

# NASA Day at State Capitol

Astronaut George Zamka addresses legislators in the Mississippi Senate during NASA Day at the Capitol activities in Jackson on Jan. 23. During his remarks, Zamka was flanked by members of the Mississippi Gulf Coast delegation, as well as Stennis Associate Director Ken Human (fourth from left) and Deputy Director Jerry Cook (fifth from left). 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.



## Stennis family celebrates 'Best Places to Work' designation

Stennis Space Center Director Rick Gilbrech (center) and Partnership for Public Service Vice President for Policy John Palguta (far right) stand with representatives of NASA departments onsite following a "Best Places to Work" presentation to employees Feb. 13. In the annual Partnership for Public Service workplace survey, NASA ranked as the best place to work in the federal government among large agencies. Stennis ranked first among all NASA centers and second out of 292 federal agency subcomponents. Jeri Buchholz, assistant administrator for NASA Human Capital Management, also participated in the celebration.

*“The one thing that has always remained constant is the unwavering dedication to excellence and the pride that is exhibited day in and day out by this (Stennis) team.”*

From the desk of

**Jerry Cook**

Deputy Director, Stennis Space Center



**G**reetings from the new guy! January 14, 2013 marked the date of my new beginning and the official date of becoming one of the newest members of the Stennis Space Center family.

I could not have been more excited to be coming to the “best place to work in NASA.” While I may be new to the center, my relationship with Stennis Space Center started early in my career as a test engineer in the Propulsion Test Laboratory at the Marshall Space Flight Center in Huntsville, Ala. During the late 1980s and early 1990s, I spent a lot of time on test stands A-1 and A-2 in support of the space shuttle main engine project and later worked hand in hand with members from the main propulsion test article team during development and operation of the Technology Test Bed at Marshall.

In 2007, after a Mississippi native, Gene Goldman, was selected to become deputy director at Stennis, I was selected as the space shuttle main engine project manager and served in that role for the last four-and-one-half years and the final 18 space shuttle flights. My relationship with Stennis was renewed. During that span, we celebrated many successes, as well as the bittersweet final space shuttle main engine test conducted in July 2009, ending an era of engine testing that spanned over 30 years.

I have never felt more at home as I did driving through the gate of this center and seeing those

historic test stands rising above the pines. My first few weeks have been fast-paced, filled with the celebration of Dr. Martin Luther King’s dreams, the solemn remembrance of our fallen space explorers, presentations of Space Flight Awareness awards to our team members and the opportunity to participate in NASA Day at the Capitol activities with many members of the Stennis team.

Throughout each of my “beginnings and endings” with the Stennis family, the one thing that has always remained constant is the unwavering dedication to excellence and the pride that is exhibited day in and day out by this team. This is truly a very special place, and I am very humbled to be able to call it my home.

I want to thank each of you for the warm welcome that my family and I have received. I also want to express my sincere appreciation for the outstanding work that each of you do everyday to make Stennis Space Center the success it has been and will continue to be in the future.

As the agency continues to map out the nation’s plans for human exploration of space, we know that the journey will begin with rocket engines that are tested at Stennis Space Center.

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## FULFILLING NASA'S EXPLORATION MISSION

# NASA begins new round of J-2X engine testing at Stennis

NASA's progress toward a return to deep space missions continues with a new round of upcoming tests on the next-generation J-2X rocket engine, which will help power the agency's Space Launch System (SLS) to new destinations in the solar system.

