National Aeronautics and Space Administration

MARSHALL STAR

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May 28, 2009

Lunar exploration missions scheduled for June 17 launch

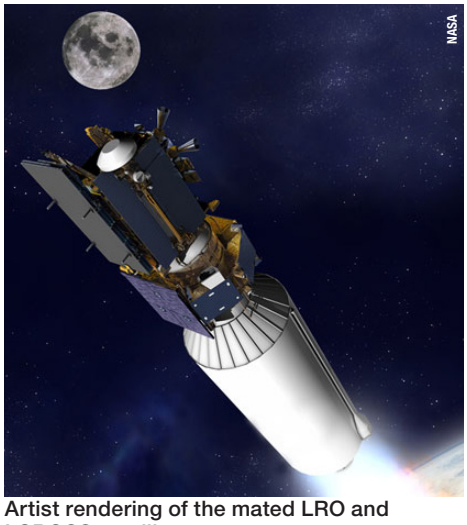
NASA Headquarters

NASA's return to the moon will get a boost in June with the launch of two satellites that will return a wealth of data about Earth's nearest neighbor.

On June 21, the agency outlined the upcoming missions of the Lunar Reconnaissance Orbiter, or LRO, and the Lunar Crater Observation and Sensing Satellite, or LCROSS. The spacecrafts will launch together June 17 aboard an Atlas V rocket from Cape Canaveral Air Force Station in Florida.

The Lunar Precursor Robotic Program Office at the Marshall Space Flight Center provides programmatic oversight and management for LRO and LCROSS missions.

"These two missions will provide exciting new information about the moon, our nearest neighbor," said Doug Cooke, associate administrator of NASA's Exploration Systems Mission Directorate in Washington. "Imaging will show dramatic landscapes and areas of interest down to one-meter resolution. The data also will provide information about potential new uses of the moon. These teams have done a tremendous job designing and building these two spacecraft."



Artist rendering of the mated LRO and LCROSS satellites.

Using a suite of seven instruments, LRO will help identify safe landing sites for future human explorers, locate potential resources, characterize the radiation environment and test new technology.

LCROSS will seek a definitive answer about the presence of water ice at the lunar poles. LCROSS will use the spent

*See **Launch** on page 2*

After successful Hubble rejuvenation, space shuttle Atlantis lands in California

Space shuttle Atlantis glides toward Runway 22 at Edwards Air Force Base, Calif., as it concludes its historic final servicing mission to the Hubble Space Telescope.

From combined reports

Space shuttle Atlantis landed at Edwards Air Force Base, Calif., May 24, completing the final servicing mission to NASA's Hubble Space Telescope. Atlantis' astronauts conducted five successful spacewalks during their STS-125 flight to enhance and extend the life of the orbiting observatory.

Shuttle Atlantis' nearly 13-day mission of almost 5.3 million miles

*See **STS-125** on page 5*

Marshall engineers successfully test world's largest rocket parachutes for Ares I

By Craig Dunn

Unfurling in majestic patriotic colors, the three, 150-foot diameter main parachutes for the Ares I rocket first stage successfully completed the first cluster test May 20 at the U.S. Army Yuma Proving Ground near Yuma, Ariz.

The Ares I, the first launch vehicle being designed for NASA's

*See **Parachutes** on page 3*

Alabama Senate recognizes Marshall's Ann McNair for outstanding achievements

Ann McNair, director of the Marshall Space Flight Center Office of Center Operations, has been commended by the Alabama Senate for her outstanding professional achievements during 50 years of service at NASA. Acting Center Director Robert Lightfoot, left, presents McNair with a copy of the resolution at the Marshall Center Management Council meeting May 19.

Launch

Continued from page 1

second stage Atlas Centaur rocket in an unprecedented way that will culminate with two spectacular impacts on the moon's surface.

"The processes that shaped the moon also shaped the Earth and other terrestrial planets, so studying the moon is a window into all rocky planets," said Todd May, Lunar Precursor Robotic Program manager at the Marshall Center. "We're looking forward to exploring the lunar surface and possibly finding that useable resources exist there."

