

National Aeronautics and
Space Administration



2024 KENNEDY SPACE CENTER

Annual
Report





Photographers at NASA capture the sunset on Tuesday, Jan. 30, 2024, near Vehicle Assembly Building at the agency's Kennedy Space Center in Florida. The iconic Vehicle Assembly Building, completed in 1966 and currently used for assembly of NASA's Space Launch System rocket for Artemis missions, remains the only building in which rockets were assembled that carried humans to the surface of another world. Photo credit: NASA/Ben Smegelsky

Table of Contents

4	Center Director's Message
5	Vision, Mission, and Core Competencies
6	Significant Events
12	Center Planning and Development
14	Commercial Crew Program
18	Launch Services Program
22	Artemis
28	Exploration Research and Technology
32	Engineering
36	Spaceport Integration and Services
42	Safety and Mission Assurance
46	Center Engagement & Business Integration Services
50	Business Report

KENNEDY SPACE CENTER HEADQUARTERS



Center Director Welcome

It's been another exciting fiscal year at NASA's Kennedy Space Center in Florida! Supporting a steady cadence of government, commercial, and private missions in addition to serving as the agency's main launch site, every day at Earth's premier spaceport is leading the way to a future filled with discovery, innovation, and inspiration.

More than 65 missions lifted off from the Space Coast in FY24, and that demand continues to rise. With 100 commercial partners and nearly 250 partnership agreements, our spaceport is providing continuous access to space through creativity and innovation. The future of space includes a robust space economy, both in low-Earth orbit and on and around the Moon. Now more than ever, Kennedy is committed to supporting at the highest level.

We are living in a time that pioneers of the past could only dream of – regularly delivering crews and science to and from the International Space Station, launching planetary science missions that tell us more about our home and the universe in which we live, and equipping explorers to venture back to the Moon and deeper into space than ever before. There are mysteries that beckon, and every program and organization at Kennedy plays a role in unlocking the secrets of the universe for the benefit of all humanity.

The pages that follow are filled with some of the remarkable achievements we've seen at Kennedy over the last 12 months. Behind each of those accomplishments is a workforce dedicated to furthering the NASA mission. They represent the dreams of the people who have gone before us, and the hope of the generations to come. They are the reason we embrace the challenges of innovation and exploration. Because of them, Kennedy has continued to rank among the Best Places to Work in Federal Government, and because of them the name of our center will continue to be synonymous with inspiration. We are launching the missions of tomorrow, we are launching the dreams of the nation, and we are launching humanity's future.



Embrace the Challenge.

Janet Petro

VISION

Igniting space exploration and discovery for all.

MISSION

Provide continuous access to space from Earth's premier spaceport through creativity and innovation.

***Launching
Humanity's Future***

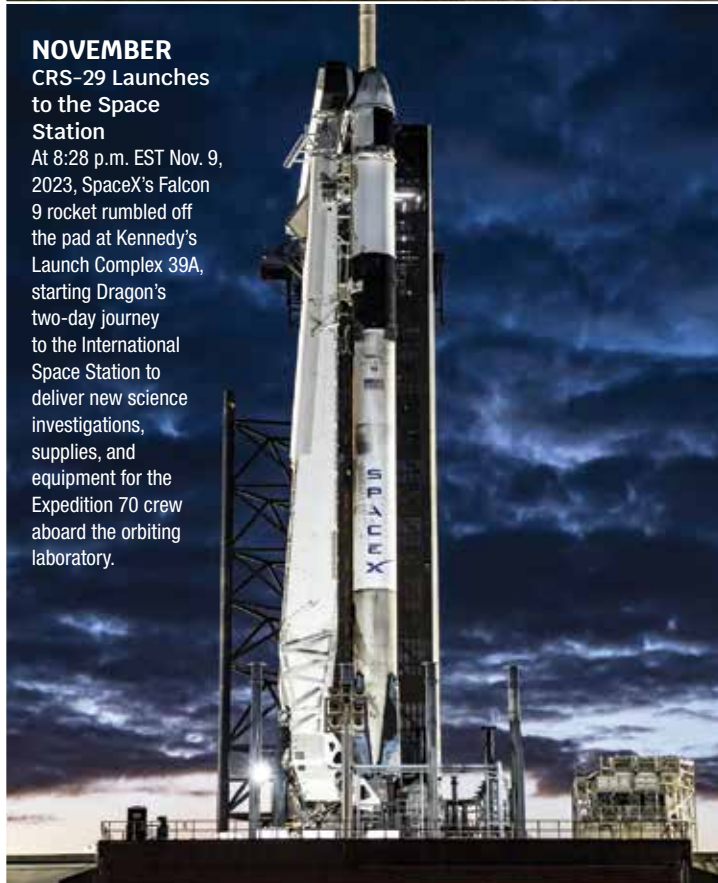
Top 20 Significant Events



OCTOBER 2023
Psyche Launches to a Metal Asteroid
 NASA's Psyche spacecraft began its six-year voyage to an asteroid of the same name, a metal-rich world that could tell us more about the formation of rocky planets, after successfully launching aboard a SpaceX Falcon Heavy rocket from Kennedy's Launch Pad 39A at 10:19 a.m. EDT on Oct. 13, 2023.



OCTOBER
Record Number of Sea Turtle Nests at KSC
 Biologists counted 13,935 sea turtle nests along Kennedy's shoreline during the 2023 nesting season, 639 more nests than 2022 and the most found on center in a single year since record-keeping began in 1984. All the sea turtle nests found belonged to species identified by the U.S. National Park Service as endangered or threatened.



NOVEMBER
CRS-29 Launches to the Space Station
 At 8:28 p.m. EST Nov. 9, 2023, SpaceX's Falcon 9 rocket rumbled off the pad at Kennedy's Launch Complex 39A, starting Dragon's two-day journey to the International Space Station to deliver new science investigations, supplies, and equipment for the Expedition 70 crew aboard the orbiting laboratory.

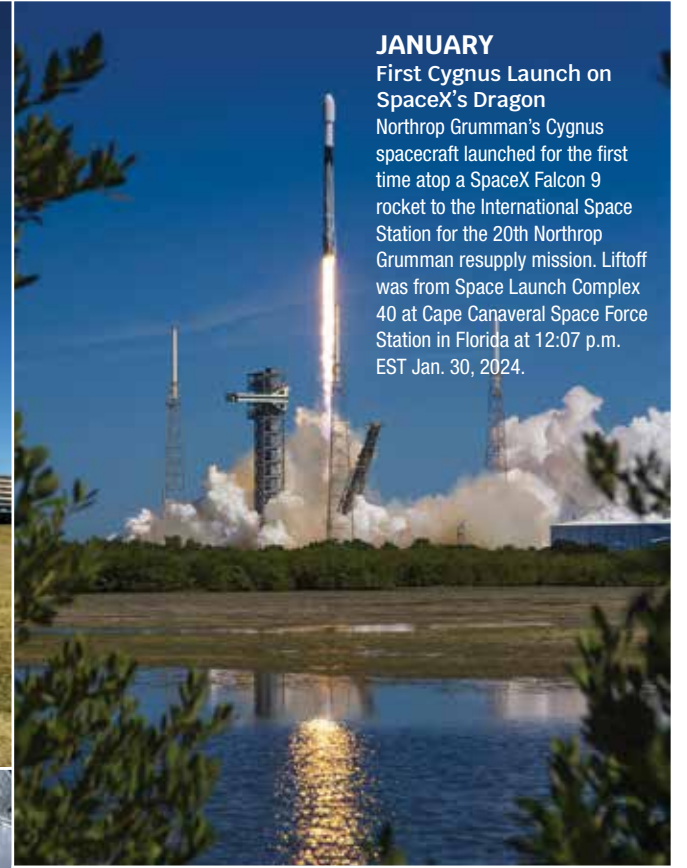


DECEMBER
SSPF Changes Name 25 Years After First Space Station Module
 Exactly 25 years after the first module for the International Space Station left the facility for launch to orbit, the Space Station Processing Facility (SSPF) was renamed "Space Systems Processing Facility," reflecting its progression into a workplace for processing hardware bound for the station as well as to the Moon and beyond.

Top 20 Significant Events



JANUARY 2024
ULA's Vulcan Launch Marks Multiple Firsts
 The inaugural launch of United Launch Alliance's Vulcan rocket also marked the first flight of NASA's CLPS (Commercial Lunar Payload Services) initiative, as the new rocket with Astrobotic's Peregrine lunar lander aboard lifted off from Space Launch Complex 41 at Cape Canaveral Space Force Station in Florida at 2:18 a.m. EST Jan. 8, 2024.



JANUARY
First Cygnus Launch on SpaceX's Dragon
 Northrop Grumman's Cygnus spacecraft launched for the first time atop a SpaceX Falcon 9 rocket to the International Space Station for the 20th Northrop Grumman resupply mission. Liftoff was from Space Launch Complex 40 at Cape Canaveral Space Force Station in Florida at 12:07 p.m. EST Jan. 30, 2024.



FEBRUARY
NASA's PACE Satellite Launch
 NASA's PACE (Plankton, Aerosol, Cloud, ocean Ecosystem) spacecraft launched on a SpaceX Falcon 9 rocket from Cape Canaveral Space Force Station's Space Launch Complex 40 at 1:33 a.m. EST Feb. 8, 2024. The Earth-observing satellite will help us better understand how the ocean and atmosphere exchange carbon dioxide. It will also show how aerosols might fuel phytoplankton growth in the surface ocean.



FEBRUARY
CLPS IM-1 Launch to the Moon
 Intuitive Machines' Nova-C-class lunar lander, launched at 1:05 a.m. EST Feb. 15, 2024, from Launch Complex 39A at Kennedy Space Center in Florida. IM-1 landed on the Moon's South Pole region near the lunar feature known as Malapert A on Thursday, Feb. 22, 2024. The launch is part of NASA's Commercial Lunar Payload Services initiative and Artemis campaign.

Top 20 Significant Events

FEBRUARY

Practice for Artemis II Splashdown Ramps Up
Members of NASA's Exploration Ground System's Landing and Recovery team and partners from the Department of Defense aboard the USS San Diego practice recovery procedures using the Crew Module Test Article during Underway Recovery Test 11 off the coast of San Diego on Feb. 23, 2024.



MARCH

NASA's SpaceX Crew-8 Launch to the Space Station
NASA astronauts Matthew Dominick, commander; Michael Barratt, pilot; and mission specialist Jeanette Epps, as well as Roscosmos cosmonaut mission specialist Alexander Grebenkin, headed to the International Space Station on NASA's SpaceX Crew-8 mission at 10:53 p.m. EDT March 3, 2024.

MARCH

SpaceX Launches 30th Resupply Services Mission for NASA

SpaceX's 30th Commercial Resupply Services mission for NASA lifted off from Space Launch Complex 40 at Cape Canaveral Space Force Station in Florida at 4:55 p.m. EDT on March 21, on a journey to deliver more than 6,200 pounds of cargo. NASA and partner research on board includes a look at plant metabolism in space and a set of new sensors for free-flying Astrobee robots to provide 3D mapping capabilities to the International Space Station.



APRIL

North America Solar Eclipse

The Solar Eclipse captivated the world as it swept across parts of North America on April 8, 2024, and NASA Kennedy provided coverage on air and online for viewers at home, sharing the point of totality from multiple cities along the eclipse's path.



MAY

Sierra Space Dream Chaser Spaceplane Arrives at NASA Kennedy
Sierra Space's Dream Chaser spaceplane, named Tenacity, arrived at Kennedy on May 18, 2024, and joined its companion Shooting Star cargo module, which arrived on May 11, to undergo final testing and prelaunch processing inside the high bay of the Space Systems Processing Facility.



JUNE

NASA's Boeing Crew Flight Test Launch
NASA astronauts Butch Wilmore and Suni Williams made history at 10:52 a.m. EDT June 6, 2024, when they launched to the International Space Station aboard Boeing's Starliner spacecraft atop a United Launch Alliance Atlas V rocket at Space Launch Complex-41 as part of NASA's Boeing Crew Flight Test.

Top 20 Significant Events

MAY

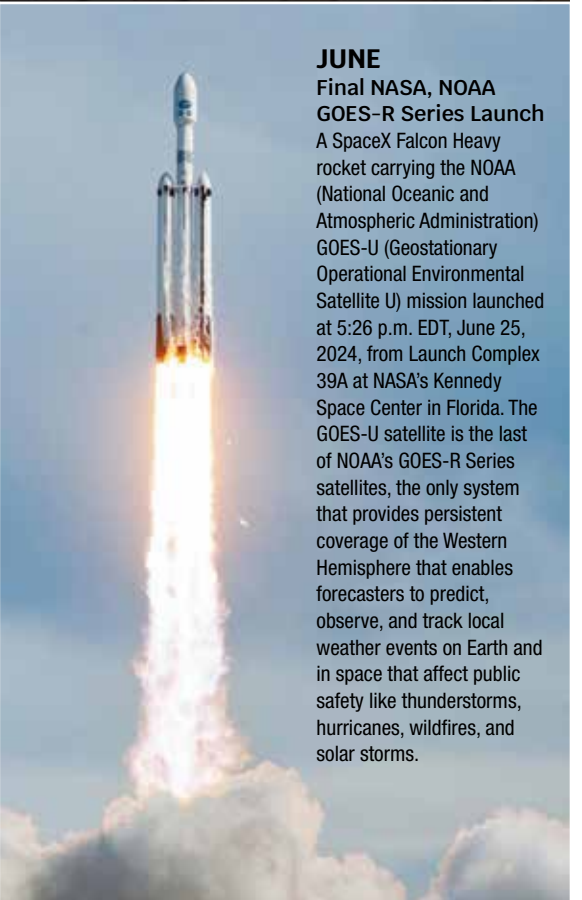
Original NASA Kennedy Headquarters Historical Marker Installation
Center leaders unveiled a large, bronze plaque marker on May 28, 2024, at the site of the original headquarters building just west of the seven-story, 200,000 square foot Central Campus Headquarters Building on NASA Parkway at NASA's Kennedy Space Center in Florida.



JUNE

Final NASA, NOAA GOES-R Series Launch

A SpaceX Falcon Heavy rocket carrying the NOAA (National Oceanic and Atmospheric Administration) GOES-U (Geostationary Operational Environmental Satellite U) mission launched at 5:26 p.m. EDT, June 25, 2024, from Launch Complex 39A at NASA's Kennedy Space Center in Florida. The GOES-U satellite is the last of NOAA's GOES-R Series satellites, the only system that provides persistent coverage of the Western Hemisphere that enables forecasters to predict, observe, and track local weather events on Earth and in space that affect public safety like thunderstorms, hurricanes, wildfires, and solar storms.



