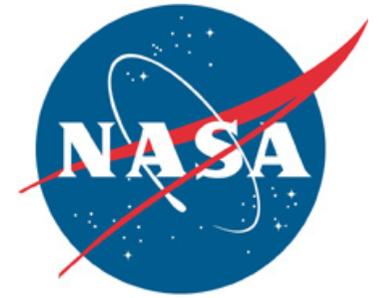


Spaceport News



John F. Kennedy Space Center - America's gateway to the universe

www.nasa.gov/centers/kennedy/news/snews/spnews_toc.html



OCO mishap tugs at Spaceport's roots

"Only those who dare to fail greatly can ever achieve greatly."

-- Robert F. Kennedy

The words of former Attorney General Robert F. Kennedy resound loudly at Kennedy Space Center, where workers were saddened by news that the Taurus XL launch vehicle, carrying a NASA satellite designed to study global warming, failed to reach orbit after it launched Feb. 24, from Vandenberg Air Force Base in California.

"Our whole team, at a very personal level, is very disappointed," Taurus Program Manager John Brunschwiler said. "We are very upset with the results."

According to NASA Launch Director Chuck Dovale, early indications are the fairing failed to open and break away from the rocket's final stage. The fairing was a clamshell structure that encapsulated the Orbiting Carbon Observatory, or OCO, as it traveled through the atmosphere.

"Seven seconds after

More online

To find out more about the NASA Mishap Investigation Board, visit: www.nasa.gov/home/hqnews/2009/feb/HQ_09-041_OCO_Chairman.html

Stage 2 ignition, we expected to see fairing separation," Dovale said. "Shortly after that, we started getting indications the fairing did not separate."

With the added weight of the fairing, the engine couldn't deliver enough push to get OCO into orbit. It fell to Earth in the Indian Ocean near Antarctica.

In the past 10 years, NASA successfully has flown 56 out of 57 vehicles, and according to Brunschwiler, has never had any issues with this fairing design.

Rick Obenschain, NASA's deputy director of Goddard Space Flight Center in Greenbelt, Md., was chosen to lead the investigation board for the unsuccessful launch.

On March 3, NASA selected the members of the board. They include: Jose Caraballo, safety manager at Langley Research Center, Hampton, Va.; Patricia Jones, acting chief of the Human Systems Integration Division in the Exploration Technology Directorate at Ames Research Center, Moffet Field, Calif.; Richard Lynch, Aerospace Systems Engineering, Goddard Space Flight Center, Greenbelt, Md.; and Dave Sollberger, deputy chief engineer of the NASA Launch Services Program, Kennedy Space Center.

The ex officio is Ruth Jones, Safety and Mission Assurance manager at Marshall Space Flight Center, Huntsville, Ala.

The board began its investigation March 3. The members will gather information, analyze the facts, and identify the failure's cause or causes and contributing factors. The MIB will make recommendations for actions to prevent a similar incident.



Photo courtesy of Orbital Sciences

NASA's Orbiting Carbon Observatory and its Taurus XL rocket on Launch Complex 576-E at Vandenberg Air Force Base in California on Feb. 22. A contingency was declared minutes after liftoff on Feb. 24, when the satellite failed to reach orbit. An investigation board has been set up to determine the cause of the launch failure.

Inside this issue . . .

Joseph Acaba



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Kepler mission



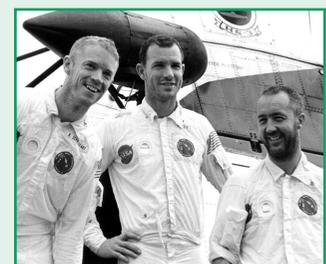
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Space Coast women engineers honored



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Heritage: Apollo 9 took off 40 years ago



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Acaba has close ties to Space Coast

By Linda Herridge
Spaceport News

A group of local teachers will be cheering from a viewing area at Kennedy Space Center as science teacher turned NASA astronaut Joseph Acaba boards space shuttle Discovery for launch on the STS-119 mission to the International Space Station. Acaba will carry their good wishes and a special memento as the shuttle lifts off from Launch Pad 39A.

