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## To INFINITY and Beyond!

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### INFINITY Science Center Celebrates 10 Years

See page 8



I was ecstatic to be invited to a party with some family and friends this last weekend. It was a perfect day for the event. The temperature stayed about 70 degrees, and that was just right for sitting around the fire pit and catching up with everybody. The country and rock music mix set a cheerful atmosphere of laughing, singing, and just letting loose. The main attraction was the season, crawfish season. In south Mississippi, people love their mudbug boils.

If you have ever eaten crawfish, you know that lots of people like to pour on the heat. The first batch might be a little mild. The second is usually hot, but the third is where you need to have a drink ready to chase down each delectable bite. Hot, in this case, must be experienced to be understood. Either chase it down with something, or you might take off like the characters in the old cartoons. Ark!

Speaking of taking off, I was super excited to see the launch and docking of the first-ever private crew this weekend. Just think about the possibilities and science. It is sure to change life on Earth. As more research gets conducted in space, the benefits seem to flood downward to Earth. Thinking of the societal impact of the cell phone, I wonder what scientific breakthroughs like that might be on the horizon in medicine, food growth and preservation, computing capabilities, and autonomy.

It makes me smile, thinking that one day, astronauts also might be enjoying crawfish on spaceflights.

While at the party, folk started playing the popular game known as corn hole. Corn hole is a bean bag game of bewilderingly serious competition. People get pretty passionate about landing on the board and so much more when hitting a bullseye. Along with the trash talk and laughter, it is so much fun. The excitement and the support coming from the spectators add to the experience. It reminds me of the enthusiasm I felt as NASA Administrator Bill Nelson recently delivered the State of NASA address. The videos NASA TV included were downright inspirational.

On the subject of inspiration, Stennis and NASA have had a busy month with lots of interesting activities for inspiring the new Artemis generation of explorers. Look inside to see what is happening with the James Webb Telescope, the Artemis I wet dress rehearsal, Stennis outreach, the INFINITY Science Center anniversary, and much more.

Well, it is getting that time of the year when there is no excuse not to hop on the old Harley and ride to my favorite places to eat. I like to support those hole-in-the-wall or mom-and-pop local places. Riders can find some pretty good barbeque, boudin, and gumbo just rolling down the old highways.

At Stennis, I look forward to grabbing a little grub at the food trucks. I hope I get some good weather to ride in for work. Riding the Harley helps with a great attitude to start the workday.



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# NASA, Aerojet Rocketdyne Complete Testing for Modernized RS-25 Engine

NASA completed developmental engine testing on March 30 with a full-duration [RS-25 hot fire](#), to support future engines that will launch [Space Launch System](#) (SLS) astronauts deeper into space than ever.

Operators fired RS-25 engine No. 0525 for about eight-and-a-half minutes (500 seconds) and up to 111% power level on the [Fred Haise Test Stand](#) at NASA's Stennis Space Center near Bay St. Louis, Mississippi. The March 30 hot fire completed the fourth developmental test in the [current series](#) and sets Aerojet Rocketdyne, the lead contractor for NASA's SLS engines, on pace to produce new RS-25s for future use.

"We've conducted a total of 25 tests during this remarkable development test program to modernize manufacturing, on-ramp additive manufacturing, and reduce the cost of the RS-25 engines for the Space Launch System," said Johnny Heflin, manager for the SLS Liquid Engines Office at NASA's Marshall Space Flight Center in Huntsville, Alabama. "These tests are helping us ensure the success of not only the upcoming flight of [Artemis I](#) but also of future missions that will lead to long-term exploration of the Moon.

NASA is building SLS to return humans, including the first woman and the first person of color, to the Moon as part of Artemis and to power future missions to Mars. Four RS-25 engines will help launch SLS missions. The first four missions, including the upcoming uncrewed Artemis I flight test to the Moon, will use modified space shuttle main engines. All Artemis 1 engines have been tested for flight.

For SLS missions beyond the first four, Aerojet Rocketdyne is modernizing the production of new RS-25 engines while also reducing costs by 30 percent. The new engines will include components manufactured with state-of-the-art fabrication techniques, such as additive manufacturing (commonly known as 3D printing). These new components have been tested during the developmental series completed at Stennis today.

"As we modernize the engines, we need to ensure that they are as robust and as reliable as the original space shuttle engines," said Jeff Zotti, Aerojet Rocketdyne RS-25 program director. "We ran the new components under the same conditions and profiles they will see in flight to ensure the engines perform as they should. This test was the last step before combining all the new, more affordable components and existing heritage components into our design certification engine."

This latest test series concludes a thorough testing campaign for NASA and its engine contractor. The agency conducted an initial series of 18 RS-25 hot fires as Aerojet Rocketdyne completed modifications to adapt the existing space shuttle



NASA conducts a full-duration RS-25 engine test on the Fred Haise Test Stand at Stennis Space Center on March 30. The hot fire marked completion of developmental testing as lead contractor Aerojet Rocketdyne prepares to manufacture new RS-25 engines for use on NASA's Space Launch System rocket.

main engines needed for early SLS missions. This series included tests of two RS-25 flight engines. Four test series, using a pair of RS-25 developmental engines, followed the initial adaptation hot fires:

- The first series included four hot fire tests of RS-25 engine No. 0528 for a total of 1,390 seconds. Operators fired the engine at 111% of the original space shuttle's main engine power level, the same level new RS-25 engines will need to help launch SLS. They also reached the 113% power level for the first time, demonstrating a margin of operational safety. The series included tests of three new engine controllers, which work as the RS-25 "brain" to help the engine communicate with the SLS rocket, as well as a 3D-printed pogo accumulator assembly. Aerojet Rocketdyne also demonstrated a new ablative material designed to help protect RS-25 nozzles.
- A second series featured nine successful hot fires of engine No. 0525 for a total of 4,016 seconds. Operators fired the engine at 113% power level for a total of 628 seconds during the series. The series featured tests of nine new engine controllers and several new engine components, including a main combustion chamber fabricated using a

[hot isostatic pressure bonding technique](#). The series also demonstrated various new engine operation procedures.

