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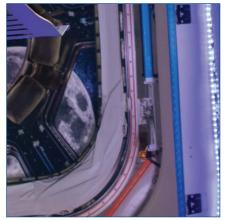














Stennis Set for Active Testing Year in 2022 SEE PAGE 3

he new year is finally here, and I am turning my attention to the future. To celebrate the arrival of 2022, Momma Gator and I built a little campfire to stay warm, poured ourselves a little muscadine wine, and kept a close eye on the horizon, waiting for fireworks. As friends and relatives began to count down from 10, my thoughts filled with hopes for an amazing 2022.

First on my mind was how compelling the images will be from NASA's new Webb Telescope. I read in news reports how we will be able to see the light from the early universe. The telescope, soon to reach operational status, will help answer fundamental questions about creation. What will we discover? The anticipation is almost overwhelming. As the fireworks expand to fill the sky, I think about the early universe beginning expansion and how beautiful that must have been.

Watching the trail of a firecracker as it shoots upward, my thoughts shift to rocket launching. The Space Launch System is soon to make its maiden flight, which will begin a new age of lunar travel. What a powerful rocket! Also deserving of mention are the new launch vehicles showing off commercial capabilities. With each new launch, I think about what new technologies working in space will change life on Earth.

As I lean back in my chair, my thoughts drift toward what will happen at Stennis this new year. Folks are starting to take notice of the unique capabilities Stennis offers and how convenient it is to work onsite at the center. I wonder what new partnerships and what type of expansion Stennis will have.

Fireworks are intriguing. Their short-lived moments of brightness in the sky remind me of Hubble images. What an amazing spacecraft Hubble has been. It reached its 1 billionth second of space operation and is still operational.

Well, my thoughts wander, and I find myself daydreaming of my version of the future. That or this muscadine wine is going to my head. Ark! While I think of the future, it is also crucial that I remember the now. Doing my part each passing day contributes in a small way to making space flight possible.

At this moment, I am thrilled to be part of telling the fantastic stories of NASA's accomplishments. I feel a great sense of appreciation for the folks I have had the opportunity to meet and interact with. From me and Momma Gator, happy New Year to you all.



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NASA's Stennis Space Center Set for Active Propulsion Testing Year

C tennis Space Center recently completed a full year of propulsion testing across multiple stands, setting the stage for an equally active 2022 featuring both agency and commercial projects.

As the new year begins, seven of the nine test stands at Stennis are being used for testing. Four stands are being operated by NASA directly, one is under a Reimbursable Space Act Agreement (RSAA) with Aerojet Rocketdyne, and two have been turned over to Relativity Space Inc. for operation under a Commercial Space Launch Act (CSLA).

"We're looking forward to an active testing year," said Joe Schuyler, director of the Stennis Engineering and Test Directorate. "Stennis already is on the front lines of testing to help power the nation's deep space exploration program. In addition, more and more commercial companies are realizing the value of our unparalleled facilities, infrastructure, and test team, and bringing their test projects on site."

The outlook for 2022 activity is a carry-over from the most recent year. In 2021, rocket engine testing at Stennis featured 11 test campaigns, including seven NASA-led projects, on eight test stands. The year's activity totaled 434 tests and 7,341 seconds of cumulative firing time.

On the commercial front, Stennis partnered with seven companies on rocket engine and component testing projects during the recent year -Aerojet Rocketdyne, Relativity Space, Virgin Orbit, Blue Origin, Ursa Major,

Launcher, and Firehawk. Aerojet Rocketdyne conducted the final scheduled RS-68 hot fire acceptance test on the B-1 Test Stand in April. However, several of the other companies are continuing testing projects into 2022. There also is the possibility of participating in partnerships with additional companies in the new year.

Meanwhile, in the most high-profile project of the year, NASA completed Green Run testing of the Space Launch System (SLS) core stage on the B-2 Test Stand in March. It followed up the yearlong testing of the core stage and its integrated systems

As 2022 unfolds, Stennis is set for another equally active new year of propulsion testing with commercial partners and government agencies. The outlook for 2022 includes continued RS-25 testing, Exploration Upper Stage preparations, and further development in autonomous systems, including those for possible use on future deep space missions. NASA continues to take the steps toward completing the Artemis mission returning humans, including the first woman and first person of color, to the lunar surface.

