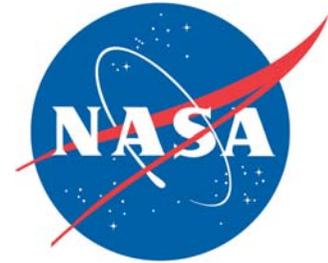


# Spaceport News



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## With Discovery back at pad, launch day nears

Return to Flight mission is less than one month away

With new safety modifications, the Space Shuttle Discovery is back at Kennedy Space Center's Launch Pad 39B. Carried by a giant Crawler Transporter, Discovery arrived at the pad at 12:17 p.m. June 15 in preparation for its historic Return to Flight mission (STS-114) planned for July.

Discovery's journey took a little longer than expected. It left the Vehicle Assembly Building about 2 a.m. June 15 for its 4.2-mile journey. The Crawler Transporter, which has a top speed of about one mile per hour, traveled even slower than normal. It stopped frequently, so engineers could address over-

heating bearings. But when Discovery finally rolled up to the pad around lunchtime, it was a satisfying sight for those who have been working more than two years to get the Shuttle back to space.

"Seeing Discovery back on the launch pad is a visible testament to the dedication of everyone involved in making sure STS-114 is the safest mission it can be," said Space Shuttle Program Manager Bill Parsons. "We still have some work to do, but today is indicative that the hardware is getting ready for a launch in

(See LAUNCH, Page 4)



SPACE SHUTTLE Discovery moves into position on the hardstand of Launch Pad 39B. First motion for the 4.2-mile journey was at 1:58 a.m. on June 15. This is the second rollout of Discovery.

## Applied Physics Lab develops new tools for Shuttle ground processing

By Linda Herridge  
Staff Writer

NASA's three orbiter vehicles, Atlantis, Discovery and Endeavour, are comprised of thousands of unique parts.

Many tools used to work on the vehicles are also unique, and were developed at Kennedy Space Center by a team in the Spaceport Engineering and Technology (SE&T) directorate's Applied Physics Lab and ASRC Aerospace Corporation for a program called the Rapid Prototype of Solutions to Shuttle Problems.

The program, more commonly known as the Proof of Concept program, unofficially began in

2001 when orbiter Atlantis arrived back at Kennedy Space Center and water was detected in the Thermal Protection System tiles. Several drying methods were employed but were time-consuming and ineffective.

A team of physicists, led by Dr. Bob Youngquist, senior scientist in the Applied Physics Lab, worked with NASA and United Space Alliance ground processing technicians and engineers to develop a water-detection tool and a fast and efficient water removal system.

"This Proof of Concept program takes small, definable problems and works to solve them in a timely manner at an affordable cost," said Craig Roszczypala, Proof of Concept

manager in the SE&T Operational Spaceport Project Office.

According to Youngquist, the process begins when Shuttle ground processing has a need for a new or improved tool or shop aid. A concept or design is proposed and a prototype is developed for review. The tool may go through several design

(See TOOLS, Page 2)



MEMBERS OF the Proof of Concept program collaborate on the orbiter tile water removal system used by the Space Shuttle processing directorate.



**Jim Kennedy**  
Center Director

## The Kennedy Update

**H**i, everyone! What a wonderful sight it was to see Discovery heading back out to Pad B on June 15. I was privileged to ride on the crawler for part of the trip and it was a thrill.

As we made the journey, I was so proud for KSC, the Agency, Florida and our nation. I'm KSC and proud to be as we take another major step in returning our Shuttles to flight.

Speaking of the crawler, a NASA legend passed away recently. Donald "Buck" Buchanan died June 13. For many of us he is known as the father of the crawler, but he did so much more for NASA.

He designed and built the Launch Complex 39 pads, mobile

launcher platforms, and hold-down posts and swing-arm posts for Apollo. Later, he led the charge to modify the pads for the Space Shuttle Program.

He will be missed, but through his contributions, Buck will definitely be a part of our successful Return to Flight mission and beyond.

I hope everyone watches from their balcony, the beach or on NASA TV Sunday night as the GOES-N mission gets ready to roar into space aboard a Boeing Delta IV rocket. The launch window is set for 6:13 to 6:58 p.m. and will carry the latest in weather satellite technology into space to help us study our planet's weather.

