



Lyndon B. Johnson Space Center

roundup



NASA STS125-S-002

Last dance with Hubble

SEPTEMBER 2008 ■ volume 47 ■ number 9

guestcolumn

On the cover

The STS 125 crew portrait. From left are astronauts Mike Massimino, Michael Good, both mission specialists; Gregory C. Johnson, pilot; Scott Altman, commander; Megan McArthur, John Grunsfeld and Andrew Feustel, all mission specialists. The STS 125 mission will be the final space shuttle mission to the Hubble Space Telescope.

My sincere thanks to Center Director Mike Coats for his kind invitation to write a guest column in the Johnson Space Center *Roundup* on my initial perceptions on my first few months here at JSC. I know how much he values the opportunity to share his thoughts with the JSC family, so I will endeavor to do my best to offer some insight concerning my impressions.



First, I know that they do things “bigger in Texas,” and that was certainly shown in my welcome to the JSC campus. Everyone—each program, department and office—has made me feel welcomed and invited into the JSC family. In my first two days, I had the opportunity to meet almost all of the External Relations staff. Within the first month, I had the chance to meet with more than 30 other groups. Each offered their support and assistance, and I thank you all.

Second, the concept of working together on a team is everywhere. You hear it in the elevator and the hallways. In briefings, rarely is the pronoun “I” used, but rather “we.” Truly, everyone I have met is proud to be part of the team at JSC, and it is joyful to experience. When I go across campus or have lunch in the Building 3 café, I see folks proudly wearing their NASA 50th anniversary shirts (and not only on the days that they get a discount on lunch!). I see NASA bumper stickers in the parking lot, and everyone’s office could be considered a living museum of memorabilia and recognition for their work and life contribution to NASA’s success.

Third, this shared commitment is also shown through our community relationships with Space Center Houston, the Bay Area Houston Economic Partnership, the University of Houston – Clear Lake and many others. With the advent of the “I and I,” or Inclusion and Innovation Team and the employee engagement teams, JSC is pledged to ensure a successful future that includes everyone’s talents and abilities.

From my perspective, the Office of External Relations supports the goals of Communication, Education and Outreach. I am thrilled to join a team that includes Public Affairs, Education, University Research, Space Flight Awareness and Community and Government Relations. Each of these areas has the most amazing, experienced professional staff who are dedicated to supporting JSC and NASA. We are dedicated to ensuring that NASA’s next 50 years are the best to come.

I often refer to the old Johnny Carson show when he played the character of “Karnak the magnificent.” Remember? He put the envelope to his head and guessed the question after he provided the answer. Well, External Relations doesn’t want to guess, we want to know your thoughts, concerns and needs! Our main focus is to listen, learn and respond so that we can support your goals, your programs and JSC. We are going to see how we can improve our communication tools and processes; we will look to partner with and support all the outreach activities within JSC; and we want to provide the best possible customer service to the programs and all the offices and directorates at JSC. So please let us know how we’re doing and what we can do better. You may call or e-mail any time—the latchkey is out. My e-mail is ellen.e.conners@nasa.gov, and I look forward to listening and learning from you. Thank you all for your warm welcome to the JSC and NASA family.

Ellen Engleman Conners

Director, JSC External Relations

Spotlight on...

Dan Bealmear

Manager, Cargo Integration Office

Q: How long have you been with NASA?

A: Fifteen years ago, I came to Johnson Space Center as a technical writer to write the operating instructions for the Building 9 mockups and trainers. Researching old mockup drawings, I was able to create the first procedures/work instructions. At the onset of ISO Certification, I was recruited by the Space Life Sciences Directorate to support their quality management team. As part of that team, I became an ISO certified lead auditor in 2004.

Q: What kind of hobbies or interesting things do you do away from the office?

A: I grew up listening to “Gone fishing, instead of just a-wishing” by Louis Armstrong and Bing Crosby. For me, catching (and releasing) fish is almost a primal need. I love the outdoors, fishing, canoeing and kayaking. This spring, I received my canoe instructor certification and teach canoeing. I also am very active in local conservation projects.

Q: What is your idea of a perfect vacation?