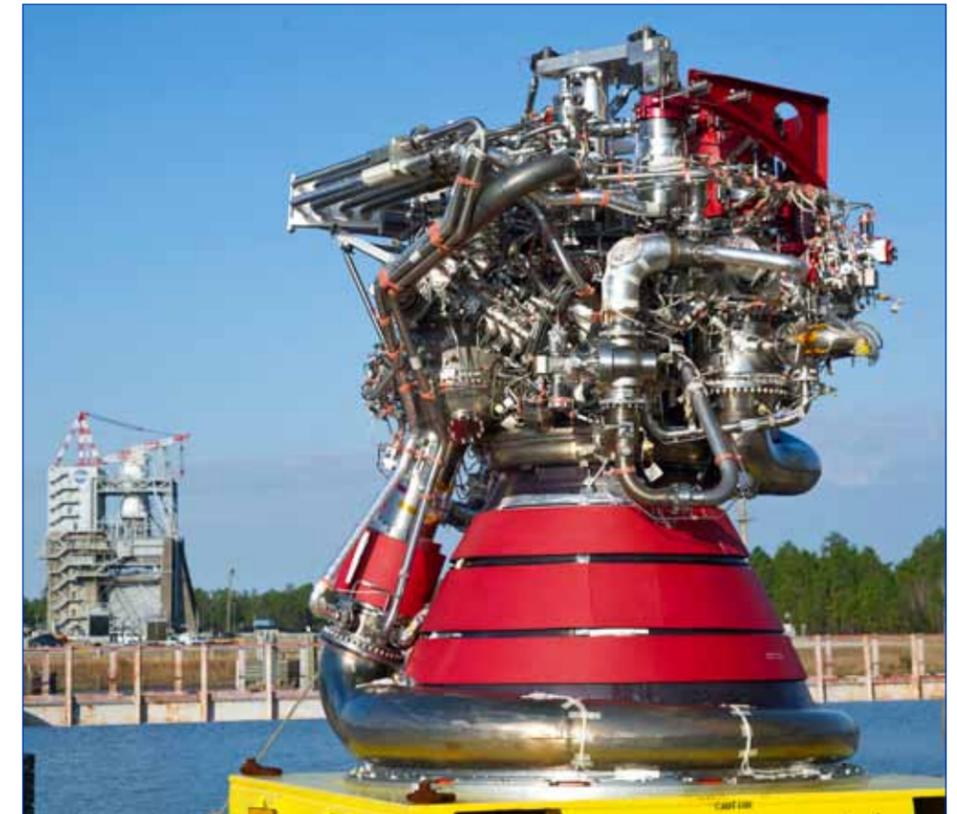
Beginning this month, engineers will conduct a series of tests on the second J-2X development engine, designated No. 10002, on the A-2 Test Stand at NASA's Stennis Space Center in Mississippi. Once the series is completed, the engine will be

transferred to the A-1 Test Stand to undergo a series of gimbal, or pivot, tests for the first time.

"The upcoming test series is not only a critical step forward, but important to the Stennis test team, as well," said Gary Benton, manager of the J-2X test project at Stennis. "This test series will help us increase our knowledge of the J-2X and its performance capabilities. In addition, the series will help us maintain the high skill level of our team as we look ahead to continued J-2X testing and testing of the RS-



NASA engineers conduct a 35-second test of J-2X engine No. 10002 on the A-2 Test Stand at Stennis Space Center on Feb. 15. The test was the first in a spring series of firings to collect performance data on the next-generation engine that will power the upper stage of NASA's new Space Launch System.



With the A-1 Test Stand at Stennis Space Center as a backdrop, J-2X engine No. 10002 is delivered to the A-2 stand for a new round of testing. Once the series of tests on the A-2 stand is completed, the J-2X engine will be moved to the A-1 stand to undergo gimbal, or pivot, testing for the first time.

25 engines that will be used to power the SLS first stage."

The first objective of the testing is to verify and demonstrate the engine's capability. Data from what is known as hot-fire engine tests will be compared to the performance of the first engine. Engineers also will vary liquid hydrogen and liquid oxygen inlet pressures and subject the J-2X engine nozzle to higher temperatures than in previous tests to see what effect they have on performance. NASA already has conducted successful tests on engine No. 10001 and on the J-2X powerpack assembly. In total, 34 tests were conducted on the J-2X engine and powerpack, with the J-2X achieving a full flight-duration firing of 500 seconds in the eighth test, earlier than any other rocket engine in U.S. history.

