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GoddardView

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JAXA President Visits NASA GSFC

By Nina Harris



In early October, Dr. Weiler hosted a visit by the President of the Japanese Aerospace Exploration Agency (JAXA). Dr. Keiji Tachikawa was appointed President of JAXA in November 2004. Prior to becoming JAXA President Dr. Tachikawa had a distinguished career in Japan's mobile communications industry.

NASA and Japan are currently participating on several successful Earth observation missions including Aqua, Terra, and the Tropical Rainfall Measuring Mission. NASA is looking forward to participating with JAXA on Solar-B, a solar physics mission.

Dr. Weiler gave the Japanese delegation an in-depth presentation of Goddard's missions and activities, followed by a tour of Goddard's world class facilities.



Dr. Tachikawa examines the HST ORU Protective Enclosure as Mike Kienlin, Deputy Project Manager for the HST Development Office looks on.

Photo Credit: Chris Gunn

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Cover: GSFC's First Safety Awareness Campaign begins in November and will run through December. This campaign is designed to keep GSFC's workforce safe. Through the Safety Awareness Campaign, employees will better understand the risks and hazards of their job as well as the strategies used to manage those risks. Each Directorate has planned informational workshops and presentations as part of the Safety Awareness Campaign. Dr. Weiler and Judith Bruner, Associate Director for Safety and Security, encourages you to participate in your Directorate's activities. Event details can be found at: <http://safety1st.gsfc.nasa.gov/safetyaware.html>. Be aware, be safe and continue Goddard's heritage of safety.

Photo Credit: Chris Gunn

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. Its circulation is approximately 11,500.

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.

Swift Wins “Best Of What’s New” In Popular Science

By Christopher Wanjek

Move over iPod. Among all the multitude of nifty gadgets and gizmos that appeared in 2005, NASA’s Swift satellite has taken a top honor in the annual “Best of What’s New” award from *Popular Science* magazine.

Swift is featured in the December issue as a winner in the aviation and space category for 2005.

Swift is a unique, multifaceted satellite dedicated to understanding gamma-ray bursts, the most powerful explosions known. Unlike most NASA satellites, Swift is not an acronym. Swift is, well, swift, and therein lies its novelty.

Moving fast and autonomously, Swift turns on a dime to capture gamma-ray bursts, flashes of light that appear randomly from any direction in the sky and last only a few milliseconds to about a minute. Because they disappear so quickly, these bursts have been a mystery since their discovery 35 years ago. Swift has three main instruments to study bursts: One detects the burst and starts the process of autonomously slewing towards the burst’s direction. The other two instruments start observing the burst afterglow and determine a precise location. All this is done within minutes.

“It used to take hours and sometimes days to find and observe a gamma-ray burst afterglow,” said Dr. Neil Gehrels, Swift Principal Investigator. “Most of the clues to what caused the burst are gone by that time. With Swift, we can be like detectives on the ‘crime scene’ immediately after the event to look for clues.”

CSI: The Milky Way and Beyond

Swift’s speed has enabled scientists to solve several mysteries. Long gamma-ray burst, lasting over two seconds, are nearly irrefutably from massive star explosions—stars over 15 times as massive as the sun. The explosion creates a black hole. Swift has solidly confirmed this theory. Working in conjunction with the High Energy Transient Explorer (HETE) mission, Swift has discovered that short gamma-ray bursts, lasting under two seconds, likely arise from collisions—either between a black hole and a neutron star or between two neutron stars.

The past year was full of discoveries. In May Swift saw that many long bursts have multiple explosions, perhaps from the newly formed black hole sloppily gorging on debris from the explosion. In September, Swift detected the most distant explosion ever seen, nearly 13 billion light years away.

NASA Goddard developed and built Swift’s Burst Alert Telescope, playfully called the BAT. This is the instrument that detects the bursts. The BAT, about the size of a pool table, has the largest-known coded aperture mask—

essentially a thin sheet that creates “shadows” of gamma-rays passing through onto the detectors below. The angle of the shadow allows scientists to determine the direction of the bursts.

