Marshall Star, February 13, 2013 Edition

MARSHALL STAR

In This Week's Star

NASA Awards Space Station Mission Operations and Integration Services Contract

NASA news release

NASA has selected Teledyne Brown Engineering Inc. of Huntsville for its International Space Station mission operations and integration contract.

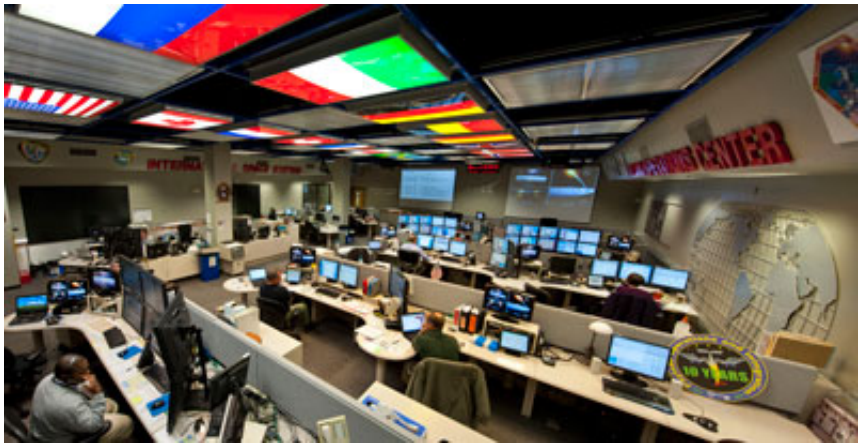

Image right: NASA's Payload Operations Center in Building 4663 at the Marshall Center provides the heartbeat for International Space Station research operations. (NASA/MSFC/Fred Deaton)

The cost-plus-award-fee services contract is valued at about $120.1 million and has a potential performance period of five years. The contract begins March 1 with an 18-month base period, followed by three one-year options and one six-month option that may be exercised at NASA's discretion. The contract includes an indefinite-delivery, indefinite-quantity component for additional services, as needed.

Teledyne Brown will provide operations in support of the International Space Station at NASA's Marshall Space Flight Center and the agency's Johnson Space Center. Support entails all phases of flight, including mission preparation, crew and flight controller training, and real-time requirements for spaceflight operations.

For information about NASA and agency programs, visit: http://www.nasa.gov.

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NASA's Space Launch System to Participate in Weeklong Events at Tennessee Tech University
By Shannon Ridinger

NASA's Space Launch System, or SLS, is taking part in Engineering Week at Tennessee Tech University in Cookeville. Starting Feb. 19, SLS will exhibit interactive displays and innovative content at the Millard Oakley Science, Technology, Engineering and Math, or STEM, Center located on the university campus.

The "SLS: Where will it take you?" Tweet chat will be held Feb. 19 with Tennessee Tech alumni who work at Marshall. The chat will be from 11 a.m. to 12 p.m. at the @NASA_SLS Twitter account and #SLSInspires. Marshall employees will answer questions about SLS and how working in the space industry launched their careers. John Rector, Joan Funk, and Mallory Johnston, all SLS engineers, will be participating in the chat.

The exhibit is only a small part of the many activities planned for the week. Also to be featured are distance-learning sessions for local schools with SLS managers and engineers, panel discussions and a Tweet chat. On Feb. 22, the STEM center will be open to the public for "FAB Friday," which will feature interactive activities for kids and a presentation by NASA's Marshall Space Flight Center Deputy Director Teresa Vanhooser.

For more information about the SLS exhibit and a complete listing of all events, or to register for the FAB Friday event, visit www.tntech.edu/stem/nasa-sls or call 931-372-6573.

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

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NASA's Chandra Suggests Rare Explosion Created Our Galaxy's Youngest Black Hole
NASA news release

New data from NASA's Chandra X-ray Observatory suggest a highly distorted supernova remnant may contain the most recent black hole formed in the Milky Way galaxy. The remnant appears to be the product of a rare explosion in which matter is ejected at high speeds along the poles of a rotating star.

