National Aeronautics and Space Administration

MARSHALL STAR

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Oct. 15, 2009

NASA spacecraft impacts moon in search for water ice

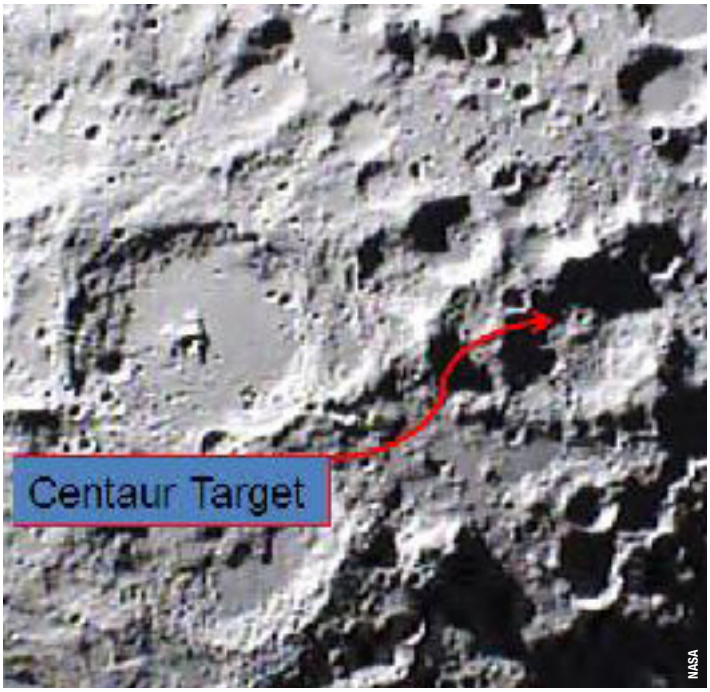
From a NASA news release

NASA's Lunar Crater Observation and Sensing Satellite, or LCROSS, created twin impacts on the moon's surface early Oct. 9 in a search for water ice. Scientists will analyze data from the spacecraft's instruments to assess whether water ice is present.

The satellite traveled 5.6 million miles during an historic 113-day mission that ended in the Cabeus crater, a permanently shadowed region near the moon's south pole. The spacecraft was launched June 18 as a companion mission to the Lunar Reconnaissance Orbiter from NASA's Kennedy Space Center in Florida.

LCROSS is one of the path-finding robotic missions to the moon, which is managed by the Lunar Precusor Robotics Program at the Marshall Space Flight Center. The program's precursor missions will help enable sustained human exploration of our solar system.

*See **Impact** on page 7*



The Centaur target crater as seen by LCROSS' visible light camera before impact.

Marshall completes successful ullage motor development test

Ares ullage motor testing at the Marshall Center

By Craig Dunn

With a loud roar and a bright flash, the first round of development testing for the ullage settling motor was successfully completed at the Marshall Space Flight Center.

The Ares I is the first rocket under development for NASA's Constellation Program, a program tasked with the development of vehicles necessary to carry explorers on future journeys of exploration.

The hot-fire test – the second in this series of development tests – was conducted Oct. 8 at Test Stand 116 in the Marshall Center's East Test Area. All test objectives were met, bringing NASA one step closer to developing America's new space

*See **Ullage** on page 6*

Marshall tests load limits for Ares I rocket main parachute

By Craig Dunn

Marshall Space Flight Center and industry engineers conducted a design limit load test of the Ares I rocket's main parachute Oct. 8 at the U.S. Army's Yuma Proving Ground near Yuma, Ariz. The Ares I is the first rocket in NASA's Constellation Program that will launch explorers on journeys to the International Space Station, the moon and beyond.

Engineers from the Marshall Center managed the team that conducted the test – the first in a series of three planned load limit tests – designed to place 100 percent of the flight dynamic loads on the parachute canopy.

From the back of a U.S. Air Force C-17 aircraft, researchers dropped a 72,000-pound payload – tying the record for the heaviest load ever extracted from the aircraft during flight – from an altitude of 25,000 feet. The parachute and all test hardware functioned properly and landed safely.

