



Lyndon B. Johnson Space Center

roundup



NASA/Markowitz STS118 IS 002

STS-118 crew

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JSCdirector

On the cover

Pictured from the left are astronauts Rick Mastracchio, mission specialist; Barbara R. Morgan, mission specialist; Charlie Hobaugh, pilot; Scott Kelly, commander; Tracy Caldwell, Canadian Space Agency's Dave Williams, and Alvin Drew, all mission specialists. The crew members are attired in training versions of their shuttle launch and entry suits.



As we approach the peak hurricane season, I want to again emphasize the importance of hurricane preparedness. Everyone working at Johnson Space Center should have received a copy of the "JSC Hurricane Emergency Info" handout that was distributed centerwide in May. I encourage you to read it thoroughly.

While we can't stop a hurricane, we owe it to ourselves and our families to have a well-thought-out Personal Plan of Action, as explained in the JSC handout. This includes decision criteria on whether to evacuate or shelter-in-place and a Disaster Preparedness Kit for either course of action. Once you make the decision to evacuate, leave promptly. Know ahead of time where you intend to go, the safest route to get there and what you need to take with you if you can't return for several days.

The JSC Hurricane Emergency Info handout also explains the JSC closure policy and the criteria we use to make the decision to close the center. The safety of our employees and their families is paramount, and I can promise you that we will make that decision as early and prudently as possible. However, even with the changes adopted by state and local officials after the numerous problems with Hurricane Rita, an evacuation of millions during the heat of the Houston summer can be dangerous. I encourage everyone to set aside a few days of personal leave time to allow you to properly secure your home and, if necessary, evacuate as early as possible.

Your Personal Plan of Action should also include a communications plan. This includes family contacts, of course, but you also need to review your emergency contact information in Employee Express, as well as make sure you have the information necessary to check in with your supervisor or the NASA Headquarters Emergency Operations Center after the storm has passed so we can account for all our employees. It is critical that we help each other by sharing information before, during and after a severe storm.

Please review the JSC Hurricane Emergency Info handout, develop a Personal Plan of Action to take care of your family and ask questions now.

A handwritten signature in blue ink that reads "Mike". The signature is fluid and cursive, written in a professional style.

'An amazing vehicle'

Evan Twyford's STS-117 launch experience officially gave him goose bumps

by Catherine E. Borsché

as the Space Shuttle *Atlantis* rocked and roared on the launch pad at 6:38 p.m. CDT on Friday, June 8, Evan Twyford felt the hair on his arms stand up.

Twyford, an aerospace architect in the Habitability Design Center, won the Johnson Space Center Office of Communications and Public Affairs essay contest, held months ago, which asked employees to answer the question, "Why is space exploration so vital to the nation?" Twyford's essay landed him a trip to the STS-117 launch as a special guest of JSC Director Mike Coats, and his award-winning essay was published in the February edition of the Roundup.

Twyford received star treatment from the moment he arrived at Cape Canaveral in Florida. On the first day of his visit, Twyford was given an extensive driving tour of Kennedy Space Center (KSC), getting a glimpse of the impressive Vehicle Assembly Building and shuttle launch pad. But that was just the tip of the iceberg...

"We got to look into the Orbiter Processing Facility and see all the parts of the International Space Station that (are) ready to go up," Twyford said. "We also stopped at the KSC Visitor Center and got to go on the new ride over there, the 'Space Shuttle Launch Experience.' That was pretty intense."

Toward the end of the day, Twyford had the opportunity to mingle with other key players at the director's reception back at the hotel.

"We're in such a niche here working in aerospace, and it's always interesting to meet people that have the same passion for spaceflight," Twyford said. "You can relate to them even though you have totally different professions."

At the reception, "I did get a chance to speak briefly with Mike Griffin and Mike Coats," Twyford said. "And meeting Mike Coats was a highlight for me. He was a real pleasure to visit with."

On launch day, Twyford and his group went to an auditorium at KSC, where they were able to watch an informative video and hear an astronaut talk about the shuttle mission.

"They educated everybody that was there for the tour really well beforehand, so not only did we get a real in-depth look at how the station and the shuttle work, we got a broader picture of how this specific shuttle mission fits into the grand scheme of the construction of the International Space Station. That was awesome because,



when we saw the shuttle take off, it meant that much more. We understood what's going on—who's going up—and what all is going to happen up there," Twyford said.

Twyford even got to see the NASA crew van roll by as their bus was stopped on the road at KSC. The crew making their way to the launch pad put a figurative cherry on the top of his magical day.

