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NASA Administrator Tours Facility Where New Deep Space Rocket is Being Built

From HQ news release

NASA Administrator Charles Bolden Monday visited the agency's Michoud Assembly Facility in New Orleans to see the progress being made on the Space Launch System (SLS), the most powerful rocket ever built that will take American astronauts into deep space, first to an asteroid beyond the Moon and eventually on to Mars.

Bolden, who was joined by Sen.

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With the Space Launch System (SLS) in the background, NASA Administrator Charles Bolden spoke Monday during a visit to the agency's Michoud Assembly Facility in New Orleans. Bolden was joined by Sen. David Vitter of Louisiana to observe progress made on the SLS. (NASA)

NASA Associate Administrator Robert Lightfoot, Deputy Associate Administrator Lesa Roe to Lead Marshall All Hands Jan. 17

NASA's Marshall Space Flight Center will host an All Hands meeting Jan. 17, led by [NASA Associate Administrator Robert Lightfoot](#) and Deputy Associate Administrator Lesa Roe.

Lightfoot and Roe will address the Marshall team to share the status of and upcoming activities related to NASA's Technical Capabilities Assessment Team, created in late

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NASA Associate Administrator Robert Lightfoot. (NASA)

Bolden Tours MAF *Continued from page 1*

David Vitter of Louisiana, toured construction of Michoud's advanced welding facility, the Vertical Assembly Center. There, 27.5-foot diameter cylinders, domes, rings and other elements will be brought together to form the fuel tanks and core stage of SLS, which is targeted for its first flight test in 2017. When completed in March, the Vertical Assembly Center will be home to one of the largest welding tools of its kind.

Five of six major robotic welding tools already are installed at Michoud, where SLS's core stage prime contractor, the Boeing Co. of Chicago, is leading a team producing test articles for the rocket. Michoud's advanced manufacturing facilities and workforce also built Orion's structure for its prime contractor, Lockheed Martin Corp. of Bethesda, Md.

"American astronauts are living and working in space aboard the International Space Station, preparing for deeper space exploration and the SLS is the rocket that will take them there," Bolden said during the tour. "We're making tremendous progress on SLS, and I salute the team at Michoud for making sure the United States continues to lead the world in exploration."

Bolden also took time during his tour to place a call to the International Space Station mission control at NASA's Johnson Space Center. He congratulated the flight team there, the International Space Station (ISS) crew and the Orbital Sciences team in Dulles, Va., on the successful installation of Orbital's Cygnus cargo spacecraft to the station Sunday.

"The United States no longer has to rely on others to get cargo and science experiments to the International Space Station," said Bolden following the call. "Thanks to the bold commercial space plan we've been pursuing, we now have two American companies to resupply station, launching once again from U.S. soil. My hat's off to the Orbital and NASA teams who worked so hard over the weekend to successfully capture and berth the Cygnus spacecraft to the ISS."

For more than 50 years, Michoud has built large-scale space systems for NASA, including stages of the Saturn V moon rockets and external tanks for the space shuttles. Michoud has more than 43 acres of advanced manufacturing space under one roof.



NASA Administrator Charles Bolden, center, talks about progress on the Space Launch System with SLS Program Manager Todd May, right, and Michoud Assembly Facility Director Roy Malone during a tour of Michoud in New Orleans on Monday. (NASA/ Michoud Assembly Facility)

"The Space Launch System is becoming a reality thanks to the unique workforce and tools at Michoud and NASA facilities across the country," said SLS Program Manager Todd May, who joined Bolden on the tour. "We're on schedule and looking forward to SLS's first launch."

During his visit, Bolden, a former astronaut, donned part of a spacesuit to make a plaster cast of his boot print to commemorate Michoud's historic role in space exploration. Bolden traveled to orbit four times aboard space shuttles between 1986 and 1994, commanding two of the missions and piloting two others. His flights included deployment of NASA's Hubble Space Telescope and the first joint U.S.-Russian shuttle mission, which featured a cosmonaut as a member of his crew.

