

LAGNIAPPE

John C. Stennis Space Center

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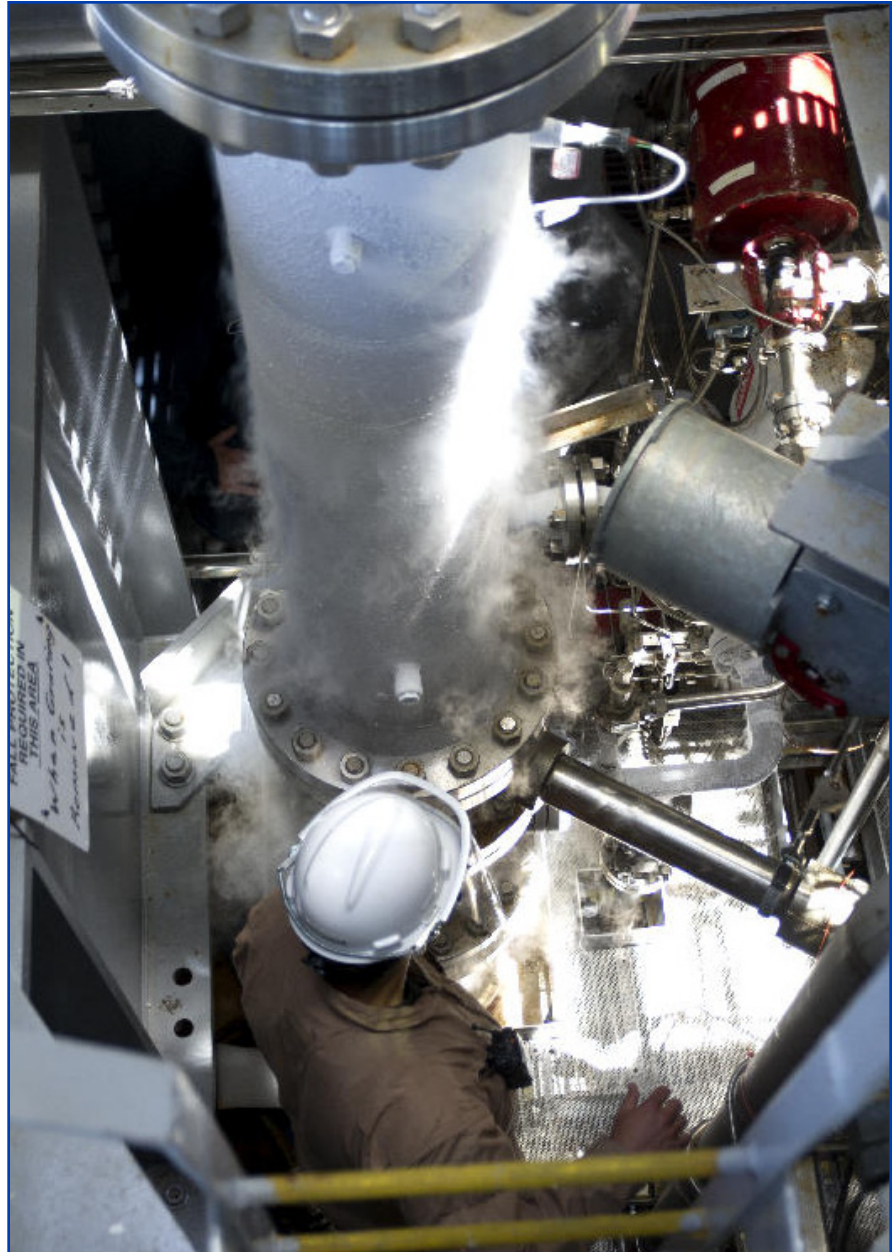
NASA achieves key milestone for RS-25 testing

NASA engineers at Stennis Space Center achieved a major milestone May 1 as they prepare to test RS-25 rocket engines that will help power the new Space Launch System (SLS) on missions to deep-space destinations.

A-1 Test Stand operators at Stennis completed a cold-shock test of the new structural piping system needed for the RS-25 engine, setting the stage for engine installation in the coming weeks and hotfire testing this summer. RS-25 engines will power the core stage of NASA's SLS, which is being built to carry humans deeper into space than ever, to destinations including an asteroid and eventually Mars.

