National Aeronautics and Space Administration

Roundup

Lyndon B. Johnson Space Center

February | 2011

Our next giant leap

JSC Director

On the cover:

The Orion Crew Exploration Vehicle Parachute Assembly System performs a successful airdrop test shortly after sunrise on July 27, 2010, at the U.S. Army Yuma Proving Grounds in Arizona.

NASA/PHOTO

Photo of the month:

Space shuttle* Discovery *waits to roll back from Launch Pad 39A to the Vehicle Assembly Building at Kennedy Space Center during the early morning hours of Dec. 21 with the beginning of the total lunar eclipse clearly in view.

NASA PHOTO

There are two topics I enjoy talking about more than anything else. First, I love talking about my family—especially my twin granddaughters Abby and Anna, who take up a great deal of space in my conversations. At age 4, they are curious, funny, loving and joyful. When my daughter says I'm spoiling them, I congratulate myself for a job well done.

My second favorite topic is to share the stories and accomplishments of my Johnson Space Center family. In a year of unparalleled challenges, all of the JSC team members continue to amaze me with their dedication and commitment to our successful and continuing mission of being the leader in human spaceflight. Each member of our civil service and contractor team deserves recognition, and I am proud to share the national recognition that has recently been announced for a few of our teammates.

Congratulations to Mike Suffredini and the International Space Station Program, recipients of the National Air and Space Museum Current Achievement Trophy

The International Space Station Program has been selected for the Current Achievement Trophy in recognition of the inspiration and incentive the program has provided to stimulate aerospace industries and the new and improved technologies, understanding and insight. Mike has been invited to receive this trophy on behalf of the station program at the annual awards event at the Smithsonian National Air and Space Museum in Washington, D.C.

Congratulations to Jeff Hanley, recipient of the Astronautics Engineer Award

Sponsored by the National Space Club, the Astronautics Engineer Award honors one engineer annually for his or her outstanding contribution to the advancement of space technology. Jeff has been selected for his innovative leadership in the field of aerospace and his exemplary contributions to the agency.

Congratulations to Steve Altemus, agency winner of the Federal Engineer of the Year

The Federal Engineer of the Year Award recognizes federal engineers for their commitment, innovation and value in service to our nation.

Congratulations to Dr. Ellen Ochoa, 2011 American Institute of Aeronautics and Astronautics (AIAA) Fellow

The distinction of fellow is conferred by AIAA upon outstanding members of the institute who have made notable and valuable contributions to the arts, sciences or technology of aeronautics or astronautics.

These are but a few of the great accomplishments that our NASA team has garnered during the past year. I know there will be many more in the future, and we can all take pride in these successes. As we work toward the future of spaceflight, JSC will be at the forefront of these efforts. We will continue to lead the way, raise the bar and set new marks. I look forward to sharing in many great achievements with you!

Mike

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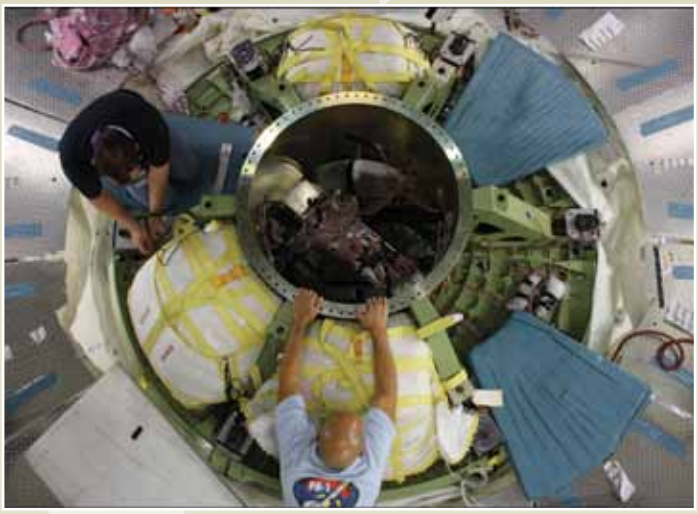
NASA/PHOTO 507169MAIN_2010-5866_FULL

A path forward

By Dale Thomas

What does 2011 hold for the Constellation team? It will be a year of change and implementation as NASA moves to build a space program for the 21st century.

With the Fiscal Year 2011 (FY11) budget request, the president called for the cancellation of the Constellation Program and gave NASA a new direction: reposition NASA on the cutting edge, adapt to a changing external environment, embrace new technologies, engage with the public and develop more partnerships and collaborations.



NASA/PHOTO

Parachutes are installed into the forward bay area of the Orion crew module Ground Test Article at the Michoud Assembly Facility in New Orleans.

Yet, despite the new direction and the Authorization Act of 2010, NASA is presently required to continue its 2010 funding lines—including the Constellation Program—as the government operates under a Continuing Resolution.

