



National Aeronautics and Space Administration

# LAGNIAPPE

John C. Stennis Space Center

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June 2019

## Getting ready for SLS core stage See page 3



**2019 Hurricane Season Guide appears at end of this issue**

In mid-June 1969, all eyes were on coastal Florida, where a Saturn V rocket stood on Launchpad 39A at what then was called Cape Kennedy. The rocket would soon launch three astronauts on the Apollo 11 mission to attempt the first ever human landing on the Moon.

Employees at Stennis Space Center watched Apollo 11 pre-launch activities with particular interest. The hope of the nation was riding on the work they had performed the previous year. Apollo 11 would be launched to space by the S-IC-6 booster stage, powered by five Rocketdyne F-1 engines to produce 7.5 million pounds of thrust, and the S-II-6 second stage, powered by five Rocketdyne J-2 engines to produce 1,155,800 pounds of thrust. Whoa – either one of those engines could make my '63 Plymouth really fly. Ark!

Most Americans could not relate to such power levels, but Stennis employees were well-acquainted with them. They had test fired the very Saturn V first and second stages that would lift Apollo 11 on its mission.

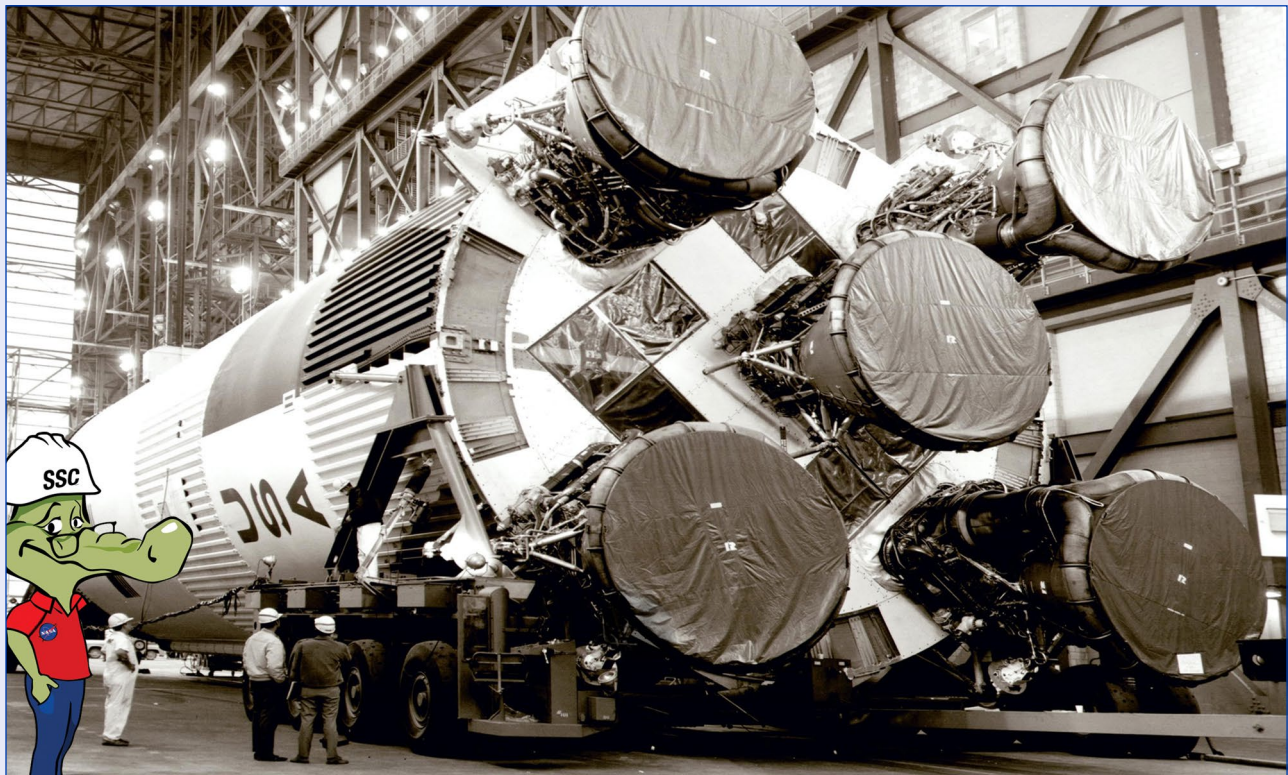
The S-IC-6 stage was shipped from nearby Michoud Assembly Facility to Stennis on March 1, 1968. When installed on the B-2 Test Stand three days later, it

marked the first occasion that all three large test stands housed Saturn V stages at the same time.

A full-duration, 125-second test was conducted on the booster stage Aug. 13, 1968. By this time, the S-II-6 stage had been shipped from California via the Panama Canal and installed on the A-2 Test Stand. It was test fired for a full-duration 368 seconds on Oct. 3, 1968. The stages then underwent refurbishment and checkout before being shipped separately by barge to Florida. Both arrived in February 1969, the second stage after what was described as an “extremely rough ride.” Just thinking about it makes me seasick. Ark!

From that point, excitement grew as Apollo 11 finally launched at 9:32 a.m. on July 16, with an estimated 1 million spectators and a worldwide television audience. They witnessed a picture-perfect launch as control center wished the three astronauts good luck. Commander Neil Armstrong replied from his perch atop the Saturn V rocket being lifted smoothly into the sky: “Thank you very much. We know this will be a good flight.”