"This is a very exciting time at NASA," said Gary Benton, RS-25 rocket engine test project manager. "We are moving closer and closer to making unprecedented space exploration missions a reality."

Renovation of the A-1 Test Stand at Stennis has been under way since last fall with installation of new equipment and components needed to accommodate RS-25 engines, including the cryogenic piping system tested May 1. The piping system is an intricate network that must handle rocket propellants flowing at extremely cold temperatures. Liquid oxygen flows at almost -300 degrees Fahrenheit, while liquid hydrogen is colder than -400 degrees Fahrenheit. RS-25 engines burn a mixture of the two to generate thrust.



A member of the A-1 Test Stand operations team examines the progress of a cold-shock test on the new A-1 structural piping system May 1. The test marked a milestone in preparing the stand to test the RS-25 rocket engines that will power the core stage of NASA's new Space Launch System (SLS). Delivery and installation of the first RS-25 engine is planned for early summer. The SLS is being developed to carry humans deeper into space than ever, to destinations including an asteroid and eventually Mars.

“We will work hard ensuring Stennis, Michoud and their resident agencies are in the best possible position for future mission success.”

From the desk of
Robert Harris

Director, Office of Procurement, Stennis Space Center



Why does it appear we have a never-ending cycle of procurement actions? It seems like we just get a contract going, then all of a sudden, we are standing up a team to initiate the next follow-on procurement action. The answer is relatively simple, but the impact certainly keeps us on our toes.

Did you figure it out yet? The answer is the Competition in Contracting Act (CICA) of 1984. CICA is United States legislation governing the hiring of contractors. It requires U.S. federal government agencies to arrange “full and open competition through the use of competitive procedures” in their procurement activities, unless otherwise authorized by law. Additionally, the Federal Acquisition Regulation imposes a five-year limitation on all our contracts (to include all options) regardless of type, unless approved at the agency level.

In many instances, once a contract is nearing the end of its term, we stand up a Procurement Development Team (PDT) to initiate the acquisition planning process. This is where the government takes a look at its needs for the future and not necessarily what it has on immediate contract. This “fresh” look at future requirements is where our best planning takes place. Unfortunately, it is this part of the acquisition cycle that puts the most uncertainty into our civil service and contractor workforce. This is because the future contract details during this stage of the acquisition process are held close by the PDT as they are considered procurement sensitive. Premature release outside of the government could negatively impact the “full and open” intent of CICA.

At Stennis Space Center, we are in the middle of this seemingly never-ending cycle of procurements. Stennis

is currently working with Marshall Space Flight Center and the Michoud Assembly Facility to put together one contract titled “Synergy Achieving Consolidated Operations and Maintenance” (SACOM). This single contract will take the place of the existing Stennis Facility Operating Services Contract, the Stennis Test Operations Contract and the Michoud Manufacturing Support Facility Operations Contract. By combining these similarly scoped contracts into one contract vehicle, both Stennis and Michoud expect to realize significant opportunities for synergies and savings between the sites.

Additionally, Stennis’ Information Technical Services and Laboratory Services contracts are set to expire April 30, 2015. As a result, our office is in the process of standing up the PDT teams that will take a fresh look into our future requirements for these expiring contracts.

I realize with all these key support contracts in various stages of the acquisition process, there is a potential for uncertainty across the center. Rest assured that our office anticipated these critical contract transitions and is working diligently with the PDT teams in a timely fashion to identify the future needs of the centers and their resident agencies. The most important thing each employee can do is to remain focused on what he or she does and be safe every day. We will work hard to minimize the uncertainties while ensuring Stennis, Michoud and their resident agencies are in the best possible position for future mission success.

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FULFILLING NASA'S EXPLORATION MISSION

NASA, SpaceX launch testing partnership



NASA and Space Exploration Technologies Corp. (SpaceX) cut the ribbon at the E-2 Test Stand at Stennis Space Center on April 21 to mark the beginning of a new testing partnership. SpaceX will test components of its methane-fueled Raptor rocket engine on the stand. Participants in the ribbon-cutting ceremony were (l to r): Mississippi Gov. Phil Bryant, U.S. Sen. Thad Cochran of Mississippi, SpaceX President and Chief Operating Officer Gwynne Shotwell, U.S. Rep. Steven Palazzo of Mississippi and NASA's Stennis Space Center Director Rick Gilbrech.

