



National Aeronautics and Space Administration



LAGNIAPPE

John C. Stennis Space Center

Volume 18 Issue 8

www.nasa.gov/centers/stennis

August 2022

3...

2...

1...

NASA's most powerful rocket prepares for upcoming launch

See page 3.

A full Moon is in view from Launch Complex 39B at NASA's Kennedy Space Center in Florida on June 14, 2022. Engineers and technicians completed final testing and checkouts of the Artemis I rocket on the weekend of Aug. 15. The final major test activity came when the team finished testing the flight termination system. NASA was set to roll out Artemis I to the launch pad Aug. 16 in preparation for the targeted launch date of Aug. 29.

Photo Credit: (NASA/Cory Huston)



When you think of a countdown, what comes to mind? As the calendar flips from July to August, schoolchildren count down the final days of summer. Sports enthusiasts are likely counting down the days until football season kicks off.

Now that NASA has announced some target launch dates for Artemis I, many are counting down the days, hours, minutes, and seconds to liftoff of Artemis I, with launch opportunities on Aug. 29, Sept. 2, and Sept. 5.

When the clock ticks down, excitement picks up. The time is almost here! As NASA Administrator Bill Nelson recently said, it is not the sky that is the limit, it is the universe that is the limit now.

The most sophisticated rocket and spacecraft ever built will begin the next great era of space exploration. No matter the role one played, each person at Stennis can take pride being a part of this history.

I am not sure if I am more excited to see the launch or to brag about my Stennis family while I am visiting

my Gator kin in Florida. How could I not boast about such great folk?

For the past seven years, I have witnessed everyone at Stennis working to bring the nation to this day. Time flies when you are having fun testing RS-25 engines for the world's most powerful rocket, the Space Launch System (SLS).

Since RS-25 testing began Jan. 9, 2015, Stennis has had many engine and SLS core stage test activities, despite delays due to a worldwide pandemic and record-breaking hurricane season, too.

It all culminated with the most powerful test in more than 40 years at Stennis to conclude the Green Run test series in March 2021. What a show that was! In the middle of such challenges, opportunities rise, and so did the people at Stennis.

When the countdown hits zero on Artemis I, let that be a time to reflect on a job well done by everyone at Stennis as NASA continues to inspire the world through discovery.



Lagniappe is published monthly by the Office of Communications at NASA's John C. Stennis Space Center.

Access monthly copies at: www.nasa.gov/centers/stennis/news/publications/index.html

Contact info – (phone) 228-688-3749; (email) ssc-pao@mail.nasa.gov; (mail) NASA OFFICE OF

COMMUNICATIONS, Attn: LAGNIAPPE, Mail code IA00, Building 1100 Room 304, Stennis Space Center, MS 39529

Managing Editor – Lacy Thompson

Editor – Bo Black

Staff Photographer – Danny Nowlin



NASA's MOON to MARS MISSION

Space Launch System



ARTEMIS I MOON ROCKET

ORION SPACECRAFT

An uncrewed Orion spacecraft will venture thousands of miles beyond the Moon, paving the way for future flights with astronauts.

ORION STAGE ADAPTER

The adapter carries small satellites to deep space where they conduct world-class science for pennies on the dollar.

INTERIM CRYOGENIC PROPULSION STAGE (ICPS)

One RL10 engine provides 24,750 pounds of thrust to send Orion to the Moon.

LAUNCH VEHICLE STAGE ADAPTER

The adapter connects the 27.5-foot diameter core stage to the 16.5-foot diameter ICPS and partially encloses the ICPS in-space stage.

CORE STAGE

The 212-foot tall core stage holds 733,000 gallons of propellant to power four RS-25 engines for eight minutes, sending the rocket soaring to space at 17,000 miles per hour.

SOLID ROCKET BOOSTERS

Each 17-story-tall booster generates 3.6 million pounds of thrust, providing 75 percent of total thrust during the SLS rocket's first two minutes of flight.

FOUR RS-25 ENGINES

As the most efficient engines ever built, the engines provide a total of two million pounds of thrust for launch and ascent to space.

NASA'S SPACE LAUNCH SYSTEM (SLS) is the only rocket built to send more than 59,525 pounds to deep space.

www.nasa.gov/sls

• The four RS-25 engines for Artemis I were tested and proven flightworthy at Stennis •



NASA's James Webb Space Telescope has peered into the chaos of the Cartwheel Galaxy, revealing new details about star formation and the galaxy's central black hole. Webb's powerful infrared gaze produced this detailed image of the Cartwheel and two smaller companion galaxies against a backdrop of many other galaxies. Read more [here](#). Photo credit: NASA/ESA/CSA/STScI

NASA in the News

NASA's Years of Testing Leads to Images Produced by the James Webb Space Telescope

The world continues to marvel over images from the James Webb Space Telescope, with the first images released last month. Webb Deputy Project Manager for Technical Verification Paul Geithner recalls another first-of-its-kind moment: when the Webb team thought for a brief moment it had broken part of the observatory. A portion of the Webb structure, custom-made of graphite epoxy composite, underwent vibration testing at NASA's Goddard Space Flight Center in late 2016. Connection points in the instrument's deployable components were stressed to see how they would hold up. All was going well, until it was not. There was a loud crack. The sound was not pretty. "People said, 'Oh my god, did we just break it?'" Geithner remembers. "I mean, it sounded bad. Then the test automatically shut down. That was probably the scariest point." No harm was done. Read more about the testing process and what followed [here](#).