The engine is being designed and built by NASA and Pratt & Whitney Rocketdyne of Canoga Park, Calif., to power the upper stage of the 130 metric-ton (143-ton) version of the SLS rocket.

The SLS will launch NASA's Orion spacecraft and other payloads from the agency's Kennedy Space Center in Florida, providing an entirely new capability for human exploration beyond low-Earth orbit.

For more information about the J-2X rocket engine and NASA's Space Launch System, including photos and fact sheets, visit: [www.nasa.gov/sls](http://www.nasa.gov/sls).

## FULFILLING NASA'S EXPLORATION MISSION

## NASA completes CSG test series at Stennis

**N**ASA has completed a successful, months-long test series on a chemical steam generator (CSG) unit that will be used on the innovative A-3 Test Stand under construction at Stennis Space Center.

In the final phase of testing, engineers validated and optimized performance efficiency of the CSG unit, marking a major step in work on the A-3 stand. The completed stand will combine unique features, including the possibility of testing full-sized engines at simulated altitudes up to 100,000 feet.

CSG units are key to enabling the specialized testing. A series of nine three-module units – 27 CSG modules total – will produce superheated steam to create the vacuum needed to simulate the altitudes.

“These CSGs have been around for decades performing only as a unit, but we’re using them like never before,” explained Barry Robinson, project manager for the CSG testing project at the E-2 Test Stand at Stennis. “No one has nine units working together. It’s just never been done on this scale.”

A critical step in employing the application was to verify and validate the three-module unit’s fabrication and confirm its performance. Engineers at Stennis already had performed tests on a Stennis-fabricated single module to confirm fabrication techniques and to compare data with hardware in use at NASA’s White Sands Test Facility in New Mexico. Eden Cryogenics of Ohio then was contracted to fabricate the nine three-module units as the Stennis team in the E Test Complex spent months preparing for the final test series.

The key was to capture issues early



Each of the nine chemical steam generator (CSG) units being installed on the A-3 Test Stand at Stennis Space Center includes three modules. The above photo shows three modules installed for testing at the E-2 Test Stand. Engineers in the E Test Complex recently completed testing of the modules and removed them for installation on the A-3 stand. The CSG units will generate the steam needed to create a vacuum that will allow operators to test rocket engines at simulated altitudes up to 100,000 feet.

in the fabrication and procurement process, Robinson explained. Engineers used real-time steam data, with the aid of Arnold Engineering Development Center experts in Tennessee, to make adjustments and identify necessary modifications to the modules. The process was a challenging one, since it involved adapting contemporary fabrication techniques and retrofitting hardware for technology decades old. Nevertheless, engineers were able to optimize performance of the CSG modules.

They focused on a range of performance details, such as the optimal flow rates for the units, which will use isopropyl alcohol, liquid oxygen and water to produce the superheated steam. They established a starting capability for the unit and verified

the ability to transfer data from module to module as well.

“We tested our way to a more efficient steam generator,” Robinson said. “We really expanded understanding of these units and how they can perform.”

Robinson credited the successful test series to a true team effort of NASA engineers and contractors. Now, attention turns to the next challenge – ensuring the performance can be duplicated on nine linked units.

“This is exciting technology,” he said. “Now, comes the challenge of linking and controlling nine units simultaneously. We feel we can duplicate performance. Our testing has built a lot of confidence in the performance of these units.”

## FULFILLING NASA'S EXPLORATION MISSION



## AJ26 engine testing continues at Stennis

Engineers at NASA's Stennis Space Center conducted a successful test of Aerojet's AJ26 Engine E12 on Jan. 18, continuing support of Orbital Sciences Corporation as the company prepares to provide commercial cargo missions to the International Space Station (ISS). A team of engineers from NASA, Orbital and Aerojet conducted the engine acceptance test on

the E-1 Test Stand at Stennis. After test data is reviewed and the engine is inspected, it will be shipped to the Wallops Flight Facility launch site in Virginia for placement on Orbital's Antares rocket. A pair of Aerojet engines will provide first-stage power for Antares rockets on ISS cargo supply missions.