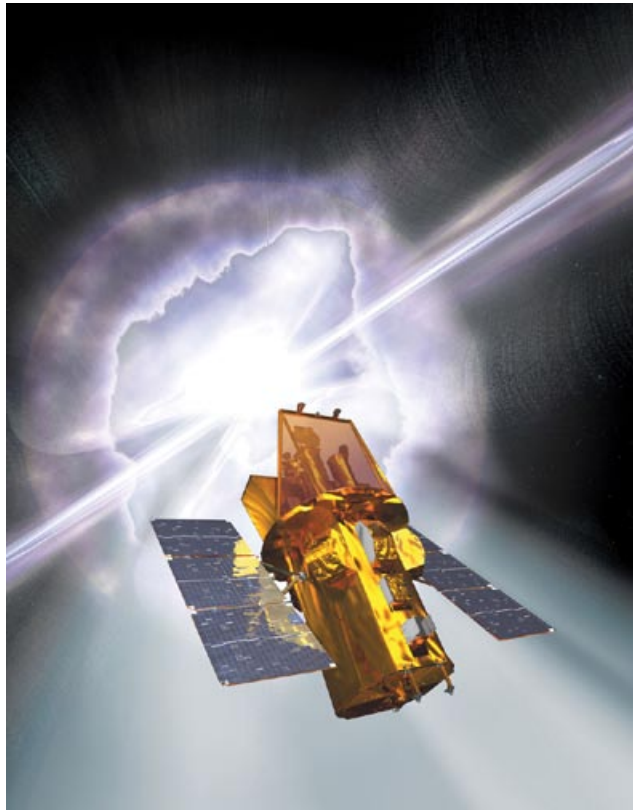


Photo Credit: NASA

An artist rendering of SWIFT

Penn State led the development of Swift’s X-Ray Telescope and UV-Optical Telescope with Mullard Space Science Laboratory and the University of Leicester in England and Brera Observatory in Milan, Italy. These two longer-wavelength (lower-energy) instruments can determine an arc-second position of a burst and the redshift, or distance, to the burst source. They can also determine physical features in the burst afterglow, such as the type, temperature and velocity of chemical elements present.

Swift gets help from other telescopes, too. Swift is plugged into the Gamma-Ray Burst Coordinates Network, created and operated by Dr. Scott Barthelmy of NASA Goddard. Through this computer network, the details of each burst (detected by any telescope) are relayed to the astronomy community. Big observatories such as Hubble, Chandra or Keck can join the search. While Swift has had a remarkable first year, the mission is really just ramping up.

More information about the Swift mission please visit:

<http://swift.gsfc.nasa.gov>

For details of each of the bursts that Swift has detected, including a real-time sky map please visit: <http://grb.sonoma.edu> ■

Goddard to Help Build Space Station Pallets

By Susan Hendrix

In a partnership that exemplifies One NASA, the Hubble Space Telescope Carriers Development Office at Goddard Space Flight Center and the External Payloads Group at Johnson Space Center are teaming up to fabricate five Space Shuttle aluminum carriers for transporting future science experiments and orbital replaceable units to the International Space Station.

The Agency selected Goddard to build the platforms based on their expertise in developing Space Shuttle hardware for missions such as Solar Maximum, Compton Gamma-Ray Observatory, Upper Atmosphere Research Satellite, Hubble Space Telescope servicing missions, and most recently astronaut tools used on the first "Return to Flight" mission in July.

"This is a huge undertaking," said Frank Cepollina, Deputy Associate Director of the HST Development Project Office at Goddard. "With a deck size of 14 feet by 17 feet, each pallet spans the entire width of the Shuttle's payload bay, must carry science experiments, and serve as a storage place for spare hardware that can be replaced robotically once on-orbit."

