



National Aeronautics and Space Administration



# LAGNIAPPE

John C. Stennis Space Center

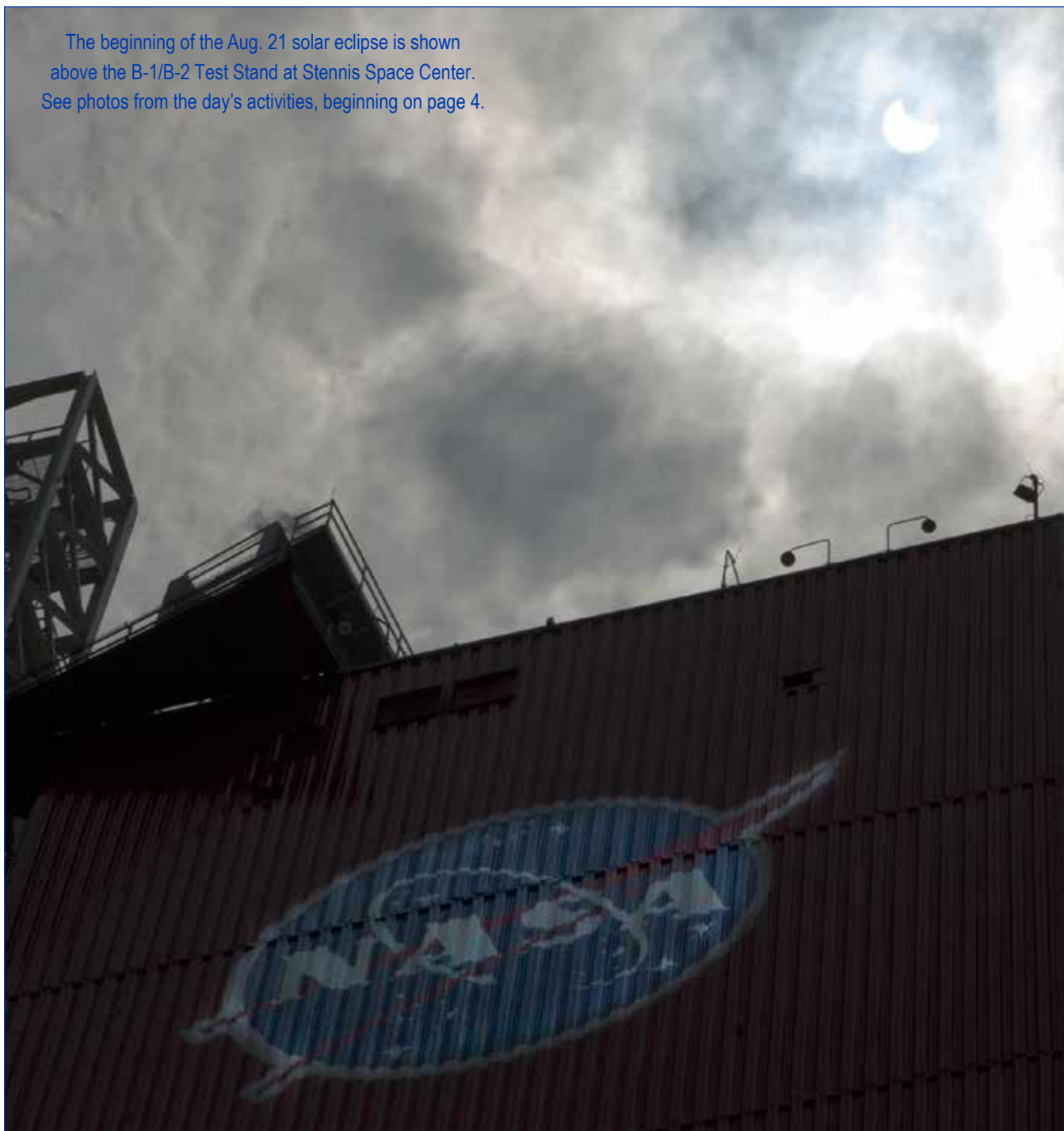
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September 2017

## A celestial show

The beginning of the Aug. 21 solar eclipse is shown above the B-1/B-2 Test Stand at Stennis Space Center. See photos from the day's activities, beginning on page 4.