United States-European Satellite Designed To Provide World's First Global Freshwater Survey

NASA is teaming up with the French space agency Centre National d'Études Spatial, with contributions from the Canadian Space Agency and the United Kingdom Space Agency, to launch the upcoming Surface Water and Ocean Topography (SWOT) satellite in November from Vandenberg Space Force Base in California. The satellite will provide a better understanding of Earth's water cycle and aid in better management of water resources and expand knowledge of how climate change affects lakes, rivers, and reservoirs. Water is life, but for all its importance, humanity has a surprisingly limited view of Earth's freshwater bodies. Researchers have reliable water level measurements for only a few thousand lakes around the world, and little to no data on some of the planet's important river systems. Engineers are finishing up work on the satellite in a facility run by Thales Alenia Space in Cannes, France. Read more about the satellite [here](#).

Two Female Test Conductors Make History on the Headset



Nyla Trumbach



Rosa Obregon



Stennis Space Center teams conduct a hot fire of an Aerojet AJ26 engine on the E-1 Test Stand (l) and a test of the J-2X powerpack assembly on the Fred Haise Test Stand (r) simultaneously on Aug. 16, 2012. The two tests made history as the first time two female conductors, Nyla Trumbach and Rosa Obregon, led testing on the same day. It also marked the first time at Stennis that two large rocket engine tests were conducted at the same time. Photo Credit: (NASA/Danny Nowlin)

Role of Test Conductor

The test conductor leads the entire day of activities on test day. This person communicates with other members of the test team to complete a multitude of tasks, such as increasing pressures and dropping propellants (such as liquid hydrogen and liquid oxygen) to the engine/test article. When the countdown checklist is complete, the test conductor ultimately presses the button to initiate the engine test. During the test, the test conductor monitors critical facility/test article instrumentation data and observes the facility for evidence of anomalies (fire, external leaks, etc.) Once complete, the test conductor is responsible for safely securing the facility afterwards.

Becoming a Test Conductor

A test operations engineer usually goes through various supporting roles before becoming test conductor. Filling the support roles ensures the person has good knowledge of the system he or she is operating, the ability to perform complex activities successfully with minimal oversight, and an understanding of how the facility and test article interact during required test operations. This allows for certain skills and a comfort level to be developed, leading one to be selected as a test conductor.

Qualities of a Test Conductor

“A good test conductor is organized, has intimate knowledge of the facility, knows what the main tests objectives are, and has been involved in getting there. One big thing is he or she must be a team player. The person will be in a position of authority, and it is an art to being able to get people to work with you and communicate honestly with you. The test conductor is sitting in a room somewhere, depending on which test project you are working on, as far as a quarter of a mile away. The rest of the team, technicians and engineers, that are on the test facility leading up to the actual hot fire are the eyes and ears of the test conductor.”

-Maury Vander, Stennis Chief of Test Operations

Nyla Trumbach was very nervous Aug. 16, 2012. It was rocket engine test day at Stennis Space Center. She had worked in supporting roles for other such engine test, but today, she was leading the way.

“My heart was pounding out of my chest,” she said. “Being nervous is not a bad thing. Something might be wrong with you if you were not nervous about it.”

Little did Trumbach know that she would be part of making history that day at Stennis Space Center, as she and Rosa Obregon became the first two female engineers to serve as test conductors for engine tests on the same day. It also marked the first time two large-engine tests were completed simultaneously by Stennis Space Center teams.

Trumbach led the J-2X engine hot fire on the A-1 Test Stand, now known as the Fred Haise Test Stand, while Obregon conducted the Aerojet AJ26 rocket engine test on the E-1 Test Stand.

In what traditionally had been a male role, two female test conductors helped show what was possible. For Trumbach, a key was believing the only barriers she faced were those she put on herself.

“When it comes down to it, if you are capable and you work hard and you do a

good job, there should be no limit,” she said.

Trumbach and Obregon followed in the footsteps of Elizabeth Messer, who became the first NASA female test conductor at Stennis Space Center in 2000. Messer led testing of a 250,000-pound-thrust hybrid rocket motor for the Hybrid Demonstration Program on the E-1 Test Stand.

Obregon has since moved on to NASA’s Johnson Space Center in Houston, Texas. Trumbach, a test operations engineer for Lockheed Martin at the time of the 2012 test, is now NASA’s lead mechanical test operations engineer on the Fred Haise Test Stand. She leads a team of six mechanical engineers that supports testing RS-25 engines for the Artemis space mission.

Since 2012, Trumbach has conducted 10 tests, including what she called one of the most exciting efforts the test team worked on with the Defense Advanced Research Projects Agency. The effort involved testing the Aerojet Rocketdyne AR-22 rocket engine 10 times in 10 days with around-the-clock operations.

For the Space Launch System (SLS) Green Run core stage testing, Trumbach was one of two female engineers, along with Angelica Baker, who served as liquid hydrogen transfer engineers. Baker now works at Kennedy Space Center, where she will follow SLS all the way to launch. Trumbach worked in many supporting roles

to reach her goal of becoming test conductor for the first time 10 years ago. She remembers the support of the test team leading up to the record-setting day.