A: As a Marine, I was stationed in Hawaii where I met my wife. Our first daughter was born in Honolulu. I would like to return there to celebrate our upcoming 50th wedding anniversary.

Q: What is the coolest part of your job?

A: I really enjoy using my writing and quality skills to help so many people here at JSC. I am a “follow the rules” and “do it right” kind of person, and being part of the JSC quality system just fits.

Q: What does JSC mean to you?

A: We are right here where it all happens.

Q: What do you look forward to at NASA?

A: I have never been to a launch, but every one that I have seen on TV still thrills me, especially when the main engines ignite.

Q: What is your favorite quote?

A: My father always treated the outdoors with respect and taught me to “leave it cleaner than you found it.”

Q: What would people be surprised to know about you?

A: I am very active in my grandson’s Boy Scouts troop and enjoy teaching camping, fishing, canoeing and conservation.

Q: What is your best memory at JSC?

A: I was privileged to receive the Space Flight Awareness Award in 2001. We were flown to Washington, D.C., to celebrate the 20th anniversary of STS-1 at the Smithsonian Institute. After we received a private tour of the Smithsonian’s aircraft restoration facility, they surprised us with a special after-hours tour of the White House, guided by the Secret Service. This award was especially meaningful to me, as it was presented by NASA’s Associate Administrator Bill Readdy and astronaut Laurel Clark.



NASA/STAFFORD JSC2008E054825

Q: Who are your heroes?

A: Zachary Cohen is my grandson and my special hero. I wish I could bottle his energy and enthusiasm. While researching a conservation project for a scouting award, he met with the Nature Conservancy at the Texas City Prairie Preserve and found that they needed help feeding the endangered, newly hatched Attwater Prairie Chickens. He organized dozens of NASA volunteers, Girl and Boy Scouts, classmates and community volunteers to capture insects with nets for the daily required feedings. The project lasted three weeks, until all of the chicks were released. He was tireless. This 13-year-old is now back working on his conservation project (helping to restore the freshwater marsh) and his Eagle Scout Leadership Project (a boardwalk through the marsh).

WANTED!

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

The Roundup shines the light on one person each month who is chosen from a cross section of the JSC workforce. To suggest a “Spotlight” candidate, send your nomination to the JSC

Roundup Office mailbox at jsc-roundup@mail.nasa.gov with the person's name, title and brief description of why he/she should be considered.

STS-125

THE FINAL VISIT

By Brandi Dean

It's a mission to once more push the boundaries of how deep in space and far back in time humanity can see. It's a flight to again upgrade what already may be the most significant satellite ever launched.

And, for the space shuttle, it's a final visit to a dear, old friend.

The STS-125 mission will return the space shuttle to the Hubble Space Telescope for one last visit before the shuttle fleet retires in 2010. During 11 days and five spacewalks, the shuttle *Atlantis*' crew will make repairs and upgrades to the telescope, leaving it ready for another five years—or more—of research.

The shuttle *Discovery* launched Hubble in 1990, and released it into an orbit 304 nautical miles above the Earth.

Since then, the telescope has circled Earth more than 97,000 times and provided more than 4,000 astronomers access to the stars not possible from inside Earth's atmosphere. Hubble has helped answer some of science's key questions and provided images that have awed and inspired the world.

"We've actually seen an object that emitted its light about 13 billion years ago," said Hubble Senior Scientist Dave Leckrone. "Since the universe is 13.7 billion years old, that's its infancy, the nursery. From the nearest parts of our solar system to further back in time than anyone has ever looked before, we've taken ordinary citizens on a voyage through the universe."

But Hubble has not done it alone.

Atlantis' crew—Commander Scott Altman, Pilot Gregory C. Johnson and Mission Specialists Andrew Feustel, Michael Good, John Grunsfeld, Mike Massimino and Megan McArthur—will be the fifth shuttle crew to fly to the telescope. *Atlantis*' spacewalkers will install the Cosmic Origins Spectrograph to observe light emitted by extremely faint, faraway quasars and see how that light changes as it passes through the intervening gas between distant galaxies. This observation will help scientists learn what that gas is made of, how it has changed over time and how it affects the galaxies around it.

"It's an important player in the story of how galaxies are formed and how the chemical makeup of the universe has changed over time," Leckrone said.