> by beginning preparations for similar Green Run testing of the new Exploration Upper Stage (EUS), being developed for use on future SLS missions.

> EUS testing also will be conducted on the B-2 Test Stand. To help prepare for the future campaign, NASA has begun modification work on the B-2 Test Stand and also performed a series of subscale diffuser tests on the E-3 Test Stand in 2021. EUS preparations will continue throughout 2022.

NASA also continued testing of RS-25 engines to help power SLS on the A-1 Test Stand throughout 2021. In addition to

another series of developmental tests, NASA will conduct hot at Stennis will be deployed from the fires of an RS-25 certification engine during the upcoming year. International Space Station later this year. The project will help The certification series will mark a major milestone towards evaluate and validate the performance of NPAS in a space production of new RS-25 engines for future SLS missions. environment.

Stennis is conducting both flight and developmental testing Stennis is America's largest rocket propulsion test site, with for the RS-25 engines that will power SLS, which is being test facilities valued at more than \$2 billion. Because of its developed for deep space exploration with the Orion spacecraft surrounding 125,000-acre acoustical buffer zone, Stennis has Developmental testing at Stennis is providing critical data the ability to conduct rocket engine and stage testing 24/7, 365 to Aerojet Rocketdyne, the prime contractor for the RS-25 days a year, without disturbing neighbors. As a result, Stennis engine, as it produces new RS-25 engines using cutting-edge is at the front end of the critical path for the future of space manufacturing materials, processes, and technology. exploration.

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The SLS is vital to NASA's Artemis program missions to return humans, including the first woman and first person of color, to the Moon and eventual missions to Mars. In its evolved design, it will be the most powerful rocket in the world and will take astronauts farther into deep space than ever before.

As part of the Artemis program, NASA is designing and building a Lunar Orbital Platform (Gateway), an in-space infrastructure needed to enable longterm exploration and development of the Moon, as well as journeys deeper into space. Gateway is designed to give NASA a strategic presence in lunar space that will drive activity with commercial and international partners to help advance exploration of the Moon.

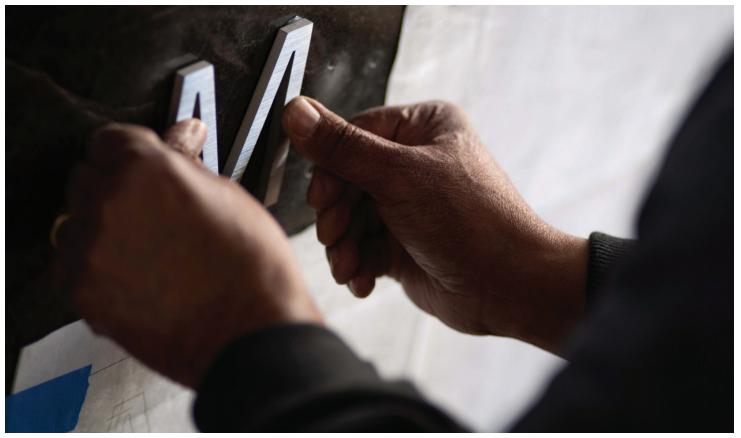
In addition to its propulsion activity, the Stennis Autonomous Systems Laboratory (ASL) team is developing autonomous software capabilities that may be used on Gateway or other deep space habitation modules to help monitor and control critical systems. This capability is vital for mission success as communication and ground control functions take longer when exploration vehicles venture further away from Earth.

