



MARSHALL STAR

Serving the Marshall Space Flight Center Community

March 5, 2009

NASA's Kepler telescope to launch aboard Delta II rocket



On Launch Pad 17-B at Cape Canaveral Air Force Station in Florida, the first half of the fairing is moved into place around NASA's Kepler spacecraft, atop the United Launch Alliance Delta II rocket. The fairing is a molded structure that fits flush with the outside surface of the rocket and forms an aerodynamically smooth nose cone, protecting the spacecraft during launch and ascent.

With the Kepler spacecraft secured tightly to the top of a Delta II rocket, engineers and technicians continue to work toward a target launch date no earlier than March 6, from Pad 17-B at Cape Canaveral Air Force Station in Florida. There are two launch windows, from 9:49-9:52 p.m. and 10:13-10:16 p.m. CST.

Kepler is a spaceborne telescope designed to search the nearby region of our galaxy for Earth-size planets orbiting in the habitable zone of stars like our sun. The habitable zone is the region around a star where temperatures permit water to be liquid on a planet's surface.

Liquid water is considered essential for the existence of life as we know it. The vast majority of the approximately 300 planets known to orbit other stars are much larger than Earth, and none is believed to be habitable. The challenge for Kepler is to look at a large number of stars in order to statistically estimate the total number of Earth-size planets orbiting sun-like stars in the habitable zone.

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U.S. Rep. Parker Griffith, Marshall Center Director David King discuss NASA's budget request



U.S. Rep. Parker Griffith, right, of Alabama's 5th Congressional District, met with Marshall Space Flight Center Director David King, left, Feb. 27 to discuss the NASA funding increase requested in President Barack Obama's 2010 fiscal year budget proposal. They also discussed the president's stated commitment to return to the moon by 2020. The Marshall Center is helping meet that commitment by leading the design and development of the Ares I rocket – the vehicle that will carry astronauts to the moon and beyond, and the Ares V heavy cargo launch vehicle – responsible for the delivery of large-scale hardware to space. The president's 2010 budget plan includes \$18.7 billion for NASA – an increase from the \$17.2 billion NASA received in fiscal 2008.

STS-126 space shuttle astronauts to speak at Marshall on March 5

Crew members who flew aboard space shuttle Endeavour's STS-126 mission will present highlights of their 15-day mission to the

International Space Station at 9 a.m. on March 5.

Their presentation in Morris Auditorium, Building 4200, will be

followed by question-and-answer and autograph sessions.

All Marshall Center personnel are encouraged to attend.

Off-world racing with tomorrow's space-age engineers

By Rick Smith

Off-road racing? So 20th century. So ... terrestrial.

Off-world racing is the name of the game at NASA's 16th annual Great Moonbuggy Race. More than 80 student teams from around the globe will gather April 3-4 at the U.S. Space & Rocket Center in Huntsville to propel wheeled lunar rovers of their own design across a simulated moonscape – one like no other race course on Earth.

More than 500 high school, college and university students from 21 states, Puerto Rico, Canada, Germany, India, Mexico and Romania will compete.

Each year, teams design, build and test a sturdy, lightweight vehicle that addresses engineering obstacles similar to hurdles overcome by the original Apollo-era lunar rover development team at the Marshall Space Flight Center in the late 1960s.

That's a key goal of the Great Moonbuggy Race: to inspire students to think like professional engineers, solving the kinds of problems NASA workers face every day as they seek to continue the nation's exploration of space, benefit life on Earth and gain new understanding of our place in the cosmos.

The event also "demonstrates how science, technology, engineering and math studies can open career doors for bright young minds," said Marshall Center engineer Mike Selby, an avionics technical assistant in Marshall's Engineering Directorate.

And Selby should know. While completing his engineering undergraduate degree at the University of Alabama in

Huntsville, he was a member of the school's Great Moonbuggy Race teams, helping them achieve a second-place finish in 1995 and capture first place in 1996. Selby joined NASA in 1997, and today builds hardware and conducts analysis for space shuttles, the International Space Station and the next-generation Ares I rocket.