Although each pallet has a multi-purpose utility (Science/un-pressurized logistics), implementation of the pallet avionics, which provides the interface of the science instrument to the ground is being deferred pending additional funds. In the meantime, engineers at the Goddard and Johnson Centers are working diligently to develop an engineering model of the avionics to use for experimenter integration as well as cost reduction initiatives.

According to Cepollina, the challenge will be solved with teamwork. "I believe that NASA can accomplish anything when employees from multiple Centers work together," he said.

Goddard is on track to deliver the first two pallets to Kennedy Space Center by November 2007, and the remaining three pallets by October 2008. This multi-million dollar effort and ambitious schedule will require the talents of more than 100 employees from all three Centers for the next three years, just one more example of the One NASA spirit. ■

Inspiring Future Scientists

By Teresa Coda



Photo Credit: NASA

Students Teresa Coda, Katie Buhrman, Tara Clopper, and Dr. Kathie Olsen

On November 10, Dr. Kathie Olsen gave a lecture entitled, "The Immortality Factor" in the Goddard Space Flight Visitor's Center. As the former NASA chief scientist and current NSF Deputy Director, Dr. Olsen had much insightful advice to give. Her talk was filled with interesting facts, humorous observations and inspirational words.

Dr. Olsen encouraged the students in the audience to consider a major in science, even if science is not necessarily their passion or forte. She recalled biology being her least favorite subject when she was in high school. It was not until she had a fantastic professor in college that she realized how much she enjoyed and excelled in science. Even if students do not necessarily hope to pursue a career as a scientist, majoring in science can open the door to many different careers, including law, politics, teaching and writing. In fact, both Herbert Hoover and Colin Powell were geology majors!

As a brain scientist, Dr. Olsen also spoke about gender differences, stating that there are "more individual differences than gender differences." She informed the audience that many professional women are paid less than men who are doing the same work, but she emphasized the fact that it does not have to be that way. "Ask for more," she encouraged.

Dr. Olsen finished her lecture with some words of advice. She said that in order to succeed in any career, especially science, one must do three things:

- Keep a high moral ground.
- Keep a sense of humor.
- Keep answering the phone! You never know when the person on the other line may be offering the perfect job opportunity.

Dr. Olsen also gave the opening lecture of the "Making of a Scientist: Images and Reality" lecture series focusing on women in space and science which was organized by the Office of Higher Education. The next speaker will be Dr. Laurie Leshin (Dec 8), the new Director of Sciences and Exploration at Goddard.

Teresa Coda is a junior at Greencastle-Antrim High School, where she is currently enrolled in a Women In Science class. Teresa hopes to be a journalist in the future. ■

Innovative Entrepreneurship Program with UMBC

By Nicole Quenelle

Goddard Space Flight Center (GSFC) has signed an agreement with the University of Maryland, Baltimore County (UMBC) to participate in the University's unique ACTiVATE program. Launched in 2004, ACTiVATE (Achieving the Commercialization of Technology in Ventures through Applied Training for Entrepreneurs) is designed to increase the commercialization of technology innovations from research institutions in Maryland by training women entrepreneurs to create technology-based start-up companies.

“Access to high-quality technology is critical to the success of the ACTiVATE program,” said Stephen Auvil of UMBC’s Office of Technology Development. “Through this key partnership with NASA Goddard Space Flight Center, the ACTiVATE program will rely on NASA’s valuable research and long tradition of innovation to provide such technologies.”

The agreement with UMBC will also enable Goddard to obtain assessment data from UMBC to assist in future NASA technology transfer efforts. Or, if program participants see sufficient potential in a Goddard technology, they can license it as the foundation for a start-up company. Goddard is the first government lab to participate in ACTiVATE and, according to Auvil, Goddard contributed more technologies than any other research institution in the state of Maryland during the program's first year.