Though Acaba was born in Inglewood, Calif., and raised in Anaheim, Calif., he has ties to central Florida. From 1999 to 2000, the bilingual teacher taught integrated science at Melbourne High School. He also taught math and science at Dunnellon Middle School in Marion County for four years.

The memento he will carry is a Melbourne High School bulldog mascot flag containing a very special



NASA/Jim Grossmann

Astronaut Joseph Acaba taught integrated science at Melbourne High School. He also taught math and science at Dunnellon Middle School in Marion County for four years.

coin that says "You Make the Difference." Vicki Detwiler, a biology teacher at Melbourne High, was instrumental in acquiring the flag for Acaba to carry.

"He made a great impression on the students and teachers," Detwiler said. "He was very creative and helped the students appreciate their diversity and potential. He was a natural in the classroom."

Detwiler hopes the flag will be returned to Melbourne High so a special tribute to Acaba can be held in the school's new science building.

She and a group of teachers heard Acaba speak at a Florida Association of Science Teachers, or FAST, conference in Orlando in 2007. Detwiler said it was great to see him and do some catching up.

"He was an outstanding role model for the students," said Melbourne High School Principal James Willcoxon. "We really enjoyed having Joe at our school."

During STS-119, Acaba will be on the flight deck as mission specialist 1 during ascent and entry. He will operate the shuttle's robotic arm and perform two spacewalks to help attach the S6 truss and final set of large solar arrays to the station.

Acaba earned a bachelor's degree in geology from the University of California-Santa Barbara in 1990, and a Master of Science in geology from the University of Arizona in 1992.

He worked as a hydrogeologist in Los Angeles and spent two years in the U.S. Peace Corps where he taught modern teaching methods to more than 300 teachers in the Dominican Republic. Acaba also served as the island manager of the Caribbean Marine Research Center at Lee Stocking

Island in the Bahamas, and the shoreline revegetation coordinator in Vero Beach, Fla., where he planned, designed and implemented a mangrove revegetation project.

The 41-year-old father of three is the first person of Puerto Rican heritage to become a NASA astronaut. In February 2006, Acaba completed astronaut candidate training, which included scientific and technical briefings, intensive instruction in shuttle and International Space Station systems, physiological training, T-38 flight training and water and wilderness survival training.

He was then assigned to the Hardware Integration Team in the Space Station Branch working technical issues with European Space Agency hardware before his assignment to the STS-119 mission.

As of press time, the STS-119 launch is tentatively targeted for March 12 at 8:54 p.m.

Stuffed duck, flags to ride up with Discovery

By Steven Siceloff
Spaceport News

From a NASCAR driver's flag to a purple stuffed duck, the collection of orbital mementos chosen by the astronauts of space shuttle Discovery's STS-119 mission highlight a diverse set of influences and interests.

The stuffed duck, one of several toy animals making the trip, represents the Japanese city of Saitama, which is the hometown of Koichi Wakata. He will fly to the International Space Station and stay as a new member of its three-person crew. The duck will return to Earth with Discovery.

STS-119 spacewalkers Richard Arnold and Joseph Acaba, both former teachers, will fly mementos,

WORD ON THE STREET

"What personal item would you like flown up to space and back?"

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such as small flags, from some of the schools where they taught.

Among the assortment of flags being flown is a National Guard design from Dale Earnhardt Jr.'s racing team. Earnhardt races in NASCAR's Sprint Cup Series in the No. 88 car sponsored in part by the National Guard.

Pilot and first-time flier Tony Antonelli arranged for Discovery to carry a green flag for Andretti Green Racing, the team of IndyCar racer Danica Patrick. Antonelli is expected

to serve as official starter for an IndyCar race after Discovery's flight.

The shuttle also will carry an extra spacesuit of sorts, although it would be too small for any of the crew members. The astronauts are taking the child-size garment into orbit for the Maryland Science Center in Baltimore. The suit is orange and resembles the pressure suits crew members wear during the climb toward space and the return to Earth.

All the items are expected to be displayed prominently after they are returned to their owners following the flight. They serve as inspirational objects for people who have never been into space or children who may set out on a scientific career in hopes of one day reaching orbit themselves.