And, since 2001, he's been head scorekeeper for the Great Moonbuggy Race.

"The race is a great experience," he said. "As a student competitor, the big thing I drew out of it was working in that team environment, being dependent on one another to get the job done. The race offers a real sense of accomplishment – designing and building a vehicle that can race competitively."

Each moonbuggy must be human powered and piloted by two students, one female and one male. There's no official buggy weight limit. But just as pairs of Apollo moonwalkers had to unload and prepare their lunar rover for travel, race drivers must be able to assemble their collapsed vehicle, then pick it up – with no help from other teammates – and carry it some 20 feet to the start of the race course.

The twisting, half-mile course includes sand and gravel pits, simulated lunar craters, humps and other obstacles. Top



Crash course! Student drivers from Puerto Rico High School in Fajardo, Puerto Rico, endure a flipping crash during the 15th annual Great Moonbuggy Race last April. The racers recovered quickly enough to post the fastest race time among the competition's newcomers, earning them the 2008 "Rookie Award."

prizes are awarded to the three teams in the high school division and three in the college division that post the fastest buggy assembly and race times. A variety of other prizes, including best buggy design and rookie team of the year, are awarded by corporate race sponsors.

Eight college teams participated in the first Great Moonbuggy Race in Huntsville in 1994. The event expanded in 1996 to include high school teams, and participation has swelled each year since.

The race is one of dozens of educational programs and initiatives led by the Marshall Center each year to help inspire and engage America's next generation of scientists, engineers and explorers – those who will carry on the nation's mission of exploration, to the moon and onward into the solar system.

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

New agency-wide calendar goes live

The NASA Shared Services Center has completed a new Web-based agency calendar, which tracks significant events including upcoming launches; significant mission events; agency

governance council meetings; and NASA Advisory Council meetings. For more information, visit http://inside.msfc.nasa.gov/announcements/agency-wide_cal.html.

For questions or issues with the new agency calendar, please contact the NSSC Customer Contact Center at nssc-contactcenter@nasa.gov or at 877-677-2123.

Marshall, Glenn partner for lunar habitat power system tests

By Janet Anderson

Engineers at the Marshall Space Flight Center are partnering with researchers at NASA's Glenn Research Center in Cleveland to test elements of a power system that potentially could provide the energy needed to support a human outpost on the moon.

A one-of-a-kind test facility at the Marshall Center is enabling engineers to simulate the nuclear power process of heat transfer from a reactor to a power converter – without using nuclear materials. For the test series, the Marshall reactor simulator has been linked to a Stirling engine, developed at Glenn Research Center. The engine, named for 19th-century industrialist and inventor Robert Stirling, converts heat into electricity.

The Marshall reactor simulator includes a specialized pump, provided by the U.S. Department of Energy, and a coolant loop filled with a mixture of sodium and potassium. The coolant loop provides heat to the Stirling engine at conditions very similar to an actual fission-based surface power system. The joint testing will help resolve potential integration issues and provide information and experience needed to reduce technology risks associated with this system concept. Testing is expected to run through 2009.

"Fission-based surface power systems could be an important source of energy for exploration on the moon and Mars," said Mike Houts, project manager for nuclear systems at Marshall. "This power system could provide an abundant source of reliable, cost-effective energy and may be used anywhere on the lunar surface."

