

Stennis receives Administrator's Cup

NASA Administrator Charles Bolden (l) and NASA Small Business Programs Associate Administrator Glenn Delgado (r) present NASA's Small Business Administrator's Cup Award to Stennis Space Center in recognition of its stellar small business program for fiscal year 2011. Receiving the award April 20 are (l to r) Stennis Procurement Office personnel Michelle Stracener and Rob Harris, along with Stennis Space Center Director Patrick Scheuermann. Bolden and Delgado presented the award during an onsite visit April 20. The NASA Small Business Administrator's Cup Program annually recognizes the NASA center with the best overall small business program and is sponsored by the NASA Office of Small Business Programs to honor successful and innovative practices that promote small business participation in NASA initiatives. During his visit to Stennis, Bolden also participated in a Digital Learning Network event with students at Petal Upper Elementary School. See additional coverage on page 3.



NASA deputy administrator views AJ26 test



NASA Deputy Administrator Lori Garver and U.S. Rep. Steven Palazzo, R-Miss., view a May 3 test of the Aerojet AJ26 rocket engine on the E-1 Test Stand at Stennis Space Center. Prior to the test, Garver and Palazzo visited in the Test Control Center with Stennis Director Patrick Scheuermann and members of the Engineering & Test Directorate. The AJ26 engine is being tested for Orbital Sciences Corporation to power the company's Antares vehicle. Orbital Sciences has partnered with NASA through the Commercial Orbital Transportation Services initiative to provide commercial cargo flights to the International Space Station.

“We will soon have a test article on seven different test positions. ... We are squarely on the radar screen of the agency and at the heart of the new age of space exploration.”

From the desk of
Randy Galloway

Director, Engineering & Test Directorate, Stennis Space Center



In the past year, we have had some tremendous successes in our rocket propulsion testing enterprise. For the first time in our history, a NASA/Lockheed Martin team assumed leadership of test operations in A Test Complex and conducted a very successful first test campaign of the J-2X engine, in concert with Pratt & Whitney Rocketdyne.

This test campaign culminated in a 500-second firing of the engine less than five months after its first test. After completion of that test series, we conducted extensive modifications on the A-2 Test Stand, and we began testing of the Powerpack 2 configuration on the A-1 Test Stand. We are continuing to test the AJ26 engine for Orbital Sciences Corporation’s Antares launch vehicle at the E-1 Test Stand and completed another successful test May 3. NASA Deputy Administrator Lori Garver and U.S. Rep. Steven Palazzo, R-Miss., watched the spectacular event.

We have begun testing for Blue Origin on the other end of the E-1 Test Stand, furthering Stennis’ role in providing test services to commercial customers. We have continued to retire risk for the A-3 Test Stand project by testing chemical steam generators at the E-2 Test Stand.

We have also had our share of setbacks in the past year. Our test team had to react quickly last summer when a customer’s test article revealed a weakness. Last fall, we had a vacuum failure on the B-1 Test Stand liquid hydrogen tank, which caused many months of outstanding team effort to recover and return to testing of the RS-68 engine.

The powerpack assembly test program on the A-1 Test Stand dealt with some early cutoffs and made necessary design adjustments in order to return to testing. On our first test of the new clamshell system on the A-2 Test Stand, a problem was found and repairs/redesigns are also being made.

Our business is one of exhilarating highs and sobering lows. As rocket testers, it is our nature to seek perfection in our work, while realizing that sometimes we will fail to attain it. We must learn from failure so as not to repeat it, but we must not become so afraid of failure that we become paralyzed. Solid engineering work, diligence in planning and execution, and good communication will help us fix problems and learn the right lessons.

If it seems like we have been doing a lot of “learning” lately, it may be due to the fact that we will soon have a test article on seven different test positions. These test articles include NASA, military and commercial customers, which fulfills the vision for Stennis Space Center that NASA Administrator Charles Bolden expressed to Congress only two years ago.

We are squarely on the radar screen of the agency and at the heart of the new age of space exploration. We are going to have a great time in the test complex this summer!