“When you sit and think about what you’re actually doing, it’s pretty cool,” Trumbach said. “It’s fun when you have problems to figure out and find the answer to, going out and troubleshooting it and being the one that comes up with the right answer or sitting down as a team and talking back-and-forth to find out answers to a problem, those things are fun. One of the best things about this job is the people. The people out here, we are like family. We really are. There are great people that work out here.”

It was a similar kind of support and encouragement she received from family growing up that Trumbach hopes will inspire young girls to realize their dreams as NASA continues to inspire the world through discovery.

“My mom always told me I could do whatever I wanted to do,” Trumbach said. “Work hard, try hard, put your mind to it, you can be and do whatever you want to do. You can be independent and be able to take care of yourself. That’s how I was raised.

“For mothers, encourage your daughters to reach for the stars, to go for what they are interested in.”

Stennis Space Center Hosts Solar Eclipse Viewing Five Years Ago



Stennis Space Center employees (bottom right photo) and INFINITY Science Center guests (top left photo) gather for a day of viewing activities during the Solar Eclipse Across America on Aug. 21, 2017. Hundreds of area residents and family members, including the New Orleans area students shown above, took part in the event, visiting INFINITY to participate in hands-on learning activities before viewing the early afternoon eclipse. The beginning of the solar eclipse is shown above the B-1/B-2 Test Stand at Stennis (top right photo). Photo Credit: (NASA/Danny Nowlin)

The Artemis generation is here as NASA prepares to send Artemis I, the uncrewed test flight, deeper into space than ever before.

Many that will watch liftoff of the world’s most powerful rocket, Space Launch System, in the coming weeks will be some of the same people that were at Stennis Space Center five years ago on Aug. 21, 2017, for the viewing of the “Great American Eclipse.”

Stennis and INFINITY Science Center hosted employees and visitors that day for the viewing of the first total solar eclipse visible in the contiguous United States in 38 years.

The next total solar eclipse that will be seen in North America – April 8, 2024 – will be around the same time NASA is preparing to launch Artemis II, which will carry astronauts around the Moon.

For a solar eclipse to happen, the Moon passes between the Sun and Earth, completely blocking the face of the Sun.

Eclipses are not only a sight to see, but they are also a great way for NASA to explore the secrets of the universe for the benefit of all.

Eclipses have inspired numerous scientific discoveries, helping scientists to decipher the Sun’s structure, find evidence for the theory of general relativity, and even discover a new element.

Today, NASA scientists still study eclipses to make new discoveries about the Sun, Earth, and our space environment. Total solar eclipses are especially important, allowing scientists to see a part of the Sun’s atmosphere, known as the corona, that is too faint to see against the bright light of the Sun.

At its height near Stennis Space Center five years ago, the Moon eclipsed about 75 percent of the Sun and was visible near the B-1/B-2 Test Stand.

Before the next visible total solar eclipse in North America happens in 2024, a partial solar eclipse will be visible Oct. 14, 2023.



Stennis Flashback: NASA Engineers Recall Challenges of Record-Breaking Hot Fire

At NASA's Stennis Space Center, a typical hot fire of an RS-25 engine lasts 500 seconds, the same amount of time it must fire to help launch the Space Launch System to orbit.

Ten years ago last month, however, Stennis engineers and operators at the Fred Haise Test Stand conducted a J-2X powerpack test for 1,350 seconds (22 and one-half minutes), almost three times as long as the RS-25 engine test.

The testing was part of a series designed to support NASA as it continues its mission to explore the secrets of the universe for the benefit of all.

The test on July 24, 2012, also broke a record of 1,150 seconds set just a month earlier and remains the record for the longest-duration firing in the site's A Test Complex. It also culminated days of hard work and preparation for the test team and marked yet another milestone for the nation's largest – and premier – propulsion test site.

“Sometimes, it’s a relief,” A Test Complex Operations and Maintenance Manager Michael Holmes said when describing the emotions that follow a hot fire test. “Sometimes, it’s a joy. But it is always interesting.”

Suffice it to say, the long duration test on July 24 was a challenge as well. After all, it takes much more time than 22 and one-half minutes to prepare for a test.

When test day arrives, months of communication already has taken place between the test article manufacturer and test team at Stennis.

There are a lot of moving pieces throughout the process – to prepare the test article, the stand, and the test team itself. The involved effort heightens the importance of getting the test off successfully when it is planned. For the test 10 years ago, there were more than 30 people working to complete the hot fire that day.

Getting the test facility ready means installing test stand instruments needed to support test specifications and calibrating those instruments to correct settings. It also means ensuring there are enough propellants to fuel the test. In this case, operators needed 67,298 gallons of liquid oxygen and 211,522 gallons of liquid hydrogen.

The amount almost doubles the capacities of the test stand run tanks, which can hold 40,000 gallons of liquid oxygen and 110,000 gallons of liquid hydrogen. These tanks must be replenished during testing from propellant barges transported to the stand via the Stennis canal waterway system.

Ensuring availability of the increased propellant requires coordination among the people delivering fuel to Stennis, loading it on barges, and then transferring it to the test stand as needed throughout the hot fire.

That is only one of the critical functions underway on test day. From engineers monitoring the transfer of liquid hydrogen and liquid oxygen to members of the team monitoring the control system, data system, and video cameras, to those watching for test anomalies, test day can stretch long.