About two hours before the launch, the group members made their way to the bleachers to find seats so they could watch the mammoth spaceship soar into space.

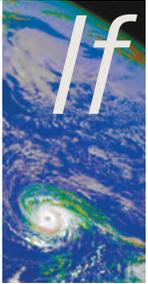
"Everything just went according to plan. I don't know if we could've asked for a better launch than that," Twyford said. "Seeing the space shuttle (take off) was radical. When I have watched it on TV or on the big screen, I'd get those great camera angles, and I never doubted that the shuttle was real. But when I was standing there with my ears popping, seeing the plumes of smoke (and that) it was just right over there across the water, I knew that it was real."

While watching the shuttle in action, Twyford thought about his fellow team members.

"We are all part of this gigantic team that must work, learn and play together. It was a humbling feeling to own even the smallest part of the greatest space organization in the world," Twyford said. "These are some of the most exotic vehicles ever built that we have the opportunity to work on. We may not all get a test drive...but we owe it to ourselves to at least visit the showroom."

'Hurri' up and get ready for hurricane season

by Catherine E. Borsché



If you haven't been paying attention to your local weather forecasters, now would be the time to start watching. June 1 ushered in the new 2007 hurricane season, and if past years are any indication, it could be a wild one. Thankfully, the Office of Emergency Management (OEM) and the National Weather Service (NWS) Spaceflight Meteorology Group (SMG) at

Johnson Space Center are acting as watchdogs for our safety, taking lessons learned from our past experiences.

"Every severe storm provides opportunities from which to learn. Katrina taught NASA centers to be prepared to help each other out—to pay attention to employee accountability, especially when employees are relocated away from their homes and work," said Bob Gaffney, JSC's Emergency Preparedness coordinator. "Hurricane Rita reminded JSC emergency planners and senior staff that maintaining communications and sharing information before, during and after severe storms was essential to continuity of government and keeping employees informed."

And, of course, who could forget Tropical Storm Allison?

"Allison's greatest lesson was that even a small storm can cause a terrible loss of life and severely disrupt lives and operations," Gaffney said.

No one can predict the hurricane season with 100-percent accuracy. Even so, forecasters do their best by monitoring the evolving weather patterns and conditions in the Atlantic basin.

"The consensus of the experts is for an above-average year for hurricane development. The National Hurricane Center is forecasting 13 to 17 named storms, with 7 to 10 becoming hurricanes—of which 3 to 5 could become major hurricanes (Category 3 or higher)," said Mark Wiley, SMG lead forecaster.

"Last year, El Niño helped to decrease the hurricane activity in the Atlantic basin. This year, El Niño has disappeared," Wiley said. "A La Niña pattern may develop toward mid- or late summer, according to the NWS Climate Prediction Center. La Niña patterns are typically associated with an increased number of hurricanes in the Atlantic basin."

To prepare for the possible wrath of weather systems, JSC has cemented a plan for hurricane readiness activities.

"That plan requires relocating the senior staff out of the hazard area to one of several pre-designated locations, where they can continue mission-essential functions and services," Gaffney said. "The Hurricane Rideout Team would stay in communication with the center director from the onsite hurricane command post to provide damage assessment information, request resources, provide center status information to employees and coordinate and communicate a safe return-to-work decision when regional infrastructure is restored."

But that is not all JSC does when the storm hits.