There was no rough ride to worry about this time. Stennis already had made sure of that.



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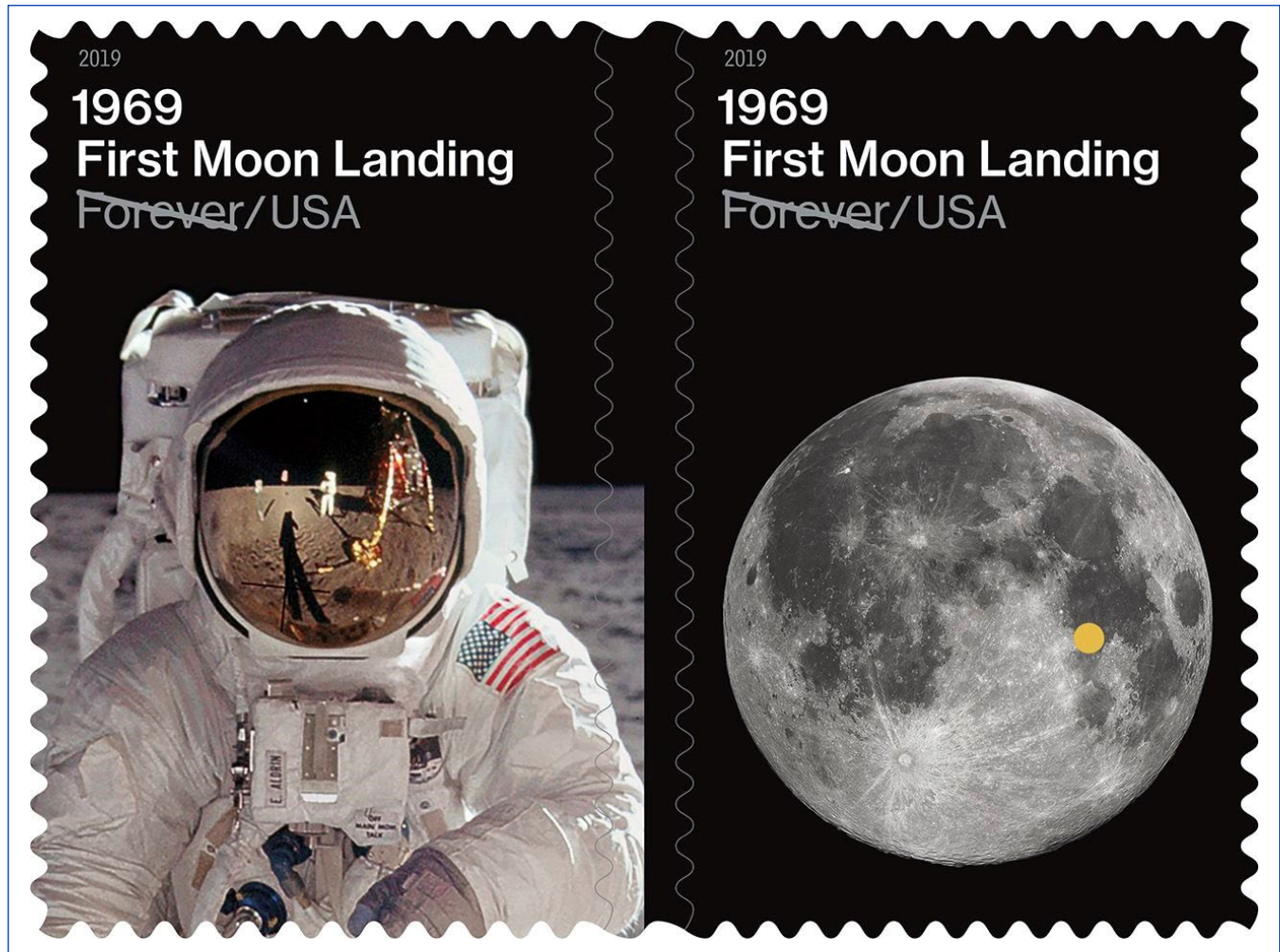


# Crews practice core stage lift procedure, begins training for test operations



A work crew participates in an early June training session for handling and lifting the Space Launch System core stage Pathfinder replica at the B-2 Test Stand at Stennis Space Center. The Pathfinder was designed and built as a full-scale “form and fit” replica of the core stage of the new SLS rocket that will enable NASA to return astronauts to the surface of the Moon by 2024. It is the same shape, size and weight (without propellants loaded) as the actual SLS core stage, with the same center of gravity. Crew members from Stennis, Michoud Assembly Facility and Kennedy Space Center are using the Pathfinder through the summer months to train and practice handling, lifting and installation techniques that will be needed for the SLS flight core stage when it arrives for testing. In this photo, crews have placed the yellow “spider” component on the forward end of the Pathfinder. Master link and hydraset devices will connect to the “spider” on one end and to the B-2 Test Stand derrick crane cable on the other end. They will enable the crane to lift the Pathfinder from its horizontal position and “break” it over into a vertical position (as the core stage will stand during a launch) for installation onto the test stand. In addition to that work, test operators have begun training in test control center procedures that will be used for core stage testing. The training involves operators from Stennis, as well as Michoud Assembly Facility, Aerojet Rocketdyne and Boeing. The team members are spending time in the test control center, working through the same procedures that will be used during testing. The current schedule calls for NASA to test the SLS flight core stage on the B-2 stand next year prior to the initial SLS Artemis 1 launch.





