

Goddard View

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One Million People Going to the Moon

By Nancy Neal Jones and Laura Spector

Did you say one million? That's how many names have been submitted so far to blast off on NASA's *Lunar Reconnaissance Orbiter*, or LRO, spacecraft.

NASA invited the public to join the excitement of the first mission in NASA's exploration program to return humans to the Moon by 2020. LRO, scheduled to launch later this year, will map the lunar surface in extraordinary detail to help future human missions to the Moon locate safe landing sites and vital resources on the Moon.

Participants can submit their names at the LRO Web site and print a certificate. The names will be placed on a microchip that will be installed on the LRO spacecraft and travel to the Moon.



Caption: Sample of the certificate generated for participants in *Send Your Name to the Moon*.

An unprecedented number of people have taken part in the *Send Your Name to the Moon* campaign. People from all over the world are telling NASA how excited they are to be a part of the Nation's journey back to the Moon. Due to the tremendous response, the deadline to submit your name has been extended to July 25.

Stephanie Stockman, LRO Education and Public Outreach lead, has been exploring ideas for NASA to reach as many people as possible.

"The outreach team has been using social media and web 2.0 for the past year, and when it was time to launch *Send Your Name to the Moon*, I promoted it on my personal blog and Twitter account," Stockman said. "*Send Your Name to the Moon* also was set up as group on Facebook and video was posted on YouTube."

"It was on blogs all over the world. I am amazed that we can reach thousands of people in days and millions of people in weeks," she added.

For more information about LRO and to send your name to the Moon, visit: <http://www.nasa.gov/LRO>. ■

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Cover caption: Engineers prepare the Super Lightweight Interchangeable Carrier (SLIC) for acoustics testing at Goddard.

Photo Credit: NASA.

GoddardView Info

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Managing Editor: Trusilla Steele

Editor: John Putman

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NASA Exhibit Pays Tribute to Fallen Heroes of Spaceflight Missions

By John Putman

A NASA exhibit focusing on safety will pay tribute to the crews of the *Columbia* STS-107 mission, *Challenger* STS-51L mission, and *Apollo 1* mission. It will be on display through July 1 in the Building 8 lobby outside the Office of Public Affairs on the first floor. NASA civil servants and contractors are encouraged to visit the exhibit that includes recovered *Columbia* hardware and reflect on the importance of each person's contributions to safety in spaceflight. The exhibit will visit every NASA Center in 2008.

On June 25, Gerry Daelemans, Chief of the Shuttle Small Payloads Project Office during *Columbia's* last flight, spoke to Goddard employees about the accident's impact on his team, who managed the Fast Reaction Experiments Enabling Science, Technology, Application, and Research (FREESTAR) Hitchhiker payload onboard *Columbia*.

Two members of that team, Tom Dixon and Mike Wright, also spoke. Tom Dixon shared his insight and some moving personal anecdotes about his interaction with some of the *Columbia* astronauts. Wright shared some of his experiences with the *Columbia* debris retrieval efforts.



Photo Credit: Debora McCallum

Caption: The NASA exhibit served as a moving reminder of the importance of safety.

Daelemans also discussed the affect of the *Columbia* accident on Goddard and our role in preventing future avoidable tragedies. He went into detail on the "institutional failures" that led to the *Columbia* tragedy and the positive steps taken by NASA since then.

After the discussion, many members of the audience made their way down-stairs to view the NASA exhibit. ■



Photo Credit: Debora McCallum

Caption: Goddard employees take a moment to reflect on the STS-107 tragedy.

Goddard Engineers Design a New Composite Carrier for *Hubble* Servicing Mission

By Ann Jenkins and Mike Weiss

Hubble engineers at NASA's Goddard Space Flight Center in Greenbelt, Md. are ushering in a new era in spaceflight with the successful design of the first of its kind composite equipment carrier.

The Super Lightweight Interchangeable Carrier (SLIC) is slimmer, weighing about half of conventional carriers, and stronger. With this new design, the Space Shuttle will be able to carry three times the payload, making room for additional scientific instruments and other components.