People often play the “where were you” game with special events, even those related to space exploration. Where were you when Apollo 11 landed on the moon, when space shuttle Challenger was lost, when Curiosity reached the surface of Mars?

For some, the Solar Eclipse Across America on Aug. 21 ranks as just such an event. It was the first solar eclipse to span the nation in 99 years. It also was the first whose path of totality stayed completely in the United States since 1776. In gator years, either one of those translates to a bayou full of time. Ark!

Solar eclipses are fascinating. People used to fear them. Some thought a demon was attacking the sun or a dragon was eating it. Some said it was the sun and moon having a fight. Others saw them as a sign of angry gods or momentous events.

Of course, we eventually got smarter and realized eclipses were not to be feared but celebrated and studied. We could learn from them – and we did. In 1868, a French astronomer discovered evidence of the second-lightest and second-most-abundant element known to humans during a solar eclipse. It was named

helium – after *helios*, the Greek word for “sun.” Half a century later, a British astronomer conducted an experiment during a 1919 solar eclipse that helped prove Einstein’s theory of relativity.

NASA and other scientists used the 2017 eclipse to learn even more – about the sun, the Earth’s atmosphere, stars and how the universe works in general. After all, this is a big world, and there is a lot we still do not understand. It is like the old Guy Clark song says, “The more I learn the less I seem to know.” Ark!

I was thinking of that as I watched the RS-25 engine test the week after the eclipse. We talk a lot about how those engines are going to take us back to deep space, to places we never have been – and that is exciting. What we may not think about as often is all we are going to learn along the way and how that will change us, change our lives, change how we see the world.

What an adventure it will be – and we are helping to make it possible. Riding on engines tested here, who knows what worlds will be found, what discoveries will be made, what mysteries will be solved? Ark! We may even find out what really happened to Major Tom.



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# NASA concludes summer of RS-25 flight controller tests