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FULFILLING NASA'S EXPLORATION MISSION

Bolden visits Stennis test stand

NASA Administrator Charles Bolden (r) discusses the upcoming testing of Blue Origin's BE-3 engine thrust chamber assembly with Steve Knowles, Blue Origin project manager, at the E-1 Test Stand during an April 20 visit to Stennis Space Center. The BE-3 will be used on Blue Origin's reusable launch vehicle as part of the agency's Commercial Crew Development Program. Blue Origin is one of NASA's partners developing innovative systems to reach low Earth orbit.



NASA administrator presents Stennis award

For the first time, NASA's Stennis Space Center has received the agency's Small Business Administrator's Cup Award in recognition of its stellar small business program.

NASA Administrator Charles Bolden and Small Business Programs Associate Administrator Glenn Delgado presented the fiscal year 2011 award to Stennis Director Patrick Scheuermann during a visit April 20.

"It gives me great pleasure to present Stennis with the 2011 Small Business Administrator's Cup. I'm very proud of Stennis and all its employees, and the center's small business work that is going to continue to grow and be critical to our future," Bolden said.

The NASA Small Business Administrator's Cup Program annually recognizes the center with the best overall small business program. The award is sponsored by the NASA Office of Small Business Programs to honor successful and innovative practices that promote small business participation in NASA initiatives.

In 2011, Stennis showed improvement in contract awards to small businesses and conducted successful outreach events to engage small businesses.

"This is an exceptional honor for the Stennis family," Stennis Director Patrick Scheuermann said. "Credit goes to everyone involved in this important area, NASA small business specialists and their resident agency colleagues alike. We are committed to continuing in our partnership efforts to reach out to small businesses and involve them in the important and varied work at Stennis."

Scheuermann credited the Mississippi Enterprise for Technology, the Louisiana Technology Transfer Office and the Partners for Stennis for their coordination of outreach events to small businesses. "Their efforts are a key reason Stennis showed improvement in contract awards to small businesses last year," he said.

For information about the NASA Office of Small Business Programs, visit: www.osbp.nasa.gov.

FULFILLING NASA'S EXPLORATION MISSION

Bigger and better

NASA begins second series of tests on next-generation J-2X rocket engine, moving a step forward in plans to return to deep space

The next-generation engine that will help carry humans deeper into space than ever is back, bigger and better. The J-2X engine is on the A-2 Test Stand at NASA's Stennis Space Center for an extensive round of tests to build on last year's successful test firings. The engine will provide upper-stage power for NASA's evolved Space Launch System (SLS), a new heavy-lift rocket capable of missions to deep space.

"We're making steady and tangible progress on our new heavy-lift rocket that will launch astronauts on journeys to destinations farther in our solar system," said NASA Administrator Charles Bolden, who recently visited Stennis and saw the J-2X in its test stand. "As we continue test firings of the J-2X engine and a myriad of other work to open the next great chapter of exploration, we're demonstrating our commitment right now to America's continued leadership in space."