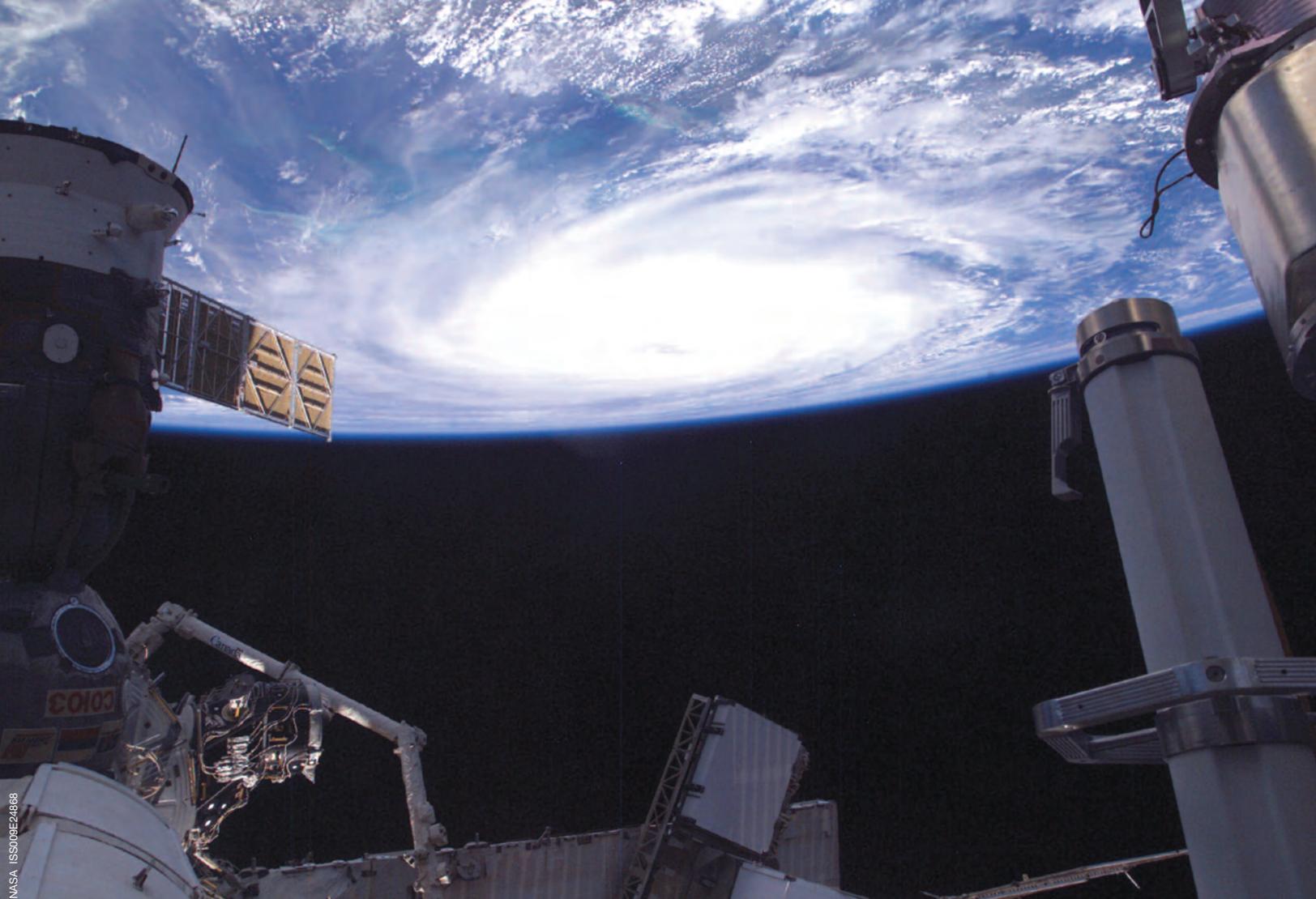
"Other process improvements include coordinating with municipal, county and state authorities for evacuation decisions, as well as conducting liaison with authorities to assure reliable information is provided to employees on return of evacuated citizens to communities," Gaffney said. "Whenever JSC closes due to a hurricane or other threat, the JSC Emergency Information Lines will be updated regularly with information on the center's status and return-to-work information. The local number is 281-483-3351, and the toll-free number is 1-877-283-1947."

Safety is always a top concern at JSC, and management has already devised a plan for the Hurricane Rideout Team if a major hurricane were to hit.

"Since JSC has no facilities that are rated safe for a sustained Category 3 storm, and several neighboring communities have built Emergency Operations Centers to survive Category 5 storms, JSC emergency planners have made arrangements to relocate to Webster or Galveston County if the reduced rideout team is stranded when threatened by a major storm," Gaffney said.

So what can employees do to get prepared?

"Employees should make a plan that includes either evacuation or sheltering from a storm and stick to the plan. They should also have an emergency supply of food for at least three days for each family member," Gaffney said. "Keep informed about hazards that could cause them to activate their emergency plan. Consider taking extra clothes,



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hand tools, important legal papers, shot and medical records and school records in the event you are displaced for an extended period of time due to the disastrous impact that could preclude resuming your normal residency (such as happened in New Orleans after Katrina).”

JSC team members are encouraged to visit their local emergency management offices or the Web site www.Ready.gov, maintained by FEMA, for excellent information on planning, emergency supplies and more.

The JSC OEM reminds employees that life is far from normal in the wake of a storm, and it is always prudent to stay tuned for the latest updates.

“When a major hurricane strikes the Houston/Galveston area, local officials will not allow residents to return to their homes until electricity and running water have been restored and streets (are) cleaned up of debris. After Hurricanes Katrina and Rita, public safety officials prevented residents from exiting highways in attempts to return home because it took quite a while to restore critical infrastructure and make it safe for people to return to their neighborhoods,” Gaffney said.