NASA's Marshall Space Flight Center manages the SLS Program and the Michoud Assembly Facility.

For information about NASA's SLS Program, visit [here](#).

For information about NASA and agency programs, visit [here](#).

For information about NASA's Michoud Assembly Facility, visit [here](#).

NASA, Obama Administration Highlight International Space Station Extension at Global Forum

From HQ news release

Speaking at a global space exploration forum on Jan. 9, John P. Holdren, director of the White House Office of Science and Technology Policy, explained the importance of President Obama's decision to extend International Space Station (ISS) operations until at least 2024.

Holdren discussed the ISS extension plan at the International Space Exploration Forum (ISEF) in Washington, where leaders from more than 35 spacefaring nations gathered for the first ministerial-level meeting ever held to build political support for global cooperation in space exploration. The U.S. Department of State hosted the meeting.

"The exploration and utilization of space benefits all humankind," Secretary of State John Kerry said in a written statement. "They further promote innovation and economic development, foster scientific advancement, and inspire the next generation of explorers to pursue studies and careers in the fields of science, technology, engineering, and mathematics. Government-level involvement in and support for human and robotic space exploration are critical to realizing these benefits. The ISEF provides us with an opportunity to strengthen international cooperation through discussions of policy issues relevant to the exploration, long-term sustainability, development, and utilization of this important domain."

Holdren touted the benefits of continuing to operate the orbiting laboratory for at least another decade in his remarks.

"The ISS is a unique facility that offers enormous scientific and societal benefits," said Holdren. "The



The Marshall Payload Operations Integration Center plans and operates science experiments on the station 24/7, 365 days a year. These research activities benefit people on Earth and support the human exploration of space. (NASA/MSFC)

Obama Administration's decision to extend its life until at least 2024 will allow us to maximize its potential, deliver critical benefits to our Nation and the world, and maintain American leadership in space."

NASA Administrator Charles Bolden emphasized in a keynote speech the importance of the role space exploration has played in scientific discovery in space and on Earth, and the ways exploration has led to new technologies.

"NASA is committed to the space station as a long-term platform to enable the utilization of space for global research and development," Bolden said. "We're committed to implementing a unified strategy of deep space exploration, with robotic and human missions to destinations that include near-Earth asteroids, the moon and Mars. And we are committed to our international partnerships and the continued peaceful uses of outer space and

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Lightfoot All Hands *Continued from [page 1](#)*

2013 to determine how best to carry forward NASA's exploration, science and engineering endeavors at its field centers around the nation.

The All Hands will begin at 8:30 a.m. in Morris Auditorium in Building 4200. Those team members

who cannot attend in person are encouraged to watch live via [DesktopTV](#).

Bus transportation will be provided. See daily "Heads Up" emails for a complete bus schedule, or visit [ExplorNet](#).