This has been challenging for the agency and even more so for those who work for Constellation. While planning continues, and with many options still under consideration, it remains important to poise Constellation work in FY11 to provide the most value to NASA. During the past year, this team has been conscientious as it attempted to answer a complex question: How can Constellation use the work required by the Continuing Resolution to make possible a running start for future programs when the time comes?

The Constellation Program captured the state of the program and re-examined the capabilities needed to develop a safe and efficient human spaceflight system and conduct mission operations. This effort was closely coordinated with headquarters and the Exploration Systems Mission Directorate. Because of this effort, Constellation is focused on development activities that should play forward to scenarios shaped by the Human Exploration Framework Team.

This past year, the Constellation team experienced great progress and accomplishments—all achieved in an environment of great uncertainty. This year will indeed be a year of transition: one of people, facilities, budgets, contracts and other assets such as analysis, data and lessons learned as the program continues to balance the work portfolio to meet future goals.

Presently that portfolio includes the following:

- The fabrication and test of the J2-X engine will, at a minimum, demonstrate the capability to plan, design, develop and validate U.S. modern rocket engine fabrication techniques. This knowledge will support any engines selected for future acquisition.
- The test stands that have been modified and renovated are now better prepared for future engine tests, including tests by commercial sources.
- The solid rocket motor development efforts have resulted in a more capable system, one ready to apply to a heavy lift system if a solid element is required.
- The upper stage development efforts apply to the design and manufacture of the core section of a heavy lift system. Knowledge gained will assist in the future acquisition of a new design.
- The Orion capsule system efforts have focused on mitigating the risks of human spaceflight, including the thermal protection system and parachutes—keys in the success of the recent SpaceX test flight.

We have been given a roadmap that calls for the next generation of space transportation systems to be as flexible as the shuttle while improving safety, taking advantage of changes in technology and reducing costs. NASA and the Constellation team are doing their best to take the most prudent path to meet those goals—a path that minimizes waste and will meet a go-forward plan.

For more transition-related articles, catch the latest in "Rendezvous" at http://rendezvous.jsc.nasa.gov/.

NASA/PHOTO

At left: Members of the Constellation leadership team, including Program Manager Dale Thomas, get an up close look at the Orion crew module Ground Test Article.

Ar right: The Orion Ground Test Article heat shield carrier structure is rotated for structural acceptance testing at Lockheed Martin Space Systems in Denver. The heat shield is 16.5 feet in diameter, and it is the largest of its kind ever fabricated.

NASA/PHOTO

Texas Twister goes Martian for the sake of humankind

How selfless of me

By Texas Twister

Did you know there is a stronger than ever possibility of cows in space? No, seriously.

So I watched this fascinating "Mars Program Update" on NASA TV that featured a variety of super-smart panelists with shiny credentials, and nearly fell out of my chair when European Space Agency Programs Coordinator Dr. Marcello Coradini said, "Does (methane) imply that we have cows on Mars?"

Cows on Mars? That is exactly why I've been saying we need to explore outer space!

Then he said, "I don't think so. But the question is—if we can find much more methane, does that discovery mean there are other life forms?"

That sound you heard? Yeah, that was the sound of my bubble bursting.

I consoled myself with the fact that super-smart panelists can't be privy (yet, anyway) to all the secrets of the universe while I listened and learned a lot more about the forbidden red planet that has been such a magnet for exploration. And—that cows could be there *already*. If we would just *open our minds*.

For instance, Dr. Steve Squyres of Cornell University reiterated the methane link to cows. He mentioned that the primary source of methane, to put it sugarcoatedly (I invented the word, so get over it, okay?), are cows having a particularly gassy day.

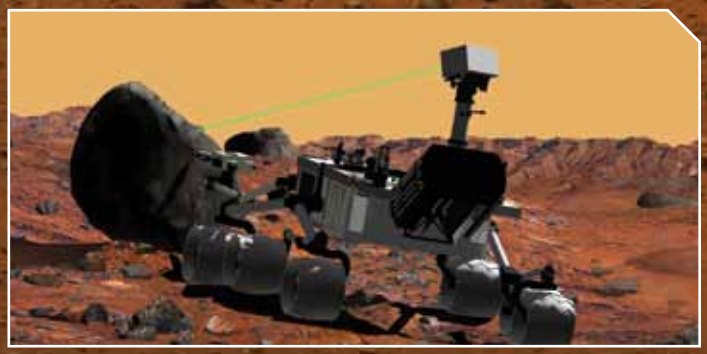
NASA/JPL-CALTECH

An artist's concept of NASA's Mars Science Laboratory (left) serves to compare it with Spirit, one of NASA's twin Mars Exploration Rovers. The images of Spirit and the more advanced rover are both superimposed by special effects on a scene from Mars' "Columbia Hills," photographed by Spirit's panoramic camera on April 13, 2005, and presented here in false color.

