National Aeronautics and Space Administration

LAGNIAPPE

John C. Stennis Space Center

Volume 18 Issue 7 www.nasa.gov/centers/stennis July 2022

THE BIG REVEAL

NASA Releases First Images From Webb Space Telescope

NASA's James Webb Space Telescope has delivered the deepest and sharpest infrared images of the distant universe to date. This image is Webb's First Deep Field galaxy cluster, SMACS 0723. The Biden-Harris Administration unveiled the image of the galaxy cluster during a White House event July 11. It covers a patch of sky approximately the size of a grain of sand held at arm's length by someone on the ground – and reveals thousands of galaxies in a tiny sliver of the vast universe. **See page 7 for additional Webb images.**

We are getting closer to the launch of Artemis I when NASA sends the Orion spacecraft on about a month-long flight around the Moon, and good-golly, I can hardly wait! This will be the beginning of the next great era of space exploration, which will land the first woman and first person of color on the Moon.

When the world watches us return to space with the uncrewed mission of Artemis I, it will be a testament to challenges presented and met with solutions by many along the way, including people currently at Stennis and from years past.

Sometimes, I venture off into the Stennis buffer zone and get lost among the trees as I think about such things. Swatting mosquitoes out here can be quite the summer workout as well. Shuffling my feet with each passing step, I am continuously amazed at how Stennis has evolved. I wonder if people from the past could truly envision the success that would follow.

Playing patty-cake with mosquitoes makes me think of the first work crews here. As they were clearing the land and fighting mosquitoes themselves, they were probably just trying to make it through the hot days.

Rising from the swamps of Mississippi, there is so much history here – and more to be made. Stennis truly is a place of possibility with people from all backgrounds and from all over the world working here daily.

It was 53 years ago this month, in July 1969, when Apollo rocket stages and engines tested right here at Stennis, then known as the Mississippi Test Facility, carried the first humans to the surface of the Moon.

Since then, Stennis has fulfilled NASA missions, transformed into a unique federal city, and formed partnerships with various companies to support their commercial space efforts.

The Artemis program will be the next chapter in the story of that greatness. It will not be much longer before Artemis I and the RS-25 engines that were tested right here at Stennis are ready to take flight. When this happens, it will be another successful piece added to the puzzle depicting Stennis' role in space history.

Now, if only I can remember which way I walked into the buffer zone, so I can find my back out. Ark!

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

Key Test Stand Data System Upgrades Underway

As NASA prepares to continue RS-25 hot fires at Stennis Space Center, upgrades to the Data Acquisition System on the Fred Haise Test Stand will improve the data collection process for the engine tests.

NASA's Stennis Space Center is completing updates to its Data Acquisition System at the historic Fred Haise Test Stand to enable collection of critical test information on RS-25 engines that will help power the Space Launch System rocket.

Operators collect data while testing RS-25 engines to better understand the engine and its performance. The data also provides information on test facility systems and helps operators determine if new engine parts and components are achieving the intended results.

The new acquisition system will improve efficiency in collecting data during such engine tests. Before the updates, the low-speed and high-speed channels, both part of the full Data Acquisition System, would take a full day to prepare prior to conducting a typical test.

The low-speed system consists of 512 channels collecting data at 250 samples per second. That equals more than 7.6 million pieces of data per minute.

The high-speed system consists of 256 channels collecting data at 102,400 samples per second. That equals more than 1.5 billion pieces of data per minute. The preparation process for the old system involved operators manually touching every electrical amp for the more than 500 low-speed channels to verify they were set properly to collect information. Engineers would sometimes have to adjust the potentiometers, small resistors used to measure electromotive force, of each amp multiple times to ensure the setup was correct.

With the new system, engineers will be able to complete the same tasks in half the time with keystrokes and a keyboard.

Stennis Space Center is currently preparing to conduct certification tests for production of new RS-25 engines for future Artemis missions. Stennis has already tested engines for the first four Artemis missions.

Every RS-25 engine that will help power the Space Launch System rocket at launch will be tested at Stennis, including those that return the first woman and first person of color to the Moon and those that will power eventual missions to Mars.