Instead of living in fear of all the possible what-ifs, it is best to just know what you would do in a disaster scenario...and then do it if need be.

“The most important information employees should know is that they need a personal emergency plan and an emergency kit, and to stay informed about the hazards that can disrupt their normal lives,” Gaffney said.

For more important resources for hurricane information, visit the following links:

National Weather Service National Hurricane Center:
<http://www.nhc.noaa.gov/>

National Weather Service Hurricane Awareness:
<http://www.nws.noaa.gov/om/hurricane/index.shtml>

National Oceanic and Atmospheric Administration Hurricane Site:
<http://hurricanes.noaa.gov/>

Federal Emergency Management Agency Hurricane Preparedness:
<http://www.fema.gov/hazard/hurricane/index.shtm>

National Weather Service Houston/Galveston:
<http://www.srh.noaa.gov/hgx>

National Weather Service Spaceflight Meteorology Group:
www.srh.noaa.gov/smg

Minus 6 degrees... and counting

by Joanne Fontenot

When 47-year-old Mick Powers of Schenevus, N.Y., found himself in between jobs, he decided to stay in bed and rest for a while—90 days to be exact.

He recently volunteered to be a test subject in NASA's bed rest study, part of Johnson Space Center's Flight Analogs Project (FAP), located at the University of Texas Medical Branch in Galveston.

Powers, a scientist by trade, said he thought the study would be a great way to contribute to the space program.

"It (the bed rest study) seemed like it would be a good experience, and hopefully, there will be some good data that comes out of it that will help out the space exploration program," Powers said. "I would encourage others to participate if they get the chance."

The study measures the effect that little or no gravity has on the human body. The bed rest participants, or "subjects," lie in bed in a head-down tilt configuration of 6 degrees, with their head always kept lower than their feet. Since head-down bed rest closely imitates the detrimental effects that microgravity can have on the human body, NASA can test and refine scientific theories and procedures on the ground before using them in space.

"The bed rest study is particularly helpful because head-down tilt bed rest causes some physiological changes that are very similar to those that occur during spaceflight," said Janice Meck, chief scientist for the Human Health and Countermeasure Element in Life Sciences directorate at JSC. "Particularly, we see bone, muscle and cardiovascular changes. Since we have so few flight opportunities, we can use the bed rest subjects to help us understand how to counteract the changes we see in flight."

Daily activities, including e-mailing, watching TV, showering and eating, are all done in the minus-6-degree position. Although every effort is made by the hospital staff to ensure the test subjects are comfortable, there are definite challenges associated with the study.

"I think the hardest part for me was about two days after lying down—that's when the back aches started. Since you are tilted head-down 6 degrees, all of your internal organs shift up. That was a little tough," Powers said.

Debra Robison, a 44-year-old nursing student and fellow bed rest subject, said the loss of her independence was her biggest challenge.

"The most difficult adjustment for me was having to be dependent on someone else for everything. Getting through the first two weeks was the toughest part—giving up my control and the freedom to just get up and take a shower or go to the restroom. But once I adapted, it went pretty well," Robison said.

Robison added that she adjusted her environment to make it easier for her to live in bed and still maintain her autonomy.

"I tried to make it where I have this little world all around me—I moved my table closer to the bed so I can just reach over and grab things. I find myself wanting to do things without having to ask for help. I like to be independent and to have control," Robison said.

The subjects are confined to bed and somewhat isolated, since they are subject to the visitation rules of the hospital, but they are definitely not lacking for attention. The hospital staff is available 24 hours a day to offer its support and keep the participants informed of their test results, schedules and just to talk, if needed. Also, participants are encouraged to receive phone calls and visits from family and friends throughout their stay.

"A large majority of people complete the studies. Our screening helps that a lot. We have lost a couple of subjects for unrelated medical issues that came up and one who just couldn't take the mental stress. We have tremendous support to help the subjects adjust and cope with the stresses of the study," Meck said.

Mick Powers uses his computer while participating in NASA's bed rest study. Participants stay in bed for 90 days with their head at minus 6 degrees to mimic the effect that microgravity can have on the human body.





Bed rest subject and nursing student, Debra Robison, said the study gave her an opportunity to see the world from a patient's perspective.

The participants are under constant surveillance by cameras mounted in their rooms, and they are on a strict schedule, beginning with a 6 a.m. wake-up call similar to those the astronauts receive when they are up in space.