On July 19, 2019, the U.S. Postal Service will issue the stamps shown above to commemorate the 50th anniversary of the Apollo 11 moon landing in 1969.

## NASA in the News

### NASA opens ISS to commercial business

NASA is opening the International Space Station (ISS) for commercial business so U.S. industry innovation and ingenuity can accelerate a thriving commercial economy in low-Earth orbit. This move comes as NASA focuses full speed ahead on its goal of landing the first woman and next man on the Moon by 2024, where American companies also will play an essential role in establishing a sustainable presence. NASA will continue research and testing in low-Earth orbit to inform its lunar exploration plans, while also working with the private sector to test technologies, train astronauts and strengthen the burgeoning space economy. Providing expanded opportunities at the ISS to manufacture, market and promote commercial products and services will help catalyze and expand space exploration markets for many businesses. The agency's ultimate goal in low-Earth orbit is to partner with industry to achieve a strong ecosystem in which NASA is one of many customers purchasing services and capabilities at lower cost. Learn more at: <https://go.usa.gov/xmugq>.

### NASA spacecraft to use 'green' fuel

A non-toxic, rose-colored liquid could fuel the future in space and propel missions to the Moon or other worlds. NASA will test the fuel and compatible propulsion system in space for the first time with the Green Propellant Infusion Mission (GPIM), set to launch this month on a SpaceX Falcon Heavy rocket. The mission will demonstrate the features of a high-performance "green" fuel developed by the Air Force Research Laboratory at Edwards Air Force Base in California. The propellant blends hydroxyl ammonium nitrate with an oxidizer that allows it to burn, creating an alternative to hydrazine, the fuel commonly used by spacecraft today. Spacecraft love hydrazine, but it is highly toxic to humans. Handling it requires strict safety precautions. GPIM promises fewer restrictions that will reduce the time it takes to prepare for launch. Another perk of the fuel is performance – the new fuel offers nearly 50 percent better performance, enabling spacecraft to operate for longer with less propellant. For more, visit: <https://go.usa.gov/xmug9>.

# Relativity to expand facilities at Stennis

Relativity Space announced June 11 that it has secured an agreement with NASA and an incentive package from the Mississippi Development Authority to expand facilities and infrastructure at Stennis Space Center.

Relativity will use existing Stennis infrastructure and capital investment incentives from the Mississippi Development Authority to build a robotic 3D-printing rocket factory and an expanded testing facility for autonomous production of its Terran 1 rocket launch vehicles. The agreement with NASA includes exclusive use of 220,000 square feet within building 9101 at Stennis Space Center for a nine-year lease. The facility includes an 80-foot high bay, multiple bridge cranes, and extensive industrial infrastructure. The agreement also includes an option to extend the lease for an additional 10 years.

Meanwhile, the partnership with the Mississippi Development Authority includes cost reimbursement

and tax incentives for Relativity's employment and capital investments in the state of Mississippi.

"This agreement demonstrates again NASA's commitment to work with our industry partners to expand commercial access to low-Earth orbit," Stennis Director Rick Gilbrech said. "This helps NASA maintain focus on the ambitious Artemis program that will land the first female and the next male on the south pole of the moon by 2024. Relativity is a valuable member of the Stennis federal city and we look forward to building on our already successful partnership. This is a significant expansion of their presence at Stennis and we appreciate their confidence in making south Mississippi an integral part of their future."

Relativity is seeking to develop the first aerospace platform to integrate machine learning, software and robotics with metal 3D-printing technology to build and launch rockets in days instead of years. Relativity's envisions an autonomous rocket platform that is highly reconfigurable, with a radically simplified supply chain and no fixed tool-

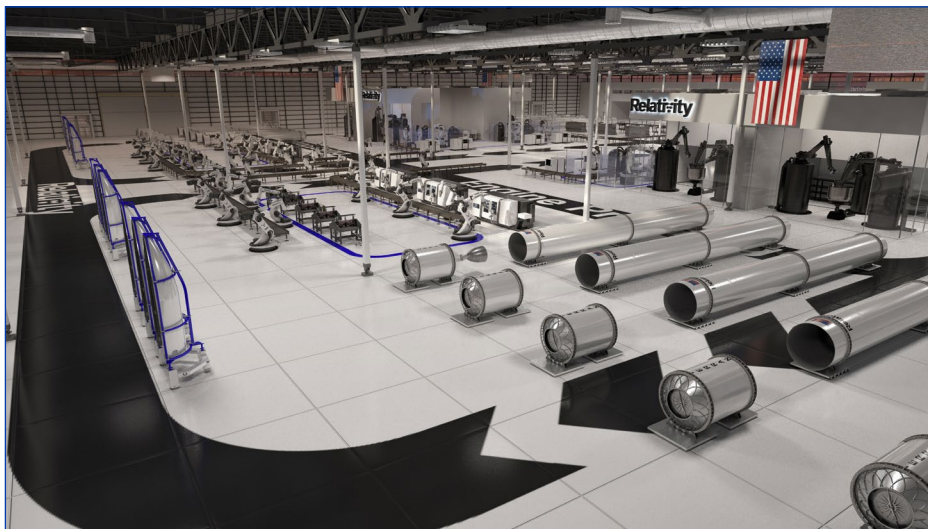
ing, reducing part count 100 times.

