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Stennis hosts NASA Day at the Capitol

Former astronaut Scott Altman addresses legislators in the Mississippi House of Representatives during NASA Day at the Capitol activities in Jackson on Jan. 12. During his remarks, Altman was flanked by members of the Mississippi Gulf Coast delegation, as well as Stennis Director Patrick Scheuermann (third from right). During the day, Stennis officials displayed exhibits highlighting the center's role in the past, present and future of America's space program, and its positive effect on surrounding communities and on Mississippi's economy and quality of life. The center has a total workforce of more than 5,000 and has a consistently strong economic impact throughout the region. Within a 50-mile radius, Stennis had a direct economic impact of \$682 million in 2011. The direct global impact of the center totaled \$882 million for the year.



Stennis employees celebrate workplace award

Stennis Space Center Director Patrick Scheuermann (l) stands with NASA department representatives during a Best Places to Work award presentation Jan. 10. John Palguta (r), vice president for policy with the nonprofit Partnership for Public Service, visited the south Mississippi facility to present the award. Stennis ranked at the top of all NASA centers and was second out of 240 federal organizations in the annual 2011 U.S. Office of Personnel Management's Employee Viewpoint Survey totaling 266,000 responses.

"In an environment where resources will continue to be tight, we will thrive. The Stennis team has always been proactive in innovation and efficiency."

From the desk of
Patrick Scheuermann
 Director, Stennis Space Center



Happy New Year! Welcome back. I hope all of you safely enjoyed time with family and friends. We had a great 2011 filled with accomplishments across the center. Beyond normal milestones, our integrated team accomplished many "first-evers" in the history of Stennis Space Center.

Good things will continue to happen as we focus on safely executing our mission. There are many variables to future success, but the No. 1 factor is our ability to work as a team on the job that is in front of us today. We will always be asked to do more for less. With agency resources getting tighter, our model for operations excels. It speaks volumes about the openness of our work environment, our professionalism in solving problems, and our inclusion to ensure all voices are heard, therefore enabling the optimum solution to any challenge we face.

The test complex projects continue to be highlighted at the national level. We continue to test AJ26 engines and have shipped tested flight engines to Wallops Flight Facility, where the Orbital Sciences Corporation vehicle will launch this spring. The entire team of NASA, Lockheed Martin, A²Research, Pratt & Whitney Rocketdyne, ASRC Research and Technology Solutions, and Jacobs Technology should be proud that the J-2X engine has safely begun testing, as will the J-2X powerpack soon. Blue Origin also has delivered their test article to the E Test Complex.

The future of NASA is happening right now at Stennis. We are on the front end of the critical path for safe flight of the Space Launch System, Commercial Orbital Transportation Services and Commercial Crew Development programs. We should get comfortable with that statement, since we will be a driving force behind people and cargo leaving the planet.

At Stennis, we have achieved much and will continue to proudly execute the NASA mission and manage the federal city. We are building on our longstanding partnership with the state of Mississippi and will see great economic benefit as a result. After accomplishing first-evers in 2011, more work will continue to be awarded to us. The following are a few of the 2011 first-evers:

- Reincorporation of the former Mississippi Army Ammunition Plant facilities.
- International Space Station live downlink event at Stennis.
- NASA-TV live broadcast of a rocket engine test.
- Focus of national media outlets on work at Stennis.
- Attainment of site STAR status under OSHA's Voluntary Protection Programs flag.
- Digitization and preservation of more than 100,000 original property records.
- CNN coverage of Applied Science and Technology Project Office work with Mississippi River floods.
- No. 1 ranking in NASA in the U.S. Office of Personnel Management's Best Places to Work survey.

In an environment where resources will continue to be tight, we will thrive. The Stennis team has always been proactive in innovation and efficiency. I ask each of you to continue to speak up when you have an idea or a way to improve our operations tempo and certainly when you can improve our safety posture.

I look forward to another great year. Keep up the great work!



FULFILLING NASA'S EXPLORATION MISSION



NASA continues commercial engine testing

Engineers at NASA's Stennis Space Center conducted a test firing on Aerojet AJ26 engine No. 8 on Dec. 15, continuing their support of Orbital Sciences Corporation as the company prepares to launch commercial cargo missions to the International Space Station. The flight engine test was conducted on the E-1 Test Stand at Stennis Space Center. Following data review, tested AJ26 engines are shipped to the Wallops Flight Facility launch site in Virginia for installation on Orbital's Antares rocket. The Aerojet engines will power Antares rockets for International Space Station cargo supply missions. Orbital is part of NASA's ongoing Commercial Orbital Transportation Services program.