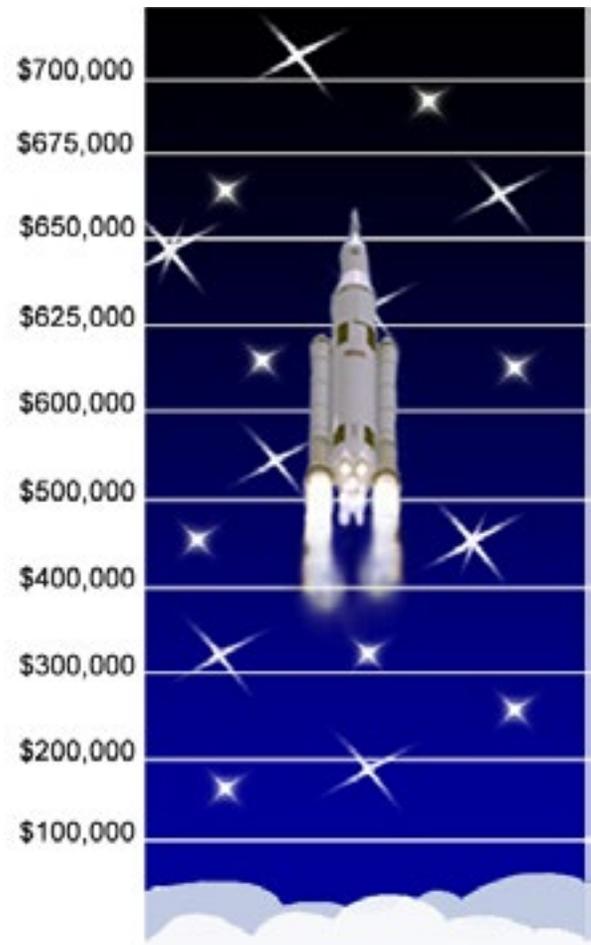
Deadline Looms to Help Beat CFC Goal

If you have been putting off your contribution to the Marshall Space Flight Center's annual Combined Federal Campaign, the deadline is midnight Jan. 15 to join the thousands of Marshall team members helping local non-profit agencies.

So far, contributions during the charity drive have reached \$651,056, only a few thousand short of the \$700,000 goal.

"Thanks to the entire team for your dedication to this very worthy cause," said Marshall Center director Patrick Scheuermann. "I appreciate every organization's final push to surpass our goal and for their efforts to date. We can do it, and the beautiful thing is that so many other people's lives are positively affected as a result."

CFC organizers are asking everyone to visit the [CFC page on ExplorNet](#) to learn how to help the many charities in need, either through financial contributions or volunteering your time.



(NASA/MSFC)

ISS Extension *Continued from page 3*

unlocking the mysteries of our vast universe."

Deputy Secretary of State William Burns spoke at the forum on behalf of the Department of State.

"We all share a deep stake in extending humanity's reach further into the solar system, advancing innovation further and faster, and extending the benefits of discovery to more people in more places," Burns said. "The question facing us today is whether we can muster the courage and political will to advance space exploration and ensure that cooperation continues to trump competition."

After the meeting, the State Department issued a forum summary on behalf of the participating countries. The full text of the summary is at the bottom of this release.

For documents issued by the State Department for

the International Space Exploration Forum, click [here](#).

For the International Space Exploration Forum Fact Sheet, click [here](#).

For remarks by Deputy Secretary of State Burns, click [here](#).

For video of Holdren's remarks, click [here](#).

For remarks from NASA Administrator Bolden, click [here](#).

For more information about Holdren's and Bolden's announcement on extended use of the International Space Station, click [here](#).

To view a video tour of the ISS Payload Operations Integration Center at Marshall, click [here](#).

SLS Avionics System Sees the (First) Light

By Megan Davidson

The modern avionics system that will guide the most powerful rocket ever built saw the light -- the "first light," that is.

Hardware, software and operating systems for NASA's Space Launch System (SLS) recently were integrated and powered up for an inaugural run -- referred to as "first light."

When completed, SLS will be capable of powering humans and potential science payloads to deep space. It has the greatest capacity of any launch system ever built, minimizing cost and risk of deep-space journeys.

"We often compare the avionics system to the body's central nervous system -- we can't function without one, and neither can the SLS," said Lisa Blue, stages avionics system manager in the SLS Program Office at NASA's Marshall Space Flight Center. "Avionics tell the rocket where it should go and end up, and how it should pivot the engines to keep on the right trajectory."

"Now we have that critical system together, and each unit has powered up successfully," Blue added. "That's a major



From left, Wayne Arrington, Gerald Clayton and Ryan MacKrell, all of The Boeing Co., work on setting up the avionics system in flight configuration in the Systems Integration and Test Facility at the Marshall Center. The units, which have powered up successfully and will undergo testing, will guide the most powerful rocket ever built -- NASA's Space Launch System. (Boeing)

See *SLS First Light* on page 6

Kessler Seeks Ideas for Grand Challenge

Jason Kessler, program executive for NASA's Asteroid Grand Challenge, visited NASA's Marshall Space Flight Center Jan. 7-8 to promote NASA's Grand Challenge, which employs open innovation tactics to accelerate work already being done for planetary defense.