Top 20 Significant Events



JULY
NASA's Artemis II Core Stage Arrival
 NASA's SLS (Space Launch System) rocket core stage, which will be used to power humans around the Moon for the agency's Artemis II launch, arrived on July 23, 2024, at NASA's Kennedy Space Center in Florida. The move to NASA Kennedy marks a major milestone as the last stop before final preparations are made for launch.



SEPTEMBER
NASA's Boeing Crew Flight Test Mission Lands
 On Sept. 7, 2024, at 12:01 a.m., NASA's Boeing Crew Flight Test's Starliner spacecraft landed uncrewed at White Sands Space Harbor in New Mexico, concluding a three-month flight test to the International Space Station.



AUGUST
NASA's NG-21 Resupply Launch to Space Station
 NASA science investigations, supplies, and equipment launched aboard a Cygnus spacecraft as part of Northrop Grumman's 21st resupply mission to the International Space Station at 11:02 a.m. EDT Aug. 24, 2024, from Space Launch Complex 40 at Cape Canaveral Space Force Station in Florida.



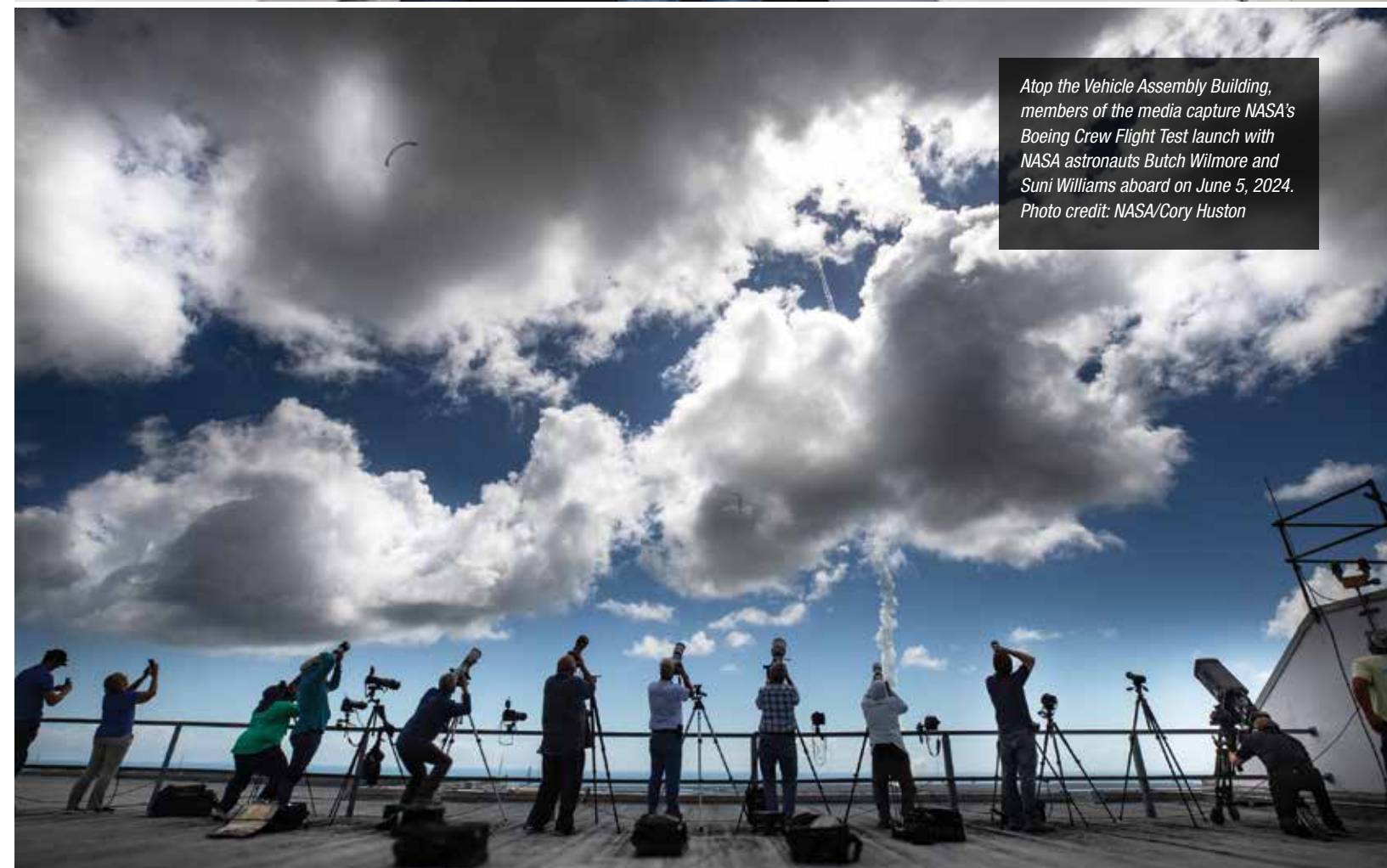
SEPTEMBER
NASA's SpaceX Crew-9 Completes Journey to Space Station
 NASA SpaceX Crew-9 astronaut Commander Nick Hague, right, and Roscosmos cosmonaut Mission Specialist Aleksandr Gorbunov, left, are at the International Space Station after a successful liftoff aboard a SpaceX Dragon spacecraft atop a Falcon 9 rocket. The launch at 1:17 p.m. on Sept. 28, 2024, was the first crewed mission from Space Launch Complex 40 at Cape Canaveral Space Force Station in Florida.

Space Chroniclers

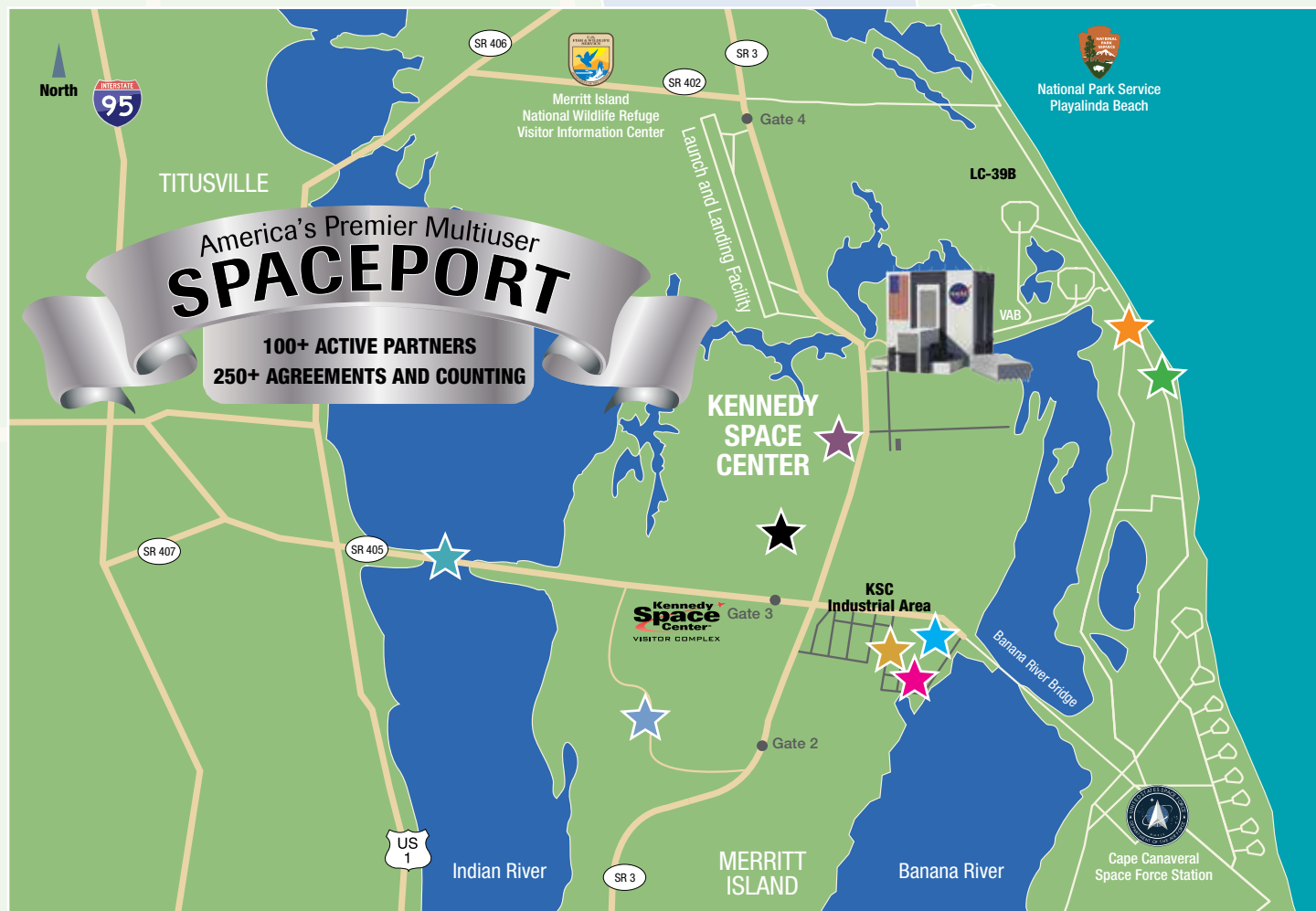
Dan Billow, Mike Brown, and Maggie Persinger were honored May 15, 2024, during the 2024 Chroniclers ceremony at the Press Site at NASA's Kennedy Space Center in Florida. Three brass plates bearing their names were added to the wall of the "bull pen," where reporters traditionally gather to cover launches and events at NASA Kennedy. The three were honored for their efforts in helping tell the story of America's space program, primarily from the Florida spaceport. They were nominated by their peers and selected by a panel of NASA officials and current space reporters. Photo credit: NASA/Glenn Benson



Atop the Vehicle Assembly Building, members of the media capture NASA's Boeing Crew Flight Test launch with NASA astronauts Butch Wilmore and Suni Williams aboard on June 5, 2024. Photo credit: NASA/Cory Huston



Center Planning and Development



KSC MASTER PLAN

Kennedy's updated Master Plan builds off the center's 2024 Framework Plan and 2021 Future Development Concept that identified projects to support the immediate success of NASA programs while enabling the agency's long-term future missions. While the concept consists of larger-scale strategies to support NASA and commercial partner operations over the next 20 years, the updated Master Plan will provide a more detailed regulatory framework that can serve as a blueprint to continue the center's evolution as Earth's premier spaceport. The Master Plan update is expected to be complete in the spring of 2025.

UNDEVELOPED LAND

Kennedy Space Center has undeveloped land identified in the Master Plan that could support additional space-related operations. KSC periodically publishes Requests for Information and competitive announcements on SAM.gov and also links these opportunities on the Kennedy Partnerships website. This supports NASA Kennedy's spaceport objectives to effectively use land suitable for new development. Interested parties are encouraged to respond during open announcement periods.

PARTNERSHIPS WEBSITE

Anyone wishing to discuss a partnership with Kennedy Space Center can visit the center's Partnership webpage and fill out the "Ready To Partner?" form to learn more about what the center offers for space-related research and development groups affiliated with higher education, government agencies, and the private sector. NASA Kennedy has a wide variety of tools that can be used for the space industry, including physical assets, technical laboratories, support services, payload processing, and a highly skilled and educated workforce.

<https://public.ksc.nasa.gov/partnerships>

★ SPACEX EXPANSION

Following a federally required environmental review process, SpaceX and NASA have agreed to a 100-acre expansion for the company's Roberts Road campus inside Kennedy Space Center. With this expansion, SpaceX can consolidate much of its on-center operations into one location, with the extra room mostly earmarked for Starship-Super Heavy rocket development. Upgrades for various utilities are included, as is a widening of Saturn Causeway to support transports to Launch Complex 39A, where SpaceX already launches Falcon rockets. The company is considering options to launch Starship from that same pad, pending a mandated environmental review by the Federal Aviation Administration (FAA).

★ INDIAN RIVER BRIDGE

The primary access for workers and visitors has seen a nearly 300% growth in transport traffic since the first of two new high-rise bridges spanning the Indian River was opened by the Florida Department of Transportation in June 2023, replacing the drawbridges built during the Apollo Program. The new bridges can handle the larger equipment needed to support NASA, military, and commercial space missions, including flight hardware. Both bridges are also designed for the increased commuter traffic expected with the spaceport's projected growth. Construction on the second high-rise bridge is about a year ahead of schedule, with a new targeted completion date of early 2025.

★ SECOORA HIGH-FREQUENCY RADAR

A partnership between NASA, the National Oceanic Atmospheric Administration (NOAA), the Southeast Coastal Ocean Observing Regional Association (SECOORA), and the University of Georgia's Skidaway Institute of Oceanography led to the installation of a new high-frequency radar system at Kennedy Space Center. This capability fills an important gap in NOAA's Integrated Ocean Observing System, providing real-time surface current information that can be used to bolster near-shore search, rescue, and recovery efforts along with monitoring water quality and tracking oil spills, marine shipping and harmful algae blooms. The data can be used for more accurate forecasts of near-shore marine conditions off the NASA Kennedy shore.

★ LAUNCH COMPLEX 48

Kennedy Space Center officials are developing strategies to support the expanding small class launch vehicle and small satellite industry at Space Launch Complex 48 at Kennedy Space Center in Florida. Located in between Launch Complex 39A at Kennedy Space Center and Space Launch Complex-41 at Cape Canaveral Space Force Station, the current development plan calls for Space Launch Complex 48 to be a multi-user launch site versatile enough to support a wide range of uses. A prior "Request For Information" public process is helping to guide the center's long-term strategy for small class vehicle launch operations. Space Launch Complex 48 currently has one small class vehicle launch pad built and can support the construction of another within its footprint.

★ SPACE LIFE SCIENCES RESEARCH

Various university partnerships are helping NASA determine how plants and food that astronauts need to survive in space can grow and thrive. Among them are two food growth research projects involving lunar and Martian soil with the Florida Institute of Technology (FIT) in Melbourne, and Winston Salem State University (WSSU) in North Carolina. NASA plans to extend the FIT agreement an additional two years, while the WSSU agreement is an expansion of a longstanding partnership. NASA also is working with the U.S. Department of Agriculture to develop imaging techniques for monitoring plant health and the U.S. Department of Defense to help develop biomanufacturing in space.