NASA announces new test series for Stennis

NASA Deputy Administrator Lori Garver visited Blue Origin in Kent, Wash., Dec. 8. The company is one of NASA's commercial partners opening a new chapter in human exploration by developing innovative systems to reach low-Earth orbit as part of the Commercial Crew Development Program.

"Blue Origin is creating cutting edge technologies to take us to low-Earth orbit," Garver said. "Like all of our commercial partners, they're making real progress and opening up a new job-creating segment of the economy that will allow NASA to focus on our next big challenges – missions to asteroids and Mars."

Garver also announced Blue Origin has delivered its BE-3 engine thrust chamber assembly – the engine's combustion chamber and nozzle – to Stennis Space Center, where testing will begin in April 2012.

The company is developing a reusable launch vehicle,

designed to take off and land vertically, and an escape system for its crewed spacecraft. Testing will take place on the center's E-1 Test Stand.

"We're delighted Blue Origin is taking advantage of Stennis, a center with a long record of propulsion testing from the dawn of the Space Age, to test the rocket engines of the future," Garver said.

"We appreciate the opportunity to work with the depth of expertise, and utilize the facilities at Stennis for our engine testing, and are glad to have the test hardware onsite and ready to go," said Rob Meyerson, president and program manager at Blue Origin.

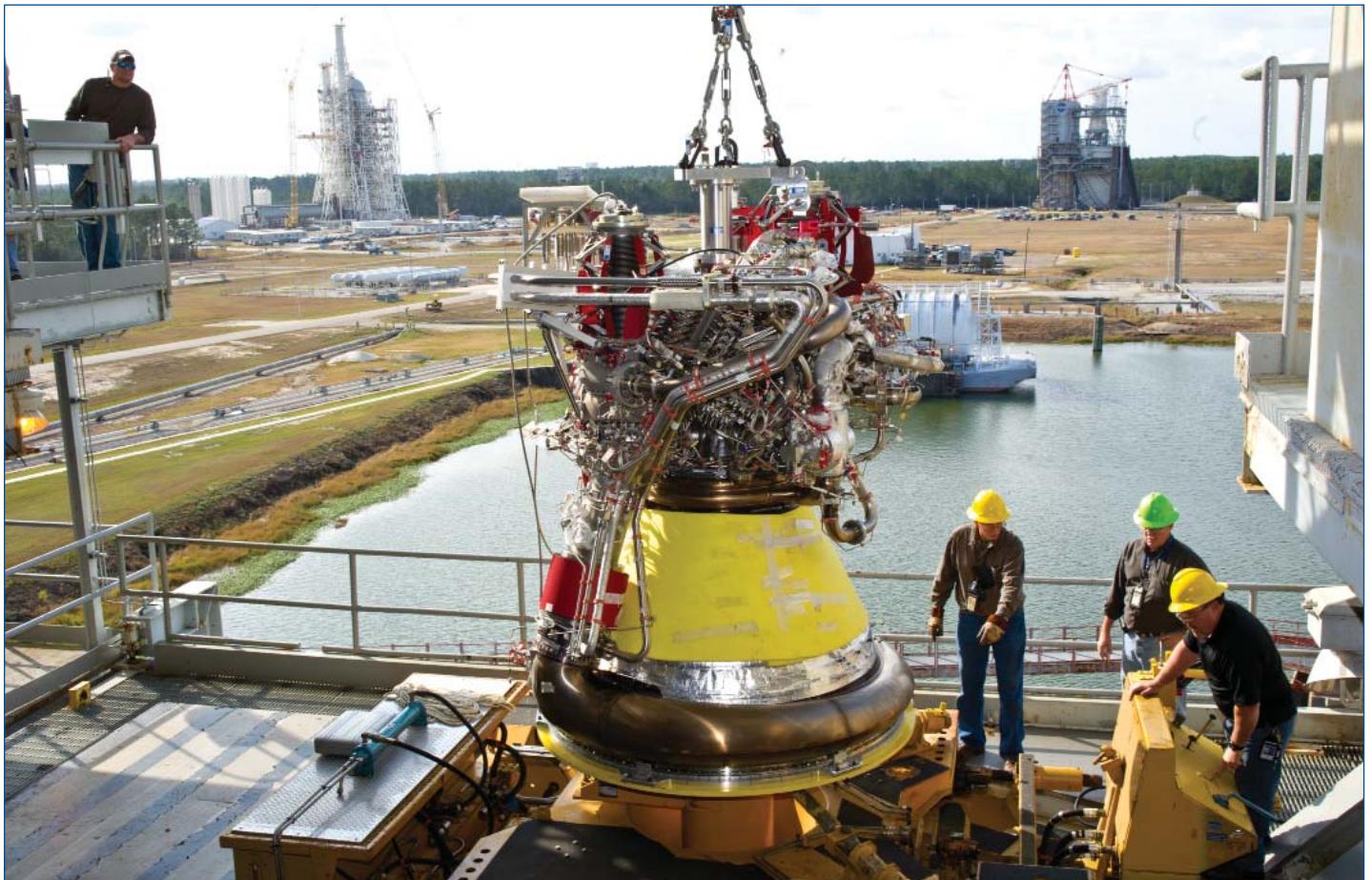
For information about NASA's partnerships for commercial space transportation, visit: www.nasa.gov/exploration/commercial