An April 21 ribbon-cutting ceremony at NASA's Stennis Space Center marked the beginning of a new NASA and Space Exploration Technologies Corp. (SpaceX) partnership aimed at continuing to propel America's burgeoning commercial space program forward and enhance utilization of NASA's advanced test facilities.

Several Mississippi leaders joined NASA and SpaceX representatives for the ceremony, including Gov. Phil Bryant, U.S. Sen. Thad Cochran and U.S. Rep. Steven Palazzo.

SpaceX signed a Space Act Agreement with the space agency last fall to test components of its methane-fueled Raptor rocket engine on the

E-2 Test Stand at Stennis. SpaceX is developing the Raptor as a reusable engine for a heavy-lift launch vehicle.

"This is a great partnership between NASA and SpaceX," Stennis Center Director Rick Gilbrech said. "These types of activities are opening new doors of commercial space exploration for companies. SpaceX is another example of the outstanding progress America's commercial space industry is making, and we are happy to welcome them as our newest commercial test customer."

Since the fall, Stennis has performed necessary maintenance to prepare the test stand and has completed equipment modifications needed to accommodate Raptor components.

With preparations complete, the ribbon-cutting ceremony paves the way for testing, which is scheduled to begin within a month.

"SpaceX is proud to bring the Raptor testing program to NASA's Stennis Space Center and the great state of Mississippi," said Gwynne Shotwell, SpaceX president and chief operating officer. "In partnership with NASA, SpaceX has helped create one of the most advanced engine testing facilities in the world, and we look forward to putting the stand to good use."

The Mississippi Development Authority and the Hancock County Port and Harbor Commission played key roles in the endeavor by fostering and supporting the new partnership.

FULFILLING NASA'S EXPLORATION MISSION

Curiosity rover drills again into Mars surface



This May 5, 2014, image from the Navigation Camera on NASA's Curiosity Mars rover shows two holes at top center drilled into a sandstone target called "Windjana." The farther hole was created by the rover's drill while it collected rock-powder sample material from the interior of the rock. Rover team members at NASA's Jet Propulsion Laboratory in Pasadena, Calif., received confirmation May 6 of Curiosity's third successful acquisition of a drilled rock sample. "The drill tailings from this rock are darker-toned and less red than we saw at the two previous drill sites," said Jim Bell of Arizona State University, Tempe, deputy principal investigator for Curiosity's Mast Camera (Mastcam). "This suggests that the detailed chemical and mineral analysis that will be coming from Curiosity's other instruments could reveal different materials than we've seen before. We can't wait to find out!"

The mission's two previous rock-drilling sites, at mudstone targets in the Yellowknife Bay area, yielded evidence last year of an ancient lakebed environment with key chemical elements and a chemical energy source that long ago provided conditions favorable for microbial life. The rover's current location is at a waypoint called "The Kimberley," about 2.5 miles southwest of Yellowknife Bay and along the route toward the mission's long-term destination on the lower slopes of Mount Sharp. Sample material from Windjana will be sieved, then delivered to onboard laboratories for determining mineral and chemical composition. One motive for selection of Windjana for drilling is to analyze the cementing material that holds together sand-size grains in this sandstone. For more information about Curiosity, visit <http://www.nasa.gov/msl> and <http://mars.jpl.nasa.gov/msl>.

PARTNERSHIP

Continued from Page 1

The piping must be able to "move" as it expands and contracts due to the extreme temperature changes caused by the propellant flows. The temperature change can be as much as 500 degrees during a hotfire test. To ensure the piping system design allows the necessary movement, NASA engineers flowed liquid nitrogen through it at -320 degrees Fahrenheit and monitored the effects. The data now will be evaluated and any necessary adjustments made.

"A test like this may sound benign since no flammable propellant is used, but it is very significant to make sure we have the proper piping design and setup for engine testing," said Jeff Henderson, A-1 Test Stand director.

In addition to the piping test, engineers performed checks of the liquid oxygen tank and vent system. They also conducted a calibration run of the new thrust measurement system (TMS), which is particularly critical so engineers can obtain accurate measurements of engine thrust during tests.

A number of additional milestones remain. The upcoming schedule includes installation of additional TMS components and various sequence and equipment checks. All work leads to delivery and installation of RS-25 engine No. 0525 in early summer. Preliminary tests will be run on the engine to collect data on the performance of its new controller and other modifications.