The next rover making a trip to Mars, leaving this calendar year around Thanksgiving, is adorably named Curiosity. (Ready, set—aww!) Curiosity is different from the Mars Exploration Rovers (Spirit and Opportunity) currently scoping out the red planet. Instead of being equipped with only super-cool cameras and such, Curiosity will also have the equivalent of a chemical laboratory in its belly. (Well, if rovers had bellies, that's where it would be.)

"This time we're going with a full laboratory of instruments, and because of that, we're going to discover new things," said NASA Goddard Space Flight Center bio/geochemist Dr. Jennifer Eigenbrode. Like—maybe—cows?

"One of the challenges of looking for life elsewhere is (that) our search is based on what we know," said NASA Astrobiology Program Manager Dr. Mary Voytek. "So how can it be expanded to include life as we don't know it? Can we use something else besides water?



NASA/PHOTO

An artist's concept of Curiosity vaporizing a patch of rock for analysis.

"We've seen lakes of methane on Titan (Saturn's largest moon), one of the bodies we're interested in. Could life grow in liquid methane? Scientists are trying to expand it to make the search as broad as possible."

To find life on Mars, one has to understand how we find life on Earth.

"We find organic molecules throughout the geological rock record," Eigenbrode said. "In this, we find evidence of microbial organisms."

NASA is evaluating where on Mars we might best find clues to life, or past lives, by "reading the rocks." We don't want to dump that adorably and aptly named Curiosity just anywhere.

"When we go to Mars, we're taking an instrument that will be capable of looking for molecular fossils," Eigenbrode said. "It kind of presents this idea—this creative conception—billions of years ago on Mars."

Just about seven years ago, Spirit and Opportunity landed on Mars.

"They drive reeeeeeally slowly," Squyres said, and have covered just more than 20 miles collectively. However, "they've told us an enormous amount of what rocks are like at these two locations on the (Martian) surface. Mars today is a cold, dry, desolate world. If you went there, you would hate it."

But—evidence shows that at one time, it may have been much more habitable. And heck, what more could organisms want? A red carpet?

Humans may be picky … but cows are certainly not such prima donnas. Someone tell me where I can catch the next rocket ship. I may want to check this out for myself.

Resupplying the International Space Station

By Rachel Kraft

In mid-February, the European Space Agency (ESA) will launch its second Automated Transfer Vehicle (ATV-2) from its spaceport in Kourou, French Guiana. This event comes shortly after the Japan Aerospace Exploration Agency's H-II Transfer Vehicle and the 41st Russian Progress launched to station in January. Coordinating the launch and arrival of a resupply vehicle takes methodical planning and precision, and preparing and transporting NASA cargo sent to station via an unmanned vehicle requires a small army.

ATV-2, named *Johannes Kepler* after the German astronomer and mathematician, will transport seven tons of cargo and is the second ESA resupply vehicle to visit station—the *Jules Verne* rendezvoused with the orbiting laboratory in 2008. NASA is sending an array of crew supplies totaling 3,000 pounds, from multipurpose goods like Nitrile gloves, batteries and tape, to socks, shirts and food for crew members. *Johannes Kepler* will also transport critical spare parts such as Recycle Filter Tank Assemblies and Multifiltration Beds that help purify water and a Power Distribution Unit that will help the station function.

PHOTO/ESA/ASTRIUM

ATV-2 *Johannes Kepler* at night during shipment.

ATV-2 will also transport crucial liquid cargo to station.

"ATV is bringing up 4,000 kg of propellant that can be used when the ATV is attached," said Launch Package Integration Manager Eugene Schwanbeck. ATV will also transport fuel that will be transferred to the station's thrusters and gaseous oxygen.

Preparing cargo for ATV-2's journey is not as easy as simply sending it directly to French Guiana, on the northeastern coast of South America.

"The vehicle office here determines that we're going to run out of things by a certain date and we need to get a few things up there," Schwanbeck said. "They look at the flight schedule and flight program and determine which (vehicle) candidates are best."

Team members must then account for every factor that could affect the cargo during flight to ensure that it will arrive to station in mint condition.

"The Joint Cargo Certification Team looks at the specific launch vehicle and the hardware to determine if they're compatible," Schwanbeck said.

Then they consider every small detail, from how much padding and foam cushioning are needed, to vibration, acoustics and temperature during flight.

"There are two parameters that we really keep in mind—mass and volume," Schwanbeck said.

Cargo that originates at Johnson Space Center is first transported to Houston's Bush Intercontinental Airport, where it is typically shipped via commercial aircraft to Paris' Charles de Gaulle Airport.

"The only cargo that goes regularly into that country is on Air France," Schwanbeck said.

