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Marshall Star, September 21, 2011 Edition

MARSHALL STAR

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Lightfoot: 'Time to Get to Work' on Space Launch System, Next Era of Discovery

By Rick Smith

On Sept. 15, a day after NASA unveiled the nation's new Deep Space Exploration System, Marshall Space Flight Center Director Robert Lightfoot addressed the center's workforce about the new rocket and the work that lies ahead.

Image right: Space Launch System Office Manager Todd May, center, answers an SLS question while Marshall Space Flight Center Director Robert Lightfoot, right, looks on during an all hands meeting Sept. 15. (MSFC/Emmett Given)



"This is our generation's opportunity to leave a legacy," he said. "Exploration is what great nations do. And we've been asked to go do that."

NASA's [Space Launch System](#) will consist of a 130-metric-ton rocket built around a core stage with the same diameter as a space shuttle external tank. Early flights will be powered by three space shuttle main engines, or SSMEs, with later flights reconfigured for five. Five-segment solid rocket boosters mounted to the sides of the tank will provide added power. Later flights may switch to liquid-fueled boosters, depending on the results of competitive industry research.

The planned launch vehicle builds on the legacy of the Saturn rocket, the space shuttle and the Ares development effort, Lightfoot told the team during the meeting -- but it's wrong for critics to dismiss the new vehicle and its architecture as "old technology."

"Getting to space is physics," he said, "and physics hasn't changed."

The advantages of the chosen architecture are self-evident, he said, from documented flight performance parameters to the substantial cost savings associated with using proven hardware -- and will help Marshall maintain the brisk development pace necessary to launch the first planned test flight on schedule in 2017.

Lightfoot said the proven design also gives NASA "great flexibility" to tap into its latest hardware manufacturing techniques -- including state-of-the-art fabrication and tooling techniques and facilities in use today at Marshall and the Michoud Assembly Facility.

Getting Started

As Marshall continues its reorganization in the weeks ahead to accommodate the new rocket program and realign its program and project structure to best serve NASA's new and existing missions, Lightfoot stressed that leaders and managers are aware the new work comes at a complicated juncture for the center, the agency and the nation.

"The next couple months will be tough," he said. "I know everybody is eager to go to work. Everyone will be saying, 'Where's my charge number? What's my task?' Be patient. It'll take some time to work through [the transition] -- but keep your eye on the prize."

The next major milestone for the Space Launch System is an Industry Day event Sept. 29 at the Davidson Center for Space Exploration in Huntsville. NASA will announce its procurement strategy, identifying for industry the specific requirements and goals of the development effort.

At that point, Lightfoot said, NASA officially opens the next chapter in the continuing saga of human space exploration.

"And this great nation just gave us the pen," he added. "Let's start writing."

Team members are invited to ask questions about the new rocket development program and the Marshall Center reorganization via email, [ExplorNet](#) and Lightfoot's video blog series "[Launching Conversations](#)."

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

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NASA Picks Boeing for Composite Cryogenic Propellant Tank Tests

NASA news release

NASA has selected The Boeing Company of Huntington Beach, Calif., for the Composite Cryotank Technologies Demonstration effort. Under the contract, Boeing will design, manufacture and test two lightweight composite cryogenic propellant tanks.

The demonstration effort will use advanced composite materials to develop new technologies that could be applied to multiple future NASA missions, including human space exploration beyond low Earth orbit.

The Marshall Space Flight Center will lead the project with support from NASA's Glenn Research Center; NASA's Langley Research Center; and NASA's Kennedy Space Center. The composite cryogenic tank effort is part of the Space Technology Game Changing Development Program, managed by the Office of the Chief Technologist.

Boeing will receive approximately \$24 million over the project lifecycle from NASA's Space Technology Program for the work which starts this month. The tanks will be manufactured at a Boeing facility in Seattle. Testing will start in late 2013 at Marshall.