Image left: W49B, the highly distorted supernova remnant shown in this image, may contain the most recent black hole formed in the Milky Way galaxy. The image combines X-rays from NASA's Chandra X-ray Observatory in blue and green, radio data from the NSF's Very Large Array in pink, and infrared data from Caltech's Palomar Observatory in yellow. (X-ray: NASA/CXC/MIT/L.Lopez et al; Infrared: Palomar, Radio: NSF/NRAO/VLA)

The remnant, called W49B, is about a thousand years old as seen from Earth and located about 26,000 light-years away.

"W49B is the first of its kind to be discovered in the galaxy," said Laura Lopez, who led the study at the Massachusetts Institute of Technology. "It appears its parent star ended its life in a way that most others don't."

Usually when a massive star runs out of fuel, the central region of the star collapses, triggering a chain of events that quickly culminate in a supernova explosion. Most of these explosions are generally symmetrical, with the stellar material blasting away more or less evenly in all directions.

However, in the W49B supernova, material near the poles of the doomed rotating star was ejected at a much higher speed than material emanating from its equator. Jets shooting away from the star's poles mainly shaped the supernova explosion and its aftermath.

The remnant now glows brightly in X-rays and other wavelengths, offering the evidence for a peculiar explosion. By tracing the distribution and amounts of different elements in the stellar debris field, researchers were able to compare the Chandra data to theoretical models of how a star explodes. For example, they found iron in only half of the remnant while other elements such as sulfur and silicon were spread throughout. This matches predictions for an asymmetric explosion.

The new results on W49B, which were based on about two-and-a-half days of Chandra observing time, appear in a paper in the Feb. 10 issue of the Astrophysical Journal. The co-authors of the paper are Enrico Ramirez-Ruiz of the University of California at Santa Cruz and Sarah Pearson of the University of Copenhagen in Denmark.

"In addition to its unusual signature of elements, W49B also is much more elongated and elliptical than most other remnants," said Ramirez-Ruiz. "This is seen in X-rays and several other wavelengths and points to an unusual demise for this star."

Because supernova explosions are not well understood, astronomers want to study extreme cases like the one that produced W49B. The relative proximity of W49B also makes it extremely useful for detailed study.

The authors examined what sort of compact object the supernova explosion left behind. Most of the time, massive stars that collapse into supernovas leave a dense, spinning core called a neutron star. Astronomers often can detect neutron stars through their X-ray or radio pulses, although sometimes an X-ray source is seen without pulsations. A careful search of the Chandra data revealed no evidence for a neutron star. The lack of such evidence implies a black hole may have formed.

"It's a bit circumstantial, but we have intriguing evidence the W49B supernova also created a black hole," said co-author Daniel Castro, also of MIT. "If that is the case, we have a rare opportunity to study a supernova responsible for creating a young black hole."

Supernova explosions driven by jets like the one in W49B have been linked to gamma-ray bursts, or GRB, in other objects. GRBs, which have been seen only in distant galaxies, also are thought to mark the birth of a black hole. There is no evidence the W49B supernova produced a GRB, but it may have properties – including being jet-driven and possibly forming a black hole – that overlap with those of a GRB.

NASA's Marshall Space Flight Center, manages the Chandra Program for NASA's Science Mission Directorate in Washington. The Smithsonian Astrophysical Observatory controls Chandra's science and flight operations from Cambridge, Mass.

For Chandra images, multimedia and related materials, visit: http://www.nasa.gov/chandra

For an additional interactive image, podcast, and video on the finding, visit: http://chandra.si.edu

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NASA's Orion Lands Safely on Two of Three Parachutes in Test
NASA News Release

NASA engineers have demonstrated the agency's Orion spacecraft can land safely if one of its three main parachutes fails to inflate during deployment.