"This was the ninth test for the Ares parachute recovery system, which is a tribute to the success of previous development testing," said James Burnum, first stage structural and mechanical team lead for the Ares Projects at the Marshall Center. "Thanks to the hard work of a dedicated team of professionals, we have taken the data collected from earlier tests, learned from it, and applied that knowledge to make sure our parachutes work right for the Ares I-X test flight and later the Ares I rocket."

Marshall and ATK successfully conducted a design limit load test of the Ares I rocket's main parachute Oct. 8 at the U.S. Army's Yuma Proving Ground near Yuma, Ariz.

As the name implies, the test is designed to push the parachute's canopy to its limit – supporting a 250,000-pound dynamic load. Dynamic load weight is generated by the drag and pull of the payload. The primary test objective was to achieve a dynamic pressure of 110 pounds per square foot on the canopy, simulating the conditions the main parachute will experience when it is deployed to slow the rapid descent of the rocket's spent first-stage motor.

"The test was a success as everything performed as planned," said Ron King, deceleration subsystem manager for the Ares I project who was onsite in Yuma for the test. "It's an impressive sight to see this giant canopy deploy and open against the blue sky of the desert, and then gently land on the desert floor. This test helps to confirm that our parachute system will be successful in safely landing the very heavy Ares solid rocket booster in the Atlantic Ocean."

The main parachute – measuring 150 feet in diameter and weighing 2,000 pounds – is the largest rocket parachute ever built and the primary element of the rocket's deceleration and recovery system, which also includes a pilot parachute and drogue parachute. The parachutes work in tandem, providing the drag necessary to slow the descent of the huge solid rocket motor. The parachute system allows the first stage to achieve a soft landing in the ocean where it will be recovered, evaluated and prepared for reuse on future missions.

The next load test, scheduled for spring 2010, will test the deployment of the drogue and pilot parachutes during a single drop.

Dunn, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

Flu shot update

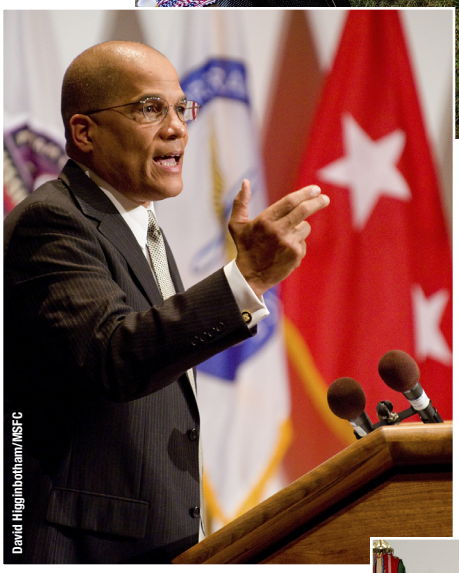
The Marshall Space Flight Center has been notified that the supply of seasonal flu vaccines at the center this year will be extremely limited. Because of the limited supply, employees who desire a vaccine are encouraged to seek an alternate source for vaccination this year.

Employees should check with their doctor, local pharmacy or other community provider if they would like a vaccine. Seasonal flu vaccine is typically covered by most insurance providers, and many vendors will process claims so that no out-of-pocket expense is incurred.

Marshall is still awaiting information about when H1N1 vaccine will be available. The center's supply of that vaccine also is expected to be limited.

CFC in full swing with celebration, agency fair, volunteering

The Marshall Space Flight Center joined other regional federal agencies at the Sept. 30 Tennessee Valley kickoff celebration and agency fair for the Combined Federal Campaign – the federal government's annual goodwill drive to benefit charitable organizations. Participants at the fair, right, had the chance to talk with representatives from local charitable organizations to learn how they benefit from the fundraising drive. CFC community service opportunities and bus tours to local charitable organizations are available for sign-up through Inside Marshall.



Dr. Delbert Baker, president of Oakwood University in Huntsville, delivers the keynote address at the CFC kickoff celebration Sept. 30 at the Sparkman Center.

