National Aeronautics and Space Administration

MARSHALL STAR

Serving the Marshall Space Flight Center Community

Jan. 8, 2009

Director's Corner

A year of remarkable accomplishment!

2008 was a year of excellent progress and remarkable accomplishment.

Nothing we do as an Agency is more important than flying the shuttle safely. We turned in four successful space shuttle missions in 2008. The modifications we've made to the shuttle, and especially to the external tank, have resulted in the cleanest vehicles and the safest flights ever.

We also made excellent progress in bringing on the next generation of launch vehicles in 2008. Thirty-two states and Puerto Rico are already involved in working on the Ares program, led by Marshall. By 2011, more than half our work force will be working on Ares. In 2008, we successfully completed the Ares I rocket Preliminary Design Review and the J-2X engine Critical Design Review and continued to develop and test hardware. We also made progress on Ares I-X and Ares V. Ares I-X hardware has already begun arriving at Kennedy Space Center, and the Roll Control System, built here in partnership with Teledyne Brown Engineering, is scheduled to ship soon. On Ares V, we started wind tunnel testing and made preparations for Phase I procurement. Overall, we've put out $9.5 billion in contracts on Ares – all without a single protest, speaking to the integrity of the process.

2008 was also a good year for our ISS team. On STS-126, we completed the Environmental Control and Life Support System for the station. The Oxygen Generation System and Water Recovery System are critical to meeting our commitments to our international partners. We also shipped the Materials Science Research Rack to the Kennedy Space Center, observed the seventh anniversary of round-the-clock operations of the Payload Operations Center here and became the official backup to mission control for ISS operations. We fulfilled that role when Hurricane Ike caused a temporary shutdown of the Johnson Space Center in September.

2008 saw many space and Earth science accomplishments, including the June 11 launch of the Fermi Glast Burst Monitor; more exciting Chandra and Hubble discoveries, including new clues about dark matter; continued successful operation of Hinode science instruments; the expansion of SERVIR to Africa and the improvement of weather predictions with the Short-term Prediction Research and Transition (SPoRT). Another Earth science mission – the Observing Microwave Emissions for Geophysical Applications (OMEGA) – flew for the first time last fall as part of a NASA-wide soil moisture mission led out of Wallops. OMEGA is a first-of-its-kind instrument for measuring soil-moisture content.

LRO/LCROSS, managed by the Lunar Precursor Robotics Program team here at Marshall, is on track to launch this spring. This mission will map the moon in unprecedented detail, help us choose lunar landing sites

and potentially answer the question of whether water exists in shadowed polar craters. Time Magazine named LRO one of the "Best Inventions of 2008."

Thanks to your great work, January 2009 finds us well positioned to support the Agency's mission on behalf of the American people. To every member of the Marshall team, well done!

Dave

Dave King
Marshall Center Director

A new look for the Marshall Star

Starting with this issue, the Marshall Star has been redesigned in an effort to make it easier to read and more visually appealing. Some changes include a cleaner, modern masthead; a body-text font change from 9.5 point ITC Officina Sans to 11 point Garamond; and a new, three-column layout. We hope this new look will improve your reading experience.

Selected highlights of Marshall's 2008 year of great accomplishments

Marshall Center welcomes visitors with new, 80-foot mural of space achievements at Huntsville International Airport

To commemorate NASA's 50th anniversary, the Marshall Center unveiled a reminder to visitors and travelers passing through Huntsville International Airport of just how the "Rocket City" got its name. The pictorial mural chronicles 50 years of space accomplishments in Huntsville. Spanning an 80-foot wall, the mural illustrates the importance of the Marshall Center to the Space Age. It depicts how Marshall is shaping the future of space exploration by helping to return humans to the moon.