Image right: A mockup Orion capsule is poised to drop from a plane 25,000 feet above the U.S. Army Yuma Proving Ground in Arizona to test the parachute design for the spacecraft that will take humans farther than they've ever been before -- and return them to Earth at greater speeds than ever before. The test was successfully completed on Feb. 12. (NASA)

The test was conducted Tuesday in Yuma, Ariz., with the parachutes attached to a test article. Engineers rigged the parachutes so only two would inflate, leaving the third to flag behind, when the test capsule was dropped from a plane 25,000 feet above the Arizona desert.

"Today is a great validation of the parachute system," said Chris Johnson, a NASA project manager for Orion's parachute system. "We never intend to have a parachute fail, but we've proven that if we do, the system is robust for our crew to make it to the ground safely."

Orion's parachutes will perform in ways no landing system for a spacecraft carrying humans has been required to do before. Because Orion will return to Earth from greater distances, it will reenter Earth's atmosphere at speeds of more than 20,000 mph. After re-entry, astronauts will rely on the parachutes to slow the spacecraft for a gentle splashdown in the Pacific Ocean.

This 21,000-pound capsule needs only two main parachutes and one drogue parachute. But NASA spacecraft, particularly those carrying humans, are designed to keep working when something goes wrong. So, Orion will be equipped with three main parachutes and two drogues, providing each system one backup parachute.

In December, engineers simulated a failure of one of the drogue parachutes in a test that ended with a safe landing, proving the system design is valid.

The Feb. 12 test was the eighth parachute engineering development drop test. The next is scheduled for May. The system also will be put to the test in 2014 when Orion makes its first flight test. During the mission, an uncrewed capsule will travel 3,600 miles from Earth, farther than any spacecraft designed to carry humans has gone in more than 40 years.

To join the online conversation about Orion, follow @NASA_Orion and the hashtag #Orion. To learn more about all the ways to connect and collaborate with NASA, visit: http://www.nasa.gov/connect.

For information about Orion, visit: http://www.nasa.gov/orion.

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NASA's 'Mohawk Guy' Attends the State of the Union Address

Bobak Ferdowsi, NASA's "Mohawk Guy," attended the State of the Union address Feb. 12 as a guest of first lady Michelle Obama. Bobak is the flight director for the Mars Curiosty rover team at NASA's Jet Propulsion Laboratory. After the successful landing of the Curiosity rover in August 2012, President Barack Obama called to congratulate the team on their success, and singled out Bobak for his unique haircut that captured the imagination of millions of people around the world. In addition to his inspiring day-to-day work on the Mars Curiosity mission, Bobak volunteers as a FIRST robotics mentor to get children excited about STEM education. (Reuters/Brian van der Brug)

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Black History Month Events to be Held Throughout February at Marshall

To commemorate Black History Month, NASA's Marshall Space Flight Center will hold several events throughout the month of February. All members of Team Redstone -- which includes the Marshall Center and U.S. Army organizations on Redstone Arsenal -- are invited to attend.

On Feb. 14, a Festival of Music lunch and learn will be held from 11 a.m. to 1 p.m. in the Building 4203 cafeteria. A variety of music will be performed by the Voices of Marshall chorus, directed by Kim A. Jones.

A Black History Month observance program will be held at 10:30 a.m. Feb. 26 in Building 4200, Morris Auditorium. Dr. Tonea Stewart, an actress best known for her role as Aunt Etta on the television series, "In the Heat of the Night," will speak. Stewart is director of theatre arts at Alabama State University in Montgomery. The Voices of Marshall chorus also will perform at the program.

The Black History Month events are sponsored by Marshall's Office of Diversity & Equal Opportunity.

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Obituaries

Walter David McNabb, 87, of Cullman died Feb. 1. He retired from the Marshall Center in 1981 as an electronics engineer. He is survived by his wife, Mary Jo McNabb.

Robert Shea Savage, 79, of Huntsville died Feb. 7. He retired from the Marshall Center in 1989 as an aerospace engineer. He is survived by his wife, Martha A. Savage.

Find this article at:

http://www.nasa.gov/centers/marshall/about/star/index.html