★ SPACE SYSTEMS PROCESSING FACILITY

NASA is gauging interest from the U.S. commercial space sector in leasing the Space Systems Processing Facility and three associated facilities inside Kennedy Space Center's Industrial Area once the agency's operation of the International Space Station ends in the year 2030. The agency will only consider proposals to process and test flight hardware designed for space, launch or re-entry vehicles, and ones that further the center's vision as Earth's premier spaceport.

★ SATURN CAUSEWAY SUBSTATION

A new electrical substation has been built by local utility provider Florida Power & Light near the southwest corner of Kennedy Parkway and Saturn Causeway. The substation provides a needed power boost to new facilities planned for commercial space development at the Launch and Landing Facility currently leased by Space Florida, the state's aerospace finance and development authority. The substation, which went online in the summer of 2024, also is designed to support SpaceX's current expansion plans for its Roberts Road facilities. An easement and license were implemented for the power transmission distribution lines.

★ SPACE COMMERCE WAY EXPANSION

The widening of Space Commerce Way from NASA Parkway West to Kennedy Parkway is now complete. The road was expanded from two lanes to four as part of a nearly \$23 million Florida Department of Transportation project supporting the continued growth of commercial space businesses. Space Commerce Way is now capable of transporting oversized space vehicles from those businesses to Kennedy Space Center's launch sites. The road also remains the main access point for the Kennedy Space Center Visitor Complex.

Commercial Crew Program

NASA's Commercial Crew Program (CCP) continued delivering on its goal of safe, reliable, and cost-effective human transportation to and from the International Space Station through partnership with commercial companies Boeing and SpaceX over the course of fiscal year 2024.

NASA and Boeing launched the agency's Crew Flight Test, the first crewed flight of Boeing's Starliner spacecraft. NASA astronauts Butch Wilmore and Suni Williams lifted off atop a United Launch Alliance Atlas V rocket from Space Launch Complex-41 (SLC-41) at Cape Canaveral Space Force Station (CCSFS) in Florida on June 5, 2024. During their flight, Wilmore and Williams successfully performed manual piloting demonstrations of Starliner before autonomously docking to the forward port of the space station's Harmony module at 1:34 p.m. EDT on June 6.

As part of NASA's certification process, the flight was an end-to-end test of Starliner and its systems, aimed at validating the launch pad, rocket, spacecraft, in-orbit operational capabilities, and a successful return to Earth in support of future rotation missions. During Starliner's approach to the space station, NASA and Boeing identified helium leaks and experienced issues with the spacecraft's service module propulsion system, prompting the agency's decision to return Starliner to Earth uncrewed out of an abundance of caution. The spacecraft autonomously undocked from the station at 6:04 p.m. EDT on Sept. 6 and performed safe and successful deorbit, entry, and parachute-and-airbag-assisted landing about six hours later at White Sands Space Harbor in New Mexico. Wilmore and Williams will remain on board the orbiting laboratory, continuing their work as part of the Expedition 71/72 crew and returning on a SpaceX Dragon spacecraft as part of the Crew-9 mission in late February 2025.



Boeing's Starliner spacecraft that launched NASA's Crew Flight Test astronauts Butch Wilmore and Suni Williams to the International Space Station is pictured docked to the Harmony module's forward port. Photo credit: NASA



NASA's Boeing Crew Flight Test astronauts (from top) Butch Wilmore and Suni Williams pose for a portrait inside the vestibule between the forward port on the International Space Station's Harmony module and Boeing's Starliner spacecraft. Photo credit: NASA

A United Launch Alliance Atlas V rocket with Boeing's CST-100 Starliner spacecraft aboard launches June 5, 2024, from Space Launch Complex 41 at Cape Canaveral Space Force Station, in Florida. Photo Credit: NASA/Joel Kowsky





A colorful sunset serves as the backdrop for SpaceX's Falcon 9 rocket and Dragon spacecraft on the pad at Launch Complex 39A at Kennedy Space Center in Florida on Feb. 26, 2024, ahead of NASA's SpaceX Crew-8 mission. Photo credit: SpaceX

By the end of the fiscal year, SpaceX had launched two operational missions to the space station with astronauts, bringing the company's total flight count to 10 crewed missions for NASA. These launches continued to see more reuse components on the Dragon spacecraft and Falcon 9 rocket certified by Commercial Crew.

On March 3, 2024, Crew-8 launched aboard a SpaceX Falcon 9 rocket from Launch Complex 39A (LC-39A) at NASA's Kennedy Space Center in Florida. The Dragon spacecraft, named Endeavour, carried NASA astronauts Matthew Dominick, Michael Barratt, and Jeanette Epps, as well as Roscosmos cosmonaut Alexander Grebenkin to the orbiting laboratory for a six-month science mission. This was the fifth flight for Endeavour, which previously supported SpaceX's Demo-2, Crew-2, Crew-6, and Axiom Space's Ax-1 flight, making this the fleet leader for CCP. Following a brief handover, Crew-7 – the first Commercial Crew flight with three international partners – undocked from the space station and splashed down in the Gulf of Mexico off the coast of Pensacola, Florida, on March 12, ending their 199 days in space.

While simultaneously supporting Boeing's Crew Flight Test, CCP also prepared for SpaceX's Crew-9 mission. NASA astronaut Nick Hague and Roscosmos cosmonaut Aleksandr Gorbunov lifted off aboard SpaceX's Dragon Freedom and Falcon 9 rocket from Space Launch Complex-40 (SLC-40) at CCSFS at 1:17 p.m. EDT on Sept. 28. This was the first crew to launch from this launch pad, bringing the total number of pads certified to support CCP human spaceflight to three: LC-39A, SLC-40, and SLC-41. Crew-9 autonomously docked to the forward port of the station's Harmony module at 5:30 p.m. EDT on Sept. 29. Crew-8 will splash down off the coast of Florida in October, following a short handover with Crew-9.

CCP's Suborbital Crew (SubC) office continues its work to enable NASA researchers and hardware developers to conduct human-tended science and hardware development aboard commercial suborbital spaceflights. Team members from across the agency are participating in the safety case assessment of potential partners Blue Origin and Virgin Galactic. In parallel, SubC is working with NASA's Science Mission Directorate to select potential human-tended suborbital payloads. Suborbital platforms provide approximately three minutes of microgravity, offering researchers and hardware developers a steppingstone between parabolic flights and low Earth orbit platforms. 🚀



NASA astronaut Jasmin Moghbeli is helped out of the SpaceX Dragon Endurance spacecraft onboard the SpaceX recovery ship MEGAN after she and the rest of Crew-7 landed in the Gulf of Mexico off the coast of Pensacola, Florida, March 12, 2024. Photo credit: NASA/Joel Kowsky



NASA's SpaceX Crew-9 crew members Roscosmos cosmonaut Aleksandr Gorbunov (left) and NASA astronaut Nick Hague smile and wave inside a Dragon spacecraft at Space Launch Complex-40 at Cape Canaveral Space Force Station in Florida ahead of liftoff on Sept. 28, 2024. Photo Credit: SpaceX

Launch Services Program

NASA's Launch Services Program (LSP) achieved several notable milestones during fiscal year 2024, including launching a trio of important missions. LSP's activities demonstrated the program's commitment to advancing space exploration and proved once again LSP is Earth's Bridge to Space.

NASA's Psyche mission to a metal-rich asteroid launched on Oct. 13, 2023. Psyche was the first NASA science mission to launch as a primary payload on a SpaceX Falcon Heavy rocket. Alongside Psyche, the Deep Space Optical Communications experiment also launched, sending NASA's inaugural demonstration of laser communications from deep space on its journey. Psyche marked the second LSP mission to launch from Launch Complex 39A at Kennedy.

LSP celebrated its 25th anniversary and kicked off the milestone by looking back to the launch of Deep Space 1 on Oct. 24, 1998. To date, the program has completed 104 end-to-end primary missions that have observed the Earth, visited other planets, and explored the universe. LSP recognized its workers, both past and present, who contributed to a quarter century of success in enabling some of NASA's greatest scientific missions and technical achievements.

In November, LSP supported the center's family day event in which over 20,000 people attended. Activities in the Mission Briefing Room showcased current LSP mission operations. Included in those missions was PACE (Plankton, Aerosol, Cloud, and ocean Ecosystem). PACE arrived in mid-November at Astrotech Space Operations in Titusville, Florida, where it began launch processing.

Also in November, LSP completed Phase 2 construction on the Payload Hazardous Servicing Facility (PHSF). The year-long, multimillion-dollar project made several upgrades to the facility, including replacing the pneumatic controls and HVAC pre-cooling coils, the chilled water supply system; as well as upgrading large equipment to redundant variable frequency drives. Completion of this project paved the way for Europa Clipper spacecraft processing.



A SpaceX Falcon Heavy rocket with the Psyche spacecraft on board is launched from Launch Complex 39A, Oct. 13, 2023, at NASA's Kennedy Space Center in Florida. Photo Credit: NASA/Aubrey Gemignani



Technicians prepare NOAA's GOES-U satellite for encapsulation inside payload fairing halves at the Astrotech Space Operations Facility in Florida. Photo Credit: NASA/Ben Smegelsky

The new year kicked off with the arrival of NOAA's GOES-U (Geostationary Operational Environmental Satellite U) at Kennedy on Jan. 23. The advanced weather satellite flew cross-country on an Air Force C-5M Super Galaxy, and teams transported it from the Launch and Landing Facility to Astrotech Space Operations in preparation for launch. GOES-U, the fourth satellite in NOAA's GOES-R Series, enhances weather and environmental monitoring. LSP has previously managed the launch services for five other GOES missions – L, M, R, S, and T.

NASA's PACE satellite launched successfully on Feb. 8, 2024, aboard a SpaceX Falcon 9 rocket from Space Launch Complex 40 at Cape Canaveral Space Force Station. This mission focused on ocean health, air quality, and climate change. PACE was LSP's first mission to launch from Space Launch Complex 40 on Cape Canaveral Space Force Station since 2018.

In March, NASA's CubeSat Launch Initiative's ELaNa 57 launched on SpaceX's Transporter-10 mission from Vandenberg Space Force Base in California. This mission included the Multi-Mode Mission (M3) CubeSat, designed

A SpaceX Falcon Heavy rocket carrying the National Oceanic and Atmospheric Administration (NOAA) GOES-U (Geostationary Operational Environmental Satellite U) lifts off from Launch Complex 39A at NASA's Kennedy Space Center in Florida on June 25, 2024. Photo Credit: NASA/Amber Jean Notvest



Below: NASA's Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) spacecraft viewed on a spacecraft dolly in a high bay at the Astrotech Space Operations Facility in Florida on Monday, Dec. 4, 2023. Photo Credit: NASA/Kim Shiflett





A NASA engineer installs the agency's CubeSat R5 Spacecraft 4 (R5-S4) into the dispenser at Firefly Aerospace's Payload Processing Facility at Vandenberg Space Force Base in California ahead of the company's Demonstration 2 launch for NASA. Photo Credit: NASA/Jacob Nunez-Kearney

by Missouri University of Science and Technology students. Also in March, ELaN 51 launched four CubeSats to the International Space Station aboard SpaceX's 30th Commercial Resupply mission. LSP booked rides for both missions.

The Europa Clipper spacecraft arrived at Kennedy on May 23, 2024, on an Air Force C-17 to begin processing at the PHSF in preparation for the journey to Jupiter's moon Europa. With launch scheduled for Oct. 2024, the spacecraft joined its solar arrays, which had arrived at the PHSF in February. The mission, aimed at exploring Europa's icy surface and subsurface ocean, will use the same side boosters that launched the Psyche mission.

NASA's PREFIRE mission, composed of two CubeSats, launched from Rocket Lab's Launch Complex 1 in Māhia, New Zealand. The first rocket,



Rocket Lab's Electron rocket called "PREFIRE and Ice," lifts off from Launch Complex 1 in Mahia, New Zealand, carrying the second satellite of NASA's PREFIRE (Polar Radiant Energy in the Far-Infrared Experiment) mission on June 5, 2024. Photo Credit: Rocket Lab



Serenity, a 3U CubeSat, awaits integration at Firefly Aerospace's Payload Processing Facility at Vandenberg Space Force Base in California ahead of the company's Demonstration 2 launch for NASA. Photo Credit: NASA

"Ready, Aim, PREFIRE," lifted off on May 25, followed by "PREFIRE and Ice" on June 5. These satellites will gather climate-related data, including temperature and water vapor. The two launches came just over nine months after LSP had awarded the mission as part of its efforts to expand access to space by embracing more commercial practices with the VADR (Venture-class Acquisition of Dedicated and Rideshare) contract.

On June 25, NOAA's GOES-U launched from Kennedy. This mission continued the advancements of the GOES series in weather and space weather forecasting, and it was the first NOAA mission to launch on a SpaceX Falcon Heavy rocket.

Firefly Aerospace's Noise of Summer mission, LSP's final Venture-Class Launch Service Demonstration 2 mission, launched July 3, 2024, on an Alpha



Jenny Lyons and Albert Sierra, deputy program and program managers for NASA's Launch Services Program. Photo Credit: NASA/Payton Wolf

rocket from Vandenberg Space Force Base. Manifested as ELaN 43, it consisted of eight CubeSats.

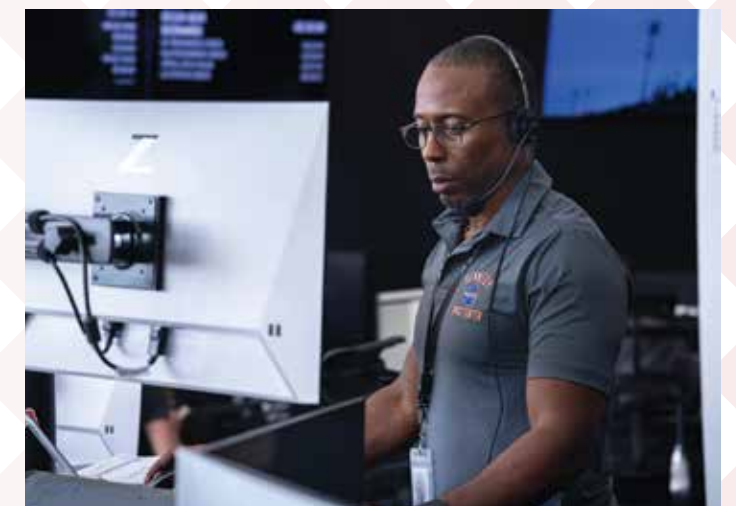
Also in July, LSP awarded launch service contracts for two important upcoming missions. The first is COSI (Compton Spectrometer and Imager), a space telescope that will study energetic phenomena in the Milky Way and beyond. The second is NOAA's JPSS-4 mission. The spacecraft is part of the multi-satellite cooperative Joint Polar Satellite System (JPSS) program, a partnership between NASA and NOAA. This mission is the next satellite in the program, which began with the Suomi National Polar-orbiting Partnership and includes the launches of JPSS-1 in 2017 and JPSS-2 in 2022.