What a great time to be alive

### TOOLS . . . (Continued from Page 1)

adjustments before the final version is approved and then produced by the KSC and ASRC Prototype shops.

Tools recently developed specifically for Return to Flight include a crane contact sensor, a scaling device to measure External Tank (ET) damage, an ET Alignment Camera, Reaction Control System Nozzle inspection tools, and an upgraded Surface Light Optimization Tool used to inspect orbiter exterior windows for imperfections or damage.

"The Proof of Concept program is very helpful to KSC's ground processing activities," said Michael Wetmore, KSC director of the Shuttle Processing Directorate.

"The grassroots collaboration of NASA and contractor engineers working together to develop practical solutions to

processing problems is a significant contributor to the continued safe and efficient operations at KSC."

Youngquist said many of the problems being addressed by this program, such as mating and positioning flight hardware and water and leak detection tools, are applicable to future launch programs.

"Our hope is that by steadily advancing spaceport technologies and solving problems, we will be in a better position to process future launch vehicles such as the Crew Exploration Vehicle," Youngquist said.

Mark Minich, a senior project manager with ASRC, said several of the prototypes have potential for commercial crossover.

"The Crane Manufacturing Association, aircraft carriers and the nuclear industry are looking at potential applications of the Crane Processing Contact Sensor," Minich said.

"The laser scaling device

and part of this Agency.

Our Administrator, Mike Griffin, is going to hold a Return to Flight update from NASA Headquarters at 2:30 p.m. Tuesday. I invite everyone to tune in. I know Mike will have a great deal of information to relay about Return to Flight and how it impacts the future of NASA.

This will be his first update since joining our NASA family back in April.

This is the last time I'll get a chance to communicate to you prior to the July 4<sup>th</sup> holiday. As we celebrate our nation's 229<sup>th</sup> birthday, I hope everyone takes

time out to celebrate the most important day in America's history with family and friends. At the same time, please be safe!

Last but not least, it is definitely time to get excited about STS-114. As I write this, we are set for launch at the opening of the launch window on July 13.

I know our KSC team has worked hard to ready Discovery and her crew for a safe return to flight. I can't wait to see Discovery take her rightful place in space.

HAPPY 4<sup>TH</sup> OF JULY EVERYONE! Have a great holiday.

**"It is definitely time to get excited about STS-114. As I write this, we are set for launch at the opening of the launch window on July 13."**



**DOUG WILLARD**, a NASA physicist in the Applied Physics Lab, demonstrates the tool developed to detect water in Space Shuttle Thermal Protection System tiles.

developed to measure ET damage is currently being sold commercially in the forensic science industry to investigate murder scenes without disturbing the evidence."

According to Youngquist, the work has increased in the last three years from a few projects to more than 30. Scientists in the Applied Physics Lab are developing radio frequency detectors for use in warning USA technicians in the Orbiter Processing Facilities when an orbiter antenna is on.

Proof of Concept developers also recently produced 14

illuminated inspection mirrors to help technicians see inside hard-to-reach areas.

"The Spaceport Engineering and Technology Directorate is a service organization whose purpose is to help our customers," said Jim Heald, SE&T director.

"We provide innovative solutions to complex technical problems. The Proof of Concept team has a proven track record of responsive and effective support to the launch and landing operations at KSC."

# Sestile relies on teamwork to process Discovery

By Linda Herridge  
Staff Writer

Processing NASA's orbiter vehicles for flight is like composing a great opera. The timing must be perfect and all the notes must flow together to work.

As NASA, United Space Alliance and Boeing employees are busy performing modifications to all three Space Shuttle orbiters, managers are determining what it will take to get the work done.

One such individual is Mark Sestile, a USA modifications manager in Shuttle ground processing. Sestile develops work-impact assessments for orbiter modifications and upgrades. During the past three years, he worked on assessments that included the Columbia Accident Investigation Board requirements and other modifications performed on Discovery for Return to Flight.

Sestile and his team analyze specific modification data, including content and the duration of work and manpower hours, to determine what is needed to complete the required upgrades and modifications. Beginning in late 2003, he gathered information from technicians, quality assurance personnel, systems engineering specialists and flow managers to develop a computer matrix of

upgrades and modifications, along with due dates for design engineering and hardware delivery for each orbiter vehicle.