- The third developmental series included seven hot fires of RS-25 engine No. 0528 for a cumulative 3,650 seconds. In addition, the series continued testing of new engine components and featured a pair of gimbal tests. Gimbaling involves pointing the engine nozzle in the direction needed to steer the rocket during flight.
- The latest series involved five hot fire tests of RS-25 developmental engine No. 0525 for a total of 2,500 seconds. The series featured a new low-pressure fuel turbopump, flex ducts, restart sensors, ignition components, 3D-printed valves, and rigid ducts not previously tested. Fifty percent of the new 3D-printed components on the new RS-25 engines were tested in the series. Other 3D-printed components are located on the new engine nozzle and will be validated during certification testing later this summer.

"This latest hot fire closes a great chapter in Stennis testing history," said Chip Ellis, Stennis RS-25 test project manager. "Completion of the retrofit series could not have occurred

without the dedicated, highly skilled workforce at Stennis. The test team has done an outstanding job getting us through this development period, and we look forward to continuing to test engines that will fly on SLS missions."

With developmental testing completed, NASA plans to begin a series of 12 hot fires this summer on an RS-25 certification engine that is the identical design to future engines being manufactured for flight. It will feature all new components, including a new nozzle, in the final flight configuration.

A follow-up series of 12 tests will be conducted on RS-25 engine No. 0525 once it is modified with new components in the final flight configuration as well. The dual series will demonstrate that the new engine design is ready to fly.

Aerojet Rocketdyne is contracted to produce 24 new RS-25 engines using the updated design to support future Artemis missions beginning with Artemis V.

RS-25 tests at Stennis are conducted by a combined team of NASA, Aerojet Rocketdyne, and Syncom Space Services operators. Syncom Space Services is the prime contractor for Stennis facilities and operations.





A work crew at Stennis space Center removes RS-25 engine No. 0525 from the Fred Haise Test Stand on April 14. Removal of the engine follows completion of developmental testing for the production of new RS-25 engines to help power deep space missions with NASA's Space Launch System rocket.



# Work Underway to Upgrade Critical Stennis Space Center Infrastructure

Replacing an average kitchen sink faucet may take an hour with a few common tools. Replacing piping needed to flow 170,000 gallons of water a minute is a different story – and one that demands a clever bit of engineering ingenuity.

Just such a project is underway at NASA's Stennis Space Center near Bay St. Louis, Mississippi, as crews work to upgrade aging infrastructure by replacing 66-inch piping leading to the historic Fred Haise Test Stand.

“This task is a major undertaking, as there are a number of underground utilities around the Fred Haise Test Stand that we must be careful not to disturb,” said Casey Wheeler, the NASA engineer spearheading the project. “However, it serves a critical need. This is the first time the water pipeline leading to the structure has been upgraded since its original installation.”

A typical single-engine test at NASA's Stennis Space Center requires a lot of water – to cool super-hot engine exhaust, reduce test-related noise and vibrations, and use in the event of a facility or propellant barge fire. As much as 1.4 million gallons of water flows to the test stand during an eight-and-a-half-minute hot fire. At pressures reaching 225 pounds per square inch, the output is enough to fill 2,125 standard bathtubs a minute.

The water flows from a 66-million-gallon reservoir at the Stennis High Pressure Industrial Water Facility. Built in the 1960s, maintaining the facility and its related piping is an ongoing challenge.



Crews use a shoring system to hold back soil March 23, 2022, as they install new 75-inch piping leading from the Stennis Space Center High Pressure Industrial Water Facility to the valve vault pit serving the Fred Haise Test Stand. The work is part of a critical infrastructure upgrade project.

forest corridor leading back to the HPIW facility.

A second portion of the upgrade project involves approximately 580 feet of existing 66-inch piping running from the valve vault pit to the test stand. This stretch of piping runs adjacent to a complicated network of underground utilities that could be damaged from intensive digging; hence,

NASA launched an effort in the mid-2010s to repair and replace system components, including pipes and valves leading to the site's large test stands. Work at two other large test stands have been completed, with crews now focused on the Fred Haise stand.

Part of the current project involves installing about 2,080 linear feet of new 75-inch piping from the HPIW facility to the valve vault pit serving the test stand. The existing 66-inch piping between these two points will be abandoned in place.

Nearly all of the pipe required for this portion of the project is on site, though four sections still are being fabricated off site. Over 500 feet of the new 75-inch pipe has been laid. The initial stage of this work has involved the use of a shoring system to hold back soil as crews install the piping underground in narrow, vertical pits. The remainder of the installation will shift to a broader, open-pit approach as crews work in a more spacious, cleared



Sections of new 75-inch pipe await installation between Stennis Space Center's High Pressure Industrial Water Facility and the valve vault pit serving the Fred Haise Test Stand on March 23, 2022. Installation of the pipe is part of a critical upgrade for the center's aging infrastructure.

the engineering challenge.

In response, work crews will forgo digging up the existing piping or even installing new piping. Instead, they will insert a new, 64-inch steel liner inside the older piping, which will reduce project time and cost. Thinking of inserting one drinking straw into another, just slightly larger drinking straw.