The fiscal year also brought several leadership changes within the LSP organization. With over 30 years of service, 14 of which were served as the LSP Program Manager, Amanda Mitskevich retired from NASA. Albert Sierra, the Deputy Program Manager was selected to serve as the new LSP Program Manager in Mitskevich's place. Sierra has been with NASA since 1990 and LSP since 2008. Following Sierra's appointment, Jenny Lyons was named the new Deputy Program Manager. Lyons returned to LSP after working as the deputy manager for the NASA Gateway Program's Deep Space Logistics. NASA named Dr. Denton Gibson launch director for the Launch Services Program. Gibson filled a position made available with the retirement of former senior Launch Director Omar Baez. Denton joined senior Launch Director Tim Dunn leading launch activities for NASA and LSP's science and robotic missions.

Throughout this fiscal year, NASA's Launch Services Program demonstrated its pivotal role in space exploration by providing launch services for three large spacecraft and 18 CubeSats from both coasts in the United States as well as New Zealand. The program also upgraded facilities for NASA's most important missions, demonstrated its prowess throughout the year of matching spacecraft with the best-suited rockets, managed the launch process, and provided support from pre-mission planning to postlaunch for its customers to ensure mission success. 🚀



Firefly Aerospace's Alpha rocket stands erect on a launch pad at Vandenberg Space Force Base in California under an overcast sky. The NASA logo and American flag are on the payload fairing at the top of the rocket. Below is the Firefly Aerospace logo. Photo Credit: Firefly Aerospace



Dr. Denton Gibson, launch director for NASA's Launch Services Program, participates in rehearsal launch operations for NOAA's GOES-U satellite at SpaceX's Hangar X on June 17, 2024. Photo Credit: SpaceX

Artemis

Fiscal year 2024 marked a period of innovation, determination, and remarkable achievements for lunar exploration at the agency's Kennedy Space Center. Ahead of NASA's Artemis missions, the spaceport's Exploration Ground Systems (EGS) led operations preparing for the assembly, launch, and recovery of SLS and Orion. Additionally, Kennedy Space Center supported lunar science flights such as the Commercial Lunar Payload Services (CLPS) initiative and leading development of the commercial supply chain in Deep Space Logistics (DSL) for the Gateway Program.

In addition to processing the SLS (Space Launch System) solid rocket booster segments inside the Rotation, Processing and Surge Facility (RPSF), the Exploration Ground Systems team made upgrades at Launch Pad 39B. Work continued to prepare the world's largest liquid hydrogen tank for testing, and teams installed a new emergency egress system to be used by personnel in the

unlikely event of an emergency during launch countdown. In addition, EGS began conducting integrated ground systems testing to verify teams are ready for launch of Artemis II. This includes conducting a series of water flow tests to the ignition overpressure protection and sound suppression system, verifying high-speed camera imagery on the mobile launcher, and testing the upgraded environmental control system and new emergency egress system.

The Artemis launch team continues to perform launch countdown simulations, as well as practicing the other new ground systems additions – like the emergency egress system – to prepare for launch with crew on board. Out at sea, the Artemis II crew, the recovery team from EGS, and members of the Department of Defense tested the procedures and tools that will be used to help the crew to safety when they splash down in the ocean at the end of their 10-day, 685,000-mile journey around the Moon.

In spring, teams transferred the primary base structure of mobile launcher 2 to its permanent mount mechanisms using the spaceport's crawler-transporter 2. Additionally, the critical design review was completed which demonstrated that the mobile launcher 2 design is fully integrated, including interdependencies between the 40+ subsystems as well as the external interfaces with flight hardware and other ground systems. Construction was completed on the first four of seven tower module assemblies. Mobile launcher 2 will serve as the primary interface between the ground launch systems, SLS rocket, and Orion spacecraft that will launch the SLS Block 1B rocket, with its enhanced upper stage that will allow the agency to send astronauts and heavier cargo into lunar orbit for Artemis IV and beyond. Umbilical testing to support the new upper stage at the spaceport's Launch Equipment Test Facility is underway.

Workers with NASA's Exploration Ground Systems and primary contractor, Jacobs, complete the painting of the agency's iconic "worm" logo along the side of the twin Artemis II solid rocket booster motor segments inside the Rotation, Processing and Surge Facility at Kennedy Space Center in Florida on Feb. 16, 2024. Photo credit: NASA/Kim Shifflett



Teams at NASA's Kennedy Space Center in Florida practice the Artemis mission emergency escape or egress procedures during a series of integrated system verification and validation tests at Launch Complex 39B on Aug. 9, 2024. Photo credit: NASA/Kim Shifflett



Teams with NASA's Exploration Ground Systems Program and primary contractor, Bechtel National, Inc., continue moving the base structure of mobile launcher 2 to a permanent mount structure where assembly will be completed at Kennedy Space Center in Florida. Photo credit: NASA/Madison Tuttle

The Artemis II Orion spacecraft is placed in the west altitude chamber inside the Operations and Checkout Building at NASA's Kennedy Space Center in Florida on June 28, 2024, before undergoing a series of tests simulating deep space vacuum conditions. Photo credit: NASA/ Rad Sinyak



During the summer, several pieces of flight hardware were delivered to Kennedy for the Artemis missions. EGS received the Artemis II core stage, the powerhouse that will produce more than 2 million pounds of thrust during launch. In addition to the core stage, the Artemis II launch vehicle stage adapter, the Artemis III core stage boat-tail, and the Artemis IV core stage engine section all arrived at Kennedy for processing.

In addition to SLS hardware, Orion also received the European Service Module 3 for the Artemis III mission. The European Service Module acts as the driving force behind Orion for deep space exploration, providing essential propulsion, thermal control, and electrical power. The European Service Module 3 also will supply the Artemis III astronauts with vital resources like water and oxygen, ensuring they're well-supported during their journey. After delivery, the European Service Module 3 was integrated with the crew module adapter for Artemis III. The crew module adapter houses electronic equipment for communications, power, and control, and includes an umbilical connector that bridges the electrical, data, and fluid systems between the main modules.

Preparations for the Artemis II mission continue with teams successfully mating the Orion spacecraft and crew module. Teams also powered up Orion and completed Electromagnetic Compatibility, Interference, and Vacuum chamber testing in a newly renovated altitude chamber to replicate deep space conditions.

Additionally, teams continue with assembly operations on the Artemis III and IV crew modules already at the spaceport.

Looking forward to the necessary capabilities needed to live and work on the Moon and beyond, Kennedy supported the launch of two CLPS flights – Astrobot's Peregrine Mission One and Intuitive Machines' IM-1 mission. Intuitive Machines Nova-C lander, named Odysseus, landed on the south pole of the Moon in February 2024, delivering NASA science and technology to the lunar surface.

Kennedy Space Center continues to support future exploration of the Moon, Mars, and beyond this fiscal year with the DSL project office significantly increasing momentum during its fifth year of operation. Teresa Kinney took on the role of the project office's chief engineer making her the first woman at NASA Kennedy to hold the title. The team also achieved the milestone of initiating the DSL-1 mission, permitting commercial provider SpaceX the authority to proceed to mature and refine their vehicle specification and operational capability in advance of the agency's Artemis IV and Gateway Logistics Services (GLS) missions.

Throughout the year, DSL hosted representatives from CSA (Canadian Space Agency) and JAXA (Japan Aerospace Exploration Agency) at NASA Kennedy while DSL team members traveled abroad for collaborative opportunities. The DSL team works with JAXA to share lessons learned and



Portrait of Teresa Kinney, chief engineer of the Gateway Deep Space Logistics project office at NASA's Kennedy Space Center. Photo credit: NASA



Top right: Members of the Gateway Deep Space Logistics (DSL) team traveled to Canada to meet with CSA (Canadian Space Agency) and MDA Space personnel. Here, they pose for a photo with the full-scale model of the Mobile Servicing System during the Gateway External Robotic System (GERS)-to-Logistics Module Integration, Test, and Requirements Technical Interchange Meeting. Photo credit: NASA



Right: Gateway Deep Space Logistics team member Bianca Rhym, R&T Manager, NASA (center), poses with University of Center Florida Knight Shadow Program student interns in front of the Vehicle Assembly Building at NASA's Kennedy Space Center. Photo Credit: NASA

expertise to inform JAXA's development of its HTV-XG logistics resupply vehicle. Likewise, DSL continues its engagement with CSA as they develop an advanced Gateway External Robotics System (GERS) that will be delivered to Gateway on a future specialized DSL mission.

Through other outreach avenues, including hosting exchange students and year-long mentorship opportunities, DSL extensively invests in academia and

STEM engagement. The team supported over 100 outreach opportunities and offered a total of 17 internship opportunities by collaborating with other offices and contracts across the agency.

This fiscal year's accomplishments underscore our collective commitment to expanding the frontiers of human spaceflight and inspiring the next generation of explorers under the Artemis campaign. 🚀

Atop the Vehicle Assembly Building at NASA's Kennedy Space Center in Florida on March 3, 2024, SpaceX Crew-8 astronauts NASA astronauts Matthew Dominick, Michael Barratt, and Jeanette Epps, Roscosmos cosmonaut Alexander Grebenkin are driven to Launch Complex 39A for launch to the International Space Station. Photo credit: NASA/Ben Smegelsky



Exploration Research & Technology



Teams at NASA's Kennedy Space Center in Florida pose inside the Space Systems Processing Facility's high bay to celebrate 25 years of supporting the International Space Station. Photo credit: NASA/Ben Smegelsky

During fiscal year 2024, NASA Kennedy's Exploration Research and Technology (ER&T) programs supported various activities including the International Space Station with ground operations, logistics, and maintenance. The team advanced the frontiers of research and technology development, collaborating with numerous customers and stakeholders across NASA and the industry to fulfill the agency's requirements. Additionally, the team contributed to various Moon to Mars initiatives.

Originally built as the final stop for components of the International Space Station, the Space Station Processing Facility was renamed this year to reflect its wider range of capabilities. To honor its legacy and embrace its role as a multi-tenant processing facility, agency officials updated its name to the Space Systems Processing Facility (SSPF). This name reflects its evolution into a hub for processing hardware destined not only for the space station but also for the Moon and beyond.

Several activities took place in the SSPF throughout fiscal year 2024. ER&T provided supply and utilization capabilities for orbital activities aboard the space station. Ground processing crews prepared payloads for five commercial resupply missions to the orbiting laboratory, including air for the Nitrogen Oxygen Recharge Systems, spare parts with orbital replacement units, and various experiments. The team also worked on final flight testing of external payloads such as AWE (Atmospheric Waves Experiment), ILLUMA-T (Integrated Laser Communications Relay Demonstration Low Earth Orbit User Modem and Amplifier Terminal),

and CODEX (Coronal Diagnostic Experiment). Additionally, the team processed the Northrop Grumman Cygnus spacecraft's pressurized cargo module for the company's 20th and 21st commercial resupply missions. The team also facilitated the quick return of science from the station, allowing researchers using the SSPF labs to analyze data swiftly with minimal loss of microgravity effects. ER&T collaborated closely with NASA's SLS (Space Launch System) team to enable the simultaneous manufacturing of multiple elements in the SSPF for future Artemis missions.

As part of NASA's efforts to expand commercial resupply in low Earth orbit, the team welcomed Sierra Space's Dream Chaser spaceplane and Shooting Star cargo module into the SSPF high bay. They will undergo final testing, including acoustic and electromagnetic interference and compatibility testing, completion of work on the spaceplane's thermal protection system, and prelaunch processing, all in preparation for launch to the space station.

Teams also worked on various lunar missions under NASA's CLPS (Commercial Lunar Payload Services) initiative. One team worked with Intuitive Machines on its first lunar mission to launch EDS (Electrodynamic Dust Shield) technology which was embedded in two lenses of EagleCam, a CubeSat camera system developed by students at Embry Riddle Aeronautical University in Daytona Beach, Florida. Additionally, they are preparing another EDS technology demonstration with Firefly Aerospace for a future lunar landing. Researchers also collaborated with Intuitive Machines to integrate an M-SOLO (Mass Spectrometer



Dream Chaser Tenacity, Sierra Space's uncrewed cargo spaceplane is lifted and moved by crane inside the Space Systems Processing Facility at NASA's Kennedy Space Center in Florida on May 20, 2024. Photo credit: Shay Saldana/Sierra Space

Observing Lunar Operations) unit onto its lunar lander for the PRIME-1 (Polar Resources Ice Mining Experiment-1) flight.

On Dec. 19, 2023, NASA's ERIE (Electrostatic Regolith Interaction Experiment) launched aboard Blue Origin's New Shepard rocket to study lunar dust and its effects in preparation for Artemis missions. The ER&T team designed a triboelectric sensor board for the ERIE payload. In microgravity, dust grains simulated lunar regolith by creating tribocharge upon contact with insulators. The electrometer measured the charge of the regolith as it passed through an electric field.

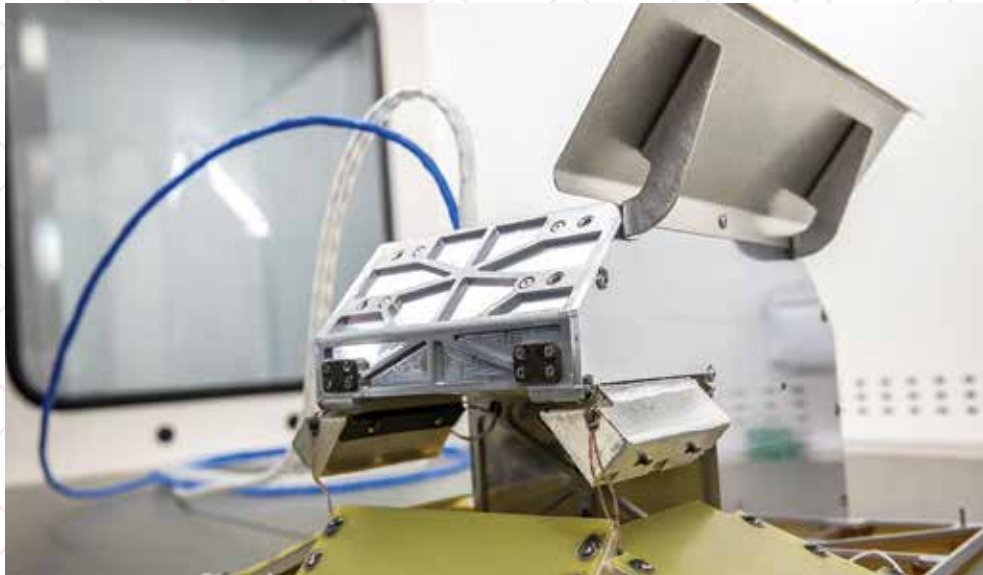
As part of NASA's mission to engage, educate, and inspire the public, ER&T provided 27 interns from 17 colleges, universities, and institutes with meaningful, hands-on experiences spanning multiple areas of research, such as in-situ resource utilization and space crop growth.