The matrix tracked 2,500 Return to Flight modification deadlines.

"It's a great tool to monitor progress of all the modifications up to the implementation phase," Sestile said. "We can update the matrix as work progresses and it's a useful tool to ensure all engineering and hardware meet established need dates."

To create the matrix, Sestile worked with The Boeing Company in Huntington Beach, Calif., and Johnson Space Center in Houston. He also interfaced with NASA and Boeing counterparts at KSC.

"Mark's innovative approach in developing the modification tracking tool brought the technical community together in assessing all of Discovery's Return to Flight modifications," said Michael Hartney, USA manager of orbiter and payload processing for ground operations.

"It takes a team of people



MARK SESTILE is a United Space Alliance modifications manager in Shuttle ground processing, who develops work-impact assessments for orbiter modifications.

working together to get the work done for Return to Flight," Sestile said. "We were able to install all required modifications into Discovery on schedule. The success is the teamwork between NASA, USA and Boeing."

Sestile is now developing work-impact assessments for the new "Space Station to Shuttle Power Transfer System" that will extend the duration of future missions. According to Sestile, the system will be installed in Endeavour's crew module, payload bay and aft compartment first. The design concept is complete and ground processing is in the implementation phase.

"When this new system is in

place, NASA can accomplish more science, more research, more extravehicular activities and more work on the Space Station during the missions," Sestile commented.

Sestile began his 26-year career at KSC as a ground support equipment technician and then a tile technician for Rockwell. He became pad leader for Lockheed for 12 years beginning in 1985.

He joined USA in 1996 and worked in various positions, including payload operations and ops chief assistant to the flow manager. In 2002, Sestile began working in his present position.

## June Employees of the Month



The NASA June Employees of the Month, from left, include: Cathy Bursey, Cape Canaveral Spaceport Management Office/Air Force; Toni Fuentes, Chief Counsel's Office; Isolda Galiana-Liang, Information Technology and Communication Services; Carol Moore, Spaceport Engineering and Technology; Tracy Boyett, Equal Opportunity Office; and Linda Maust, Center Operations. Not shown are: Tom Cook, Chief Financial Office; Billy Stover, Shuttle Processing; Ken Hale, Safety and Mission Assurance; Michael Generale, ISS/Payloads Processing; and Bryan Song, Launch Services Program.

### Badged employees receive free Visitor Complex admission

Kennedy Space Center badged employees will receive one complimentary Maximum Access admission to the KSC Visitor Complex through Labor Day, Sept. 5. Employees may also purchase up to six additional Maximum Access admissions at 50 percent off. Employees must present their badge in person to purchase tickets between 9 a.m. and 4 p.m. at ticket windows 1-4. For more information, call (321) 449-4444.

# Discovery returns to Launch Pad 39B a

## LAUNCH . . .

(Continued from Page 1)

July.”

With Discovery at the pad, workers will begin final preparations for launch, including closeouts, testing and installing the payload, NASA’s Italian-built Multi-Purpose Logistics Module, Raffaello.

They will also load the hypergolic propellants for flight. The process includes adding the propellants, monomethyl hydrazine and nitrogen tetroxide, into the Orbiter Maneuvering System and the Forward Reaction Control System.

Discovery was de-mated from its previous External Tank (ET-120) and attached to a new External Tank (ET-121) on June 7. The new tank was fitted with temperature sensors and accelerometers to gather information

about the tank’s performance and measure vibration during flight.

“Returning Discovery to the launch pad is the last major processing milestone prior to launch,” said NASA Launch Director Mike Leinbach. “The launch team is completing the final procedures and documentation, and we are looking forward to beginning the launch countdown three days prior to liftoff.”

NASA plans to launch Discovery during a window from July 13 to 31. A launch date will be set during the Flight Readiness Review scheduled for June 29 and 30.