NASA/MARKOWITZ JSC2008E007759

STS-125 crew members participate in an exercise in the systems engineering simulator in the Avionics Systems Laboratory at Johnson Space Center.

Astronauts Michael Good and Megan McArthur, both STS 125 mission specialists, participate in an exercise in the Systems Engineering Simulator.



NASA/MARKOWITZ_JSC2008E007758

The new Wide Field Camera 3 (WFC3) will allow Hubble to take large-scale, extremely clear and detailed pictures over a very wide range of colors. At ultraviolet and infrared wavelengths, the WFC3 represents a dramatic improvement in capability over all previous Hubble cameras.

Before those much-anticipated views are seen, though, the equipment has to be installed—a process that will be exciting in its own right. The spacewalks necessary to outfit Hubble will be very different from the spacewalks conducted at the International Space Station.

“It’s more like brain surgery than construction,” Lead Flight Director Tony Ceccacci said. “On station

spacewalks, you’re installing large pieces of equipment—trusses, modules, etc.—and putting it together like an erector set. You can’t do that with Hubble. Hubble spacewalks are comparable to standing at an operating table, doing very dexterous work.”

The new camera and spectrograph are designed to complement the scientific instruments already on the telescope—specifically, the Advanced Camera for Surveys and the Space Telescope Imaging Spectrograph. But pieces of those instruments have failed in past years. The crew will replace only the pieces that have failed. The challenge? Those instruments were never designed to be repaired in space. In fact, they were specifically designed not to come apart.

“I think it’s a step that we need to take to make us better able to go to places like Mars,” Altman said.

The Hubble spacewalks won’t be the only things that differ from missions to the space station. Confined to just the shuttle, the quarters will be tighter; with five back-to-back spacewalks, the pace will be faster.

“Hubble puts cutting-edge science together with a visual image that grabs the public’s imagination,” Altman said. “I think that’s the first step in exploration. Because Hubble takes light that’s been traveling for billions of years, sucks it in and shows it to us. It’s like taking you on a journey 13-and-a-half billion light-years away while you sit there at home and look out at the universe.”

While seated at the commander’s station, Scott Altman, STS-125 commander, participates in a post-insertion/de-orbit training session in the crew compartment trainer in the Space Vehicle Mockup Facility at Johnson Space Center.



NASA/MARKOWITZ_JSC2008E008461

It came from inner space

Team of renowned experts explore inside Leonardo—the world's best-preserved dinosaur

By Laura Rochon



NASA/STAFFORD_JSC2008E027183

Group photo of key members of the Leonardo Project team. Representation included organizations such as Carestream Health/Eastman Kodak, NDT Group, ConAm, Houston Museum of Natural Science, Children of the Middle Waters Institute and Myth Merchant Productions.

His species may not have been the fittest. But his remains survived millions of years undamaged.

Leonardo, a 77-million-year-old fossilized dinosaur mummy discovered in Montana, arrived in Houston where an all-star team of paleontology researchers, scientists and imaging experts took a peek inside him at Johnson Space Center.

The young *Brachylophosaurus*, buried alive at the age of four, is exceptional in that he was found with almost 90 percent of his body covered in fossilized skin, earning him an entry into the Guinness Book of World Records in 2004 as the Best-Preserved Dinosaur ever found. Because most of the skin is unbroken, it is necessary to study him using a variety of high-tech imaging instead of digging into and damaging the fossilized corpse.

NASA partnered with the Houston Museum of Natural Science and Montana's Great Plains Dinosaur Museum to provide just the unique facility at Ellington Field to haul the 23-foot-long, 2-ton duckbill dinosaur into—Hangar 150, which is insulated with lead walls to protect against radiation during diagnostic X-rays of aircraft. The team assembled

for over a week, occasionally in the middle of the night due to the use of intensive cobalt radiation required for powerful, nondestructive imaging onto digital X-ray plates.