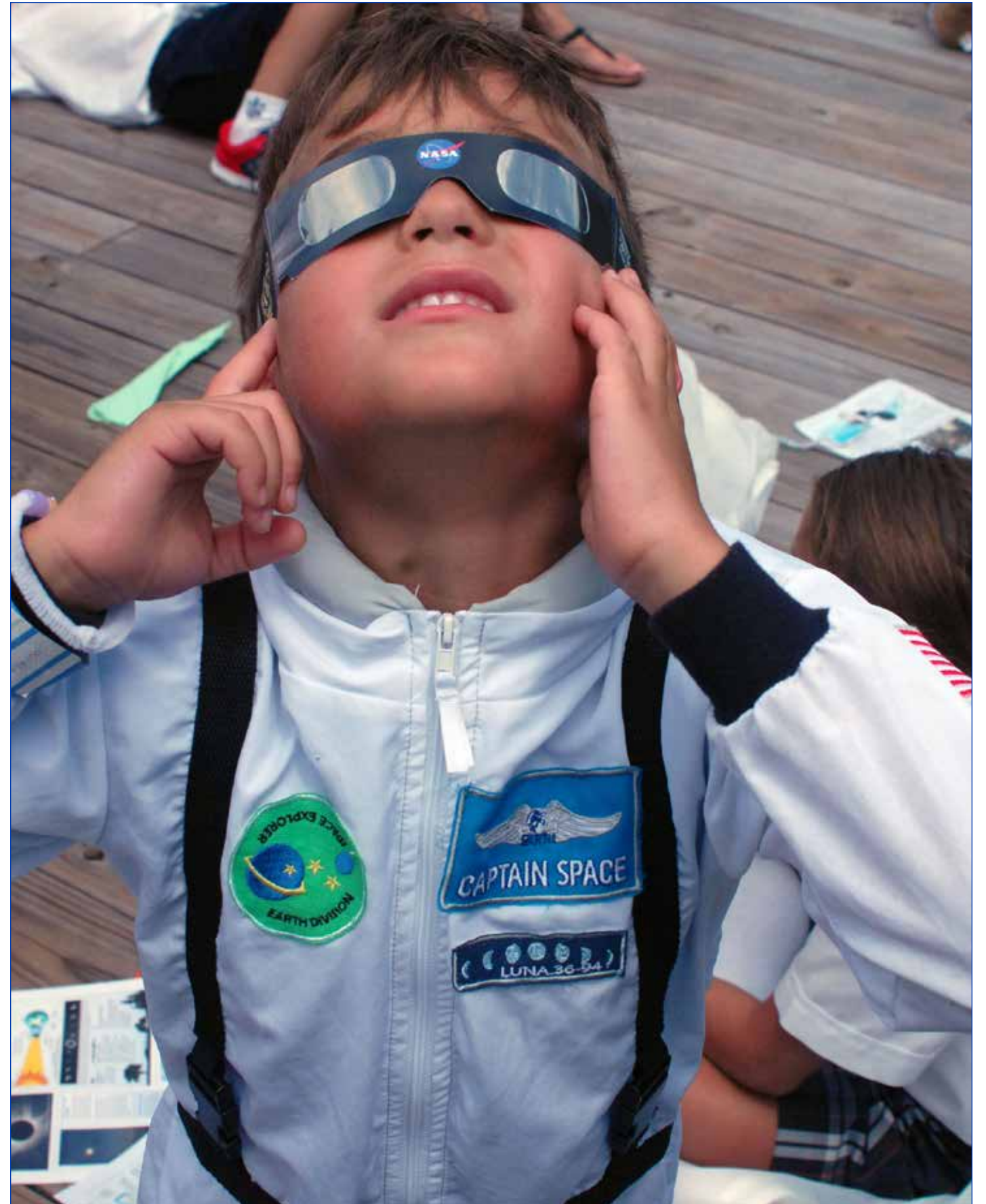
NASA engineers closed a summer of successful hot fire testing Aug. 30 for flight controllers on RS-25 engines that will help power the new Space Launch System (SLS) rocket being built to carry astronauts to deep-space destinations, including Mars. The space agency capped off summer testing with a 500-second hot fire of a fifth RS-25 engine flight controller unit on the A-1 Test Stand at Stennis Space Center. The controller serves as the "brain" of the engine, communicating with SLS flight computers to ensure engines are performing at needed levels. The test marked another step toward the nation's return to human deep-space exploration missions. NASA tested the first flight controller unit for the SLS engine in March. The agency launched a series of summer tests with a second flight controller unit hot fire at the end of May, then followed up with three additional tests. The flight controller tests are critical preparation for upcoming SLS flights to deep space—the uncrewed Exploration Mission-1 (EM-1), which will serve as the first flight for the new rocket carrying an uncrewed Orion spacecraft, and EM-2, which will transport a crew of astronauts aboard Orion. Each SLS rocket is powered at launch by four RS-25 engines firing simultaneously and working in conjunction with a pair of solid rocket boosters. The engines generate a combined 2 million pounds of thrust at liftoff. With the boosters, total thrust at liftoff will exceed 8 million pounds. The RS-25 engines designated for use on the initial SLS missions are former space shuttle main engines, modified to provide the additional power needed for the larger, heavier SLS rocket. The new flight controllers are a critical component of the engine modification. During tests, the controllers are installed on a developmental RS-25 engine, which is then fired in the same manner and for the same amount of time that will be needed during an SLS launch. In addition to tests of actual flight controllers, NASA also conducted hot fires of controller prototypes at Stennis to collect valuable development data for prime contractor Aerojet Rocketdyne and subcontractor Honeywell. Tests are conducted by a team of NASA, Aerojet Rocketdyne and Syncom Space Services engineers and operators. Syncom Space Services is the prime contractor for Stennis facilities and operations.



# INFINITY visitors, Stennis employees look skyward to view eclipse



Stennis Space Center and INFINITY Science Center hosted employees and visitors for a day of viewing activities during the Solar Eclipse Across America on Aug. 21, as the photos on the following pages show. Hundreds of area residents and family members visited INFINITY to hear speakers, participate in hands-on learning activities and view the early afternoon eclipse. The day's activities also featured a dedication ceremony for a special U.S. Postal Service stamp commemorating the solar eclipse. At the center, employees were able to collect eclipse information and viewing glasses, and hear guest speakers prior to gathering outside various buildings to view the event. At its height in this area of the country, the moon eclipsed about 75 percent of the sun, as shown in the left photo taken at the B-1/B-2 Test Stand.