For more information about Blue Origin, visit: www.blueorigin.com

FULFILLING NASA'S EXPLORATION MISSION

NASA concludes 1st round of J-2X engine testing

NASA engineers conducted the final J-2X rocket engine test (right photo) of the year Dec. 14, the 10th firing in a series of tests on the new upper-stage engine that will carry humans farther into space than ever before. The J-2X engine was fired 235 seconds on the A-2 Test Stand at Stennis Space Center for the final test. The engine – E10001 – was removed from the test stand Jan. 6 (bottom photos) to allow for installation of equipment needed for additional engine tests in 2012. The next-generation engine will be returned to the stand early in upcoming weeks to resume the test series. The initial round of testing focused on characterizing basic components' performance: understanding integrated engine system performance during prestart, start, full-power operation and shutdown; and demonstrating full mission duration. The engine was fired for a total of 1,040 seconds during the 10 tests. It was fired at 100 percent power in four tests and achieved a full flight-duration test of 500 seconds in the eighth firing, which is quicker than any other U.S. rocket engine in history. NASA engineers praised the results, saying they validate the engine design and allow for quicker development work. The J-2X engine is being developed by Pratt & Whitney Rocketdyne for NASA's Marshall Space Flight Center in Huntsville, Ala. It will provide upper-stage power for NASA's new Space Launch System. The SLS will carry the Orion spacecraft, its crew, cargo, equipment and science experiments to space – providing a safe, affordable and sustainable means of reaching the moon, asteroids and other destinations in the solar system. For J-2X information and video, visit: www.nasa.gov/mission_pages/j2x/index.html.



NASA in the News

NASA's top stories for the past calendar year:

- **NASA decides architecture for future human deep space exploration.** NASA announced decisions on a crew exploration vehicle and Space Launch System to carry humans deeper into space than ever before.
- **Commercial space efforts accelerate.** NASA awarded four Space Act Agreements worth \$269.3 million in the second round of the agency's Commercial Crew Development Program in April.
- **International Space Station shifts to utilization and research.** NASA and its international partners celebrated 11 years of permanent human habitation on the International Space Station on Nov. 2.
- **Space shuttle flies final three flights; program ends.** The Space Shuttle Program ended in 2011 with three final missions to the International Space Station.
- **NASA chief technologist ramps up space technology program.**
- **NASA awards technology scholarships to educate the next generation of space technologists.**
- **NASA spacecraft continue making discoveries on Mars.** Groundbreaking research on the Red Planet in 2011 helped lay foundation for future human missions.
- **Aquarius yields NASA's first global map of ocean salinity.** NASA's new Aquarius instrument, launched into Earth orbit June 10, produced its first global map of the salinity of the ocean surface.
- **Twin solar spacecraft take first complete image of far side of the sun.**
- **Year of the solar system for NASA planetary missions.** NASA's Year of the Solar System resulted in three planetary launches, major science observations, an asteroid rendezvous and a comet flyby.
- **Voyager missions suggest magnetic bubbles at solar system edge.** Data from NASA's Voyager spacecraft, humanity's farthest deep-space sentinels, suggest the edge of our solar system may not be smooth, but filled with a turbulent sea of magnetic bubbles.
- **NASA telescopes join forces to observe black-hole-devouring star.**
- **NASA's Kepler spacecraft confirms its first planet in habitable zone of sun-like star and first Earth-sized planets beyond our solar system.**
- **Aeronautic research paves way for future air travel.** NASA's innovators focused on new ways to manage air traffic, build more fuel-efficient and environmentally friendly airliners, and ensure aviation's safety record.
- **NASA builds on award-winning online media efforts, including social media.**
- **NASA Education Office engages students in science, technology, engineering and math through new partnerships and activities.**

Access news release at:
<http://www.nasa.gov/news/index.html>

A changing landscape

The skyline at Stennis Space Center changed shape throughout 2011 as construction of the A-3 Test Stand continued.