Shuttle engine cut-off sensor system performs flawlessly on STS-122

STS-122 launched Feb. 7 from the Kennedy Space Center, Fla., on an 11-day mission to the International Space Station. The mission was twice delayed in December 2007 after false readings in the engine cut-off sensor system during tanking. The sensor system is one of several that protect the shuttle's main engines by triggering their shutdown if fuel runs unexpectedly low. Tests revealed that open circuits in the tank's electrical feed-through connector were the most likely cause. A modified connector, designed with pins and sockets soldered together, was installed for the mission. Extensive testing on the redesigned connector was performed in the Marshall Center's unique test facilities. The sensor system performed flawlessly during space shuttle Atlantis' liftoff. Resolution of the engine cut-off sensor system problem is a huge success story for the Marshall team and the Space Shuttle Program.

Payload Operations Center marks 7th anniversary

March 19 marked the seventh anniversary of round-the-clock operations of NASA's Payload Operations Center at Marshall. The payload operations team plans and coordinates all U.S. science and research on board the International Space Station. Working with scientists and other control centers around the world, the operations team sends commands to experiments, watches progress, monitors the health of experiments and receives data. In addition, the Payload Operations Center is responsible for coordination of the mission planning work of the space station's international partners, all science experiments going to and coming from the station, and experiment training and safety programs for station crews and ground personnel.

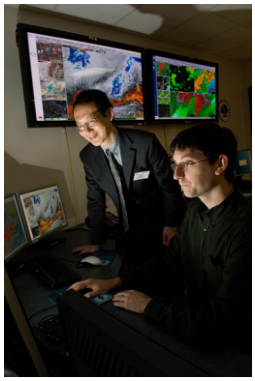
STS-123 delivers Japanese, Canadian, components

STS-123 – the first shuttle mission with all international partners participating – launched March 11 from the Kennedy Space Center. The 16-day mission to the International Space Station delivered two new components to the orbital outpost: the Japanese Experiment Logistics Module, Pressurized Section, or JLP; and the Canadian Space Agency's two-armed robotic system, known as Dextre. Landing was March 26 at Kennedy.

Saturn Dynamic Test Stand lowers door

Engineers began preparations to renovate the historic, 360-foot-high Saturn V Dynamic Test Stand at the Marshall Center. As part of this effort, the massive, 144-foot-high, 71-ton door was opened March 31 – ushering in a new century in NASA's rich history of testing rockets for spaceflight. The test stand will be used for ground vibration testing of Ares rockets.

NASA's SPoRT Center celebrates five years of helping improve weather forecasts



In April, NASA's Short-term Prediction Research and Transition, or SPoRT, Center celebrated five years of fruitful collaboration with the Huntsville National Weather Service Forecast Office and burgeoning collaborations with other operational weather partners. The SPoRT program aims to improve the accuracy of weather predictions by developing specialized tools, which tap into streams of research information available from NASA instruments. Due to SPoRT's innovative collaborations, NASA Earth science satellite measurements are improving short-term weather predictions. The SPoRT Center is managed by Marshall scientists and operates in concert with other government, university, and private sector partners.

Teams battle in 15th annual Great Moonbuggy Race

Twenty-two high school and 24 college/university student teams battled against the clock for top awards and prizes April 4-5 in NASA's 15th annual Great Moonbuggy Race at the U.S. Space & Rocket Center. The race – hosted by the Marshall Center – was inspired by the original lunar rover designed by Marshall engineers. It draws competitors from across the world. In 2008, both winning teams took home trophies depicting NASA's original lunar rover. Students from Erie High School in Erie, Kan., winners of the high school division, also received a one-week trip to the advanced Space Camp program at the Space & Rocket Center, courtesy of ATK Launch Systems and Jacobs Technology. The winner of the college title was the University of Evansville in Evansville, Ind. The team also received $5,700 from Northrop Grumman Corp.