There are at least eight items that are not expected to survive long enough to make the flight home, however. They are eight chocolate bars made by a company in India that gives part of its profits to conservation groups protecting endangered species throughout the world.

Steve Swanson, a mission specialist who will make several spacewalks during STS-119, asked for the dark chocolate bars to be packed aboard and eaten as dessert during one of the meals with the shuttle and space station crews.

Scores of objects are on display all over the world from previous space missions, and space shuttles typically carry a number of tokens that are handed out in recognition of employees and others.

Kepler shoots stars for similar planets

Johannes Kepler probably never considered that his invention of refining the telescope would lead to an observatory in space bearing his name and looking for planets similar to his own.

That is the goal of NASA's latest tool for looking out into space. By joining elements of today's digital camera with the basic design of the telescope Kepler helped develop, scientists plan to scan 100,000 stars in the Milky Way for telltale signs of planets like Earth orbiting around them.

Kepler will launch atop a Delta II rocket from Cape Canaveral Air Force Station's Launch Pad 17-B, currently targeted for March 6.

Once NASA's Launch Services Program, or LSP, gets Kepler to an orbit where it will watch the stars without being blocked by Earth, the spacecraft can begin to detect planets by looking for a slight dimming of light from the stars. It's a process called planet transit, and it has already been used to find planets the size of Jupiter outside our solar system.

Finding a much smaller planet similar to Earth at such distances requires cutting-edge technology built into the Kepler spacecraft.

"A planet transit occurs when a planet passes in front of its star and blocks part of the star's light," said NASA Mission Manager Armando Piloto. "Kepler will search for planets in the habitable zone, which is a distance from the star that would have the highest probability of finding liquid water.

"These planets, if discovered, would have the best chance of supporting life as we know it."

If Kepler does find an



NASA/Jack Pfaller

NASA's Kepler spacecraft, atop the United Launch Alliance Delta II rocket, waits for encapsulation in the fairing on Launch Pad 17-B at Cape Canaveral Air Force Station. Kepler is designed to survey more than 100,000 stars in our galaxy to determine the number of sun-like stars that have Earth-size and larger planets, including those that lie in a star's "habitable zone," a region where liquid water, and perhaps life, could exist. If these Earth-size worlds do exist around stars like our sun, Kepler is expected to be the first to find them and the first to measure how common they are.

Editor's note

As of press time, the launch of a Delta II rocket carrying the Kepler observatory was targeted for March 6.

For complete coverage and photos, go to:
www.nasa.gov.

Earth-like planet, it will take far more research and new technology to find out if humans live or could live there, but that's not stopping astronomers from doing the work they can right now.

"Whether or not we find other Earth-like planets, it reaffirms the purpose of our agency, which is exploration," NASA Launch Director Omar Baez said. "If we do find interesting objects, I would expect we would study it further, and surely believe a visit is one of the potential options."

Kepler is the third launch in 30 days for LSP, two of which took place at California launch pads. Because Kepler is launching from Florida, the launch team can get back to its home base for a little while.