Participating in the CFC kickoff celebration are, from left, Herb Shivers, deputy director of Marshall's Safety & Mission Assurance Directorate; U.S. Army Maj. Gen. James Myles, commanding general of Redstone Arsenal; Irene Taylor, executive chairperson for Marshall's 2009 CFC and manager of Marshall's Mission Systems Assurance and Technical Support Department in the Safety & Mission Assurance Directorate; Linda Gomez, Marshall's CFC executive vice chairperson for promotions and an external relations program support specialist in Marshall's Office of Strategic Analysis & Communications; and Linda Schrimsher, a CFC monitor and management support assistant in Marshall's Logistics Services Office in the Office of Center Operations.

Discovery astronauts share highlights of their STS-128 mission during visit to Marshall

By Sanda Martel

Space shuttle Discovery astronauts who flew the STS-128 mission visited the Marshall Space Flight Center on Oct. 13 to share highlights of their 13-day visit to the International Space Station.

Marshall Center Director Robert Lightfoot introduced Commander Rick Sturckow and Mission Specialist John "Danny" Olivas to Marshall team members gathered in Morris Auditorium, Building 4200. They began their mission Aug. 28 from Kennedy Space Center, Fla., landing Sept. 11 at Edwards Air Force Base, Calif.

Sturckow thanked Marshall for being a part of the "great team effort that allows the shuttle to fly safely."

He mentioned the superior performance of the space shuttle main engines, external tank and reusable solid rocket boosters during Discovery's launch. The Marshall Center is responsible for the space shuttle's propulsion system, consisting of the main engines, the solid rocket boosters with their solid rocket motors and the external tanks. The three high-performing, reusable liquid propellant rocket engines, along with the solid rocket boosters, provide more than 7.8 million pounds of thrust to lift the space shuttle to orbit.

"It was a beautiful night launch on an important mission that delivered more than seven tons of supplies, science racks, equipment and additional environmental hardware to sustain six crew members," said Sturckow.

He credited the Marshall Center for its contributions to science experiments conducted aboard the space station, including delivery of the Materials Science Research Rack by the STS-128 crew. The rack will be used for basic materials research in the microgravity environment of the orbiting outpost. It can accommodate and support experiments with many material types, including alloys, polymers, semiconductors, ceramics, crystals and glasses, which can be studied to discover new applications for existing materials and new or improved materials.

Olivas served as lead spacewalker for the mission, participating in all three spacewalks. His tasks included installation of a new ammonia tank on the space station and stowing an empty tank on Discovery's payload bay for return to Earth; retrieving two experiments from the European Columbus module for return to Earth; and routing power cables for Tranquility, Node 3.

"The construction of the space station is almost complete," Olivas said. "We are stepping up science to a new level and our mission contributed to the amount of science experiments that will be conducted aboard the space station."

For more information about the STS-128 mission, visit http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/sts128/main/index.html

Martel, an Allied Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

Mission Specialist "Danny" Olivas, left, and Commander Rick Sturckow take questions from the news media at the Marshall Center on Oct. 13.

Marshall's new voicemail system to become effective Oct. 28

A new voicemail system for Marshall Space Flight Center telephone users will become effective Oct. 28 at 6 a.m. The Office of the Chief Information Officer is leading this effort.

To prepare for the new system, users should dial 544-8000 to set up their voicemail account prior to Oct. 27. A tutorial will guide users through each step.

A passcode will be mandatory to use the new system. The default code to access the system for setup is "1234." Team members may then set a new, personal code.

Please visit Inside Marshall for instructions, or refer to the centerwide e-mail sent to team members Oct. 14.

For questions, please call 544-2020.

NASA Exchange annual nut sale pre-orders under way

The NASA Exchange is offering Marshall team members and retirees the opportunity to purchase nuts through pre-orders. Orders will be accepted through Oct. 29 to ensure delivery by Thanksgiving. The expected delivery date is Nov. 19.

The order form should be completed and mailed or delivered, along with payment, to the NASA Exchange Space Shop, Attn: Sherry, HS01XX, Bldg. 4203, Huntsville, AL 35812.