The Northrop Grumman Cygnus spacecraft's pressurized cargo module for the company's 21st commercial resupply mission is moved by a crane inside the Space Systems Processing Facility at NASA's Kennedy Space Center in Florida on June 1, 2024, as prelaunch processing operations continue. Photo credit: NASA/Glenn Benson



Teams with NASA and Intuitive Machines work together to integrate MSOLO (Mass Spectrometer Observing Lunar Operations) onto a lunar lander for the PRIME-1 (Polar Resources Ice Mining Experiment-1) flight. Photo credit: NASA



Left: Electrodynamic Dust Shield: Inside the Electrostatics and Surface Physics Laboratory at NASA's Kennedy Space Center in Florida, a completed assembly of the electrodynamic dust shield (EDS) payload is in view. The payload was successfully integrated with Firefly Aerospace's Blue Ghost lunar lander as part of NASA's Commercial Lunar Payload Services (CLPS) initiative. Photo credit: NASA/Cory Huston

Below: The New Shepard crew capsule, carrying NASA's Electrostatic Regolith Interaction Experiment, descends under parachutes during its launch Dec. 19, 2023. Photo credit: Blue Origin



As a result of the research conducted under ER&T, inventors submitted 32 new technology reports, contributing to a total of 80 reports processed by NASA Kennedy's Tech Transfer Office. Additionally, one provisional and four nonprovisional patent applications were filed. This fiscal year, one nonprovisional patent was issued, led by NASA, along with two jointly owned nonprovisional patents that included ER&T inventors. Kennedy's research and technology efforts span 28 states through a variety of mechanisms including licenses, space act agreements, grants, and Small Business Innovative Research/Small Business Technology Transfer contracts.

The technological advancements driven by the ER&T team at Kennedy are paving the way for the capabilities needed to live and explore on the Moon and, one day, Mars. 🚀

NASA Administrator Bill Nelson visits the agency's SLS (Space Launch System) rocket core stage for the Artemis II mission inside NASA's Kennedy Space Center in Florida on Aug. 29, 2024. Photo credit: NASA/Ben Smegelsky



Engineering

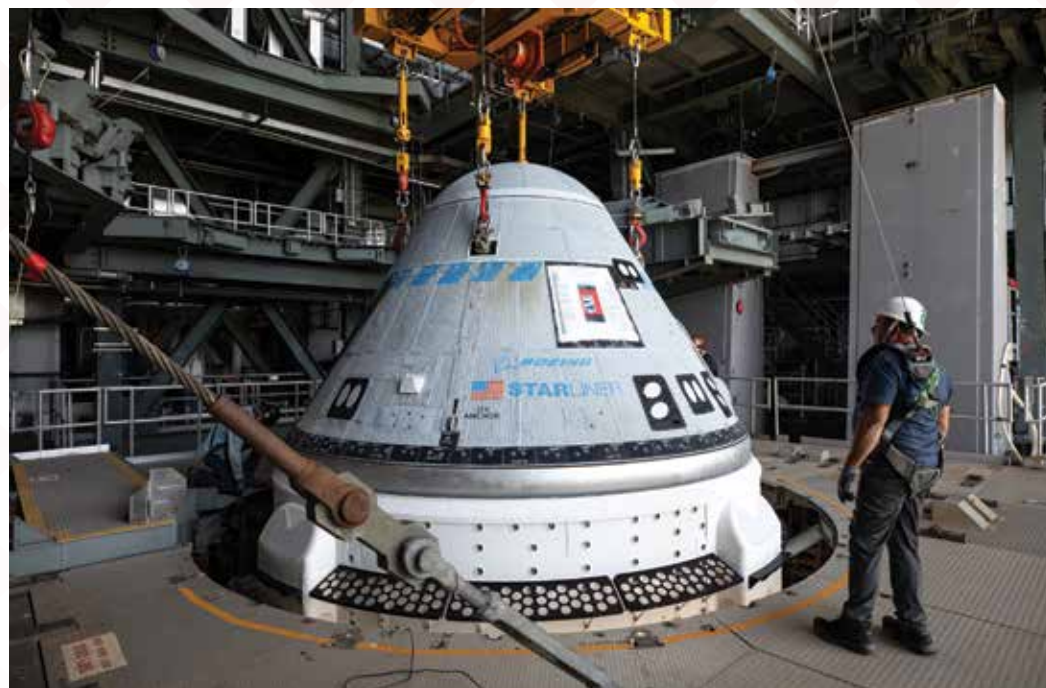
NASA Engineering at Kennedy Space Center excels in the design, development, and operation of launch vehicles, spacecraft, payloads, lab systems, software systems, ground systems, and facilities. The Engineering team is integral to the Commercial Crew Program, Launch Services Program, and Exploration Research and Technology programs. The team significantly contributes to the Artemis missions through Exploration Ground Systems, Human Landing Systems, and Gateway Deep Space Logistics. Additionally, they support the International Space Station, and Center Engineering, Safety, and Operations. Over the next five years, Kennedy Engineering will provide essential leadership and support for more than 165 major milestones, 130 launches, and 15 different launch vehicle fleets, ensuring NASA's mission success.

Launch Services Program

The Engineering team successfully supported the launch of scientific and technological missions from Kennedy Space Center, including NASA's Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) mission on a SpaceX Falcon 9 rocket and the National Oceanic and Atmospheric Administration (NOAA) Geostationary Operational Environmental Satellite U (GOES-U) mission on a SpaceX Falcon Heavy. Engineering played a critical role in troubleshooting and resolving time-critical issues leading to the successful launch of both missions.



Above: NASA and SpaceX technicians safely encapsulate NASA's PACE (Plankton, Aerosol, Cloud, ocean Ecosystem) spacecraft in SpaceX's Falcon 9 payload fairings on Jan. 30, 2024, at the Astrotech Space Operations Facility near the agency's Kennedy Space Center in Florida. Photo credit: NASA/Denny Henry



Left: The Boeing Starliner spacecraft is lifted at the Vertical Integration Facility at Space Launch Complex-41 at Cape Canaveral Space Force Station in Florida on April 16, 2024. Photo credit: Kim Shiflett



Teams work on the next phase of exploration upper stage umbilical testing at the Launch Equipment Test Facility. The umbilical is part of mobile launcher 2, designed to support the SLS (Space Launch System) Block 1B configuration and provide liquid hydrogen and oxygen to the exploration upper stage. Photo credit: NASA

Commercial Crew Program

The Engineering team supported operations for NASA's SpaceX Crew-7 landing, Crew-8 launch, Crew-9 launch, and NASA's Boeing's Crew Flight Test launch. They continued monitoring the certification of Launch Complex 39A and Space Launch Complex-40 for SpaceX Falcon 9 human rated flight operations. Multi-center collaborations enable engineers to evaluate the flight worthiness of future suborbital launch vehicle prospects to determine how these vehicles will best support the Commercial Crew Program and potentially take NASA to future commercial low Earth orbit destinations.

Laboratories, Development, and Testing

The Engineering team played a crucial role in the success of missions and projects across various agency programs and with numerous external aerospace partners. They provided expertise in design troubleshooting and prototyping, large-scale article testing, component qualification, rapid failure analysis, and a

wide range of laboratory and testing services. The team continues to offer multi-disciplinary engineering support for the Artemis II launch campaign, focusing on ground support equipment readiness and umbilical testing for mobile launcher 2.

Engineering support for the International Space Station also remained consistent, with ongoing ground processing of cargo, payloads, and orbital replacement units. Additionally, the team worked to certify Commercial Crew spacecraft and launch vehicles, while contributing to the planning of future Moon to Mars missions through emerging programs like Commercial Low Earth Orbit and Gateway.

Exploration Ground Systems

The Engineering team continued to work with Exploration Ground Systems to prepare for the Artemis II mission by conducting booster hardware inspections and processing at the Rotation, Processing, and Surge Facility, as well as playing a significant role in verification and validation activities for various ground



Engineers and technicians process the right forward center segment of the SLS (Space Launch System) solid rocket boosters for the Artemis II mission inside the Rotation, Processing and Surge Facility (RPSF) at NASA's Kennedy Space Center in Florida by removing the yellow cap and inspecting propellant on Nov. 27, 2023. Photo credit: NASA/Kim Shiflett

hardware and software systems. The team was crucial in commissioning the emergency egress system and in the verification and validation of the crew access arm and environmental control systems at Launch Complex 39B and the Vehicle Assembly Building.

The team supported the Underway Recovery Test 11 at Naval Base San Diego and continued to perform cryogenic loading and terminal countdown training exercises with the launch team. Additionally, the team played a pivotal role in post-Artemis I development activities, including critical design reviews and comprehensive structural, thermal, and loads analysis during the assembly of mobile launcher 2 hardware and software. They also continued to lead the development of the SLS (Space Launch System) Block 1B rocket, with a particular focus on the Exploration Upper Stage Umbilical and vehicle damper system.

Spaceport Support

The Construction of Facilities continues to enhance the resilience of critical infrastructure systems by modernizing the nation's premier spaceport. This includes the ongoing refurbishment of essential facility systems to support SLS core stage processing at NASA Kennedy. The team has also completed upgrades to the Payload Hazardous Servicing Facility systems, made critical foundation modifications in one of the Vehicle Assembly Building's high bays, and refurbished key facility systems. Additionally, they have constructed and modified the Environmental Control Systems at both Launch Complex 39B and the Vehicle Assembly Building and installed a new Liquid Nitrogen system at the pad, which is vital for future Artemis missions.

NASA Kennedy also has expedited emergency repairs to damaged river shorelines and is leading the design of a larger, more robust repair for the remaining shoreline areas compromised by recent severe storms. Furthermore, the team has initiated two design projects in collaboration with the U.S. Army Corps of Engineers, focusing on the dredging of the Banana River and coastal shoreline restoration.

Human Landing System

Engineering provided valuable insights into Human Landing System activities for SpaceX and Blue Origin on behalf of the Lander Ground Operations Office. NASA is working with U.S. industry

Technicians and engineers with Exploration Ground Systems at the NASA's Kennedy Space Center in Florida recently tested the Crew Access Arm that was added on the mobile launcher being prepared to support the agency's Orion spacecraft and SLS (Space Launch System) rocket. Photo credit: NASA/Kim Shiflett



Beau Peacock, software engineer, conducts testing of the Volatile Monitoring Oxygen Measurement Subsystem (VMOMS) for Molten Regolith Electrolysis (MRE) inside a laboratory in the Neil A. Armstrong Operations and Checkout Building at NASA's Kennedy Space Center in Florida on April 19, 2024. The high-temperature electrolytic process aims to extract oxygen from simulated lunar regolith which will be critical to the agency's Artemis campaign. Photo Credit: NASA/Isaac Watson



to develop the Human Landing System lunar landers. This approach allows NASA to share its knowledge and maintain oversight of safety, while companies develop, test, and iterate on designs. The Human Landing System is the mode of transportation that will take astronauts to the lunar surface, including the first woman and the first person of color. Crews will board the Human Landing System in lunar orbit and descend to the surface where they will collect samples, perform science experiments, and observe the lunar environment before returning to orbit in the Human Landing System.

Deep Space Logistics

The Deep Space Logistics (DSL) Gateway Project had considerable changes and progress in the fiscal year. DSL received Authority to Proceed funding for the Artemis IV mission and began to work with SpaceX, the on-contract provider. The Engineering team played a critical role during contract modification negotiations for scope change. For components and hardware transferred to the Artemis IV logistics module, the engineering team is working to define environments and configurations to satisfy testing for launches and overall Gateway mission success. 🚀

Teams with NASA's Exploration Ground Systems Program, in preparation for the agency's Artemis II crewed mission to the Moon, begin installing the first of four emergency egress baskets on the mobile launcher at Launch Complex 39B at the agency's Kennedy Space Center in Florida on Jan. 24, 2024. Photo credit: NASA/Isaac Watson



Engineers with the Launch Services Program at NASA's Kennedy Space Center and mission managers participate in a mission dress rehearsal on Monday, June 17, 2024, inside Hangar AE at Cape Canaveral Space Force Station in Florida for the National Oceanic and Atmospheric Administration (NOAA) GOES-U (Geostationary Operational Environmental Satellite U) mission. The GOES-U satellite serves a critical role in providing continuous coverage of the Western Hemisphere, including monitoring tropical systems in the eastern Pacific and Atlantic oceans. Photo credit: NASA/Ben Smegelsky

Spaceport Integration & Services

The Heartbeat of Kennedy Space Center

Spaceport Integration and Services (SI) supports all government and Federal Aviation Administration (FAA)-licensed launches from Kennedy Space Center and Cape Canaveral Space Force Station in Florida.

86 launches and 57 other major events, including static fire tests and wet dress rehearsals, occurred during fiscal year (FY) 2024.

SI also manages multiple contracts to support the spaceport's various missions, including a large facilities operations and maintenance contract, and a large medical, occupational health, industrial hygiene, and environmental services contract. In addition, SI oversees contracts for NASA Kennedy's propellants, gas distribution systems, and life support systems, as well as contracts to supply commodities vital to the success of Kennedy's missions.

Other contracts run by SI at NASA Kennedy include construction and design, custodial services, mail, recycling, roads and grounds, trash collection, and utilities. These contracts are key to ensuring the spaceport has the capacity and reliability to support all the needs of NASA Kennedy's mission partners, programs, and workforce.

In coordination with federal, state, and local government agencies, SI is responsible for environmental planning, permitting and compliance, remediation, and sustainability efforts within NASA Kennedy, ensuring the health and safety of employees and visitors while protecting the wildlife and environment in and around the center.