## Stennis remembers fallen space heroes

Stennis Space Center Director Rick Gilbrech (right) and Deputy Director Jerry Cook lead a moment of silence Feb. 1 in memory of NASA family members who lost their lives while furthering the cause of exploration and discovery. Stennis employees gathered that morning to place a wreath in the lobby of the Roy S. Estess Building in memory of those who gave their lives in support of space exploration, including the crews of Apollo 1 and shuttles Challenger and Columbia. The NASA Day of Remembrance is observed each year. "All of humanity has benefited from their courage and example," Gilbrech said during the remembrance ceremony. The names of the fallen crew members were read, followed by the tolling of a bell.



## FULFILLING NASA'S EXPLORATION MISSION

# Curiosity collects Martian bedrock sample

**N**ASA's Curiosity rover has, for the first time, used a drill carried at the end of its robotic arm to bore into a flat, veiny rock on Mars and collect a sample from its interior. This is the first time any robot has drilled into a rock to collect a sample on Mars.

The fresh hole, about 0.63 inches wide and 2.5 inches deep in a patch of fine-grained sedimentary bedrock, can be seen in images and other data Curiosity beamed to Earth on Feb. 9. The rock is believed to hold evidence about long-gone wet environments. In pursuit of that evidence, the rover will use its laboratory instruments to analyze rock powder collected by the drill.

“The most advanced planetary robot ever designed is now a fully operating analytical laboratory on Mars,” said John Grunsfeld, NASA associate administrator for the agency's Science Mission Directorate. “This is the biggest milestone accomplishment for the Curiosity team since the sky-crane landing last August, another proud day for America.”

Rock powder generated during drilling travels up flutes on the bit. The bit assembly has chambers to hold the powder until it can be transferred to the sample-handling mechanisms of the rover's Collection and Handling for In-Situ Martian Rock Analysis (CHIMRA) device.

“Building a tool to interact forcefully with unpredictable rocks on Mars required an ambitious development and testing program,” said Louise Jandura, chief engineer for Curiosity's sample system at NASA's Jet Propulsion Laboratory in Pasadena, Calif. “To get to the point of making this hole in a rock on Mars, we made eight drills and bored more than 1,200 holes in 20 types of rock on Earth.”



(Top image) At the center of this image from NASA's Curiosity rover is the hole in a rock called “John Klein” where the rover conducted its first sample drilling on Mars. The drilling took place on Feb. 8, Curiosity's 182nd Martian day of operations. Several preparatory drill activities preceded the operation, including a test to produce the shallower hole on the right two days earlier.

(Right image) This rectangular version of a self-portrait of NASA's Mars rover Curiosity combines dozens of exposures taken by the rover's Mars Hand Lens Imager (MAHLI). The rover's robotic arm is not visible in the mosaic. MAHLI, which took the component images for this mosaic, is mounted on a turret at the end of the arm. The arm was positioned out of the shot in the images or portions of images used in the mosaic.

Image Credit: NASA/JPL-Caltech/MSSS



The rock Curiosity drilled is called “John Klein” in memory of a Mars Science Laboratory deputy project manager who died in 2011.

Drilling for a sample is the last new activity for NASA's Mars Science Laboratory Project, which is using the car-size Curiosity rover to

investigate whether an area within Mars' Gale Crater has ever offered an environment favorable for life.

JPL manages the project for NASA's Science Mission Directorate in Washington. For more information, visit: [www.nasa.gov/msl](http://www.nasa.gov/msl) and <http://mars.jpl.nasa.gov/msl/>.