Photo Credit: NASA

Caption: Engineers subjected the Super Lightweight Interchangeable Carrier (SLIC) to static loads testing during spring 2007 at NASA's Goddard Space Flight Center. The test was conducted to ensure the carrier is capable of surviving a Shuttle launch, and in-orbit and landing loads while in the Shuttle.

Although the main focus of this year's Shuttle mission to *Hubble* is to deliver as much scientific and life-extending hardware as possible to the telescope, the new composite technology used to build SLIC is directly applicable to other spacecraft, launch vehicles, and structures where weight is a critical consideration.

Typical carriers, which can span the entire width of the Shuttle's payload bay, add thousands of pounds. Because space transport vehicles have a maximum weight limit, every pound trimmed from a payload is another pound that can be reserved for scientific instruments and other cargo.

SLIC's incredibly lightweight frame stems from the innovative use of carbon fiber with cyanate ester resin and titanium metal matrix composites. These new composites are proving especially effective in spaceflight applications, where maximizing a launch vehicle's ability to efficiently lift mass into orbit is the name of the game.

Compared to aluminum and titanium, metals typically used in spacecraft and launch vehicle design, the composites used to build SLIC have greater strength-to-mass ratios. SLIC also features performance characteristics such as fatigue resistance, which means it is less susceptible to wear and tear.

SLIC will make its maiden voyage this summer aboard the Space Shuttle *Atlantis* when it lifts off for the famed *Hubble Space Telescope*.

Inside Goddard's High Bay clean room, engineers are busy configuring SLIC to carry the Wide Field Camera 3 science instrument, along with two new battery modules, to be installed during the servicing mission.

"This new composite carrier is just the beginning," said Mike Weiss, *Hubble*'s Technical Deputy Program Manager at Goddard. "SLIC has established the benchmark for technology required for future space missions, including analysis, testing, and verification." The *Hubble* team's extensive experience with composites will enable these future missions to experience greater leaps in performance.

A similar composite structure is slated for use on the Crew Exploration Vehicle (Orion) Launch Abort System. This 48-foot long, 36-inch diameter multi-stage rocket will allow a crew of astronauts to safely escape in the event of an emergency while still on the launch pad or during the atmospheric ascent of the Orion vehicle into Earth orbit.



Photo Credit: NASA

Caption: Engineers prepare the Super Lightweight Interchangeable Carrier (SLIC) for acoustics testing at Goddard.

Engineers for programs such as the Orion Crew Exploration Vehicle are currently in discussions with Goddard engineers to learn how they succeeded with SLIC so they, too, can construct stronger, more efficient composites in the decades to come.

"*Hubble* and NASA are about the future," said Frank Cepollina, *Hubble* Development Project Manager. "Composite structures such as SLIC will play a vital role in the future of human spaceflight." ■

Goddard Gets on iTunes

By Maria-Emilia Garcia

Looking for a fun way to keep up with all the cool science and engineering projects going on at Goddard? Now available for free through the Apple iTunes application is the official NASA Goddard Shorts podcast series. The podcast series consists of short videos, updated weekly, that showcase Goddard's exciting research, discovery, and innovation in science and technology. NASA Goddard Shorts covers a wide array of topics that feature the diversity of the Center's programs and projects.

With more than a dozen exciting missions planned for the coming year, the podcasts will keep you up to date on all of them. Recently posted videos highlight missions such as the *Gamma-ray Large Area Space Telescope* (GLAST), *Hubble Space Telescope's* Servicing Mission 4, the *Lunar Reconnaissance Orbiter*, and the *Solar Dynamics Observatory*.

In addition, the podcasts discuss Earth's changing climate, space weather, and observations of deep space.

NASA Goddard Shorts also focuses on the people who work at Goddard. From Nobel Prize winning physicist John Mather to the summer interns who flock to the center each June, the videos tell the stories of the brains behind the Center's projects, inventions, and discoveries.

Goddard is home to the Nation's largest organization of scientists and engineers working to expand our knowledge of Earth, the solar system, and the universe. Our mission is to discover and learn more about space and Earth sciences so that we may gain a better understanding of our planet and the mysteries of the universe. The new podcast series, NASA Goddard Shorts, gives us a chance to show the world what we're up to.