The following are some of SI's most notable accomplishments during FY 2024.



IOP/SS System 'Go' for Future Artemis Launches

Launch Complex 39B's Ignition Overpressure Protection and Sound Suppression (IOP/SS) system is recertified for the Artemis Program following modifications to optimize performance, with testing led by the SI Subsystem Team. Several changes were needed to prepare for Artemis II, including altering the flow patterns of the mobile launcher's "rainbird" water nozzles. Orifice plate changes increased the flow rate to nearly one million gallons per minute, improving protection for the SLS (Space Launch System) from the extreme acoustic energy and overpressure generated during launch. Innovative changes to the rainbirds for future Artemis launches were also tested, which will spare the SLS from water damage in case of an aborted launch, saving between \$5 to \$8 million in mobile launcher development costs. Other alterations include adding deflectors and dams for channeling and diverting water, timing adjustments for peak IOP/SS functionality, and ensuring no obstructions for the camera views needed to observe water flow.



'Critical Day' Policy Change Brings More Efficient Spaceport

With more rockets launching from Kennedy Space Center than ever before, and the launch pace continuing to increase, spaceport officials adapted the center's "Critical Day" policy. A "Critical Day" designation prohibits certain types of work on center, usually during crewed missions or other launches where full flight range support is necessary. Under the new policy, a "Critical Day" no longer applies for commercial launches where minimal flight range support is required. Critical days are also no longer called for training events, static fires, exercises, tests, rehearsals, or other activities leading up to or supporting commercial launches. This policy change is expected to free up more than 150 days per fiscal year, allowing more flexibility for employees to perform the essential construction and maintenance needed to keep the spaceport running smoothly.



Teamwork and Training Keeps Kennedy Space Center Secure

Kennedy Space Center's security is of paramount importance. That's why the center's Flight Operations and Protective Services Office conducts regular joint training sessions as they work hand-in-hand to patrol and secure everything within the center's more than 7,500 acres as well as more than 140,000 acres making up the Merritt Island National Wildlife Refuge surrounding NASA Kennedy. Some of those training sessions include live-fire on the ground and in the air, while others are scenario-based with a focus on all types of potential threats. This type of teamwork is vital to ensuring the continued security of the spaceport and all who work within, now and into the future.

Kennedy Team Leads the 'Charge' for Electric Vehicles

A team of seven Kennedy Space Center employees was recognized by the White House during summer 2024 for partnering with local utility provider Florida Power & Light to expand the center's sustainable electric vehicle (EV) fleet. NASA Kennedy's first EV chargers were installed in August 2022, but the team's efforts to add more increased after Executive Order 14057 was issued, mandating that federal agencies lead the way in creating an American electricity sector with no carbon pollution by the year 2035 and net-zero emissions throughout the economy by the year 2050.





Students Learn About Rockets & Environment During Earth Day Event

In celebration of Earth Day 2024, a group of local middle schoolers joined a virtual audience of students across the country at NASA's Next-Gen STEM (science, technology, engineering, and math) Earth Day event inside the John Holiman Auditorium of the News Center at NASA's Kennedy Space Center in Florida. Two SI employees served as panel experts. They discussed NASA Kennedy's unique role in balancing space launch technology and protecting the habitat that is home to more than 1,500 species

of plants and animals, making the spaceport one of Earth's most biologically diverse places. NASA Kennedy shares a boundary with the Merritt Island National Wildlife Refuge and the Canaveral National Seashore, encompassing more than 140,000 acres of land, waters, and protected habitats. Students also learned about the center's electric vehicle infrastructure, including the all-electric crew transport vehicles that take Artemis astronauts from the Astronaut Crew Quarters to the launch pad just before they depart Earth.

Beach House Ready for Future Astronaut Gatherings

An iconic NASA Kennedy Space Center facility that astronauts have used since the agency's early days as a place to gather with loved ones before heading into space now is ready to host more of those intimate moments. SI employees oversaw the replacement of the entire wood deck and stairs with composite materials at the Beach House. During the demolition of the old wood deck, workers discovered termite damage, which required the Beach House to undergo a complete fumigation before the new deck went in. The Beach House, located just steps from the Atlantic Ocean on Cape Road, also received new accent lighting on the property. The work was done just in time for NASA's SpaceX Crew-8 crewmembers to use the Beach House before they launched to the International Space Station in March 2024.



New Helium Pump, Recovery and Control Systems Support Spaceport Launches



Ongoing upgrades to Kennedy's Converter Compressor Facility (CCF) will enhance the center's ability to meet the helium needs of its commercial launch partners and the Artemis campaign as it establishes humanity's presence on the Moon and Mars. Scheduled for completion in March 2025, the improvements include a new pump system, which runs more efficiently, gives increased redundancy, and is more reliable than the old system. It can pump helium much quicker than its predecessor, a necessary step for getting rockets off the ground at a rate that meets the spaceport's projected demands. The CCF also upgraded much of its internal infrastructure along with its gaseous helium recovery and control systems, allowing for the automation of the helium conversion and compression process. These modifications are part of NASA Kennedy's plan to earn the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification for the CCF, joining nine other on-center facilities in achieving that rating.

Kennedy Goes Green and Saves Green in the Process

More than 30,000 lights have been replaced under the Phase 1 Utility Energy Services Contract at Kennedy Space Center, a nearly \$22 million project that now helps the center generate 3,000 megawatt-hours per year of clean energy and has significantly contributed to NASA's goals of achieving net-zero emissions. Accomplished through a partnership with local utility provider Florida Power & Light, the project provides a diverse mix of conservation measures which enhances savings, resilience, efficiency, and security to critical space missions. Street and parking lights were included in the upgrades, as were light and water fixtures inside various NASA Kennedy facilities. It also includes the installations of a two-megawatt solar power plant, over 70 new transformers and new boilers, chillers, and mechanical controls. The project is expected to save \$1.4 million in energy and maintenance costs a year along with saving the center 2.3 million gallons of water a year and 28.3 billion British thermal units of energy a year.



Flamingos Displaced During Hurricane Idalia Find New Home

In fall 2023, a small flamboyance of American Flamingos was discovered at the Merritt Island National Wildlife Refuge (MINWR), which encompasses all of Kennedy Space Center inside its over 140,000 acres. More commonly found in Mexico and Cuba, they have since settled near Haulover Canal and the Indian River. Scientists believe they ended up on Merritt Island after they were blown away from their normal habitat during Hurricane Idalia. It's the first documented sighting of flamingos at MINWR since 1992. Merritt Island's strategic location along the Atlantic Flyway provides a resting and feeding place for thousands of wading birds, shorebirds, and songbirds. MINWR is one of the most biologically diverse places on Earth, housing more than 310 species of birds, 25 mammals, 117 fishes, and 65 amphibians and reptiles inside its borders, along with over 1,000 different plant species.

Kennedy Workers Come Through for America Recycles Day

Even though bad weather forced a scrub of the initial collection date, Kennedy Space Center still donated 6,906 pounds to Goodwill Industries of Central Florida in November 2023 for America Recycles Day. With the assistance of the Brevard County Solid Waste Management Department, Kennedy employees nearly doubled the previous year's donated amount of 3,541 pounds. Among the items recycled include obsolete computers and other electronic equipment, kitchen appliances, household furniture, pet supplies, cell phones, eyeglasses, corks, and aluminum can tabs. Those items were taken away by Goodwill after they were dropped off via vehicle at a staging point near Kennedy's iconic Vehicle Assembly Building.



Historic Marker Celebrates Kennedy's Old Center Headquarters

A large bronze plaque at Kennedy Space Center now marks the location of the original headquarters building. Approved in April 2023 as part of the State of Florida's Historical Markers program, the plaque was publicly unveiled in May 2024 by center leaders as part of National Historic Preservation Month. The new marker, a project spearheaded by SI's Cultural Resources Division, will be displayed permanently just west of the Central Campus Headquarters Building, which replaced the old building in 2019. It is the seventh location within the Merritt Island National Wildlife Refuge and Canaveral National Seashore to have a marker approved by the Florida Historic Marker Council, joining three others within Cape Canaveral Space Force Station and three more on Kennedy Parkway.



Electrical Gear Replacement 'Sparks' Up Historic Launch Complex

A group of employees worked around an increasingly crowded launch schedule to shut down and replace critical electrical components of a switch station at Launch Complex (LC) 39A, ensuring its continued use for NASA and commercial rocket launches. The team earned a Kennedy Space Center group achievement award by finding collaborative ways to free up LC-39A with our launch partners, working around a continuously changing calendar to ensure minimal disruption to the center's launch cadence. The time was spent installing a new high-voltage breaker system to replace the one that was past its life expectancy due in part to Kennedy's corrosive environment, threatening LC-39A's ability to support future launches. Originally built in 1965 to support the Apollo Program, LC-39A has been adapted for Space Shuttle and commercial space missions as well as the Artemis Program.



Sustainability Speaker Series Educates Employees on Environment

Over 2,000 Kennedy Space Center employees took part this fiscal year in the Sustainability Speaker Series, which are webinars focused on various aspects of Florida's climate and environment. Attendees heard subject-matter experts speak about various topics including marine ecology, historic preservation, invasive species, sustainable aviation, prescribed burns, wetlands, and migratory birds. The webinars are part of the center's response to Presidential Executive Order (EO) 14057, which aims to create a sustainable climate and environmental culture throughout

the federal workforce. Among its goals are building employees' skills and knowledge through engagement, education, and training. Other ways the center complied with EO 14057 include two hands-on team-building activities to plant mangroves on a living shoreline and a multi-faceted sea turtle nesting season outreach campaign.



Splice Work Shoring Up Kennedy's Power Grid

An ongoing multi-million dollar project will ensure exceptional power service to the world's premier multi-user spaceport at Kennedy Space Center. Starting in September 2023, the center began replacing around 3,600 splices on the center's underground medium voltage cables with a cold shrink version, eliminating known failure risks associated with the current splices. Along with reducing the risks to personnel working underground, the new splices should increase the power grid's reliability and prevent unplanned outages by reducing potential failure points. Along the way, workers will fix broken cable racks and re-label cables to better plan for future center development projects. The project completion date is targeted for 2026.



Spaceport Supports SpaceX Starship Environmental Review

Officials with SI's Environmental Management Branch, supported by those in NASA's Human Landing System, Environmental Management Division, and the Office of General Counsel, are playing a vital support role in the FAA's preparation of an Environmental Impact Statement (EIS) evaluating SpaceX's proposal to operate Starship-Super Heavy vehicles at Kennedy Space Center's Launch Complex 39A. Employees served as subject-matter experts for the public to consult during three in-person and one virtual public scoping meetings the FAA held for this proposal in summer 2024. The EIS will be prepared in accordance with the National Environmental Policy Act of 1969 along with applicable federal, state and environmental laws and regulations. Additional information regarding the proposal is available via the FAA's website https://www.faa.gov/space/stakeholder_engagement/spacex_starship_ksc.

Safety and Mission Assurance

VISION: Push boundaries and go home safely.

MISSION: Enable safe and successful access to space.

VALUES: Helpfulness, relationships, and knowing what matters. These are so much more than words on a website; rather, they reflect a way of doing business every single day for the Safety and Mission Assurance (SMA) directorate.

At Kennedy, SMA demonstrates a dedicated commitment to NASA's core values of Safety, Integrity, Teamwork, Excellence, and Inclusion. The team works in earnest to promote a strong safety and health culture within the workforce while protecting people, hardware, and facilities, and ensuring the integrity of agency missions.

Kennedy achieved significant milestones this year, and SMA is proud to have played a key role in helping Earth's premier multi-user spaceport reach historic heights.

Through NASA's Artemis campaign, the agency is collaborating with commercial and international partners to establish the first long-term presence

on the Moon. To support this endeavor, which will land the first woman and first person of color on the lunar surface, SMA performed numerous technical assessments and government mandatory inspection points for the Artemis II launch campaign. The team conducted a thorough evaluation of Artemis I integration processes while applying risk-based analysis to improve Artemis future mission affordability and efficiency.

Other instrumental efforts included emergency egress system basket testing for our astronauts, active involvement in all prelaunch training and testing of recovery operations, and successful implementation of the mobile launcher 2 critical design review, representing a significant milestone required for the Artemis IV mission.

To better predict and model risks during Artemis missions and commercial space activities, SMA upgraded the center's range flight safety analysis software, including the use of 3D weather forecasts to improve predictions on the spread of any potentially harmful materials after a launch. Additionally, the team made strides in simulating spacecraft re-entry into the atmosphere. These upgrades mark a significant step forward in keeping everyone – and everything – on the ground safe.

While playing a pivotal role in processing experiments and equipment for the space station, SMA provided essential oversight for SpaceX and Northrop Grumman commercial resupply missions. The organization maintained a strong safety presence and culture in the Space Systems Processing Facility, where safety teams worked with multiple contractors across diverse programs. This includes acoustic and electromagnetic interference and compatibility testing,



The Northrop Grumman Cygnus spacecraft's pressurized cargo module for the company's 21st commercial resupply mission is lifted and moved by a crane inside the Space Systems Processing Facility at Kennedy Space Center on June 1, 2024. Photo credit: NASA/Glenn Benson



Teams at Kennedy Space Center practice the Artemis mission emergency egress procedures during a series of integrated system verification and validation tests at Launch Complex 39B on Aug. 9, 2024. Photo credit: NASA/Kim Shiflett

completion of work on the thermal protection system, and final payload integration of Sierra Space's uncrewed cargo spaceplane, Dream Chaser.

