (perihelion time) within 22 minutes.

"Before SOHO was launched, 16 sungrazing comets had been discovered by space observatories. Based on that experience, who could have predicted that SOHO would discover more than sixty times that number, and in only nine years? This is truly a remarkable achievement!" said Dr. Chris St. Cyr, Senior Project Scientist for NASA's "Living With a Star" program at Goddard.

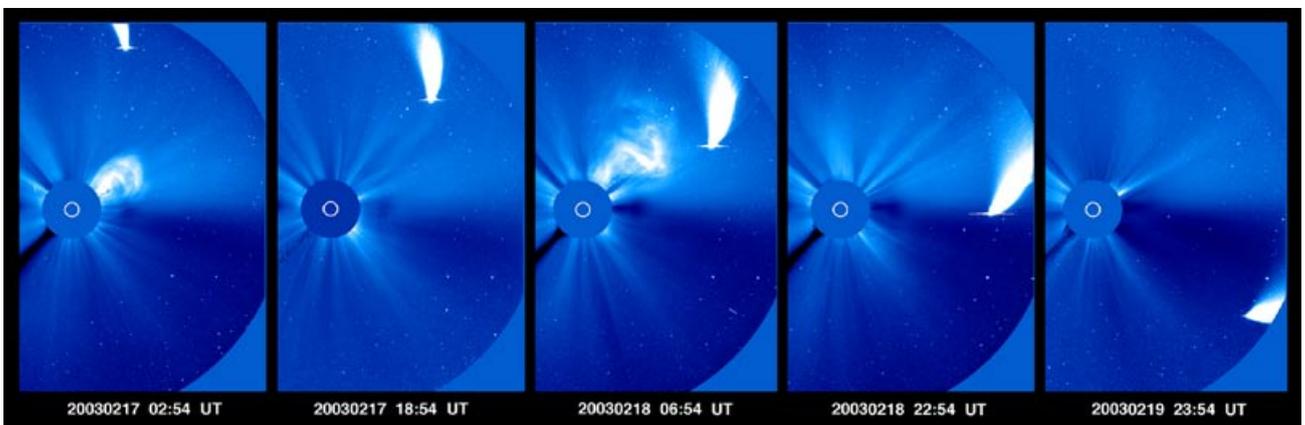
About 85 percent of the SOHO comets discovered so far belong to the Kreutz group of "sungrazing" comets, so named because their orbits take them very close to the Sun. SOHO's 999th and 1,000th comets also belong to the Kreutz group. The Kreutz sungrazers come within 500,000 miles (800,000 km) of the Sun's visible surface. SOHO has also been used to discover three other well-populated comet groups: the Meyer (at least 55 members), Marsden (at least 21 members), and Kracht (24 members) groups. These comet groups are named after the astronomers who suggested that the comets are related because they have similar orbits.

Because comets in a group have similar orbits, they are believed to be fragments from a larger comet that broke apart. Sungrazing comets can break up as they approach the Sun due to the Sun's gravity and heat. It is likely that small fragments continue to break off all around their orbits, because SOHO observes a stream with tiny Kreutz members reaching the Sun almost every day, and bits as small as these would have simply vaporized if this had happened near the Sun. Most of these comet fragments are not visible from Earth because their small size makes them extremely faint. A typical comet nucleus is as big as a mountain, while most of the SOHO comets are only as big as a large room or small house.



SOHO comets 999 and 1,000.

For more information, images, and movies on comets, visit: <http://www.nasa.gov/vision/universe/solarsystem/1000comet.html>



Comet NEAT as seen by SOHO in February 2003.

SEWP Working Capital Fund

By Theresa Kinney

The SEWP Program held their Working Capital Fund Charter Ceremony on July 19, 2005. The charter sets forth the authority, provisions, mission and responsibilities of the SEWP business entity as an Agency-wide function operating in the National Aeronautics and Space Administration (NASA) Working Capital Fund (WCF). The implementation of a WCF presents SEWP with the unique opportunity to apply best practices from the public and private sectors to improve its organizational performance, operational efficiencies, and to promote full cost recovery of goods and services.