## NASA honors employees for flight safety efforts

Eight Stennis Space Center employees were honored Jan. 28 by NASA's Space Flight Awareness Program for contributions to flight safety. Awards were presented by NASA Deputy Associate Administrator for the Human Exploration and Operations Mission Directorate Greg Williams, Stennis Deputy Director Jerry Cook and astronaut Shane Kimbrough in conjunction with the launch of NASA's latest spacecraft in the Tracking and Data Relay Satellite System. Stennis employees receiving SFA recognition were: (left row, from top) Jason Hopper (NASA), Michael Sheffield (Lockheed Martin Test Operations Contract Group), Sheila Varnado (A<sup>2</sup>Research Laboratory Support Services Contract), Daniel Allgood (NASA); (right row, from top) Michael D'Antoni (Pratt & Whitney Rocketdyne), Lorna Ammond (Mississippi Research Consortium), Adrienne Peyton Ragan (NASA) and Grover Bennett (Jacobs Technology Facilities Operating Services Contract Group).



## NASA workshop highlights Earth science research

Results of four dozen applications projects funded by NASA's Gulf of Mexico Initiative, part of NASA's Applied Sciences Program in the Earth Sciences Division, were presented during a three-day workshop in New Orleans on Jan. 23-25.

People from across the nation attended the workshop to report on accomplishments achieved across a variety of topics including fisheries management, levee management, marsh loss, water quality, coastal conservation, disaster management, and public health.

"These projects created tools and information that will benefit the Gulf of Mexico region for years to come," said Duane Armstrong, chief of the Applied Science & Technology Project Office at Stennis Space Center, which manages the Gulf of Mexico Initiative and hosted the New Orleans workshop. "They are perfect examples of NASA Earth science research helping people and organizations across the Gulf Coast to make informed decisions when dealing with important issues."

The projects featured at the New Orleans workshop focused on issues identified by the states bordering



Lawrence Friedhl of NASA's Applied Science Program addresses participants at a three-day workshop in New Orleans on Jan. 23-25. The workshop highlighted results of Earth science projects funded by NASA's Gulf of Mexico Initiative.

the Gulf of Mexico. A sampling of projects presented at the workshop highlighted the following priorities:

- Subsidence and land loss in southern Louisiana
- Monitoring coastal marshes for persistent flooding and salinity
- Improved levee management
- Water quality at beaches and shellfish beds
- Improved coastal cypress forest management
- Estuary water quality
- Hurricane evacuation routes
- Conservation and restoration along the northern Gulf of

Mexico coast

- Air quality and visibility during wildfire and prescribed burning events
- Harmful algal blooms in the eastern Gulf of Mexico
- Oil slick detection

"The devastating hurricanes of 2005 highlighted the pressing needs throughout the coastal regions of the Gulf of Mexico," Armstrong said. "Through its Gulf of Mexico Initiative and applied science research efforts, NASA has helped communities and decision-makers address those needs."

# Stennis employees recall NASA careers

*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 highlights a moment in the history of the south Mississippi rocket engine test center.*

