



LAGNIAPPE

John C. Stennis Space Center

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Stennis receives top small business honor

NASA's Stennis Space Center in Stennis, Mississippi, has been awarded the agency's fiscal year (FY) 2016 NASA Small Business Administrator's Cup. The award is presented annually to recognize the NASA center that has the best overall small business program. It is the second time Stennis has earned the cup in the award's eight-year history.

Stennis first received the cup in 2011 for having the most innovative small business program in the Agency. Five years later, Stennis is receiving the cup for the tremendous center-wide effort and support to promote and better integrate all small businesses in support of the Stennis programs and mission. In FY 2016 Stennis had its most successful overall year on record with regard to the percentage of dollars awarded to small businesses.

The award was presented to Stennis Director Richard Gilbrech and Stennis Office of Procurement Director Robert Harris by Acting NASA Administrator Robert Lightfoot and NASA Associate Administrator of the Office of Small Business Programs Glenn Delgado.

"The Stennis Space Center has earned this award by demonstrating, at every level, a dedication to America's small businesses who are essential to NASA's mission," said Delgado, whose office sponsors the annual award.

"This is a great honor for Stennis Space Center and reflects the hard work and effort of our dedicated workforce," Gilbrech said. "Small



NASA Acting Administrator Robert Lightfoot (l) and Associate Administrator of the Office of Small Business Programs Glenn Delgado (r) present the 2016 NASA Small Business Administrator's Cup for small business excellence to Stennis Director Rick Gilbrech during a site visit May 17.

Participants in the presentation of the 2016 NASA Small Business Administrator's Cup on May 17 included Stennis Office of Procurement Director Rob Harris (l) and former Stennis Small Business Specialist Robert Watts. Watts received the NASA Small Business Specialist of the Year award earlier this spring for his work at Stennis. He recently accepted a position at Johnson Space Center.



businesses are vital to both NASA and Stennis, and we are very committed to ongoing partnerships with them. This award demonstrates the depth of that commitment."

Harris added, "The credit goes to the firm commitment from senior levels of leadership across the center, program offices, and the Office of Procurement because everyone

knows support to small business is a priority. This commitment is contagious and it permeates through all areas of the center."

The award honors the significant contributions that the center's senior management, program and technical personnel, and procurement office have made to the agency's Small Business Program.

While waiting for the RS-25 test to begin the other day, I got to thinking about past tests conducted here at Stennis Space Center. One series that came to mind was the space shuttle main engine Block I hot fires conducted 22 years ago.

The space shuttle main engine is perhaps the most sophisticated rocket engine ever built. Through 30 years, it helped power 135 space shuttle missions, including ones that launched the Hubble Space Telescope and built the International Space Station. No mission ever failed due to an engine malfunction.

This is a remarkable record, especially if you consider that, at some point during the course of its long usage, every major space shuttle main engine component was modified and improved. There were a variety of small, incremental changes, as well as more extensive ones introduced as new engine “phases” or “blocks.”

Of course, those changes had to be tested before they could actually be used on missions. I certainly would want every single thing possible tested before sitting on top of a rocket and waiting for a few millions pounds of thrust to shoot me into space. Ark!

It should come as no surprise that the same site that tested every flight engine used on the 135 shuttle missions also tested every change introduced. That accounts for the 2,000-plus space shuttle main engine tests conducted at Stennis from 1975 to 2009. In that number were the space shuttle main engine Block I tests that concluded successfully in May 1995. Block I introduced a number of engine upgrades to improve reliability and safety. Just a year later, in May 1996, shuttle mission STS-77 was the first to fly with three Block I engines tested at Stennis.

Thinking about that, it just seemed fitting that Stennis would be conducting an RS-25 test 22 years later to the month. These first RS-25s are themselves space shuttle main engines modified to increase their power and performance. Where else would you expect them to be tested and proven flightworthy?

For that matter, maybe we need to amend the famous saying about having to go through south Mississippi to get to deep space. It seems if you want to get there faster, safer and more efficiently than ever before, you have to go through Stennis Space Center for that as well.



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AR1 engine component completes successful series of tests

Stennis Space Center and Aerojet Rocketdyne operators conduct a test of the AR1 rocket engine preburner on the E-1 Test Stand during the first week of May. A series of tests was conducted to verify the preburner design for the new engine, being built as a possible alternative to Russian-built engines used to launch most American national security payloads into space.