Several construction milestones were achieved during the year, including installation of the stand's test cell and dome, as well as a pair of large propellant tanks atop the test structure.

The A-3 stand is the first large test structure to be built at Stennis since the 1960s. When completed and activated in 2013, the stand will allow operators to conduct simulated high-altitude testing on next-generation rocket engine being developed to carry humans deeper into space than ever before.

Construction of the stand will continue throughout 2012, but without the visible milestones of the previous 12 months. Much of the work for the upcoming year focuses on installation of a series of 27 chemical steam generators. The CSG units produce the steam needed to create a vacuum that simulates altitudes up to 100,000 feet. It is critical that next-generation engines be able to start at such altitudes in order to enable deep space missions.

Ground was broken for the A-3 Test Stand in 2007. The structure features 4 million pounds and 16 stages of fabricated steel erected on the concrete foundation. It also features a network of 14 water, isopropyl alcohol and liquid oxygen tanks, as well as 32 gaseous nitrogen bottles.

A "topping out" milestone was reached April 13 with placement of the test cell dome on the stand. Installation of the 35,000-gallon liquid oxygen tank atop the stand was completed June 8. Placement of the 80,000-gallon liquid hydrogen tank followed on July 25.

Those installations raised the height of the stand to more than 300 feet, making it visible above the treeline to travelers on a nearby I-10 overpass.

Construction of the A-3 Test Stand continued at Stennis throughout 2011



Construction of the A-3 Test Stand at Stennis Space Center featured both large-crane operations and small-scale detail work in 2011. (Clockwise, from top left) The stand as it appeared at the start of 2011. A welder works on supporting structures on the stand. A large crane lifts the test cell dome into place, marking a major "topping out" milestone in April 2011. A test cell isolation valve is installed on the new high-altitude simulation stand. Stennis employees prepare the A-3 Test Stand thrust measurement system for placement.





(Clockwise, from top left) The 80,000-gallon liquid hydrogen tank is lifted into place atop the A-3 Test Stand, raising the height of the structure to more than 330 feet. A network of gaseous nitrogen bottles will support operation of the chemical steam generators needed to allow testing at simulated altitudes up to 100,000 feet. The sun creates a sparkling view of the liquid hydrogen tank atop the A-3 stand. A Stennis employee performs detail work on the stand. The 35,000-gallon liquid oxygen tank is installed atop the A-3 Test Stand. Stennis employees complete installation of key components on the A-3 structure.

NASA selects small business proposals

NASA has selected 85 small business proposals to enter into negotiations for Phase II contract awards through the agency's Small Business Innovation Research Program.

The selected projects have a total value of about \$63 million. NASA will award the contracts to 79 small high-technology firms in 27 states. These competitive awards-based programs encourage U.S. small businesses to engage in federal research, development and commercialization. The programs also enable businesses to explore technological potential, while providing the incentive to profit from new commercial products and services.

One of the business projects involves technology being developed for the Office of the Chief Technologist at Stennis Space Center: "A Robust Real-Time Collaboration Technology for Decision Support in Multi-Platform Virtual Globe Environments" with StormCenter Communications Inc., in Baltimore, Md.

For project list, visit: <http://sbir.nasa.gov>. For more about NASA's Office of the Chief Technologist and the Space Technology Program, visit: www.nasa.gov/oct.