LRO's instruments will help scientists compile high-resolution, three-dimensional maps of the lunar surface and also survey it in the far ultraviolet spectrum. The satellite's instruments will help explain how the lunar radiation environment may affect humans and measure radiation absorption with a plastic that is like human tissue.

LRO's instruments also will allow scientists to explore the moon's deepest craters, look beneath its surface for clues to the location of water ice, and identify and explore both permanently lit and permanently shadowed regions. High-resolution imagery from its camera will help identify landing sites and characterize the moon's topography and composition. A miniaturized radar system called mini-rf will image the poles and test the system's communications capabilities.

While most second stage Atlas Centaur rockets complete their work after boosting payloads out of Earth's orbit, the LCROSS Centaur will journey with the spacecraft for four months and be guided to an impact in a permanently shadowed crater at one of the moon's poles. The resulting debris plume is expected to rise more than six miles. It presents a dynamic observation target for LCROSS as well as for a network of ground-based telescopes, LRO, and possibly the Hubble Space Telescope. Observers will search for evidence of water ice by examining the plume in direct sunlight. LCROSS also will increase knowledge of the mineralogical makeup of some of the remote polar craters that sunlight never reaches. The satellite represents a new generation of fast development, cost-capped missions that use flight-proven hardware and off-the-shelf software to achieve focused mission goals.

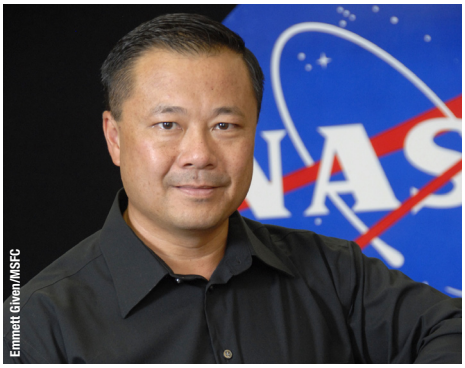
LRO and LCROSS are the first missions launched by NASA's Exploration Systems Mission Directorate. The satellites' data will be used to advance goals of future human exploration of the solar system. LRO will spend at least one year in low polar orbit around the moon, collecting detailed information for exploration purposes before being transferred to NASA's Science Mission Directorate to continue collecting additional scientific data.

Goddard Space Flight Center in Greenbelt, Md., built and manages the Lunar Reconnaissance Orbiter. LRO is a NASA mission with international participation from the Institute for Space Research in Moscow. Russia provides the neutron detector aboard the spacecraft. Ames Research Center in Moffett Field, Calif., manages the Lunar Crater Observation and Sensing Satellite. Northrop Grumman in Redondo Beach, Calif., built the LCROSS spacecraft.

THE FACE OF MISSION SUCCESS IS:

Howard Soohoo

Executive intern to the Marshall Center Director



- **Organization:** Office of the Director
- **Joined NASA**: 1987
- **Education**: Bachelor's degree in electrical engineering, 1987, New Mexico State University in Las Cruces
- **Responsibilities**: I support the day-to-day activities of the Office of the Director, as well as a multitude of center-related functions and meetings.
- **Previous experience**: Engineer supporting the Test Integration Office, integrating avionics hardware systems for the Ares I first stage and Ares I upper stage projects
- **What is the coolest thing about your current job**? Getting a crash course in executive leadership and management at the center-director level.
- **Who is someone you highly respect?** My grandfather immigrated to the United States from China to start a new life for his family. He spoke no English, but overcame adversity by moving to a new country – with no support system – to raise his three children. He was a strong individual with deep commitments to his family, work and health. He always had a smile on his face and a positive attitude about life.

Parachutes *Continued from page 1*

Constellation Program, will carry explorers to the International Space Station, the moon and beyond in coming decades. The main parachutes are designed to slow the rapid descent of the spent first stage, permitting its recovery for use on future flights. The parachutes and all test hardware functioned properly and landed safely.