(Top photo) Karen Roark talks to INFINITY Science Center visitors during Solar Eclipse Across America activities Aug. 21. Roark is an educational professional development specialist for Texas State University at NASA's Ames Research Center in Mountain View, Calif.

(Bottom photo) a group of New Orleans students gaze in wonder at the Aug. 21 solar eclipse during their visit to INFINITY Science Center.





(Top left photo) Stennis Space Center employees gather materials and viewing glasses prior to the solar eclipse Aug. 21.

(Top center photo) WXXV-TV broadcaster Gina Tomlinson interviews station meteorologist Ryan Mahan prior to the solar eclipse outside the Roy S. Estess Building at Stennis. Mahan also spoke to Stennis employees and INFINITY Science Center visitors about the eclipse during the day's activities.

(Bottom left photo) Stennis employees enjoy the chance to view the Aug. 21 solar eclipse.

(Right photo) Stennis Director Rick Gilbrech (r) joins Associate Director Ken Human (l) and other employees viewing the solar eclipse outside the Roy S. Estess Building.







## After years of discoveries, a mission's end

After two decades in space, NASA's Cassini spacecraft is nearing the end of its remarkable journey of exploration. Having expended almost every bit of the rocket propellant it carried to Saturn, operators are deliberately plunging Cassini into the planet Sept. 15 to ensure Saturn's moons will remain pristine for future exploration. During the mission finale, Cassini will continue to send science data for as long as its small thrusters can keep the spacecraft's antenna pointed at Earth. Soon after, the spacecraft will burn up and disintegrate like a meteor. With this image from October 2016, Cassini captured one of its last looks at Saturn and its main rings from a distance. The Saturn system has been Cassini's home for 13 years.

Cassini has been orbiting Saturn for nearly a half of a Saturnian year. This extended stay has permitted observations of the long-term variability of the planet, moons, rings and magnetosphere, observations not possible from short, fly-by style missions. Launched on Oct. 15, 1997, Cassini's tour of Saturn was extended twice beyond its original four-year prime mission. Its key discoveries have included the global ocean with indications of hydro-thermal activity within Enceladus, and liquid methane seas on Titan. For more information about the mission, visit: <https://saturn.jpl.nasa.gov> and <https://www.nasa.gov/cassini>. The Cassini imaging team home page is at: <http://ciclops.org>.

## NASA in the News

### Statement on planned NASA nomination

The following is a statement from acting NASA Administrator Robert Lightfoot on the Sept. 1 announcement of the intended nomination by President Donald Trump of U.S. Rep. Jim Bridenstine to serve as the 13th NASA administrator: "I am pleased to have Rep. Bridenstine nominated to lead our team. Of course, the nomination must go through the Senate confirmation process, but I look forward to ensuring a smooth transition and sharing the great work the NASA team is doing. I look forward to working with a new leadership team, and the administration, on NASA's ongoing mission of exploration and discovery. Our history is amazing, and our future is even brighter, as we continue to build on this nation's incredible global leadership in human exploration, science, aeronautics and technology." Bridenstine, a pilot in the U.S. Navy Reserve and former executive director of the Tulsa Air and Space Museum and Planetarium, was elected to the U.S. Congress in 2012 to represent Oklahoma's First Congressional District.

### New Horizons set for Kuiper Belt flyby

NASA's New Horizons mission has set the distance for its New Year's Day 2019 flyby of Kuiper Belt object 2014 MU69, aiming to come three times closer to MU69 than it famously flew past Pluto in 2015. That milestone will mark the farthest planetary encounter in history – some 1 billion miles beyond Pluto and more than 4 billion miles from Earth. If all goes as planned, New Horizons will come to within just 2,175 miles of MU69 at closest approach, peering down on it from celestial north. The alternate plan, to be employed in certain contingency situations such as the discovery of debris near MU69, would take New Horizons within 6,000 miles – still closer than the 7,800-mile flyby distance to Pluto. If the closer approach is executed, the highest-resolution camera on New Horizons should be able to spot details as small as 230 feet across. Using onboard science instruments, New Horizons will obtain extensive data on MU69 and will search for an atmosphere and moons. For more on New Horizons, visit: <https://go.usa.gov/xRM8t>.