NASA/MSFC Exchange Marshall Exchange

"NASA EXCHANGE ANNUAL NUT SALE"

Order Form

NAME:_____ **Office Symbol:**_____

Office Phone:_____ **Email Address:**_____

SPECIFY QUANTITY AND TOTAL PRICE

Product (16 oz. Unless noted):	QUANTITY	TOTAL PRICE
Pecan Halves @ $7.00.....	_____	$_____
Raw Peanuts @ $2.00.....	_____	$_____
Chocolate Covered Pecans @ $7.50.....	_____	$_____
White Chocolate Pecans @ $7.50.....	_____	$_____
Roasted & Salted Pecans @ $7.50.....	_____	$_____
Crunchy Praline Pecans @ $7.50.....	_____	$_____
Natural Almonds (12 oz.) @ $3.50.....	_____	$_____
Slivered Almonds (11 oz.) @ $3.50.....	_____	$_____
Pistachios @ $6.50.....	_____	$_____
Cashews @ $7.00.....	_____	$_____
English Walnuts @ $5.25.....	_____	$_____
Totals		$_____

******PAYMENT MUST ACCOMPANY ORDER*******

Make Checks Payable to: NASA Exchange - MSFC

DEADLINE FOR ORDERING IS: *October 29, 2009* to ensure delivery before Thanksgiving.

PLEASE MAIL CHECK & ORDER TO: NASA EXCHANGE SPACE SHOP, ATTN: Sherry, HS01XX BLDG. 4203, Huntsville, AL 35812. Payment may be made by Cash, VISA, MasterCard, Discover, or American Express by taking your order form to the NASA Exchange Space Shop located in Building 4203.

Received by:_____ **Date** _____

MSFC One-Time Form ()

'Sailing with NASA' blog to offer insight into ocean-going voyage, spaceflight of shuttle external tank ET-134

NASA will provide a unique behind-the-scenes look at the ocean journey of a space shuttle external tank from the Michoud Assembly Facility in New Orleans to NASA's Kennedy Space Center in Florida.

ET-134 is set to depart Michoud Oct. 15 on NASA's Pegasus barge for a 900-mile sea journey to Kennedy. The barge will be towed by NASA's solid rocket booster retrieval ship, the Liberty Star.

On board will be Marshall Space Flight Center Public Affairs Officer Steve Roy, who will blog via the NASA portal several times a day with stories, updates, images and video. Mick Speer, a producer for Marshall TV, will document this portion of NASA's maritime operations and life on board the ship during the six-day trip.

Upon its arrival at Kennedy, ET-134 will become the "backbone" of the shuttle stack and gas tank for main engines during the February launch of space shuttle Endeavour's flight to the International Space Station. The external tank is 153.8 feet long, 27.6 feet in diameter and weighs approximately 58,500 pounds.

To follow the journey, visit http://blogs.nasa.gov/cm/blog/sailing_with_nasa/.

Ullage *Continued from page 1*

transportation system.

"The success of the test is an important step in the continuing development of the elements necessary to successfully launch the Ares I rocket," said Craig McArthur, acting upper stage manager for Ares Projects at Marshall. "While this is a relatively small motor, at only 9 inches in diameter and 47 inches in length, it will play a major role by ensuring safe and successful flights for the Ares rocket."

The word "ullage" is derived from the French word "ouillage," a term used in winemaking to describe the air pocket between wine and the top of a storage container, such as a barrel or bottle. In reference to the Ares I, ullage refers to the space inside the top of the upper stage fuel tank and the need to settle the fuel to the bottom of the tank.

The ullage settling motor is a small, solid rocket motor that serves a key role during the launch of the Ares I rocket. During first stage separation, which occurs 125.8 seconds into flight, the motor will fire for four seconds, producing the forward thrust needed to ensure the rocket's liquid fuel is properly pushed to the bottom of the upper stage fuel tank prior to ignition of the J-2X engine that powers the upper stage.