Student rocketeers fly high in Student Launch Initiative

Rockets soared through the air in April and May as middle school, high school and college/university students converged in Huntsville for the annual Student Launch Initiative and University Student Launch Initiative rocketry challenges. Hosted by the Marshall Center's Academic Affairs Office, the events drew student teams from around the nation to launch homemade rockets to an altitude of 1 mile and retrieve them intact. Students are paired with NASA engineers for mentoring in scientific research and real-world engineering processes. College and university students flew their rockets April 19. To determine a winner, NASA engineers and scientists evaluated each college and university team's rocket design, its flight data and its final written report on payload results and overall experience. Utah State University in Logan won first place. Middle and high school teams showed off their projects in the lobby of Building 4200 where Marshall engineers provided a professional review of the rockets before sending them aloft April 25-26.

Chandra discovers youngest supernova in our galaxy

The youngest supernova in our galaxy explosion occurred about 140 years ago, making it the most recent in the Milky Way. Previously, the last known supernova in our galaxy occurred around 1680, an estimate based on the expansion of its remnant, Cassiopeia A. This result, announced in May, was found by using NASA's Chandra X-ray Observatory and the National Radio Astronomy Observatory's Very Large Array. It will help improve our understanding of how often supernovae explode in the Milky Way galaxy. The Marshall Center manages the Chandra program.

Casting of Ares I inert motor sections completed

In May, engineers with the Ares I first-stage prime contractor ATK Launch Systems of Brigham City, Utah, cast the first inert or inactive motor for the new five-segment booster. This motor will be used for integrated vehicle ground vibration tests of the fully integrated Ares I rocket at Marshall Center beginning in 2010.

Ares J-2X power pack tests conclude at Stennis

Engineers at NASA's Stennis Space Center near Bay St. Louis, Miss., concluded a test series on a heritage J-2 "powerpack" May 8. This was the first series of tests in the early development of the J-2X engine that will power the upper stages of the Ares I and Ares V rockets.

'New' space shuttle external tank improves safety, performance

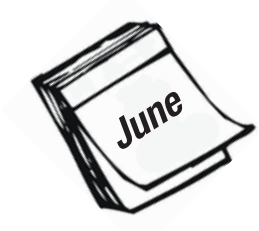
External tank, ET-128, set a new standard in outstanding tank performance when it launched on space shuttle Discovery from the Kennedy Center on May 31. ET-128 was the first tank completed since the first Return to Flight mission in 2006 with all redesigned features incorporated during production. Flying on the tank for the first time were redesigned liquid hydrogen tank ice frost ramps at 17 locations and redesigned liquid oxygen feedline brackets. These changes improved performance and flight safety. The 14-day mission to the space station included delivery of the Japanese Aerospace Exploration Agency's Kibo Japanese Pressurized science laboratory to the station. The laboratory further expanded the Japanese segment on the station.

Marshall's Impact Test Team wins 2008 Stellar Award for expanding test capabilities

The Marshall Center's Impact Test Facility Development Team received a Rotary National Award for Space Achievement Foundation Stellar Award. The team was recognized for its efforts to expand test capabilities covering weather, launch debris and micrometeoroid impacts to spacecraft.

Performance of aging shuttle motors tested in Utah

A space shuttle reusable solid rocket motor was tested in Promontory, Utah, on May 1. The test provided important information for continued launches of the shuttle, including possible performance changes as motors age. It also measured external sound, or acoustics, to help define motor-generated external loads for Ares I. This valuable data will assist in the final design of the launch structure for Ares I rockets by engineers from NASA and ATK Launch Systems Group of Promontory.



Fermi's Gamma-Ray Burst Monitor spots more than 100 bursts

NASA's Fermi Gamma-Ray Burst Monitor, a space-based instrument for studying gamma ray bursts, is one of two instruments on NASA's Fermi spacecraft, which was successfully launched into orbit June 11. To date, the Gamma-Ray Burst Monitor has spotted more than 100 gamma-ray bursts, the most powerful explosions in the universe. Instrument development was a collaboration between the Marshall Center and the Germany-based Max Plank Institute for Extraterrestrial Physics.