On path to first orbital launch in 2020, Relativity will be building out first stage assembly, engine integration and testing, and a full production line at Stennis. The factory build-out and expansion will create a total of 200 jobs and invest \$59 million in the state of Mississippi.

The partnership between Relativity, NASA and the Mississippi Development Authority is expected to help advance innovation, economic development and job growth in the Gulf Coast area. Relativity will invest in regional workforce development programs, university and education outreach, and community engagement initiatives.

In turn, the infrastructure and resource incentives will enable the company to accelerate development and scaling of its technology and shorten lead times to launch.

"We are excited to partner with NASA and the Mississippi Development Authority



An artist rendering from Relativity shows what their future factory at Stennis Space Center may look like.

ity to bring our patented 3D-printing rocket platform to Hancock County," said Jordan Noone, cofounder and chief technology officer of Relativity. "We believe this groundbreaking technology is the future of aerospace manufacturing, and we look forward to bringing this innovation to the Gulf Coast."

"The Mississippi Gulf Coast has a strong aerospace presence, and Relativity's expansion at Stennis further positions our state as a leader in this prominent sector," Governor Phil Bryant said. "The important work that will be done for Relativity by our skilled workforce will play a crucial role in developing new methods to connect to outer space and other planets."

Last spring, Stennis and Relativity entered into a 20-year Commercial Space Launch Act agreement that grants the company exclusive use of the E-4 Test Complex at Stennis to develop multiple stands for testing its engines and vehicles.

For more, please visit: <https://www.relativityspace.com/>.

# Stennis hosts annual Old Timers' Day



Former Stennis Space Center employees enjoyed a return to the site for Old Timers' Day activities May 17. The annual fellowship was attended by retirees, guests and employees. The gathering was sponsored by the Stennis Recreational Association, with contributions from several companies and organizations. Participants included former Stennis employees (top left photo, l to r) Dorothy Gardner and Caroline Bowers; (bottom left photo, l to r) Roger Clements, Whitey Barnes and Tom Favre, standing with Stennis Fire Capt. Allan Price; and (below photo) Clyde Dease.



## Senate staff members visit Stennis

Andrew Hinkebein (r), southern regional director for U.S. Sen. Roger Wicker of Mississippi, and Rick VanMeter, communications director for the U.S. Senate Committee on Commerce, Science and Transportation, stand on the B-2 Test Stand during a visit to Stennis Space Center on May 28. In addition to touring the test stand, the pair was briefed about ongoing work at Stennis and visited the Aerojet Rocketdyne Engine Assembly Facility.

# 1960s – From NACA to NASA to the Moon



*Note: NASA's John C. Stennis Space Center has played a pivotal role in the success of the nation's space program. The following offers a glimpse into the history of the rocket engine test center.*

In 1915, the National Advisory Committee for Aeronautics (NACA) was created to promote aeronautical research. It existed until Oct. 1, 1958, when it was converted to a new agency, the National Aeronautics and Space Administration.

The reason for the conversion was the Soviet Union launch of the satellite Sputnik I into low-Earth orbit on Oct. 4, 1957. The Soviets later would launch the first human in space, cosmonaut Yuri Gagarin. There was a congressional review of the American space program under way at the time of the Sputnik launch, and using the organizational bones of NACA, a

bill was presented to President Dwight Eisenhower in July 1958 to create NASA. The official beginning of the agency was Oct. 1, 1958.

In May 1961, President John F. Kennedy delivered a speech before a special joint session of Congress, proclaiming that the United States should put a person on the Moon before the decade of the 1960s was out. The challenge meant NASA had less than nine years to place a human on the Moon.

In order to do so, the agency needed to build large rockets and needed a place to test the large rocket stages that would launch the Moon missions. In August 1961, an ad hoc committee of members from NASA Headquarters

and Marshall Space Flight Center in Huntsville, Alabama, began the work of finding the perfect location to conduct such testing.

There were several variables to consider since the rockets would be assembled at the Michoud Assembly Facility outside of New Orleans and launched from Cape Canaveral, Florida. NASA needed a facility that, ideally, would lie between these two places, be situated away from a densely populated area because of the noise associated with testing rocket engines and stages, have access to both waterway and highway, have a mild climate so

testing could conceivably be conducted year round and have supporting communities nearby.

On Oct. 25, 1961, NASA announced that a rocket test site would be established in Hancock County in the southwestern corner of Mississippi. The site, then known as Mississippi Test Operations, would be the facility to test the Saturn rockets that



Capt. William C. Fortune (left), the first manager of Stennis Space Center, then known as Mississippi Test Operations, speaks with U.S. Corps of Engineers representatives Maj. Gen. Thomas Hayes (seated) and Charles Jackson during the early days of construction at the engine test site.

would launch the Apollo missions to the Moon.

Just over seven years later, on July 20, 1969, Neil Armstrong, followed by Buzz Aldrin, stepped onto the surface of another world, the Moon. The Apollo 11 crew did not get there on their own. It is estimated that 400,000 people worked to get humans to the moon.

That number included thousands of workers who built the Mississippi Test Operations site, including the test stands and control buildings used to test the rocket stages that powered humans to the Moon. They, along with hundreds of engineers, scientists and technicians in Hancock County, Mississippi, all had a part to play in that momentous historical event.