The NASA WCF is not a physical entity or organization, but rather is a funding mechanism used to finance certain organizations within NASA, like SEWP, that operate like commercial businesses. WCF business entities finance their operations with cash earned through the production and sale of goods and services rather than direct appropriations from Congress.

Among the speakers at the Charter Ceremony were Ronald Brooks, NASA Headquarters, Director of Policy and Business Integration; Nancy Abell, Goddard Space Flight Center, Chief Financial Officer; Joanne Woytek, SEWP Program Manager; and Adrienne Ferguson, NASA Headquarters, Chief of Data Analysis.

For more information on SEWP, visit:

<http://www.sewp.nasa.gov/>

For more information on NASA's Working Capital Fund, visit:

http://www.nasa.gov/offices/ocfo/references/ocfo_WCF_details.html ■

Partners for Joint Research

By Kim Lembo

On August 18, companies, universities, and government labs within the central New York region had the opportunity to meet with some of Goddard's senior technologists to explore areas of mutual R&D interest and opportunities for joint research. More than 50 senior executives from 32 organizations attended NASA Goddard's Joint Venture Workshop on Technology Trends, which exceeded the attendance goal.

Held in Utica, the workshop was sponsored by Goddard's Office of Technology Transfer and organized by NASA's Northeast Regional Technology Transfer Center (RTTC), and the Center for Technology Commercialization (CTC). The central New York region has several technical strengths that overlap with NASA's core technology development interests, including sensors, hardware/software development, electronic components, and advanced manufacturing automation systems.

The workshop gave attendees the opportunity to make connections and develop relationships with Goddard's technology decision makers. Speakers and attendees were welcomed by U.S. Congressman Sherwood Boehlert, Chairman of the House Science Committee, and Utica Mayor Tim Julian. Presenters from Goddard included: Peter Hughes, Chief Technologist, who gave an

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Proposal Opportunities

NASA Research Announcements (NRA)

Discovery (Pending Release)

LWSRBSP (Pending Release)

ESSP (Pending Release)

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

Research Opportunities in Space and Earth Science (ROSES)

NASA Energy and Water Cycle Study

NOI: 8/18/2005

Proposal Due Date: 10/5/2005

Land Cover/Land Use Change

Proposal Due Date: 8/1/2005 (Step 2)

Remote Sensing Science for Carbon and Climate

Proposal Due Date: 8/3/2005

Astrobiology: Exobiology and Evolutionary Biology

Proposal Due Date: 8/5/2005

Planetary Protection Research

Proposal Due Date: 8/5/2005

Mars Data Analysis

Proposal Due Date: 8/12/2005

New Investigator Program in Earth-Sun System Science

Proposal Due Date: 8/31/2005

2001 Mars Odyssey Participating Scientists

Proposal Due Date: 9/1/2005

Living with a Star/CEDAR Collaborative Studies with C/NOFS

Proposal Due Date: 9/9/2005

Terrestrial Ecology and Biodiversity

Proposal Due Date: 9/12/02005

FUSE Guest Instigator/Cycle 7

NOI: 9/16/2005

Proposal Due Date: 9/16/2005

Planetary Instrument Definition and Development

Proposal Due Date: 9/16/2005

For more information contact the New Opportunities Office x6-5442

Intern Envy

By Amy Pruett

Secretly, everyone wants to be envied. After classes have resumed, students and teachers often spend their first week back at school one-upping each other with tales of their summer break. However, 400 individuals are set to win hands-down as they can proudly state that their summer days were spent at NASA Goddard Space Flight Center enrolled in exciting, stimulating educational programs.

Annually, hundreds of individuals of all skill levels, backgrounds, and ages arrive between the months of June and August to participate in numerous educational programs distributed throughout Goddard. The participants range from middle school students to undergraduate and graduate students as well as educators interested in all aspects of science, technology, mathematics, and engineering.

Twenty-three female eighth graders participated in the Summer Institute in Science, Technology, Engineering, and Research (SISTER) program from June 21 – July 1. The annual 5-day program's goal is to introduce young women from the surrounding area to potential career paths in science and technology. Their daily activities varied, but each one included working with various Goddard women engineers, mathematicians, scientists, and researchers. "The SISTER program gives its participants a chance to see different women scientists and engineers in action," says SISTER coordinator Terri Patterson. "I enjoyed everything but was most excited about making a rocket and launching it," said Tosin David, participant of the SISTER program "I also enjoyed meeting the young ladies who were working there for the summer in the SHARP program. They showed me that you have to work hard and prepare for college but you should be well rounded and do a variety of things."