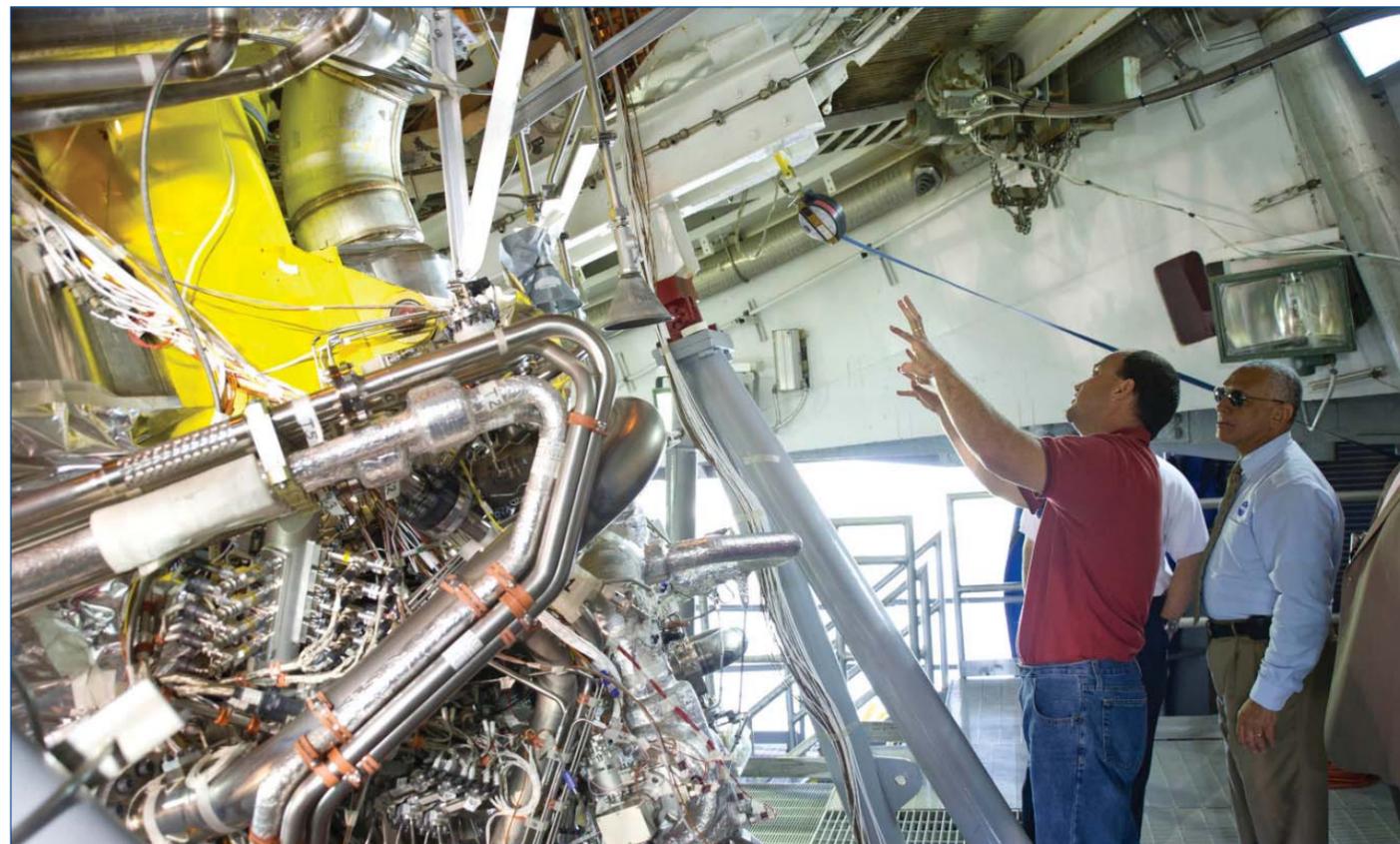
The space agency conducted an initial round of sea-level tests on the first developmental engine last year. This second test

series began April 26 and will simulate high-altitude conditions where the atmospheric pressure is low. The SLS will use J-2X engines on the second stage of flight after the first stage is jettisoned.

"The first round of testing helped us get to know the engine, how it operates and its basic performance characteristics," said Tom Byrd, J-2X engine lead in the SLS Liquid Engines Office at NASA's Marshall Space Flight Center in Huntsville, Ala. "Now, we're looking forward to testing J-2X in the SLS flight configuration, collecting nozzle data and continuing to learn about the performance of the engine itself."

NASA has worked closely with the J-2X prime contractor, Pratt & Whitney Rocketdyne of Canoga Park, Calif., to prepare the J-2X engine, dubbed E10001, for its second round of tests.

The J-2X engine nozzle is different from the nozzle used on the space shuttle main engine for the last 30 years of space mis-



NASA Administrator Charles Bolden (r) takes an up-close look at the first development J-2X engine on the A-2 Test Stand at Stennis Space Center. Pictured with Bolden is A-2 Test Stand Director Skip Roberts. The J-2X engine is being developed for NASA by Pratt & Whitney Rocketdyne.



Stennis operators begin a second testing series on the next-generation J-2X rocket engine with an April 26 firing on the A-2 Test Stand.

sions. While the space shuttle main engine nozzle was hydrogen cooled to save weight, the J-2X hydrogen-cooled nozzle is shorter and attached to a lightweight, passively cooled nozzle extension.