Marshall Space Flight Center engineers managed the team that conducted this first cluster test with the newly designed parachutes. This was the eighth in an ongoing series of flight tests supporting development of the Ares I parachute recovery system. Researchers dropped the 41,500-pound load, which simulates the rocket's spent first stage motor, from a U.S. Air Force C-17 aircraft flying at an altitude of 10,000 feet.

Marshall and ATK successfully conducted an Ares I main cluster parachutes test May 20 at the U.S. Army Proving Grounds in Yuma, Arizona.

"The successful cluster test of the Ares I rocket main parachutes confirms the development and design changes we have implemented for the first stage recovery system," said Ron King, Ares I first stage deceleration subsystem manager for the Ares Projects at the Marshall Center. "Thanks to our great collaborative team, everything went as anticipated and all of our design objectives were met. The test was spectacular. To see three, 150-foot diameter parachutes fully inflated at one time, dropping against a desert background, is just awesome!"

The main parachutes – the largest rocket parachutes ever manufactured – measure 150 feet in diameter and weigh 2,000 pounds each. They serve as the central element of the rocket's deceleration system, which includes a pilot parachute, a drogue parachute and the main parachutes. Deployed in a cluster, the main parachutes open at the same time, providing the drag necessary to slow the descent of the huge solid rocket motor for a soft landing in the ocean.

ATK Space Systems near Promontory, Utah, is the prime contractor for the first stage booster. ATK's subcontractor, United Space Alliance of Houston, is responsible for design, development and testing of the parachutes at its facilities at NASA's Kennedy Space Center, Fla.

NASA's Johnson Space Center in Houston manages the Constellation Program, which includes the Ares I rocket, the Ares V heavy-lift launch vehicle and the Orion crew spacecraft. The Marshall Center manages the Ares Projects. The U.S. Army's Yuma Proving Ground provides the test range, support facilities and equipment to NASA for parachute testing.

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

Volunteers still sought for 'Take Our Children to Work Day' June 4

On June 4, the Marshall Space Flight Center will host its annual "Take Our Children to Work Day." All Marshall Center team members with children in grades 3-12 are invited to participate.

The Office of Diversity and Equal Opportunity continues to seek volunteers to support the event. Marshall Center team members may volunteer by e-mailing their name and phone number to Abbie Johnson at abbie.j.johnson@nasa.gov or Phyllis Olinger at phyllis.y.olinger@nasa.gov. Volunteer registration ends June 2.

For a complete schedule of events and other information about "Take Our Children to Work Day," visit http://eo.msfc.nasa.gov/c2w/.

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, June 4, is 4:30 p.m. Thursday, May 28.

Miscellaneous

John Deere tractor, 85HP, cab, A/C, 4WD, 8' Bushhog, $23,000. 425-1762

HP LaserJet 1300 laser printer, $100. 883-2877

Honda lawnmower, HRT-216, self-propelled, bag or discharge, 8 years old, $130. 348-9381

Black and Decker Leaf Hog blower/vacuum, electric, $20. 882-3983

Fiddle-back Windsor chairs; Queen Anne dining table, solid oak, clear finish, photos available. 347-1674

Whirlpool dishwasher, portable, almond, $200. 773-5051

3-SW Ping Eye2 Irons, greendot, $160; Ping G5 Hybrid 22 degree, $50. 683-3397

Windsor upright commercial vacuum, two-stage filtration, $150. 508-4379

2008 scooter, 150cc, less than 50 miles, auto, disc brakes, street legal, $800. 352-9340

AKC Parson Jack Russell Terrier puppies, $325 each. 572-0284

2003 Club Car golf cart, gas, beige, windshield. $2,250 obo. 682-6326

Thule roof rack two-bike carriers, was on a Grand Cherokee, $250. 658-8241

Four person hot tub, $700. 617-2709

White porcelain Kohler double bowl sink, white Delta pull-out faucet, $100. 679-6676

Kenmore washer, XL capacity, $75; queen Serta box spring mattress, $100. 837-6228

Connelly, Snooker and Billiards pool table, 9feet, light, accessories, pics at www.thewillettfamily.com/forsale/, $2,250. 883-7021