## Acting NASA administrator visits Stennis

NASA Acting Administrator Robert Lightfoot speaks to Stennis Space Center employees during an on-site all hands gathering Aug. 16. In addition to updating Stennis employees on NASA programs, the agency leader had the chance to view the Aug. 16 RS-25 engine test on the A-1 Test Stand.



## NASA honors employees for flight safety



Astronauts Steve Bowen (l) and Nicole Mann (r) stand with recipients of NASA's Space Flight Awareness Honoree Award following an Aug. 16 ceremony in Orlando, Fla. In recognition of their flight program contributions, honorees traveled to Florida to tour Kennedy Space Center facilities and attend the Aug. 18 launch of the Tracking and Data Relay Satellite. Honorees included seven Stennis Space Center employees and one NASA

Shared Services Center (NSSC) employee. Honorees (and their companies) were: (l to r): Travis Sanders (A<sup>2</sup>Research), Kent Morris (Syncom Space Services), Dwayne LaVigne (Syncom Space Services), LaSonya Pulliam (Aerojet Rocketdyne), Brandi Head (NSSC), Daniel Puckett (SaiTech) and Matt Ladner (NASA). Robert Drackett, a NASA employee at Stennis, is not shown.

## National geospatial-intelligence analysts visit Stennis

Members of the National Geospatial-Intelligence Agency Missile Community of Practice visited Stennis Space Center stand at the B-1/B-2 Test Stand during an onsite visit Aug. 30. In addition to learning about ongoing work at the center and touring site facilities, the visiting analysts had a chance to view the scheduled test of an RS-25 engine flight controller on the A-1 Test Stand.



## Congressional staff members tour Stennis facilities



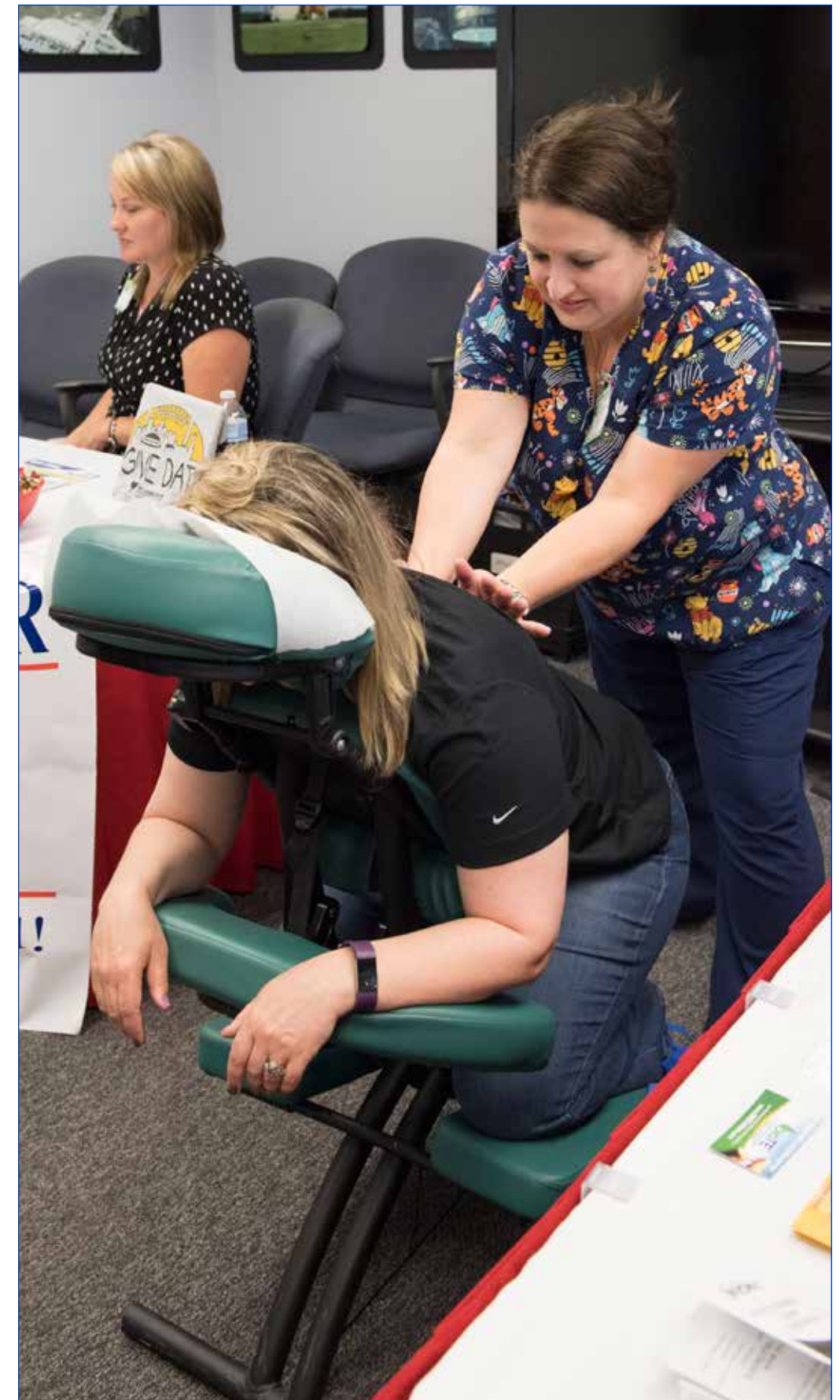
Congressional staff members for U.S. Sen. Thad Cochran of Mississippi stand atop the B-1/B-2 Test Stand during an onsite visit and tour Aug. 20. During the visit, staff members were briefed on preparations for testing the

