National Aeronautics and Space Administration

MARSHALL STAR

Serving the Marshall Space Flight Center Community

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Discovery docks with International Space Station

13-day STS-131 mission continues

By Sanda Martel

Space shuttle Discovery docked to the International Space Station April 7 at 2:44 a.m. CDT, after a predawn launch from NASA's Kennedy Space Center, Fla., on April 5.

Discovery's launch began a 13-day flight to the space station. It is the second of five shuttle missions planned for 2010.

STS-131 is delivering science experiments, equipment and supplies

*See **STS-131** on page 4*

Space shuttle Discovery lifts off April 5.

Visiting Endeavour astronauts thank Marshall team for 'great ride up'

By Sanda Martel

Marshall Space Flight Center team members, students from area schools and a group of Ohio students attending Space Camp at the U.S. Space & Rocket Center in Huntsville gathered in Building 4200's Morris Auditorium March 31 to welcome astronauts who flew the STS-130 mission in February.

Marshall Center Director Robert Lightfoot introduced four of the six crew members to a packed auditorium, noting the astronauts flew 5.7 million miles in 13 days. Commander George Zamka, Pilot Terry Virts and Mission Specialists Nicholas Patrick and Stephen Robinson received a warm reception from the audience as they shared highlights of their mission to the International Space Station.

Space shuttle Endeavour launched from the Kennedy Space Center, Fla., Feb. 7 and landed at Kennedy on Feb. 21.

"Thanks for the great ride up," said Zamka, speaking to the Marshall team responsible for the propulsion elements that boost the orbiter from the launch pad. The Marshall Center is responsible for the shuttle propulsion elements – the space shuttle main engines, external tank and solid rocket boosters – that lift the orbiter from the launch pad and propel it on its journey into orbit.

Patrick also thanked Marshall engineers for their role in training the shuttle crew on the installation of the Node 3, also known as Tranquility, which was delivered and installed during the mission.

"The folks here at Marshall, the Node 3 engineering team, were really instrumental in preparing us for the flight,"

*See **Endeavour** on page 3*

Marshall team members invited to participate in special solicitation for Haiti earthquake victims

On Jan. 12, the country of Haiti experienced a catastrophic 7.0-magnitude earthquake, affecting an estimated three-million people. Marshall Space Flight Center team members have an opportunity to help earthquake victims through a special solicitation authorized by the U.S. Office of Personnel Management to raise funds for Haiti outside of the regular Combined Federal Campaign season.

Following the Haitian earthquake, President Barack Obama asked former Presidents Bill Clinton and George W. Bush to raise funds for immediate, high-impact relief and long-term recovery efforts to help those who are most in need of assistance. In response, the two presidents established the Clinton Bush Haiti Fund to respond to unmet needs in the country, foster economic opportunity, improve the quality of life over the long term for those affected and assist the people of Haiti as they rebuild their lives.

The Clinton Bush Haiti Fund is working with and supporting the efforts of reputable 501 c (3) nongovernmental and nonprofit organizations. Presidents Clinton and Bush oversee the fund through their respective nonprofit organizations, the William J. Clinton Foundation and Communities Foundation of Texas.

"Our Marshall team has a long history of showing compassion and generosity to those in need and this effort will assist thousands of Haitians as they work to restore their lives and their nation," said Marshall Center Director Robert Lightfoot.

The Haitian government reports that between 217,000 and 300,000 people have died, an estimated 300,000 were injured and an estimated 1,000,000 are homeless.

There are multiple ways to contribute to the Haiti fund including online giving, mobile giving and by mail. For more information, visit http://clintonbushhaitifund.org/. A link to the Web site is available on Inside Marshall.

Pad abort flight test set May 6 at White Sands

NASA's latest flight test for future human space exploration, the Launch Abort System Pad Abort 1, or PA-1, test is set for May 6 at the Orion Abort Flight Test Launch Complex 32E at the U.S. Army's White Sands Missile Range near Las Cruces, N.M.

Information gathered through PA-1 testing will be valuable in design and development of future systems built for use in providing a safe escape for the crew in the event of an emergency. The launch abort system, or LAS, could be used on the launch pad or during the first stage of ascent to orbit.

In partnership with the lead center, Langley Research Center in Hampton, Va., the Marshall Space Flight Center is responsible for providing propulsion oversight during the development of the three motors, which includes an abort motor that pulls the Orion capsule from danger, an attitude control motor to provide directional control and the jettison motor that separates the system from the crew module. Marshall also has supporting roles in thermal analysis, structures, mechanisms, avionics, systems engineering, flight test and ground operations.

The launch abort system for the Pad Abort-1 flight test is positioned on the launch pad in preparation for the test at the U.S. Army's White Sands Missile Range in New Mexico.

This month at Marshall 50 years ago...

In April 1960, four of the eight H-1 engines of the Saturn C-1 first-stage booster were successfully static-fired at Redstone Arsenal for seven seconds.

Exchange offers discount tickets for Yuri's Night April 10

On Saturday, April 10, Huntsville will experience a premier Yuri's Night Event at the Davidson Center for Space Exploration.