[See page 8 for more.](#)



Operators conduct a record-setting hot fire of an upgraded J-2X powerpack on the Fred Haise Test Stand on July 24, 2012. The flame exiting the test stand through the discharge duct is from the combustion of the test article. The powerpack fired for 1,350 seconds, surpassing a previous record of 1,150 seconds established just six weeks earlier. The hot fire still stands as the longest-duration test ever conducted in the A Test Complex. Photo Credit: (NASA/Danny Nowlin)

1,350

seconds of testing

• Nearly 3x longer than RS-25 engine testing of 500 seconds •

67,298

gallons of liquid oxygen used

• Liquid oxygen test stand tank holds 40,000 gallons •

1,150

seconds of testing

• The previous test complex testing record set a month earlier •

211,522

gallons of liquid hydrogen used

• Liquid hydrogen test stand tank holds 110,000 gallons •

Stennis Flashback: NASA Engineers Recall Challenges of Record-Breaking Hot Fire Test

Test Article

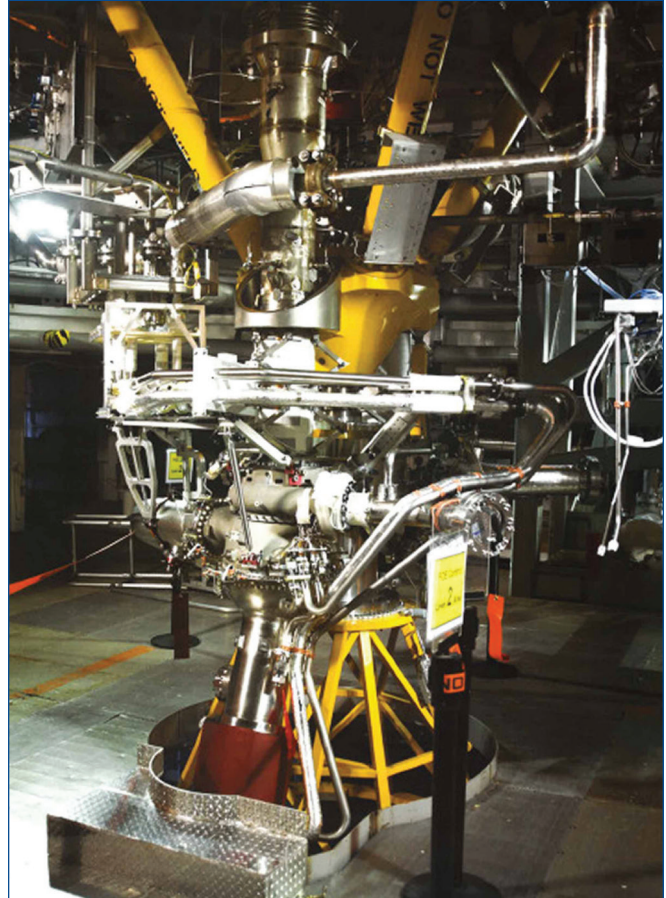
- The J-2X powerpack was a system of components located at the top of the J-2X engine. It included the gas generator, oxygen and fuel turbopumps, and related ducts and valves. It fed the thrust chamber, which produced engine thrust. The powerpack testing allowed operators to fire the components over a wide range of conditions to understand operating limits.

Test Complex

- The A Test Complex consists of three test facilities – the Fred Haise Test Stand, the A-2 Test Stand, and the A-3 Test Stand. The Fred Haise and A-2 stands are single position, vertical firing facilities that can test rocket engines in an upright position with thrust directed downward. The A-3 Test Stand is the only stand in the country with combined capabilities to conduct long-duration tests on full-scale engines at simulated altitudes up to 100,000 feet and gimbal, or pivot, engines during testing as they must operate in flight.

History of Test Stand

- The Fred Haise Test Stand was constructed from December 1964 to February 1967. It first was used to test Saturn V second stages and their five J-2 engines. Since then, various test articles have been fired on the stand, including space shuttle main engines (1975-2006), the XRS-2000 aerospike engine (1998-2001), the J-2X powerpack assembly (2007-2012) and engine (2013), the AR-22 engine (2018) and RS-25 engines (2015-current).



An upgraded J-2X powerpack was installed on the A-1 Test Stand, now known as the Fred Haise Test Stand, in December 2011 for a new round of testing. The powerpack was tested a total of 13 times with the record-setting hot fire coming on July 24, 2012, the ninth of the series. The final test in the series came in December 2012. Photo Credit: (NASA/Danny Nowlin)

Continued from page 7

Ensuring pre-test conditions are met can take anywhere from four to five hours before the actual hot fire even begins.

During the test, the team then watches data in real time to make sure objectives are being met. For the test 10 years ago, there were six primary objectives and seven secondary objectives.

If something does not look right, prompt adjustments to a valve or pressure setting can be made.

Every second of a test can seem

extremely long with members of the test team focusing on specific tasks.

“To me test days are a mix between a mid-term exam in college and a sporting event game day,” said Ryan McKibben, Deputy Chief of the Mechanical Operations Branch. “We have prepared our systems as well as we can to test and characterize the hardware.”

In July 2012, operators initially planned for a 1,500-second test, knowing that it likely would hit an automatic cutoff point sometime prior to that time. The cutoff came 1350.524 seconds into the firing.