Among the group of 40 experts involved in the “Leonardo Project” include iconic paleontologist Dr. Robert Bakker, who is credited with the “Dinosaur Renaissance” and was an advisor to the movie “Jurassic Park.” He said the greatest discovery so far about Leonardo is that, with this equipment and expertise, you can explore dinosaur “inner space—see the ribs, the shoulder and ghost of internal organs, and the 3-D internal map we have of Leonardo is remarkably precise. But he is still much of a mystery, and that’s why we’re exploring his inner space.”

The Houston Museum of Natural Science will showcase the famous fossil in the world premier of their exhibit, “Dinosaur Mummy CSI: Cretaceous Science Investigation.” The display is set to run Sept. 19, 2008, through Jan. 11, 2009.

Leonardo will get more exposure this month on the Discovery Channel when their special, “Secrets of the Dinosaur Mummy,” premieres Sept. 14 at 8 p.m. CDT. Michael Jorgensen, producer/director for Myth Merchant Films, has been traveling with the Leonardo Project team documenting their imaging and diagnostic process.

Jorgensen said he has an interest in “good, once-upon-a-time stories. When you tell people about a team that’s found, not just bones of a dinosaur, but the whole body with organs inside, that’s a pretty compelling once-upon-a-time story.”

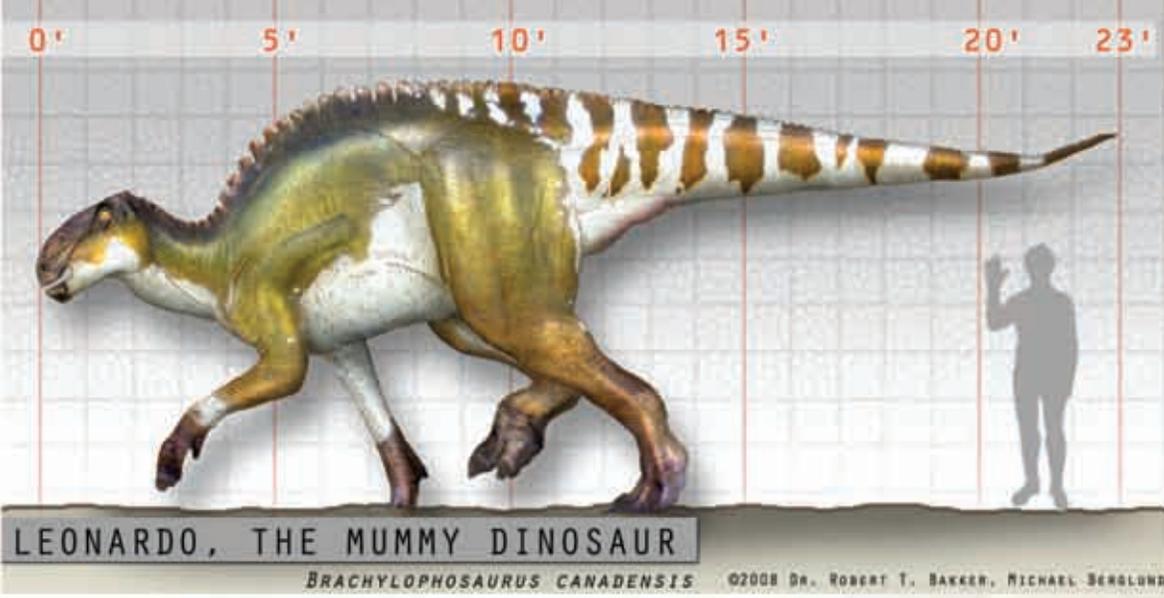
Just what is a fossilized mummy? When original soft tissue such as skin, nails, beak and organs does not decay but is somehow preserved in a unique environment, such as being quickly covered with sediment, the soft tissue is replaced with minerals before bacteria has a chance to destroy it. Over time, it then becomes fossilized—in other words, turns to stone.



NASA/STAFFORD_JSC2008E027172

Inside Hangar 150 at Ellington Field, Dr. Bob Bakker (pointing) and the team examine digital X-rays of Leonardo looking for proof of internal organs.

ILLUSTRATION BY MICHAEL BERGLUND



A full-body view of Leonardo, a Brachylophosaurus canadensis, shown with an average-sized human, for scale.