NASA's RS-25D rocket engine arrives at Stennis

RS-25D rocket engine No. 2045 is unpacked and positioned at Stennis Space Center on Jan. 17 for future testing and use on NASA's new Space Launch System (SLS). A total of 15 RS-25D engines will be delivered from NASA's Kennedy Space Center in Florida to Stennis, where they will be stored until certification testing can begin. "The relocation of RS-25D engine assets represents a significant cost savings to the SLS Program by consolidating SLS engine assembly and test operations at a single facility," said William Gerstenmaier, NASA's Associate Administrator for Human Exploration and Operations Mission Directorate. Once tested, the RS-25D engines will power the core stage of the new launch system. The SLS is a new heavy-lift launch vehicle that will expand human presence beyond low-Earth orbit and enable new missions of exploration across the solar system. The system will be powered by two engines: the RS-25D and the J-2X, which will provide upper-stage power. Testing of the next-generation J-2X engine already is under way at Stennis. Delivery of the 15 RS-25D engines will continue throughout the next few months. A test schedule for the engines has not yet been determined. The 15 RS-25D engines at Kennedy are being transported on the 700-mile journey to Stennis one at a time. Built by Pratt & Whitney Rocketdyne of Canoga Park, Calif., the RS-25D engine powered NASA's space shuttle program with 100 percent mission success.



Hail & Farewell

NASA bids farewell to the following:

Amy Grose Chief Counsel, Office of the Chief Counsel

And welcomes the following:

John Cecconi Procurement Analyst, Office of Procurement

Tiffany Hawkins AST, Facility Systems Safety, Office of Safety & Mission Assurance

Matthew Ladner AST, Experimental Facilities Techniques, Center Operations Directorate

Office of Diversity and Equal Opportunity

What If ... a new approach is tried in 2012?

I took a class several months ago that showed me a different approach to diversity and inclusion. Rather than just laying out the reasons that it is beneficial in business, it took a nonblaming approach to how diversity and inclusion can benefit every aspect of our lives.

The instructor was Dr. Steve Robbins. Robbins' unique concept of "Unintentional Intolerance" has captured wide acclaim from numerous audiences and organizations across the United States. An approach that does NOT blame or point fingers, it challenges individuals and organizations to be more open-minded, mindful and intentional about inclusion and valuing people for their unique gifts, abilities and experiences.

I left there realizing the world will be a better place when we take the time to appreciate what makes each of us unique in our approach, but the same in the end desire to accomplish what life brings before us both in the workplace and our private lives.

Robbins has a simple approach to changing the way we respond to life's challenges:

WHAT IF?

- Unity did not require uniformity.
- Those with the most stood up for those with the least.
- Life was a journey of error correction.

- We were more curious and less certain.
- We listened more than we talked.
- People mattered more than Blackberrys and iPhones.
- Slowing down was necessary for speeding up.
- We activated our ears more than our mouths. (There's a good reason why we have two ears and one mouth.)
- We said "Yes, and" more than we said "Yes, but."
- Mistakes were the pathway to success.
- The joy of comfort came from the pain of discomfort.
- Those who suffered the least spoke up the most.
- The softest voice had the loudest impact.
- Walls of protection were actually walls of imprisonment.
- Caring for strangers created more friends.

What If ... we were really open to new approaches that our co-workers bring to the table? What If ... we cared more about one another and less about whether the end result was accomplished using defined guidelines from the past? What If ... it opened abilities within us that we didn't even realize we possessed?

It is my hope that each of us would give some thought to the above statements in the new year. "What If?" opens up a world of new possibilities. Happy New Year!

— Brian Hey, Program Specialist
Stennis Office of Diversity and Equal Opportunity

Stennis mosaic memorializes fallen astronauts



Note: For 50 years, NASA's John C. Stennis Space Center has played a pivotal role in the success of the nation's space program. This month's issue of Lagniappe highlights a moment in the history of the south Mississippi rocket engine test center.

In 2004, Elizabeth Veglia, a renowned mosaic tile artist from Hancock County, Miss., was commissioned to design and create a memorial mural in honor of America's fallen astronauts for Stennis Space Center.

Prior to the first anniversary of the space shuttle Columbia tragedy on Feb. 1, 2004, then-NASA Administrator Sean O'Keefe declared Jan. 29, 2004 as Remembrance Day for crews of Columbia, Apollo 1 (Jan. 27, 1967) and Challenger (Jan. 28, 1986). In the mosaic, the moon, a space shuttle, Earth and the heavens represent aspects of each of those missions. Clusters of stars to the right of the nose of the space shuttle represent the astronauts aboard the missions: a cluster of three stars for Apollo I; and two seven-star clusters for Challenger and Columbia.

Renowned mosaic muralist Elizabeth Veglia stands with the completed astronaut memorial mural that is on display in the StenniSphere visitors center.