Another summer program, The Robotics Internship Program (RIP) recruits undergraduate students with an interest in robotics. In its pilot year, the program is geared towards developing the next generation of robotic specialists, "not only for NASA, but also for academia and the robotic industry," says Dave Rosage, RIP coordinator at Goddard. The bulk of the student participants are rising freshmen and sophomores, a group that is often overlooked in internship programs. RIP coordinators and mentors recognize that students just beginning an education in engineering can be just as valuable to robotics research as advanced undergraduate students. Students enrolled in the program will enhance the intelligence, independence, and efficiency of robotic systems destined for space exploration in industry and academia laboratories. "I've learned quite a bit so far. We get to work right next to engineers and get hands on experience on real projects, finding out what robotics engineering is really like. It's a career I definitely would like to get into," says Noah Desch, RIP participant.

During the week of July 11-15, NASA Explorer School's (NES) six newest participants from the Maryland to Maine region visited Goddard for a summer workshop. Fifty elementary and middle schools from across the country make up the NES program that involves a three-year partnership with NASA. Each respective school forms a team of state-certified educators and administrators that will work one-on-one with NASA scientists and engineers. This is done at events such as summer workshops. They strengthen and increase their knowledge as well as learn real-world, practical applications of science, technology, engineering, and mathematics, to share in their school's classrooms in the coming school year. In this manner, NASA content is disseminated to hundreds of elementary and middle school students because of this innovative and excellent program. "As a result of their time here, edu-

[Continued on Pg 12](#)



Par

Photo Credit: Debora McCallum

Future Scientist Represents Goddard During JASON Expedition

By Debra Jensen

Megan Shaffer, a 14-year old student from St. Hugh's Elementary School in Greenbelt, Md., visited Goddard Space Flight Center on July 22 to learn more about the agency she will be representing during the JASON Expedition: Mysteries of Earth and Mars. Megan has been selected as a student Argonaut—a term used to describe students and teachers working with host researchers on a JASON expedition—and will join some of NASA's top scientists in this year's program.

The JASON Expedition is a program administered by the JASON Foundation for Education, a non-profit educational group founded by Robert Ballard in response to thousands of letters he received from children asking how he found the wreck of the RMS Titanic. The children wanted to know how they could accompany him on his research expeditions.

The JASON Expedition has a science curriculum for children in grades four through nine involving research about a particular place on Earth. This curriculum usually consists of each of the main areas of scientific study including biology, earth, and physical science. There is a satellite broadcast highlighting scientists and select students and teachers conducting research in the area being studied in the curriculum. This broadcast adds value and application to what the students are studying in class by showing the students how the material they are learning is applied in a real-life situations.

Shaffer will join the team going to Mono Lake, Calif., where the scientists and students will research extreme environments, such as very salty water, and the life forms that live in them. NASA Chief Scientist Jim Garvin, who is currently working at Headquarters, is a host researcher for the expedition. Jack Farmer, an astrobiologist at Arizona State University, leads Shaffer's team. From September 16-18, this team will study the very salty and high pH environment of Mono Lake for the broadcast.

Shaffer was the only student accepted to accompany the research expedition from a NASA affiliated Primary Interactive Network (PIN) site. A PIN site is where teachers receive their training so they can effectively teach the JASON curriculum in their classrooms. Shaffer's science teacher attends training at Goddard at the Howard B. Owens Science Center PIN site which nominated Shaffer. The satellite broadcast is also down linked for participating schools at the PIN sites. This year, there are only three students accompanying each of the scientists during their field research, and each PIN Site could nominate up to three students for consideration as Argonauts. There are about 31 PIN sites across the country.

While at Goddard, Shaffer received a tour of a clean room and learned about how clean rooms worked, met the thermal technicians who worked on the thermal blankets, saw the facilities used to test instruments, and got to see

the control room for SOHO. Shaffer also learned about the upcoming New Horizons mission to Pluto and the Kuiper Belt.