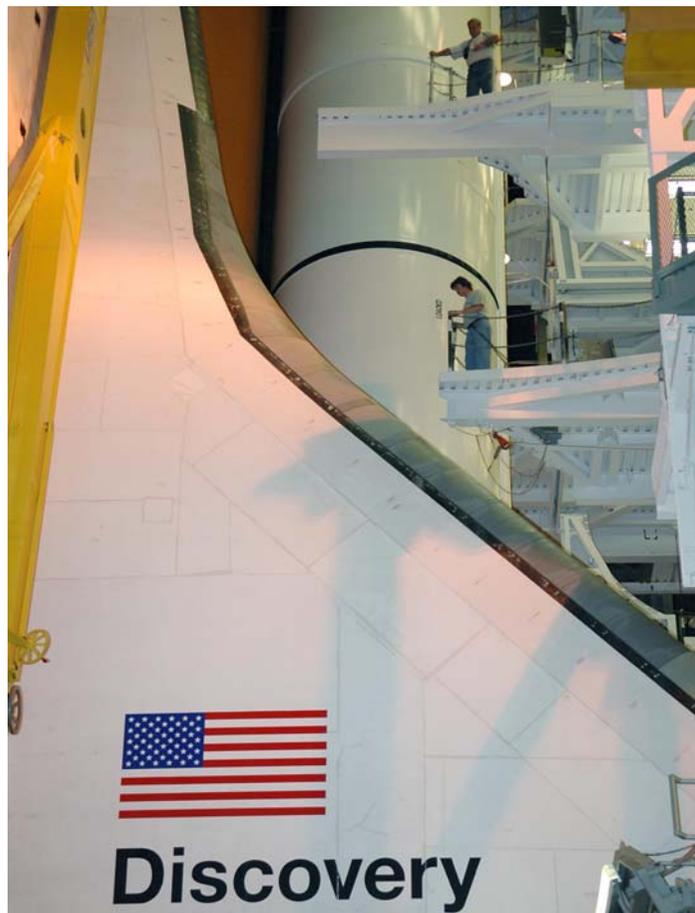
During their 12-day mission, Discovery’s seven crew members will test new hardware and techniques to improve Space Shuttle safety. They will also deliver supplies to the International Space Station.



SUSPENDED BY a 175-ton bridge crane, the orbiter Discovery is lowered next to the new External Tank, ET-121, and Solid Rocket Boosters in high bay 3 for mating.



IN THE Space Station Proc Logistics Module Raffaello moved back to its work sta mechanical fasteners insid feature. The assessment a disengagement during ascent.



IN HIGH BAY 1 of the Vehicle Assembly Building, workers on different levels watch as orbiter Discovery is lifted by crane away from the External Tank and Solid Rocket Boosters (behind the orbiter).

STS-114 MISSION Specialists Charles Camarda (left) and Andrew Thomas monitor the progress of Discovery as it makes its way along the crawlerway.



SPACE SHUTTLE Discovery makes its way along the crawlerway from high bay 3 to Launch Pad 39B as the sun rises. First motion for the 4.2-mile journey was at 1:58 a.m.



# STS-114 as Return to Flight approaches

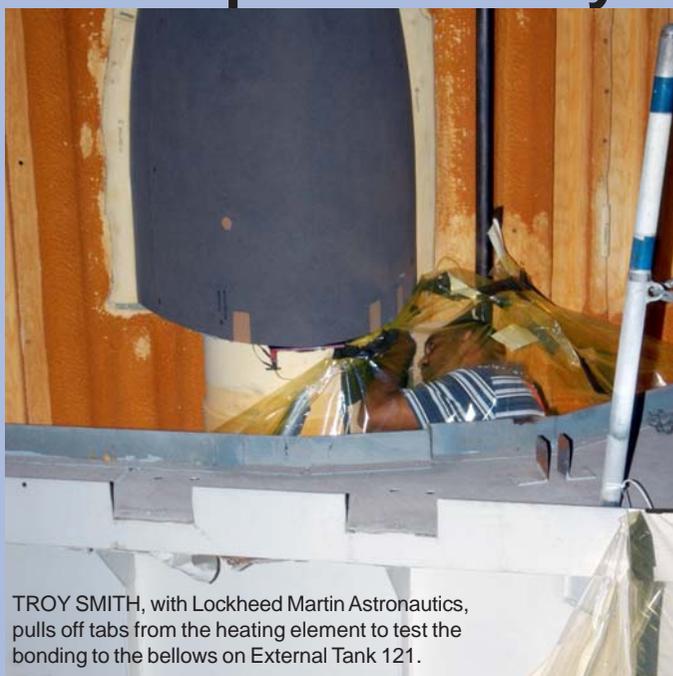


At the Space Station Processing Facility, employees close the hatch opening on the Multi-Purpose Logistics Module Raffaello. Previously loaded into the Payload Canister Transporter, Raffaello was moved back to its work stand to allow the processing team access to address concerns with mechanical fasteners inside the module that do not incorporate an adequate secondary locking device. The assessment and additional work was conducted to ensure that the fasteners do not vibrate during ascent.