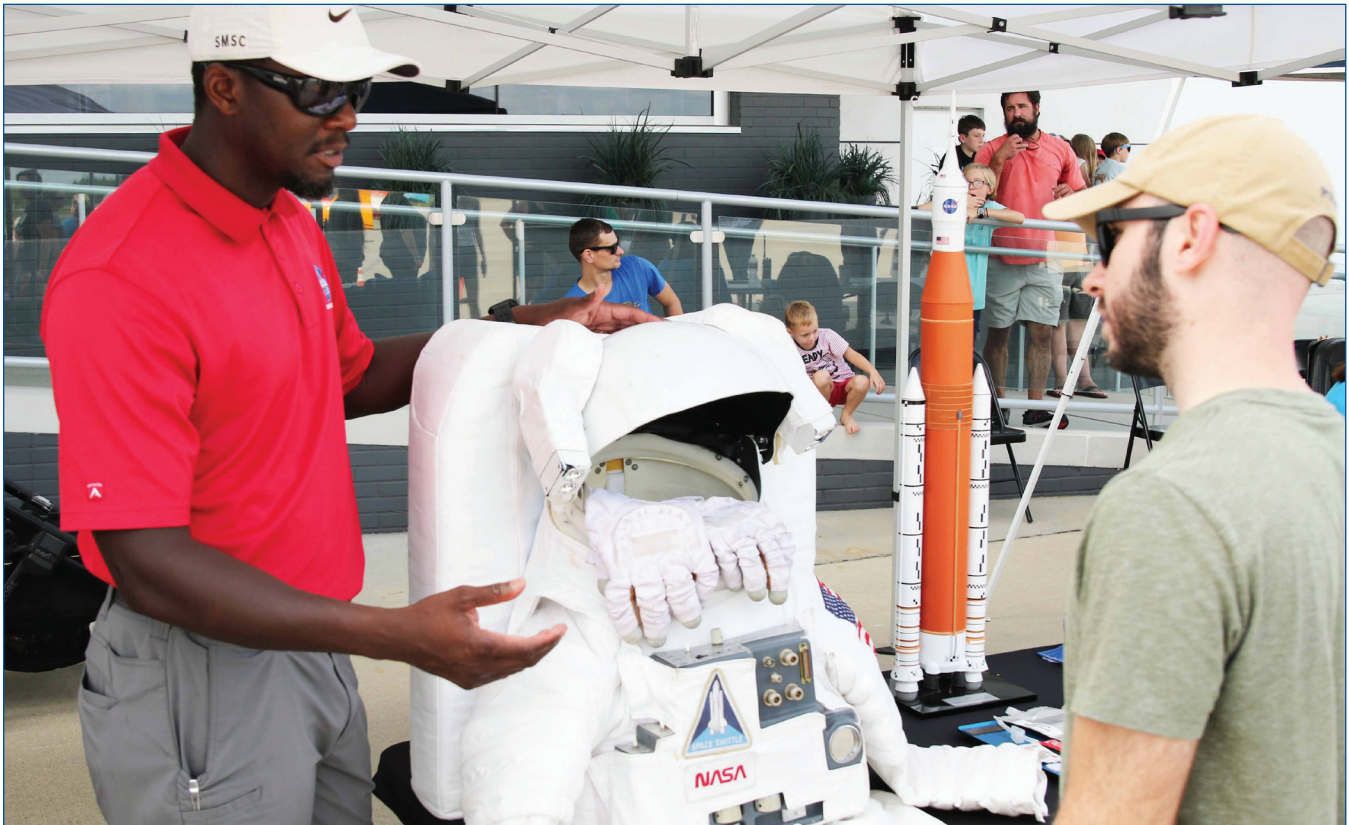
Completion of a test does not mark

the end of the day for the team of operators and engineers, however. Additional work must be done to secure the test article and stand, begin post-test processes, return propellant barges to the Cryogenic Storage Facility, collect all test data, and review any lessons learned in preparation for future hot fires.

Most data reviews include combing through a couple hundred slides of information.

“Even after testing out at Stennis Space Center for 15 years, test days are still special and I get excited to come to work on those days and learn,” McKibben said.

Stennis News



NASA Inspires Attendees at Local Event

Stennis Visitor Relations Specialist Nick Middleton talks with an attendee of the Stennis Fly-In event on July 16. The event marked the 15th anniversary of the Federal Aviation Administration Air Traffic Control Tower. In addition to learning more about NASA's upcoming Artemis I mission and everything happening at NASA, attendees toured the air traffic control tower at Stennis International Airport. Photo Credit: (NASA/Ronnie Good)

Stennis Space Center Employee Named Space Hero



Valerie Buckingham

To mark progress in NASA's Artemis program that will return humans, including the first woman and first person of color, to the Moon, the space agency has been recognizing Space Heroes performing necessary and critical work. Overall, 36 Stennis Space Center employees have been cited for their Artemis-related efforts. The latest honoree is NASA employee Valerie Buckingham. As communications integrator in the Office of Communications, Buckingham collaborated with multiple centers and commercial partners, leading up to the Space Launch System core stage hot fires, to ensure the story of the Artemis mission was being told. Buckingham hosted multiple media outlets and documentary crews on site to see the work being put into the SLS Green Run series of tests. Buckingham served as the communications point of contact within the Test Control Center during the first hot fire. In this role, she ensured leadership and fellow communications colleagues were receiving timely information.