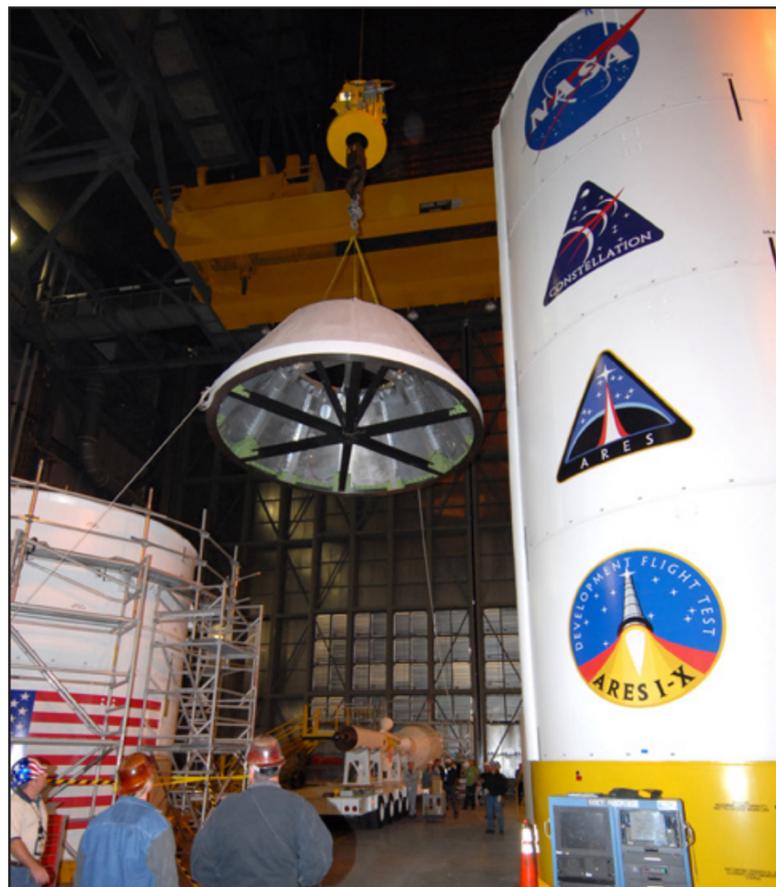
"Although, our work-day pace doesn't slow down," Baez said. "It allows us a chance to bring our family life back to some normalcy."

Slowing down isn't an option for the LSP team, because getting a spacecraft past Earth's orbit takes a few extra steps.

"All spacecraft that leave Earth's orbit require a rigorous testing regimen to handle the harsh environment of space," Piloto said. "Kepler has undergone numerous tests to ready it for this important mission.

"LSP has a lot of experience with ground-breaking, cutting-edge missions and is very excited about the upcoming Kepler launch."

SCENES AROUND KENNEDY SPACE CENTER



NASA/Tim Jacobs

A crane moves the Ares I-X crew module simulator in High Bay 4 of the Vehicle Assembly Building at Kennedy Space Center. Other Ares I-X segments are stacked around the floor of the bay. The launch of the 327-foot-tall, full-scale Ares I-X, that is targeted for July 2009, will be the first in a series of unpiloted rocket launches from Kennedy. When fully developed, the 16-foot-diameter crew module will furnish living space and re-entry protection for the astronauts.



For NASA

Lockheed Martin recently donated \$3,000 to MILA Elementary School for science achievement programs. Shown holding the check are, from left, Dr. Betsy Butler, MILA principal; Karin Jamison, director of test and support systems engineering; Herb Yamada, senior test engineer; Adrian Laffitte, director of Florida government relations at Lockheed; and Sharon Loines, MILA assistant principal.



NASA/Jack Pfaller

Three new towers surround Launch Pad 39B after the final 100-foot-tall lightning mast was installed Feb 13. The new lightning protection system is being built for the Constellation Program and Ares/Orion launches. Each tower is 500 feet tall with an additional 100-foot-long fiberglass mast atop supporting a wire catenary system. This improved lightning protection system allows for the taller height of the Ares I rocket compared to the space shuttle. Pad 39B will be the site of the first Ares vehicle launch, including the Ares I-X flight test that is targeted for July 2009.



NASA/Jack Pfaller

Technicians check out the solar arrays for NASA's Lunar Reconnaissance Orbiter, or LRO, at the Astrotech processing facility in Titusville, Fla. Accompanying LRO on its journey to the moon will be the Lunar Crater Observation and Sensing Satellite, or LCROSS, a mission that will impact the lunar surface in its search for water ice. Launch of LRO/LCROSS is targeted for May 20.



NASA/Tim Jacobs

NASA's Lunar Crater Observation and Sensing Satellite, known as LCROSS, is displayed after its shipping material was removed at the Astrotech payload processing facility in Titusville, Fla. The satellite's primary mission is to search for water ice on the moon in a permanently shadowed crater near one of the lunar poles.



NASA/Tim Jacobs

External fuel tank ET-131, which will be used on space shuttle Endeavour's STS-127 mission, moves from the turn basin to the Vehicle Assembly Building at Kennedy Space Center on Feb. 21. The tank was transported to a high bay for checkout. The tank will help launch the Japanese Experiment Module's Experiment Logistics Module-Exposed Section, or ELM-ES.