core stage for NASA's new Space Launch System rocket on the B-2 stand. Cochran is Mississippi's senior U.S. senator, having served since 1978, and current chair of the Senate Appropriations Committee.

# Stennis focuses on health and safety – ‘Walk the walk, talk the talk’



Stennis Space Center focused on employee health and safety with annual Safety and Health Day activities Sept. 9 (photos on pages 13-14). The theme of the day was "Walk the walk, talk the talk." Activities included site and outside vendors highlighting various aspects of safety and health, as well as visits and demonstrations by emergency crews and Gulf Coast Rescue Dog. Exhibits included information on topics ranging from industrial hygiene to personal stress to the dangers of electricity. Employees also had opportunities to learn and gather health-related information from medical professionals. A pair of sessions featured guest speaker Chris Hansen, manager of the Extravehicular Activities Office at NASA's Johnson Space Center.





# New Lagniappe feature focuses on safety at Stennis

*Note: This month begins a regular focus on safety and health at Stennis Space Center. Future issues will include information on various aspects of safety and health at the rocket engine test site. This month's article was written by Kamili Shaw, safety, quality and management systems lead in the Stennis Safety and Mission Assurance Directorate.*

will include a feature in the Lagniappe that will focus on safety at Stennis Space Center each month. Our intent is to focus on areas that survey takers found were not always effectively communicated, like safety personnel highlights, lessons learned, safety incident data, safety

award recognition and safety activities around the center.

As the Stennis Space Center safety culture representative, it was my pleasure to administer the safety culture survey for Stennis in January of this year. The safety culture survey measures the five factors of the safety culture model that is used agency-wide: reporting, just, flexible, learning and engaged.

Stennis had the best-ever response rate due to the hard work of many individuals at all levels enthusiastically promoting the survey. Stennis also had a lot of good news. We are essentially in line with agency results. In addition, overall, Stennis has a good attitude reporting safety incidents, which is a center strength that we should be diligent about maintaining. However, there was some room for improvement in the areas of recognition of employees and communication of a variety of safety topics.

In order to begin to address these shortcomings while making best use of the resources already available, we

We look forward to being able to bring safety highlights from not only from civil servants but also contractors, subcontractors, tenants and resident agencies. Our goal is to highlight the great work that many of you put in around this center to maintain and continue to elevate a positive safety culture. As we go forward in this venture, I hope that all of the Stennis community will find this space to be an opportunity to share both our successes and lessons learned for the benefit of all.

We welcome your participation. For details about submitting an article

about safety from your organization, please contact: Kamili Shaw at [kamili.j.shaw@nasa.gov](mailto:kamili.j.shaw@nasa.gov) or 228-688-3025; or Karen Patton at [karen.patton@nasa.gov](mailto:karen.patton@nasa.gov) or 228-688-2056.