The ullage motor is similar in design to the booster separation motor used on the space shuttle's reusable solid rocket motor. Four ullage motors will be arranged in equally spaced locations (every 90 degrees) around the Ares I upper-stage aft skirt.

The Oct. 8 test marked the final development ullage workhorse motor test, which uses a heavy steel motor case designed for multiple tests. Engineers used data collected from the first ullage motor test in September 2008 to modify the motor for this test. Refinements include increased motor burn time, the addition of a new flight igniter to start the motor, a newly designed nozzle throat insert, and bonding of the motor insulation material to aluminum instead of steel.

Instrumentation also was added to track motor performance by measuring acoustics and combustion stability. Several upper-stage witness panels were placed in the plume flow to determine the potential erosion effect of the burning propellant on the exterior of the Ares I vehicle.

"Thanks to our great team, we have been able to take this motor from the drawing board to the test stand and implement the changes necessary for a successful test series," said Steve Harvison, ullage settling motor design lead at Marshall.

The ullage motor is the first small motor in decades to be designed, developed and tested at the Marshall Center. The ullage team included Marshall engineers; ATK Space Systems; and the U.S. Army's Aviation and Missile Research, Development, and Engineering Center – or AMRDEC – at Redstone Arsenal.

The Boeing Company's Space Exploration division team in Huntsville, the upper stage prime contractor, and ATK Space Systems, Magna, Utah, the subcontractor, have been awarded NASA contracts to manufacture the remaining development and qualification test motors for the next series of tests scheduled to begin in spring 2010.

NASA's Johnson Space Center in Houston manages the Constellation Program, which includes the Ares I rocket, the Ares V heavy-lift launch vehicle, the Orion crew capsule and the Altair lunar lander. The Marshall Center manages the Ares Projects for the agency.

Dunn, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

Impact *Continued from page 1*

"I'm very proud of the LCROSS team," said Todd May, manager of Marshall's Lunar Precursor Robotic Program. "They managed to put together a small robotic mission that returned key scientific data about one of the moon's permanently shadowed craters, and they did it on time and within budget."

In preparation for impact, LCROSS and its spent Centaur upper stage rocket separated about 54,000 miles above the surface of the moon Oct. 8 at approximately 8:50 p.m. CDT.

Moving at a speed of more than 1.5 miles per second, the Centaur hit the lunar surface shortly after 6:31 a.m. Oct. 9, creating an impact that instruments aboard LCROSS observed for approximately four minutes. LCROSS then impacted the surface at approximately 6:36 a.m.

"The LCROSS science instruments worked exceedingly well and returned a wealth of data that will greatly improve our understanding of our closest celestial neighbor," said Anthony Colaprete, LCROSS principal investigator and project scientist at NASA's Ames Research Center in Moffett Field in California. "The team is excited to dive into data."

"This is a great day for science and exploration," said Doug Cooke, associate administrator for the Exploration Systems Mission Directorate at NASA Headquarters in Washington. "The LCROSS data should prove to be an impressive addition to the tremendous leaps in knowledge about the moon that have been achieved in recent weeks. I want to congratulate the LCROSS team for their tremendous achievement in development of this low-cost spacecraft and for their perseverance through a number of difficult technical and operational challenges."

Twenty-five Earth-based observatories were aimed at the twin impacts. The data obtained will be shared with the LCROSS science team for analysis. The LCROSS team expects it to take several weeks of analysis before it can make a definitive assessment of the presence or absence of water ice.

"I am very proud of the success of this LCROSS mission team," said Daniel Andrews, LCROSS project manager at Ames. "Whenever this team would hit a roadblock, it conceived a clever work-around allowing us to push forward with a successful mission."

The images and video collected by the amateur astronomer community and the public also will be used to enhance our knowledge about the moon.

"One of the early goals of the mission was to get as many people to look at the LCROSS impacts in as many ways possible, and we succeeded," said Jennifer Heldmann, Ames' coordinator of the LCROSS observation campaign. "The amount of corroborated information that can be pulled out of this one event is fascinating."