Spaceport News wants to know about your special talent

If you have a hidden talent or an interesting hobby, Spaceport News would like to share it. Send your information to **KSC-Spaceport-News@mail.nasa.gov** or mail it to Spaceport News at: IMCS-440, Kennedy Space Center, FL 32988.

Women engineers honor outstanding colleagues

*“Step with care and great tact
and remember that life’s a great
balancing act.”*

-- Dr. Seuss

No one understands those words more than a talented group of women engineers. That’s why Rachel Hutter, director of engineering at Disney’s Animal Kingdom, quoted Dr. Seuss’ “Oh, the Places You’ll Go” to inspire her colleagues at the Space Coast Section Society of Women Engineers’ awards banquet Feb. 24.

Each year, the section honors women who excel in their field, advance their organization’s mission and give back to the community.

“Honoring these women provides visibility to the many highly significant positions women engineers in our area hold,” said Lori McPherson, president of SWE’s Space Coast Section. “The banquet helps provide recognition that there isn’t a single important female engineer -- but many, many of them.”

The New Woman Engineer of the Year Award went to Capt. Lindsey Mahoney, field program manager for the U.S. Air Force’s 45th Space Wing.

Mahoney currently is serving as the chief of spacecraft integration for the Orbital Test Vehicle, or OTV -- an uncrewed long-duration, reusable

List of nominees

Nominees for the Distinguished New Woman Engineer of the Year Award included, Jessica Beahn, Harris Corp.; Lt. Sofia Calica, U.S. Air Force; Yashica Hunt, Harris Corp.; Kungun Mathur, Harris Corp.; Tuyet Nguyen, United Space Alliance; and Elizabeth Spalding, United Space Alliance. Nominees for the Technical Achievement Award included, Chandra Connerton, Lockheed Martin; Kirsten Dreggors, Northrop Grumman; Ashley Funderburke-Swingle, Northrop Grumman; Brenda Kaiser, Harris Corp; and Martha Meyer, Harris Corp. Nominees for Woman Engineer of the Year Award included, Charlie Blackwell-Thompson, NASA; Kimberly Guodace, United Space Alliance; Alene Heuser, Harris Corp.; Barbara Kerschner, Lockheed Martin; and Kelle Wendling, Harris Corp.

space vehicle that can return experiments to Earth. Mahoney is lead for integrating the spacecraft to its Atlas V rocket, including site procedures, fueling, customer concerns and control room setup.

“I never thought I would be involved with satellites, but since my first assignment at Schriever Air Force Base doing on-orbit satellite operations, I couldn’t picture myself doing anything else,” Mahoney said. “After on-orbit operations it seemed like a natural progression to do launch site mission assurance.”

The Technical Achievement Award went to Donna Waln, cargo integration engineering manager for Boeing at Kennedy Space Center.

Waln provides technical leader-

ship for the integration of space shuttle payloads into the orbiter cargo bays. Waln’s team of engineers currently is providing technical expertise for the resolution of an in-flight anomaly on the remotely operated electrical umbilical, or ROEU, during shuttle Endeavour’s STS-126 mission. The ROEU is the most highly complex piece of cargo integration hardware and is used to provide power and data to various payloads, including Multi-Purpose Logistics Modules, and the Japanese Experiment Module to be flown on Endeavour’s upcoming STS-127 mission.

“I am truly humbled to have won this award among such amazing candidates,” said Waln. “I feel

very proud and honored to work for the Boeing Company, and to have had the opportunity to work on the Space Shuttle Program for the last 21 years.”

Waln said her success wouldn’t be possible without her bosses, peers, employees and her husband, who “shares the crazy balancing act” they call life.

“Balancing work and family is an ongoing strategic operation,” McPherson said. “We’re all thankful for those employers willing to provide workplace flexibility. The end result is a more motivated, harder-working employee, working with greater efficiency and a better overall attitude.”

The Woman Engineer of the Year Award went to Wendy Martin, director of engineering at Harris Corp.