Yamaha gas golf cart, maintenance record, $800. 468-5914

Callaway 460 Tour Driver, 3-wood, right hand, firm graphite shaft, head covers, $125. 653-1568

Honda riding lawnmower, 9HP, $200. 509-7993

Two Bonarroo tickets, $525. 882-2928

Lane five-piece dark brown leather sectional sofa, chaise lounge, $1,800. 348-8316

Vehicles

2007 Ford Focus ZX3, loaded, power everything except seats, anti-lock brakes, 25k miles, $12,000. 426-5707

2007 Corolla, loaded, keyless entry, cruise, 26k miles, $12,560. 772-1870

2007 Sidney Outback 28-foot Fifth Wheel Camper, $20,500. 679-2410

2006 Mini Cooper S, blue/white stripes, 48/48 factory warranty, dual sunroof, 17,500 miles, $19,250. 714-3742

2006 22-foot Fisher 2210 deck boat, 4.3 Mercury 220HP, D finders, $24,000. 753-2313 or 640-7395

2005 Chevy Tahoe LT, silver, loaded, DVD, 83k miles, $16,250. 565-9918

2005 Honda Element EX, 2WD, five speed, gray, 73k miles, $11,500. 278-1974

2001 EZGO electric golf cart, 2.5-year-old batteries, green, top, $1,550. 325-2919

2000 Mercedes ML430 SUV, loaded, white, leather, entertainment package, navigation, $7,500 obo. 520-2802

1998 Honda Accord EX, V6, loaded, tan leather, sunroof, new tires, 174k miles, $4,200. 931-581-7625

1998 Volvo S70, black, black leather, 179k miles, $2,650. 658-8241

1992 Lincoln Town Car, 92k miles, $2,500. 881-8970 or 503-2440

1984 Toyota Cressida Sports Sedan, five speed, factory shop manual, $99 obo. 233-0705

1982 Ford F-150, 5.8L, automatic, A/C, dual tanks, AM/FM/CD, bedliner, 113k original miles, $2,500. 468-9792

Wanted

FAA Inspection Authorization needed for annuals/maintenance on Cessna 210M hangered at Huntsville airport. 832-928-6066

Ladies to host makeover or spa parties using all-natural, botanical products. 426-7862

Houses to clean; elderly/children assistance. 651-4723

Wireless Pet Fence system for 1 acre or less. 566-1554

Free

Two telephone "like" poles, approximately 15 feet long; twin mattress/box spring set. 655-6701

Help rename the Saturn/Apollo Reunion

The U.S. Space & Rocket Center is preparing for its sixth and final Saturn/Apollo Reunion, which will be held July 10-11. The rocket center is asking the public to help rename the reunion. For more information and to submit a name idea, visit www.spacecamp.com/reunion. Ideas are being accepted through June 5.

STS-125 *Continued from page 1*

rejuvenated Hubble with state-of-the-art science instruments designed to improve the telescope's discovery capabilities by as much as 70 times, while extending its lifetime through at least 2014.

"This mission highlights what the challenges of spaceflight can bring out in human beings," said Bill Gerstenmaier, associate administrator for Space Operations at NASA Headquarters in Washington. "This mission required the absolute best from the shuttle team, the Hubble science and repair teams and the crew. The results are a tribute to the entire team and the years of preparation."

"This is not the end of the story but the beginning of another chapter of discovery by Hubble," said Ed Weiler, associate administrator for the Science Mission Directorate at NASA Headquarters. "Hubble will be more powerful than ever, continue to surprise, enlighten and inspire us all, and pave the way for the next generation of observatories."

Scott Altman commanded the shuttle flight and was joined by Pilot Gregory C. Johnson and Mission Specialists Megan McArthur, John Grunsfeld, Mike Massimino, Andrew Feustel and Michael Good. McArthur served as the flight engineer and lead for robotic arm operations, while the remaining mission specialists paired up for challenging spacewalks on Hubble.