A total of 16 tests are scheduled. They are expected to conclude by the end of this year. In its first round of testing, the J-2X engine reached 100 percent power in just four tests and achieved a full flight-duration firing of 500 seconds in its eighth test, faster than any other U.S. engine. The engine was fired 10 times in the first series for a cumulative 1,040 seconds of testing various performance aspects.

The J-2X is a redesign of the heritage J-2 engine that helped send astronauts to the moon during the Apollo Program in the 1960s and 1970s. In addition to testing the engine, NASA is conducting tests on the J-2X powerpack, which includes the gas generator, oxygen and fuel turbopumps, and related ducts and valves. Tests of the powerpack components are being conducted on the A-1 Test Stand at Stennis.

The J-2X is being developed for NASA by Pratt & Whitney Rocketdyne. It is the first new liquid-oxygen and liquid-hydrogen rocket engine developed in 40 years that will be rated to carry humans into space.

FULFILLING NASA'S EXPLORATION MISSION

NASA operators conduct a long-duration test of the J-2X powerpack on the A-1 Test Stand at Stennis Space Center on May 10.

J-2X powerpack test series continues

NASA conducted a long-duration test of the J-2X powerpack, 340 seconds total, at Stennis Space Center on May 10, marking another step in development of the next-generation rocket engine that will carry humans deeper into space than ever before.

The powerpack is a system of components on the top portion of the J-2X engine, including the gas generator, oxygen and fuel turbopumps, and related ducts and valves. On the full J-2X engine, the powerpack system feeds the thrust chamber system, which produces engine thrust.

The long-duration test was planned to operate the powerpack turbopumps over a range of speeds by varying the gas generator valve positions. The turbopumps have been

heavily instrumented in order to determine performance and structural capabilities of this new design.

Data from Stennis tests provides critical information for continued development of the engine, which is the first human-rated liquid oxygen and liquid hydrogen rocket engine to be developed in four decades. The J-2X is being developed by Pratt & Whitney Rocketdyne of Canoga Park, Calif., for NASA's Marshall Space Flight Center in Huntsville, Ala.

This May 10 test is part of a series of firings on the J-2X powerpack. The J-2X turbopumps were designed using test data from a 2008 test series at Stennis to gather data on Apollo-era J-2S turbopumps.



A panoramic photo from the top of the A-3 Test Stand at Stennis Space Center offers a bird's-eye view of the facility's test structures. The portion of the photo at top provides a view of the E Test Complex, a versatile complex constructed in the late 1980s and the 1990s. E Complex stands are used for a variety of testing projects, including some to support NASA's commercial space flight partners. The portion of the photo in the center of the page shows the A-1 Test Stand, constructed in the 1960s and used to test engines that powered Apollo Program missions. The portion of the photo at bottom overlooks the A-2 Test Stand (foreground) and the B-1/B-2 Test Stand, both built in the 1960s and used to test Apollo-era engines. The A-1 and A-2 stands also were used to test every main engine used on 135 space shuttle missions. Both stands now are involved in testing for the next-generation J-2X rocket engine. The B-1 position now is used to test RS-68 rocket engines for Pratt & Whitney Rocketdyne.



View from on high



Harvest time at INFINITY

Students from Benjamin E. Mays Preparatory School in New Orleans enjoyed a hands-on experience at the INFINITY at NASA Stennis Space Center facility May 7. The Louisiana students assisted in the first harvest of lettuce from the Controlled Environment Agriculture unit at INFINITY. The exhibit grows trays of butterhead lettuce, using an aeroponic process that involves no soil and advance LED lighting techniques, as shown in the photo below. The exhibit is a demonstration of a growing technique that could be used as a food source for future space travelers, as well as to meet food needs of the world's ever-growing population. In the top right photos, Janice Hueschen of Innovative Imaging & Research Corp. helps students (including Shaanee Smith in the right photo) harvest the heads of lettuce from the unit. It takes a little more than a month for the lettuce to grow to harvest size. In the bottom center photo, student Shania Etheridge shows off the head of lettuce she harvested from the unit. In the bottom right photo, student Lauren Lombard enjoys the fruits of the harvest activity, joining her classmates in sampling the aeroponically-grown lettuce. Future lettuce grown in the unit could be used by food vendors located at INFINITY.