Stennis News

Sign up for AIML at NASA Updates

In today's world, humans and machines are producing data at a rate that far surpasses human ability to organize and interpret that information.

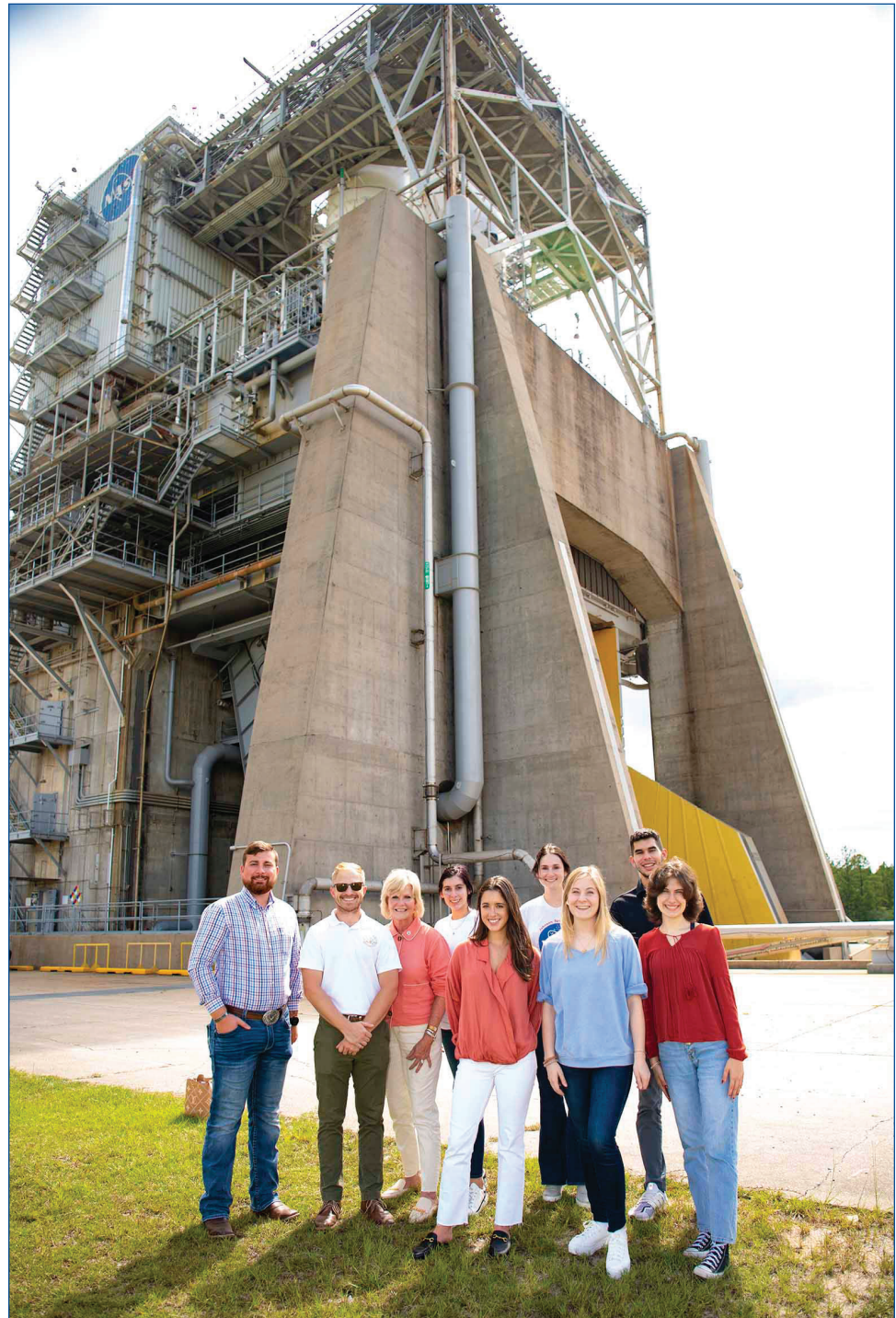
Intelligent machines are shaping the future and increasing efficiency in many sectors including finance, healthcare, transportation, criminal justice, national security, and even into space.

This is where Artificial Intelligence and Machine Learning (AIML) helps humans make complex decisions and discoveries through data.

Read more and keep updated on how NASA is using AIML for the benefit of humanity by subscribing to the NASA AIML community mailing list [here](#).

AIML is used in an increasingly broad range of applications including descriptive analytics, autonomy for robotics, and other systems such as space communication.

In addition, learn what the featured AIML Podcast of the Month and Book of the Month are, along with many other resources.