"They have a musical wake-up call that is usually a taped recording of a previous ground control to space station wake-up call," Powers said. "Vital signs are taken daily: weight, blood pressure, temperature, followed by breakfast, then usually free time until lunch. Sometimes there are diagnostic tests done, such as MRIs; while other days you have a lot of free time."

Although the subjects are in bed most of the day, napping is not permitted and lights out is at 10 p.m. every night. For recreation, the subjects are rolled out in their beds to a common area to share stories, play cards, watch movies or just hang out—all in the head-down position.

One major challenge for the test subjects is to overcome boredom and remain upbeat during their long stay in bed. Since their physical world is very limited, access to a computer can be a lifesaver.

"The Internet is really indispensable. I don't know that too many people would be able to get through this without the Internet," Powers said. "I suppose they could get away with reading books and listening to music, but the Internet has just been invaluable for keeping busy and keeping in touch."

Robison said she used her time to take advantage of her limited mobility and used it to help focus on a specific objective.

"I had a goal of working on some math. I am not a math person, so to stay in bed and actually work on math really helped me," Robison said. "I couldn't go anywhere, so I thought this would be a good opportunity to let it sink in. I have 26 DVDs of college algebra that I have been working on. One of my goals was to have it finished by the time I got out of here."

Milestones are celebrated during the study at 45, 60 and 90 days, complete with balloons and brightly colored signs—to help keep the participants' spirits up. The hallways are also decorated with images of space as an inspiration.

"We try to keep people motivated by reminding them why they are here, what they are doing for NASA and what contributions they are making to the space program," said Joe Neigut, FAP deputy project manager.

Diet, nutrition and exercise play a major role in the study, just as in space.

"You would think with no exercise that everybody would gain weight (during the study), but they don't. They end up losing weight and we don't know why that is. It is very similar to the astronauts during a mission," Neigut said. "The biggest challenge for the kitchen is to get enough calories in the food so that they (the test subjects) are gaining the right amount of weight. Everybody is going to be losing muscle mass and gaining fat and we don't want to give them too much. The thing we always hear from every one of our subjects is that we are feeding them way too much."

Each subject has a meal plan tailored to their individual needs, with inputs and outputs measured at specific intervals throughout the day.

"The food is a very low-sodium diet—very bland and very healthy. It seems that they have perfected the amount of food you need to eat to maintain your weight," Powers said. "Their (the staff) desire is to let you go home in the same shape you came in at—in all aspects—height, weight, psychological state and balance," Powers said. "They give you three meals a day, with no snacks. It was very precise, and you had to eat it all."

Robison said her eating experience was more of a mind game that she believes could have lasting affects.

"The food gets really old. For the first couple of weeks it wasn't too bad, but then I started having psychological problems with it. I would look at it and think that I will probably never touch this type of food ever again—it definitely affected me."

Both Powers and Robison said that spending endless days in bed gave them a greater appreciation for their health and spurred thoughts of the future.

"It really made me stop and think how I would handle becoming elderly and ending up in a nursing home. It also helped me, as a nurse, to relate to the patients that can't do things for themselves," Robison said.

"Another benefit of the study is someone my age (47 years old) being able to say that I can go through something like this. Although it is not a physically challenging experiment, it is not everyday life—just to know that I can still physically do that was a bonus," Powers said.

The FAP is one way NASA will answer questions about future space exploration, as well as devise methods to ensure astronaut health, safety and productivity. To learn more about this project and the bed rest study, go to <http://www.bedreststudy.com>.

STS-118:

Build the station. Build the future.



Like all shuttle missions, STS-118 is about the future: putting the International Space Station a step closer to completion and gathering experience that will help people return to the moon and go on to Mars.

But this mission will also see a two-decade-old dream realized and a vision of inspiration completed. Twenty-two years after first being selected as Christa McAuliffe's backup in the Teacher in Space Project, Barbara R. Morgan will strap into Space Shuttle *Endeavour* as a fully trained astronaut. She is one of five mission specialists in the seven-member crew.

"The mission has lots of angles," said Matt Abbott, lead shuttle flight director. "There's a little bit of assembly; there's some resupply; there's some repairs. And there are some high-visibility education and public affairs events. It's a little bit of everything."

The little bit of assembly—as in assembly of the space station—refers to the next segment that will be attached to the right side of the station's backbone, or truss. The new segment, known as the S5, is relatively small and weighs about 5,000 pounds. The piece provides clearance between sets of solar arrays on the truss structure.