The ASL team will mark a major milestone of its own later in 2022. A project proposed by the team was one of 10 selected by NASA as part of an effort to enable new technology capabilities for deep space human exploration. Through Project Polaris, a small satellite infused with the NASA Platform for Autonomous Systems (NPAS) developed

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NASA's Best Images Offer a Look Back at 2021





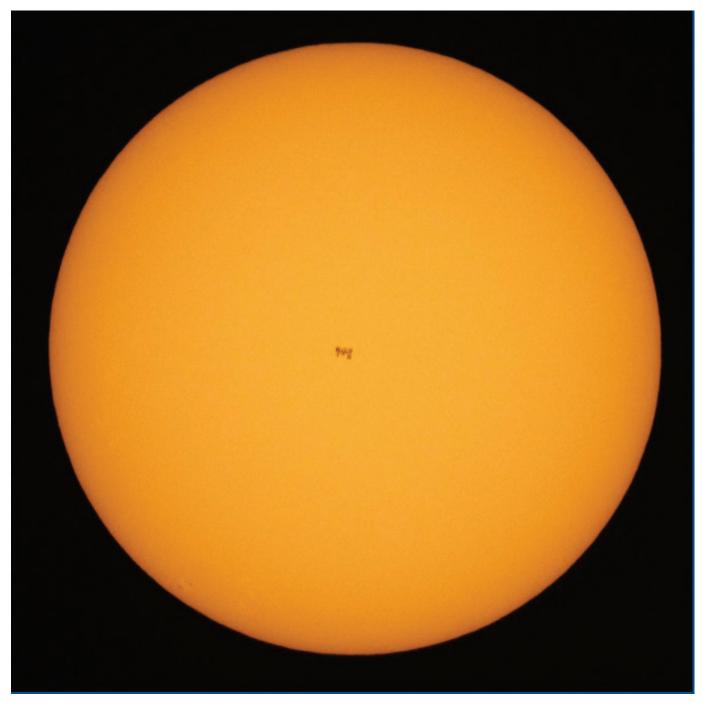
(Top left) Members of NASA's Perseverance rover team at NASA's Jet Propulsion Laboratory in Pasadena, California, react after receiving confirmation the spacecraft successfully touched down on Mars on Feb. 18, 2021. A key objective for Perseverance's mission on Mars is astrobiology, including the search for signs of ancient microbial life. The rover will characterize the planet's geology and past climate, pave the way for human exploration of the Red Planet, and be the first mission to collect and cache Martian rock and regolith. For more on NASA's 2021 missions results, click here. Photo Credit: (NASA/Bill Ingalls)

(Bottom left) The Mary W. Jackson NASA Headquarters sign in Washington, D.C., is installed ahead of the building naming ceremony Feb. 25, 2021. Jackson, the first African American female engineer at NASA, began her career with the agency in the segregated West Area Computing Unit of NASA's Langley Research Center in Hampton, Virginia. The mathematician and aerospace engineer went on to lead programs influencing the hiring and promotion of women in NASA's science, technology, engineering, and mathematics careers. In 2019. she posthumously received the Congressional Gold Medal. Photo Credit: (NASA/ Joel Kowsky)

(Right) A partial solar eclipse is seen as the sun rises behind the Delaware Breakwater Lighthouse on June 10, 2021, at Lewes Beach in Delaware. The annular or "ring of fire" solar eclipse is only visible to some parts of Greenland, Northern Russia, and Canada. Photo Credit: (NASA/Aubrey Gemignani) January 2022



LAGNIAPPE NASA's Best Images Offer a Look Back at 2021



(Top left) The International Space Station, with a crew of seven onboard, is seen in silhouette as it transits the Sun at roughly five miles per second June 25, 2021, from near Nellysford, Virginia. Onboard are Expedition 65 NASA astronauts Megan McArthur, Mark Vande Hei, Shane Kimbrough, ESA (European Space Agency) astronaut Thomas Pesquet, Japan Aerospace Exploration Agency (JAXA) astronaut Akihiko Hoshide, and Roscosmos cosmonauts Pyotr Dubrov and Oleg Novitskiy. At the time of the transit, Kimbrough and Pesquet were working outside on the station's port 6 truss to install the second ISS Roll-Out Solar Array on the 4B power channel. For more on the International Space Station in 2021, click here. Photo Credit: (NASA/Joel Kowsky)