Louisiana Congressional Staff, Interns Tour Stennis Space Center Facilities

The legislative staff and interns from the office of U.S. Rep. Garrett Graves of Louisiana stand in front of the Fred Haise Test Stand July 14. During the afternoon visit, the group learned more about internship opportunities with NASA and Stennis Space Center. In addition to touring the test complex where RS-25 engines were tested that will power NASA's Artemis space mission, the group visited the Aerojet Rocketdyne Engine Assembly Facility, the manufacturer of the RS-25 engine. Photo Credit: (NASA/Danny Nowlin)

Oliver Keeps NASA Network Safe and Secure



Stennis Space Center Chief Information Security Officer Bonita Oliver serves in NASA's Office of the Chief Information Officer. For the past 12 years, she has worked in a variety of roles including Application Developer Manager, IT Project Management Officer, and Identity, Credential, Access Management Subject Matter Expert. Photo Credit: (NASA/Danny Nowlin)

Bonita Oliver realized computers were becoming more and more a part of daily life as a young girl in Macon, Mississippi. The ever-changing technology and her interest in wanting to know how things operated is what put her on the path to working at Stennis Space Center.

Oliver has turned that curiosity into a 21-year career at Stennis, including the past 12 years coming in the Office of the Chief Information Officer (OCIO).

As Stennis Chief Information Security Officer, Oliver helps protect NASA data through its various computer networks. Her primary duty is overseeing cybersecurity and privacy services at Stennis. This includes ensuring systems on the Stennis network are compliant with federal guidelines.

The Biloxi resident also played a critical role with the inception of an agencywide securities contract NASA entered into this summer.

Oliver has served as chairperson the past two years for the Cybersecurity and Privacy Enterprise Solutions and Services (CyPrESS) Requirements Development Team and Source Evaluation Board (SEB).

The CyPrESS contract, the first enterprise cybersecurity and privacy services contract for NASA's OCIO, has a

total value of \$622.5 million, with a potential savings of \$46 million. It makes the cybersecurity and privacy work agencywide more efficient, consolidating the various center and enterprise information technology contracts.

One aspect of Oliver's job with NASA that she said she enjoys is building relationships and working with people from different backgrounds. Oliver became chairperson of the SEB as the COVID-19 pandemic started, which led to meetings going virtual.

In this new role and working with others throughout NASA, Oliver turned the challenge of not having in-person meetings into an opportunity to learn new skills in building relationships with others to get the job done.

"When we first met virtually, I asked each person to tell something about themselves that they do outside of work, so we could start making those connections and start being comfortable to talk," she said. "That was important. ...I wanted them to express whatever they had on their mind without fear."

This collaboration throughout NASA has helped Oliver and the OCIO answer any challenge that may come their way.

"Information Technology is constantly changing," she said. "That means we are constantly learning."

1987 - Test Site Dedicates Technology Center

Site Manager Jackson Balch once dreamed the Mississippi Test Facility (MTF) would become a “scientific utopia.”

He tried for years to establish state and federal agencies at the facility to work together on projects that would benefit not only each other but the scientific community as a whole.

In 1972, Balch began to see his dream come to fruition. A few federal and state agencies began to move to MTF and brought together their resources and staff. The following year, a combination of 16 federal and state agencies and universities moved to the facility and worked together on various projects using data, sensors, computers, and instruments that they would not have had access to working alone.

In 1980, Roy Estess became deputy manager of the newly renamed facility, National Space Technology Laboratories (NSTL). He had been tasked with marketing the test site to other agencies in the 1970s by Balch. Estess did not stop there.

He was head of the Applications Engineering Office and division leader within the Earth Resources Laboratory. As head of the Applications Engineering Office, Estess knew how important it was for NASA to relate to the other resident agencies.

His experience and expertise with this helped champion the development of the Mississippi Technology Transfer



Mississippi Governor Bill Allain signs an official order dedicating the Mississippi Technology Transfer Center at the then-National Space Technology Laboratories (NSTL) in 1987. He is joined by NASA Associate Administrator For Space Flight Richard Truly (standing), and NSTL Director Jerry Hlass (seated, right).

Center, which was dedicated 35 years ago on June 11, 1987.

The Technology Transfer Center allowed the citizens of Mississippi to benefit from innovations developed by NASA and by the resident agencies at NSTL.

It was such a success that it became a model for supporters of technology transfer programs. It provided technical assistance and other support to hundreds of private companies, medical institutions, and other organizations.



Stennis Visits Lake Castle Summer Camp

Participants in the Lake Castle Slidell (Louisiana) Summer Camp conduct a pair of Stennis Space Center-hosted experiments July 14. Stennis personnel visited the camp to help children, pre-K through first grade, conduct two experiments. In the first, the children put skittles in a circle on a flat plate and poured water in the circle. The colors diffused toward the center to form a beautiful rainbow. The second experiment involved blowing balloons using the carbon dioxide gas produced from mixing baking soda and vinegar. Photo Credit: (NASA/ Brittany Bouche)

Office of Diversity and Equal Opportunity

Celebrate Women's Equality Day Aug. 26

The United States observes and celebrates Women's Equality Day each year on Aug. 26. This day commemorates the passage of women's suffrage and remembers the women who helped overcome gender discrimination in the United States.

The fight for women's suffrage can be traced back to 1848 with the Seneca Falls Convention. The convention was the first major public political meeting in the United States that advocated for women's rights. Notable leaders at the Seneca Falls Convention included Susan B. Anthony, Lucretia Mott, and Elizabeth Cady. The convention at Seneca Falls resulted in the Declaration of Sentiments and Resolutions, which listed the ways that American women were oppressed and relegated to inferior status by the existing male power structure and pushed for the voting rights of women.