“Inserting the new liner requires careful, precise work, with just a two-inch difference in diameter between the liner and the existing piping,” Wheeler said. “We will also be competing against the clock to complete our job within a set timeframe so as to not hold up RS-25 engine testing on the stand.”

This portion of the project will require careful timing, as it will necessitate a service disruption to the test stand's water supply. Crews will have only 110 days to complete the work in order not to disrupt a busy testing schedule as NASA fires RS-25 engines for its Space Launch System (SLS) rocket on the Fred Haise stand.

Installing the liner requires cutting out a section at the top of the existing pipe and loading in new pieces of rolled steel plating. Crews then will slide the inserted segments into place and weld them together to create a continuous run. Because

of the size discrepancy between the existing pipe and the liner, grout will be added into the annular space between them.

While the steel liner will reduce the inside diameter of the water pipe leading from the valve vault pit to the Fred Haise Test Stand, a special interior coating enhancing the new pipe's smoothness is expected to compensate for the smaller diameter, ensuring no reduction in water flow.

In addition to this engineering feat, crews are slated to install a new 16-inch water line, 460 feet in length, connecting the HPIW piping system to the test stand's liquid hydrogen barge dock. The new line will provide water in case of a fire involving the highly flammable propellants used for engine testing. The crews also will install a new 12-inch water line running 430 feet from the HPIW system to the test stand's liquid oxygen barge dock. Similar work is scheduled at the A-2 Test Stand, where large piping sections already have been upgraded.

“These critical upgrades will enable Stennis Space Center to sustain its rocket propulsion testing capabilities for NASA-led and commercial applications,” Wheeler said. “We look forward to continuing Stennis' legacy as America's premier rocket propulsion test site.”





The SpaceX Falcon 9 rocket carrying the company's Crew Dragon spacecraft is launched on the Axiom-1 mission to the International Space Station on April 8, carrying the first private astronaut crew of four. The mission represents both a culmination of NASA's efforts to foster a commercial market in low-Earth orbit and the beginning of a new era of space exploration that enables more people to fly on more kinds of missions. (Image credit: SpaceX)

## NASA in the News

### NASA Uses Moonlight to Improve Satellite Measurement Accuracy

NASA's airborne Lunar Spectral Irradiance, or air-LUSI, flew aboard NASA's ER-2 high-altitude aircraft March 12-16 to measure accurately the amount of light reflected off the Moon. Reflected moonlight is a steady source of light that researchers are taking advantage of to improve the accuracy and consistency of measurements among Earth-observing satellites. The air-LUSI flights are part of NASA's comprehensive satellite calibration and validation efforts. The results will complement ground-based sites, and together, these will provide orbiting satellites with a robust calibration dataset. NASA has more than 20 Earth-observing satellites that give researchers a global perspective on the interconnected Earth system. Many of those satellites measure light waves reflected, scattered, absorbed, or emitted by Earth's surface, water, and atmosphere. By using moonlight data, scientists can more easily compare data from different satellites to look at global changes over long periods of time. For more, click [here](#).

### Hubble Identifies Jupiter-like Planet Forming in Unconventional Way

NASA's Hubble Space Telescope has directly photographed evidence of a Jupiter-like protoplanet forming through what researchers describe as an "intense and violent process." This discovery supports a long-debated theory – termed "disk instability" – for how planets like Jupiter form. The new planet is estimated to be around 2 million years old. That is about the same age of Earth's solar system when its planet formation was underway. (The solar system's age is currently estimated at 4.6 billion years.) All planets form from material that originated in a circumstellar disk. The dominant theory for Jovian planet formation is called "core accretion," a bottom-up approach where planets embedded in the disk grow from small objects colliding and sticking together as they orbit a star. This core then slowly accumulates gas from the disk. In contrast, the disk instability approach is a top-down model where as a massive disk around a star cools, gravity causes the disk to rapidly break up into one or more planet-mass fragments. For more, click [here](#).



## *NASA in the News*

# NASA Continues Artemis I Preparations



NASA's Space Launch System (SLS) rocket with the Orion spacecraft aboard is seen at sunrise atop a mobile launcher at Launch Complex 39B, April 4. NASA is conducting prelaunch tests of the rocket in preparation for its upcoming Artemis I uncrewed mission to the Moon. The rocket was rolled out to the Kennedy Space Center launchpad April 17-18 to conduct a wet dress rehearsal. Once the rehearsal test is completed, the rocket will be returned to the Vehicle Assembly Building at Kennedy for final launch preparations. NASA is building SLS as the world's most powerful rocket to launch Artemis missions back to the Moon and eventual missions to Mars. Through Artemis, NASA will land the first woman and the first person of color on the Moon, paving the way for a long-term lunar presence and serving as a stepping stone on the way to Mars. For updates on Artemis I launch preparations and schedule, follow along on NASA's Artemis blog [here](#).



# NASA in the News

## Nelson Delivers 2022 State of NASA Address



NASA Administrator Bill Nelson delivers the 2022 State of NASA address on March 28, 2022, from the agency's Kennedy Space Center in Florida. Nelson highlighted NASA's plans to explore the Moon and Mars, address climate change, promote racial and economic equity, and drive economic growth while sustaining U.S. leadership in aviation and aerospace innovation. The address coincided with release of President Biden's fiscal year 2023 budget request of nearly \$26 billion for NASA, an 8% increase from the current budget total. In a released statement, Nelson noted: "Greater than a number, statistic, or fact is what the president's budget request represents. This budget reflects the Biden-Harris Administration's confidence in the extraordinary workforce that makes NASA the best place to work in the federal government. It's an investment in the businesses and universities that partner with NASA in all 50 states and the good-paying jobs they are creating. It's a signal of support for our missions in a new era of exploration and discovery." The budget request would make critical investments in the American people that will help lay a strong foundation for shared growth and prosperity for generations to come, Nelson maintained. For more information on the 2023 request, visit [here](#). To view the State of NASA video, click [here](#).