During the visit, Kessler discussed ideas with employees in a think-tank format about how to find, track and deflect asteroids.

NASA's asteroid initiative has two parts: the mission by astronauts to explore an asteroid, and a grand challenge to protect the planet. The asteroid redirect mission leverages the agency's progress on asteroid discovery and study, the Space Launch System rocket, Orion spacecraft and cutting-edge technology development.



Jason Kessler, foreground, program executive for NASA's Asteroid Grand Challenge, is joined by NASA engineers Devon Sanders, kneeling, and Daniel Heater, background, at Marshall's Robotics Laboratory in Building 4619, site of a floor used to test telerobotics and inspace propulsion. (NASA/MSFC/Courtney Wilson)

Marshall Co-sponsors 2014 FIRST Robotics Competition Kickoff

Student leaders on the Morgan County “Mech Tech” robotics team pick up a kit of parts during the 2014 FIRST Robotics Competition kickoff at the U.S. Space & Rocket Center. More than a dozen teams from high schools in Alabama, Tennessee and Mississippi participated, and will compete with 2,700 teams worldwide in a series of regional and district contest rounds that begin in February and lead to the FIRST Championship in April. “For Inspiration and Recognition of Science and Technology,” or FIRST, was founded in 1989 by inventor Dean Kamen in Manchester, N.H., to inspire young people to pursue careers in science and technical fields. Morgan County Mech Tech and the “Mad Rockers” of Bob Jones and James Clements High Schools in Madison are sponsored by the Marshall Space Flight Center. Leaders of Mech Tech are, from left, Joseph Miller, Vance Lawrimore, sponsor Tim Sharp, Katherine Hetrick, Jordan Ratliff, Gunter Chenoweth, Zoie Garnett and Leanna Cobbs. (NASA/MSFC/Kenneth Kesner)



SLS First Light *Continued from page 5*

accomplishment toward getting ready for the first flight of SLS.”

The Integrated Avionics Test Facilities team provided and installed the structure and simulation capability to model the environments the vehicle will experience during launch. With the avionics hardware units arranged in flight configuration on the structure and with the flight software, the facility will replicate what will actually fly the rocket. “We are using and testing state-of-the-art technology, including the most powerful computer processor ever used on a flight system,” Blue said.

NASA and Boeing engineers will test the system in early January at the Systems Integration and Test Facility at the Marshall Center. They will run flight simulations to see how SLS will perform during launch.

“Completing the first light milestone establishes a capability to perform early avionics and software integration and testing to help us find and fix any problems with the system, and make sure the units communicate together as they are designed to do,” said Dan Mitchell, SLS Integrated Avionics and Software lead engineer at the Marshall Center.

Avionics and the flight computer will be housed in the SLS core stage. When completed, the core stage will be more than 200 feet tall and store cryogenic liquid hydrogen and liquid oxygen that will feed the vehicle’s RS-25 engines. The Boeing Co. is the prime contractor for the SLS core stage, including avionics.

In late January, the team will start working on the



James Peckham, an nLogic Inc. test engineer supporting the Stages Office at the Marshall Center, runs an avionics flight simulation to see how SLS will perform during launch. (Boeing)

entire avionics system operating together as one unit. In 2015, the avionics will be shipped to NASA’s Michoud Assembly Facility, where the core stage is being manufactured, and integrated onto the actual rocket.

For more information on SLS, visit: <http://www.nasa.gov/exploration/systems/sls/>

Davidson, an ASRC Federal/Analytical Services employee, supports the Office of Strategic Analysis & Communications.

Marshall Association Kicks Off New Year

By Shannon Ridinger

Ask Johnny Stephenson one of his goals as the new Marshall Association president for 2014 and he is quick to tell you “encouraging new and young employees to get involved at our great center!”

Stephenson, deputy director of the Office of Strategic Analysis & Communications, joins three other new officers who will kick off the New Year at the first 2014 Marshall Association meeting on Jan. 17. The meeting will feature keynote speaker and NASA Associate Administrator Robert Lightfoot.