Stennis Space Center employees and the public helped place tiles on the mural under the direction of the artist. The idea for the mosaic was developed by Stennis' former NASA Public Affairs Officer Linda Theobald. "We felt it was important to not only create a permanent memorial to America's fallen astronauts," Theobald explained.

On Remembrance Day 2004, then-Stennis Center Director Tom Q. Donaldson V, RDML USN (Ret.), honored the work by laying the first tile. "I can't think of a better way to personally take part in memorializing these American heroes," Donaldson said.



NASA hosts 2nd Spaced Out Sports competition

NASA announced a second Spaced Out Sports competition Jan. 11, challenging students in grades 5-8 to create science-based games that will be played by astronauts aboard the International Space Station (ISS).

The challenge comes a year after the initial Spaced Out Sports competition, which attracted 56 submissions from the United States and internationally. It is part of an agency education effort to engage students in science, technology, engineering and mathematics (STEM) activities.

"We were excited about the response to last year's competition and how it focused attention on important science principles," said Katie Wallace, director of the Stennis Office of Education, which is managing the competition through the NASA Teaching From Space Office. "This is a fun, interactive way to encourage students to pursue studies and careers in science and related fields."

The challenge helps students learn and apply Sir Isaac Newton's Laws of Motion. It is part of the Science and Sports curriculum released by the Stennis Office of Education last fall. Using the curriculum and Digital Learning Network (DLN) modules, teachers lead students through a study of Newton's laws, highlighted by hands-on activities. They also use video podcasts featuring NASA scientists and engineers who explain how science concepts are

used in the space program.

The videos and modules feature celebrity sports figures explaining the "science behind their games." Contributing sports figures include Olympic gymnast Nastia Liukin, NASCAR driver Juan Pablo Montoya, Women's National Basketball Association player Temeka Johnson, National Hockey League player Ryan O'Reilly and members of the New Orleans Saints. Former astronaut and NASA Associate Administrator for Education Leland Melvin and astronaut Nicole Stott also are featured.

Students have until March 16 to design or redesign a game to illustrate and apply Newton's laws. They will submit game demonstrations for review via a playbook and video, and three submissions will be chosen before the end of the 2012 spring school semester. The first-place team will be awarded a school-wide celebration sponsored by NASA. All three of the winning teams will be able to watch their games played aboard the ISS. All contributing schools will have an opportunity to participate in a DLN webcast with an ISS astronaut.

For more about Spaced Out Sports, visit: <http://education.ssc.nasa.gov/spacedoutsports.asp>. For more about Teaching From Space, visit: www.nasa.gov/education/tfs. For more about NASA education programs, visit: www.nasa.gov/education.

Game on!

2012 FIRST Robotics season kicks off

Forty-one teams from Alabama, Florida, Louisiana and Mississippi high schools and 350 guests traveled to Stennis Space Center on Jan. 7 for the kickoff of the 2012 FIRST (For Inspiration and Recognition of Science and Technology) Robotics season.

Participants watched a broadcast from FIRST headquarters in Manchester, N.H., featuring FIRST founder Dean Kamen, former Presidents Bill Clinton and George W. Bush, and will.i.am of The Black Eyed Peas to learn their 2012 competition challenge. Teams also received parts kits they will use to build robots for the challenge.

The competition seeks to inspire students to pursue careers in science, technology, engineering and mathematics (STEM). Teams are given identical parts kits and six weeks to build robots to compete in scheduled events.

For this year's "Rebound Rumble" theme, a pair of three-team alliances will compete on a 27-by-57-foot playing field equipped with higher and lower basketball goals at each end. Teams will try to score as many basketballs as possible during a two-minute and 15-second match. Balls scored in higher hoops earn more points. Alliances are awarded bonus points if their robots are balanced on bridges at the end of the match. A description and video simulation of the "Rebound Rumble" game can be found online by searching keyword - FIRST Robotics.

NASA and Stennis support FIRST Robotics Competition with mentors, volunteers and contributions. Interested mentors should call Katie Wallace at 228-688-7744 or email katie.v.wallace@nasa.gov. The 2012 Bayou Regional FIRST Robotics Competition is scheduled at the Pontchartrain Center in Kenner, La., on March 15-17.



(Top photo) Rules of the 2012 FIRST Robotics "Rebound Rumble" challenge are explained during the season's kickoff event Jan. 7 at Stennis Space Center.

(Above photo) Stennis employees deliver a kit of parts to Tracy Hoffman (second from left) and Matthew Casnave (right) from Fontainebleau High School in Mandeville, La.