244 employees, contractors, teams recognized

In June, the Marshall Center honored 184 individuals and 60 teams from its civil service and contractor work force – all of whom made critical contributions to the nation's space program and NASA's ongoing mission of exploration and discovery. Among the achievements: Three Marshall Center employees received Presidential Rank Awards: Pam H. Cucarola, chief financial officer; Daniel L. Dumbacher, director of the Engineering Directorate; and Joan A. "Jody" Singer, deputy manager of the Space Shuttle Propulsion Office. NASA Distinguished Service Medals were awarded to archaeologist Thomas L. Sever in the Science & Mission Systems Office and Thomas D. Wood, chief engineer in the Space Shuttle Solid Rocket Booster Project. NASA Exceptional Engineering Achievement Medals were presented to Katherine P. Van Hooser, chief engineer for the Space Shuttle Main Engine Project; and Thomas F. Zoladz, an unsteady flow and acoustics engineer in the Fluid Dynamics Branch of the Engineering Directorate's Propulsion Systems Department.

Ares first stage preliminary design review successfully completed

NASA successfully completed the preliminary design review for the first stage of the Ares I rocket in June. This review, conducted at Marshall, looked at the current designs for the first stage to ensure that the planned technical approach will meet NASA's requirements for the vehicle.

Marshall issues request for proposal for Michoud Assembly Facility's operations support

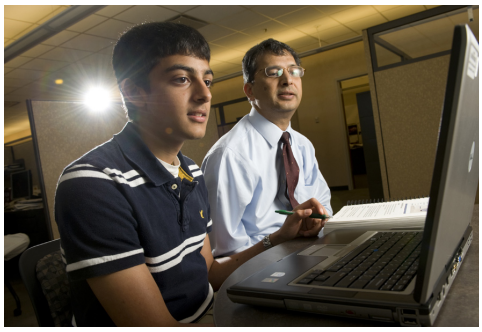
On June 6, the Marshall Center issued a request for proposal for the Manufacturing Support and Facility Operations contract for the Michoud Assembly Facility, beginning a new era of operations at the facility. Since 1976, Lockheed Martin has manufactured the external tank for the Shuttle Propulsion Office at Michoud, and has been the facility's sole contractor. The new contract will allow an on-site facility integration and operations contractor to oversee facility operations and ensure collaboration among contractors that will provide support for the Constellation fleet at Michoud. The contract is slated for award in January 2009.

Space station astronauts share mission memories with Marshall Center

International Space Station crew members for Expeditions 15 and 16 shared highlights of their missions on the orbiting laboratory during a visit to the Marshall Center on July 22. Expedition 16 Commander Peggy Whitson, Expedition 16 flight engineer Dan Tani and Expedition 15 flight engineer Clay Anderson thanked the Marshall team for its support of each mission.

Ares drogue parachute test a success

NASA and industry engineers successfully completed the first drop test of a drogue parachute designed to slow the rapid descent of the spent first-stage motor, cast off by the Ares I rocket during its climb to space. The test was conducted on July 24 at the U.S. Army's Yuma Proving Ground near Yuma, Ariz.



'INSPIRE' interns spend the summer with astronauts, engineers and scientists

More than 150 high school and college students from 23 states and Puerto Rico took part in a new NASA education project "INSPIRE" – the Interdisciplinary National Science Project Incorporating Research and Education Experience. Nearly 400 students applied for summer internships at NASA's 10 field centers. At the Marshall Center, 18 high school seniors and college freshmen from Alabama, Arkansas, Iowa, Missouri and Tennessee spent two months immersed in the real-world work of the U.S. space program. The students spent the summer helping to develop NASA Web site content, test scale rocket engines and lay the groundwork for building the Ares I rocket, while rubbing shoulders with astronauts and prize-winning scientists.