Four Goddard Technologies Selected for Program ACTiVATE participants evaluated four Goddard technologies as part of Phase I of the 2005 program:

- MEMS Devices for Spacecraft Thermal Control Applications
- Capillary-Pumped Loop Body Warmer (CPL)
- Method for Coding Low Entropy Data
- Method for Coding Multiple Source Data

Benefits of the Agreement:

- NASA gains the opportunity for potential technology licenses to ACTiVATE program participants.
- NASA gains technology evaluation data from program participants for use in future NASA technology transfer efforts.
- ACTiVATE participants gain access to Goddard invention disclosures and

patents, building their experience evaluating new technologies' start-up potential.

- Program participants may realize financial benefits from start-up ventures launched as a result of licensing Goddard technologies.
- The state of Maryland may benefit from the economic impact of new start-up ventures based on NASA technologies.

In Phase I, participants conduct an opportunity analysis for each technology. Multidisciplinary technical/business teams are formed to analyze the business opportunity. Projects are coupled with a rigid entrepreneurial curriculum and the support of Entrepreneurs in Residence and other mentors. Each team completes Phase I by pitching its opportunity to a review committee.

Based on the results of Phase I, Goddard's CPL technology was selected to move on to Phase II, in which larger, entrepreneur-led business teams are formed to establish a business plan for the technology. Final presentations to a review committee will determine which technologies move on to Phase III, a participant-initiated stage in which would-be entrepreneurs seek potential funding and licensing and may form start-up companies based on the licensed technologies.

For those technologies that do not move onto Phase II, NASA will have access to the participants' assessments, enabling Goddard researchers to leverage the data for future technology transfer efforts.

The Transfer Process

UMBC contacted GSFC personnel to initiate discussions about potential technology transfer efforts to benefit the ACTiVATE program. UMBC's Stephen Auvil worked with Goddard's Office of Technology Transfer to establish the terms of the agreement and select potential technologies.

Looking Ahead

Program participants are currently working on business plans for Goddard's CPL technology as part of Phase II. If selected by the final

review committee, the technology may be licensed by the participants and marketed for commercial use.

Goddard is currently selecting technologies to submit for evaluation in the 2006 ACTiVATE program and expects to complete this selection process by March 15, 2006.

For more information about NASA Goddard's agreement with UMBC, contact the Office of Technology Transfer: Internet: <http://techtransfer.gsfc.nasa.gov> ■

Did You Know?

Cell Phone

A receiving amplifier helped NASA hear weak communication signals from space, and helped boost cellular phone frequencies, as well as television and radio broadcasts.

NASA's GSFC "We Recycle"

By Alana Little

"In 2004, Goddard collected 65 tons of white paper, 465 tons of cardboard, 90 tons of scrap metal, and 9 tons of batteries," quoted Barbara Cherry, GSFC's Associate Director for Communications and guest speaker at this year's America Recycles Day kick-off. The event, held in the lobby of Building 28 celebrates America Recycles Day, a national day of recognition for recycling now in its eighth year.

"We are a waste generation," said Darlene Squibb from the Safety and Environmental Division (Code 250). "We have to recycle because there's nowhere else to put our stuff." Every year Darlene and her team of various Code 200 organizations plan an event to make employees aware of onsite recycling activities. Goddard has recycle bins centrally located in every building and white paper bins are scattered throughout the Center. The Safety and Environmental Division will soon have drop-off locations for NiCad and Lithium battery recycling also.

Remembering to recycle is great, but it's not enough. We must also teach our children how to recycle. Visitors of the Recycle Day events were witnesses to how the Goddard Child Development Center (GCDC) is teaching the children about recycling. The children were costumed in recycled brown paper bags with the Earth's image painted on the front. Led by teachers Elycia Chew and Lakshini Wijeweera and accompanied by "Recycle Rocky," a robot made of recycled materials which the children made themselves, the "Rockies" gifted everyone with a rousing rendition of *Recycle* sung to the tune of *The Itsy*

Bitsy Spider, and *Reduce, Reuse, Recycle*, which was sung to the tune of *So Early in the Morning*. The children then led a recycling demonstration where they each placed a recyclable item in its proper bin.