"Podcast" is short for "personal on-demand broadcast," and is a collection of audio or video content driven by subscription software called Really Simple Syndication (RSS). They are generally

in the popular MP3 and MP4 formats and can be subscribed to using a number of services and programs, such as My Yahoo! and iGoogle.

Many of the podcast episodes feature the award-winning products of Goddard's Scientific Visualization Studio, whose work facilitates the understanding of NASA discoveries through visualizations, such as imagery and animation.

To subscribe to the podcasts, visit the NASA Goddard Shorts home page: <http://svs.gsfc.nasa.gov/vis/iTunes>.

Make sure to check out other NASA podcasts at <http://www.nasa.gov/multi-media/podcasting>. ■



NASA Technology Contributes to National Security

By Lori Keeseey

Detecting gamma ray bursts from space is really no different than finding and intercepting nuclear material stowed inside shipping containers or trains—at least that's the view of the Principal Investigator who created the Burst Alert Telescope (BAT) that has detected hundreds of gamma ray bursts from all directions in the sky.



Photo Credit: NASA

Caption: Scott Barthelmy of NASA Goddard with a prototype Gamma ray detector built using technology from NASA's Swift mission.

To prove his point, Principal Investigator Scott Barthelmy of NASA's Goddard Space Flight Center in Greenbelt, Md., received Department of Energy funding to assemble a prototype system using leftover components from the BAT development effort.

Although his prototype would have to be smaller and more mobile to operate as a counter-terrorism tool, the same principles are at play. He hopes to make the case and win Department of Homeland Security (DHS) funding to build a second-generation detection system equipped with more capable detectors now being developed under Goddard's Internal Research and Development (IRAD) program.

The instrument that inspired the potential spin-off application is now flying aboard NASA's *Swift* mission, which, as its name implies, swiftly detects gamma ray bursts and then targets itself toward the event in about one minute to make detailed observations. Gamma ray bursts are the most powerful explosions in the universe—second only to the Big Bang in terms of total energy output. They occur randomly about once per day, lasting only a few milliseconds to tens of milliseconds in duration.

Scientists believe these split-second flashes of gamma ray light signal the collision of a black hole and a neutron star, or the collision of two neutron stars that then create a black hole. Hypernovae, the explosion of massive stars, also are believed to cause the bursts.

BAT is the instrument that detects and locates the burst. Developed with Goddard R&D funding several years ago, BAT carries out its job using a technique called a "coded aperture mask" that creates a gamma ray shadow on its 32,768-pixel, cadmium-zinc-telluride (CZT) detector plane. The mask itself contains 52,000 randomly placed lead tiles that block some gamma rays from reaching the detectors. With each burst, some of the CZT detectors light up while others remain dark, shaded by the lead tiles. The angle of the shadow points to the direction of the gamma ray burst.

The same instrument concept is ideal for homeland security, Barthelmy said. "We've already produced an instrument that has a 100-degree field of view and can pinpoint the location of a gamma ray source," Barthelmy said. "It's what you would need to find and intercept nuclear material stowed inside shipping containers and trains."

A new generation of CZT detectors and electronics, which Barthelmy is developing under current IRAD funding for possible use on NASA's proposed Energetic X-ray Imaging Survey Telescope (EXIST), would further improve the prototype. "They really need the ability to distinguish legitimate sources," he said. The new CZT technology would do just that. It could distinguish isotopes and determine whether the detected nuclear material was medical in nature or posed a national security threat.

The next step, according to Barthelmy, is winning DHS funding and developing a second-generation prototype using the EXIST detectors. "We really want to move into the second stage." ■

GLAST Safely in Orbit, Getting Checkups

By Rob Gutro

Just weeks after launch, NASA's *Gamma-ray Large Area Space Telescope*, or GLAST, is safely up and running well in orbit approximately 350 miles (565 kilometers) above Earth's surface.

GLAST was successfully launched aboard a Delta II rocket from Cape Canaveral Air Force Station in Florida at 12:05 p.m. EDT on Wednesday, June 11.