Breast Cancer Awareness Month lunch-n-learn to be held Oct. 15

All Marshall Space Flight Center team members are invited to a Breast Cancer Awareness Month lunch-n-learn from 11 a.m. to 1 p.m. Oct. 15 in Building 4200, Room 409.

Guest speakers will be Patty Stutts from the Clearview Cancer Center, and Bridget Dietz and Shannon Siegel from NESIN Therapy Services. Both companies are based in Huntsville.

Please bring a sack lunch and drink. For questions, contact Inge Kuberg at 544-5678.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, Oct. 22, is 4:30 p.m. Thursday, Oct. 15.

Miscellaneous

Pair of upholstered bucket swivel chairs, ottoman, $75; Two ornate wood twin headboards, $75. 714-4651

Set of 36 Princess Diana stamps, in sleeves, from the International Collectors' Society, $18. 837-6776

Electric hospital bed, $250 obo; rolling walker, $100 obo; diabetic shoes, size 8, negotiable. 922-1424

Garmin 750 GPS, universal dash mount, $200 obo. 883-2982

Dining table and chairs, five pieces, $30. 990-4243

Mizerak 8-foot pool table, all accessories, $175 or would consider trade for foosball table. 520-3740

Babicz finger-style guitar rosewood, tobacco sunburst top, LR Bagg, HS case, $850. 603-9371

Antique dining set, buffet, china cabinet, table, six chairs, $1,000 obo; antique sofa. 325-1017

Multi-section entertainment center with storage, 63 inches long, $800; two oak entertainment centers, $50 each. 508-1144

Swimming pool leaf net cover for 16x32 foot pool, $75. 883-2653

17-inch rims and tires, 5 lugs, pictures available, $500. 759-3009

Pink and yellow cana lilies, $1.50 each; lot of more than 100 plants, $100. 773-5051

Twin bed headboard and footboard, Tell City hard rock maple, spindle design, $250. 881-8953

Two twin-size mattresses, box springs, frames, king-size headboard, $175. 851-0893

Two Talladega OV Hill North tickets, two wrist bands for Halloween party, $200. 230-6819

Cherry-finish pool table, claw feet, tan cloth, $1,200 obo. 541-6074

Vehicles

2008 Lexus IS 250, warranty, 19.8k miles, $34,000 negotiable. 457-1804

2008 Sun Tracker Party Barge 22 Sport Fish, 115 EFI 4-stroke, Snap-on cover, $28,500. 509-2524

2006 Chrysler Pacifica Touring, red, third row, 25k miles, $13,000. 797-1300

1978 28-foot Holiday Rambler camper trailer, $1,000 obo. 859-2975 or 651-6454

Wanted

Houses/offices to clean, available evenings and weekends, gift certificates available. 777-8595 leave message

Free

Kittens, two black, two white, one gray, litter box trained. 652-2462

Lost

Men's Progressive Lens eyeglasses, metal frames, Building 4201 vicinity, Oct. 2. 544-9418

Space shuttle Atlantis rolls out to launch pad

Space shuttle Atlantis began its journey to the launch pad at the Kennedy Space Center, Fla., Oct. 14. The 3.4 mile trip – with Atlantis atop a crawler transporter – takes about six hours. Atlantis and its crew of six astronauts are targeted to launch Nov. 12 on the STS-129 mission to the International Space Station.

Marshall team encouraged to participate in Veterans Day parade

Marshall Space Flight Center team members can recognize the "heroes among us" by taking part in Huntsville's annual Veterans Day parade Nov. 11.

The event, sponsored by Huntsville television station WAFF, Channel 48, begins at 11 a.m. in downtown Huntsville. This year's parade theme is "Courage, Sacrifice, and Duty –Heroes Among Us."

Participating Marshall team members are encouraged to wear clothing with the NASA logo and meet at 10 a.m. in the parking lot next to the Coca-Cola Bottling Company on Clinton Avenue. Shuttle vans will be provided for those who cannot walk the two-mile route.

For more information about the parade or for specific accommodations, contact Phyllis Olinger, in Marshall's Office of Diversity and Equal Opportunity at 544-0022.

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