The engine controller regulates valves that control the flow of propellant to the engine, which determines the

amount of thrust generated during a hotfire. In flight, propellant flow and engine thrust determine the speed and trajectory of a spacecraft, allowing it to follow the proper flight and orbit path. The controller also regulates the engine startup sequence, including valve positioning and timing. That sequence is especially important on an engine as sophisticated as the RS-25. Likewise, the controller determines the engine shutdown sequence, ensuring it will occur properly in both normal and emergency conditions. Stennis tests will provide data to verify controller performance and its engine startup and shutdown sequences.

Later, NASA will conduct flight acceptance tests of all RS-25 engines planned for SLS use.

"Morale is high as we continue to move forward," Henderson said.

OSHA recertifies Stennis as VPP Star site

NASA Stennis Space Center was recertified as a Voluntary Protection Program (VPP) Star site, a designation of safety excellence, following a scheduled visit by an Occupational Safety and Health Administration (OSHA) team April 24.

“VPP recertification represents a major accomplishment for all NASA employees at Stennis,” Center Director Rick Gilbrech said. “It is a testament to their commitment to safety, from top to bottom and across the board.”

Stennis was awarded Star status in 2011, culminating a four-year process with official recognition of its excellence in areas of safety and health. OSHA established VPP in 1982 as a proactive safety management model to recognize such practice. To achieve Star status, an organization must demonstrate comprehensive and successful safety and health management programs in the workplace. This includes achieving injury and illness rates at or below the national average of their respective industries.

Once Star status is awarded, OSHA teams return at regular intervals to recertify that designated sites are continuing in safety and health efforts. OSHA’s visit to Stennis last month was the site’s first recertification review.

Space Launch System team members visit B-1/B-2 stand



NASA and Boeing Company team members involved in avionics work for NASA’s new Space Launch System stand in front of the B-1/B-2 Test Stand during a visit to Stennis Space Center on April 25. Team members were briefed on work under way to prepare the B-2 stand to test the SLS core stage in 2016. They also toured the Aerojet Rocketdyne engine assembly facility, where the RS-25 engines that will power the SLS core stage will be prepared for testing. The SLS is being built to carry humans farther into space than ever.

NASA interns tour Stennis



NASA interns from Johnson Space Center in Houston stand in front of the A-2 Test Stand during a visit to Stennis Space Center on April 24. In addition to touring the A-2 stand, which just completed testing of the J-2X rocket engine, the interns were briefed on applied science work under way at Stennis, participated in a site tour and visited the Aerojet Rocketdyne engine assembly facility.



Stennis observes Holocaust remembrance

Stennis Space Center Director Rick Gilbrech presents a plaque of appreciation to Judy Roheim following her presentation at the Stennis 2014 Holocaust Days of Remembrance program April 30. Roheim spoke about her experiences in Hungary during World War II. Roheim was 10 years old in 1944 when her family was forced to live in a Jewish ghetto, sharing a small apartment with eight other families. She witnessed many atrocities firsthand, including having several of her family members shipped to German labor camps, never to return. Stennis observes Holocaust Days of Remembrance each year. This year's theme was "Confronting the Holocaust: American Voices."



Stennis hosts 2014 Earth Day activities

Cathy Bordelon (l) of Crosby Arboretum in Picayune, Miss., talks with Lisa Oliver and Susan Johnson, both of the NASA Shared Services Center, during Stennis Earth Day activities April 22. Stennis employees observed Earth Day with an expo featuring environmentally focused information and presentations, and displays of eco-friendly merchandise for purchase.

NASA selects small business proposals

Recognizing the critical role of American small businesses and research institutions play as innovation engines for new space technologies that will enable future space exploration, NASA has selected 383 research and technology proposals for negotiations that may lead to contracts worth a combined \$47.6 million.

The proposals are part of NASA's Small Business Innovation Research Program (SBIR) and Small Business Technology Transfer (STTR) Program.