"It's a pretty exciting time for us over here at the Fred Haise Test Stand, being able to test the engines that are going to be powering us and Artemis back to the Moon," NASA electrical engineer Cory Beckemeyer said.

Watch the video short on the Data Acquisition System project here.

The last rays of an orbital sunset burst through Earth's horizon as the International Space Station flew 258 miles above Brazil in this image from June 2022. In 24 hours, the space station makes 16 orbits of Earth, traveling through 16 sunrises and sunsets.

NASA in the News

Novel NASA Instrument Sets Sights on Earth-bound Solar Radiation To Learn More

A very small instrument has a big job ahead of it: measuring all Earth-directed energy coming from the Sun and helping scientists understand how that energy influences Earth's severe weather, climate change, and other global forces. About the size of a shoebox or gaming console, the Compact Total Irradiance Monitor is the smallest satellite ever dispatched to observe the sum of all solar energy Earth receives from the Sun — also known as "total solar irradiance." Total solar irradiance is a major component of the Earth radiation budget, which tracks the balance between incoming and outgoing solar energy. Increased amounts of greenhouse gases emitted from human activities, such as burning fossil fuels, trap increased amounts of solar energy within Earth's atmosphere. That increased energy raises global temperatures and changes Earth's climate, which in turn drives things like rising sea levels and severe weather. To learn more about this instrument, click here.

Cloudspotting on Mars Project Invites Public to Identify Clouds in Red Planet Atmosphere

NASA scientists hope to solve a fundamental mystery about Mars' atmosphere and are asking the public to help. They have organized a project called Cloudspotting on Mars that invites the public to identify Martian clouds using the citizen science platform Zooniverse. The information may help researchers figure out why the planet's atmosphere is just 1% as dense as Earth's even though ample evidence suggests the planet used to have a much thicker atmosphere. The air pressure is so low that liquid water simply vaporizes from the planet's surface into the atmosphere. But billions of years ago, lakes and rivers covered Mars, suggesting the atmosphere must have been thicker then. How did Mars lose its atmosphere over time? One theory suggests different mechanisms could be lofting water high into the atmosphere, where solar radiation breaks those water molecules down into hydrogen and oxygen. To read more, click here.

NASA Conducts Water Flush at Historic Fred Haise Test Stand

As NASA's Stennis Space Center prepares to resume testing on RS-25 engines to power the Space Launch Systems to deep space, Stennis Space Center engineers and technicians performed a June 22 water flush of the critical FIREX system at the Fred Haise Test Stand.

The FIREX system, in addition to putting out a fire, can be utilized to mitigate an event involving a cryogenic fluid.

To ensure the system is available as needed, Stennis conducts this routine maintenance procedure every 12 to 24 months. During the procedure, they look for leaks and verify the spray patterns are properly situated.

Functioning like a large plumbing system, water flows from a 66-million gallon reservoir through underground pipes to the test stands.

Much of the system is made up of carbon steel pipe, which can be damaged by cryogenic fluid. Over time, the carbon steel pipe produces carbon steel rust. The smaller pipes in the system can become clogged with debris, which can impact the FIREX nozzles.

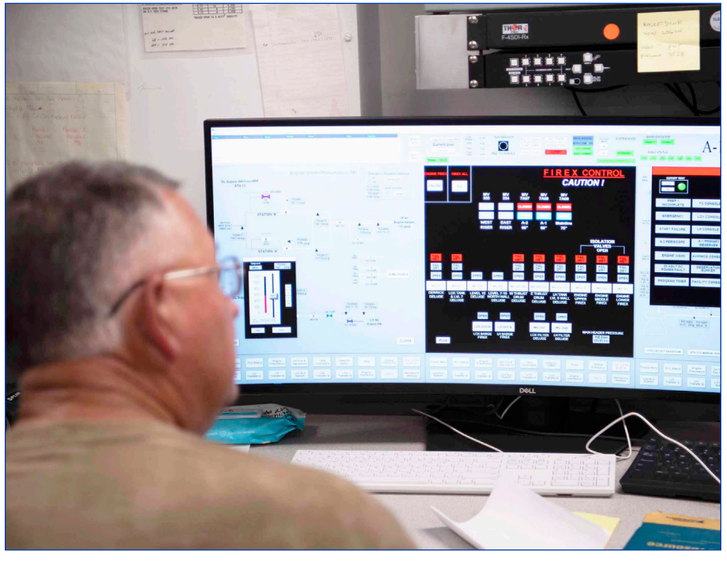
"When you build up that debris, it becomes evident, and it comes out at your nozzles and can plug them," said Jeff Henderson, test director at the Fred Haise Test Stand. "When the nozzle is plugged and water cannot flow, that can affect safety and performance of the testing. We flush out the lines, put the nozzles back on, and do our work."