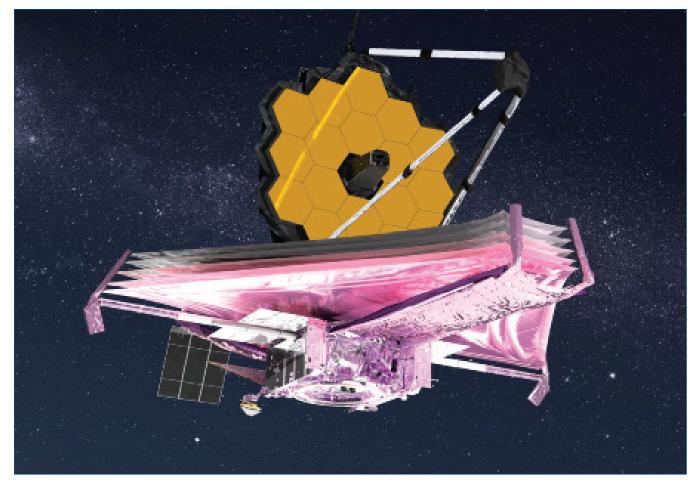
(Top right) A United Launch Alliance Atlas V rocket with the Lucy spacecraft aboard is seen in this 2 minute-and-30 second exposure photograph as it launches from Space Launch Complex 41 at Cape Canaveral Space Force Station in Florida, on Oct. 16, 2021. Lucy will be the first spacecraft to study Jupiter's Trojan Asteroids. Like the mission's namesake - the fossilized human ancestor, "Lucy," whose skeleton provided unique insight into humanity's evolution - Lucy will revolutionize knowledge of planetary origins and the formation of the solar system. Photo Credit: (NASA/Bill Ingalls)

(Bottom right) A meteor streaks across the sky in this 30-second exposure taken in Spruce Knob, West Virginia, during the annual Perseid meteor shower on Aug. 10, 2021. Photo Credit: (NASA/Bill Ingalls)









This artist's conception of the James Webb Space Telescope in space shows all its major elements fully deployed. The telescope was folded to fit into its launch vehicle, and then was slowly unfolded over the course of two weeks after launch on Dec. 24, 2021. Credits: (NASA GSFC/CIL/Adriana Manrique Gutierrez) NASA's James Webb Space Telescope team fully deployed its 21-foot, gold-coated primary mirror, successfully completing the final stage of all major spacecraft deployments to prepare for science operations. Follow the progress of JWST as it brings its systems online <u>here</u>.

NASA in the News

Hubble Passes 1-Billion Second Mark

On Jan. 1, 2022, NASA's Hubble Space Telescope officially passed the 1 billion-second mark. Hubble was deployed from the Space Shuttle Discovery's cargo bay on April 25, 1990, making it more than 31 years since Hubble began operating. For more than three decades, Hubble has provided groundbreaking scientific discoveries and iconic images of space. Hubble's first 1 billion seconds included five astronaut servicing missions to replace and repair components of the telescope, and more than 1.5 million scientific observations and counting. One can only imagine what discoveries the next 1 billion seconds will bring as new telescopes like the recently launched James Webb Space Telescope and the future Nancy Grace Roman Space Telescope build upon Hubble's discoveries and work together with Hubble to expand understanding of the universe. For more on Hubble with videos and images, click here.

"Mini" Galaxies Hold Black Hole Clues

The discovery of a supermassive black hole in a relatively small galaxy could help astronomers unravel the mystery surrounding how the very biggest black holes grow. Researchers used NASA's Chandra X-ray Observatory to identify a black hole containing about 200,000 times the mass of the Sun buried in gas and dust in the galaxy Mrk 462. Mrk 462 contains only several hundred million stars, making it a dwarf galaxy. By contrast, the Milky Way is home to a few hundred billion stars. This is one of the first times that a heavily buried, or "obscured," supermassive black hole has been found in a dwarf galaxy. In larger galaxies, astronomers often find black holes by looking for the rapid motions of stars in the centers of galaxies. However, dwarf galaxies are too small and dim for most current instruments to detect this. The researchers in this study used Chandra to look at eight dwarf galaxies that had shown hints of black hole growth.