Weather concerns prevented the crew from returning to the Kennedy Space Center, Fla., the primary end-of-mission landing site. In seven to 10 days, Atlantis will be transported approximately 2,500 miles from California to Florida on the back of a modified 747 jumbo jet. Once at Kennedy, the shuttle will be separated from the aircraft to begin processing for its next flight, targeted for November.

The crew of space shuttle mission STS-125 gathered on the runway at Edwards Air Force Base, Calif., after space shuttle Atlantis landed May 24. From left are Mike Massimino, Greg Johnson, Scott Altman, Megan McArthur, John Grunsfeld, Andrew Feustel and Michael Good.

The STS-125 mission was launched May 11 from the Kennedy Center and was the 126th shuttle flight, the 30th for Atlantis and the second of five planned shuttle missions in 2009.

Hubble was delivered to space April 24, 1990, on the STS-31 mission. Atlantis' landing at Edwards was the 53rd shuttle landing to occur at the desert air base.

Hubble has enabled a number of ground-breaking discoveries during its time in orbit. They include determining the age of the universe to be 13.7 billion years; finding that virtually all major galaxies have black holes at their center; discovering that the process of planetary formation is relatively common; detecting the first-ever organic molecule in the atmosphere of a planet orbiting another star; and providing evidence the expansion of the universe is accelerating because of an unknown force that makes up approximately 72 percent of the matter-energy content in the universe.

With Atlantis and its crew safely home, the focus will shift to the launch of STS-127, targeted for June 13. Space shuttle Endeavour's 16-day flight will deliver a new station crew member and complete construction of the Japan Aerospace Exploration Agency's Kibo laboratory. Astronauts will attach a platform to the outside of the Japanese module that will serve as a type of "back porch" for experiments that require direct exposure to space.

For information about NASA's Hubble Space Telescope, visit http://www.nasa.gov/hubble.

For more about the STS-125 mission and the upcoming STS-127 flight, visit http://www.nasa.gov/shuttle.

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

May is National Bike Month

Marshall, Redstone cyclists peddle 23 miles during 'Tour d'Arsenal'

By Jessica Wallace

As you were leaving Redstone Arsenal on May 19 around 5 p.m., did you notice a lot of cyclists riding around?

More than 100 fastened their helmets and hopped on their bikes for a 23-mile ride around the base that day, as Team Redstone – including the Marshall Space Flight Center and U.S. Army organizations on the arsenal – hosted the "Tour d'Arsenal." The annual bike ride marks May's National Bike Month.

For eight years, Team Redstone cyclers have gathered at the Marshall Wellness Center to gear up for the Tour d'Arsenal.

"The tour was started to persuade folks to ride their bikes to see the Army test areas on the closed section of Dodd Road, and to show newcomers the bike trail," said the leader of the tour Jamie Miernik, an ERC Inc. employee supporting Marshall's Engineering Directorate. "We let people know that commuting to the arsenal is possible, and any way to save gas is great."

Cycling is an environmentally friendly means of transportation that more people are discovering," added Miernik. "If you live in Huntsville, bike commuting is a great option. We are hoping that with more people moving to the area, road improvements will be made to make cycling safer."

Cyclists participating in the Tour d'Arsenal take off from the Wellness Center on May 19 to begin their 23-mile bike ride around Redstone Arsenal.

The tour takes the bikers along Dodd, Buxton and Patton roads, and through part of the Wheeler National Wildlife Refuge, before going to the Army's test areas and across the Tennessee River. The route then follows a portion of the bike/pedestrian trail that crosses Neal Road and returns to the Wellness Center.

Miernik always reminds cyclists to share the road – and be safe. "The most important safety advice for a cyclist is to always dress and equip your bike for maximum visibility – day and night," she said. "The arsenal's regulation now requires a reflective vest at all times. Helmets have always been required for all cyclists on Redstone." She added that all riders must have lights on their bikes at night, on or off base.

For more information on bike safety, visit http://she.msfc.nasa.gov/.

National Bike Month was founded by the League of American Bicyclists in May 1956. For more information, visit http://www.bikeleague.org/.

Wallace, an AI Signal Research Inc. employee and the Marshall Star editor, supports the Office of Strategic Analysis & Communications.

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