## NASA Honors 2020 Stennis Employees for Flight Safety



Astronaut Shannon Walker stands with the 2020 Silver Snoopy recipients from Stennis Space Center following the presentation of the awards during an onsite ceremony March 29. Silver Snoopys are astronauts' personal awards, given in recognition of contributions to flight safety and mission success and presented to less than 1% of the total NASA workforce annually. Recipients (and their companies) and ceremony presenters of the 2020 awards were: (l to r) Rebecca Mataya (Syncom Space Services), Stephen Rose (Syncom Space Services), Daniel Allgood (NASA), Jasper Cook (NASA), Rodney McKellip (NASA Stennis Space Associate Director and ceremony speaker), Robert Knight (Aerojet Rocketdyne), Michael Pannell (NASA), Shannon Walker (NASA astronaut presenting the awards), Kevin Herrington (NASA Shared Service Center), Nicole Kelsch (NASA Shared Service Center), Jack Allen (SaiTech), Monti Muhsin (NASA), and Rowe Crowder (Syncom Space Services).

## NASA Honors 2021 Stennis Employees for Flight Safety



Astronaut Shannon Walker stands with the 2021 Silver Snoopy recipients from Stennis Space Center following the presentation of the awards during an on-site ceremony on March 29. Silver Snoopys are astronauts' personal awards, given in recognition of contributions to flight safety and mission success and presented to less than 1 percent of the total NASA workforce annually. Recipients (and their companies) and ceremony presenters (and their involvement) of the 2021 awards were: (l to r) Marc Shoemaker (NASA), Joshua McBeth (Aluttiq Essential Services), Ernest Ford (Aerojet Rocketdyne), Scot Gressaffa (NASA), Rodney Valdes (NASA), James Hamilton (NASA), Kevin Bobo (Defense Contract Management Agency), Rodney McKellip (NASA Stennis Space Associate Director and the ceremony speaker), Shannon Walker (NASA astronaut presenting the awards), Sharon Beard (NASA Shared Service Center), Steven Shireman (Aerojet Rocketdyne), Cynthia Leitell (NASA Shared Service Center), and Elizabeth Calantoni (NASA).



# INFINITY Science Center Celebrates 10 Years, Looks to Future Growth

For INFINITY Science Center leaders, commemoration of the 10th anniversary of the Hancock County, Mississippi, facility on April 30 represents not just a celebration but a renewed beginning.

In addition to marking a decade of growth and tens of thousands of visitors, INFINITY is poised to emerge from its pandemic status and take its place as a premier visitor center and tourist attraction, said Michelle Anderson, chief executive officer and executive director of the center.

“We really are a hidden jewel for many people,” she said. “But I look around at similar facilities across the country and see INFINITY Science Center growing as big and popular as any of them in the days ahead.”

The belief is not a mere sentiment for Anderson. She proved her faith in the possibilities for the facility by leaving her position with the Mississippi Development Authority and moving her family to the Gulf Coast to join the INFINITY team as the director of business services in August 2020, right in the midst of the COVID-19 pandemic. “I just fell in love with the center and its ‘dream team’ of staffers,” she said.

The original plan was for Anderson to work and learn about the center for two to three years, then possibly assume the executive director role, should the center’s board of directors approve her as a suitable candidate. However, staff changes within a matter of months resulted in the INFINITY board elevating Anderson to the top leadership position, responsible for steering the science center through the trying pandemic period.

The COVID-19 outbreak forced INFINITY to close its doors in December 2020. At the time, the facility was drawing thousands of visitors each month. INFINITY reopened five months later at the end of May 2021. “We survived the pandemic and now are working to recover our fiscal footing,” Anderson said.

In that sense, April 30 marks a dual celebration for the 72,000-square-foot facility.

INFINITY opened in April 2012 as a front-door attraction for the state of Mississippi. Located on I-10 Exit 2, just inside the Mississippi state line from Louisiana, the center is visible to multiple thousands of eastbound travelers each day.

In its first decade, the center has established itself as a popular destination spot for school and organizational groups. The facility is perfectly suited for the former groups, Anderson said. “INFINITY is just an awesome experience for school groups,” she explained. “It is all hands-on. So, they get to learn and play at the same time.”

(Top left photo) Plans for INFINITY Science Center date back well more than its decade of operation. Community leaders from Mississippi and Louisiana broke ground for the new facility on Nov. 20, 2008. The event marked the awarding of a \$4.8 million infrastructure development contract. Groundbreaking guests included, among others, INFINITY board member and Apollo 13 astronaut Fred Haise (third from left) and then-Stennis Director Gene Goldman (fourth from left).

(Bottom left photo) Less than four years after breaking ground for construction of INFINITY Science Center, officials gathered to cut the ribbon opening the new facility in April 2012. Participants included (l to r): Gulfport (Mississippi) Mayor and then-INFINITY Science Center Inc. Chair George Schloegel; U.S. Rep. Steven Palazzo of Mississippi; U.S. Sen. Roger Wicker of Mississippi; late-Stennis Director Roy S. Estess granddaughter Lauren McKay; then-Mississippi Gov. Phil Bryant; Leo Seal Jr. grandson Leo Seal IV; then-Stennis Director Patrick Scheuermann; the late U.S. Sen. Thad Cochran of Mississippi; then-NASA Chief of Staff David Radzanowski; and Apollo 13 astronaut and INFINITY Science Center Inc. Vice Chair Fred Haise.