From there, the cargo is consolidated with other cargo, trucked across town to the city's other major airport and flown to Cayenne, the capital of French Guiana. After the aircraft lands, the cargo is transported up the country's coast to Kourou, where ESA assembles the cargo in the ATV before launch aboard the Ariane 5 rocket.

NASA allows the shipment process to take two weeks to account for possible delays en route, but the agency's ATV-2 cargo shipment arrived in Kourou in four days.

Schwanbeck emphasized that "standing armies," from a stowage integrator to teams that do the physical packing, help carry out the logistics of readying cargo for a trip to space. Once docked to station, *Johannes Kepler* will spend more than three months on orbit, allowing station crew members enough time to unload the many tons of supplies and restock it with trash that, after undocking, will incinerate as it reenters the Earth's orbit during descent.

PHOTO/ESA/THALES ALENIA SPACE

The Integrated Cargo Carrier for Europe's second Automated Transfer Vehicle, *Johannes Kepler*, is prepared for transportation from Thales Alenia Space Italy in Turin, Italy, to EADS Astrium in Bremen, Germany.

PHOTO/ESA TV

ATV-1 left the International Space Station in September 2008.

Orion: The next-generation spacecraft

NASA's Orion spacecraft has seen tremendous technological advancements in the past year. The capsule is undergoing continuous research and development phases geared toward being the next manned spacecraft after the retirement of the space shuttle.

Orion next-generation networking

With computing power 1,000 times faster than current shuttle systems, NASA's Orion Crew Exploration Vehicle (CEV) is designed to be the most technically self-sufficient spacecraft ever built. Orion will use a networking technology called Time Triggered Gigabit Ethernet (TT-GbE), which will allow NASA engineers to categorize different types of data and prioritize how that data should travel through the network.

NASA/PHOTO

The Orion Ground Test Article will serve as a production pathfinder to validate the flight vehicle production processes and tools. This first full-sized crew module will be tested on the ground in equivalent flight-like environments.

This technology ensures that critical data and nonessential data will be able to safely travel over a single network onboard the spacecraft, as opposed to the shuttle and the space station, where critical data travels over separate dedicated networks.

TT-GbE data is time-critical control data that manages vital systems like navigation and life support. This data will have guaranteed bandwidth and message timing to ensure it will always reach its destination on time, regardless of other network traffic.

Orion's easily upgradable design makes it adaptable for future technology advancements. For example, Honeywell is already actively investing in future technology research to make Orion-like avionics available to future space vehicles at 1/10th the current size, weight and power penalty. These additional savings are necessary to enable longer missions to more distant destinations in the near future.

Riding the STORRM to safer, more reliable docking navigation

An inventive navigation system that will make docking operations safer and easier for future spacecraft will be Orion's first system to be flown and tested on orbit. Developed collaboratively by NASA, Ball and Lockheed Martin, the docking navigation system prototype will be tested by astronauts aboard STS-134 in an unprecedented on-orbit maneuver as part of the Sensor Test for Orion Relative Navigation Risk Mitigation (STORRM) Development Test Objective. On Flight Day 11 of the mission, the shuttle crew will undock from station and then re-rendezvous with the station on an Orion-like approach.

As Orion approaches the station, STORRM's sensors will provide real-time, 3-D images to the crew with a resolution 16 times higher than the current shuttle sensors. This single-system design provides the required docking accuracy and range capability necessary to meet Orion's crew safety, mass, volume and power constraints.

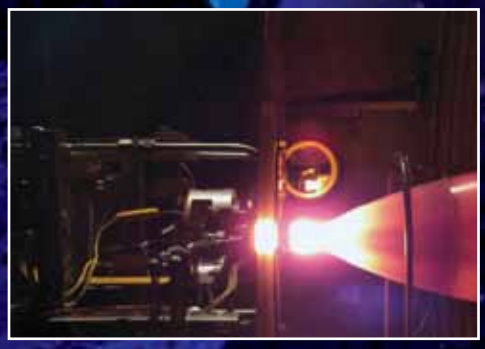
NASA/PHOTO

Ball Aerospace technicians work with STORRM, an inventive navigation system of the future, in a clean room.

Because of its capability to determine shapes, intensity and distance, STORRM's sensing technology may also improve a variety of Earthbound applications such as terrain mapping, deforestation monitoring and transportation hazardous avoidance systems.

Orion's right stuff: Thermal protection system

Protecting the spacecraft and its crew from the extreme temperatures experienced during reentry is one of the most mission-critical requirements for human spaceflight. Orion will be protected by the world's largest heat shield structure, composed of a newly developed resin that can endure higher reentry temperatures, which will result in improved crew safety and mass optimization of the Orion spacecraft.