Contracting Officer Lives the Country Life at Stennis

arol (Thibodeau) Kellar, chief of the Procurement Management Support Division at NASA's Stennis Space Center, helps make human deep space exploration possible from the Mississippi backwoods, where she plans to live out her "happily ever after."

Kellar's involvement hides behind the scenes in her current role, but her contributions extend throughout many center missions' tasks. She joined the Stennis Office of Procurement in 2004 and regularly participated across multiple areas, activities, and teams. Woolmarket Elementary, moved on to D'Iberville Middle and High Schools, and continued to Mississippi Gulf Coast Community College. Afterward, she moved on to the University of Southern Mississippi, Gulf Coast Campus, for an undergraduate degree. Kellar next finished her Master of Business Administration degree at William Carey University, then called William Carey College.

Experience, opportunity, and the willingness to take a risk also contributed to Kellar's career with NASA. Kellar worked in public education and private industry before

For example, she served as a procurement analyst, the contracting specialist/officer for two previous test operations contracts and for propellant delivery orders, the lead contracting officer for the current Synergy Achieving Consolidated Operations and Maintenance contract, and in a detail position within the Stennis Center Operations Directorate.

"I am also fortunate to have been able to work with a variety of cross-organizational teams both at Stennis and within NASA," said Kellar. "All held the same goal, do great things. I am always learning something new in this



Carol Kellar is making a difference at Stennis from behind the scenes.

profession. That makes for a very satisfying career, and it's right here where I want to live."

For Kellar, the Mississippi Gulf Coast is home. Kellar grew up in the coastal community of Woolmarket, now part of the city of Biloxi, with a widowed mother on a limited income. "My mother provided endless encouragement and a place to call home, …" she said. "So, although I have lived in other places, I always made my way back home. I now live with my husband of eight years, two teenagers, two dogs, and a horse."

Kellar diligently pursued local higher education, which ultimately led her to a skilled position with NASA. "I received a full education right here on the Mississippi Gulf Coast," Kellar said. She began grade school at the first Space Launch System core stage onsite.

"I am proudest of the various roles I have served in supporting rocket propulsion testing," Said Kellar, "I love testing. After 17 years, it has never gotten old. Whenever I walk outside and hear the sound or see the 'cloud' of a test onsite, it always makes me smile. That's what we do. That's what we support."

Kellar looks forward to enabling the future of spaceflight. "I am so excited about NASA furthering the United States' presence on the Moon and, then, on to Mars. Reaching, landing, and working on Mars is like something out of a science fiction novel, of which I am very fond of reading," said Kellar. "Stennis is the gateway to space."

joining the federal ranks in 1997. She started in civil service at Keesler Air Force Base, working in the 81st Contracting Squadron for seven years. "When an opening appeared for a contract specialist position at Stennis, I jumped at the chance and was fortunate to get picked up," said Kellar.

Kellar directly supports NASA's Artemis to take the next man, first woman, and first person of color to the lunar surface. Kellar manages a "support organization within a support organization." Her teams' support is critical to the successful oversight of the contracts responsible for many of the work activities in NASA and Stennis missions, including recent Green Run testing of

Stennis News

Stennis Hosts Congressmen Babin and Palazzo



U. S. Reps. Brian Babin (I) of Texas and Steven Palazzo (r) of Mississippi visit on the Fred Haise Test Stand at Stennis Space Center during a site visit Dec. 16, 2021. During their visit, the two representatives met with Stennis leadership and also toured other site facilities, including the B-2 Test Stand, E-1 Test Stand, and Aerojet Rocketdyne Engine Assembly Facility.

NASA Recognizes Stennis Space Center Employee

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, 28 Stennis Space Center employees have been cited for their Artemis-related efforts.



Alex Elliot currently supports the Exploration Upper Stage (EUS) test project as the lead electrical design engineer. He leads a team of electrical engineers and is responsible for the design and implementation of all critical electrical systems to ready the

B-2 Test Stand to accept and test the EUS. He also supported the Space Launch System (SLS) core stage Green Run test project as the lead software engineer, where he developed software to interface the Stennis data acquisition system with the SLS core stage controller, the Stennis facility controls system, the Kennedy Space Center's hazardous gas detection system, and offsite systems at the Marshall Space Flight Center.