In a subsequent release, Aerojet Rocketdyne announced the tests had confirmed the preburner design, marking a major development milestone. Component testing is designed to minimize changes once full-scale engine production and testing begins. Full-scale testing of AR1 engines also will be conducted at Stennis, with preparation under way on the A-2 Test Stand.

NASA in the News

NASA releases spacewalk video

NASA has released an “action cam” video of a spacewalk on the International Space Station (ISS), showing what exactly takes place after an astronaut steps out of the orbiting lab. The space agency shared the footage, which was captured by French astronaut Thomas Pesquet on March 24, by posting it YouTube. Pesquet arrived on the ISS last November for a six-month stay to serve as a crew member of Expedition 50 and Expedition 51. The spacewalk footage shows Pesquet and American astronaut Shane Kimbrough, who returned from the ISS in April, conducting a spacewalk outside of the orbiting lab. It also presents views of Earth from an altitude of 250 miles. The main objective was to prepare the Pressurized Mating Adapter-3 for installation of the second International Docking Adapter, which will accommodate commercial crew vehicle dockings. The action cam video shows almost eight minutes of the spacewalk, which actually lasted six hours and 34 minutes. To view the video on YouTube, visit: <https://www.youtube.com/watch?v=jBpT'ZI8ofHU>.

Webb telescope undergoes testing

NASA has shipped the James Webb Space Telescope, the acclaimed successor to the Hubble telescope, to Johnson Space Center in Houston where it will undergo some critical cryogenic tests before the flight. The main purpose of this test is to check its ability to withstand intense cold temperature in deep space. The James Webb Space Telescope is a joint project of NASA, the European Space Agency and the Canadian Space Agency. The device already has passed vibration tests at NASA's Goddard Space Flight Center. It then was disassembled and shipped to Johnson, where it will be reassembled and undergo days of testing at super-cold temperatures in a vacuum to ensure the telescope's optics will operate at its frigid destination in space. After completing the cryogenic test, the telescope's next destination is Northrop Grumman Aerospace Systems in California for its final assembling and testing. A tennis court-sized sun shield also will be attached to the telescope for its protection against infrared radiation.

NASA safety standdown focuses on fall protection



Stennis Space Center Director Rick Gilbrech (right photo) assists in a fall protection demonstration during a NASA-sponsored safety standdown on site May 11. OSHA sponsored a voluntary national safety standdown May 8-12, encouraging employers to discuss fall protection with construction employees. Falls account for about 350 construction employee deaths each year, an average of more than one-third of all annual construction employee deaths. During the Stennis emphasis, a trio of employees were recognized for safety contributions, followed by a demonstration of fall protection devices by Bayou Safety and Supply.



State military groups visit Stennis

A pair of Mississippi military-related groups visited Stennis Space Center on April 26, learning about work at the site and touring various facilities.

(Top photo) Members of a Hancock County military affairs group stand in the flame trench during a tour of the A-2 Test Stand.

(Right photo) Mississippi Air National Guard members stand at the A-2 Test Stand. They also viewed an RS-68 rocket engine test on the B-1 Test Stand.



Stennis hosts former employees for Old Timers' Day

Former Stennis Space Center employees enjoy a return to the site for Old Timers' Day activities May 5. The annual fellowship was attended by about 180 retirees, guests and employees. About 16 different companies, as well as NASA, were represented by participants. Attendees included: (top photo, l to r) Carol Mix, Boyce Mix, Dick King and Shirley King; (bottom photo, l to r) Dick King, Bob DeLeuze, Chuck Stewart, Marvin Carpenter, Tommy Taylor and Pat Mooney. The gathering was sponsored by the Stennis Recreational Association, with contributions from several companies and organizations, including the NASA Exchange, Aerojet Rocketdyne, IAM Union, Keesler Federal Credit Union and VBS, LLC.



Stennis supports NASA Day at the Louisiana Capitol activities

Stennis Space Center educator Louis Thompson (right) and others collaborated with representatives from NASA's Marshall Space Flight Center and Michoud Assembly Facility to support activities during NASA Day at the Louisiana Capitol in Baton Rouge on May 4. While Marshall representatives met with Louisiana officials, Stennis and Michoud educators visited local Greenbrier and Winbourne elementary schools, engaging students in STEM (science, technology, engineering, and mathematics) activities. The schools are in two of the Baton Rouge areas hardest hit by August 2016 flooding and still have displaced students and teachers. Stennis Office of Education representatives also visited the area immediately after the floods to provide educational activities and assistance. In addition to the school visits, Stennis educators also visited two Baton Rouge area Boys and Girls clubs, providing space-related activities and presentations.