THE PAYLOAD canister that will launch aboard Space Shuttle Discovery's Return to Flight mission STS-114 is lifted up to the Payload Changeout Room.

## Heater on Discovery tank improves safety



TROY SMITH, with Lockheed Martin Astronautics, pulls off tabs from the heating element to test the bonding to the bellows on External Tank 121.

A new heater added to the Space Shuttle's fuel tank will significantly reduce the potential for ice and frost buildup and improve the safety of the tank.

The 15-story tank is filled with more than a half-million pounds of super-cold liquid oxygen and liquid hydrogen fuel. Because ice sometimes forms on portions of the tank's exterior and can break off during launch, NASA made the decision to re-schedule the Shuttle's Return to Flight mission to July so the heater could be installed on the Return to Flight tank.

The belt-like heater wraps around the top joint of the External Tank's liquid oxygen propellant line, which runs from the tank's midsection to its base. NASA already had planned to add the heater to the liquid oxygen feedline bellows - a fuel line joint that feeds the Shuttle's main engines - for the Shuttle's third mission after returning to flight. It has now been added to External Tank-121, which will help carry Discovery into space on the upcoming STS-114 mission.

STS-114 MISSION Specialists Charles Camarda (left) and Andrew Thomas monitor the progress of Discovery as it makes its way along the crawlerway.



FOR THE STS-114 Return to Flight mission, Discovery's payloads include the Multi-Purpose Logistics Module Raffaello, the Lightweight Multi-Purpose Experiment Support Structure Carrier and the External Stowage Platform-2.

## Spacesuit used for secret training program uncovered

A recent venture into a long-locked room at the Cape Canaveral Air Force Station uncovered interesting artifacts of a by-gone era: retired spacesuits from Americans who trained in the 1960s to be astronauts aboard an Air Force orbiting reconnaissance laboratory.

Two security officers were doing a check of a facility known as the astronaut ready room at the Launch Complex 5/6 museum. NASA Special Agent Dann Oakland and Security Manager Henry Butler, of the company that oversees the museum, Delaware North Parks and Resorts, discovered a locked room - and they had no key.

They eventually were able to unlock the door using a master key. With no power, the room had evidently not been accessed by people in many years. The officers used flashlights to explore the room and make their noteworthy find.

But Oakland and Butler weren't the first visitors. Rodents had clearly explored the room over the years. Still, two blue spacesuits were "complete and in remarkable shape," according to the suits' manufacturer, who examined them.

Investigators started looking into who owned the spacesuits. A NASA technician initially thought they were training suits from the end of the Gemini or beginning of the Apollo space



AT LEFT, NASA Special Agent Dan Oakland holds up a long-lost spacesuit recently uncovered at the Cape Canaveral Air Force Station (CCAFS). Above is the astronaut ready room entrance hallway on the left and the Launch Complex 5/6 blockhouse, where the spacesuit was found, on the right.

programs. The manufacturer, however, determined that they were MH-7 training suits from a short-lived Cold War-era military program to put a manned reconnaissance station in space.

Begun in 1964, the Manned Orbiting Laboratory (MOL) program was an Air Force initiative that would have sent Air Force astronauts to a space station in a Gemini capsule. After spending a few weeks in orbit, the crew would undock and return to Earth.

The Air Force abandoned the program in 1969, but the program produced a great deal of technological development, and

three groups of military officers trained to be MOL astronauts.

The spacesuit with identifying number 008 had the name "LAWYER" on the left sleeve. The suit was traced to Lt. Col. Richard Lawyer, a member of the first group recruited to be MOL astronauts in 1965. Records show that official ownership of this suit was transferred by NASA to the Smithsonian Institution in 1983.

The suit itself has now been returned to the Smithsonian.