Ares completes upper stage preliminary design review

On Aug. 5, the Ares I upper stage team successfully completed its preliminary design review, and gained overall approval for NASA's technical design approach for the rocket. This step in the review process addressed more detailed requirements for the vehicle design to assess that the overall system will provide a safe and reliable flight. It also identified technical and management challenges and addressed ways to reduce potential problems as the project moves forward. This review was part of a series of milestones that occur before the actual flight hardware is built.

Marshall's friction stir welder premiers

The world's largest known welding machine of its type – capable of building major components of NASA's Ares I and Ares V rockets – was installed at the Marshall Center in 2008. The friction stir welder offers rocket builders a modern welding technique by using forging pressure and frictional heating to produce high-strength bonds virtually free of defects. In August engineers made the first "official" weld with this tool that will enable development of the upper stage of the Ares I rocket.

J-2X gas generator series completed

Engineers at the Marshall Center completed a series of tests on a key component of the J-2X engine in August. The J-2X will power the upper stage of the Ares I rocket, which will launch human explorers to the International Space Station and to the moon. The gas generator test program is designed to demonstrate the component's performance, durability and combustion environment, and to reduce risk in the design, fabrication and operation of flight hardware. This completed the second of four planned series of tests on the workhorse gas generator, the driver for the turbopumps that will start the J-2X engine.

Marshall engineers complete ullage settling motor test

In September, engineers at Marshall successfully completed the first-round hot-fire testing for the new ullage settling motor. This small solid rocket motor will serve two key roles during the launch of the Ares I rocket. During first stage separation the motor will fire for four seconds, producing the forward thrust needed to push the second, or upper, stage away from the first stage. This forward thrust also ensures 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.

Payload Operations Center serves as space station backup for Johnson flight teams

When Hurricane Ike forced the Johnson Space Center to close Sept. 11, the International Space Station's Backup Control Center at Marshall was activated for the first time – just days after it was initially certified for this purpose. A 35-member space station flight control team from Houston relocated to Marshall on Sept. 13-19 to continue operating the station. Also for the first time, on Sept. 17, the Johnson team controlled the docking of a Russian Progress cargo ship to the station from Marshall's Backup Control Center. The Progress – carrying two tons of supplies – arrived at the station after a five-day delay by Ike.

Preliminary design review completion key Ares I milestone

NASA took a major step toward building the nation's next generation launch vehicle with the successful completion of the Ares I rocket preliminary design review Sept. 10. The review, conducted at the Marshall Center, was the first such review in more than 35 years for a U.S. rocket that will carry astronauts into space.

Von Braun Symposium looks to future of spaceflight

The Marshall Center and the Ares Projects team played a major role in the first Wernher von Braun Memorial Symposium hosted in October at the Von Braun Center. The symposium, with the theme "Building on the Past to Power the Future," featured panel discussions and speakers focusing on the current state and future of human spaceflight.

Marshall engineering team receives Space Flight Awareness Team Award for space station support

Marshall's Tribology Team – part of the Engineering Directorate's Materials and Processes Laboratory Mechanical Test Branch – was honored with a Space Flight Awareness Team Award. This team helped the International Space Station Program determine the root cause of a problem with hardware that helps the station's solar arrays track the sun for power.

Shuttle Transition Office activated

The Shuttle Transition Office was activated in October to ensure a smooth transfer of the shuttle work force and hardware assets to the Constellation Program when the space shuttle is retired in 2010.

Annual Combined Federal Campaign exceeds $600,000 goal

The 2008 Combined Federal Campaign began at the Marshall Center in October with the goal to raise $600,000 by Dec. 12. This year's campaign kicked off with a Team Redstone rally in September featuring musical entertainment, refreshments and door prizes. Lee Marshall, founder of Kids to Love Foundation, spoke. On Oct. 23, Marshall held its own CFC rally with entertainment by the Madison County High School cheerleaders and the Lee High School marching band. Violet Parker Edwards, chief executive officer of Christmas Charities Year Round, a non-profit Madison County organization, was keynote speaker. Lindsey Jones, the 12-year-old daughter of Marshall employee Terry Jones, told her story as a cancer survivor. At the end of the campaign, Marshall exceeded $696,000.