NASA selects small business research projects

NASA has selected 399 research and technology proposals from 277 U.S. small businesses and 44 research institutions that will enable NASA's future missions into deep space, and advancements in aviation and science, while also benefiting the U.S. economy. The awards have a total value of about \$49.9 million.

These include 13 projects tied to Stennis Space Center.

The agency received 1,621 proposals in response to its 2017 solicitation for its Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. From those, NASA selected 338 SBIR and 61 STTR Phase I proposals for contract negotiations. The SBIR Phase I contracts last for six months and STTR Phase I contracts last for 12 months, both with maximum funding of \$125,000.

Seven SBIR and six STTR proposals involve technology monitored at Stennis. One involves a company at Stennis.

The seven SBIR projects are:

- “Multi-Physics NTR Safety analyses,” developed by Little Prairie Services in Edgewood, New Mexico.
- “Novel Sorbent to Remove Radioactive Halogens and Noble Gases from NTP Engine Exhaust,” developed by TDA Research Inc. in Wheat Ridge, Colorado.
- “An Affordable Autonomous Hydrogen Flame Detection System for Rocket Propulsion,” developed by Innovative Imaging and Research Corp. at Stennis Space Center.
- “Advanced Propulsion Systems Ground Test Technology,” developed by Intelligent Fiber Optic Systems Corp. in Santa Clara, California.
- “Innovative Ultra-High Efficiency Cryogenic Actuators for Rocket Test Facilities,” developed by PolyK Technologies, LLC in State College, Pennsylvania.
- “Helium and Hydrogen Mixed Gas Separator,”

developed by Reactive Innovations, LLC in Westford, Massachusetts.

- “H₂/He (molecular hydrogen and helium) Separation System,” developed by TDA Research Inc. in Wheat Ridge, Colorado.

The six STTR projects are:

- “Waste Heat Recovery by Thermo-Radiative Cell for Space Applications,” developed by Advanced Cooling Technologies Inc. in Lancaster, Pennsylvania, and Carnegie Mellon University in Pittsburgh.
- “Through Wall Wireless Intelligent Sensor and Health Monitoring (TWall-ISHM) System,” developed by American GNC Corp. in Simi Valley, California, and Rensselaer Polytechnic Institute in Troy, New York.
- “Encrypted Self-Targeting Energy Beams for Power Transmission Designed for Satellite and Space Habitat Applications, developed by Applied Material Systems Engineering, Inc. in Schaumburg, Illinois, and The Board of Trustees of the University of Illinois in Champaign, Illinois.
- “Electrical Power from Thermal Energy Scavenging in High Temperature Environments,” developed by Physical Sciences Inc. in Andover, Massachusetts, and Purdue University in West Lafayette, Indiana.
- “High Performance Simulation Tool for Multiphysics Propulsion Using Fidelity-Adaptive Combustion Modeling,” developed by Streamline Numerics Inc. in Gainesville, Florida, and Stanford University in Palo Alto, California.
- “Self-Powered Multi-Functional Wireless Sensor Network for Nondestructive Evaluation and Structural Health Monitoring,” developed by X-wave Innovations Inc. in Gaithersburg, Maryland, and New York Institute of Technology in New York City.

For a more information, visit: <https://sbir.nasa.gov>, https://sbir.nasa.gov/prg_selection/node/58009 or https://sbir.nasa.gov/prg_selection/node/58010

Hail & Farewell

NASA bids farewell to the following:

Randy Holland	AST, Engineer Project Management	Engineering and Test Directorate
Pat Ryan	AST, Experimental Facilities Development	Center Operations Directorate
Matt Willis	AST, Experimental Facilities Tech	Center Operations Directorate

1970 – a defining year for Stennis Space Center

Note: For more than 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 Lagniappe provides a glimpse into the history of NASA and the south Mississippi rocket engine test center.

1970 was a defining year in the history of what is now Stennis Space Center. The Mississippi Gulf Coast was still reeling from the devastating blow of Hurricane Camille, the Apollo Program was ending, and NASA budgets were being cut.