In addition to Stephenson, new officers include DeWitt Burns, Marshall Association vice president of programs and chief of Marshall’s environmental effects branch of the Materials and Processes Laboratory; Shannon Ridinger, the association’s vice president of communications and a Marshall public affairs officer; and Beverly Reynolds, the association’s treasurer and a program analyst in Marshall’s Resource Management Office.

“Our theme this year is ‘Growing Leaders: Learning from our Failures, Partnering for our Success,’ and it’s all about sharing with each other the lessons we’ve learned through leading and partnering with others, not only at NASA but throughout industry,” said Stephenson. “The great leaders are lifelong learners. We learn and grow together through our successes and our failures. It is important that we include our new and less experienced employees as we learn together. It’s those individuals who are going to be the next generation at NASA, and we



The new Marshall Association officers, from left, President Johnny Stephenson, Vice President of Communications Shannon Ridinger, and Vice President of Programs DeWitt Burns, were introduced to association members at the last meeting of 2013. (NASA/MSFC/Emmett Given)

owe it to them to share what we’ve learned.”

The Marshall Association was established as a way to exchange innovative ideas within the Marshall community, and membership originally was limited to managers and supervisors. The membership was expanded to include non-supervisory employees, contractors, members of the industry community and retirees. Since then, membership has grown to include members from all walks of life, which has fostered a great sense of community and networking among the members. The association supports several activities and non-profit fundraisers throughout the year, as well as monthly luncheons featuring keynote speakers.

For more information about the Marshall Association, attending the first meeting Jan. 17 with Lightfoot, or to join at a discounted rate of \$12.50 through March 31, visit the [Marshall Association ExplorNet](#) page.

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



Beverly Reynolds is the new Marshall Association treasurer. (NASA/MSFC/Shannon Ridinger)

Expedition 35/36 Astronaut Chris Cassidy to Share Mission Highlights with Marshall Jan. 22

Expedition 35/36 astronaut Chris Cassidy will present mission highlights at 1 p.m., Jan. 22, in Morris Auditorium, Building 4200. All Marshall Space Flight Center team members are invited to attend.

Cassidy returned to Earth on Sept. 10 after more than five months on the International Space Station. His launch in March was the first expedited trip in the 12-year history of the space station. The Soyuz spacecraft carrying him and his crew members docked to the orbiting laboratory in just six hours instead of the usual two days. The crew completed 2,656 orbits of Earth and traveled more than 70 million miles.

During his time aboard the station, Cassidy worked on hundreds of research experiments and science investigations that will have benefits for future human spaceflight and life on Earth. He also saw the arrival of the European Automated Transfer Vehicle-4 cargo spacecraft, the Japanese H-II Transfer Vehicle-4 cargo spacecraft and two Russian Progress resupply spacecraft.

An autograph session will follow the event in the auditorium.



Expedition 35/36 astronaut Chris Cassidy (NASA)

Death by Black Hole in Small Galaxy?

From news release

A bright, long-duration flare may be the first recorded event of a black hole destroying a star in a dwarf galaxy. The evidence comes from two independent studies using data from NASA's Chandra X-ray Observatory and other telescopes.

As part of an ongoing search of Chandra's archival data for events signaling the disruption of stars by massive black holes, astronomers found a prime candidate. Beginning in 1999, an unusually bright X-ray source had appeared in a dwarf galaxy and then faded until it was no longer detected after 2005.

"We can't see the star being torn apart by the black hole," said Peter Maksym of the University of Alabama in Tuscaloosa who led one of the studies, "but we can track what happens to the star's remains and compare it with other, similar events. This one fits the profile of 'death by a black hole.'"

See **Black Hole** on [page 9](#)



A dwarf galaxy is located in the galaxy cluster Abell 1795. (X-ray: NASA/CXC/Univ. of Alabama/W.P.Maksym et al & NASA/CXC)

Robert “Bob” L. Sackheim, Former Marshall Center Assistant Center Director and Chief Engineer, Dies

Robert “Bob” L. Sackheim, 76, of Huntsville, died Dec. 22. He is survived by his wife, Babette Sackheim.