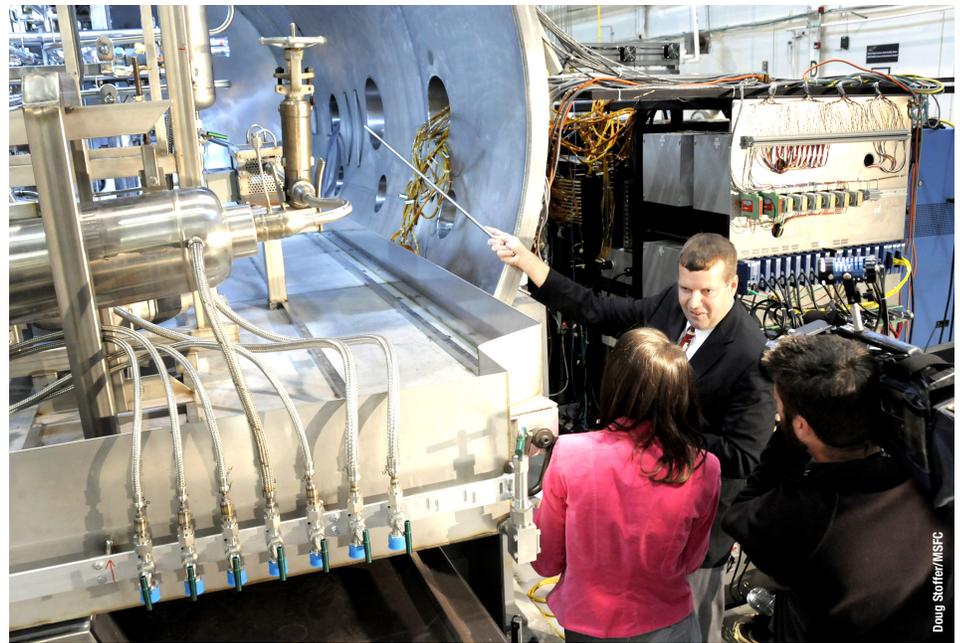
A fission-based surface power system would offer consistent power in the harsh environment of space. The proposed system is capable of generating 40 kilowatts of electricity, enough to power approximately eight houses on Earth.

Lee Mason, a Glenn principal investigator for the project, said the tests "will be a key factor in demonstrating the readiness of fission surface power technology, and would provide NASA with an efficient and robust system to produce power in the harsh environment on the moon and Mars."

A nuclear reactor used in space is very different than Earth-based systems. There are no large concrete cooling towers, and the reactor is about the size of a propane tank used to run a backyard grill. The amount of energy produced from a space reactor is much smaller, but more than adequate for the projected power needs of a lunar outpost.

The test series is being conducted as part of the Fission Surface Power Project within NASA's Exploration Technology Development Program. The program is developing advanced technologies that will enable NASA to conduct future human exploration missions, while reducing mission risk and cost.

Anderson is a member of the Public & Employee Communications Office in the Office of Strategic Analysis & Communications.



Mike Houts, project manager for nuclear systems at the Marshall Center, explains the new test facility and its goals to local reporters at a media event Feb. 19.

Cast your vote to name space station's Node 3

NASA is asking the public to choose the name of the International Space Station's Node 3. Node 3 will provide room for many of the station's life support systems in the form of eight refrigerator-sized racks.

Names suggested by NASA are

Earthrise, Legacy, Serenity or Venture.

To vote, visit http://www.nasa.gov/externalflash/name_ISS/index.html.

For those who wish to create their own name, visit the Web site and select "suggest your own."

Voting will continue until March 20.

The new name will be announced at the unveiling of Node 3 at Kennedy Space Center, Fla., on April 28. Node 3 is scheduled to launch in December aboard space shuttle Endeavour.

Huntsville, Madison mayors share goals at Marshall Association luncheon

Huntsville Mayor Tommy Battle and Madison Mayor Paul Finley spoke to a crowd of more than 90 at the Marshall Association luncheon Feb. 25.

They discussed how they are working together to provide a better quality of life for Huntsville and Madison.

Finley, right, at the Marshall Association, discusses ways he and Battle, left, are developing plans to improve the cities of Huntsville and Madison.



Battle, right, greets Marshall Space Flight Associate Director Robin Henderson, left; and Sandra Turner, protocol officer in the Office of Strategic Analysis & Communications.



Kepler *Continued from page 1*

“Kepler finally puts us in a position to answer all those questions about other planets: Are we alone, or do other Earths exist?” said Steve McClard, Kepler mission manager of the Discovery, New Frontiers and Lunar Science Program Office, located at the Marshall Space Flight Center. “This mission opens a whole new, exciting field of science surrounding exoplanet research.”