Casting of Ares DM-1 Motor completed

In November, Ares first-stage prime contractor ATK Launch Systems cast the first segment of the Ares I demonstration motor called DM-1. The first ground test for the first fully developed Ares I five-segment solid rocket booster – which will ignite NASA's next generation of human launch vehicles – is planned for fall 2009.

Last space shuttle flight engine tested at Stennis

The final space shuttle flight engine was tested at the Stennis Space Center on Oct. 22, marking the end of an era. The 520-second test of engine 2061 was the final flight certification test for flight engines built for the nation's Space Shuttle Program.

Ares V begins aerodynamic testing at Trisonic Wind Tunnel

Marshall engineers began aerodynamic testing of a 0.34-percent scale model of the Ares V heavy cargo launch vehicle in the Trisonic Wind Tunnel in Building 4732. The stainless steel and aluminum model was tested under simulated flight conditions to evaluate the aerodynamics of the vehicle to characterize the ascent trajectory of Ares V. This will help the Ares V team determine basic requirements for guidance, navigation and control of the rocket. Test results will be entered into a database to help better understand how the vehicle will respond to various flight conditions during ascent, stresses on the vehicle, drag loss and other aerodynamic factors.

Ares: J-2X critical design review completed

NASA's newest high-performance rocket engine, the J-2X, successfully completed its critical design review Nov. 13 at the Marshall Center. The engine will power the upper stage of NASA's next-generation Ares I rocket and the Earth departure stage of the Ares V heavy cargo launch vehicle.

Marshall scientists announce discovery of a previously unidentified nearby source of high-energy cosmic rays

Researchers – including Marshall scientists – from the Advanced Thin Ionization Calorimeter collaboration announced the discovery of a previously unidentified nearby source of high-energy cosmic rays. The findings were made with a NASA-funded balloon-borne instrument high over Antarctica. The new results show an unexpected surplus of cosmic ray electrons at very high energy – 300-800 billion electron volts – that must come from a previously unidentified source or from the annihilation of very exotic theoretical particles used to explain dark matter.

Water Recovery System delivered to space station on STS-126

The Water Recovery System, developed and managed by the Marshall Center, was delivered to the space station by space shuttle Endeavour. It is part of a comprehensive life support system that will recycle crew urine, wastewater and cabin humidity condensate, creating water clean enough to drink. Recycling water reduces the crew's dependence on Earth resupply. It can reduce the need for outside water and consumables by up to 15,000 pounds per year. The Kennedy Center night launch was Nov. 14. The 16-day mission featured four spacewalks primarily focused on servicing the station's two Solar Alpha Rotary Joints, which allow the outpost's solar arrays to track the sun. A solid rocket booster improvement – the frangible nut crossover system – flew the first time on STS-126. The system prevents hold-down post hang-ups during a shuttle launch. The EXPRESS Rack 6 – the sixth in a series of standardized payload racks developed and managed by Marshall that transport, store and support experiments aboard the space station – was delivered to the orbital outpost. Landing was Nov. 30 at Edwards, Calif.

NASA and USAID bring Earth observation benefits to Africa

NASA and international partners cut the ribbon Nov. 21 in Nairobi, Kenya, for SERVIR-Africa. The SERVIR system integrates the satellite resources of the United States and other countries into a Web-based Earth information system. This effort puts previously inaccessible information into the hands of local scientists, government leaders and communities to help address concerns related to natural disasters, disease outbreaks, biodiversity and climate change. SERVIR, Spanish for "to serve," has been in operation in Central America, the Caribbean and southern Mexico since 2005. Now, through the support of multiple government agencies and other organizations, NASA and USAID have expanded the system to Africa. The SERVIR coordination office and rapid prototyping facility is located at the Marshall Center.