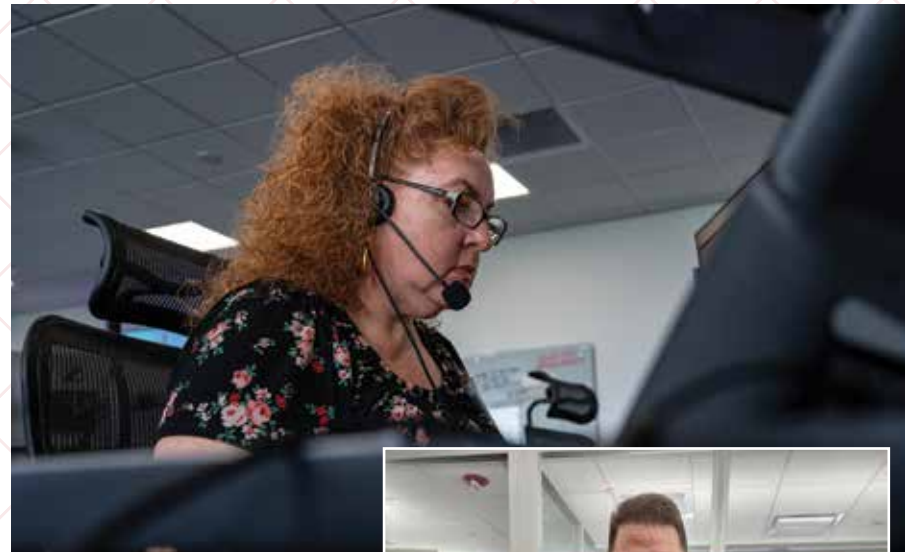
SMA worked in partnership with the Commercial Crew Program to ensure the certification and operation of spacecraft and launch systems for multiple crewed missions to the International Space Station. This included SpaceX's Crew-7 return, Crew-8 launch, and Crew-9 launch, as well as Boeing's Crew Flight Test launch and landing.

The team identified measures to mitigate risks, conducted audits and assessments of commercial partners' adherence to standards, and enhanced surveillance strategies for flight hardware reuse. Additionally, SMA reviewed requirements for the Commercial Low Earth Orbit Development Program and assessed safety, quality, and risk management for NASA's suborbital crew endeavors.

In its dedication to the workforce, SMA successfully organized Kennedy's "Fall Into Safety & Health" and "Safety & Health Days" events, creating a strong focus on safety. These events featured interactive training, demonstrations, and presentations to help employees stay safe and healthy. Highlights included K9 Officer demonstrations, workshops on lessons learned from past mistakes, virtual reality safety training displays, and presentations from the local Occupational Safety and Health office. The success of these initiatives shows a commitment to building a safe workplace where everyone prioritizes safety.

In an effort to renew our unwavering commitment to NASA's Safety culture, SMA developed and implemented a Safety Stand Up initiative for the Exploration Ground Systems Program – performed at multiple Kennedy sites – involving the communication of recent close-call events to a multi-contractor and civil servant workforce.

In addition, SMA executed independent technical authority oversight for the successful launches of the Psyche, PACE, and GOES-U missions. The team ended the fiscal year working toward the successful launch of the NASA flagship mission Europa Clipper while upholding its commitment to protect the people and safeguard the integrity of NASA missions. Safety is one of NASA's core values, and Kennedy continues to promote a strong safety culture and provide consistent support across the center. 🚀

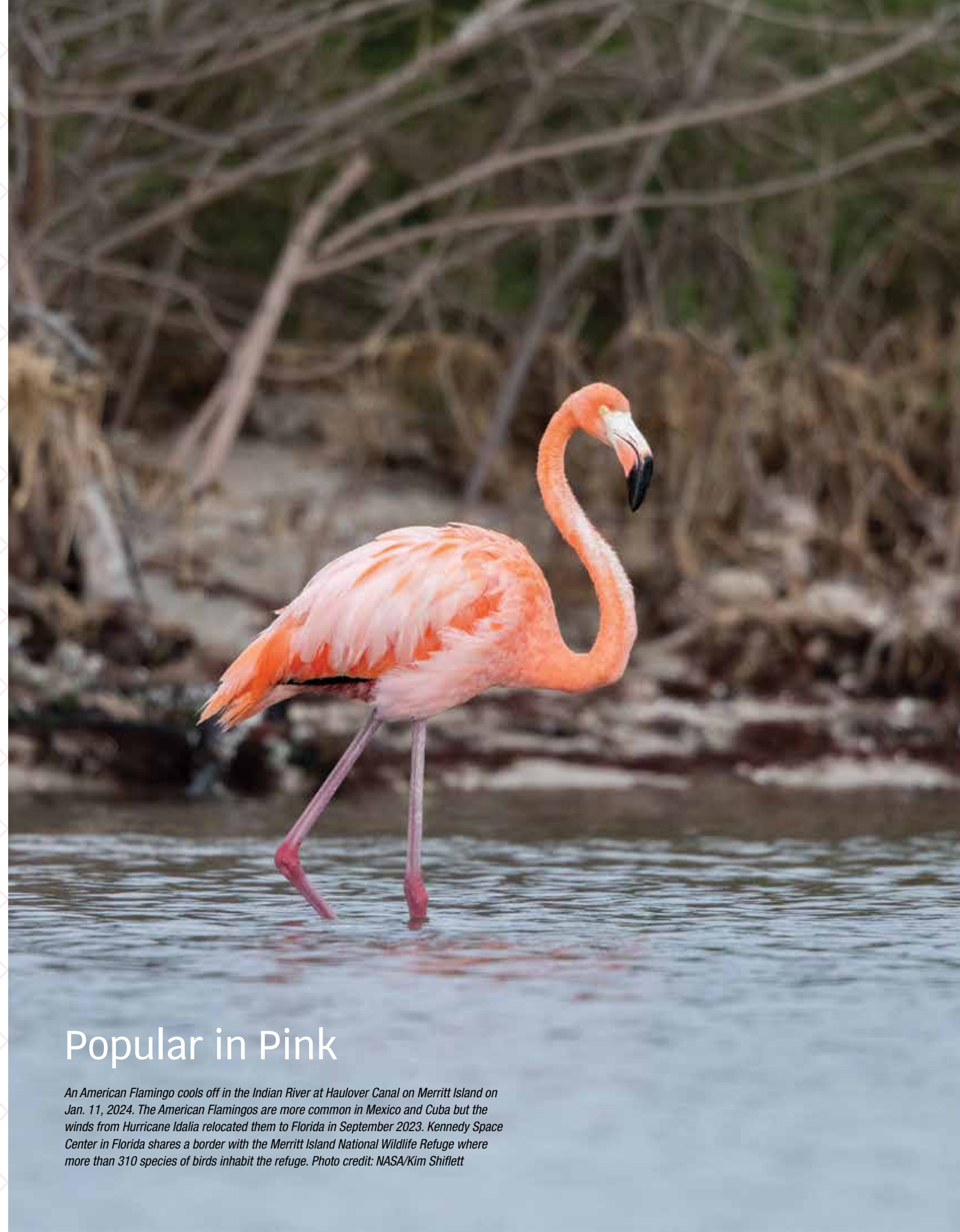


Above: Coleen Taylor, deputy chief Safety and Mission Assurance officer for NASA's Launch Services Program, participates in rehearsal launch operations for the GOES-U mission inside Hangar X at Kennedy Space Center on June 17, 2024. Photo credit: SpaceX



Right: Andy Knutson, deputy chief of NASA's Safety and Mission Assurance's Institutional Division at Kennedy Space Center, shows his pride for safety in the workplace. Photo credit: NASA

Below: Employees at NASA's Kennedy Space Center in Florida participate in the Safety and Health Days activities on May 9, 2024. The annual event demonstrates NASA's commitment to the safety and health of its workforce. Photo credit: NASA/Glenn Benson



Popular in Pink

An American Flamingo cools off in the Indian River at Haulover Canal on Merritt Island on Jan. 11, 2024. The American Flamingos are more common in Mexico and Cuba but the winds from Hurricane Idalia relocated them to Florida in September 2023. Kennedy Space Center in Florida shares a border with the Merritt Island National Wildlife Refuge where more than 310 species of birds inhabit the refuge. Photo credit: NASA/Kim Shiflett

Center Engagement & Business Integration Services

Office of Communication

Kennedy Space Center's Office of Communication is all about sharing the excitement of space exploration with the media and the public through live broadcasts, engaging social media content, and informative events and news briefings.

This fiscal year, the team has produced 10 live launch broadcasts, each reaching millions of viewers worldwide. The most watched was NASA's Boeing Crew Flight Test, which racked up more than 6.6 million views within the first 24 hours. Kennedy also played a major role in NASA's Total Eclipse show, which garnered more than 21 million views on April 8, 2024.

Beyond these broadcasts, Kennedy's communication team keeps the

buzz going with feature stories, blog updates, and original content across social media platforms. With more than 5.5 million followers on Facebook, X, Instagram, and YouTube, Kennedy's X account achieved a staggering post reach of 1.6 billion, while Facebook's post reach saw over 26.5 million, and Instagram's had over 23.7 million. The highlight of the year was Kennedy's post on X featuring the Boeing Crew Flight Test launch broadcast, which drew over 46 million views.

Additionally, the Kennedy team hosted six NASA Social events, giving nearly 150 digital content creators and social media influencers exclusive behind-the-scenes tours and chances to connect with industry leaders.

Media Attendance at Milestone Events

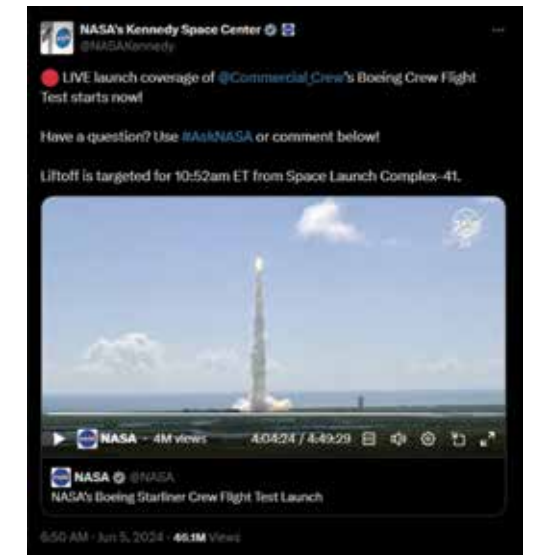
LAUNCHES and EVENTS			
Date	Mission	Media in Attendance	NASA Social Participants
10/13/23	NASA's Psyche	150	16
11/09/23	SpaceX Commercial Resupply Services 29	50	N/A
01/08/24	Commercial Lunar Payload Services (CLPS) Vulcan Peregrine Mission 1	102	N/A
01/30/24	NASA's Northrop Grumman Resupply 20	50	N/A
02/08/24	NASA's Plankton, Aerosol, Cloud, ocean Ecosystem (PACE)	50	14
02/15/24	NASA's CLPS Intuitive Machines 1 (IM-1)	75	N/A
03/03/24	NASA's SpaceX Crew-8	90	28
03/21/24	NASA's Northrop Grumman Resupply 30	35	N/A
06/05/24	NASA's Boeing Crew Flight Test	180	37
06/25/24	NOAA (National Oceanic and Atmospheric Administration) GOES-U (Geostationary Operational Environmental Satellite U) mission	80	30
07/23-24/24	NASA's Artemis II Media Day	135	N/A
08/04/24	NASA's Northrop Grumman Resupply 21	83	N/A
09/26/24	NASA's SpaceX Crew-9	244	12



Digital content creators pause for a group photo near the countdown clock at the NASA News Center at the agency's Kennedy Space Center in Florida on Feb. 28, 2024, ahead of NASA's SpaceX Crew-8 mission to the International Space Station. Photo credit: NASA/Glenn Benson



Digital content creators pose for a photo at Space Launch Complex-41 at Cape Canaveral Space Force Station in Florida with NASA astronauts Bob Hines, Artemis II crew members Reid Wiseman, Victor Glover, and CSA (Canadian Space Agency) astronaut Jeremy Hansen, as well as United Launch Alliance President and Chief Executive Officer Tory Bruno on May 6, 2024, ahead of NASA's Boeing Crew Flight Test launch to the International Space Station. Photo credit: United Launch Alliance



This screenshot features Kennedy Space Center's launch broadcast on X at the moment of NASA's Boeing Crew Flight Test launch, which received 46.1 million views. Photo credit: NASA. Link to post: <https://x.com/NASAKennedy/status/1798306406770319512>



Digital content creators pose for a photo with NASA Social panelists on June 24, 2024, at the Kennedy Space Center Press Site in Florida ahead of the launch of NOAA's (National Oceanic and Atmospheric Administration) GOES-U (Geostationary Operational Environmental Satellite U) mission weather-observing satellite. Photo credit: NASA/Cory Huston

Engagement Office

Kennedy Space Center Guest Operations creates unparalleled, inspiring launch experiences that foster global agency support and connect audiences to space exploration. To aid in this, a new system for nominations and invitations debuted spring 2024, enhancing capabilities to strategically manage guests for NASA launches from Kennedy, Cape Canaveral Space Force Station, and Vandenberg Air Force Base. This fiscal year, more than 12,000 guests had a front row seat to witness 12 missions launch from the Space Coast. Guests included key stakeholders, global and industry leaders, and mission teams and represented more than 60 countries, broadening NASA's reach.

More than 242,000 people from around the world virtually experienced the excitement of NASA missions through this fiscal year's 12 Virtual Guest Program opportunities, with 28.4% (68,835) being new participants. Since its inception in May 2020, the program has enrolled over 1.3 million people from all 50 U.S. states and over 170 countries and the program's standing guest list has grown by 33.9%. NASA's Boeing Crew Flight Test saw particularly high participation of 65,181 virtual guests as well as the Total Solar Eclipse event which attracted 36,749 virtual guests.

Kennedy's Outreach programs captivate, engage, and inspire diverse NASA audiences. The Center Exhibits Program (CEP) and Community Outreach (CO) directly engaged the local community and NASA enthusiasts at conferences, sporting events, and other large gatherings. CEP's eight events drew 82,168 guests and CO hosted 13 events attracting 34,520 guests in FY2024, its first year.

Noteworthy events include the debut of the new Exploration Ground System Crew Transportation Vehicles at the Formula 1 Race in Austin, Texas, with an impact of 40,716 guests, and Kennedy's Niagara Falls "Sunspot" for the historic total solar eclipse, with an impact of 28,366 guests.



The NASA story was shared at the Formula 1 Race in Austin, Texas. Photo credit: NASA

Another avenue to share NASA's story is the Learn & Engage with NASA Studio (LENS), a studio offering services such as streaming, filming, editing, and creative development. LENS livestreamed three live and two hybrid events during FY 2024 including Lunabotics, a NASA university-level



Guests watch the launch of a SpaceX Falcon Heavy rocket with NASA's Psyche spacecraft onboard, Oct. 13, 2023, from Operations and Support Building II at Kennedy Space Center in Florida. Photo credit: NASA

engineering competition, and the eclipse activities at Niagara Falls, attracting 2,394 participants. An additional effective outreach experience, the immersive Exploration Station Classroom welcomed 3,111 youths representing 13 Florida counties and Puerto Rico. Participants came from formal K-12 schools, homeschool groups, and informal groups.