More can be found about NASA safety culture online at: <https://sma.nasa.gov/sma-disciplines/safety-culture>.



## Hail & Farewell

NASA welcomes the following:

Heather Cooper

Pathways Intern

Office of the Director

## 1970 – Earth Resources Laboratory established

*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.*

On Sept. 9, 1970, NASA established the Earth Resources Laboratory (ERL) at the Mississippi Test Facility (MTF), now Stennis Space Center. Robert Piland, the deputy director of science and applications at the Manned Space Craft Center in Houston, was selected to head the new laboratory.

ERL researched applications of remote sensing techniques and used data generated by aircraft that flew out of both Houston and the Stennis Airport in Hancock County in conjunction with images from the technology satellite and Skylab spacecraft for research in the seafood, forestry, and agriculture industries.

Then-MTF Director Jackson Balch, was building the

engine test site into a multiagency facility after the Apollo Program ended and was excited to have a big piece of his “environmental center” come to MTF.

Housing the ERL at MTF pulled together the establishment of a state-of-the-art environmental research facility on the Mississippi Gulf Coast.

Balch began developing a consortium of environmental management. With the Earth Resources Laboratory as the backbone, other agencies joined in the consortium, including the Department of the Interior's U.S. Geological Survey, the Earth Resources Observation Systems regional office, the National Oceanic and Atmospheric Administration's National Data Buoy Program Office, the Remote Sensing Engineering Development Office, the Experimental Field Test and Integration Center, the National Oceanographic Instrument Center, and the Environmental Protection Agency's National Pesticide Monitoring Laboratory.



A satellite image from the late 1980s shows the Louisiana and Mississippi coastline. Stennis Space Center became a leader in Earth science and remote sensing technology with the establishment of the Earth Resources Laboratory at the site in the fall of 1970.

## Office of Diversity and Equal Opportunity

# Diversity and inclusion valued at NASA and Stennis

*This article was written by Michael J. Vallan, an attorney in the Office of the Chief Counsel at Stennis*

A few weeks ago, *The New York Times* reported the United States Department of Justice (DOJ) was seeking lawyers to investigate and litigate race-based discrimination in U.S. higher education. The investigation would involve reviewing a complaint brought by 64 Asian-American associations alleging the admissions policies and practices of a university racially discriminated against Asian-Americans. The DOJ announcement was alarming to some and welcomed by others. As seen by the recent events in Charlottesville, Virginia, race is a sensitive subject. Similarly, the words “affirmative action” oftentimes evoke mixed reactions and emotions. But what exactly does affirmative action have to do with college admissions?

Merriam-Webster defines affirmative action as either “an active effort to improve the employment or educational opportunities of members of minority groups and women” or an “effort to promote the rights or progress of other disadvantaged persons.” Over the last several years, the U.S. Supreme Court has issued a number of decisions which addressed the propriety of using race in the college admission process. The most recent case to address such matters was *Fisher v. University of Texas at Austin*, 136 S. Ct. 2198 (2016).

Petitioner Abigail Noel Fisher filed suit against the University of Texas at Austin (UT Austin) alleging the university’s consideration of race in its admissions process violated the Equal Protection Clause of the U.S. Constitution. Fisher alleged that the consideration of race, as part of its holistic-review of applicants, disadvantaged her.

In reviewing the university’s admissions program, the Supreme Court clearly recognized that a university cannot impose a fixed quota or otherwise define diversity as some percentage of a particular group. However, the court also recognized that a university may institute a “race-conscious” admissions program as a means of obtaining the educational benefits that flow from a diverse student body. To this point, the court stated that enrolling a diverse student body “promotes cross-racial understanding, helps to break down racial stereotypes and enables students to better understand persons of different races, promotes learning outcomes and better prepares students for an increasingly diverse workforce and society.” *Fisher*, 136 S. Ct. 2198 (2016).

Ultimately, the court ruled that UT Austin’s admissions program did not violate the Equal Protection Clause and that race could be used as one factor among many in the college admission process. However, by no means does the Supreme Court ruling in *Fisher* completely settle the

issue. College admission is a high-stakes strategic chess game. Going to the right school oftentimes means getting the right job.