For four weeks, engineers will continue to be busy around the clock turning on and checking out the various components on the spacecraft. "Things are looking good so far," said GLAST Deputy Project Scientist Julie McEnery from NASA's Goddard Space Flight Center, Greenbelt, Md. "We expect to turn the instruments on in about a week, and we can't wait to see the first gamma rays!"



Photo Credit: NASA/J.D. Harrington

Caption: A Delta II rocket carrying the Gamma-ray Large Area Space Telescope (GLAST) blasts off from Launch Pad 17-B at Cape Canaveral, Fla.

Two days after launch, both of GLAST's solar arrays were rotated successfully. The solar arrays are the "wings" of GLAST that utilize the Sun's energy to power the spacecraft. That same day, flight software controlled heaters were enabled. Those heaters are important because they help GLAST to operate in the cold of space.

"Once the Large Area Telescope is operational, GLAST will survey the entire sky every three hours, using the sky survey control mode," said Kathy Turner, GLAST Program Manager at the U.S. Department of Energy in Germantown, Md. Sky survey is the primary science fine pointing control mode for the mission.

As of June 16, "Two star trackers are also now acquiring and identifying stars," said GLAST program manager Kevin Grady of NASA Goddard. "All systems continue to function well as the activation continues," he said.

NASA's GLAST mission is an astrophysics and particle physics partnership, developed in collaboration with the U.S. Department of Energy, along with important contributions from academic institutions and partners in France, Germany, Italy, Japan, Sweden, and the United States.

To follow GLAST's progress, check out Project Scientist Steve Ritz's GLAST blog at: <http://blogs.nasa.gov/cm/blog/GLAST>. For more information on GLAST, visit: <http://www.nasa.gov/glast>. ■

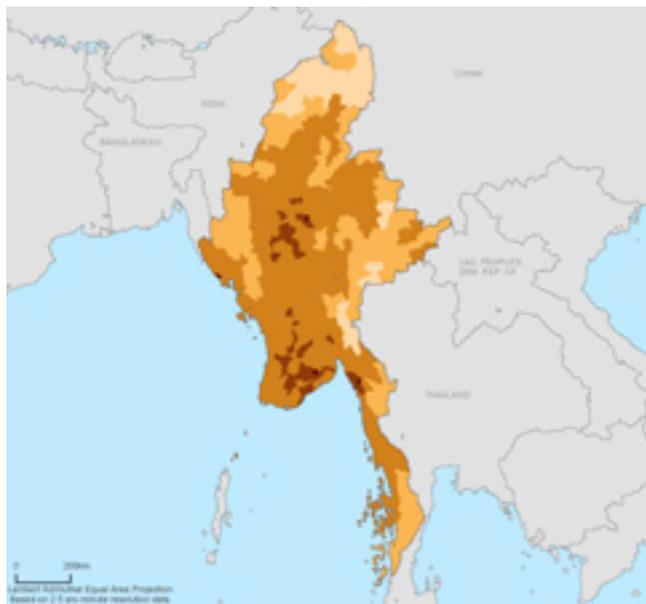
NASA Data Helps Pinpoint Impacted Populations in Disaster Aftermath

By Gretchen Cook-Anderson

When two catastrophic natural disasters struck within days of each other in May 2008, disaster relief, humanitarian aid, and health officials, as well as members of the news media tapped into a unique set of NASA data products describing the location of the exposed populations. In the hours and days following the cyclone in Burma and the earthquake in China's Sichuan province, workers had the data they needed to assess the numbers of people possibly affected by these deadly events. What arose was a timely example of how NASA data comes to the aid of officials when such disasters occur.

"The gridded population product we produce helps officials understand the density of the population in and around a disaster area," said Robert Chen, Manager of NASA's Socioeconomic Data and Applications Center (SEDAC) and Director of the Center for International Earth Science Information Network (CIESIN), part of the Earth Institute at Columbia University in New York. "The data set shows where people actually live in relationship to hazardous events."