That doesn't mean, however, that installing it will be easy. Every crew member will play a part. Pilot Charlie Hobaugh and space station Flight Engineer Clay Anderson will operate the station robotic arm that moves the segment into place, while spacewalkers Dave Williams and Rick Mastracchio provide guidance from the outside and finish the installation. Commander Scott Kelly and Mission Specialists Tracy Caldwell and Alvin Drew will help out inside. Morgan will operate the shuttle robotic arm to provide television views of the operation.

"It's less than two inches from some critical electronic components that we want to make sure we don't come in contact with," Kelly said. "So that's a very tight clearance."

Endeavour will carry enough supplies to last the station residents for awhile. This will be the last dedicated shuttle mission providing cargo to the station for 12 to 15 months. Russian Progress vehicles and the European Space Agency's Automated Transfer Vehicle will bring cargo to the station in the interim.

"I think right now the manifest has us bringing up about 5,000 pounds and then bringing down about 5,000 pounds," Kelly said. "So it's a lot of spare parts, food, clothing, (and) scientific experiments. We'll unload that and then reload it with stuff that needs to come home—garbage, spare parts that are no longer needed on the station."

Then there's the repair work, which Lead Station Flight Director Joel Montalbano expects to be one of the most difficult parts of the mission. One of the station's control moment gyroscopes, a spinning wheel used to control the space station's orientation, experienced problems and was shut down in October. Program managers determined that it needed to be replaced during STS-118. Kelly's crew had less than a year to train for the task.

"The other stuff is a challenge, but we've known it was coming," Montalbano said. "We've developed procedures, we've trained the crew—it's all known. The gyroscope, it's a little bit new to us. We're putting a major task in when we're well into training."

Luckily, it's not new to NASA. The crew of STS-114 replaced a faulty gyroscope in 2005, and Montalbano said learning from their experience should help the team overcome the time crunch.

Added all together, it's a lot to get done in one mission—but thanks to an electrical boost from the space station, the STS-118 crew could have a little more time than most missions to get it all done. *Endeavour* will be the first to try out a new system designed to let the shuttle use electrical power from the station.

The extra juice will allow *Endeavour* to stay in space for an extended period of time while docked to the station. STS-118 currently is an 11-day mission with three spacewalks planned. Mission managers could add three more days and an additional spacewalk after the Station-Shuttle Power Transfer System (SSPTS) is activated and checked out.

Future missions could gain as many as six extra days once all the station's solar arrays are installed and providing power to the SSPTS. This will become more important as the construction of the station continues.

"I'm really excited about going up and doing our jobs and doing them well," Morgan said. "I'm excited about experiencing the whole spaceflight, seeing Earth from space for the very first time and experiencing weightlessness and what that's all about. I am excited about seeing what it's like living and working onboard the International Space Station."

Meet the crew



Scott Kelly, Commander

Selected by NASA in April 1996, Kelly reported to JSC in August 1996. Following completion of training, he was assigned technical duties in the Astronaut Office Spacecraft Systems/Operations Branch. He served as pilot on STS-103 in 1999 and has logged over 191 hours in space. Following STS-103, Kelly served as NASA's director of Operations in Star City, Russia. He served as a backup crew member for Expedition 5 and, more recently, as the Astronaut Office Space Station Branch chief.

Kelly was also a naval aviator. He made overseas deployments to the North Atlantic, Mediterranean Sea, Red Sea and Persian Gulf aboard the USS Dwight D. Eisenhower (CVN-69). Kelly was selected to attend the U.S. Naval Test Pilot School in January 1993 and completed training in June 1994. Kelly was the first pilot to fly an F-14 with an experimental digital flight control system installed and performed subsequent high angle of attack and departure testing. Kelly has logged over 3,700 flight hours in more than 30 different aircraft and has had over 250 carrier landings.



Alvin Drew, Mission Specialist

Selected as a mission specialist by NASA in July 2000, Drew reported for training in August 2000. Following the completion of two years of training and evaluation, he was assigned technical duties in the Astronaut Office Station Operations Branch.

Drew has also had extensive flight experience in the United States Air Force, flying combat missions in operations Just Cause, Desert Shield/Desert Storm and Provide Comfort. He has also commanded two test flight units and served on Air Combat Command Staff. He has logged 3,000 hours flying time in over 30 types of aircraft.