NASA, ATK successfully test first Orion launch abort motor

Flames shot more than 100 feet high in a successful 5.5-second ground test firing Nov. 20 of a launch abort motor for NASA's next generation spacecraft, the Orion crew exploration vehicle. NASA and the Orion industry team conducted the firing at the Alliant Techsystems facility in Promontory, Utah. The abort motor will provide a half-million pounds of thrust to lift the crew module off the Ares I rocket, pulling the crew away safely in the event of an emergency on the launch pad or during the first 300,000 feet of the rocket's climb to orbit. The firing was the first time a motor with reverse flow propulsion technology at this scale has been tested. It also is the first test of its kind since the beginning of the Apollo Program. Marshall is providing technical and engineering support to the Orion Launch abort system.

Time Magazine names Lunar Reconnaissance Orbiter one of best inventions of 2008

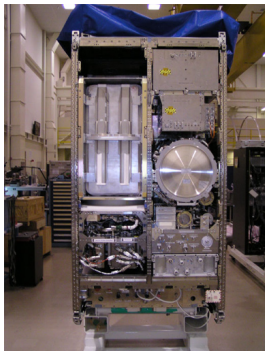
NASA's Lunar Reconnaissance Orbiter is an unmanned mission to create the comprehensive atlas of the moon's features and resources necessary to design and build a lunar outpost. The orbiter objectives are to find safe landing sites, locate potential resources, characterize the radiation environment and demonstrate new technology. Marshall manages the Lunar Robotics Orbiter and Lunar Crater Observations and Sensing Satellite missions, scheduled for launch later this year. Time Magazine ranked the orbiter third among picks for the top innovations of 2008.

NASA calls for comment on draft Ares V request for proposals

On Nov. 25, NASA has released a draft request for proposals, or RFP, regarding Phase I of its Ares V launch vehicle. The rocket will perform heavy lift and cargo functions as part of the next generation of spacecraft that will return humans to the moon. Phase I will define operational concepts, develop requirements, and refine design concepts for the Ares V. This document is a draft of the final version of the RFP for Phase I (which was issued in Jan. 5, 2009).

Shuttle motor test fired in Utah

A space shuttle reusable solid rocket motor test was successfully conducted Dec. 4 in Promontory, Utah. The test evaluated possible performance changes as shuttle motors age. The seven-year-old, four-segment motor was the oldest ever fired. It also provided important information for development of the Ares I rocket, including performance data on a new nozzle design.



Materials Science Research Rack begins journey to space station

A new materials science laboratory left the Marshall Center for the Kennedy Space Center for final flight preparations Dec. 3. The research rack is a highly automated facility that will allow for study of a variety of materials – including metals, ceramics, semiconductor crystals and glasses – onboard the orbiting laboratory. The development of the research rack was a cooperative effort between the Marshall Center and the European Space Agency.

James Webb Space Telescope mirrors chill out at Marshall

The first of 18 mirror segments that will fly on NASA's James Webb Space Telescope arrived in December for testing at Marshall's X-ray & Cryogenic Facility. While the mirrors chill down, engineers will precisely measure the structural stability of the hardware to ensure it will perform as designed once operating in extreme temperatures of space. The X-ray & Cryogenic Facility will test each mirror twice through 2010.