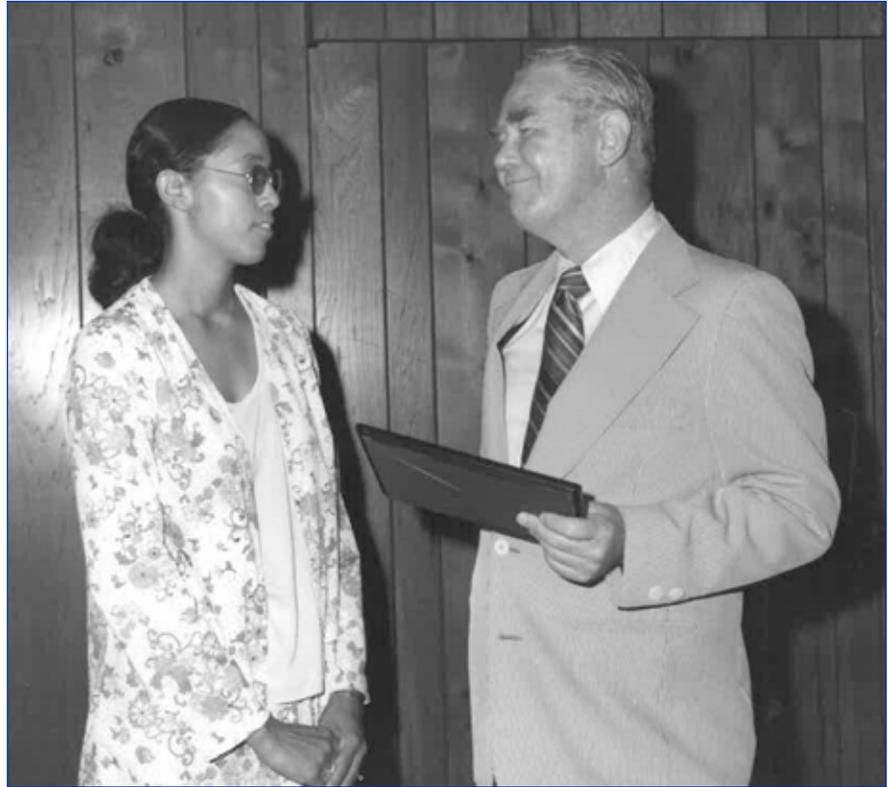
Patricia “Pat” Baker and Theodore “Ted” Franklin made their marks in Stennis Space Center’s history by being among the first African American NASA employees.

“In the early days, all of the black people working in or near the administration building could fit at one round table in the cafeteria,” said Pat Baker, formerly of Slidell, La. “I started at the space center in the early ’70s when it was the Mississippi Test Facility.”

Baker began onsite as a typist with North American Rockwell when NASA’s Apollo Program was winding down. In the early ’70s, she was hired by NASA after passing a required civil service exam. She credits education – at the now-defunct predominately black St. Tammany High School (1964) and Straight’s Business School in New Orleans – as a foundation that prepared her for a rewarding career. “I may have been the first black person working for NASA then,” said Baker. “I worked for a number of years, advancing from typist to secretary to an administrative assistant.”

Still in a transitional period at MTF, many NASA employees felt uncertainty about their jobs. Baker continued to work as an administrative assistant for the second MTF director, Jackson Balch, who was instrumental in transforming the facility from a single mission to a multiagency model. After Balch retired in 1975, Baker headed to another resident agency, the Naval Ocean Research and Development Activity (NORDA).

“Working for Mr. Balch was



Mississippi Test Facility Director Jackson Balch visits with Pat Baker in 1975.

wonderful,” said Baker. “He truly believed in everyone having an equal opportunity to succeed. NASA and NORDA were both very important experiences in my life and were essential building blocks for the opportunities afforded me later in my career.”

When Baker left Stennis in 1989, she was ranked as a GS-12 contract negotiator at NORDA. Baker’s career highlights entail becoming certified in human resources management from the University of Virginia’s Fall Church campus and retiring in 2012 at the pinnacle of her career as vice president of human resources at Apptis, a small mid-tier defense contractor in Chantilly, Va.

Unlike Baker’s short stint with NASA, Ted Franklin did the opposite in spending a walloping 30 years at Stennis, retiring in 2007 as a program analyst. Franklin’s career began as a staff accountant in 1977 at the then-National Space

Technology Laboratories. During his career, Franklin was promoted from chief of Accounting Reports and Analysis Branch to chief of the Financial Management Division of the Resources and Financial Management Office in 1980. He was presented an incentive award for outstanding performance in 1979.

A native of New Roads, La., he attended Southern University on a football scholarship and earned his accounting degree in 1967. “When I realized I was never going to make it playing football, I began a serious search for a more promising career and that’s when I got into accounting,” he said in a 1980 Lagniappe interview.

“The deeper I got into it, the more I liked it and that’s why I chose it as my profession. That’s when things really began to happen for me. You have to want to do something very badly to succeed at it. You can’t be forced to do it.”