The workforce at the Mississippi Test Facility (MTF) had been cut back to under 2,000 workers. Facility Manager Jackson Balch jumped on the offensive and began working with Sens. John C. Stennis of Mississippi and Allen Ellender of Louisiana, as well as NASA Administrator Thomas Paine and the White House to keep MTF viable.

Balch began to talk to other government agencies about locating to the facility, including the Earth Resources Observation Systems Program, the U.S. Navy, the U.S. Coast Guard, and the Bureau of Commercial Fisheries. However, communications were confused and agencies were being contacted multiple times by different people from MTF, Marshall Space Flight Center (MSFC) and NASA Headquarters, harming the chance for commitment from the agencies.

On Feb. 3, 1970, less than six months after Hurricane Camille hit the Mississippi Gulf Coast, NASA Deputy Administrator George Low made a statement while visiting MSFC that MTF “would be reduced to a caretaker status,

employing no more than 150-200 persons.” That prediction meant 1,800 people could be laid off from MTF.

In the midst of the possibility of serious cutbacks at MTF, Apollo 13 launched successfully from Cape Canaveral, Fla., on April 11, 1970, with one of the Mississippi Gulf Coast's own on board, Fred Haise. Haise, along with James Lovell Jr., and John Swigert were on their way to the moon for the third lunar lander attempt. How-

ever, just two days into the mission, oxygen tank No. 2 blew up, causing tank No. 1 also to fail.

The command module had no electricity, no water, and the crew was 200,000 miles from Earth. News agencies flocked to the homes of the astronauts to get family reactions, which included the home of Haise's family in Biloxi. MTF dispatched a representative to the home of Haise's mother. MTF helped the family by fielding all questions and phone calls for them from April 14-17.

Due to NASA ingenuity and quick thinking, the Apollo 13 crew

was safely returned home. Biloxi marked the return of Haise with a celebration on May 30, 1970.

The Mississippi Test Facility managed many successes that year and the following one, including securing the engine testing assignment for the Space Shuttle Program and having many non-NASA agencies locate offices to the facility. Today, Stennis Space Center continues testing rockets for NASA, the Department of Defense and the commercial sector.



The Apollo 13 crew poses following their return to Earth from their Apollo 13 mission. Shown are (l to r): Commander Jim Lovell, command module pilot John Swigert and lunar module pilot Fred W. Haise. Haise is a native of Biloxi.

Office of Diversity and Equal Opportunity

Take time to observe Asian/Pacific Heritage Month

The journey of a thousand miles begins with one step. - Lao Tzu

May is Asian/Pacific American Heritage Month – a celebration of Asians and Pacific Islanders in the United States. A rather broad term, “Asian/Pacific” encompasses all of the Asian continent and the Pacific islands of Melanesia (New Guinea, New Caledonia, Vanuatu, Fiji and the Solomon Islands), Micronesia (Marianas, Guam, Wake Island, Palau, Marshall Islands, Kiribati, Nauru and the Federated States of Micronesia) and Polynesia (New Zealand, Hawaiian Islands, Rotuma, Midway Islands, Samoa, American Samoa, Tonga, Tuvalu, Cook Islands, French Polynesia and Easter Island).

With such a vast array of countries and cultures to celebrate during the month, how can we celebrate the beauty and diversity of Asian Americans? The following was written by Rodney Jay C. Salinas, former executive director of the Asian Pacific American Institute for Congressional Studies, suggesting a few things individuals can do to learn more about and raise broad awareness of the Asian American culture.

- Instead of just eating at an Asian restaurant, talk to the owners. Learn more about their stories, how they went about establishing their business, the obstacles they have faced, local issues that they care about as business owners. It will give one a better sense of just how difficult it is to establish a business, especially if the owners are first-generation immigrants.
- Attend an Asian Pacific American temple, mosque or church, even if it is not one’s own religion. There are thousands of religious establishments that were created by, and for, Asian Pacific Americans. By learning about a person’s religion or spiritual beliefs, one can get a better sense of his or her value system and motivation.
- Flip through any popular magazine and carefully look at how they portray Asian Pacific Americans. Are the portrayals negative? Positive? Are the women portrayed as “exotic, sex symbols?” What other kinds of stereotypes are depicted? What kind of message do you think this sends to other readers?
- One might have a friend or know of someone who was adopted. Every year, more and more children from Asia are being adopted by non-Asian families in the United States. Ask the friend about his or her experiences growing up: Was it difficult growing up as an Asian Pacific American with Caucasian or African American parents? Was the person exposed to his/her Asian culture?
- Visit the Census Bureau’s Web site, type in city and state, and look up the most recent demographics of one’s area. This is an excellent way to survey surroundings and understand how the population is shifting. In many cases, one will see a significant increase in the Asian Pacific American population.
- Go to a local bookstore and pick up a book. The book does not even need to be specifically about Asian Pacific Americans, as long as it is written by one. Because each author writes through unique “lens” and his/her perspective is reflected in the writing, the book could be about anything under the sun (i.e., popular culture, fiction, biography, etc.).
- Tell a non-Asian Pacific American that May is recognized as Asian Pacific American Month! This is perhaps the simplest, yet most effective way to raise awareness. Tell him or her what it means to personally, invite the person to a local event, or share an historical fact.