The event was capped off with an auction hosted by the Property Management Branch, and led by Joyce Brooks, from the Logistics Management Division. The auction included 10 Dell computers complete with Windows operating systems, a 32" Sony TV, and two office chairs. The Materials Management Branch brought out samples of post consumer recycled content products that can be ordered through the stock system on center. Various green plants were on sale also from Melwood Horticulture. Plants create natural recycling and contribute to better air quality.

The overall message of the event was not just to remember to recycle but to reduce the amount of waste created. "You can prevent waste by reusing products such as reusable containers and utensils for lunch, and reusing office products such as file folders," said Darlene. This year, as the Center rolls out an Environmental Management System it is paramount that we as employees think about reducing our waste. An EMS targeted goal is to reduce waste by 20 percent by 2010. So, the next time you go to toss that soda can away or go to get a fresh file folder, think about putting that can in the allotted bin and use some White-Out on that old file folder to get a second use out of it, the Earth will be better for it. ■



Kevin Gu & Alexander Chen, two members of "the Rockies" pose with "Recycle Rocky"

Photo Credit: Pat Izzo

Viewing Solar Eclipse with Tunisian Students

By Cynthia O'Carroll

Two NASA researchers flew to Tunisia in northern Africa to experience the October 3 solar eclipse with over 80 Tunisian students. The Goddard solar scientists, astrophysicist Joseph Davila and planetary research scientist Mehdi Benna, a native Tunisian, were invited to participate by the Tunisian Young Science Association (AJST).

"Tunisia is a developing country where science is mixed with passion and fantasy," stated Benna. "Eclipses can be frightening events and Tunisia has no astronomers or space physicists that can explain these events. Benna hopes that their explanations can help make future eclipses exciting, rather than scary.



Photo Credit: NASA

Joseph Davila, Mehdi Benna and Ambassador Hudson (in the middle), and a few of the AJST student members.

Participating in this event was particularly important to Benna because he was a member of AJST as a youngster. "I was delighted to have the chance to give something back to my country and perhaps influence the career choices of young people since this group helped to steer me towards a career as a scientist," stated Benna.

In preparation for the eclipse, two Tunisian students and a film crew were fortunate enough to visit Davila and Benna at Goddard in late September to practice setting up some of the experiments to be carried out during the eclipse. They also spent a few days in Washington touring the National Air and Space Museum and dropped in on a local astronomy and telescope-making club in Maryland.

Once scientists arrived in Tunisia's capitol city of Tunis, they participated in a press roundtable at the U.S. Embassy. Representatives attended from the major French language and Arabic newspapers in Tunis, and from two major radio stations.

In a series of lectures at the City of Science, a new science museum in Tunis, Benna and Davila spoke to approximately 100 students and members of the public. Benna spoke about the history of Mars exploration and the anatomy of space missions, including how a spacecraft is built, tested and launched; what kind of data scientists expect; and how long it takes to build and test such missions.

Davila discussed the current state of space weather forecasting, which attempts to predict solar flares. "Solar storms produce energetic particles that can be harmful for humans in space, high-latitude power grids, and communication systems that rely on satellites in orbit around Earth. To travel to the moon and Mars routinely and safely, we must be able to forecast solar storms," remarked Davila.

And finally, in an interesting marriage of science and social behavior, Benna and Davila participated along with Professor Chapoteau, a Professor of History at the University of Tunis, in a public round-table to discuss the history and mythology of solar eclipses in past civilizations.

These events were well received by the Tunisians and they provided the first contact with Americans for many of the attendees. The local press covered the talks with positive coverage in more than 12 news stories.

The Goddard scientists then traveled to the southern city of Douz at the edge of the Sahara desert where they set up a number of experiments to be carried out by the students. In addition, several telescopes were available for public viewing during the eclipse. Using these telescopes, along with SolarScopes, models, and diagrams, the students explained the science of eclipses to hundreds of public observers. The United States Ambassador to Tunisia, Mr. William Hudson and his wife Marion attended the event.