Joe Iacuzzo, former editor of the Jurassic Park Institute for Universal Pictures, now coordinates the Leonardo Project science team, exhibition and education program. He says the mission is two-fold: to document the physical attributes of Leonardo—viewing the arrangement of internal organs; and to understand the chemical makeup of the fossil and the processes that preserved Leonardo—analyses which could revolutionize what we know about dinosaurs.

Recently, some of the 3-D images captured at JSC were converted into a composite mosaic, applying contrast and different filters, to get actual models of the internal soft tissue structures.

“We’ve found internal soft tissue structure and something in the chest cavity, which is where the heart should be...that’s what ties in so great with NASA—we’ve applied science and technology to Leonardo that has never been used in paleontology before. But the quality of images we took won’t allow us today to say we’ve definitely found organs,” Iacuzzo said.

A determination was made in the last year to not finish preparing the other side of the fossil, specifically because the team does not know what new techniques may be available in five to 10 years.

“We are looking at future generations—the research on this fossil is far from finished. There are undoubtedly things that are inconclusive now, but hopefully in 10 years we can say ‘this is his heart, these are his lungs,’” Iacuzzo said.

Iacuzzo added that the time spent at JSC was extremely productive. “People at NASA have been nothing but wonderful and supportive...it’s nice to be around people that appreciate science. But we also are doing science for the children, whose interest in the scientific method might be sparked by looking at the dinosaur. Then they may be inspired to be doctors, astronauts or researchers. They are the ones that hopefully are going to make our world a better place.”



PHOTO BY GRANT DELIN

The fossil block, weighing 6.5 tons, reveals secrets that would not be evident from bones alone. For example, note the pouch under the throat—it may be a crop, to store food—a feature that also exists in modern birds.

Bakker also made the connection about paleontology to space exploration, in that they similarly inspire children to discover and possibly lead them into the sciences.

“A kid’s mind naturally explores—they want to probe the unknown. It’s an adventure and they want to go off on an expedition into the unknown...a surprising, scary mystery to solve and with no limit to space,” he said. “Leonardo is such a special find, because it’s worthwhile getting inside. All science, whether you’re talking about rocket science or dinosaur science, builds on everything that’s been found before you.”

More than a figment of our imaginations

Exploration Development Lab continues Orion testing



By Catherine E. Ragin

Lockheed Martin software engineers William Wolfe, left, and Joel Turner check display visibility in the Orion crew module mockup in the Exploration Development Lab. The multi-functional mockup is being used for human engineering evaluations as part of Orion's design and development.

Although resembling something more out of a sci-fi movie set, the 9,000-square-foot Exploration Development Lab (EDL) is making very real strides in realizing the goals of the Constellation Program's Orion crew exploration vehicle.

"The EDL provides a tremendous benefit to NASA and the Lockheed Martin team as we begin a very robust test program for Orion," said Cleon Lacefield, vice president and Orion program manager for Lockheed Martin.

The EDL is a multiuse facility that offers resources to support Orion production: avionics and Human Factors evaluations; flight and ground equipment software development and testing; flight-test avionics and software development; and test procedure development with dry runs.

The initial testing of critical avionics systems will be done in the EDL. These systems will include: guidance, navigation and control; automated rendezvous and docking; crew interfaces; and software development processes. System testing will be conducted to reduce risk prior to Orion Flight Test Article launch abort flight tests at White Sands Missile Range (WSMR) and Kennedy Space Center.

EDL testing will include system integration and mission tests that employ the team's "test like you fly" philosophy, meaning environments and scenarios encountered will mirror a mission.

The first flight event that will benefit from all the practice at EDL will be the Pad Abort-1 (PA-1) test flight at WSMR, scheduled for the spring of 2009.

Inside the EDL, avionics tests are coordinated like a seamless ballroom dance. Everything from the positioning of the equipment and cables to the numbers being run in the computers during test runs are exactly as they would be in an actual Pad Abort Flight Test Article or an Orion crew module.

"The avionics actually operates as if Orion is really flying, without ever having to leave the lab," said Olivia Fuentes, Lockheed Martin EDL section manager of the Human Engineering and Orion mockups, simulator. She also supports the avionics integration and tests leading up to the PA-1 test in White Sands, N.M.