Throughout the Fred Haise Test Stand there are more than 400 FIREX nozzles. When activated, it performs like a high-powered pressure washing system.

If there were a fire alarm during an engine test, operators in the Fred Haise Test Stand control center can initiate FIREX flows at specific locations as needed. Ready to go at a moment's notice, the nozzles are designed to spray at approximately 220 pounds per square inch within four seconds.

"There's a lot of thinking that goes into (activating the system)," Henderson said. "It's not like a building where the fire alarm goes off and all the sprinklers go off. We have control over what goes off and when. Water could harm the engine. If you get a false alarm, you do not want it automatically going off."

The next RS-25 engine test at the Fred Haise Test Stand is expected to be in late September. After that, approximately 24 tests are scheduled for 2023.



(Left photo) Water flows from the Fred Haise Test Stand at Stennis Space Center during a recent FIREX system flushing procedure. The water flush procedure takes place every 12 to 24 months, depending on the test schedule. The purpose is to push out any carbon steel rust that may clog the smaller pipes of the FIREX system. (Top photo) Engineers and technicians observe the water flush procedure June 22 to look for leaks and to verify that spray patterns are accurate. (Above photo) The FIREX system on the Fred Haise Test Stand is monitored electronically during a water flush procedure June 22. In the event of a fire, the system can be activated and directed to specific locations of the test stand.

NASA's JAMES WEBB SPACE TELESCOPE FIRST IMAGES

Webb Telescope Offers New Views of Universe

NASA's James Webb Space Telescope is the largest and most complex science observatory ever built. During a 10-year mission to space, it is expected to transform how the world views the universe and deliver world-class science. Led by NASA, in partnership with the European and Canadian space agencies, Webb is an international collaboration involving hundreds of scientists and thousands of engineers.

Webb launched December 25, 2021 from French Guiana, to enter an orbit around the Sun and about 1 million miles from Earth.

Following a series of activation and checkout procedures, the telescope's first images were revealed July 12. These first images demonstrate Webb at its full power. Click the links below to learn more.

See the James Webb Space Telescope First Images here.

Download the Webb Space Telescope Poster here.

Learn all there is to know and more about Webb here.

NASA's JAMES WEBB SPACE TELESCOPE FIRST IMAGES

Stephan's Quintet is a visual grouping of five galaxies. It is best known for being prominently featured in the holiday classic film, "It's a Wonderful Life." Now it is being revealed in a new light by the James Webb Space Telescope. It is the largest image to date from the telescope and covers about one-fifth of the Moon's diameter. It contains over 150 million pixels and is constructed from almost 1,000 separate image files.

NASA's JAMES WEBB SPACE TELESCOPE FIRST IMAGES

The young, star-forming region of the universe called NGC 3324 in the Carina Nebula has a landscape of "mountains" and "valleys" speckled with glittering stars, as shown by this image from the James Webb Space Telescope. The image reveals for the first time previously invisible areas of star birth. Webb's seemingly three-dimensional picture looks like craggy mountains on a moonlit evening. In reality, it is the edge of the giant, gaseous cavity within NGC 3324, and the tallest "peaks" in this image are about seven light-years high. The cavernous area has been carved from the nebula by the intense ultraviolet radiation and stellar winds from extremely massive, hot, young stars located in the center of the bubble, above the area shown in this image. Webb reveals emerging stellar nurseries and individual stars that are completely hidden in visible-light pictures. Because of Webb's sensitivity to infrared light, it can peer through cosmic dust to see these objects.

NASA Tops Best Places to Work List

For the 10th consecutive year, the Partnership for Public Service has ranked NASA the Best Place to Work in the Federal Government among large agencies.