"The goal of this particular technology demonstration effort is to achieve a 30 percent weight savings and a 25 percent cost savings from traditional metallic tanks," said the Director of NASA's Space Technology Program, Michael Gazarik at NASA Headquarters in Washington. "Weight savings alone would allow us to increase our upmass capability, which is important when considering payload size and cost. This state-of-the-art technology has applications for multiple stakeholders in the rocket propulsion community."

By investing in high payoff, disruptive technology that industry does not have today, NASA matures the technologies required for future missions, while proving the capabilities and lowering the cost of government and commercial space activities.

Continuing the advancement of technologies required for NASA's missions in deep space exploration, science and space operations, the composite cryotank demonstration effort will advance the areas of materials, manufacturing and structures.

The tanks incorporate design features and new manufacturing processes applicable to designs up to 10 meters in diameter. Tanks could be used on future heavy-lift vehicles, in-space propellant depots and other Earth-departure exploration architectures.

"This technology demonstration effort is different in the fact that we're focused on affordability concurrently with performance," said John Vickers, NASA project manager for the Composite Cryotank Technologies Demonstration effort at Marshall. "This technology has excellent transition potential for NASA and commercial product lines. Critical technology advances such as out-of autoclave composites are being matured, and when demonstrated in an operational environment will let us go well beyond the state-of-the-art."

For information about NASA's Office of the Chief Technologist and Space Technology Program, visit:

<http://www.nasa.gov/oct>

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Space Station Trio Lands Safely In Kazakhstan

NASA news release



Three International Space Station crew members safely returned to Earth on Sept. 15, wrapping up a six-month mission of research and exploration.

Image left: The Soyuz spacecraft lands with Expedition 28 Commander Andrey Borisenko, and Flight Engineers Ron Garan and Alexander Samokutyaev in a remote area outside of the town of Zhezkazgan, Kazakhstan. (NASA/Bill Ingalls)

NASA's Ron Garan, Expedition 28 Commander Andrey Borisenko and Flight Engineer Alexander Samokutyaev, both of the Russian Federal Space Agency, landed their Soyuz spacecraft in Kazakhstan at 11 p.m. CDT. The trio, which arrived at the station on April 6, had

been scheduled to land Sept. 8, but that was postponed because of the Aug. 24 loss of the Progress 44 cargo ship.

Before leaving the station, Borisenko handed over command to NASA's Mike Fossum, who leads Expedition 29. He and Flight Engineers Satoshi Furukawa of Japan and Sergei Volkov of Russia are conducting research and maintenance aboard the station. The launch date for the remaining Expedition 29 crew members, NASA's Dan Burbank, and Russia's Anatoly Ivanishin and Anton Shkaplerov, is under review.

For more information about Expedition 29 and the space station, visit <http://www.nasa.gov/station>.

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Marshall Veteran Ann McNair Receives the 'Women Honoring Women' Award

By Rick Smith

Ann McNair, director of the Marshall Space Flight Center's Office of Center Operations, has been honored with the "Women Honoring Women" award from the nonprofit [Women's Economic Development Council Foundation](#) of Huntsville.

Image right: Ann McNair, center, is presented with the 2011 Technology "Women Honoring Women" award during the annual Women's Economic Development Council celebration Sept. 15. Event co-chairs Carolyn Lord, left, from OmniTeam Inc. and Marcia Burnette, right, from Oakwood University, presented McNair with the honor. (WEDC)



The council is [an affiliation of professional business women](#) in Madison, Marshall, Morgan and Limestone counties of Alabama. The awards celebration -- in its 10th year -- was held Sept. 15 in the Von Braun Center in Huntsville.

McNair received the 2011 Technology Award, recognizing her decades of success as a woman, mentor and engineer in a

technical field. McNair started her NASA career when the Marshall Center was founded in 1960, and holds the distinction of being the center's first female supervisor in engineering.

"This honor comes as no surprise to those who work each day with Ann McNair," said Robert Lightfoot, director of the Marshall Center. "Her leadership, her technical expertise and her genuine love for the business of spaceflight and the work of the nation's space program are emblematic of the truest spirit of public service, and an example to new generations of scientists and engineers -- and indeed to us all."