(Right photo) A young visitor views a model of NASA’s new Space Launch System rocket, being built to send astronauts on deep space missions to the Moon and Mars, during early 10th anniversary activities at INFINITY Science Center on April 2.



INFINITY features several “galleries” of exhibits and activities, including a Natrium that features carnivorous plants, both a science and an Earth gallery, a Little Learner’s Lab for children from birth through five years old. Each area includes interactive exhibits and features.

“We are all things STEM (science, technology, engineering, and mathematics),” Anderson said. “You can find some of everything here.”

With its location just a few miles from Stennis Space Center, INFINITY also serves as the official visitor center for the NASA site. Among other items, it features a pair of Apollo-era rocket engines, the Apollo 4 command module that flew

to space in 1967, a full-sized, walk-through mockup of the International Space Station’s Destiny module, and the Saturn V S-IC-15 stage built to launch the Apollo 19 mission before it was canceled.

Fred Haise, a native of Biloxi, Mississippi, was scheduled to command the Apollo 19 mission. In 1970, he also flew as lunar module pilot on the Apollo 13 mission, which experienced an in-flight explosion and a perilous return to Earth. Although he has relocated from the Gulf Coast area, Haise has been a strong supporter of INFINITY since the beginning, and memorabilia from his astronaut career is featured at the facility.

Haise also continues to participate in INFINITY Science

Center activities from time to time and will be a featured virtual guest for the April 30 celebration. The showcase of the day’s activities will be a viewing of an Apollo 13 documentary produced by Mississippi State University.

The documentary will recount the mission, which captured worldwide attention at the time and still is remembered as one of NASA’s finest moments. Following the showing on April 30, Haise will join INFINITY Science Center visitors virtually to answer questions about the 1970 mission.

He will be joined at the time by Apollo 13 engineer Gilroy Chow, a native of Cleveland, Mississippi, who is featured in the documentary and is scheduled to attend the showing in person.



# INFINITY Science Center Celebrates 10 Years, Looks to Future Growth



INFINITY Science Center has hosted a range of activities during its first decade of operation.

(Top left photo) Mississippi student Ariana Lyons of Moss Point experiences "tries on" a NASA spacesuit during INFINITY Science Center activities in December 2014 to mark the 40th anniversary of the Apollo 17 mission.

(Top center photo) New Orleans student Shania Etheridge participates in a hands-on experience at the INFINITY Science Center in May 2013. Etheridge assisted in the first harvest of lettuce from the Controlled Environment Agriculture unit at INFINITY.

(Top right photo) NASA Astro Camp participants at INFINITY Science Center take part in an "out of this world" experience in July 2018, speaking live with astronaut Ricky Arnold aboard the International Space Station.

(Bottom left photo) Young visitors to INFINITY Science Center participate in an informational activity in November 2013 to mark launch of NASA's Mars Atmosphere and Volatile Evolution (MAVEN) mission to Mars.

(Bottom right photo) Astronaut Jeanette Epps speaks to visitors at INFINITY Science Center during a July 2014 event about the training astronauts undergo to serve as International Space Station crew members.



# INFINITY Science Center Celebrates 10 Years, Looks to Future Growth

(Top photo) Since 2012, INFINITY Science Center has served as a front-door attraction for travelers entered Mississippi via I-10 from Louisiana. Located at I-10 Exit 2, the center and its Saturn V S-IC-15 booster display is viewed by thousands of interstate travelers each day.

(Bottom left photo) New Orleans students view a solar eclipse during their visit to INFINITY Science Center in August 2017.

(Bottom center photo) Stennis Director Rick Gilbrech addresses guests during dedication activities for the Saturn V S-IC-15 stage relocated to INFINITY Science Center in June 2016. Originally meant to power a mission to the Moon, the Saturn V S-IC-15 rocket stage was the last of the Saturn V first stages built in the late 1960s and early 1970s. It was built at Michoud Assembly Facility in New Orleans, then transported to Stennis Space Center for testing in September 1970. It returned to Michoud and remained there after its Apollo 19 mission to the Moon was canceled. In May 2016, the stage made a return waterway trip to Stennis, then was transported a few miles farther to the INFINITY Science Center for permanent display.

(Bottom right photo) Mandeville student Jackson Barber stands in front of an inflatable Mars rover outside of INFINITY Science Center during the facility's grand re-opening in May 2021. The day marked the first time the center had been open since its temporary closure in December 2020 due to the COVID-19 pandemic.









# Stennis News

## Stennis Engages in Museum, Job Expo Outreach



(Top photo) Stennis Space Center Visitor Relations Specialist Holly Argus speaks to Mississippi Children's Museum visitors in Jackson, Mississippi, during NASA Day activities at the facility March 12. Stennis representative provided NASA Day support at Mississippi Children's Museum in Meridian as well. Stennis personnel in both locations provided NASA memorabilia and shared information about what it is like for astronauts to live and work in space.

(Left photo) Stennis Space Center Visitor Relations Specialist Nick Middleton talks with participants at the Job1 Youth and Young Adults Career Expo at Xavier University in New Orleans on April 12. During the event, Middleton shared information about Stennis and NASA-related student opportunities.