NASA in the News

Study reveals sand movement on Mars

NASA's Mars Reconnaissance Orbiter (MRO) has revealed that movement in sand dune fields on the Red Planet occurs on a surprisingly large scale, about the same as in dune fields on Earth. This is unexpected because Mars has a much thinner atmosphere than Earth, is only about 1 percent as dense and its high-speed winds are less frequent and weaker than Earth's. Scientists examined images taken in 2007 and 2010 to estimate the volume of moving sand. Their findings were published online May 9 by the journal *Nature*. For images and information about MRO, visit: www.nasa.gov/mro.

NASA telescope detects 'super-Earth'

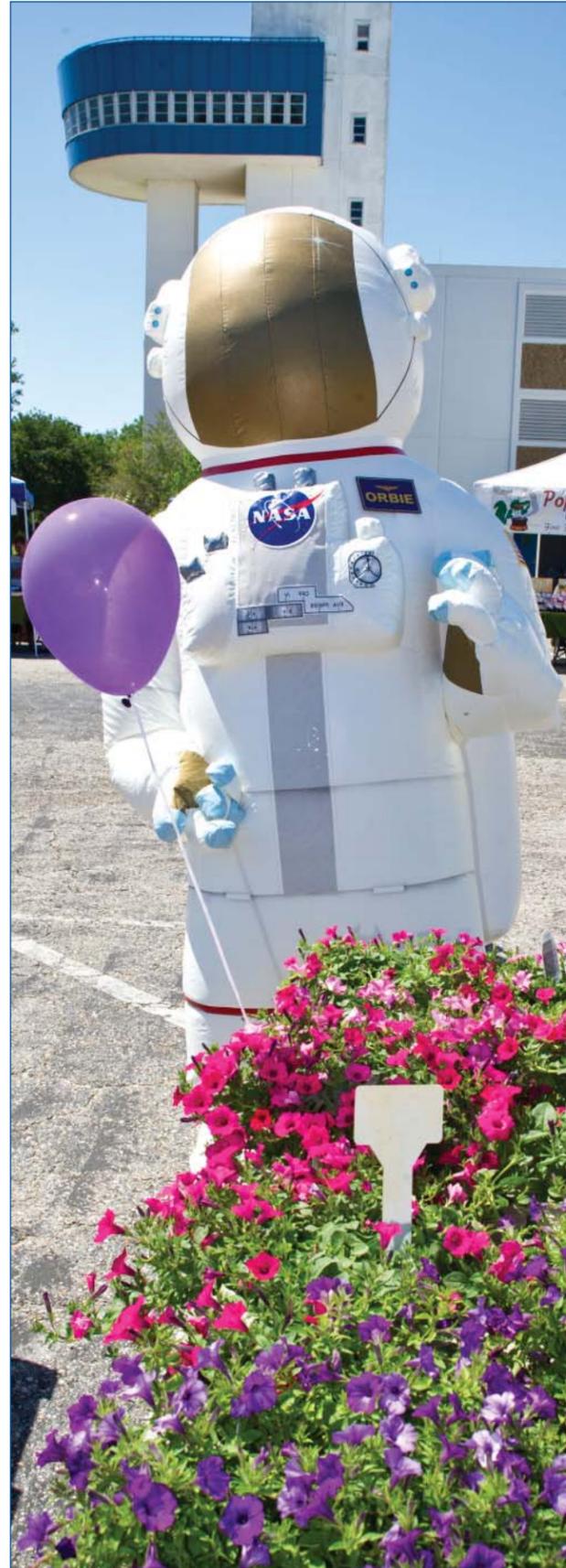
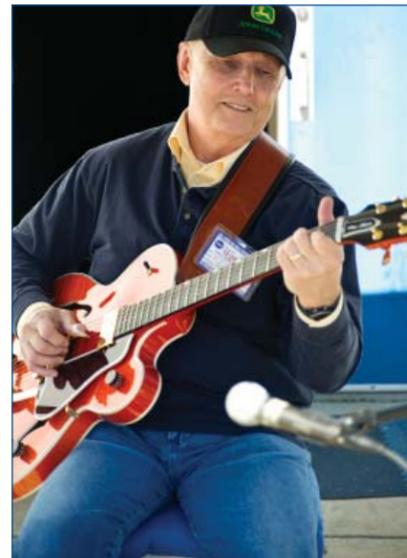
NASA's Spitzer Space Telescope has detected light emanating from a "super-Earth" planet beyond this solar system for the first time. While the planet is not habitable, the detection is a historic step toward the eventual search for signs of life on other planets. "Spitzer has amazed us yet again," said Bill Danchi, Spitzer program scientist at NASA Headquarters in Washington. "The spacecraft is pioneering the study of atmospheres of distant planets and paving the way for NASA's upcoming James Webb Space Telescope to apply a similar technique on potentially habitable planets." The planet, called 55 Cancri e, falls into a class of super-Earth planets that are more massive than our home world but lighter than giant planets like Neptune. This one is about twice as big and eight times as massive as Earth. NASA's James Webb Space Telescope, set to launch in 2018, likely will be able to learn even more about the planet's composition. For more about Spitzer, visit: www.nasa.gov/spitzer.