Charlie Hobaugh, Pilot

Selected by NASA in April 1996, Hobaugh reported to JSC in August 1996. He completed two years of training and evaluation and was qualified for flight assignment as a pilot. Hobaugh was initially assigned technical duties in the Astronaut Office Spacecraft Systems/Operations Branch. Projects included Landing and Rollout, evaluator in the Shuttle Avionics Integration Laboratory, Advanced Projects, Multifunction Electronics Display Enhancements, Advanced Cockpit and Cockpit Upgrade, Rendezvous and Close Proximity Operations and Visiting Vehicles prior to his first flight assignment. Most recently, he served as CAPCOM, working in the Mission Control Center as the voice to the crew.



Dave Williams, Mission Specialist

In January 1995, Dr. Williams was selected to join the international class of NASA mission specialist astronaut candidates. He reported to JSC in March 1995 for a year of training and evaluation. Following his successful completion of training, he was assigned to the Payloads and Habitability Branch of the NASA Astronaut Office. In 1998, Dr. Williams participated in STS-90 as Mission Specialist 3. During the 16-day flight, called Neurolab, the crew served as both experiment subjects and operators for 26 individual life science experiments. From July 1998 until September 2002, Dr. Williams held the position of director of the Space and Life Sciences Directorate at JSC. With this appointment, he became the first non-American to hold a senior management position within NASA. In October 2001, he became an aquanaut through his participation in the joint NASA-National Oceanic and Atmospheric Administration NEEMO 1 mission, a training exercise held in Aquarius, the world's only underwater

research laboratory. Years later, Dr. Williams took the lead of NEEMO 9 as the crew commander, a mission dedicated to assess new ways to deliver medical care to a remote location.



Barbara R. Morgan, Mission Specialist

Morgan was selected as the backup candidate for the NASA Teacher in Space Program on July 19, 1985. From September 1985 to January 1986, Morgan trained with Christa McAuliffe and the Challenger crew at JSC. Following the Challenger accident, Morgan assumed the duties of Teacher in Space designee. From March 1986 to July 1986, she worked with NASA, speaking to educational organizations throughout the country. In the fall of 1986, Morgan returned to Idaho to resume her teaching career. She taught second and third grades at McCall-Donnelly Elementary and continued to work with NASA's Education Division, Office of Human Resources and Education. Her duties included public speaking, educational consulting, curriculum design and serving on the National Science Foundation's Federal Task Force for Women and Minorities in Science and Engineering.

Selected as a mission specialist in January 1998, Morgan reported to JSC in August that year. Following the completion of her training, she was assigned technical duties in the Astronaut Office Space Station Operations Branch. She then worked in Mission Control as a CAPCOM. More recently, she served in the Robotics Branch of the Astronaut Office.



Rick Mastracchio, Mission Specialist

In 1990, Mastracchio joined NASA as an engineer in the Flight Crew Operations Directorate. From 1993 until 1996, he worked as an ascent/entry Guidance and

Procedures Officer (GPO) in Mission Control. An ascent/entry GPO has both pre-mission and real-time space shuttle support responsibilities in the areas of onboard guidance, navigation and targeting. During that time, he supported 17 missions as a flight controller.

In April 1996, Mastracchio was selected as an astronaut candidate and started training. He has worked technical issues for the Astronaut Office Computer Support Branch for Space Station Operations and the Extravehicular Activity Branch. He next served as lead for cockpit avionics upgrades. Mastracchio flew as a mission specialist on STS-106 and has logged over 283 hours in space.



Tracy Caldwell, Mission Specialist

Selected by NASA in June 1998, Dr. Caldwell reported for training in August 1998. In 1999, Dr. Caldwell was first assigned to the Astronaut Office International Space Station Operations Branch as a Russian Crusader, participating in the testing and integration of Russian hardware and software products developed for the station. In 2000, she was assigned prime crew support astronaut for the fifth Expedition crew, serving as their representative on technical and operational issues throughout the training and on-orbit phase of their mission. During station Increments 4-6, Dr. Caldwell served as a station CAPCOM inside Mission Control. In 2003, she transitioned to the Astronaut Shuttle Operations Branch and was assigned to flight software verification in the Shuttle Avionics Integration Laboratory and also worked supporting launch and landing operations at Kennedy Space Center. She also served as Lead CAPCOM for Increment 11.

NASA/Blair JSC2007E09842

NASA/Markowitz JSC2006E43169

NASA/Markowitz JSC2006E44694

NASA/Blair JSC2007E00789

NASA/Stafford S99-12685

NASA/Markowitz JSC2006E49784

NASA/Blair JSC2007E-00790

Building connections to the future

by Debbie Nguyen

ABOUT A MONTH BEFORE

Space Shuttle *Endeavour* was set to dock with the International Space Station, STS-118 Commander Scott Kelly, Mission Specialists Barbara R. Morgan and Dave Williams and the Expedition 15 crew made their own connections on the ground with the next generation of explorers.