The PA-1 flight test will be a demonstration of the Orion Launch Abort System's ability to remove the crew module from the launch pad and land a safe distance away from any

potential danger at the pad site. The PA-1 mockup in the EDL was built to perform fit checks of the cable harnesses and avionics hardware before deployment in the flight test at White Sands. Engineers are also using the PA-1 configuration for the development and checkout of test procedures, which will be used for preflight checkout.

The Lockheed Martin team is also working closely with NASA on a Human Factors Engineering mockup of the crew cabin that enables the team to perform fact-finding assessments of reach zone, panel displays, internal lighting, seat mockup and development, docking hatch development, crew stowage, hand controller development and other human interface devices.

Organizing a small capsule filled with a crew is much more challenging by the inch than figuring out furniture placement in a new home. Space is of the utmost concern, as is the ease in operating the control panels and moving around in the limited square footage. Every nook and cranny in Orion will be allotted for, and that is what Human Factors engineers will determine with the use of mockups developed for Human Engineering Design and Development assessments.

“We have to figure out the space available for sleep, exercise, emergency egress and many other evaluations,” said Mike Peel, EDL Houston Integration lead for Lockheed Martin. “For example, if you have six astronauts secured in their seats in the crew cabin, how long will it take them to get out in the event of an emergency situation?”

Recently, team members conducted an assessment of the Orion lighting system, as well as a life raft stowage and retrieval evaluation. Figuring out the basics now will help make future designs of the Orion spacecraft interior as comfortable, safe and functional as possible.

With the EDL testing fast and furiously to make NASA’s stellar travel possible, our big plans will no longer be a figment of our imaginations.



NASA/BLAIR JSC2008E046491

Fuentes, foreground, explains the avionics interfaces within the Exploration Development Lab during a guided tour.

The makeup of the Exploration Development Lab

The EDL was built by Lockheed Martin with contributions from Honeywell and USA, along with the state of Texas. Completed in November 2007, the lab will be a precursor to the Orion crew exploration vehicle Avionics Integration Lab.

- The Test Operations Center will eventually contain the Test Conductor and Operator consoles. This is where test orchestration will take place. For the PA-1 testing, this is equivalent to the Missions Operations Facility (MOF) and Vehicle Interface Van (VIV).
- The MOF will contain the following avionics systems:
 - Command and Control Server
 - Telemetry Data Processing System
 - Communications
- The VIV will contain systems such as:
 - Vehicle Interface Unit
 - Vehicle Power Unit
 - Radio Frequency Test Set
 - Communications
- The Human Engineering Design and Development mockup was developed to demonstrate Lockheed Martin’s concept for the crew module to NASA. The current design has changed quite a bit from the initial one, with the outer mold line being reduced from 5.5 meters to 5 meters. The internal mold line of the mockup has been adjusted to the volume of the current vehicle design. This mockup is being used by the Human Factors Engineering Group to perform Human Factors evaluations such as maneuverability within the module, access to controls and crew safety.



NASA/BLAIR JSC2008E046493

Olivia Fuentes, section manager for Lockheed Martin’s Exploration Development Lab – Houston, explains the commander’s perspective of the Orion crew cabin to Richard Gilbrech, associate administrator for NASA’s Exploration Systems Mission Directorate.

End of an era

Space Shuttle Program Manager John Shannon talks about NASA's transition, Constellation Program

By Brandi Dean



NASA STS-111-S-035

On June 5, 2002, the Space Shuttle Endeavour lifted off, creating billows of smoke and steam on its way into space for mission STS-111. The end of the Space Shuttle Program will begin a new era of space exploration for NASA.

It seems fitting that a man who started his career at the guidance, navigation and control console in Mission Control would be the one in charge of keeping the Space Shuttle Program on course for its final missions.

After making his way up through the ranks of the flight director's office and into Space Shuttle Program management, John Shannon now finds his name preceded by the title Space Shuttle Program manager. But at this point in the program's life, he said, his real job is managing Transition.

"In a program as mature as the Space Shuttle Program is, with the leaders we have built on this team, people know the basic job very, very well," Shannon said. "So my job as program manager is really to make sure that we maintain our rigor in the current process and fly out the program safely and efficiently. But the strategic management part of my job is all about going from where we are right now, phasing out the Space Shuttle Program and then engaging in the next program."