## Office of Diversity and Equal Opportunity

# June Pride Month commemorates LGBT community

**L**esbian, Gay, Bisexual, and Transgender (LGBT) Pride Month is celebrated each year during June. The purpose of the commemorative month is to recognize the impact that LGBT individuals have had on history locally, nationally and internationally.

The month of June was selected for Pride Month to honor the 1969 Stonewall riots in New York City. The Stonewall riots were a tipping point for the Gay Liberation Movement in the United States.

On June 28, 1969, the Stonewall Inn in New York was infiltrated by police officers for suspicion of serving alcohol without a license. New York's gay community had suspected the police were targeting gay clubs and broke out into a violent riot when the police began arresting employees as well as patrons. The number of protestors grew to over 1,000, and the riot lasted for hours. The Stonewall riots are largely regarded as the beginning of the LGBT rights movement. This year marks the 50th anniversary of the Stonewall riots.

The riots inspired LGBT people throughout the country to organize in support of gay rights, and within two years after the riots, gay rights groups had been started in nearly every major city in the United States. Over the years since the event, many gay rights organizations have been formed – not just in the United States but around the world.

Pride Month is important because it marks the start of huge change within the LGBT community, as well as the wider societal implications. Although negative attitudes and injustice still remain, society has come a long way since riots of 1969. By continuing in this longstanding tradition, people continue to raise awareness, improve the attitudes of society and encourage inclusiveness.

Throughout the month, federal departments and agencies, in partnership with employee resource groups and

special emphasis programs, create the opportunity to celebrate the contributions of all sexual orientations and gender identities in the workforce, to our nation and around the world.

As the nation's largest employer, the federal government should set an example for other employers that employment discrimination based on sexual orientation or gender identity is not acceptable. All federal workers – including LGBT individuals – should be able to perform

their jobs free from any unlawful discrimination.

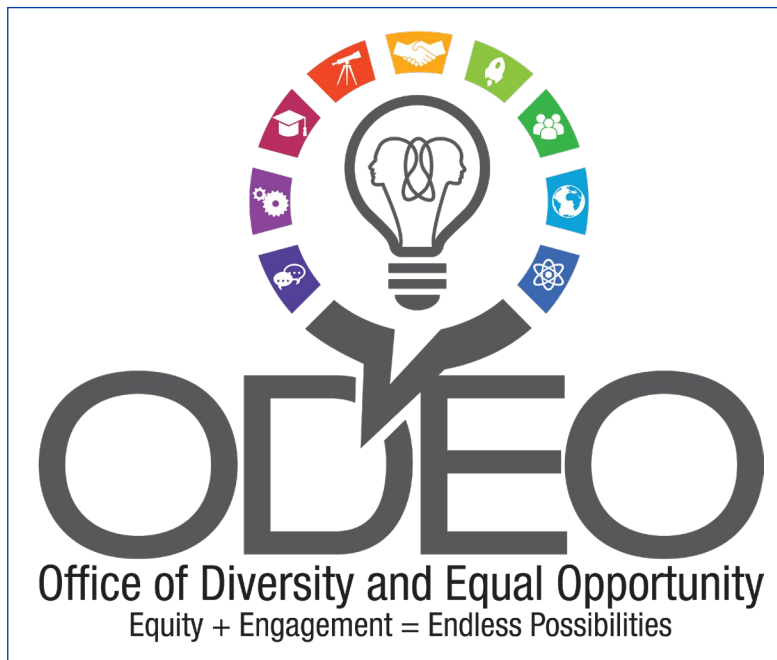
It is the policy of the federal government to provide equal employment opportunity to all individuals. Executive Order 11478 was signed in 1969 to prohibit discrimination within the federal civilian workplace on the basis of race, color, religion, sex, national origin, handicap, and age. It later was amended to prohibit discrimination based on sexual orientation

and gender identity as well. It also prohibits discrimination based on race, color, religion, sex, national origin, disability, parental status, and age.

The Executive Order states that this non-discrimination policy “must be an integral part of every aspect of personnel policy and practice in the employment, development, advancement, and treatment of civilian employees of the federal government, to the extent permitted by law.” There are a number of administrative and legal protections available to federal workers who believe they have been discriminated against because of their sexual orientation or gender identity.

This month, join others to celebrate the progress made in ensuring equality for all individuals. Strive to create a culture that is aware, accepting, inclusive and respectful of diversity and seek to create an environment where each employee feels valued and respected.

*Article includes information from [opm.gov](http://opm.gov), [deomi.org](http://deomi.org), and [brc.org](http://brc.org).*





# NASA awards small business tech projects

Managing pilotless aircraft and solar panels that could help humans live on the Moon and Mars are among the technologies NASA is looking to develop with small business awards totaling \$106 million. In all, NASA has selected 142 proposals from 129 U.S. small businesses from 28 states and the District of Columbia to receive Phase II contracts as part the agency's Small Business Innovation Research (SBIR) program.

These include three projects tied to Stennis Space Center.

"Small businesses play an important role in our science and exploration endeavors," said Jim Reuter, acting associate administrator of NASA's Space Technology Mission Directorate. "NASA's diverse community of partners, including small businesses across the country, helps us achieve our mission and cultivate the U.S. economy. Their innovations will help America land the first woman and the next man on the Moon in 2024, establish a sustainable presence on the lunar surface a few years later, and pursue exciting opportunities for going to Mars and beyond."