Shaffer will attend Elizabeth Seton High School in Bladensburg, Md., this August. She said marine biology, one of the sciences she learned about while studying previous JASON expeditions, is her favorite type of science. She has participated in three JASON expeditions: From "Shore to Sea" studying the California Channel Islands, "Rainforests at the Crossroads" in Panama, and "Disappearing Wetlands" in southern Louisiana, which was one of her favorite curriculums. She said she hopes this experience will teach her how to work as a team member, and she knows she will be able to apply what she is learning on this expedition in her future career goals. Shaffer hopes to be a scientist by the time we send humans to Mars.

The JASON Expedition: Mysteries of Earth and Mars will be broadcast the week of Jan. 30 – Feb. 3, 2006. ■

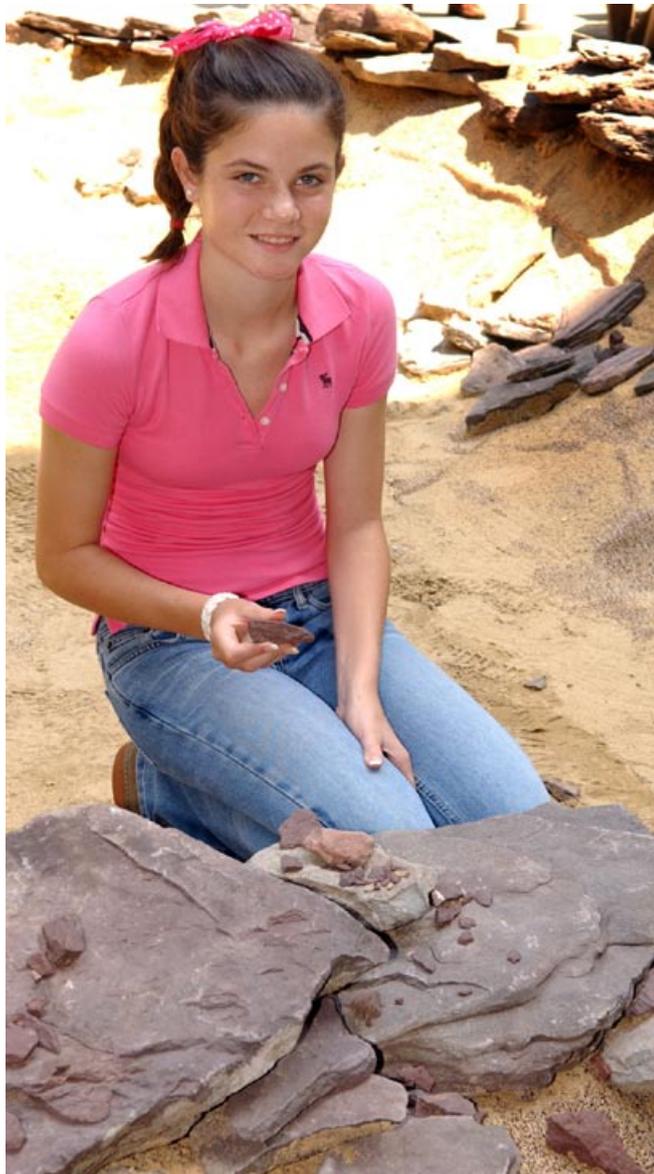


Photo Credit: Chris Gunn

Megan Shaffer stops for a photo while on her tour of Goddard's facilities.

Employee Spotlight

By Cynthia O'Carroll

As **Ernest Hilsenrath** fills up the boxes in his office with books and memorabilia, he ponders his long career with NASA Goddard Space Flight Center. Looking back, he realizes how lucky he was to work on the first meteorological satellites and build rocket experiments to sample ozone in the atmosphere well before ozone depletion became an environmental concern.

Hilsenrath has many fond memories of his 40-year career. "There is no place on Earth like Goddard. The skills, energy, and dedication of the people who work here are unbeatable and they are the reason for all my successes. Goddard is the place where good ideas take you wherever you want to go," remarked Hilsenrath.