NASA/PHOTO JSC2010E198535

Aerojet completed acceptance testing of the second R-4D development engine at their test facility in Redmond, Washington. The R-4D is the Aerojet engine that will be used on the Orion vehicle for Service Module Auxiliary propulsion.

The Lockheed Martin Orion team in Denver recently performed a heat shield "flipping" procedure to

Compiled by Neesha Hosein

conduct static testing and prepare the structure for simulated Avcoat application and painting. When the simulated Avcoat is applied and painted, the heat shield will be ready for integration to the Orion Crew Module Ground Test Article vehicle. Once integrated with the heat shield and thermal protection backshell, the spacecraft will undergo rigorous testing in flight-like environments. The craft will also undergo a series of drop tests later this year at the NASA Langley Research Center Hydro Impact Basin.

Serious software

Orion's robust software architecture is highly reconfigurable, using a table-based approach that allows for mission-to-mission flexibility. In addition, the software development team integrated commercial off-the-shelf products with heritage products to incorporate operational applications without unnecessary rework, thereby saving time and money. Orion's software architecture, requirements and initial design successfully passed NASA's Software Preliminary Design Review in 2010, proving that the design encompassed Orion's five necessary software elements: flight software; electronic ground support equipment software; simulation and test software; data services software; and initial updates to the backup flight control software.

PHOTO/ NICK HEATH/SILICON.COM

This reproduction of part of the Orion cockpit dashboard is used inside a flight simulator.

Orion's software demonstrated the right stuff during Orion's successful Pad Abort 1 flight test in May of last year. The crew module test article used included Honeywell avionics and Lockheed Martin software for onboard control of abort sequencing and inertial navigation. The three pallet-mounted avionics systems for the flight test hosted a vehicle management computer system based on integrated modular avionics technology developed for the Boeing 787 and a remote interface unit that works between the vehicle computers and all analog parts of the system.

Wind tunnel testing

The CEV Aeroscience Project (CAP) aerothermal group uses a complex combination of high-fidelity computational simulations and wind tunnel testing to create design environments for the Orion Command Module (CM) and the Launch Abort Vehicle. Each phase of wind tunnel testing covers a different flight regime, physical phenomenon or geometric complexity to support the engineering tools and computational prediction of flight environments. These predictions give the extreme temperatures during hypersonic reentry that the CM must withstand using its thermal protection system.

NASA/PHOTO

The High Fidelity Wind Tunnel Model for aerothermodynamic testing of the Orion Capsule, mounted on a blade sting in CUBRC's Large Energy National Shock Tunnel. Each of the gold dots is a thin film sensor measuring heat transfer values.

The high-fidelity aerothermodynamic testing of the Orion CM backshell, CAP's most ambitious and extensive wind tunnel test, was recently completed after years of planning. The test results gave vital information in its prediction of flight environments, and also provided data on the complex aerothermal environment on the CM backshell in all its intricacies.

Parachutes: Ensuring crew safety by design

The CEV Parachute Assembly System (CPAS) will ensure the crew enjoys a safe and gentle landing following a dynamic, high-speed reentry from space. The entire system is made up of eight parachutes: two mortar-deployed drogues for stabilization and initial speed reduction; three pilots; and three main parachutes, which further reduce the speed of the module to its final descent rate of 25 feet per second. The CPAS airdrop development test program is responsible for robust risk mitigation of parachute deployment through a variety of possible reentry conditions.

Orion's system combines proven heritage design elements of the Apollo-era parachutes with new innovations that will meet more demanding mission challenges. The drogue chutes will deploy at a higher altitude to provide increased vehicle stability. (Orion can still land safely even if a drogue or main parachute fails to deploy.) And, the system can ensure a secure landing in an emergency, as demonstrated during the successful Pad Abort 1 flight test.

To date, CPAS has completed both Generation 1 and 2 test series in preparation for the Engineering Development Unit test series that will begin this year, which will fully characterize the end-to-end system performance, validate the simulations, reduce technical risk and demonstrate reliability in the various operational configurations. These tests will provide the insight into the parachute system leading to qualification for human spaceflight.

NASA Ambassadors

By Rachel Kraft

In January, 16 Johnson Space Center interns were selected to be part of NASA Ambassadors, a program where many of the agency's highest achieving student interns are chosen to do research in their fields and help encourage and inspire other students in science, technology, engineering and mathematics (STEM) fields. JSC's newly minted ambassadors were nominated by their managers and mentors and will join nearly 100 other interns selected agencywide this year and nearly 200 selected in 2009 and 2010.

"The students who are nominated to the ambassadors and to represent NASA are the outstanding students in their programs, the ones who go above and beyond excelling both in school and at work," said Sherri Burrow, program coordinator for the Career Explorations Program (CEP), which helps high school and college students learn administrative and technical skills at NASA, and from which seven of JSC's ambassadors were selected this year. Nine were selected from the Minority University Research Education Program (MUREP). "They love NASA and love to share that with their peers."