No records were found for the other suit, with the intriguing identifying number 007. It has been returned to the

Smithsonian, who sent NASA a mole suit in return. Other historical treasures found in the room include old film canisters, one flown Shuttle main landing tire, electrical equipment, and various miscellaneous boxes.

The MOL program left other legacies to NASA, as well. When the program was cancelled, seven of the younger astronauts were transferred to the Agency's human space flight program and went on to have standout careers.

Among them were Robert Crippen, pilot of the first Space Shuttle mission, and Richard H. "Dick" Truly, who later became NASA Administrator.

## Management welcomes students to summer programs

The Education Programs and University Research Division at KSC manage a variety of programs for students ranging from high school to post doctorate during the summer months. The NASA-KSC Intern Orientation June 6 in the Operation and Checkout Building's Mission Briefing Room gave students a chance to learn what activities are taking place at the Center and how they can contribute.

NASA's Summer High School Apprenticeship Research Program (SHARP) is a paid, eight-week program for high

school students who have demonstrated an interest in engineering, science or technology careers. The objective of SHARP is to encourage the career paths of pre-college students who have been traditionally underrepresented in math, science, engineering and technology fields. Opportunities to conduct meaningful research help the students develop oral and written communications, and leadership skills. Information on the participating institutions can be found at: <http://www.nasasharp.com>.



CENTER DIRECTOR Jim Kennedy addresses students participating in the 2005 summer programs.

# Remembering Our Heritage

## 40 years ago: White was eager to extend America's first spacewalk on Gemini 4

By Kay Grinter  
Reference Librarian

In 1965, the space "race" was all about fitness and the focus was on walking - spacewalking, that is.

Cosmonaut Aleksey Leonov stepped outside his spacecraft, Voskhod 2, for the first extravehicular activity (EVA) on March 18. Edward White was hot on his heels, exiting the Gemini 4 capsule on June 3 for a 21-minute spacewalk.

White and crewmate James McDivitt had been propelled to the starting line at 11:16 a.m. June 3 by a Titan II rocket. After unsuccessful attempts to rendezvous with the rocket's second stage, White exited the capsule - hoses hooked up, umbilical tethering line ready, and zip gun in hand.

White propelled himself away from the spacecraft with bursts from the zip gun, a compressed gas maneuvering unit. The gun performed much as it had during ground training on an air-bearing table.

Radio listeners heard White describe his beautiful view of

Earth and how well he was feeling.

When the 10-minute walk doubled in length, Mission Control ordered him back inside. "It's the saddest moment of my life," he sighed.

White reported that he found the experience exhilarating, an indication that he produced plenty of endorphins. His pulse - 150 at the beginning of the excursion - rose to 178 just before he opened the hatch.

The capsule landed in the Atlantic Ocean on June 7 after 62 orbits taking a total of 97 hours and 56 minutes, the longest mission to date.

Several days later, NASA Administrator James Webb escorted McDivitt and White to a news briefing in Houston. He wanted a moment alone with them to let them know that he considered their attitude too carefree during the EVA.

All was forgiven, however, by the start of the briefing, and at a June 17 ceremony at the White House's Rose Garden they received NASA Exceptional Service Awards from President Lyndon Johnson.



THE GEMINI-TITAN 4 lifts off carrying James McDivitt and Ed White for a four-day mission. This flight included the first spacewalk by an American astronaut, performed by Ed White.

BELOW, ASTRONAUT Ed White floats in zero gravity of space.



## Crawford retires after devoted service to the nation

By Jennifer Wolfinger  
Staff Writer

James "Larry" Crawford, director of Kennedy Space Center's Safety and Mission Assurance (S&MA) organization, has retired after 35 years of dedicated service to NASA and the U.S. Army.

Crawford joined KSC in 2004 to lead the new S&MA organization, which was created to centralize the safety and mission assurance activities into a single, effective organization. Through his leadership, the Center's

safety reporting structure was tremendously strengthened.

"In reorganizing the S&MA directorate, employees made it clear that they wanted a seasoned veteran as their director," said KSC Director Jim Kennedy. "Larry was the right man at the right time and has made significant accomplishments."

According to Crawford, S&MA is a large and evolving structure that has made major contributions in reducing risk to flight and ground crews.