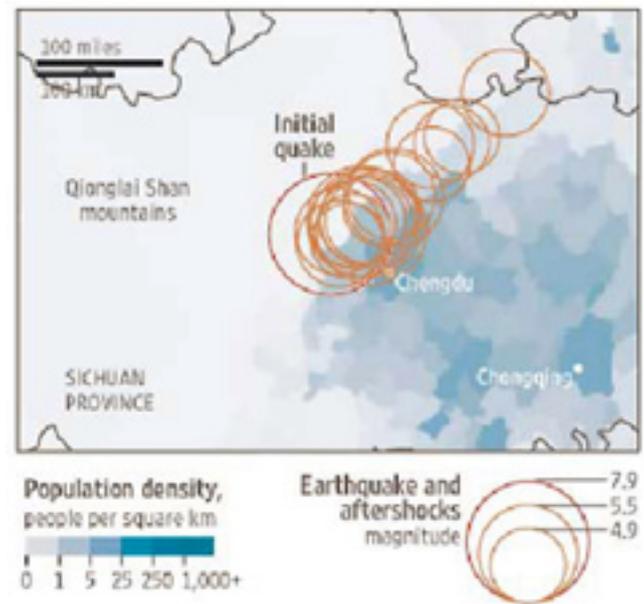
Members of the news media use the data and associated maps to report on possible casualties and property destruction. "When a major disaster hits, people want to know how many people were exposed to the disaster, in addition to how many were killed," said Chen. "For example, CNN used our map of population density in Burma to help explain how the unusual path of cyclone Nargis affected the low-lying, densely populated delta."



Caption: SEDAC/CIESIN's gridded population map of Myanmar captures areas in shades of brown that become darker with increased population. Coastal areas hit hardest by the May 2008 cyclone were highly populated.

Using the SEDAC data, media were able to report that 25 percent of Burma's 57 million people resided in coastal areas overpowered by the cyclone. They also projected that a million people would likely face homelessness, a number calculated by the United Nations (UN) also by using data made available by SEDAC.

SEDAC, a part of NASA's Earth Observing System Data and Information System, collects, stores, processes, and distributes population, land use, and socioeconomic data. A significant mission of NASA's Earth Observing Satellite (EOS) program is to enable scientists and other users to conduct analyses and make decisions based on the resulting data. SEDAC advances this mission by developing and operating practical applications that merge social science and Earth science data to improve knowledge of how humans interact with Earth's environment.



Caption: Maps like this one indicate to officials the geographic distribution of populations at risk from the initial quake.

SEDAC and CIESIN's joint staff of more than 60 is made up of a diverse array of demographers, geographers, Earth scientists, public health specialists, and information technologists. For the gridded population data, they collect two different types of input data: state and local population data for every country of the world and Geographic Information System (GIS) data on the boundaries of states, provinces, counties, and other administrative units within these countries.

Next, they integrate the population figures with the GIS data to produce density estimates for a given area. By converting these data to a regular latitude-longitude grid, they enable the data to be used with a range of remote sensing information such as land cover data from the Moderate Resolution Imaging Spectroradiometer instrument aboard NASA's *Terra* and *Aqua* satellites, data from the NASA-built Landsat satellite for vegetation data, and high-resolution satellite images from the ASTER instrument on the *Terra* satellite. *Terra* and *Aqua* are both managed by Goddard Space Flight Center in Greenbelt, Md., and are part of EOS.

Marc Levy, SEDAC's Lead Project Scientist and CIESIN's Deputy Director, pointed out that a particular concern in the case of Sichuan is the location

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NASA Data Helps Pinpoint Impacted Populations in Disaster Aftermath

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of built-up urban areas. "For that, SEDAC's Global Rural-Urban Mapping Project (GRUMP) has combined satellite data on night-time lights with population and other administrative data to estimate urban characteristics," said Levy. The GRUMP data available from SEDAC include urban versus rural population densities and the extent of built-up urban areas.