For the past six years, Hilsenrath has been the Aura Deputy Project Scientist. Aura was launched on July 15, 2004 and is part of the Earth Observing System, a program dedicated to monitoring the complex interactions that affect the globe. Hardware issues, science strategies, negotiations with management, and international intrigues were many of the Aura mission challenges. Working with the Aura instrument science teams has been fantastic for Hilsenrath. "They are such brilliant people, scientists, and engineers who conceived and built instruments that send us vital information on the health of our planet," stated Hilsenrath.

He began working at Goddard in 1962 in a radiometry laboratory for William Nordberg, the first Director of Space Applications at Goddard, and became a pioneer in using remote sensing to investigate the Earth and its environment. Nordberg's group set up the first meteorological satellites, TIROS and Nimbus, and Hilsenrath tested the instrument components. After that, he designed a rocket payload that measured stratospheric ozone and flew 55 missions, mainly in Polar Regions where ozone amounts were totally unknown.

After the discovery that Chlorofluorocarbon by-products depleted ozone, Hilsenrath flew a Solar Backscatter Ultraviolet Radiometer (SBUV) instrument on the Shuttle, called the SSBUV, and it eventually flew on eight subsequent shuttle missions. Two missions were flown to test a new ozone measuring technique, the last being the ill-fated STS-107 Columbia mission.

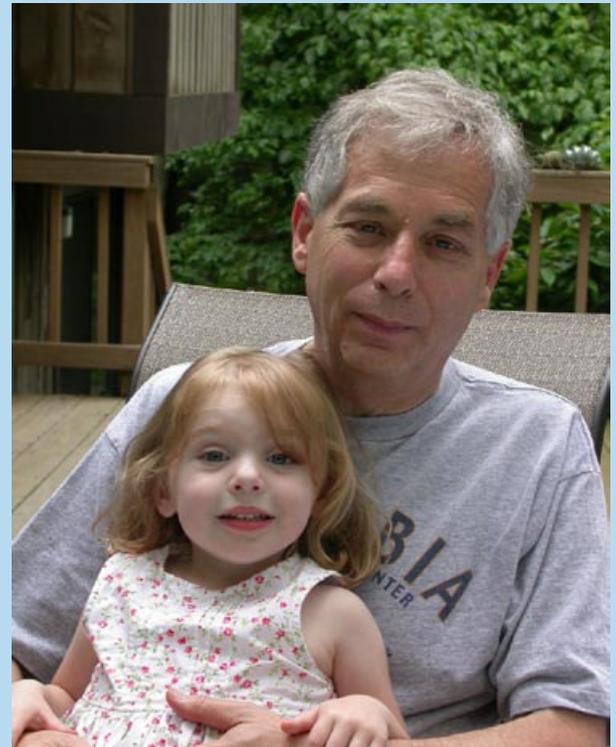


Photo Credit: Courtesy of the Hilsenrath family

Pictured above is Ernest Hilsenrath with his granddaughter, Emily.

Hilsenrath was born in Germany and immigrated as an infant to the U.S. in 1940. He wanted to be an astrophysicist and was excited by the idea of space flight after the Russians put Sputnik into orbit. Following a trip to Langley Research Center to see a mockup of the Echo satellite, he knew he had to get a job at NASA and so his story began. ■

Partners for Joint Research

Continued from Pg 9

overview of the Center's technical needs over the next 10 years; Julie Loftis, Assistant Chief for Technology, Information Systems Division; Jill Holz, Robotics Manager, Hubble Space Telescope Development Project; and Sachi Babu, Acting Assistant Chief for Technology, Instrument Systems Division.

In the morning, Goddard representatives presented their future technology needs. In the afternoon, each of the presenters met one-on-one with attendees. NASA has found that this format is an excellent method for creating lasting relationships with potential partners. ■

Intern Envy

Continued from Pg 10

cators left Goddard with a greater knowledge of Goddard's current research initiatives and developed a deeper understanding of what it means to be a NASA Explorer School," says Andrea Owens, NES Coordinator. "We open up the cupboard of resources and show them what goodies we've got. It is then up to them to figure out what they want to do, what direction they want to go in, and develop a plan," says Rich Varner an NES specialist.

The participants of the SISTER, RIP, and NES programs will undoubtedly be the envy of their school classmates as they return to school. Not everyone can say that they spent their summer working alongside the world's finest engineers and scientists available at NASA Goddard Space Flight Center. ■