Sources: <http://www.asian-nation.org/heritage.shtml> and <http://asianpacificheritage.gov>.



Stennis remembers Holocaust

Stennis Space Center observed Holocaust Days of Remembrance on April 20 with a presentation by Martin “Marty” Weiss, who was born in Czechoslovakia in 1929 and immigrated to the United States in 1946. He lived through deportations to both ghettos and concentration camps and the associated carnage. Weiss spoke about those experiences in support of the 2017 remembrance theme – “the strength of the human spirit.”



Faces of Stennis

Each month, Lagniappe will feature employees at Stennis Space Center whose work enables the center to fulfill its mission as the nation's largest rocket engine test center. This month's employees are highlighted on the following pages.



Maria Lott



Maria Lott watched with interest as Neil Armstrong become the first human to step onto the moon in 1969. Not only was the moment historic, but Lott's brother had just begun working at Kennedy Space Center in Florida and would spend his career involved with the U.S. space program. Now, as Lott considers the "dream job" she has as the National Astro Camp Lead at Stennis Space Center, she wonders if involvement with NASA and space exploration is something that runs in the family. A retired schoolteacher, Lott has not spent her entire career in the field but has worked at Stennis in some way since 1992. It began when the Bay St. Louis native and Picayune resident attended a Stennis education workshop that focused on space. She soon received a call from Stennis, asking if she would help develop a program that came to be known as Astro Camp. From

1992 to 2013, Lott filled the part-time role of camp director each year. In 2016, she joined the Stennis education team in her full-time lead position, shepherding the expansion of Astro Camp through NASA's Out-of-School Learning Program. In addition to six weeks of local camp this summer, 39 sites in four states now have been designated as official 2017 Astro Camp locations. The effort is exciting for Lott, who talks about students who are inspired by camp experiences to continue studies and careers in space and related fields. "Their dreams continue long after a week in the summer," she says. Lott is also proud to be part of the Stennis family and all that involves. "We work together, sometimes we laugh together, sometimes we cry together, but we are always strong together. This is the Stennis Space Center team, and once you're a member, you're always a member."

Melissa Wagner



Melissa Wagner always knew she wanted to work at Stennis Space Center. Growing up in nearby Pass Christian, she heard numerous stories about the site, mostly from her grandfather, an ironworker who helped build Stennis test stands in the 1960s. “He’s always been proud to have worked at Stennis,” Wagner recalls. “I just never thought I’d get here.” It did not happen quickly. After high school, Wagner enlisted in the U.S. Navy and spent four years assigned to the USS Nimitz. She traveled the world but missed home. After her service term, she returned to Mississippi to work with the U.S. Department of Agriculture and, later, with the Navy once more. When a management support assistant position opened at Stennis, she jumped at the chance to interview but failed to get the job. “That didn’t deter me, though,” she says. “I kept my eyes open.” When a similar position

with the NASA Safety and Mission Assurance Directorate opened in 2013, she interviewed again and was hired. “I was ecstatic,” she says. Wagner later moved to a contract specialist position in the NASA Office of Procurement, supporting Stennis test complexes with contracting needs. Her role includes conducting market research, preparing and issuing solicitation documents, analyzing and evaluating proposals, and preparing for the award of contracts. “I’m most proud when I get a contract awarded that benefits the site and also saves money for the government and taxpayers,” she says. Wagner loves her work and work environment. “As so many have stated, the people are the best thing about working at Stennis,” she says. “We have such a diverse group with the most interesting jobs. I can honestly say that I’ve found my career. It’s no longer just a job.”