The rankings, released July 13, reflect the agency's continuing dedication to supporting and strengthening its workforce while also carrying out its mission of exploration and discovery for the benefit of all humanity.

"For an unprecedented 10th consecutive time, NASA has been named as the Best Place to Work in the federal government among large agencies by the Partnership for Public Service," said NASA Administrator Bill Nelson. "This is only possible because of the NASA family, which empowers our agency to continue achieving monumental milestones that shape history and benefit all of humanity. I am deeply proud to be a part of and represent such a creative and talented workforce.

"Despite a global pandemic, we came together to make 2021 a banner year for space exploration and discovery," Nelson added. "And we are poised to accomplish more daring feats with new advancements in aeronautics, more scientific contributions, and incredible technological breakthroughs, especially as our Artemis I mission paves the way for future crewed missions to the Moon and beyond."

The Best Places to Work in the federal government rankings are based on responses to the Office of Personnel Management's annual Federal Employee Viewpoint Survey from almost 624,800 employees at 482 federal agencies and offices. The Partnership for Public Service began publishing the rankings in 2003.

View the rankings here.

U.S. Navy to Open New Operations Range

The U.S. Navy will begin routine live-fire exercises August 2022 at its Western Maneuver Area (WMA) located within the NASA controlled area known as Stennis Space Center.

The purpose of these live-fire exercises is to provide U.S. armed forces with the ability to receive qualification credentials for a course known as the Joint Terminal Attack Controller Course. This course gives operators the ability to direct attacks from U.S. or allied aircraft to a specific and accurate location for close air support. Enhanced close air support ability in combat is devastating to America's enemy combatants and is an effective offensive shield for American and allied troops on the ground in hostile areas.

Currently, dry-run flights are being conducted for orientation, communications checks, flight path clarity, and to work through air space closure operating procedures. The dry-run exercises are designed to enhance the safety and effectiveness of the course.

The expected use and duration of this land for these types of missions is roughly six times through the rest of calendar year 2022. In future years, the qualification course could be conducted as many as 40 times with the qualification course lasting from two to three days and with each of these exercises occurring at night.

Due to the remote nature of the land used in the WMA, local residents in the municipalities closest to the exercise area will likely never hear or see the aircraft exercises due to the buffer zone and the Pearl River Wildlife Management Area that exists between them.

An extensive environmental study has been completed and has determined that no significant or adverse effects to human health or environmental effects are expected. The study looked at possible effects on surface water, ground water, air quality, and biological resources (vegetation or wildlife and soil).

Various measures also are planned to ensure safe communications and operations in the area and will be monitored by an assigned Range Control Officer. Ground support personnel will ensure the range area is clear prior to all operations. During operations, multiple confirmations will be required to initiate systems firing, and systems have safeguards that will not allow them to fire unless they are properly angled.

"The health and safety to local communities and natural resources is our top priority," said Ron Jenkins, the community planning and liaison officer for the Naval Construction Battalion Center. "A lot of planning and effort has gone into choosing this unique site to conduct this training in this remote area. Without the support of this training area by NASA and the local community, it would be more difficult to keep service members trained in this proven U.S. service member life-saving combat capability."

"We appreciate the diligence of the Navy Special Warfare Command in the planning and activation of the new training area," Stennis Space Center Director Dr. Rick Gilbrech said. "They have demonstrated a clear commitment to ensuring safe operations, and we are proud to support this critical training opportunity for our U.S. forces."

(Provided by Brian Lamar with the Naval Construction Battalion Center in Gulfport, Mississippi.)

Stennis News

Hancock Whitney Advisory Board Visit Stennis

Members of the Hancock Whitney Advisory Board stand in front of the B Test Stand during a Stennis Space Center visit June 28. The group was welcomed by Stennis Space Center Associate Director Rodney McKellip. McKellip gave an overview of Stennis prior to the advisory board meeting held in the Gainesville Conference Room of the Roy S. Estess Building.

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, 35 Stennis Space Center employees have been cited for their Artemis-related efforts. The latest honoree is NASA employee Trevor Brownlow.

As a public affairs specialist in the Office of Communications, Brownlow was a key member in supporting and executing a successful Green Run hot fire viewing for high-level officials and special guests. He also used his writing skills to develop a wrap-up story for the current RS-25 engine test series.