Astronomers note black hole homicide

Astronomers have gathered the most direct evidence yet of a supermassive black hole shredding a star that wandered too close. NASA's Galaxy Evolution Explorer, a space-based observatory, and the Pan-STARRS1 telescope on the summit of Haleakala in Hawaii, were among the first to help identify the stellar remains. Supermassive black holes, weighing millions to billions times more than the sun, lurk in the centers of most galaxies. These monsters lay quietly until an unsuspecting victim, such as a star, wanders close enough to get ripped apart by their powerful gravitational clutches. Astronomers have spotted stellar homicides before, but this is the first time they identified the victim, a star residing in a galaxy 2.7 billion light-years away. A report was published online May 2 by the journal *Nature*. The observation yields insights about the harsh environment around black holes and the types of stars swirling around them. For images, video and information, visit: <http://hubblesite.org/news/2012/18>.

For the latest NASA news, visit: www.nasa.gov/news/releases/latest/index.html.

Stennis Farmer's Market hosts spring celebration



Mississippi legislators visit Stennis

Legislators from across Mississippi visited Stennis Space Center on May 7, touring various facilities, including the A-1 Test Stand shown above, and learning about work under way at the facility. The legislators also toured the INFINITY at NASA Stennis Space Center facility and met with Apollo 13 astronaut Fred Haise.

The Stennis Farmer's Market marked its move to a new onsite location and its six-month anniversary with a spring celebration event April 24. Activities included door prizes, vendor discounts and entertainment by local musicians and dance groups, such as the Coastal County Pickers and Diamondhead Line Dancers. The NASA Exchange sponsors the market, which is held on the first and third Tuesday of each month, from 10 a.m. to 2 p.m. Items sold at previous markets include such products as pecans, tangerines, satsumas, free-range quail and chicken eggs, fresh ground corn meal, jams, jellies, artisan breads, scones, muffins, cookies, milk, cheese, grass-fed beef (frozen), soap, tomato syrup, greens, hot gumbo and stuffed peppers. All products sold at the market are grown or otherwise locally produced by the vendor. Value-added products, such as jams, jellies, honey and similar items, include at least one major ingredient locally produced by the vendor. Products are only sold by the producer, a direct family member, or an employee with significant involvement in the operation. No commercially-prepared products or crafts are allowed at the market.

Stennis history rooted in May events

The month of May is noted for three significant events in the history of NASA and Stennis Space Center.

More than half a century ago, on May 25, 1961, President John F. Kennedy spoke before a special joint session of Congress that set the United States on a course for space exploration, which would lead directly through south Mississippi.

“First, I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the earth,” Kennedy said. “No single space project in this period will be more impressive to mankind, or more important for the long-range exploration of space.”