Women's rights conventions spread across the United States following the Seneca Fall Convention. Many activists joined the fight for equality, including racial equality. Sojourner Truth, a former slave, delivered her speech entitled "Ain't I a Woman?" in Akron, Ohio, which spoke of the hardships that enslaved women faced and asked suffragists to include Black women in their fight for injustice. Ida B. Wells was a leader of the Alpha Suffrage Club of Chicago, marched in the Women's Suffrage Procession, and later helped co-found the National Association of Colored Women (NACW). Lastly, Frances Ellen Watkins Harper organized the American Woman Suffrage Association and the American Equal Rights Association. She helped co-found the NACW with Wells.

Thirty years after the Seneca Falls Convention, a Women's Suffrage Amendment was introduced to the United States Congress. The amendment was not approved by the House and the Senate until 1919. Historical accounts note that suffragists spent the next year lobbying state legislatures to support the bill, which needed to be approved by two-thirds of the states. Tennessee became the 36th and final state needed to approve the amendment. Thus, on Aug. 26, 1920, the 19th Amendment was signed by Secretary of State Bainbridge Colby. ([National Women's History Museum](#))

In 1970, Betty Friedan and the National Organization for Women organized a nationwide women's strike to demand equal opportunities in employment and

education. This came 50 years after the passage of the Women's Suffrage Amendment. The strike generated nationwide participation and was the largest protest for gender equality in United States history. The National Women's History Museum states, "There were demonstrations and rallies in more than 90 major cities and small towns across the country and over 100,000 women participated."

Following the Women's Strike in 1971, Representative Bella Abzug introduced a bill to designate Aug. 26 as Women's Equality Day. The bill states, "The women of the United States have designated Aug. 26, the anniversary date of the certification of the Nineteenth Amendment, as a symbol of the continued fight for equal rights; and whereas, the women of the United States are to be commended and supported in their organizations and activities."

In recent years, women's equality has shifted its focus to the gap in gender equity. In 2019, the Pipeline Equity, Inc. shared statistics that highlight the inequality among the genders:

- Women are paid, on average, 80 cents on the dollar of their male colleagues (the number is worse for women of color).
- Of the top 2 percent of wage earners in the United States, women are paid 39 cents on the dollar of their male colleagues.
- Ninety percent of women leave the workforce due to workplace issues unrelated to having a child.
- Half of the women in STEM fields will leave their roles due to hostile work environments.
- In a time when finding qualified labor is an issue, women hold the majority of higher education degrees, but are leaving the workforce at a consistent rate.

Gender equity strives for the fair treatment of women and men according to their respective needs. In 1920, the fight was for women's right to vote, and in 1970, it was for equal opportunity in employment and education. The struggle continues for gender equity in 2022. Individuals are urged to take time this month to remember the activists who helped along the way.

To learn more, click the links below.

[Key Figures of the Movement - Women's Suffrage Centennial](#)
[Woman's Suffrage History Timeline](#)
[Women's Equality Day | National Women's History Alliance](#)

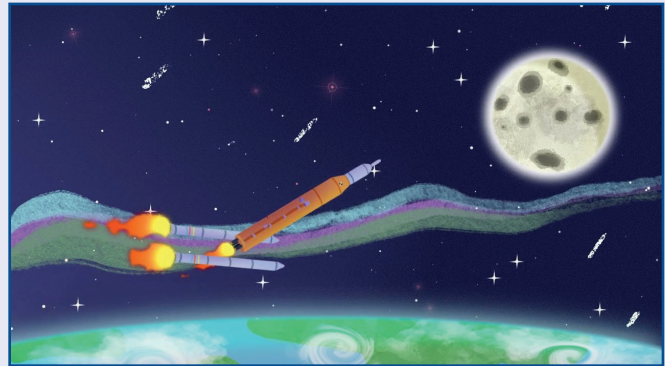
Online Resources

Watch Orion's Journey

Part 1: [Leaving Earth](#)

Part 2: [Entering Distant Retrograde Orbit](#)

Part 3: [Return Home](#)



[WGNO Highlights Stennis' Role in Upcoming Artemis I Launch](#)

[WLOX Goes Behind The Scenes at Stennis Space Center](#)

[WXXV Visits Stennis Space Center Ahead of Artemis I](#)

[Stennis Space Center Fact Sheets](#)

[Video Short: Data Acquisition System](#)

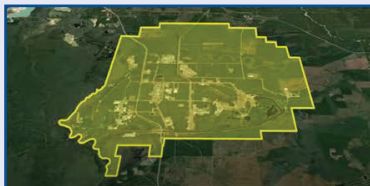
[Video Short: Thrust Vector Control System](#)



Stennis Artemis Resources

[Stennis Emergency Management](#)

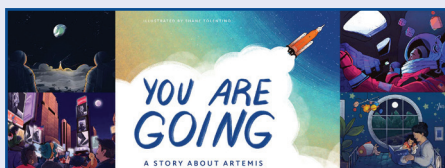
[I Am Stennis Facebook Videos](#)



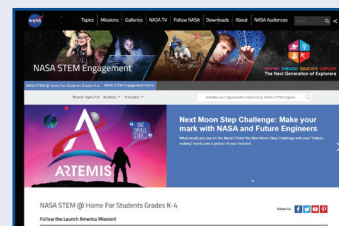
Stennis Virtual Tour



First Woman Graphic Novel



You Are Going Children's Book



NASA STEM@Home for Students