NASA selected the proposals based on a range of criteria, including technical merit and feasibility, as well as the organizations' experience, qualifications, and facilities. Additional criteria included effectiveness of proposed work plans and the commercial potential of the technologies.

The selected proposals will support the development of technologies in the areas of human exploration and operations, space technology, science, and aeronautics. The proposals offer a breadth of applications, including solar panels that deploy like venetian blinds; a high-resolution X-ray instrument to analyze surface rocks and core samples on planets and asteroids; and a suite of technologies for managing autonomous aircraft.

The three proposals managed by Stennis are:

- "Balanced Floating Piston Valve for Ultra-High, High-Volume Liquid and Gaseous Flow Control,"

developed by C-Suite Services, LLC of Metairie, Louisiana. C-Suite licensed the floating piston valve from Stennis. This award enables continued development of a robust, reliable high-pressure valve suitable for use in the Stennis test complex, which directly addresses a critical need.

- "Additively Manufactured Dynamically Adjustable Venturi," developed by Parabilis Space Technologies Inc. of San Marcos, California. The award enables verification testing of a prototype venturi, as well as design and manufacture of a full-scale version for use in engine testing. Success of this leading-edge technology would be a substantial advancement that reduces engine test turn-around timelines and costs.
- "High Performance Solver for Coupled Cavitation and Fluid-Structure Interaction in Cryogenic Environments," developed by Streamline Numerics Inc. of Gainesville, Florida. The award enables continued development of state-of-the-art computer modeling/simulation of how cryogenic fluids interact in systems, which can help prevent damage to system components and reduce engine test and launch operations.

"The SBIR program provides a unique and valuable platform to define our technology needs and to develop and fund commercial and academic relationships that assist us in meeting those needs," said David Coote, deputy chief engineer in the Stennis Engineering and Test Directorate. "Stennis has derived substantial leading-edge knowledge and test-related technology through the program. We have numerous examples of such technology helping to improve the quality, safety and reliability of test services we provide."

For more about the SBIR and STTR programs, including the selection list, visit: <https://sbir.nasa.gov/>. For more about NASA's investment in space technology, visit: <https://www.nasa.gov/spacetechnology>.

## Hail & Farewell

### NASA bids farewell to the following:

Michael Kersanac	AST, Experimental Facilities Development	Center Operations Directorate
Bryon Maynard	AST, Tech Management	Engineering and Test Directorate

### NASA welcomes the following:

William McKenzie	Student Trainee (Engineering)	Engineering and Test Directorate
Kamwren Nichols	Contract Specialist	Office of Procurement
Jennifer Rolison	Procurement Analyst	Office of Procurement
Robert Smith	AST, Electronic Instrumentation Systems	Engineering and Test Directorate

# Hurricane Guide

The 2019 hurricane season has arrived – and NASA’s John C. Stennis Space Center has prepared this four-page guide as a resource for Stennis employees. The guide offers interesting and valuable information, including a contraflow evacuation map and contact numbers for emergency situations. It also serves as an important reminder for every Stennis employee to be prepared and alert for whatever the 2019 storm season may deliver.

## Stennis Space Center WILL NOT serve as a shelter to any workers or families (to include families of ride-out personnel).

As part of their hurricane season preparation, individuals are urged to contact county/parish offices to identify available shelters in their areas.

In both Mississippi and Louisiana, persons are reminded they may call 211 to obtain information about health and human services available in their areas.

The number is staffed 24 hours a day in Louisiana and on weekdays, 8 a.m. to 5 p.m., in Mississippi. It offers information on various services, including food, clothing, shelters and transportation assistance.

Stennis employees are reminded to discuss their evacuation plans with supervisors so they can be contacted after a storm or to acquire their company/agency policy on contacts after a storm.

NOTE: If NASA employees cannot contact Stennis due to downed communications after a storm, they should call 877-776-4654 to report their status.

### Severe weather terms

#### Storm surge

An abnormal rise of sea/gulf water along a shore as the result, primarily, of winds from a storm.

#### Watch

Adverse conditions are *possible* in the specified watch area, usually within 48 hours. A watch may apply to thunderstorms, tornadoes, floods or hurricanes.

#### Warning

Adverse conditions are *expected* in the specified warning area, usually within 36 hours. A warning may apply to thunderstorms, tornadoes, floods or hurricanes.

### Public shelter information

Shelters are operated by trained individuals and are designed to ensure the safety, security and basic needs of sheltering residents are met.

#### What to bring to a shelter

Residents should bring a change of clothing, a blanket and a pillow for each person. Residents also should bring their disaster supply kit, including food, medications, comfort items and needs for infants or elderly persons.

#### What not to bring to a shelter

No weapons, illegal drugs, alcohol or pets are allowed (service animals are permitted).