To fulfill the president’s lofty goal, NASA needed a place to test engines for the huge Saturn V rockets that would propel astronauts to the moon. Officials soon discovered an area of land in rural Hancock County, Mississippi. With its sparse population and proximity to the Pearl River, the area that would become



President John F. Kennedy addresses a special joint session of Congress on May 25, 1961, issuing a challenge for the United States to send humans to the moon by the end of the decade.

NASA’s Mississippi Test Operations (now Stennis Space Center) was the perfect site for a rocket test facility.

Almost two years after Kennedy’s speech, a dozen men with Guy Stockstill of Picayune, cut the first tree to start clearing land for con-

struction on May 17, 1963. The workers started chopping away in an area known as Devil’s Swamp, which lies about one-and-a-half miles from the east Pearl River. The building of the test facility signaled the beginning of the largest construction project in the history of Mississippi and one of the largest of its kind in U.S. history. Stockstill cleared the land for T.L. James and Co. of Ruston, La.

That first clearing project made way for a boat harbor and construction dock, where barges brought steel in from Pittsburgh, Chicago and Birmingham, Ala., to a dock that was once a cypress and pine thicket.

Finally, on May 20, 1988, President Ronald Reagan signed an executive order to rename NASA’s rocket engine test facility for the distinguished Mississippi Sen. John C. Stennis, long-term congressional leader and supporter of the space program. The designation gave the facility its fourth name, preceded by Mississippi Test Operations, Mississippi Test Facility, and the National Space Technology Laboratories.

Stennis observes Earth Day

Bonnie Humphrey of NASA (l to r), Van Ward of NASA, Kim Maddox of the Naval Oceanographic Office, and Al Bryden of the NASA Shared Services Center learn about the Crosby Arboretum in Picayune during the Stennis Earth Day celebration. Stennis employees observed Earth Day on April 24, with an expo presentation of various environmentally friendly and energy-conscious displays.



Office of Diversity and Equal Opportunity

Celebrate Asian/Pacific American heritage

Each year, the month of May provides an opportunity to recognize the rich culture of Asian Americans and Pacific Islanders. They are a vast and diverse community in ethnicity and in their cultural and historical experiences, some native to the United States, hailing from Hawaii and our Pacific Island territories, others tracing their heritage to dozens of countries.

There are many Asian Americans and Pacific Islanders who have lived in the U.S. for several generations, but there also are a high number of recent immigrants who contribute to a great diversity in language and culture among this group. Asian Americans and Pacific Islanders are often portrayed as the model minority.

The “Asian/Pacific American” designation encompasses over 50 ethnic or language groups, including native Hawaiians and other Pacific Islanders. There are now more Asian and Pacific Islander groups than in the past, with 28 Asian and 19 Pacific Island subgroups representing a vast array of languages and cultures. According to the 2010 census, the estimated number of U.S. residents of Asian descent was 17.3 million, comprising 5.6 percent of the population. Persons of Native Hawaiian or other Pacific Islander descent numbered 1.2 million, comprising 0.4 percent of the total population.

Asians are the third-largest minority group and the second fastest growing group in the United States, according to the Census Bureau, which predicts Asians will increase from 5 percent to 9 percent of the population by 2050. The largest population of Asians is in California, with 5.6 million, followed by New York, Texas and Hawaii. More Asian Americans claim Chinese heritage than any other background, followed by Filipinos, Indians, Vietnamese, Koreans and Japanese.

There are many interesting facts that pertain to Asian/Pacific Americans, such as:

- Asian/Pacific women first entered military service during World War II. The Women’s Army Corps recruited 50 Japanese-American and Chinese-American women to the Military Intelligence Service Language School at Fort Snelling, Minn., for training as military translators.

- On January 21, 2009, former Army Chief of Staff and now-retired Army General Eric K. Shinseki was sworn in as the nation’s Secretary of Veterans Affairs. Born in 1942 on the island of Kauai, Hawaii, Shinseki graduated from the U.S. Military Academy at West Point, N.Y., in 1965.

- Maya Lin rose to fame in 1981 as a 21-year-old architectural student at Yale University. Lin won a contest to design the Vietnam Veterans Memorial in Washington, D.C. Her design beat out more than 1,400 entries. The memorial’s 594-foot granite wall features the names of the more than 58,000 U.S. soldiers who died during the Vietnam War.