McNair said she was surprised and humbled by the honor, announced by the Foundation in August.

"It's so gratifying to realize you can reach out and help someone else," she said. The award goes on her list of the "wow" moments of her career, she said -- alongside such thrills as seeing the Saturn IVB rocket ignite in Earth orbit during Apollo test missions in the 1960s, signaling a major milestone in sending human explorers to the moon.

Bob Devlin, deputy director of Marshall's Office of Center Operations, said a number of McNair's colleagues contributed to her nomination, highlighting her strong leadership both as a veteran NASA contributor and as a mentor for young women and men across the Marshall workforce.

"Through her strong sense of the [work] environment, her willingness to share her experiences and help people work through issues and relationships, Ann epitomizes the heart of mentorship," Devlin wrote. "She has had a lasting impact on a number of individuals and the organization."

Named to her current position in 2007, McNair oversees institutional services -- including environmental management and occupational health; logistics, facility maintenance and operations; industrial labor relations; and protective services -- for the Marshall Center, NASA's [Michoud Assembly Facility](#), [Santa Susana Field Laboratory](#) and supporting contractor and government facilities

McNair, a native of Moundville, Ala., graduated in 1958 with a bachelor's degree in mathematics and physics from the University of Alabama in Tuscaloosa. She was selected in 2000 for the Senior Executive Service, the personnel system covering top managerial posts in some 75 federal agencies.

Among her numerous achievements and honors, she was awarded the Presidential Rank Award for Meritorious Executives in 2009 -- the highest honor for federal employees. Also in 2009, she was commended by the Alabama Senate for her outstanding professional achievements during 50 years of NASA service.

Read more about McNair's career achievements [here](#).

Learn more about the Marshall Center's Office of Center Operations [here](#).

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

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NASA Seeks Undergraduates to Fly Research in Microgravity; Proposals Due Oct. 26

From a NASA news release

NASA is offering undergraduate students the opportunity to test an experiment in microgravity as part of the agency's Reduced Gravity Education Flight Program. The program is accepting proposals for two different flight experiences in 2012.

Proposals for student-driven experiments are due Oct. 26, and selected teams will be announced Dec. 7. The actual flight experience will take place in June 2012.

The initiative, managed by the Education Office at the Johnson Space Center, provides future scientists and engineers an opportunity to design, build and fly an experiment aboard a microgravity aircraft. The aircraft is a modified jet that flies approximately 30 roller-coaster-like climbs and dips to simulate micro- and hyper-gravity. The overall experience includes scientific research, hands-on experimental design, test operations and public outreach activities.

"This program leverages NASA's unique resources and allows students to determine what it takes to be a real-world scientist or engineer," said Reduced Gravity Education Flight Program Manager Doug Goforth.

NASA personnel also have identified student opportunities related to ongoing systems engineering projects that are pertinent to future agency research and missions. Students interested in working on these projects are encouraged to apply for the Systems Engineering Educational Discovery, or SEED, flight week opportunity. Proposals are due by Oct. 26, and selected teams will be announced Nov. 30. The SEED flight week will take place in April 2012.

All applicants for these programs must be U.S. citizens. Full-time students must be at least 18 years old. Selected teams may invite an accredited journalist to fly with them to document the experience.

For more information about the Reduced Gravity Education Flight Program, the application process or to submit a proposal, contact jsc-reducedgravity@nasa.gov or visit the [Microgravity University](#) website.

To view SEED flight week opportunities, visit [here](#).

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Star Blasts Planet with X-rays

NASA news release



A nearby star is pummeling a companion planet with a barrage of X-rays 100,000 times more intense than the Earth receives from the sun.

Image left: Image and illustration of a nearby star, CoRoT-2a, and an orbiting planet, CoRoT-2b. (Optical: NASA/NSF/IPAC-Caltech/UMass/2MASS, PROMPT; Wide field image: DSS; X-ray: NASA/CXC/Univ of Hamburg/S.Schröter et al; Illustration: CXC/M. Weiss)

New data from NASA's Chandra X-ray Observatory and the European Southern Observatory's Very Large Telescope suggest that high-energy radiation is evaporating about 5 million tons of matter from the planet every second. This result gives insight into the difficult survival path for some planets.