## Hurricane Facts and Trivia

- The Atlantic Ocean hurricane season extends from June 1 through November 30 each year, hitting its peak from mid-August to late October. Of the 64 major hurricanes (Category 3-5) that made landfall in the United States during the 20th century, 36 hit in September. The next busiest month was August with 15 storm strikes.
- The terms “hurricane,” “typhoon” and “cyclone” all refer to the same storm tropical cyclone phenomenon. Storms in the Atlantic and eastern Pacific Oceans are called “hurricanes.” Western Pacific Ocean storms are referred to as “typhoons.” Storms in the Indian Ocean and Bay of Bengal are “cyclones.” Australians refer to a tropical cyclone as a “willy-willy.”
- Tropical cyclones spin counterclockwise in the northern hemisphere and clockwise in the southern.
- The word “hurricane” comes from “Hurican” or “Huracan,” the name of an evil Caribbean god. It also has roots to Hunraken, the Mayan god of wind, fire and storm who is said to have caused a great flood on Earth as an act of divine retribution against humans.
- A hurricane has remarkable power. It can reach as high as 40,000 to 50,000 feet into the sky, stir up millions of miles of air and produce more than 2.4 trillion gallons of rain a day. During its lifespan, a hurricane produces as much energy as several thousand atomic bombs.
- The first European report of an Atlantic Ocean hurricane dates back to 1495, when a storm struck Hispaniola during Christopher Columbus’ second voyage to the region.
- Hurricanes spin around a low-pressure center known as an “eye.” The eye may be 20-30 miles wide and remains calm and without clouds. It is surrounded by a thick “eye wall,” which represents the strongest part of the hurricane, while spiral rain bands extend out from the wall to represent the largest portion of the storm. A hurricane makes landfall when its eye crosses a coastline, not when the spiral rain bands arrive.
- The right side of a northern hemisphere hurricane is typically stronger in terms of winds, tornado potential and storm surge.
- Project Stormfury was an effort by the U.S. government from 1962 to 1983 to weaken hurricanes by flying aircraft into them and “seeding” them with silver iodide. Scientists thought the silver iodide would disrupt the inner composition of the hurricane. However, this proved not to be the case. The final seeding flight was flown in 1971, and the project was canceled the following decade. Despite its lack of success, the aircraft flights did provide valuable observation data and research that helped meteorologists better understand and predict the storms.
- Hurricanes kill more people than any other type of storm. By one estimate, the storms have killed almost 2 million people worldwide during the past two centuries.
- For hundreds of years, hurricanes were not named or named on a local and random basis. The United States began using female names for storms in 1953, adding male names in 1979. Six lists of 21 names each now are maintained and rotated. The lists are in alternating (male/female or female/male) and alphabetical order (with no names used for the letters q, u, x, y and z).
- Names of powerful or destructive hurricanes are permanently retired (by decision of a world committee) from the naming lists and replaced as needed. Since the 1950s, 87 names have been retired, including two in 2018 (Florence and Michael).
- Names for 2019 Atlantic Ocean hurricanes are – Andrea, Barry, Chantal, Dorian, Erin, Fernand, Gabrielle, Humberto, Imelda, Jerry, Karen, Lorenzo, Melissa, Nestor, Olga, Pablo, Rebekah, Sebastien, Tanya, Van and Wendy. The six rotating naming lists can be viewed at: <http://www.nhc.noaa.gov/aboutnames.shtml>.
- Scientists believe Jupiter’s “red spot” is a raging storm (for at least 150 years) larger than the size of Earth.

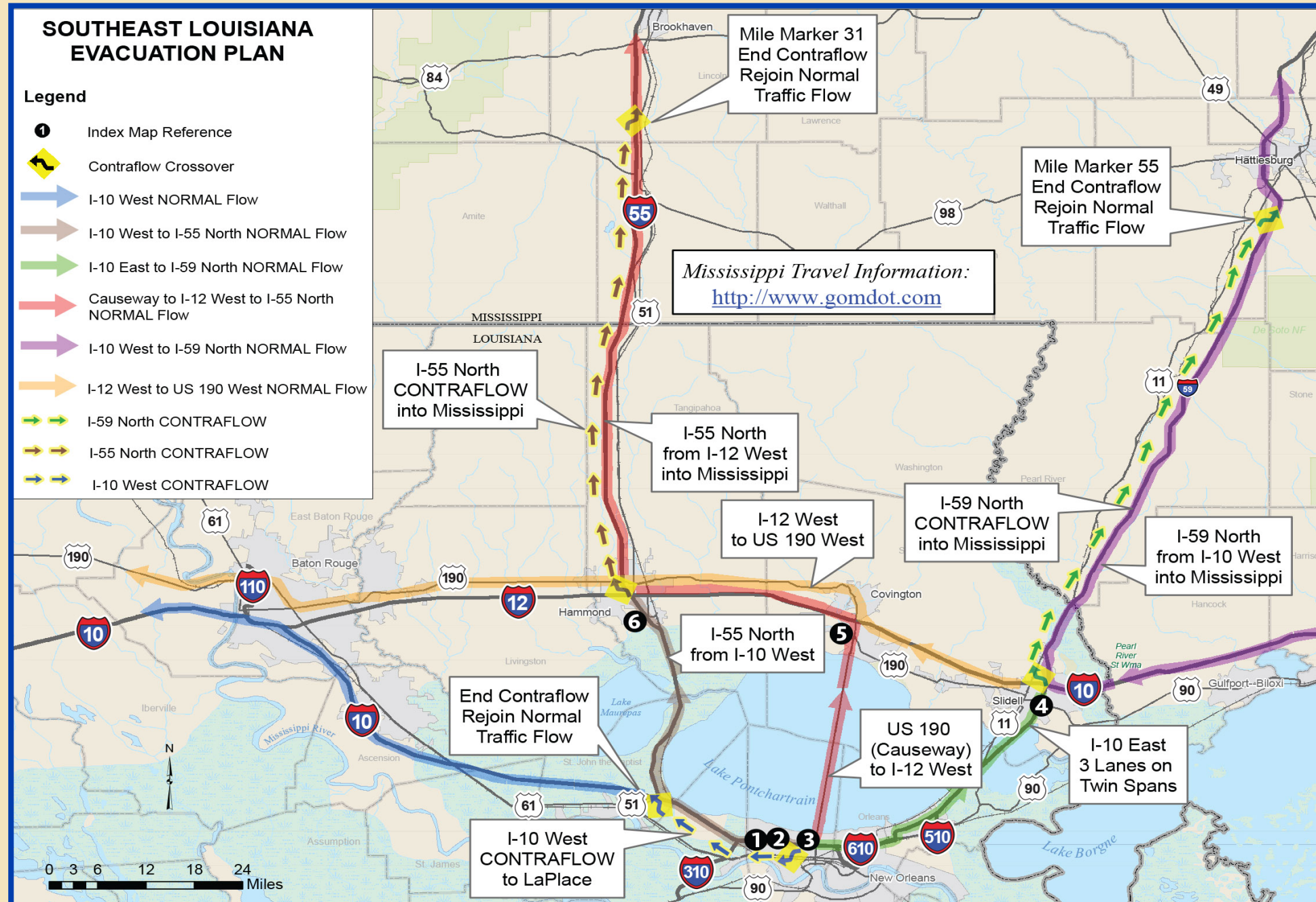
# Louisiana-Mississippi interstate contraflow plan