Joining NASA in 1999, Sackheim served as the assistant center director and chief engineer for propulsion at NASA’s Marshall Space Flight Center. Before retiring in 2006, he was responsible for providing technical leadership for the center’s flight propulsion systems and for research and development of new propulsion technology for advanced space transportation systems.

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Robert L. Sackheim (NASA/MSFC)

Black Hole *Continued from [page 8](#)*

Scientists predict that a star that wanders too close to a giant, or supermassive, black hole could be ripped apart by extreme tidal forces. As the stellar debris falls toward the black hole, it would produce intense X-radiation as it is heated to millions of degrees. The X-rays would diminish in a characteristic manner as the hot gas spiraled inward.

In the past few years, Chandra and other astronomical satellites have identified several suspected cases of a supermassive black hole ripping apart a nearby star. This newly discovered episode of cosmic, black-hole-induced violence is different because it has been associated with a much smaller galaxy than these other cases.

The so-called dwarf galaxy is located in the galaxy cluster Abell 1795, about 800 million light years from Earth. It contains about 700 million stars, far less than a typical galaxy like the Milky Way, which has between 200 and 400 billion stars.

“Scientists have been searching for these intermediate mass black holes for decades,” said Davide Donato of NASA’s Goddard Space Flight Center, who led a separate team of researchers. “We have lots of evidence for small black holes and very big ones, but these medium-sized ones have been tough to pin down.”

The evidence for a star being ripped apart by the dwarf galaxy’s black hole came from combing through Chandra data that had been taken over several years. Because Abell 1795 is a target that Chandra observes regularly to help calibrate its instruments, the researchers had access to an unusually large reservoir of data on this object.

The dwarf galaxy’s location in a galaxy cluster also makes it a potential victim of another type of cosmic violence. Because galaxy clusters are crowded with galaxies, it’s possible that a large number of stars have been pulled away from the dwarf galaxy by gravitational interactions with another galaxy in the past, a process called tidal stripping.

Astronomers believe that intermediate mass black holes may be the “seeds” that ultimately formed the supermassive black holes in the centers of galaxies like the Milky Way.

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

To watch an animated tour of galaxy cluster Abell 1795, click [here](#).

Sackheim *Continued from page 9*

Prior to his service at Marshall, Sackheim retired from TRW Space and Electronics Group after 35 years in various management positions. During his time with TRW, he was the manager of the Propulsion and Combustion Center in Redondo Beach, Calif. Sackheim also led the TRW team responsible for design, development and flight qualification of the Chandra Integral Propulsion System, which successfully placed NASA's Chandra X-ray Observatory into its final operational orbit in 1999.

Throughout his distinguished career, Sackheim

wrote more than 150 technical papers, contributed to four books on rocket propulsion, held eight patents in spacecraft propulsion and control systems technologies, and was an instructor in space propulsion at the University of California in Los Angeles.

He was the third Marshall Center inductee to the National Academy of Engineering. He also received numerous awards and honors from TRW, NASA, and from various academic and aerospace organizations worldwide.

Obituaries

Garland G. Betterton, 89, of Arab, died Dec. 10. He retired from the Marshall Center in 1964 as an aerospace engineer.

Gordon Edward DeRamus Jr., 76, of Huntsville, died Dec. 18. He served as a mechanical engineer in the Quality and Reliability Laboratory and the Materials and Processes Laboratory at the Marshall Center. He is survived by his wife, Roseanne DeRamus.

Donnie Ray Burch, 66, of Toney, died Dec. 20. He retired from the Marshall Center in 2011 as an electronics technician. He is survived by his wife, Susan Burch.

James Thomas Rogers, 84, of Huntsville, died Jan. 5. He retired from the Marshall Center in 1985 as an aerospace engineer. He is survived by his wife, LaVerne Turner Rogers.

John "Jack" Housley, 77, of Huntsville, died Jan. 8. He retired from the Marshall Center in 1998 as a technical manager. He is survived by his wife, Sandy Housley.