To date, it is unclear if the scope of the DOJ’s planned investigation will extend beyond the complaint raised by the Asian-American organizations or whether any such investigation will result in any significant change in current university admission practices. Closer to home, it does not take long to recognize that diversity is valued at NASA and Stennis. As recognized by former NASA Administrator Charlie Bolden, “journeying beyond Earth’s orbit, as NASA is committed to do, will require a diverse team of many individuals with the best minds, the most comprehensive expertise, the broadest knowledge, the strongest talent, and the greatest integrity.”

To that end, NASA has made a commitment to diversity and equality by providing an environment that “honors integrity, excellence, teamwork, fairness and equity.” The numerous events, programs, visiting speakers, etc. all clearly demonstrate a concerted effort to celebrate the vibrant and diverse group of people working for NASA. By many accounts, this is a good thing, and such efforts have widely contributed to the success of Stennis and NASA missions. Regardless of the investigation’s outcome, it is clear that universities, colleges and businesses alike see the value in having a diverse student body and a diverse workforce.



### Stennis promotes women's equality

Patricia Brown speaks to Stennis Space Center employees during an onsite Women's Equality Day program Aug. 24. Brown is senior service hydrologist for the National Oceanic and Atmospheric Administration's National Weather Service Forecast Office in Slidell, La.





# 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 employee is highlighted on the following page.



## Ronnie Good



As far as Ronnie Good is concerned, getting a chance to work at Stennis Space Center four years ago was nothing less than an answer to prayer. “I lived in Columbus, Mississippi, and was searching for a safety position when I saw a listing online with ASRC Federal,” he recalls. “I came in for an interview and was blessed to be hired.” Good began work as a safety specialist with ASRC Federal in early 2013 and now fills the same role for SaiTech, Inc., which holds the information technology services contract at Stennis. In that role, he works to ensure workplace safety for fellow employees and contract workers and to maintain the company’s Voluntary Protection Program (VPP) compliance. He also participates in various committees and work groups to promote sitewide safety. This includes involvement with the Mississippi/Louisiana Gulf Coast VPP Council, which has

been recognized by the VPP Participants’ Association as a regional mentor of the year group and which Good previously co-chaired. Good himself has received a NASA SHAKERS (Smart Human Actions Keep Everyone Really Safe) Award for identifying a facility safety hazard. He loves the people and culture of Stennis, as well as the fact that safety is a core site value. Good remembers watching Apollo Program launches and splashdowns as a child. Now, he looks forward to working with others in the Stennis family to support exploration missions of NASA’s new Space Launch System. Outside of work, the Waveland resident stays active with his family and in his local church and a local ministry. He and wife Kathy have three children, the oldest of whom recently completed college and married. Two others are now in college, which leads Good to joke – “Can you say OUCH?”

# Jason Hopper



Jason Hopper still remembers performing the “T-minus 10 ... 9 ... 8 ...” countdown as an elementary school student for launch of his first model rocket. Years later, he finds himself engaging in the same activity as a NASA test conductor at Stennis Space Center. Born in Meridian, Mississippi, and reared in Ridgeland, Hopper is now a resident of Long Beach and entering his second decade of work at Stennis. While on a rock climbing trip in his senior year of aerospace engineering studies at Mississippi State University, Hopper met a fellow climber whose father worked at the rocket engine test site. After graduating, Hopper contacted the father, arranged for an interview and was hired by Aerojet Rocketdyne (then Pratt & Whitney Rocketdyne). Beginning in 2007, Hopper worked as a test engineer, conducting space shuttle main engine tests and supporting the RS-68 engine test

project. He joined NASA in 2011 as the agency assumed control of all test stand operations. Hopper conducted J-2X rocket engine tests and supported various test projects on every Stennis stand. “Being a member of the team to successfully transition test complex operations during a new test project was my proudest moment to date as a Stennis employee,” he says. Since last year, Hopper has served as a NASA test director, coordinating activities at the E-2 and E-3 test stands. He also is test conductor for the upcoming Space Launch System core stage test project on the B-2 Test Stand. Looking ahead, Hopper is excited to be part of a new generation of NASA leaders during a time of reprioritizing and change, thanks to the growth of commercial spaceflight. Outside of work, he remains an avid outdoorsman while also enjoying his role as a new father.