In an effort to assist Louisiana in the event of a mandatory hurricane evacuation, the Mississippi Department of Transportation will implement contraflow (lane reversal) for I-59 and I-55 when requested by Louisiana and approved by the Mississippi governor.

- A contraflow decision is not automatic and will only be used when absolutely necessary. Citizens should not delay evacuation plans in anticipation of contraflow.
- I-59 contraflow will begin in Louisiana, extend into Mississippi and end at mile marker 55.

- I-55 contraflow will begin in Louisiana, extend into Mississippi and end at mile marker 31.
- Exits within the contraflow sections of the interstate highways will remain open as conditions allow. Law enforcement officers will assist with traffic control.
- Shoulders of both Interstates 59 and 55 should be kept clear for emergency vehicles. Motorists needing to stop should use the next available exit.
- Motorists traveling west into Louisiana on I-10 will be routed north onto I-59 at the I-10/I-12 split.

- Tune in to public broadcasting radio stations for emergency information and road conditions.
- The following procedures will be enforced in the Hattiesburg area to avoid severe congestion:
  - Northbound traffic on Hwy. 49 may not be allowed to exit at either Hwy. 98 or I-59.
  - Northbound traffic on I-59 can only exit at Hwy. 11 (Exit 60) or west onto Hardy Street/Hwy. 98 (Exit 65).
  - Westbound traffic on Hwy. 98 will not be allowed to exit onto Hwy. 49, but directed to merge onto I-59 instead.



## National resource information

- American Red Cross**  
www.redcross.org 800-REDCROSS (733-2767)
- Federal Emergency Management Agency**  
www.fema.gov 800-621-FEMA (3362)
- NOAA National Hurricane Center**  
www.nhc.noaa.gov nhc.public.affairs@noaa.gov (email)

## Mississippi resource information

- Mississippi Emergency Management Agency**  
www.msema.org 866-519-MEMA (6362) (24 hrs) 800-222-MEMA (6362)
- Mississippi Department of Transportation**  
www.mdot.ms.gov www.mdottraffic.com 866-521-MDOT (6368)
- Mississippi Highway Safety Patrol**  
www.dps.state.ms.us 601-987-1212 (\*HP from any cell)
- Mississippi Public Broadcasting**  
www.mpbonline.org 601-432-6565
- Governor's Office**  
www.governorbryant.com 601-359-3150
- Mississippi Insurance Department**  
www.mid.ms.gov 800-562-2957
- U.S. Coast Guard - Sector Mobile**  
www.uscg.mil/D8 251-441-5720
- Mississippi Power**  
www.mississippipower.com 800-487-3275
- Coast Electric Power**  
www.coastepa.com 877-769-2372

## Louisiana resource information

- Office of Homeland Security and Preparedness**  
www.gohsep.la.gov 225-925-7500
- Louisiana Department of Transportation**  
www.dotd.louisiana.gov 877-4LA-DOTD (452-3683)
- National Weather Service Forecast Office**  
(New Orleans/Baton Rouge) 985-649-0429 or 504-522-7330
- Louisiana State Police**  
www.lsp.org 800-469-4828 (\*LSP from any cell phone)
- Louisiana Traveler Information**  
www.511la.org dial 511 in state 88-ROAD-511 (888-762-3511) outside state
- Louisiana Governor's Office**  
www.gov.louisiana.gov 866-366-1121
- Louisiana Department of Insurance**  
www.lidi.louisiana.gov 800-259-5300 or 225-342-5900
- U.S. Coast Guard - Sector New Orleans**  
www.uscg.mil/D8/sectNOLA/ 504-365-2200 or 800-874-2153
- Cleco Corporation**  
www.cleco.com 800-622-6537
- Entergy (www.entropy-louisiana.com)**  
800-ENTERGY (368-3749) Power outages: 800-9OUTAGE (968-8243)
- Washington-St. Tammany Electric Cooperative**  
www.wste.coop 985-839-3562 Power outages: 866-672-9773