Yuri's Night is a celebration of humanity's achievements in space. On or about April 12, people from around the world come together to mark the anniversary of Yuri Gagarin's first flight into space in 1961, and the first launch of the U.S. space shuttle in 1981.

The event will be hosted by CAJA Friends Inc. The night will begin with a "Permission to Dream Big" VIP reception and continue with a World Space Party.

Tickets are available through the NASA Exchange in the Building 4203 Space Shop at a discounted rate of $18 for the World Space Party and $90 for the VIP reception.

For more information regarding the event, visit http://www.yurisnighthsv.org/.

Endeavour

Continued from page 1

STS-130 crew members, visiting children at the Marshall Child Development Center on March 31, are from left, Mission Specialist Nicholas Patrick, Commander George Zamka, Mission Specialist Stephen Robinson and Pilot Terry Virts.

Patrick said. "They had a test rig here for the ammonia lines that Bob (Mission Specialist Robert Behnken) and I installed on orbit."

"We never would have been able to do it without you," said Patrick.

The Node Integration Office provided technical assistance and coordination on Tranquility, the last of three space station nodes to be launched. The nodes are interconnecting elements between the various pressurized modules on the space station. They allow passage of crew members and equipment to other station elements and also provide vital functions and resources for the crew members and equipment.

During the mission's second spacewalk on Feb. 14, Patrick and Behnken installed custom ammonia lines to link Tranquility with the space station's heating and cooling systems. Ammonia acts as a coolant on the station by dispersing heat built up by the electronics inside.

"The folks here at Marshall, the Node 3 engineering team, were really instrumental in preparing us for the flight."

— STS-130 Mission Specialist Nicholas Patrick

The astronauts answered questions from the students in the audience following a mission highlights video and also signed autographs.

For more information about the STS-130 mission, visit http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/sts130/main/index.html.

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

to the space station, including a multipurpose logistics module filled with science racks managed by the Marshall Space Flight Center. Known as the Window Observational Research Facility, or WORF, the module provides a facility for Earth science remote-sensing instruments using the Destiny science window. WORF includes the highest-quality optics ever flown on a human-occupied spacecraft.

Also being delivered are new crew sleeping quarters and science racks that will be transferred to the space station's laboratories. This is the final complement of laboratory facilities that will complete the station's overall research capabilities.

The flight will include three spacewalks, to install a spare ammonia storage tank and return a used one; retrieve a Japanese experiment from the station's exterior; and switch out a gyroscope assembly on the truss, or backbone of the orbiting research center. The gyroscope assembly is an electronics box that helps the space station determine and maintain its flight attitude in orbit.

Commander Alan Poindexter is joined on the mission by Pilot Jim Dutton and Mission Specialists Rick Mastracchio, Dottie Metcalf-Lindenburger, Stephanie Wilson, Clay Anderson and Japan Aerospace Exploration Agency astronaut Naoko Yamazaki. Dutton, Lindenburger and Yamazaki are making their first spaceflights. These three astronauts are the last rookies that will fly aboard the shuttle before its planned retirement.

Lindenburger is the last of three teachers selected as mission specialists in the 2004 Educator-Astronaut class to fly on the shuttle. The educational activities on the STS-131 mission will focus on robotics and promoting careers in science, technology, engineering and math.

For more information about the STS-131 mission, visit http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/sts131/index.html.

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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, April 15, is 4:30 p.m. Thursday, April 8.

Miscellaneous

Two outdoor 100-watt speakers camouflaged as rocks, $80. 617-0750

Shoninger piano, spinet style, $100; desk, $25. 337-8930

Green\tan\blue plaid couch, matching loveseat, pictures available, $150. 684-1021

Lily Flagg pool membership, $600 obo. 656-2951

Disney's Little Einstein, 10 DVD box set, $35. 617-1822

Sony KV-32FV300 32-inch TV, remote, IR headphones, $100. 541-4991

Sofa, brick velveteen; framed and unframed limited edition wildlife prints. 694-0880

Homedics Shiatsu massaging cushion, model SBM-300, $40. 891-1073

X-Box 360Pro, 60Gig, all cables, wireless controller, head set, nine games, extras., $350 obo. 883-8340

Lawn sweeper for riding mower, 42-inch, $100; live animal trap, medium sized, $20. 880-6544

Girl's white eight drawer dresser with mirror, $100. 682-7165

Maytag smoothtop electric stove/oven, microwave, dishwasher, $150 each or $300 total. 864-0413

Playstation 3 game, Little BIG Planet, Game of the Year edition, rated E, $40. 828-1234

Set of 35-pound Cap brand, hex shaped dumbbells, $40. 348-4139

White love seat, RCA console TV, white butcher block, tiletop table, six chairs. 603-0894