Martin helped with the engineering design of the space station, as well as provided MPEG encoding of video and audio for record and playback on mission computers for next-generation aircraft. She’s also active with local schools, exposing young girls to the thrill and satisfaction of engineering.

The section also awarded \$1,000 scholarships to four graduating seniors who will study engineering, math or computer science in college.



Among those attending the Space Coast Section Society of Women Engineers’ award banquet Feb. 24 were, from left, Lori McPherson, president of the Space Coast Section Society of Women Engineers; Wendy Martin, director of engineering at Harris Corp.; Capt. Lindsey Mahoney, field program manager for the U.S. Air Force’s 45th Space Wing; Donna Waln, cargo integration manager for Boeing Co.; and Rachel Hutter, director of attractions engineering services and quality assurance at Walt Disney World Co.

Remembering Our Heritage

Quick switch helped Apollo reach landing goal

This story is the first in a series of four Apollo articles.

By Kay Grinter
Reference Librarian

The success of Apollo 9 in March 1969, was essential if NASA's Apollo Program was going to meet the fast-approaching lunar landing deadline, set by then-President John F. Kennedy. The first human test of the lunar module, or LM, was the mission's primary objective. If the LM did not perform as expected, a moon landing would be greatly delayed.

By 1967, NASA had adopted an alphabetical stairway for reaching the moon in progressive mission tasks. Following this plan, step A provided for launch vehicle and command and service module, or CSM, development in a series of test flights. In step B, uncrewed flights targeted lunar module development and proof of the propulsion and staging systems.

In step C, crew performance operating the CSM would be evaluated. Step D flights further evaluated crew performance during combined operations of the LM with the CSM in low-Earth orbit. The step E flights would do the same in high-Earth orbit. Lunar-orbit, or deep space evaluation of the hardware, would come in step F; with step G accomplishing the ultimate goal -- a lunar landing.

Each step would be repeated as many times as necessary for its successful accomplishment.

When it became apparent that the LM would not be ready in time to support the plan and still meet the "end of the decade" landing goal, NASA managers revamped the sequence to take advantage of the readiness of the CSM for human testing. The newly conceived mission became Apollo 8, the first human mission to orbit the moon.

Inserting this new mission into the schedule meant the cancellation of the E flight and reassignment of the already established crews to the newly ordered missions. Next up



NASA file/1990

The Apollo 9 command and service module nicknamed "Gumdrop," and lunar module nicknamed "Spider," are shown docked together as Command Module Pilot David Scott stands in the open hatch. Astronaut Russell Schweickart took this photograph of Scott during his spacewalk as he stood on the porch outside Spider. Apollo 9 was an Earth-orbiting mission designed to test docking procedures between the modules, as well as test fly the lunar module in the relatively safe confines of Earth's orbit.

More online

To read astronaut James McDivitt's oral history interview in its entirety, visit: www.jsc.nasa.gov/history/oral_histories/participants.htm

to crew Apollo 9 was Commander James McDivitt and Command Module Pilot David Scott, both veterans of the Gemini Program, teamed with Lunar Module Pilot Russell "Rusty" Schweickart, a rookie.

Apollo 9, originally a D mission, was slated to use two Saturn IB rockets to launch the CSM and LM separately. To save some of the time required to process two launch vehicles, a Saturn V was enlisted to place both modules in orbit together.

The LM was "key to the whole

program," in McDivitt's words, "And trying to get it light enough to fly was a real challenge. We got to the point where we were filing little blousons off of castings and things like that to get the weight down."

During the 10 days following launch on March 3, the lunar module "Spider" did everything it was expected to do in lunar flight except land on the moon. Rendezvous with the CSM "Gumdrop" went well, and in McDivitt's evaluation, NASA did a "good job of engineering it, because we really didn't have very many big problems with the spacecraft.

"We did a dock burn with the lunar module. We did a bunch of oscillating tests with the command module. We did an EVA (spacewalk). We checked all the alternative methods of doing star alignments. We had multiple burns on the

descent stage. Throttled the engine up and down through regimes it probably was never throttled at when it landed on the moon. And it worked out really great."