Eight selected proposals involve technology being administered by the Office of the Chief Technologist at NASA's Stennis Space Center. The 2014 SBIR Phase I projects affiliated with Stennis are:

- "Hydrogen Wave Heater for Nuclear Thermal Propulsion Component Testing," developed by ACENT Laboratories LLC of Manorville, New York.
- "High Temperature Resistance Claddings for Nuclear Thermal Rockets," developed by MesoCoat of Euclid, Ohio.
- "VTX HyHeat," developed by Orbital Technologies Corporation of Madison, Wisconsin.
- "Fabrication and Testing of Nuclear-Thermal Propulsion Ground Test Hardware," developed by Ultramet of Pacoima, California.
- "A Geospatial Decision Support System Toolkit," developed by Applied Geosolutions LLC of Newmarket, New Hampshire.
- "SAVDS – A Decision Support Tool (DST) Enabling UAV Flights Beyond Visual Line-Of-Sight," developed by SAVDS Inc. of Mountain View, California.

The 2014 STTR Phase I projects affiliated with Stennis are:

- "Compact Energy Conversion Module," developed by Extreme Diagnostics Inc. of Boulder, Colo., and The Regents of the University of Michigan of Ann Arbor, Michigan.
- "Heat Harvesting by Artificial Muscles," developed by Lynntech Inc. of College Station, Texas, and the University of Texas-Dallas of Richardson, Texas.

Stennis feature celebrates workplace diversity

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 the south Mississippi rocket engine test center.

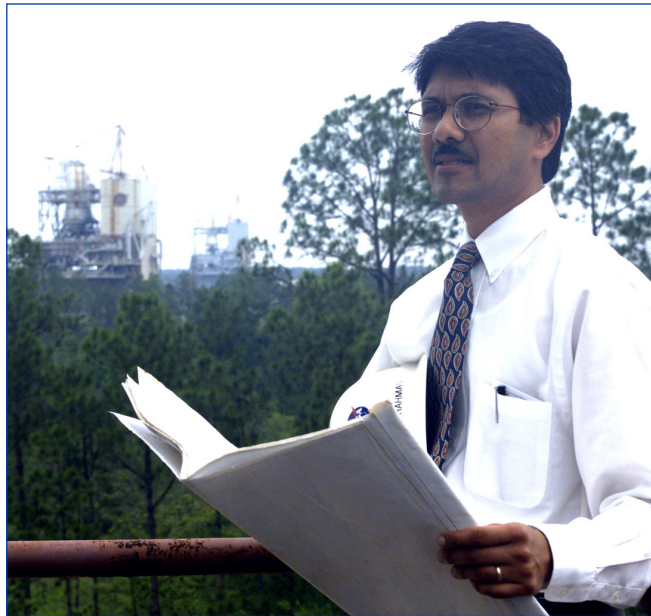
Among NASA's diverse ethnic employees is former Stennis Deputy Director for Engineering and Test Directorate Shamim Rahman, who has made his mark in the area of propulsion. He now works at Johnson Space Center. Eleven years ago in 2003, Rahman was featured in Lagniappe during May's observance of Asian American Pacific Islander Heritage Month. Below is a reprint of the published article:

NASA has touched Dr. Shamim Rahman's life for about as long as he can remember – or at least as far back as 1969, when he was glued to the television watching Neil Armstrong step onto the lunar surface. “That’s when I decided to join whoever went to the moon,” he said. “At the time, I could barely spell NASA.”

Now he does a lot more than spell, since he's NASA's chief engineer for the Propulsion Test Directorate at Stennis Space Center. He provides technical oversight for one-of-a-kind national test facilities collectively valued at over \$2 billion and for a variety of research and development test projects for next-generation rocket engines.

Born in 1963 in Jamshedpur, India, Rahman was always fascinated by flight, visiting airports just to watch takeoffs and landings. After he completed elementary school in Bahrain and high school in India, his father sent him to the U.S., where, in 1979, he enrolled at Texas A&M University and experienced another turning point in his life.

Pleasantly surprised that he could major in aerospace engineering, he began working with Rockwell International Corp. through a cooperative student program between NASA Johnson Space Center and A&M. In 1981, the first space shuttle mission, STS-1, launched. “That was the beginning of my direct involvement with the space program,” he said. “Apollo got me excited about space flight, but STS was the motivation.” STS stands for Space Transportation System, which includes all space shuttle components, such as the orbiter, external fuel tank and solid rocket boosters.



A year later, he met a scientist widely heralded as one of the original founding fathers of modern rocketry and astronautics, Hermann Oberth. The two met when Rahman was doing research with a professor who nominated him to attend an international astronautics conference in Budapest, Hungary, where students were presenting papers. Oberth was at the conference.