Stennis News

GenSea, USM For Stem Educators Visit Stennis

Members of GenSea and the University of Southern Mississippi (USM) for Stem Educators group stand in front of the B Test Stand during a day-long visit to Stennis Space Center on June 9. The group's tour of the site included visits to Aerojet Rocketdyne's Engine Assembly Facility and the USM Division of Marine Science, Hydrographic Science Research Center, Center for Gulf Studies, and Center of Higher Learning, all located at Stennis. GenSea is a partnership at USM to introduce students to career opportunities in the coastal corridor. It is led by USM's Center for STEM Education and the School of Ocean Science and Engineering.

Stennis Teaches Kids about Life in Space during Astro Camp

Stennis Visitor Relations Specialist Vicki Bess presents the "Living and Working in Space" demonstration to participants in the Lynn Meadows Discovery Center Astro Camp on June 15 in Gulfport, Mississippi. Astro Camp presents math and science principles through fun, hands-on activities that inspire future astronauts and engineers to learn about space with NASA unique activities.

Stennis Contract Specialist Plays Key Role

Contract Specialist Sarah Maine supports NASA missions through the Office of Procurement. Maine has supported several major contracts in her 15 years at Stennis Space Center and received multiple awards for her efforts.

There was not a cloud in sight when Sarah Maine heard a thunder-like sound in the distance as a young child growing up in Slidell, Louisiana. She remembers her parents saying, "They must be testing rocket engines today," referring to what is now Stennis Space Center.

It was Maine's earliest space memory, and little did she know at the time that one day she would make her way to the very place her parents referenced.

Maine began supporting NASA product operations at Michoud Assembly Facility in New Orleans, Louisiana, through an internship as contract administrator with the Defense Contract Management Agency.

Shortly after completing the internship, Maine was hired by NASA as contract specialist in the Office of Procurement and started permanently working at Stennis.

She has supported several major contracts in her 15-plus years with the Office of Procurement, including the Synergy-Achieving Consolidated Operations and Maintenance SACOM), Facility Operations Services, and Information Technology Services contracts, as well as many smaller ones over the years.

She administratively supported Green Run testing at Stennis, which was the first "full-up" test of the Space Launch System core stage and all of its integrated systems, as a contracting officer on the SACOM contract.

In 2021, Maine was recognized in a group award with the Silver Achievement Medal for Operational Readiness of B-2 and the SLS Core Stage. Previously she was awarded the Early Career Achievement Metal.

More recently, Maine has worked as contracting officer for the Lab Services Contract and the new construction task order under the Multiple Award Construction Contract.

The Louisiana native also has supported the Procurement Management Review for the Office of Procurement at NASA Headquarters. Maine also currently serves as executive secretary for the Stennis Control Board.

The contract specialist points to the environment created at Stennis through a diverse workforce as the best part of working at Stennis.

Looking forward, Maine ssaid she is most excited about what is to come at Stennis, the innovative genius concept or idea that will be tested next, and the various commercial, even global, companies Stennis will be doing business with in the future.