The 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.

The planet, known as CoRoT-2b, has a mass about three times that of Jupiter -- 1,000 times that of Earth -- and orbits its parent star, CoRoT-2a at a distance roughly 10 times the distance between Earth and the moon.

The CoRoT-2 star and planet -- so named because the French Space Agency's Convection, Rotation and planetary Transits, or CoRoT, satellite discovered them in 2008 -- is a relatively nearby neighbor of the solar system at a distance of 880 light years.

"This planet is being absolutely fried by its star," said Sebastian Schroeter of the University of Hamburg in Germany. "What may be even stranger is that this planet may be affecting the behavior of the star that is blasting it."

According to optical and X-ray data, the CoRoT-2 system is estimated to be between about 100 million and 300 million years old, meaning that the star is fully formed. The Chandra observations show that CoRoT-2a is a very active star, with bright X-ray emission produced by powerful, turbulent magnetic fields. Such strong activity is usually found in much younger stars.

"Because this planet is so close to the star, it may be speeding up the star's rotation and that could be keeping its magnetic fields active," said co-author Stefan Czesla, also from the University of Hamburg. "If it wasn't for the planet, this star might have left behind the volatility of its youth millions of years ago." Support for this idea come from observations of a likely companion star that orbits CoRoT-2a at a distance about a thousand times greater than the separation between the Earth and our sun. This star is not detected in X-rays, perhaps because it does not have a close-in planet like CoRoT-2b to cause it to stay active.

Another intriguing aspect of CoRoT-2b is that it appears to be unusually inflated for a planet in its position.

"We're not exactly sure of all the effects this type of heavy X-ray storm would have on a planet, but it could be responsible for the bloating we see in CoRoT-2b," said Schroeter. "We are just beginning to learn about what happens to exoplanets in these extreme environments." These results were published in the August issue of *Astronomy and Astrophysics*. The other co-authors were Uwe Wolter, Holger Mueller, Klaus Huber and Juergen Schmitt, all from the University of Hamburg.

More information, including images and other multimedia, can be found at:

<http://chandra.harvard.edu>

and

<http://www.nasa.gov/chandra>

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NASA Web Chat Series Continues Sept. 22 with 'And You Thought NASCAR Was Fast: Lightning Explained, Part 2'

Lightning is an atmospheric electrostatic discharge "spark" accompanied by thunder, which typically occurs during thunderstorms. From this discharge of atmospheric electricity, a leader of a bolt of lightning can travel at speeds of 140,000 miles per hour, and can reach temperatures approaching 54,000 Fahrenheit, hot enough to fuse silica sand into glass channels.

Image right: A large lightning strike lights up the sky during a thunderstorm. (NASA)



Join lightning chat experts Sept. 22 from 2-3 p.m. CDT for "Lightning, Explained: Part 2" to learn more about lightning safety and lightning research at NASA. Join the chat by logging on [here](#).

Lightning chat experts Dr. Richard Blakeslee, an atmospheric research scientist at the Marshall Space Flight Center and thunderstorm physicist Dr. Monte Bateman of Universities Space Research Association, will answer your questions about lightning safety, the global distribution and frequency of lightning occurrence as well as some of its physical characteristics, the relationship of lightning to severe storms and weather (e.g., lightning rate changes may serve as a "pre-cursor" or advanced indicator to later severe weather at the ground such as tornadoes), and other lightning research topics such as lightning-hurricane relationships and terrestrial gamma-ray bursts.

For a transcript on the lightning web chat, part 1, click [here](#).

For more information on the "Back to School" Web Chat science series, click [here](#).

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Shuttle Buddies to Meet Sept. 26

The Shuttle Buddies will meet at 8:30 a.m., Sept. 26, at Mullins Restaurant on Andrew Jackson Way in Huntsville. For more information, call Deemer Self at 256-881-7757.

Find this article at:

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