Past the point of no return

"People keep asking if we're past the point of no return on the Space Shuttle Program, and the answer is yes," Shannon insisted. "We'll be able to fly an additional one or two missions if called upon to do so. Beyond that, we'll have the heart for it, but we won't have the hardware."

That can be bittersweet, but Shannon believes that it also makes this an incredibly interesting time to be in the space program, because plans are being made that have to be executed to realize the vision.

View of STS-102 launch activities inside the Mission Control Center in Building 30S. At the console, Flight Directors Wayne Hale, left, and John Shannon discuss a mission detail.



NASA/MARKOWITZ JSC2001E06214

“Once we finish station, once we go back to Hubble one more time, the space shuttle has done all of the jobs it was designed to do,” Shannon said. “And the shuttle is a risky vehicle. There is absolutely no denying it. The probabilistic risk assessment for the shuttle is one in 78. So is it the right thing to do, to continue to fly this shuttle beyond its primary mission? In my mind, the answer is no. And the agency doesn’t want to move in that direction either. We want to do exploration.”

Tapping into an incredible resource

The shuttle workforce already knows how to launch vehicles, execute missions, keep things on production and cost and make good, sound technical decisions. Rebuilding all of that would be senseless—not to mention very difficult, which is why Shannon asked the shuttle team to talk to their Constellation counterparts to identify areas where shuttle can help.

“We have 10 flights left, and if we fly different pieces of Orion flight hardware or use different operating principles on the shuttle that will help prove them out to Constellation, then that’s in Constellation’s best interest,” Shannon explained. “But it also helps us. We are building a relationship between the Space Shuttle Program and the Constellation Program. Once we have that relationship, once there is some trust built between the two, I think these folks can help us operate.”

It’s not clear yet whether the operating team would exist inside the Constellation Program or be separate, but Shannon said that doesn’t matter so much at this point.

“You can’t just hand a rocket over and say, ‘Here is the manual—go operate it,’” Shannon added. “Constellation recognizes that, as they go through design and development and the early test flights, the eventual operators of the system have to be involved.”

A united sense of mission

Turning his attention back to the task at hand—flying out the shuttle manifest—Shannon said that there’s a united sense of mission right now.

“We have a challenge in front of us in the missions we are going to fly,” Shannon said. “The Hubble mission later this year and the remaining station missions are extremely challenging. We’ve got to keep our eye on the ball. I want to make sure that we do this right, that we execute appropriately, and that we end the program on a very good note.”

And, when that’s done, proudly pass the mission control consoles to the next generation of space-farers with stars in their eyes and exploration in their hearts.



NASA/MARKOWITZ JSC2001E06200

Shannon during STS-102, evaluating data in the Mission Control Center.

Of Superheros and Lunar Landers

“I guess I’ve always been in this environment,” Shannon said. “My folks have an old snapshot of me, parked in front of the TV in my Spiderman pajamas, watching the Apollo 11 Moon landing.”

John Shannon officially came to NASA in 1987, fresh out of Texas A&M University’s aerospace engineering department. He was hardly new to Johnson Space Center, however. Like so many others who consider human spaceflight (and the Space Shuttle Program, in particular) their professional calling, he was born into the program. His fascination with spaceflight started with his father and his father’s colleagues, the original members of NASA’s Landing and Recovery Directorate.



NASA/SMITH JSC2008EC01690

The Orion crew exploration vehicle will replace the shuttle after its retirement.

Coats in the trenches



Center Director Mike Coats and his staff toured the Johnson Space Center Rockyard, where representatives from the Engineering Directorate gave them a firsthand look at the lunar truck, a new NASA ground prototype vehicle, which is being developed by the Constellation Program for lunar transportation and exploration.

From left, Bobby Watkins, Mike Coats, Ellen Ochoa, Ron Difiler, Dan Harrison, Steve Poulos, Milt Heflin, Matt Ondler and Robert Ambrose.



Coats and Ochoa take a ride on the NASA ground prototype vehicle for lunar transportation.

Space Center 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 2200 Space Park Drive, Rm. 220. The mail code is AP22. 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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