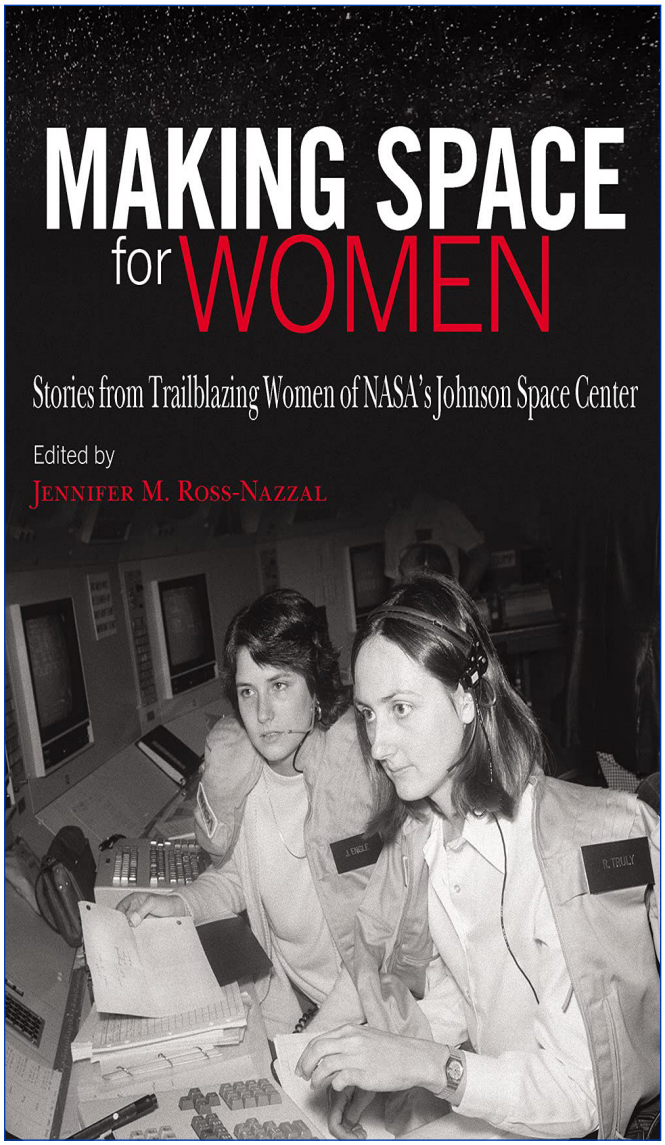
History Shows Women Make Space a Better Place

When one thinks about the nation's space history, they might consider all the accomplishments, inventions, and discoveries made by those working to help advance space exploration efforts. Yet, the women who helped make the history might not come to mind.

Earlier this year, a book titled, "Making Space for Women: Stories from Trailblazing Women of NASA's Johnson Space Center" was released. The book was edited by Johnson Space Center historian Jennifer M. Ross-Nazzal.

Ross-Nazzal always has been interested in the history of women and, specifically, in learning more about the history of women in NASA. She believes there is great public interest in that as well.

"I get a lot of calls and emails from people who want to know more about women at NASA," Ross-Nazzal said. "I think the only way we will capture that history, at least from those early years, is with oral history."



Making Space for Women details how careers for women at NASA have changed in the past 50 years as the workforce has become more diverse.

The recent book captures 21 in-depth interviews for the NASA Oral History Project with women who worked in the space program at Johnson Space Center. All come from different backgrounds, experiences, and educations to form a career in a field once exclusively for men. They discuss leadership, teamwork, the lessons they learned along the way and their experiences of being "the first."

Another reason Ross-Nazzal's wanted to do the book is to encourage young girls and college-age women to think about careers in science, technology, engineering, mathemathics, and aerospace.

"I don't think that they necessarily consider it," she said. "But I think if I had read some of these stories or was more aware of these type of opportunities, I might have considered a different path for myself, so I think it is very important to capture these histories and make them available."

The book reveals how careers for women at Johnson Space Center have changed over the past 50 years as career fields once closed to women began to open to them with the changing agency.

The stories show that there is no limit to a career at NASA for those who choose to seize the opportunities and inspire others.

Jennifer M. Ross-Nazzal is a two-time recipient of the Society for History in the Federal Government's Charles Thomson Prize and a member of the editorial board for Quest: The History of Spaceflight Quarterly. She has published numerous articles and is the author of "Winning the West for Women: The Life of Suffragist Emma Smith DeVoe."

Hail & Farewell

NASA welcomes the following:

Patrick Appleman	Director	Center Operations Directorate
Rebecca Mayata	Management and Program Analyst	Office of the Chief Financial Office

NASA bids farewell the following:

Gage Haas	AST, Electrical Experimental	Engineering and Test Directorate

Office of Diversity and Equal Opportunity

Generational Differences in the Workplace

The workplace has become more diverse and adapted to many changes in recent years. While overcoming unique challenges of working from home and navigating the future of work, the workplace also has become more generationally diverse.

According to a recent generational study by Purdue University Global, there are five generations within the workforce: Traditionalists, Baby Boomers, Generation X, Generation Y, and Generation Z. Members of each generation has their own set of attributes and characteristics stemming from the social, cultural, economic, and advances in technology that occurred during their childhoods. These different attributes and characteristics create a diverse and dynamic workplace.