The economic profile of Asian Indians has changed dramatically. While the first immigrants were agricultural and manual laborers, significant numbers of Asian Indians now are engaged in professions such as medicine, accounting and engineering. A recent study indicated that a higher percentage of Asian Indians are engaged in managerial positions today than any other ethnic group in the U.S.

The Stennis Diversity Council would like to invite you to join in festivities planned for this month in recognition of Asian Americans and Pacific Islanders.

Stennis marks Holocaust Days of Remembrance

Holocaust survivor Anne Levy of Metairie, La., speaks to Stennis employees during a Holocaust Days of Remembrance program April 24. This year’s program, the 22nd annual observance of the Holocaust for the Stennis community, focused on the theme “Choosing to Act: Stories of Rescue.” Levy was a four-year-old child in Poland when the Nazis invaded the country in 1939. She and her family survived in a Warsaw ghetto for two years before escaping.



NASA hosts celebration for Spaced Out Sports winners



NASA and the Stennis Space Center Education Office sponsored a celebration for students at Pierremont Elementary School in Manchester, Mo., on May 7 (top photo), recognizing the school as the first-place winner of the Spaced Out Sports Design Challenge. Celebration Day activities included Living and Working in Space activities for grades K-3 and Spaced Out Sports and rocketry activities for grades 4-5. Astronaut Dr. Linda Godwin (above photo) talked to students about her space experiences and presented winning team members with Spaced Out Sports certificates and a framed award for the school. Spaced Out Sports is a Teaching From Space project developed by the Stennis Education Office, which challenges students in grades 5-8 to design a game for astronauts to play on the International Space Station. Pierremont's Starfield game is designed for astronauts to travel through a course gathering power stars and shooting them through a black hole target. Challenge information can be found on the Spaced Out Sports website at: <http://education.ssc.nasa.gov/spacedoutsports.asp>.

Stennis supports Food for Thought-themed event



Teaching from Space's Food for Thought project featured prominently at this year's FIRST LEGO League (FLL) World Festival in St. Louis, Mo. The annual robotics and research competition explored food safety during the 2011-12 season. The Food for Thought curriculum guide and website, which explores space food, food safety and nutrition, was developed by the Stennis Space Center Education Office in cooperation with FLL. Several key events were scheduled at the World Festival to highlight the project. On April 26, NASA Associate Administrator for Education Leland Melvin (right photo) made two Living and Working in Space presentations on space food. In addition, NASA Program Executive for Solar System Exploration Dave Lavery (center, above photo) recognized the Blue Gear Ticks from Lincoln, Mass., as the highest-placing U.S. FIRST LEGO® League team. With the recognition, the team earned a VIP tour of Johnson Space Center facilities this summer. More than 1,000 NASA Food for Thought wall-sheets were distributed to students, educators and parents, along with many other informational handouts on NASA robotics and educational programs. The three-day event, which ran from April 26-28, was attended by an estimated 50,000 participants. For information on Food for Thought activities, visit <http://education.ssc.nasa.gov/foodforthought.asp>.



Stennis educators host activities during USA Science and Engineering Festival

Stennis Space Center Astro Camp staff members and other Stennis education specialists traveled to Washington, D.C., on April 27-29 to support activities at the U.S. Science and Engineering Festival.

Team members presented four hands-on science activities to visitors at the event: star life cycle, ultraviolet (UV) beads, satellite docking and "moon phasers." About 1,500 students and adults directly participated in Astro Camp hands-on activities. More than 20,000 people attended the three-day event, which included more than 2,000 interactive displays and more than 200 live presentations by scientists, engineers and authors.

The USA Science & Engineering Festival is the

country's only national science festival. It was developed to increase public awareness of the importance of science and to encourage youth to pursue careers in science, technology, engineering and mathematics by celebrating science. The festival is a grassroots collaboration of more than 500 leading science and engineering organizations in the United States.

STEM activities and emphases are a key focus of NASA and the Stennis Education Office. For more information on education activities, visit: www.nasa.gov/centers/stennis/education.

For more information about the USA Science and Engineering Festival and its goals, visit online at: www.usasciencefestival.org/.