On July 11 in JSC's Teague Auditorium, approximately 200 students and educators who were spending their summer interning at JSC for the NASA team, were invited to a special event aimed at giving them a preview of the next mission.

"We look forward to seeing you in a month to continue assembly of the International Space Station," Kelly said to the Expedition 15 crew. "Thanks a lot and we'll see you in about a month."

"It was great to talk to you today, and we had a great time. We hope you learned something. Scott, have a safe trip, and I look forward to seeing my former crew and welcoming you to our home," said Anderson, who was originally assigned to go to the station as part of the STS-118 crew before he was finally launched as part of the STS-117 crew in June.

Afterward, Kelly gave the audience a synopsis of his crew's upcoming flight to continue building the station. Specifically, the crew will install the S5 truss segment and an external stowage platform and replace a failed control moment gyroscope. In addition to the construction, they'll also be transferring about 5,000 pounds of supplies, food and experiments using the SPACEHAB module.

"We are the first flight to carry the Station-Shuttle Power Transfer System. That allows the shuttle, (which) normally produces electricity using oxygen and hydrogen in our fuel cells, to get electricity from the space station solar arrays. If it works, we can increase our mission from 11 to 14 days and get a lot more work done," Kelly said.

Morgan, who is also an educator, and Williams of the Canadian Space Agency joined their commander to help answer additional questions from the audience.

"How can educators get their students more involved in this whole mission?" asked Monica Crocker, one of about 30 Texas educators who were participating in Middle School Aerospace Scholars at JSC.

Morgan answered with information on the engineering design challenge. To get students more involved in NASA's missions and in science, technology, engineering and math, students in grades K-12 will have the opportunity to design and build a lunar-growth chamber in the upcoming school



STS-118 Commander Scott Kelly and Mission Specialist Barbara R. Morgan describe a sample plant-growth chamber similar to one they will take to the station.

The event kicked off with a live downlink with Expedition 15 Commander Fyodor Yurchikhin and Flight Engineers Oleg Kotov and Clay Anderson, who first answered questions from the students.

The connection didn't just provide the students and teachers with a glimpse of the station. It also provided the station's next visitors a chance to say hello.



NASA/Blair JSC2007E035080

Office of Communication and Public Affairs Deputy Director Phil West, STS-118 Commander Scott Kelly and Mission Specialists Barbara R. Morgan and Dave Williams watch as Expedition 15 crew members Clay Anderson, Fyodor Yurchikhin and Oleg Kotov answer questions from middle-school educators and high school and college students in the Teague Auditorium at Johnson Space Center.

year. Teachers can then sign up to receive some of the 10 million basil seeds that will be taken up and returned on STS-118 to validate the students' designs. STS-118 will also deliver two sample plant-growth chambers to the station as part of the education payload.

"We would love for you guys to actively participate with us now and start helping us figure out the answers to these big questions," said Morgan. "One of those questions is 'how do you feed people in the long haul?' Maybe you can help us design some growth chambers, whether it's in your backyard or on the moon."

At the end of the event, Kelly, Morgan and Williams also got to talk to Texas high school students about the students' projects—Martian rovers which their teams built as part of High School Aerospace Scholars (HAS).

"Showing them the rovers was mind-blowing, because we got to meet three actual people going to space," said Cara Blais, a HAS student from Tomball High School.

Another student was also excited about learning how to take part in the engineering design challenge and what that means for future generations.

"It's like the ultimate science fair opportunity. I think not only would kids take advantage of it, but it will open their outlook in careers like science and design," said Jennifer Hass, a HAS student from Reagan High School in San Antonio.

"Education is built into every aspect of the space program, and we're trying to communicate that message to the next generation of folks who are going to design the spacecraft, do the research experiments we're going to be doing and even fly in those missions," said Williams. "Wouldn't it be amazing to think someone in this audience today could be an astronaut in the future going on those missions back to the moon and on to Mars?"



NASA/Blair JSC2007E035114

STS-118 Mission Specialist Barbara R. Morgan talking to Texas students Jennifer Hass and Cara Blais about their team's self-designed and built rovers, which they constructed as part of the High School Aerospace Scholars at JSC.

Bring Our Children to Work Day



Vickie Kloeris demonstrates how the drink pouches are used in space.



The demonstration of how to grow plants in space drew many questions from the floor.



The children prepare to launch paper rockets they made with paper, straws and tape.

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