# Stennis Participates in Saints and Pelicans STEM Fest in New Orleans



(Top photo) School-age participants visit a NASA exhibit during the New Orleans Saints and Pelicans STEM Fest at the Ochsner Sports Training Facility in Metairie, Louisiana, on April 1. Holding a blue International Space Station sleep restraint, Stennis Visitor Relations Specialist Vicki Bess presents what it is like for astronauts to live and work in space. Next to Bess on the table is a scale model of NASA's new Space Launch System (SLS), 100 times smaller than the actual craft it represents. During the STEM Fest, Bess used the model to tell students about NASA's upcoming Artemis missions. The SLS is a key component of Artemis missions. (Photo Credit: NASA/Media Fusion's Michael DeMocker)

(Bottom left and bottom center photo) Students of local New Orleans schools collect NASA during the New Orleans Saints and Pelicans STEM Fest on April 1. Items on the table, including NASA iron-on patches, were provided by NASA's Michoud Assembly Facility, NASA's Office of STEM Engagement, and Stennis Space Center. (Photo Credit: NASA/Media Fusion's Michael DeMocker)

(Bottom right photo) The Artemis I banner stands to the right of the table as students reach for NASA items at the New Orleans Saints and Pelicans STEM Fest on April 1. The banner represents NASA's commitment to return American astronauts, including the first woman and the first person of color, on the Moon. Through the Artemis lunar exploration program, NASA establish a long-term presence on the Moon, while preparing for eventual missions to Mars. The upcoming Artemis I mission is set as the first integrated flight of the Space Launch System rocket and Orion spacecraft. (Photo credit: NASA/Michael DeMocker)





## Office of Diversity and Equal Opportunity

# 2022 Holocaust Days of Remembrance – Take Time to Reflect on World War II Mass Killing at Babyn Yar Ravine in Ukraine

The Holocaust (also called the Shoah) was the systematic, state-sponsored murder of 6 million Jews by Nazi Germany and its collaborators during World War II. It was part of the “Final Solution” – the Nazi plan to annihilate more than 9 million Jews in Europe. The Nazis murdered millions of others as well.

In 1980, Congress expressed its intent that the Holocaust should be commemorated throughout the United States each year to honor and remember the victims of the Holocaust and their liberators.

As Stennis Space Center observes the annual Holocaust Days of Remembrance, individuals are encouraged to take time to remember the events of Babyn Yar in Ukraine.

On March 2, 2022, a Russian airstrike struck Kyiv’s main television tower near Ukraine’s capital. The airstrike also was near the Babyn Yar Holocaust Memorial, which commemorates the lost lives of more than 70,000 Jewish residents from 1941 to 1942. The Babyn Yar memorial sustained minimal damage but reminded the world of the site’s significant and horrific history.

Babyn Yar is a large ravine located on the northern edge of Ukraine’s capital Kyiv. In 1941, the year of the Babyn Yar massacre, the most notable structures around the ravine were a designated Jewish cemetery and the remnants of St. Cyril’s Monastery, which was open in the 1760s and later became a home for people with disabilities, as well as a mental hospital in 1876.

In 1941, the Sixth German Army troops entered Kyiv to begin a two-day execution of the Jewish citizens in and around Kyiv. The Museum of Jewish Heritage stated that Nazi soldiers posted a notice around Kyiv that instructed Jewish residents to appear next to the cemetery with their documents, money, and valuables.

The Einsatzgruppen, with the assistance of auxiliary police, gathered the Jews at Babyn Yar. The victims were forced to leave each of their belongings in a designated place and undress. They were then led into the ravine, where they were shot in groups.

In the months and years following September 1941, thousands more were murdered at Babyn Yar, including more Jewish victims and Roma, Soviet POWs, and anti-Nazi activists.

In total, it is believed that 100,000 people were murdered by the Nazis at Babyn Yar, making the area one of the largest mass killings at a single location during World War II.

According to the Babyn Yar’s 80th-anniversary committee, “In 2017, a special working group was established at the Institute of History of Ukraine of the National Academy of Sciences, including historians, museum specialists, architects, and lawyers. The team authors had developed a concept of a comprehensive vision of Babyn Yar memorialization as a unique place of memory.”

The plan calls for creation of a Babyn Yar Memorial Park, a Babyn Yar Memorial Museum, a Ukrainian Holocaust Museum, physical memorials, and monuments outside the park.

Currently, there is no physical museum building near the site. Due to the COVID-19 pandemic and recent events, the physical memorial and museum development have been postponed. However, one can read about the plans by following the link – [Babyn Yar 80th Memorial](#)

Though the most recent remembrance of Babyn Yar is not ideal, it is necessary to continue to educate others about the site and respectfully observe the tragedy.

To learn more about Babyn Yar and recent events, as well as about the Holocaust in general, visit the links below:

[Museum Statement on Damage to Babyn Yar — United States Holocaust Memorial Museum \(ushmm.org\)](#)

[Remembering Babyn Yar | Museum of Jewish Heritage \(mjhny.org\)](#)

[U.S. Holocaust Memorial Museum](#)



# NASA Rocket Scientist Fulfills Childhood Dream with Stennis

When Travis Martin was in the third grade, he asked his teacher if he could make a class presentation on his most passionate subject – space. Once the teacher gave permission, Martin told his classmates everything he knew about space, stars, planets, and moons.

He concluded his impromptu presentation by announcing he would become an astronaut or rocket scientist one day.

“I guess I really did reach my childhood dream job,” said Martin, a technical project manager in the Office of Technology Development at NASA’s Stennis Space Center near Bay St. Louis, Mississippi. “As far back as I can remember, I have been a bit of tinkerer and investigator.”

Born at Fort Benning in Columbus, Georgia, Martin currently lives in the Gentilly neighborhood of New Orleans. He has been with NASA for over 17 years and transitioned through three NASA centers before landing at Stennis 11 years ago.