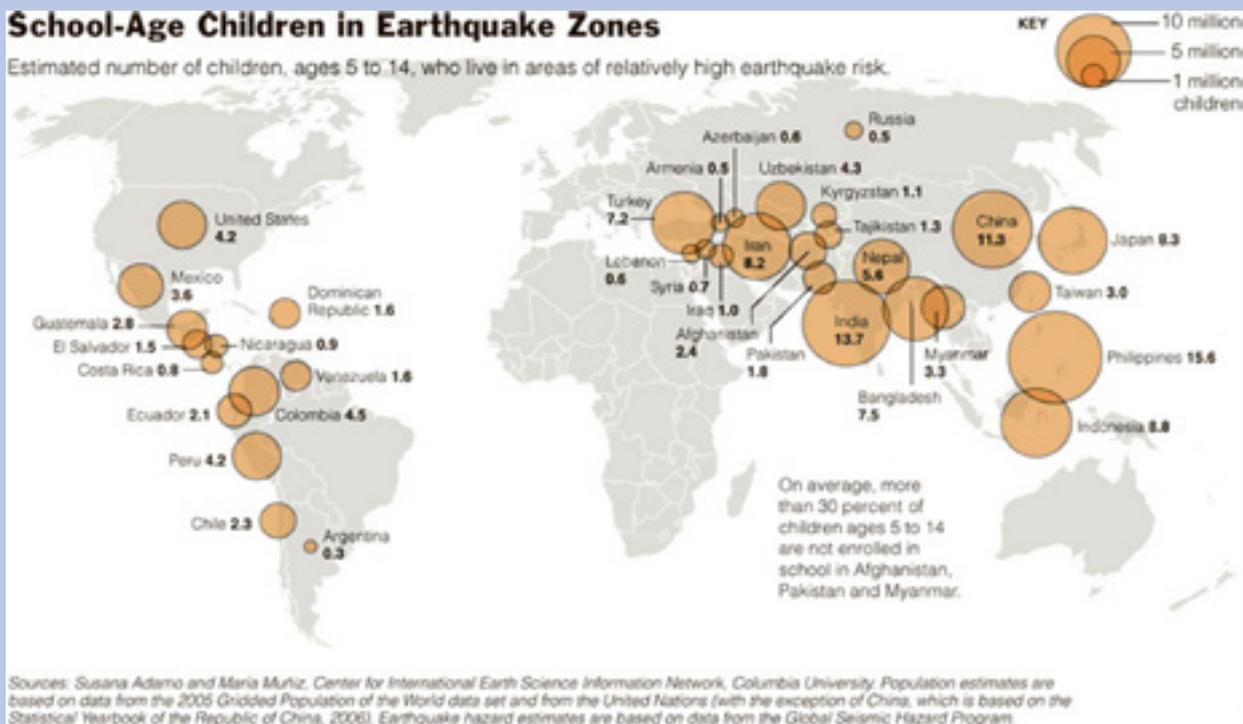
Columbia University researchers worked with the World Bank and other partners in recent years to develop integrated maps of global disaster risk hotspots. Many parts of the world, including the heavily populated Asia-Pacific region, are even susceptible to overlapping hazards like cyclones, earthquakes, landslides, and tsunamis. The team linked six natural hazards—earthquakes, volcanoes, landslides, cyclones/hurricanes, floods, and drought—with population exposure, historic mortality, and economic impacts data to identify areas of relatively high risk of disaster. In fact, CIESIN researchers have recently used population maps in the wake of significant child casualties in the Sichuan quake to estimate the number of children around the world who live in areas of relatively high earthquake risk.

"Although our information is most useful for groups needing to know how many people were in the exposure zone where a disaster occurred, it also helps when looking downstream at secondary impacts like disease,

homelessness, hunger, and even conflict," said Levy. "We have begun working with groups like the UN's World Food Programme and nongovernmental aid groups to develop new data and tools to assist with planning for disaster recovery and reconstruction."

SEDAC and CIESIN work with both U.S. and international agencies such as the U.S. State Department, the UN Geographic Information Support Team, and the World Health Organization to ensure that SEDAC's data are both accessible and usable. "Sometimes users just need a simple map, but at other times they need detailed data for analysis," said Chen. "We are working to provide both, in part by making our data available through tools such as Google Earth and NASA's World Wind that enable users to visualize data quickly and easily."