Traditionalists are people born before 1946 and make up about 2% of the country's workforce. They were shaped by The Great Depression, World War II, radio, and movies. Traditionalists can be described as dependable, straightforward, tactful, and loyal, which makes them the most likely to work for the same organization until retirement. They appreciate meaningful work and enjoy stability and personal connection. Traditionalists value respect, recognition, obedience, and prefer advancing through a workplace hierarchy.

Baby Boomers were born between 1946 and 1964 and make up 25% of the country's workforce. Their generation was shaped by the Vietnam War, the Civil Rights Movement, and Watergate. Baby Boomers can be described as optimistic, competitive, workaholics, and team-oriented. The generation values company loyalty, teamwork, and duty. Boomers appreciate the opportunity to learn new skills and career development but are dedicated to the enterprise. They believe that achievement comes after dues are paid, and success comes after sacrifice. Individuals in this generation prefer ways to measure success for their career progression, like goal setting and deadlines. Moreover, they can enjoy mentor roles and coaching-style feedback.

Generation X are individuals born from 1965 to 1980. They make up 33% of the country's workforce. Members of this generation were shaped by the AIDs epidemic, the fall of the Berlin Wall, and the dot-com boom. Generation X employees can be described as flexible, informal, skeptical, and independent. They value personal career goals, rather than the institution that they work for, and are motivated by diversity and a work-life balance. They respond well to feedback, a flexible work schedule, and, lastly, career and personal development.

Generation Y, also known as Millennials, were born from 1981 to 2000 and make up 35% of the country's workforce. Millennials were shaped by Columbine, 9/11, and the internet. They can be described as civic-minded, open-minded on diversity, and achievement-oriented. Individuals of Generation Y are motivated by responsibility and personal growth, which makes these employees seek a unique work experience and more likely to leave an organization if they have concerns with the workplace. Generation Y grew up with a rise of technology, which makes them adaptable to change and able to efficiently communicate through email and texts.

The last generation in the workplace is Generation Z. These employees were born after 2001 and make up 5% of the country's workforce. They are shaped by the aftermath of 9/11, the Great Recession, and the rapid expansion of the digital age. Generation Z can be described as global, entrepreneurial, progressive, and less focused. They are motivated by individuality and creativity. Generation Z follows millennials by being on the cutting edge of the digital age. As a result, they prefer to work with new technologies and prefer social media. Generation Z can work on multiple projects at the same time and like to work independently.

Each generation brings its own unique characteristics to the workplace that can be beneficial. By understanding and acknowledging the differences, employees can avoid ineffective communication, intergenerational conflict, negative judgments of co-workers, and decreased productivity. Learning and understanding how to work together with individuals of different generations can help create a more inclusive workplace. When working with a multigenerational team, one should think about how to include each person's unique generational attributes to promote inclusion when addressing the task at hand.

For more information, visit: Purdue Global: Generational Differences in the Workplace

Online Resources

Watch Orion's Journey

Part 1: Leaving Earth

Part 2: Entering Distant Retrograde Orbit

Part 3: Return Home

WDSU-TV Interview with Stennis Engineer Travis Martin

Video Short: Thrust Vector Control System

Video Short: Data Acquisition System

I Am Stennis Facebook Videos

Stennis Fact Sheets

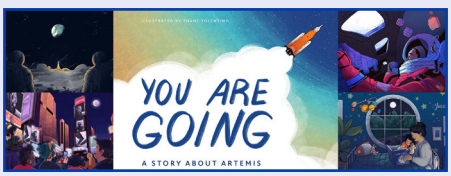
Hubble: Not Yet Imagined

Stennis Artemis Resources

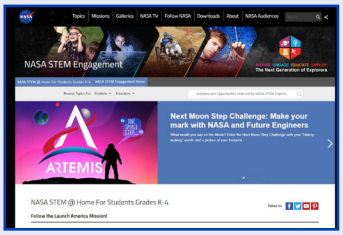
Stennis Emergency Management

Stennis Virtual Tour

First Woman Graphic Novel



You Are Going Children's Book



NASA STEM@Home for Students