Stennis Announces Small Business Industry Awards

Stennis recently announced its 2021 Small Business Industry Awards and Small Business Advocate Award winners. They include:

- Small Business Prime Contractor of the Year: Alutiiq Essential Services and Alcyon Inc.
- Small Business Subcontractor of the Year: Madison Services Inc.
- Small Business Technical Person of the Year: Dwayne K. Stockstill

Along with being selected as Stennis small business center-level award winners, the honorees now will be considered candidates in the same categories for agencywide recognition. For more on NASA small business awards, click <u>here</u>.

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Taking Part in Greatness Requires Sacrifices

The history of the area where Stennis Space Center now sits can be traced back well before Mississippi entered statehood in 1817. Then, there were five towns located in what now is the acoustic buffer zone that surrounds Stennis: Napoleon, Logtown, Gainesville, Santa Rosa and Westonia. Each of these towns has a unique history leading to them inevitably becoming the nation's premier rocket engine testing location.

The town of Napoleon began with 640 acres granted by the British government to John Claudius Favre in 1767. By 1808, John Favre transferred the land to his son, Simon Favre, who built the first house and store in Napoleon's small town. The town's claim to fame was a home named "Parade Rest" that was more than 3,000 square feet with thousands of azaleas and camellias decorating the landscape. Santa Rosa was one of the more distinctive towns in the buffer zone. At its largest, it only had a handful of homes, but what it lacked in population, it made up for in character. In the town were a couple of stores and churches, a post office, a one-room schoolhouse and quite a few bars. These "dens of iniquity" were closed and chased out of town many times, but the bars always reopened. There was quite a bit of illegal activity going on at the bars for the time, one being the sale of whiskey. Mississippi was a dry state at the time, and moonshiners populated the area surrounding Stennis until the mid-1960s.

The town of Westonia was named for the lumber tycoon Horatio Weston, who founded the H. Weston Lumber Company. Westonia grew up around the timber industry

Logtown, at its peak, had 3,000 residents, most of whom worked for the lumber industry that was very prevalent in the area. The earliest resident of what would become bustling Logtown was Jean Baptiste Rousseve, who was given the land in 1788. The first log mill was built



Officials of Marshall Space Flight Center (MSFC) and others raise the American flag for the first time in front of the Rouchon House in 1962 at Mississippi Test Operations (MTO), denoting NASA's presence in south Mississippi. Pictured (I to r) are: Bart Slattery, public affairs officer; Dr. Werhner von Braun, MSFC director; Capt. William Fortune, MTO first site manager; Dr. George Constan, Michoud Assembly Facility manager; Dr. Oswald Lange, chief, Saturn Program Office; Dr. Hermann Weidner, chief, structures and mechanics laboratory; Karl Heimburg, director, test laboratory; and Dan Driscoll, test laboratory.

engines. It was a small town with churches, stores, one hotel, a small school, and a couple of wells used for the steam engines that traveled through the town. However, after 1930 and the Great Depression, the timber industry in the area shut

and housed a repair station

for flat railroad

cars and steam

there in 1845, and the town grew until 1930. Then, with the Great Depression and the railroad passing through the area north of town, by 1961, only 250 residents remained.

Gainesville was the only town in what is now the Stennis fee area. It began in 1810 with a land grant by Dr. Ambrose Gaines for more than 500 acres in what was then Spanish territory. Gaines laid out his plan for a new town, naming it Gaines Bluff. Just before the Battle of New Orleans in 1813, Andrew Jackson marched his troops through Gainesville to avoid detection by British soldiers. Gainesville grew due to the shipping and logging industries along the Pearl River, but in 1883, the Southern Railroad Line between New Orleans and Meridian, Mississippi, bypassed the town by 10 miles. By 1961, when NASA was looking to build the rocket test facility, Gainesville only had 35 families left. down. By the 1960s, the town was almost nonexistent.