# Stennis Diversity and Inclusion Implementation Plan

This past August, Stennis Space Center was selected by the NASA Headquarters Office of Diversity and Equal Opportunity (ODEO) to participate in a study to assist in developing a Diversity and Inclusion (D&I) Strategic and Implementation Plan. Curtis Lewis & Associates conducted focus group interviews to obtain information about Stennis culture. The focus group report, along with the 2010 NASA Diversity and Inclusion Survey results, will serve as the foundation for developing Stennis' new plan.

That's interesting, but what really came out of the focus group report? First, let's look back. Stennis should be proud of having the highest rate of response among all of the NASA centers to the Stennis Diversity and Inclusion Assessment Survey (DIAS) – one indicator of employee engagement. Stennis employees also responded more positively to DIAS items than the overall NASA population. Moreover, Stennis had the highest ranking among 10 NASA centers in Partnership for Public Service's Best Places to Work Survey.

The focus group report is broken down into three themes. The first is: The difficulty of addressing the resistance to changing operations i.e., maintaining “the way we do things here” when positive perceptions of the center's diversity and inclusion efforts are ahead of the overall NASA curve. Employees expressed a very positive view of the workplace. However, some employees indicated that some operational standards are overly cumbersome, create barriers to productivity and take time away from their specific work requirements. Most employees agreed that rigid standards are needed in areas such as testing, security and safety. Yet, they generally viewed this training as repetitive and limited in offering additional knowledge.

Theme two is: The lack of skill in human resource management of some leaders/managers/supervisors. Employee comments indicated a range of supervisory ability in interpersonal and management skill level, ranging from

excellent to “bullies” in managing the center's human resources. Such variability can work to undermine efforts to achieve excellence in all areas of operations.

Theme three is: The role and impact of training generally and the lack of distinction between “training” and “education for professional development.” Technical training should distinguish clearly from the deeper level professional development education required to establish a diverse and inclusive workplace. This education is particularly important for those who supervise and lead teams and functional areas. For employees to perform at the very highest levels, their leaders must be technically skilled but also skilled at managing human resources.

So, where do we go from here to improve? Employee Resource Groups (ERGs) can be a catalyst for ensuring an inclusive, open and productive workplace. ERGs can be established as places where employees' good ideas are seriously heard, earnestly tweaked and developed. When employees understand these groups can be venues where leadership and professional skills are developed and where they have access to successful leaders who effectively mentor them to thrive in the workplace, then the center, the agency and the ERG members reap the benefits.

Senior leaders might consider having one among them with very good facilitation skills to engage a diverse team of supervisors, managers and leads in working together to examine an operational process that needs to be addressed and that also matters to the selected team members. It is critical for employees to observe models of leaders exhibiting the behavior expected of them. If leadership wants to demonstrate that diversity and inclusion has advantages to the individuals engaged (and benefits for the center and NASA), employees need to observe how this occurs.

Stennis' D&I Implementation Plan is a work in progress. ODEO and Stennis Space Center senior leaders will continue to provide employees with updates on progress.

## Hail & Farewell

### NASA welcomes the following:

<b>Janet Haselmaier</b>	Management Support Assistant Engineering & Test Directorate	<b>Truc Le</b>	AST, Facility Systems Safety Office of Safety & Mission Assurance
<b>Mary Horne</b>	Student Trainee Office of External Affairs	<b>Mario Murray</b>	AST, Facility Systems Safety Office of Safety & Mission Assurance
<b>Patricia White</b>	Student Trainee Office of Procurement	<b>Aaron Head</b>	AST, Electrical Experimental Equipment Engineering & Test Directorate
<b>Delton Rodriguez</b>	AST, Facility Systems Safety Office of Safety & Mission Assurance	<b>Robert Reis</b>	AST, Electrical Experimental Equipment Engineering & Test Directorate



## Apollo 13 astronaut visits INFINITY

Former astronaut and Biloxi native Fred Haise speaks to visitors at INFINITY Science Center on Feb. 14. Haise spoke twice during the day, recounting his experiences as one of the nation's earliest astronauts. Haise served as lunar module pilot on the Apollo 13 mission (shown on screen behind him), which suffered an in-space explosion that scuttled its landing on the moon and forced a perilous return to Earth. He also served as commander of space shuttle Enterprise for approach and landing test flights.