One of Rahman's most prized possessions is a picture of him meeting Oberth at the conference. Another is a signed copy of Oberth's book (in German), “The Rocket into Planetary Space,” published in 1923. In the 1930s, Oberth took on a young assistant in Germany named

Wehrner von Braun, who became a leading rocketry researcher for Germany, then after World War II led the U.S. drive to land on the moon. Oberth died in 1989 at age 95, von Braun in 1977 at age 65.

All of Rahman's education and experience has led him to the Stennis test stands, where all of today's space shuttle main engines are tested, and future developments are demonstrated. “This is where the ideas prove themselves,” he said. “At full scale and full power, the engine tests give us the confidence to turn test engines into flight

engines. These facilities are unique in the world.”

With a master's degree from California Institute of Technology and a doctorate from Pennsylvania State University, where he concentrated on rocket propulsion research, Rahman cannot give enough credit to the educators in his life. “Learning continues to be a lifelong endeavor,” he said, “and I feel very much indebted to the many great teachers over the years.”

That's particularly true about his thesis adviser at PSU, Robert Santoro. “He was the type of person who would teach you to learn on your own,” he said. “He'd give you all the resources you needed, but support you when you needed help.”

He's also indebted to all his colleagues in the E Test Complex at Stennis. “We continue to learn together, pushing the boundaries in our work of rocket propulsion testing,” Rahman said. “That's what makes this time so rewarding.”

Office of Diversity and Equal Opportunity

Celebrate Asian Americans and Pacific Islanders

"Your uniqueness is your greatest strength, not how well you emulate others." (Simon S. Tam)

Since 1977, the month of May has been a time to recognize the achievements and contributions of Asian Americans, Pacific Islanders and Native Hawaiians to the American story. Asian Americans are those having origins in Asia or the Indian subcontinent. Pacific Islanders are those having origins in Hawaii, Guam, Samoa or other Pacific Islands.

Generations of Asian Americans and Pacific Islanders have helped develop and defend the United States, often in the face of tremendous racial and cultural prejudice. Despite these difficulties, these men and women struggled, sacrificed and persevered to build a better life for their children and all Americans.

Asian Americans and Pacific Islanders have had a deep impact on our society as leaders in all facets of American life, thriving as athletes, public servants, scientists and artists. Whether as small business owners or as proud members of the United States Armed Forces, Asian Americans and Pacific Islanders will prove instrumental in writing the next chapter of the American story.

In celebration of Asian American Pacific Islander Month, Patriot Technologies, the Navy Office of Civilian Human Resources and the Stennis Diversity Council are hosting a Lunch and Learn on May 20 at 11 a.m. in the Logtown Conference Room in the Roy S. Estess Building. The speaker will be Lori Huthoefer, president of Patriot Technologies. Patriot has administered the Administrative Clerical Support Services contract at Stennis since 2008.

Huthoefer was born in Seoul, Korea and adopted at age two by an American family. She came to the United States at age five, settling in San Antonio, Texas, where she spent her school years until leaving for college. Huthoefer earned a bachelor's degree in economics from the University of Mary Washington and a master's degree in economics from the University of Arizona.

Her career spans a broad range of civil service positions including the U.S. Department of Agriculture, the U.S.

International Trade Commission and the Federal Communications Commission/Pricing Division. Huthoefer's background in civil service prepared her well for the challenges of business ownership in the government-contracting world. Patriot Technologies was incorporated in 2000. During its 14 years in operation, the company has provided a wide range of services to numerous federal

and state agencies ranging from professional staffing to engineering and aviation-related services. Huthoefer has four children – two sons and two daughters – and lives in Colorado Springs, Colorado.

Join us during the month of May to "remember Asian Americans and Pacific Islanders who have made our country bigger and brighter again and again, from native Hawaiians to the generations of striving immigrants who shaped our history – reaching and sweating and scraping to give their children something more. Their story is the American story, and this month, we honor them all." (President Barack Obama)

Office of Diversity & Equal Opportunity

Mission and Vision



Mission: To make equal opportunity and the appreciation of diversity an integral part of all NASA SCC programs.

Vision: To set an example of diversity appreciation and teamwork for NASA SCC; To be an excellent resource for our customers, stakeholders, and partners; To have a sustained impact on NASA SCC and beyond.

Hail & Farewell

NASA bids farewell to the following:

Mario Murray

AST, Facility Systems Safety

Safety & Mission Assurance Directorate