PHOTO/ LAUREN REID, UNIVERSITIES SPACE RESEARCH ASSOCIATION

Recently selected NASA Ambassadors (left to right): Zaida Hernandez, Selina Zalesak, Martin Guevara and Fidelina Quiroz.

Each ambassador brings a unique perspective to the program. Zaida Hernandez, now a mechanical engineering major at the University of Houston, has always enjoyed building things and began considering engineering as a major in college, and as a profession, after she took engineering graphics classes in high school.

"I knew I wanted to be an engineer, but my internship at NASA last year helped me decide that I wanted to pursue mechanical engineering," Hernandez said.

Hernandez works in the Space Suit and Crew Survival Systems Branch and will help test self-adjustable gloves and boots this year. She is looking forward to helping other students realize that their dreams in STEM fields are attainable.

"Two years ago I had no idea that NASA even hired interns," Hernandez said. "I want to let people know that if working at NASA is their dream, there are many ways to reach that goal."

Martin Guevara grew up in Mexico and is pursuing an engineering degree at the University of Houston. He said that he hopes the program will enable him "to inspire at least one person … one that will keep that inspiration continuous so that it may propel him forward into a STEM field and that in the end, he and our society may find progress."

Guevara is interested in improving the link between technology and the environment. During his time at NASA, he studied how cyanobacteria adapts to extreme environments in the Astromaterials Research and Engineering Science Directorate, and worked with lunar dust and regolith in the toxicology research department. Guevara currently works in the Habitability and Environmental Factors Division, where he studies human factors to allow for safe and productive space missions.

Other JSC interns selected for NASA Ambassadors from the MUREP and CEP programs have supported Mission Operations, Engineering, White Sands Test Facility, assisted with tests to perfect the Orion design, worked on robotics programming, worked in the International Space Station's Procurement Office and supported 2010 Summer of Innovation programming—and that's on top of continued leadership in and out of the classroom at their respective universities.

Through peer-to-peer interaction, the NASA Ambassadors program helps show a broad range of students that people like them can pursue opportunities to help NASA accomplish its mission.

"They bring fresh ideas to the agency, they bring boundless energy, enthusiasm and amazing 'I can do anything' attitudes, along with intelligence and common sense," Burrow said.

For more information, see http://go.usa.gov/rL4 or visit the SOLAR website: http://intern.nasa.gov

Looking to the future of spaceflight by harnessing the **past**

Compiled by Catherine E. Williams

Johnson Space Center is one of the few centers with a Chief Knowledge Officer (CKO) and comprehensive knowledge-management program—essential to the capture and retention of more than 50 years of human spaceflight expertise. Since its inception in 2006, the avenues for sharing knowledge within JSC have grown exponentially. You may have heard of the Office of Knowledge and Quality Management through popular storytelling events, but there is more to it—all for the wider goal of enhancing what you know (tacit knowledge gained through experience and training), who you know (your social network) and what everyone else knows (explicit knowledge that has been codified and made available in knowledge bases).

NASA/BLAIR JSC2010E061626

JSC Voices, the center's storytelling program, provides the platform and means for team members to pass on their work experiences to future generations.

JSC Voices

JSC Voices is the center's StoryCorps program, where participants can produce their own movie or be in a production sponsored by the CKO, showcasing their NASA experiences. The project honors these personal stories and makes them accessible to everyone. When colleagues hear these stories, they become a part of the trials and triumphs and hear the courage and humor found in an incredible range of voices. JSC Voices ensures that these moments are preserved so that they can be passed on for future knowledge transfer.

Storytelling

A vital component of knowledge management, in a single word, is storytelling. Each month, the CKO holds storytelling sessions where JSC team members can listen to a cross section of current and former employees on a variety of topics with broad, centerwide appeal. These stories can be from the past, present or future—and are offered in a lighthearted or serious vein.

Lessons Learned

Lessons learned share knowledge derived from experience to promote the recurrence of desirable outcomes or preclude the recurrence of undesirable outcomes. The references to lessons learned reflect the need to communicate acquired data and ensure that beneficial information is factored into planning, work processes and activities.

The JSC Lessons Learned Program consists of a number of local, agency and program collections and a center-level coordinating function—the Center Data Manager (CDM). Because of the diverse nature of JSC work, the infrastructure mechanisms are tailored to each local level. JSC organizations fit their own processes in accordance with their functions, responsibilities and authorities. The CDM links the local, agency and program collections together to facilitate the sharing of lessons with JSC organizations and the agency.

Lean Six Sigma

Lean Six Sigma (L6S) is a structured approach to process evaluation for improvement. Analysis tools and techniques are used to identify possible forms of waste, such as procedural steps that may be required but don't add value and causes of variation in product.