Vehicles

2008 Nissan Altima 2.5 SL, navigation, Bluetooth, red exterior, leather interior, 68k miles, $16,000 obo. 931-625-0671

2008 Chrysler Town & Country, all electric, DVD, under NADA wholesale, 9,900 miles, consider trade. 852-6952

2007 Fisher Prohawk 180 bass boat, under warranty for three years, $13,000. 205-887-3965

2006 Scion xB RS-4.0, auto, power windows/locks, remote keyless entry, 7/100 warranty, 54k miles, $9,900. 783-2886

2005 Honda Accord Hybrid, 31/42MPH, gray, navigation, heated seats, loaded, full warranty, $15,400. 464-9871

2005 Kawasaki zx636 Ninja, new tires, title, 9,500 miles, $4,850. 205-807-7841

2005 Ford Five Hundred Limited AWD sedan, leather, moon roof, loaded, 45k miles, $12,000. 651-8264

2004 VW Jetta GLI VR6, 94k miles, $8,500. 931-703-5956

2003 Xterra 4x4, black/gray, 95k miles, $9,650; 1984 BMW 528e, 5 speed, gray, $1,650. 658-8241

2001 Chevy Cavalier, gold, 143k miles, $3,400. 468-9377

2001 Heritage Soft Tail Classic, chrome and Mag wheels, 23k miles. 651-2825

1998 Stingray RS180, new 140HP, bowrider, bimini covers, fish/ski, seats seven, ski equipment. 640-6427

1998 Toyota Corolla LE, white, 118k miles, $3,000. 233-3443

1995 Volvo 850 GLT, 170k miles, $2,200. 527-6655

1989 Volvo 760 wagon, 16-valve, non-turbo engine, automatic transmission, $950. 227-0339

Wanted

Four-drawer vertical file cabinet or two-drawer lateral, preferably wood but will take metal. 724-2112

2001 to 2005 Honda CR-V or Toyota RAV4 in good condition. 656-3123

At the unveiling of the new tank dome manufacturing process are, from left, Marshall Center Deputy Director Gene Goldman; Lesa Rowe, director of Langley Research Center, Hampton, Va.; Dr. Axel Roenneke, head of strategy, business development and sales for MT Aerospace, Augsburg, Germany; Dr. Ray O. Johnson, vice president of technology for Lockheed Martin Space Systems, Denver; Diane Hope, program element manager for the Exploration Technology Development Program Office at Langley; Dr. Sandeep Shah, manufacturing and assembly sub-system manager for the upper stage project at Marshall; Louis F. Lollar, contract technical manager for the exploration advanced capabilities office at Marshall; and Dr. Raymond "Corky" Clinton, acting manager for the Science & Missions Systems Office at Marshall.

NASA unveils new manufacturing tank dome technology

By Kim Newton

On March 30, NASA and its industry partners unveiled a revolutionary new manufacturing process that could lower the cost of producing a tank dome – the end piece of a fuel tank – as much as 25 percent by using commercial materials and state-of-the-art technologies in an innovative application.

Manufacturing a traditional tank dome requires welding eight curved, pie-shaped pieces of metal together, and a fitting on the top and bottom. This requires several costly manufacturing and inspection steps to ensure the welds are acceptable for flight. The new application calls for one weld to join two large, flat blank panels together, eliminating at least seven major welds, reducing steps and cost.

This is the first time this combination of technologies and alloy has been successfully applied to produce a full-scale 18-foot-diameter, 2195-aluminum-lithium dome that is lighter, has fewer defects and costs less to develop.

The process employs friction stir welding, a solid state joining process; spin forming, a metal working process used to form symmetric parts; and 2195 aluminum lithium, a higher-strength, lower-density alloy. The alloy could be used in the design of launch vehicles, crew vehicles, habitat modules, and other space hardware.

One additional full-scale development tank dome is scheduled for manufacture and testing in the coming months as part of the joint, four-year technology demonstration program.

The dome at left was created using the new manufacturing processes and eliminates at least seven major welds. A pie-shaped piece has been removed for material testing. Several weld demarcation lines are visible on the traditional fabricated tank dome at right.

The Marshall Space Flight Center and Langley Research Center in Hampton, Va., partnered with Lockheed Martin Space Systems in Denver, and MT Aerospace in Augsburg, Germany, to push the envelope in dome manufacturing by making use of existing commercial materials and cutting edge technology. This international partnership demonstrates the agency's desire to tap into rich sources of innovation to help address technical challenges that will mutually benefit NASA and next-generation space exploration.

Newton is a public affairs officer in the Office of Strategic Analysis & Communications.

What are you doing to reduce your carbon footprint?

We want to hear from you. Please tell us what you are doing to reduce your carbon footprint. Send your stories to Roger Bunnell/AS10. Select responses will be printed the following week.

Out-of-this-world images

Images from NASA's observatories are included in the "From the Earth to the Universe" project, a worldwide series of exhibitions featuring remarkable astronomical imagery. The exhibit, which won the Mani Bhaumik award for excellence in astronomy education and public outreach, recently opened at the U.S. Space & Rocket Center in Huntsville. The award, presented during the Communicating Astronomy conference in March in Cape Town, South Africa, was given for the best of the tens of thousands of activities conducted during the International Year of Astronomy 2009. NASA was a major sponsor of the project, which was led by the Chandra X-ray Center in Cambridge, Mass. These images were placed into public parks, metro stations, libraries and other nontraditional locations around the world. The exhibit showcases some of the best astronomical images taken from telescopes both on the ground and in space, representing the wide variety of wavelengths and objects observed.

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