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

Miscellaneous

Remington model 1100 12-gauge shotgun, $400 obo. 771-3154

Eureka Zeus 1 backpacking tent, single wall, one person, $75 obo. 880-1544

Five shelves of engineering books, includes math, radar, many others, $3 each. 837-6776

Peavey Mark VIIII bass amp head, 210tx/410tx bass enclosure, $600; Fender bass guitar, $500. 636-2978

Garbage compactor, residential, brown, Whirlpool Model TF4600XTP0, $300 obo. 852-5595

Blow-up mattress, queen size, built-in pump, stand, $130. 882-3895

Firewood, $80 per truckload. 755-0050

Kenmore dishwasher, Microwave/hood oven, white, $100 each. 232-9565

Cherry dining room table, seats six, matching china cabinet, $650. 457-9126

Everlast heavy punching bag, $40. 423-341-4393

CKC Yorkie, born Nov. 24, female, toy size, $600. 890-6193

Two tickets, Predators vs. New Jersey Devils, Jan. 19, $25 each. 566-3549

Vermont Castings ventless cast-iron gas logs/ stove, manual-propane, heats 1,000 plus square feet, $550. 655-6348

John Deere 870 tractor, 28HP, turf tires, 5-foot Woods RM360 finishing mower. 931-625-1144

2006 John Deer riding mower, 30 hours, 54-inch cutting deck, 25HP VTwin engine, $2,000 obo. 337-7243

Nordic Track CX 985 Elliptical, $250. 655-4820

Lined drapes, two pairs, 96Wx82L, rods, gold. 837-2267

Two tickets, Los Angeles Lakers vs. Memphis Grizzlies, Jan. 31, Memphis, Tenn. 508-5503

Paintball auto loader, $15; paintball full mask, $15. 527-0110

"ocRAMP" quarterpipe skateboard ramp, weatherproofed, $500 obo. 350-1292

Kenmore washer/dryer, heavy duty, large capacity, all hoses, white, $350 for pair. 975-1667

Vehicles

2008 Nissan Maxima, warranty, leather, smart key, Bose, sunroof, loaded, 14k miles, $19,995. 520-2802

2005 Ford Taurus Five Hundred Limited, AWD, leather, power moon roof, 44k miles, $13,500. 975-1667

2005 Nissan Armada LE, loaded, towing package, DVD, leather interior, 40k miles, $18,500. 347-1674

2005 Chevy Z71 crew cab, Tonneau bed cover, Bose, new Michelin tires, $17,000 obo. 497-8894

2004 Chevy Silverado, red, 65k miles, $7,998 obo. 961-7521

2004 black convertible Mustang, leather interior, GT hood, 60k miles. 476-4636

2000 Cougar, all power/leather, $4,400. 479-5953 or 890-0799

2000 Mercedes-Benz E320, four-door sedan, silver, Bose, power sunroof, 102,500 miles, $8,800. 684-0089

1998 Dodge Ram Crew Cab, V8, auto, air, 139k miles, $5,800. 468-3206

1997 Jeep Grand Cherokee Limited, 4.0-V6, new tires, 175k miles, $3,200. 931-993-7768

1995 Lincoln Continental, loaded, retractable sun roof, $2,850. 586-7424

1972 Chevrolet LWB pickup, new 350 motor, $3,900; 1995 Palomino Mustang TXL-DD. 773-5051

Self-contained mobile detailing trailer, $6,495. 228-4450

Wanted

Trailer donation, 15-foot flat bottom boat, 501(c) (3) Search and Rescue Team, ED. 859-5550

Electrical work to do, wiring houses, detached garage, adding/removing lights, switches, plugs. 468-8906

Used iPhone, excellent condition. 335-5896

Tickets to the Broadway Theater League's "Chitty Chitty Bang Bang," Sunday, Feb. 1. 603-1273

Houses to clean; children and elderly sitting. 651-4723

Used full- or twin-size bedroom suite with dresser. 931-625-1144

Go-Cart, running or not, frame desired for project. 325-3589

Roommate, private room, northeast home. 539-0777

Found

Set of Chrysler car keys, pink key ring, Building 4200 area, Dec. 16; gold bracelet, loading dock area, Building 4200, Dec. 30. 544-4680

Clip on shaded eye glass cover, outside Building 4705. 544-2962

MARSHALL STAR

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