The Kepler spacecraft will watch a patch of space for 3.5 years or more for signs of Earth-sized planets moving around stars similar to the sun. The patch that Kepler will watch contains about 100,000 stars like the sun. Using special detectors similar

to those used in digital cameras, Kepler will look for slight dimming in the stars as planets pass between the star and Kepler. The Kepler's place in space will allow it to watch the same stars constantly throughout its mission, something observatories like Hubble Space Telescope cannot do.

NASA's Launch Services Program at NASA's Kennedy Space Center, Fla., is responsible for the launch of Kepler aboard a Delta II 7925-10L rocket. United Launch Alliance is conducting the launch for NASA. NASA's Ames Research Center in Moffett Field, Calif., is the home organization of the principal

science investigator and is responsible for the ground system development, mission operations and science data analysis. NASA's Jet Propulsion Laboratory in Pasadena, Calif., is responsible for the spacecraft and the Kepler mission development. Ball Aerospace & Technologies Corp. of Boulder, Colo., is responsible for developing and building the Kepler spacecraft and supporting mission operations.

Kepler is a Discovery Mission. The Discovery Program at Marshall has oversight responsibility for all aspects of the project from technical and budget to schedule.

Space Shuttle Program completes new plan for next launch

NASA Headquarters news release

NASA's Space Shuttle Program has established a plan that could support space shuttle Discovery's launch to the International Space Station, tentatively targeted for March 12. An exact target launch date will be determined as work progresses with the shuttle's three gaseous hydrogen flow control valves.

At NASA's Kennedy Space Center, Fla., technicians have started removing Discovery's three valves, two of which will undergo detailed inspection. Approximately 4,000 images of each valve will be reviewed for evidence of cracks. Valves that have flown fewer times will be installed in Discovery.

Engineering teams also will complete analysis and testing to understand the consequences if a valve piece were to break off and strike pressurization lines between the shuttle and external fuel tank. Hardware modifications may be made to the pressurization lines to add extra protection in the unlikely event debris is released.

NASA and contractor teams have been working to identify what caused damage to a flow control valve on space shuttle Endeavour during its November 2008 flight. Part of the main propulsion system, the valves channel gaseous hydrogen from the main engines to the external tank.

After a thorough review on Feb. 20 of shuttle Discovery's readiness for flight, NASA managers decided more understanding of the valve work was required before launching Discovery.

The Space Shuttle Program was scheduled to meet March 4 to review new data and assess ongoing work. Managers then will decide whether to move forward with a flight readiness review on March 6.

If Discovery's tentative launch date holds, there will be no effect on the next two shuttle launches – STS-125 to NASA's Hubble Space Telescope and STS-127 to the International Space Station.

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, March 12, is 4:30 p.m. Thursday, March 5.

Miscellaneous

Couch, love seat, black and tan striped, \$225. 461-7520

Firewood, \$80 per truckload. 755-0050

OC Ramp quarter pipe skateboard ramp, portable, weather proofed, \$500 obo. 350-1292

Lawn/garden edging, corrugated aluminum, 6" x 25' roll, \$3; pallet red clay flower pots, \$100. 776-7248

Sumter Cabinet Company queen-size bedroom suite, six pieces, \$1,250. 828-5303

Two antique twin beds, four posts, mahogany pineapple, king-sized mattress, \$700. 880-9658

Tonneau bed cover, fits 2005 Z71 Crew Cab, white, \$700 obo. 497-8894

Canon Printer All-In-One Scanner Copier, PIXMA MP170, no ink, \$19. 417-4828

80GB Apple iPod Classic, black, \$160. 361-7799

RCA XL-100 26-inch TV, artificial wood grain exterior. 325-9264

Two tickets to "The Rat Pack," Von Braun Center, March 29. 503-7060

Seven hand-hewn pine beams, old growth, 9 feet long by 12X7 inches. 534-5142

Lab mix puppies, full immunizations, please have vet reference, \$55 each. 303-0124

Blow-up mattress, queen size, built-in stand/electric pump, \$120. 882-3895

Nokia BLC-2 cell phone battery. 656-1231

Light wood table, six cloth-covered rolling chairs, matching China cabinet, \$400. 461-0472