"I am very proud of what the KSC team has accomplished and

S&MA in particular, and will cherish the time I had here," said Crawford, who led nearly 250 KSC professionals. "When I started this job, a good friend and safety professional at another NASA Center gave me a copy of a prayer to use before starting work each day. I try to bring God's presence with me each day, and I know who gets credit for whatever has been accomplished in the time I have been here."

Crawford began his NASA career in 1980 as NASA director of safety in Washington, D.C.



LARRY CRAWFORD has retired as KSC's director of Safety and Mission Assurance.

# Kennedy administrators host community leaders

By Linda Herridge  
Staff Writer

**K**ennedy Space Center's Return to Flight activities and its role in the Vision for Space Exploration were part of the main focus at the annual Community Leaders Breakfast on June 17 at the KSC Visitor Complex's Debus Conference Center. KSC Director Jim Kennedy welcomed guests from local business, government, academia and industry leaders to the event.

Special guests included Florida Rep. Thad Altman and representatives from the government offices of Florida Sens. Bill Nelson, Mel Martinez and Dave Weldon. Assistants from the offices of Florida Reps. Tom Feeney and Mike Haridopolos were also present. Former astronaut Norman Thagard and several Tuskegee Airmen also attended the breakfast.

Kennedy started the briefing with an overview of newly appointed NASA Administrator Michael Griffin's experience, and expressed his own excitement about Return to Flight activities at the Space Center. "We are ready to return Space Shuttles to flight. The future is bright," Kennedy said. "What we do today is at the heart of space exploration."

He also reported the construction progress of several KSC facilities, including the new Training Center in the Industrial Area, the Operations Support Building II in the Launch Complex 39 Area, and the Mid-Field Tower at the Shuttle



MEMBERS OF NASA management answer questions from guests at the Community Leaders Breakfast, including, from left: Lisa Malone, director of External Relations; Stephen Francois, manager of the Launch Services Program; Michael Wetmore, director of Shuttle Processing; Jim Kennedy, director of Kennedy Space Center; Shannon Bartell, director of the Exploration Office; and Jennifer Kunz, deputy director of operations for International Space Station/Payload Processing.



GUESTS AT the 2005 Community Leaders Breakfast enjoyed delicious food while listening to the major milestones and goals for the Center.

Landing Facility.

Updates on current and future activities at KSC were presented by Steve Francois, manager of the Launch Services Program (LSP); Michael Wetmore, director of Shuttle Processing; Jennifer Kunz, deputy director for operations in International Space Station/Payload Processing; and Shannon Bartell,

director of KSC's Exploration Office.

Francois said the LSP's role has expanded at KSC. He presented an overview of past missions and spoke about future missions including Calipso/

CLOUDSAT, the Mars Reconnaissance Orbiter and the New Horizons spacecraft voyage to Pluto. These will be NASA's first missions set to launch aboard Atlas V vehicles.

Wetmore discussed NASA's Implementation Plan and said that all but three of the 15 Columbia Accident Investigation Board recommendations were completed.

During the Space Station update, Kunz gave an overview of past Expedition crews and the Expedition 11 crew currently on the Station. "We're excited about the return to flight and return to assembly of the Station," said Kunz.

Bartell summarized KSC's Exploration Office progress. She said the key to the future of Space Exploration is sustainability and the Vision for Space Exploration will be supported by NASA, as well as engineering, industry, science, academia and research communities.

"This vision goes beyond our generation," Bartell said. "We're building on what we're doing today."

At the conclusion of the program, the panel fielded questions from the audience on topics such as inspiring the next generation of explorers, whether the Hubble Space Telescope will be reconsidered for a repair mission, and how NASA will expand international partners in future space endeavors.

## Turtle Watch tours offered by park service

**T**urtle Watch programs provide an opportunity to learn about sea turtles and the role that the National Park Service plays in their conservation. The staff at the Canaveral National Seashore is taking telephone reservations for the July Turtle Watch programs at (386) 428-3384, ext. 18. The programs are open to those ages 8 and older

and are limited to 30 people per night, with a maximum of six people needed. Tours run Wednesday to Sunday nights.



John F. Kennedy Space Center

## Spaceport News

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Editor..... Jeff Stuckey  
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