Weather conditions were perfect to view the eclipse and applause broke out as the moon moved across the sun, eventually covering 95 percent of it. "It was a beautiful twilight that covered the desert, and all activity stopped for a few minutes. People gazed upward, while the camels, unimpressed, sat quietly on the ground," observed Davila.

The trip was made possible by a June 2004 science and technology agreement between the United States and Tunisia, and was sponsored by NASA and the U.S. State Department. NASA provided 10,000 educational solar eclipse posters in Arabic, French and English for distribution to Tunisian students and the public, and thousands of eclipse-viewing glasses. The State Department supported the travel expenses.

A well known Tunisian movie studio, Cinetelefilms, is producing a documentary that will include the footage shot at Goddard and capture the scientists' interaction with the Tunisian astronomy students along with the observation of the eclipse. This film is slated to become a pilot for a series of science documentaries aimed at promoting mutual understanding between the West and the Arab world. A DVD will be made of the trip for distribution to schools in Tunisia and elsewhere throughout the Arab world.

The NASA visit has prepared the students for the March 29, 2006 total eclipse of the sun, which will be visible in Brazil and across the Atlantic in northern Africa and central Asia. Teams of scientists, including NASA observers, plan to travel to Libya for scientific observations of the spectacular solar event. ■

Employee Spotlight

JoAnn Swaim

By Alana Little

"I think of what I want to do, then I have to think about whether it's physically possible, then find a way to do it," said JoAnn Swaim, Thermal Engineer at Goddard Space Flight Center. JoAnn could easily be talking about her work on Global Precipitation Measurement (GPM) where she performs thermal modeling and analysis, but a Penn State student reporter quoted JoAnn saying this as an upperclassman when referencing her hobby—juggling.



Photo Credit: Pat Izzo

First a co-op student then a full fledged GSFC civil servant as of 2001, JoAnn has juggled schedules, deadlines, technology, budgets and time. In fact, JoAnn is better than the average person at juggling.

At age 8 she spent her hard-earned allowance on a video on juggling from her school's Weekly Reader book program that caught her interest. VCR's were just hitting the market, so the thought of owning a video drove her to purchase the tape, but in the end, the information on the video changed her life forever. Shortly after learning the basics using scarves and 'juggleloons'—small sand-filled balloons that she made with the help of her father—JoAnn learned the basic three-ball cascade pattern, sparking a lifelong passion.

A few years later, her hobby stepped up to the next level as during a family trip to visit the Philadelphia Museum of Art, she encountered a juggling conference. She watched as people milled around, practicing their moves. It inspired her to develop her skills further, and after acquiring permission to tag along with the Philadelphia Jugglers, she started meeting with them weekly.

Since that day JoAnn has excelled in the pastime, and has even made appearances on *Mister Rogers' Neighborhood* as well as *The Late Show with David Letterman*. In addition, she has traveled to Scotland, Canada, and all around the U.S. showcasing her talent.

In 2000, she became the first woman to win the International Jugglers' Association Three Ball Open, a juggling event where artists are judged on unique moves that they design. Her signature "Jumpin' JoAnn" won her the trophy. The signature move involves allowing two beanbags to fall towards her feet. She then jumps, simultaneously kicking the beanbags—one with each foot—back up to her hands, and continues her routine flawlessly.

Not only has juggling helped to make JoAnn into a well-rounded person, but it also has led her to the love of her life, fiancé A.J., a fellow Nittany Lion, juggler and mechanical engineer. When he heard about this petite woman who shared his unusual interests from a friend, he became smitten and e-mailed her right away. After a Google search that confirmed that he had a stellar background and an impressive GPA, JoAnn agreed to meet him. Since then, the couple has been inseparable, and plans to wed soon. Who knew that juggling could be such a beneficial hobby? It teaches priceless life lessons such as patience, endurance, and creativity, as well as provides one with fame and love. It can certainly change a life, just as it did with JoAnn Swaim. ■