McDivitt left the astronaut corps after Apollo 9 to ultimately become manager of the Apollo Spacecraft Program. He made the career change, he explained, because it was "apparent to me that I wasn't going to be the first guy to land on the moon, which was important to me. And being the second or third guy wasn't that important to me."

The switch in crews for the reordered missions was decisive in who became the first man to walk on the moon. By the process of crew rotation in place, Pete Conrad, backup commander for the Apollo 9 crew, would have been in line for prime crew commander of Apollo 11.

NASA Employees of the Month: March



NASA/Kevin O'Connell

Employees of the month for March are, from left, Chad Carl, Engineering Directorate; William Manley, Engineering Directorate; Nathan Gelino, Safety & Mission Assurance Directorate; David Sumner, Center Operations; Timothy Freeland, Procurement Office; and Sarah Schilling, Launch Vehicle Processing Directorate. Not pictured, include, Sariah Adams, Chief Council; Amos Reckline, Information Technology & Communications Services; Gary Letchworth, Constellation Project Office; Michael O'Malley, Launch Services Program; Lisa Stephany, Human Resource Office; and Andres Adorno, External Relations.

WORD ON THE STREET

What personal item would you like flown to space and back ?



"A scapular that my grandmother wore her entire life. It is my most-prized possession."

Thomas Ferruzza,
with NASA

"My family Bible. It represents the values that our country were founded upon."

Jane Dumont,
with REDE/Critique Inc.



"My daughter . . . because her life-long goal has always been to be an astronaut."

Alan Littlefield,
with NASA

"I have my kids' shoes that all my children have worn hanging in my truck."

Richard Snyder,
with NASA



"A University of Missouri alumni pennant. It's where I went to school."

Stephen Van Genderen,
with NASA

Looking up and ahead

Targeted for March 6	Launch/CCAFS: Delta II, Kepler; 10:49:57 p.m. EST
March 7	KSC All-American Picnic, KARS Park I
Tentatively targeted March 12	Launch/KSC: Discovery, STS-119; 8:54 p.m.
No earlier than March 13	Launch/CCAFS: Atlas V, WGS SV-2; 9:25 p.m.
No earlier than March 24	Launch/CCAFS: Delta II, GPS IIR-20; 4:34 a.m.
No earlier than April 28	Launch/CCAFS: Delta IV, GOES-O; 6:24 p.m.
Target May 12	Launch/KSC: Atlantis, STS-125; 1:11 p.m.
Target May 15	Launch/KSC: Endeavour, STS-127; 4:52 p.m.
No earlier than May 20	Launch/CCAFS: Atlas V, LRO/LCROSS; TBD
June	Launch/CCAFS: Falcon 9; TBD
No earlier than June 16	Launch/CCAFS: Delta II, STSS Demo; TBD
No earlier than July 8	Launch/CCAFS: Delta IV, WGS SV-3; TBD
Target July 11	Launch/KSC: Ares I-X flight test/Launch Pad 39B; TBD
Target Aug. 6	Launch/KSC: Atlantis, STS-128; TBD
No earlier than Aug. 14	Launch/CCAFS: Delta II, GPS IIR-21; TBD
No earlier than Sept. 29	Launch/CCAFS: Delta IV, GPS IIF-1; TBD
No earlier than Oct. 1	Launch/VAFB: Taurus, Glory; TBD
No earlier than Oct. 8	Launch/CCAFS: Atlas V, SDO; TBD
Target November	Launch/KSC: Discovery, STS-129; TBD
Target Nov. 12	Launch/KSC: Discovery, STS-129; TBD
No earlier than Nov. 12	Launch/CCAFS: Delta IV, GOES-P; TBD
December	Launch/CCAFS: Atlas V, Commercial Payload; TBD
Target Dec. 10	Launch/KSC: Endeavour, STS-130; TBD
Target Feb. 11, 2010	Launch/KSC: Atlantis, STS-131; TBD
Target April 8, 2010	Launch/KSC: Discovery, STS-132; TBD
Target May 31, 2010	Launch/KSC: Endeavour, STS-133; TBD



John F. Kennedy Space Center

Spaceport News

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