Sixty years ago, on Nov. 1, 1961, on the grounds of the Logtown elementary school, U.S. Sen. John Stennis of Mississippi gave a speech to the 1,500 people living in these towns and surrounding areas. The government planned to build a rocket testing center on their land. Stennis said, "There is always the thorn before the rose; ... you have got to make some sacrifices, but you will be taking part in greatness." It was a "call to arms" in the space race against the Soviet Union. The citizens' lands and properties were then sold or leased for government use. Soon, because of those families' sacrifices, the construction of the rocket engine test site began. It was widely said, "If you want to go to the Moon, you first have to go through Hancock County, Mississippi."

Office of Diversity and Equal Opportunity Shifting Priorities to Make the Beloved Community

hough January is filled with new beginnings and resolutions for personal growth, it is also the month nationally honoring and celebrating Dr. Martin Luther King (MLK) Jr. Day on its third Monday.

MLK Day has been a federal holiday since 1983 and has been widely celebrated since King's death in 1968. The holiday invites observers to honor King's life in a day of service and advocacy.

The fundamental message behind MLK Day and the perils King faced can be found at the King Center in Atlanta.

The King Center, established in 1968 by Coretta Scott King, serves as a memorial and non-profit organization providing resources for nonviolent social change.

As reported by the King Center, nearly a million people visit the National Historic Site each year to "learn, be inspired, and pay their respects to King's legacy." (Who We Are - The King Center)

Every year, The King Center announces a theme for MLK Day. This year's theme is "It Starts with Me: Shifting Priorities to Make the Beloved Community."

The 2022 theme comes from King, who once said, "I am convinced that if we are to get on the right side of the world revolution, we as a nation must undergo a radical revolution of values. We must rapidly begin the shift from a 'thing-oriented' society to a 'person-oriented' society." The theme expresses the individual responsibility to help create and grow the Beloved Community.

The King Center has often used the idea of the Beloved Community to bring people together in advocacy. The King Center states, "The Beloved Community is an inclusive, achievable society, in which problems and conflict can exist but are resolved peacefully. In the Beloved Community, poverty, discrimination, and violence are unacceptable, and its policies, practices, and language are infused with unconditional love." 2021 included frustrations centered around racial injustices and conditions associated with the global COVID-19 pandemic. The King Center urges citizens to take a stand united and choose a path of nonviolence to help "create a world where injustice ceases, and love prevails."

King used nonviolent demonstrations to bring social change.

In his Nobel Peace Prize lecture in 1964, King said, "We adopt the means of nonviolence because our end is a community at peace with itself." King's legacy included countless demonstrations of nonviolent activism. King explains the philosophy of nonviolence in his book "Stride Toward Freedom" through six principles:

1. One can resist evil without resorting to violence.

2. Nonviolence seeks to win the opponent's "friendship and understanding," not to humiliate him.

3. Evil itself, not the people committing evil acts, should be opposed.

4. Those committed to nonviolence must be willing to suffer without retaliation as suffering itself can be redemptive.

5. Nonviolent resistance avoids external physical violence and internal violence of spirit.

6. One must have deep faith in the future, stemming from the conviction that the universe is on the side of justice.

For more information about King, the King Center, and civil rights, visit the links below.

The King Center | The Center for Nonviolent Social Change

Mississippi Civil Rights Museum (ms.gov)

Nonviolence | The Martin Luther King, Jr., Research and Education Institute (stanford.edu)

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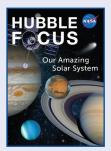
Online Resources

NASA's Year in Review

The 9 Most Memorable International Space Station Downlinks of 2021 This is NASA 2022 video



First Woman Graphic Novel



NASA E-Book Downloads



MARS 2020 STEM Toolkit



NASA at Home

Stennis Emergency Management

NASA Coronavirus Response

Stennis Fact Sheets

I Am Stennis Facebook Videos

McKellip WLOX Interview



You are Going Children's Book



Stennis Artemis Resources page



NASA STEM@Home for Students



Stennis Virtual Tour