Martin began his NASA career at Marshall Space Flight Center in Huntsville, Alabama, as an aerospace materials test engineer. He also worked as the manufacturing operations lead for the space shuttle external tank program at NASA’s Michoud Assembly Facility in New Orleans, as a systems engineer at NASA’s Jet Propulsion Laboratory in California near Los Angeles, and as a systems engineer at Stennis before moving to his current position.

Martin’s current role includes project management at Stennis’s High-Pressure Gas Facility and E-3 Test Stand. He also serves as the information security owner for [Stennis’s Autonomous Systems Laboratory](#).

Most notably, Martin serves as mission operations lead for the Stennis [ASTRA](#) (Autonomous Satellite Technology for Resilient Applications) project. The headline project will demonstrate the NASA Platform for Autonomous Systems developed at Stennis during a satellite mission scheduled to launch this fall.

ASTRA represents the first-ever “flight” project for Stennis. It was one of only 10 proposals chosen as part of NASA’s Project Polaris, which is focused on providing new technologies and capabilities needed for extended deep space missions to the Moon and, eventually, Mars. For instance, the ASTRA mission developed by Stennis space Center will demonstrate integrated systems health management capabilities essential to NASA’s [Gateway](#) orbiting lunar outpost and human landing system.

Project Polaris represents an opportunity to build the expertise of early-career employees to support future human exploration missions. It also poses challenges for Martin and his team.

“Managing the risks associated with the integration of semi-autonomous software

Martin said he is excited not only to be part of the ASTRA effort but to play a role in expanding software development capabilities at Stennis. “Stennis has always had capabilities outside of propulsion testing,” he said. “I am glad to see these capabilities now being recognized by others outside the center.”

ASTRA is not the first exciting project for Martin, however. Early in his career, he was involved in Return to Flight efforts following the loss of the space shuttle Columbia in 2003. A couple of years later, he was among many others impacted by Hurricane Katrina, which hit the Louisiana-Mississippi coast in August 2005. Martin was part of a small team that helped NASA’s Michoud Assembly Facility in New Orleans deliver a needed space shuttle external tank ahead of schedule despite the storm’s impact.

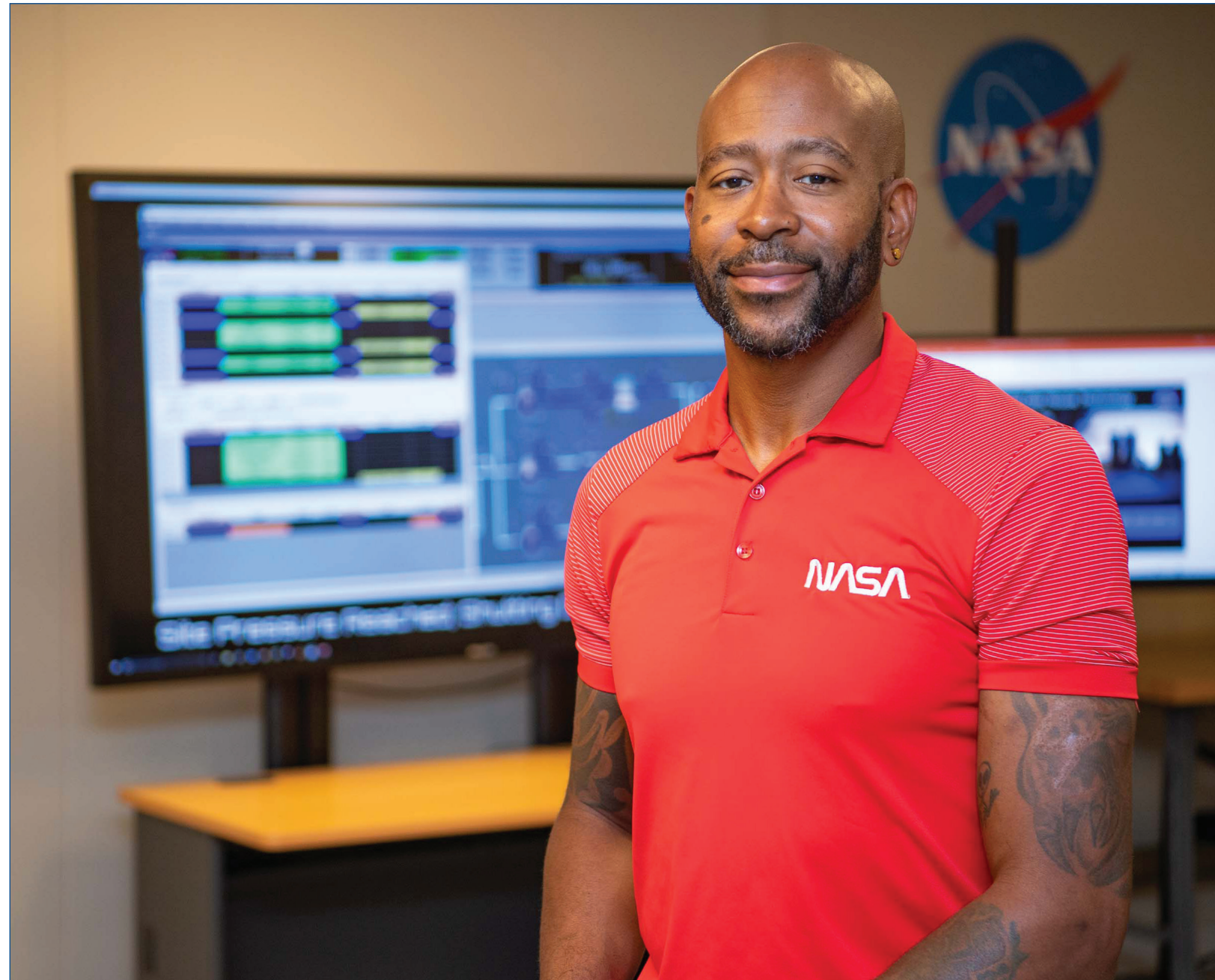
Martin counts this post-Katrina work as one of his proudest work accomplishments. “If my team was not working on the fuel tank, we were helping one another pick up the pieces and gut our flooded-out houses,” he said. “The bond I made with those individuals remains strong to this day, and we tell that story every time we meet.”