In the future, Chen says that the Center will try to gain more insight into a variety of issues, such as how age, gender, and health affect vulnerability, and how other factors such as poverty, conflict, infectious disease, and water scarcity interact with natural hazards. "We need to improve our understanding of the human side of the equation using the data capabilities we have and will have in the future," said Chen. "This is very critical to the welfare of populations everywhere." ■



Caption: SEDAC and CIESIN aided media after the Sichuan quake with this population map that shows the number of children across the globe who are exposed to earthquake hotspots—a tool officials can also use in disaster planning.

Inventive Machinist Builds Spectrometer for Mars Mission

By Cynthia O'Carroll

The Quadruple Mass Spectrometer (QMS), one of the instruments in the Sample Analysis at Mars (SAM) suite, is due to launch aboard the Mars Science Laboratory (MSL) in 2009.

The SAM QMS is being built by Dan Carrigan, a core member of the Atmospheric Experiment Branch at NASA's Goddard Space Flight Center in Greenbelt, Md. Although he is a machinist, he now specializes more in assembling intricate parts than in the machining of them. Precision mechanical assembly requires knowledge of how the final instrument will be used and what materials are suitable for accomplishing the critical mission.

"Working in such a small scale requires a different set of skills. Just being able to see and hold the parts can be challenging," stated Carrigan. "You have to be inventive and creative."

Although the QMS has no moving parts, it is made up of almost 300 individual pieces. It weighs almost 6 pounds and is 13 inches tall—about the size of a mini-baguette. Titanium is the most common material used in building the QMS, with many of the smaller parts made from inconel, nickel, and some non-metals like alumina and ruby. The entire SAM suite weighs about 74 pounds and is almost small enough to fit within the dimensional limits for carry-on luggage.



Caption: Carrigan manipulating miniscule parts.

Once on Mars, a sample of gas will travel through the subway-like system of piping to the QMS and will be broken down into basic components for analysis. The design of the QMS was modified from past missions to operate in the Martian atmosphere. Clad in clean room gear, Carrigan assembled the QMS on a small table in a second floor laboratory in Building 33.

Designing and assembling the instrument is quite a challenge because it requires careful measurements and manipulation of miniscule parts to fit into the many tiny openings and crevices. Like a skilled surgeon, Carrigan has



Caption: Dan Carrigan.

great eyesight, steady hands, and the ability to concentrate intently on the task at hand. To help him maneuver the delicate pieces into place, he relies heavily on a magnifying lens attached to an adjustable arm.

The filaments used in the two electron guns of the QMS were formed from tungsten wire, not much larger than a human hair. Although some of the parts are outsourced, Carrigan has customized many, and still others may require his delicate skill of hand machining. He also performs quality control tests on parts custom machined by a local contractor.

With his ability to focus on tiny details, it is no surprise that Carrigan enjoys building model ships and aircraft. He is a member of the U.S. Naval Academy Ship Model Society, a club that helps build models for the Naval Academy Museum. Carrigan also enjoys boating and lives close to the water with his family in Annapolis, Md.

The SAM instrument suite is being assembled at NASA's Goddard Space Flight Center. Paul Mahaffy is the Principal Investigator for SAM and is also the Chief of Goddard's Atmospheric Experiment Laboratory.

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

For more information about Sample Analysis at Mars (SAM), visit: <http://ael.gsfc.nasa.gov/marsSAM.shtml>. For more information about Mars Science Laboratory (MSL), visit: <http://mars.jpl.nasa.gov/msl>. ■

New Group Brings Social Networking to Goddard

By Rivers Lamb

A new group called OpenGoddard has been started out of a desire to influence the future of Goddard by enabling innovation, collaboration, and inspiration. There's a lot of energy and passion about creating a place where folks can create and implement their dreams for Goddard's future. People are interested in having a place where they can be heard, a place where their dreams and inspirations can make a difference. OpenGoddard offers events and other opportunities to interact and learn.

OpenGoddard kicked off with a social networking event over lunch in the Goddard library on May 20. The hour was spent building relationships through a name tag game where people met one another, then tagged each other with notes about what they had learned from their conversations. About 60 people attended and took the opportunity to meet, greet, and connect with folks from all walks of life across the Goddard community. Those who acquired enough name tags even got a blinking NASA pin. The prizes, pizza, ice cream sandwiches, and drinks were provided by the Space Generation Advisory Council.