In May 2009, the Quality and Flight Equipment Division and the Office of Knowledge and Quality Management partnered to integrate the principles and practices of L6S into the continuous improvement aspect of the JSC Quality Management System. The training division of Human Resources provided training, facilities for events and an L6S Implementation and Facilitation Team (LIFT) member. Engineering joined the effort and added a member to the LIFT as well.

JSC's implementation was guided and supported by the NASA Lean Six Sigma Office and industry L6S experts. The combined effort provided training, mentoring, certification criteria, checklists and other tools needed for a successful program.

At JSC, NASA is partnering with local contractors, many of whom have years of L6S experience. Several L6S process-improvement events have been held—some of which have completed

NASA/DEHOYOS JSC2010E042046

The Office of Knowledge and Quality Management offered "A Six-pack of Wisdom: 5 Engineers + 1 Astronaut" to viewers in Building 30.

(continued on page 11)

Spotlight Mitchell Sweeney

Altitude Rescue Specialist, Jacobs Technology

Q: We've never heard of an "Altitude Rescue Specialist." What do you do?
A: Altitude Rescue Specialists serve as rescue personnel for the astronauts while they perform any training inside altitude chambers. We train to remove the crew member from his/her Extravehicular Mobility Unit (EMU) in any dangerous or uncomfortable situations he or she may experience when testing inside the human-rated vacuum chambers. We do manned and unmanned testing in the vacuum chambers of Buildings 7 and 33, testing flight hardware and also full EMUs. We are partially responsible for assisting astronauts in the use of the Space Station Airlock Test Assembly located inside Building 7. Our secondary duties involve building testing apparatuses and assemblies for advanced life-support testing related to various projects.

Q: Favorite hobbies or interesting things you do away from the office?
A: Gardening, boxing, muay thai and jiu jitsu.

Q: What was your first job (not necessarily at NASA, but ever)?
A: In high school I did large-scale car wash maintenance and automotive detail and installation for car dealerships.

Q: If you could trade places with any other person for a week, famous or obscure, living or dead, real or fictional, who would it be?
A: Any member of a U.S. Special Forces team.

Q: What would people be surprised to know about you?
A: I enjoy vegetable gardening.

Q: What is your favorite quote or motto?
A: "Ignorance more frequently begets confidence than does knowledge." – Charles Darwin

Q: What would we find in your refrigerator right now?
A: Grandma's homemade stew.

Q: Last good book or article you read?
A: "The Encyclopedia of Country Living."

Q: Favorite travel destination (or place you'd love to go if given the opportunity)?
A: Alaska.

Q: Favorite TV show and why?
A: "Modern Marvels." It gives a good amount of insight to the process and manpower it takes to accomplish large tasks—similar to what goes on here at NASA—many minds being utilized to accomplish a common goal.

PHOTOS ARE COURTESY OF MITCHELL SWEENEY

Q: What is your most prized possession?
A: My thoughts, if they could be considered a "possession!"

Q: Describe yourself in three words.
A: Humble, open, blunt.

Q: 13. What is your best memory at NASA or Johnson Space Center?
A: Being very young and getting to tour the facilities with my grandfather, who has served NASA for 45+ years!

WANTED!

Do you know a JSC colleague or team that does something extraordinary on or off the job? Whether it's a unique skill, interesting work, special professional accomplishment, remarkable second career, hobby or volunteerism, your nominee(s) may deserve the spotlight!

The Roundup shines the light on one special person or team each month, chosen from a cross section of the JSC workforce. To suggest "Spotlight" candidates, send your nomination to the JSC Roundup Office mailbox at jsc-roundup@mail.nasa.gov. Please include contact information and a brief description of why your nominee(s) should be considered.

Toys for Kids

Johnson Space Center supported U.S. Representative Sheila Jackson Lee's annual Toys for Kids event at the George R. Brown Convention Center on Dec. 18. Astronauts George Zamka, Stephanie Wilson, Lee Morin and Dottie Metcalf-Lindenburger took part by speaking to the crowd and signing autographs. NASA's exhibit featured the inflatable International Space Station node display, children's interactive displays and volunteers to engage the approximately 3,000 children in attendance. JSC's mascot, Cosmo, also participated in this year's event, which marked the 16th anniversary of Toys for Kids.

NASA/STAFFORD JSC2010E196927

NASA/STAFFORD JSC2010E196930

Calling all retirees

Have you retired from NASA and taken up a unique hobby, new profession or are involved in interesting volunteer work? We want to hear what you've been up to since leaving NASA. Send us an e-mail at jsc-roundup@mail.nasa.gov. We may choose to feature you in *Roundup* or on JSC Features!

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implementation plans, and others with numerous actions in work.