Most recently, Martin also served as a systems engineer during the renovation of the B-2 Test Stand and the Green Run testing of the first Space Launch System core stage at Stennis. The Green Run test campaign concluded on March 18, 2021, with a hot fire test of the core stage’s four RS-25 engines firing simultaneously, just as during an actual launch.

“It was not only an amazing experience to participate in such an endeavor but an opportunity to take part in the rich history of large-scale test projects,” Martin said. “The satisfaction of working to restore and utilize test structures used by some of the most brilliant engineering minds is something more than a few often overlook.”

In terms of satisfaction, Martin considers the family atmosphere and culture at Stennis as one of the best things about working at the south Mississippi propulsion test center. “We celebrate the people and the experience of having them in our lives more so here than anywhere else I know,” he said.

Stennis also has made “significant improvements in cultivating a more diverse work environment,” Martin said. “When I first came to Stennis, I was likely to be the only minority male at a meeting or event on any given day, and I cannot say that in 2022. I am also pleased to see more women in leadership roles today. Diversity and inclusion are an ever-evolving process, but I feel Stennis is doing its part.”



For NASA engineer Travis Martin, working as a technical project manager in the Office of Technology Development at Stennis Space Center is a childhood dream job come true.

systems with the rigorous standards for human-rated flight projects is one of the biggest challenges my team and I have been working through since the onset of the Artemis campaign,” he explained. “In many cases, the standards for implementation such systems do not exist and must be developed with key stakeholders from across the agency.”



## Captivating Pearl River Site Selected for Rocket Testing



A 1963 photo captures the east bank of the Pearl River at Gainesville, Mississippi, before the site of Stennis Space Center began to take shape.

In 1963, after NASA announced plans to build a rocket testing facility in Hancock County, Mississippi, officials began arriving in the old town of Gainesville. The Rouchon House became the site headquarters. The first employee of the new Mississippi Test Operations (MTO), Margaret McCormick, was busy ensuring everyone checked in, had their assignments, and had a space to work.

Before the work began, NASA and the Corps of Engineers were captivated by the area's beauty. The Pearl River wound through the magnolias and pine trees. The massive wisteria was in full bloom at that time of spring. The air was heavy with both humidity and the smell of honeysuckles.

The river itself held its own interesting creatures. Alligators could be seen slowly swimming up, down, and across the riverbanks, the shiny heads of water moccasins slithered through the water, and the occasional ripple as bass fed on insects that got too close to the surface.

There were dangers on land as well. Aside from the

swarms of mosquitos and the snakes, wild boars roamed the area, and sometimes a panther's shrill scream could be heard. This area did not seem like a place where, by April of 1966, the first Saturn V rocket booster test would be conducted. This project was the largest construction project in the history of Mississippi at the time and the largest of its kind in the country as well.

One of the first things that needed to be done before the major construction of the facility could begin was to get to know the area. The first engineer to report to MTO was Obed E. "Dusty" Batson. Batson, a Mississippi native, was instructed to become familiar with "every inch" of the 13,500-acre site. "There were no roads then, just State Highway 43 that ran through the area and Upper and Lower Gainesville Roads," Batson later recalled. "So, I would drive as far as I could and get out to walk the rest of the way."

That is how Batson got to know every inch of the site. His knowledge assisted in determining the locations of many buildings, support facilities, and equipment. Spring was a time of growth for the new facility.

### Hail & Farewell

#### NASA welcomes the following:

**Carla Guttry**  
**Anna Lizana**

Financial Management Specialist  
Environmental Protection Specialist

Office of the Chief Financial Officer  
Center Operations Directorate



# Online Resources

**NASA Spinoff 2022**

**Supertalk Mississippi interview with Fernando Figueroa**

**I Am Stennis Facebook Videos**

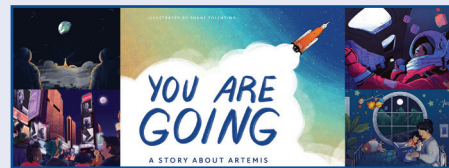
**Stennis Emergency Management**

**NASA Coronavirus Response**

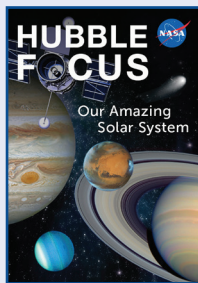
**Stennis Fact Sheets**



**First Woman Graphic Novel**



**You Are Going Children's Book**



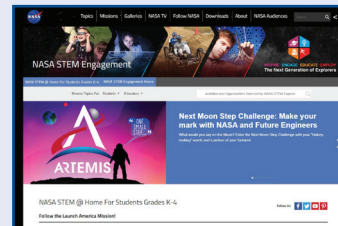
**NASA E-Book Downloads**



**Stennis Artemis Resources**



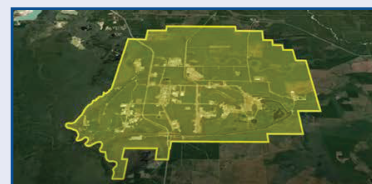
**MARS 2020 STEM Toolkit**



**NASA STEM@Home for Students**



**NASA at Home**



**Stennis Virtual Tour**