Broyhill kitchen hutch, glass sides/doors/shelves, \$325; five-piece indoor wicker set, \$350. 975-1667

Pro Form treadmill, incline, speed, time, distance, EKG, \$250. 534-2705

Firewood, truck load, \$65. 232-8311

Vehicles

2008 Mustang GT Coupe, silver, leather, six-disc premium sound, Sirius, Bluetooth, 6,600 miles, \$22,900. 724-1789

2006 BMW 325i, white/tan, loaded, 42k miles, \$21,500. 883-6894 or 468-6894

2006 Chrysler 300C, special anniversary edition, \$18,500 final. 797-6099

2006 SL55 Mercedes AMG, loaded, hardtop convertible, silver, 14k miles. 830-5999

2005 Ford Five Hundred Limited, AWD, leather, power moon roof, 44k miles, \$12,500. 975-1667

2005 Ford Escape Limited, leather, V6, auto, red, black leather, \$6,450. 572-1867

2003 Honda Accord LX, four door, black, tan interior, tinted

window, 147k miles, \$6,700. 425-3582

2000 Buick Century Custom, silver, new tires, 137k miles, \$2,700. 772-9018

1998 Stingray RS180, bow-rider, seats seven, new Mercruiser 140HP engine, ski accessories, bimini top. 640-6427

1998 Acura 3.2 TL, 122k miles, \$3,600. 721-7799

1998 Mercury Sable GS, white, gray interior, power seat, 54k miles, \$4,300. 880-9025

1996 Mazda Miata M-Edition, leather, new Bilstein shocks, 115k miles, \$5,000. 714-1941

1977 Ford E-150 van, 6-300/C6, rough body, runs nicely, seats five, \$500. 520-5014

Wanted

Tree work, complete tree removal, trimming/shaping, stump grinding; electrical work, wiring houses, switches, plugs. 468-8906

Enclosed trailer, small, 4x6. 880-6146

Horse pasture boarding, near Huntsville, one gelding, beginning in May. 694-9184

Table saw, belt-driven model. 259-1523

Upright or stationary bike. 656-8272

Found

Black Sprint PDF belt carrier, south parking lot, Building 4200. 544-4680

Free

35mm SLR Mamiya/Sekor camera, lens/accessories. 880-6146

'Focus on Marshall' goes on road trip highlighting launch preparations for shuttle propulsion elements

By Lori Meggs

The Marshall Space Flight Center is known for its expertise in propulsion, helping design and build NASA's current flagship vehicle, the space shuttle. But have you ever wondered how all of the space shuttle propulsion elements get ready to fly?

The March episode of the Marshall Center's monthly video program "Focus on Marshall" takes viewers on a cross-country trip to the facilities where the external tank, space shuttle main engines and the solid rocket motors are prepared for launch.

From the solid rocket motors' train ride from Utah to the external tank's barge ride from the Michoud Assembly Facility near New Orleans, the episode features their journey to the Kennedy Space Center, Fla. The Focus on Marshall team follows the hardware, culminating in the launch of STS-126.

Viewers also get a first-hand look, from the deck of the "Freedom Star" recovery ship, at retrieval of the solid rocket booster after launch. Also featured is the smoke and fire from a space shuttle main engine test at the Stennis Space Center, Miss.

"Focus on Marshall" airs on Marshall TV March 5, 17 and 19 at 11 a.m., noon and 1 p.m. It also is available on NASA TV, Inside Marshall and on the NASA Portal.

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

NASA successfully tests parachute for Ares I rocket



On Feb. 28, under brilliant blue Arizona skies, Marshall Space Flight Center and industry engineers successfully completed the second drop test of a drogue parachute for the Ares I rocket at the Army's Yuma Proving Grounds near Yuma, Ariz. The drogue parachute – which pulls out the three main parachutes for Ares I – will be used to recover the first stage of Ares I-X during its test flight later this year. The test was a milestone in the development of the Ares I rocket first stage recovery system. ATK Launch 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.

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