For more information regarding training or improvement events, or to discuss opportunities for L6S in your organization, contact: Cheryl Corbin (cheryl.a.corbin@nasa.gov); Cheryl Andrews (cheryl.r.andrews@nasa.gov); Laurie Peterson (laurie.j.peterson@nasa.gov); or Terri Washington (terri.r.williams@nasa.gov).

Or, access the LIFT website: http://www6.jsc.nasa.gov/ISO9000/Lean_6_Sigma

JSC Taxonomy

The CKO has developed the JSC Taxonomy to capitalize on the accomplishments of yesterday while maintaining the flexibility needed for the evolving information environment of today. The taxonomy is a set of labels, known as preferred terms, arranged in a hierarchy to effectively categorize the information associated with more than 50 years of human spaceflight.

Participating in the JSC Taxonomy is now easier than ever. The first version of the Taxonomy Feedback Tool is available at JSC Knowledge Online (http://knowledge.jsc.nasa.gov). With this tool, JSC users can suggest terms, images and websites, and can comment on others' ideas. The ultimate vision for taxonomy is to connect information stovepipes and present a unified view for information and knowledge across the center, organizations and decades.

The Rosetta Stone provided a common vocabulary for the use of hieroglyphic, demotic and Greek scripts, allowing multiple groups to communicate information. The JSC Taxonomy acts as our own Rosetta Stone as it identifies terms to accurately describe JSC content.

For more on taxonomy, contact JSC Taxonomist Sarah Berndt (sarah.berndt@nasa.gov); Katie Redmond with JSC taxonomy support (katie.p.redmond@nasa.gov); or Information Resources Directorate Taxonomist Ebony Fondren (ebony.n.fondren@nasa.gov).

Quality Management System

The JSC Quality Management System (QMS) is the collection of management principles, people and policies into a single system used to manage the work of the center. The eight management principles (customer focus, leadership, involvement of people, process approach, system approach to management, continual improvement, factual approach to decision-making and mutually beneficial supplier relationships) are the basis for the International Standards for Quality Management.

JSC's QMS has been certified to the ISO 9000 standard since March 1998, and has been recertified every three years to its latest revision. Additionally, the JSC QMS was certified to the International Standard for Aerospace Quality Management Systems in 2006. These certifications ensure that JSC complies with federal/agency policies and maintains an integrated management system. It also means that JSC uses the same quality-management standards as our International Partners and local contractors.

More information on the QMS can be found at http://www6.jsc.nasa.gov/ISO9000/index.cfm.

Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Johnson Space Center, Houston, Texas, and is published by the Public Affairs Office for all Space Center employees. The Roundup office is located at the Johnson Space Center, Building 2. The mail code is AD94. Visit our Web site at: http://www.jsc.nasa.gov/roundup/online/ For distribution questions or to suggest a story idea, send an e-mail to jsc-roundup@mail.nasa.gov.

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Keeping tabs on the 'lab aloft'

The International Space Station Program has incorporated new tools for enthusiasts to keep up with what's going on in the orbiting laboratory.

Space and science aficionados can follow on Twitter, where the program tweets multiple times a day under @ISS_Research. NASA's official space station Facebook page (http://www.facebook.com/ISS)republishes the Twitter feed for additional outreach to the public.

Station also launched a new and improved subsection on nasa.gov (http://www.nasa.gov/station/research) that provides access to weekly science updates and interesting feature stories regarding station research stories, experiments and results. Additional content and features will be added in the next six months. This is where interested parties can read up on the orbiting laboratory's facilities and current tasks and find information on how to get new experiments onboard the station.

More personal communications about research and accomplishments were added with the launch of a blog titled "A Lab Aloft" (http://blogs.nasa.gov/). This blog shares International Space Station Chief Scientist Dr. Julie A. Robinson's observations of station research, along with a large number of guest bloggers—investigators, astronauts and implementation teams—providing personal accounts, opinions and experiences. This forum also allows readers the capability to comment and respond, opening an opportunity for dialogue.

Stay connected with the "lab aloft" as it embarks on exciting new discoveries during its first full year of the era of International Space Station utilization.

NASA/PHOTO ISS026-E-014925

NASA astronaut Cady Coleman, Expedition 26 flight engineer, removes the Low Gradient Furnace and installs the Solidification and Quench Furnace in the Material Science Laboratory in the Destiny laboratory.

NASA/PHOTO ISS025-E-009858

From 220 miles above Earth, an Expedition 25 crew member took this nighttime photo featuring the bright lights of Cairo and Alexandria, Egypt, on the Mediterranean coast. The Nile River and its delta stand out clearly as well. On the horizon, the airglow of the atmosphere is seen across the Mediterranean. The Sinai Peninsula, on the right, is outlined with lights highlighting the Gulf of Suez and Gulf of Aqaba.