Folks participated in OpenGoddard's second event on June 6, a communications workshop presented by Lois Yoon of Vanto Group, Inc. The event was an opportunity to discover how communication can be used to increase performance and create breakthrough results.



Photo Credit: Clay Templeton

Caption: Goddard employees enjoy some social networking.

OpenGoddard also hosted an "Awesome Outdoor Games" event on June 10 at the pavilion near the Child Care Center. Games like croquet, badminton, and ring toss provided a chance for Goddard employees to meet and mingle with each other over lunch. Refreshments were sponsored by four different directorates: Flight Projects, Safety and Mission Assurance, Management Operations, and Applied Engineering and Technology.

A regular OpenGoddard event is the Goddard Roundtable, which takes place in the library every Tuesday from 12-1 p. m. Inspired by the famous Algonquin Roundtable of the 1920s, the OpenGoddard Roundtable is a place where you can indulge in enlightened conversation about Goddard and other space-related topics. Over lunch we discuss news, developments, and ideas within the realm of space exploration.

OpenGoddard is open to all Goddard employees. The group is open to any and all ideas for activities and events, and will support you in your vision for what is possible with our Center. For more information about OpenGoddard and a list of upcoming events, visit: <http://www.opengoddard.com> or contact Rivers Lamb at Rivers.Lamb@nasa.gov. ■



Photo Credit: Clay Templeton

Caption: OpenGoddard members interact over games.

New Faces:

A monthly feature spotlighting new members of the Goddard community.

By John Putman



Photo credit: Pat Izzo

Caption: Mark Melton.

Mark Melton is a Systems Engineer in the Mission Systems Engineering Branch, Code 599.

A local, Mark grew up in Howard County, Md. He graduated from the University of Maryland, earning a B.S. in aerospace engineering in 1993. Mark explains, "I participated in the cooperative engineering program at Maryland, working at Swales Aerospace while in school. After graduating, I worked at Swales for 15 years before coming to GSFC, first as a thermal engineer and then as a systems engineer."

Mark has been involved with GSFC programs since he started as a co-op student at Swales in 1991. Mark says, "I've enjoyed the unique challenges that each has presented and really enjoy the people and the environment at GSFC. I'm very excited at the opportunity to work for NASA GSFC."

Mark's latest project has seen recent success with a launch on June 11. "I've worked on the *Gamma-ray Large Area Space Telescope* (GLAST) project for the last 6 ½ years. Now that GLAST is on-orbit and in its checkout phase, it's thrilling to see all of the hard work paying off. The scientists are full of excitement as they begin calibrating their instruments in preparation for opening a new view on the universe. Knowing I helped make this happen is very rewarding."

When not working on GLAST, Mark loves spending time with his wife and three kids—ages 3, 5, and 8. "They keep us quite busy," says Mark. When he gets the chance, Mark enjoys, "getting out for a round of golf." ■



Photo credit: Pat Izzo

Caption: Denise Tarrance.

Denise Tarrance is Branch Secretary in Code 543, the Mechanical Engineering Branch.

Denise applied for the position knowing, "it was nothing like I had ever worked around before. I knew there would be so many learning opportunities for me to expand my knowledge of space and planets, and what opportunities are possible for exploration."

In her previous position, Denise worked in the aircraft division with the Department of the Navy and enjoyed learning about different types of aircraft. Denise jumped at the opportunity to, "learn a completely different area such as satellites, spacecraft, and the Shuttle, and all the fantastic things to teach people about the world, environment, and space just made this seem like it would be a great and exciting place to work."

According to Denise, her favorite part of working at Goddard is the people, "Everyone has been so fantastic and patient with me knowing that I have no knowledge of what all our missions can and could possibly accomplish. What has impressed me most is how anyone will take the time to explain exactly what a satellite will do for us when it is successful."

The highlight for Denise so far: "I was able to watch a launch, which was really cool."

Outside of work, Denise loves spending time with her son, looking for shark's teeth at the beach around the Chesapeake Bay, going camping, and traveling. Denise especially enjoys going fly fishing every chance she gets. ■