## NASA in the News

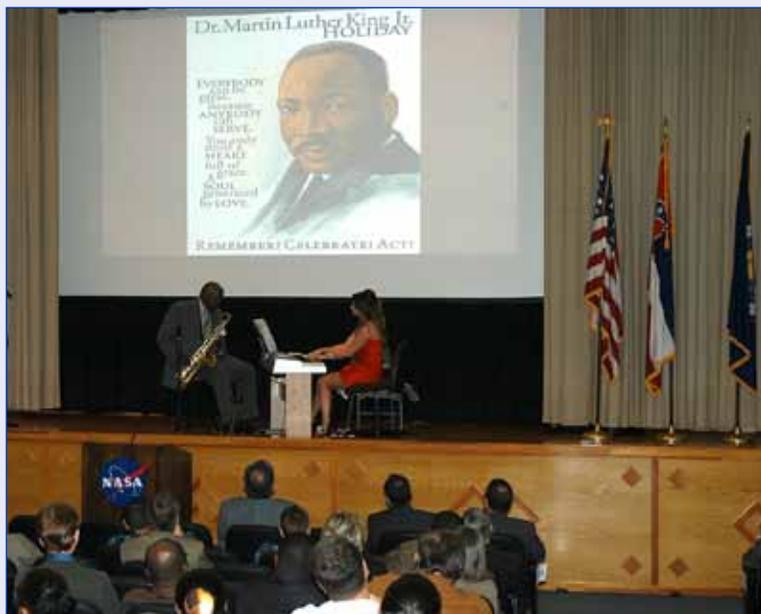
### Orion passes test

NASA engineers have demonstrated the agency's Orion spacecraft can land safely if one of its three main parachutes fails to inflate during deployment. The test was conducted Feb. 12 in Yuma, Ariz., with the parachutes attached to a test article. Engineers rigged the parachutes so only two would inflate, leaving the third to flag behind when the test capsule was dropped from a plane 25,000 feet above the Arizona desert. "Today is a great validation of the parachute system," said Chris Johnson, a NASA project manager for Orion's parachute system. To join the online conversation about Orion, follow @NASA\_Orion and the hashtag #Orion. To learn more about all the ways to connect and collaborate with NASA, visit: [www.nasa.gov/connect](http://www.nasa.gov/connect). For more about Orion, visit: [www.nasa.gov/orion](http://www.nasa.gov/orion)

### Spinoff 2012 released

A plant texts a farmer to say it needs more water. An invisible coating scrubs pollutants from the air. A robot roams a hospital's halls, aiding doctors and nurses by recording vital signs and registrations. The 2012 edition of NASA's annual *Spinoff* publication captures a nation and world made better by advancements originally achieved for space technology. *Spinoff 2012* offers a close-up look at how NASA's initiatives in aeronautics and space exploration have resulted in commercial technologies with benefits across the economy: health and medicine, transportation, public safety, consumer goods, energy and environment, information technology and industrial productivity. "Every spinoff is a tangible reminder of NASA's return on investment to the taxpayer," NASA Chief Technologist Mason Peck said. *Spinoff 2012* is available online at: <http://spinoff.nasa.gov>.

For the latest NASA news, visit online: [www.nasa.gov/news/releases/latest/index.html](http://www.nasa.gov/news/releases/latest/index.html).



## Stennis observes MLK Jr. Day

Former Stennis Space Center employee Frank Hobson Jr. (left) and Jennifer Haselmaier Whitfield provide music during the annual observance in memory of civil rights champion Martin Luther King Jr. on Jan. 31 at Stennis Space Center. The observance also included songs by Voices of Stennis and personal reflections and poetry by Stennis employees.