Kennedy hosted 17 Center Events this fiscal year consisting of multiple Town Halls, special speaker events, a movie screening of "Fly Me to the Moon" and "Family Day." More than 29,000 people attended the events with online activities generating 1,794 views. In addition, for the third year, Kennedy welcomed Delta Air Lines' Women Inspiring Our Next Generation (WING) flight in observation of International Girls in Aviation Day. An all-female flight crew brought girls from Atlanta, Georgia, ranging in age from 12 to 18, to learn about various careers available at the Florida spaceport, view center facilities, hear from a panel of women of diverse career backgrounds from Kennedy and Delta, and tour the Kennedy Space Center Visitor Complex.

Kennedy's Protocol and VIP Tours team hosted 351 VIP tours and 39 Protocol tours, welcoming more than 6,877 guests, including foreign delegations from the Czech Republic, France, Italy, Japan, the Republic of Korea, Norway, Peru, Sweden, and the United Kingdom. Notable visitors included representatives from various space agencies and governmental bodies, such as the Office of Management and Budget, the Federal Communications Commission, and the Department of Defense.

In April, Japanese Minister of Education, Culture, Sports, Science and Technology Masahito Moriyama visited Kennedy following an official visit by the Japanese Prime Minister to the United States. This visit underscored the strengthening U.S.-Japan alliance as it evolves into a global partnership committed to promoting shared progress. Discussions centered around the signing of the historic agreement between the United States and Japan to advance sustainable human exploration of the Moon and other space related initiatives.

Additionally, in January, the center hosted Czech Republic Ambassador Miloslav Stašek and Minister of Transportation Martin Kupka following the signing of the Artemis Accords, marking a significant step in space cooperation between the two nations. The Czech Republic, with its active space industry companies, many of which are engaged in European Space Agency projects, discussed the agency's Artemis initiatives and Kennedy's role in these efforts.



On Sept. 20, 2024, Delta Air Lines' Women Inspiring Our Next Generation (WING) flight brought STEM (science, technology, engineering, and math)-focused students to Kennedy to tour the center and learn about career possibilities from female leaders. Photo credit: NASA

NASA and Lockheed Martin leaders led a tour of the Neil A. Armstrong Operations and Checkout Building at NASA's Kennedy Space Center in Florida for Japanese Minister of Education, Culture, Sports, Science and Technology (MEXT) Masahito Moriyama (center) on April 12, 2024. Photo credit: NASA/Kim Shiflett



Office of STEM Engagement

- ✿ In fiscal year 2024, Kennedy hosted 104 science, technology, engineering, and math (STEM) interns on-site, hybrid, and virtually.
- ✿ NASA Days events reached more than 475 students at minority-serving institutions (MSIs) and events. Participating institutions and events included Bethune-Cookman University in Daytona Beach, Florida; Clark Atlanta University in Georgia; the NASA Infusion Road Tour; the National Society of Black Engineers; the Central Intercollegiate Athletic Association; and the Annual National Historically Black Colleges and Universities Week Conference.
- ✿ The Lunabotics robotic mining competition engaged 435 college students and faculty from 26 states and Puerto Rico, with 24% of participating institutions being MSIs.
- ✿ Lunabotics Junior engaged 42 students at four robotics-themed workshops. In addition, 39 local teachers attended three Educator Professional Development workshops on the Lunabotics Junior pilot program, which introduces middle school students to block coding through rovers built by high school interns.
- ✿ NASA MINDS challenged 325 students from 32 minority-serving institutions in 16 states and territories to help bridge technology gaps for future Artemis missions.
- ✿ Kennedy hosted 174 students and educators for Next Gen STEM activities surrounding Earth Day and the Lunabotics competition. Through Virtual Classroom Connections hosted around the country, a total of 21,629 participated in educational STEM programs.
- ✿ The Students to Launch program hosted 99 students and chaperones from underserved and underrepresented communities in six states across the U.S. for the inspirational launch of the GOES-U satellite.
- ✿ First Nations Launch challenged 194 students from 23 Tribal Colleges and Universities (TCUs) to design, build, and fly high-powered rockets in the annual launch competition in Kenosha, Wisconsin.
- ✿ Established Program to Stimulate Competitive Research (EPSCoR) awarded \$20.8 million in direct funding, including:
 - ☆ 14 research awards totaling \$10.5 million.
 - ☆ 28 Research Infrastructure Development awards totaling \$5.8 million.
 - ☆ 45 Rapid Response Research awards totaling approximately \$4.5 million.



Lunabotics Students with Worcester Polytechnic Institute in Massachusetts, hoist their robotic rover over their heads during the Lunabotics Challenge at NASA's Kennedy Space Center in Florida, on May 22, 2024.

Workplace Overview

Kennedy Space Center is Earth's premier spaceport. It is an integral part of the local economy, providing more than 15,000 jobs for civil servants, contractors, tenants, and construction crews. In Fiscal Year 2024, the total KSC population increased by close to 1,200 people.

The workforce includes people with diverse skills dedicated to supporting the nation's space program and NASA's exploration to destinations including the Moon, Mars, and beyond. To accomplish the agency's various missions, these individuals fulfill a multitude of tasks.

Each year, the center takes a snapshot of its workforce. This picture includes all federal and contractor employees chartered to work for NASA Kennedy. Personnel serving other organizations, such as Cape Canaveral Space Force Station, support the spaceport's operations but are not reflected in these numbers.

The civil servant skill mix includes those in science, technology, engineering, and mathematics positions, as well as those in professional administrative and clerical positions. All employees work together to explore the universe for the benefit of all mankind.

Kennedy Space Center Workforce Profile

*Civil Servants	2,022
NASA Pathways Interns	76
Total Civil Servants	2,098
Civil Servants Skill Mix	
Scientific, Technology, Engineering and Mathematics	67%
Clerical and Professional Administrative	33%
**On-site Contractor Employees	4,873
Off-site/Near-site Contractor Employees (Excludes construction workers)	44
Total Contractor Employees	4,817
Total Construction Workers	402
Total Tenants	7,703
TOTAL KSC POPULATION	15,120

*Civil Servants as of September 21, 2024

**Contractors, Construction Workers and Tenants as of September 30, 2024

—For those Contractors, Construction Workers and Tenants that are reportable.

Diversity and Equal Opportunity

NASA is fully committed to Diversity, Equity, Inclusion, and Accessibility (DEIA) within our workforce and throughout our workplaces. We are dedicated as a federal agency to promoting an environment where employees receive fair and just treatment, fostering a respectful and inclusive culture for all, and ensuring employees can fully and independently access facilities, information and communication technology, programs, and services.

DID YOU KNOW?

NASA Kennedy Employees Believe*:

Kennedy teams are committed to helping their organization accomplish its goals (99%)

KSC employees feel they are treated as a valued member of the team (93%)

Managers and supervisors are committed to a workplace representative of all segments of society (92%)

KSC has an effective process for meeting accessibility needs (91%)

Supervisors demonstrate a commitment to workforce diversity (90%)

*Source: 2024 Federal Employee Viewpoint Survey

FEVS 2024 Update:

KSC teams are committed to helping their organization accomplish its goals (99%)

Employees in my work unit make me feel like I belong (90%)

My organization's management practices promote diversity (89%)

My organization meets my accessibility needs (90%)

My supervisor demonstrates a commitment to workforce diversity (91%)

As a result of NASA's prioritization of DEIA, NASA has been ranked the **"Best Place to Work in the Federal Government"** among large Federal agencies for twelve consecutive years. Based on data from the Federal Employee Viewpoint Survey (FEVS), Kennedy is ranked **FIRST** amongst NASA centers in the categories of DEIA, Recognition, and Effective Leadership.

Age Demographics at KSC

- Boomers (born 1946 – 1964) 18%
- Gen X (born 1965 – 1979) 33%
- Millennials (born 1980 – 1996) 43%
- Gen Z (born 1997 – 2012) 6%

- Average age: 46 years
- Most junior employee: 20 years
- Most senior employee: 78 years

Key Areas of Employee Satisfaction

96 Performance Confidence

89 Engagement

88 Diversity, Equity, Inclusion, and Accessibility Average

81 Job Satisfaction

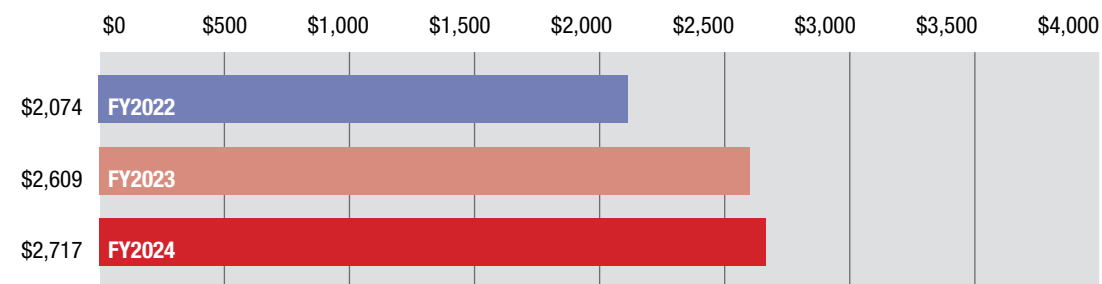
Budget Authority

Industry Partners at a Glance

Kennedy Space Center FY 2024 Budget Authority (\$ in Millions)

Commercial Crew Program	811
Engineering, Safety and Operations (ESO)	114
Exploration Ground Systems	884
Launch Services/Science	388
Mission Services and Capabilities (MSaC)	217
Space Station	37
Other	265
Total KSC	\$2,717

NASA/KSC Budget Authority Summary FY 2022 through FY 2024 (\$ in Millions)



FY 2024 KSC Budget by Element (\$ in Millions)

Space Exploration Technologies Corporation (SpaceX) participated in NASA's goal of developing and operating orbital commercial Crew Transportation Systems. Under the Commercial Crew Transportation Capability (CCtCap) contract for NASA's Launch America initiative, SpaceX continued providing safe, reliable, and cost-effective crew transportation to and from the International Space Station on American spacecraft launched from the United States. Under the NASA Launch Services II (NLS II) contract, SpaceX provides complete launch services to the Launch Services Program (LSP). In addition, SpaceX is the contractor for the Deep Space Logistics Gateway Logistics Services (GLS) contract. In this role they will provide delivery of cargo, experiment C2: C6s, and other supplies to the Gateway. Lastly, SpaceX is a provider for LSP's Venture-Class Acquisition of Dedicated and Rideshare (VADR) IDIQ contract. They offer a dedicated or rideshare opportunity to support risk tolerant launch services for Class D missions and a streamlined launch service for cubesats.

Jacobs Technology Inc., prime contractor for the Consolidated Operations, Management, Engineering and Test (COMET) contract, is responsible engineering; ground system development; flight vehicle/spacecraft processing; and launch, landing, and recovery operations in support of the following exploration systems development programs: Exploration Ground Systems, Space Launch System, and Orion spacecraft. The COMET contract also supports the International Space Station Program, Launch Services Program, and other NASA programs, commercial ventures, and partnerships at Kennedy.

Bechtel National Inc. is the prime contractor for the design and construction services for Exploration Ground Systems' mobile launcher 2. Bechtel is responsible for the design, construction, testing, and commissioning of the structure. The mobile launcher 2 is necessary to meet NASA's goal of landing the first woman, the first person of color, and the first international partner on the Moon.

Air Products and Chemicals, Inc. (APCI) provides bulk liquid helium (LHe) to Kennedy Space Center (KSC). The Government requires the delivery of bulk LHe and the lease of six helium pumps at KSC to support a range of activities at KSC and Cape Canaveral Space Force Station (CCSFS). LHe is converted to gaseous helium (GHe) through a pressurization process using an APCI proprietary LHe pump. The high pressure GHe is in turn pumped into the KSC GHe pipeline and is distributed and utilized by nearly every customer at KSC and CCSFS. GHe is used as an inert purge gas for hydrogen systems and as a pressurizing agent for ground and flight fluid systems. Helium is also used for spacecraft and launch vehicle processing, launch operations, and as a cryogenic cooling agent.

AI Solutions, Inc. provides integrated support services primarily to the Launch Services Program for NASA and NASA sponsored payloads in the areas of launch vehicle system engineering and mission analysis; launch site support engineering; safety and mission assurance, technical integration services; institutional services at Vandenberg Space Force Base; information technology; and engineering, operations, and maintenance of communications and telemetry system.

Engineering Research and Consulting, Inc. (ERC) provides laboratory services in support of multiple customers and projects at the agency's Kennedy Space Center (KSC). Under the Laboratory Support Services and Operations (LASSO) II contract, support includes program management; laboratory maintenance and support; operational laboratory services; and professional and technical support for scientific research, engineering, test and evaluation in laboratory environments. ERC operates and maintains a diverse set of laboratories, developmental shops and test facilities that support programs and projects at the Florida spaceport, including Center Engineering, Safety, and Operations; Exploration Ground Systems; International Space Station; Launch Services Program; the Space Technology Mission Directorate; Science Mission Directorate; and the U.S. Space Force Space Launch Delta 45 at Cape Canaveral Space Force Station.

Your Procurement Dollars at Work

Geographical Distribution by State (Fiscal Year 2024 Obligations)

STATE	TOTAL DOLLARS	STATE	TOTAL DOLLARS
ALABAMA	81,368,459	NEVADA	26,226,845
CALIFORNIA	1,162,265,802	NEW HAMPSHIRE	7,500
COLORADO	2,183,133	NEW MEXICO	4,844,615
CONNECTICUT	4,053,357	NEW YORK	1,387,840
FLORIDA	107,337,201	NORTH CAROLINA	3,357
GEORGIA	1,051,047	OKLAHOMA	28,249,902
ILLINOIS	383,462	PENNSYLVANIA	126,998,853
INDIANA	1,725,632	TENNESSEE	337,283,896
LOUISIANA	9,576,455	TEXAS	28,027,777
MARYLAND	69,022,147	VIRGINIA	454,966,814
MISSISSIPPI	186,601	WASHINGTON	1,000
MISSOURI	1,392,062	TOTAL STATE OBLIGATIONS	2,448,543,758

Top 25 KSC Business Contractors for FY 2024

CONTRACTOR	DOLLARS
SPACE EXPLORATION TECHNOLOGIES CORP.	975,826,961
BECHTEL NATIONAL, INC.	294,396,909
JACOBS TECHNOLOGY, INC.	275,761,827
AIR PRODUCTS AND CHEMICALS, INC.	87,594,545
AMENTUM SPACEPORT, LLC	49,058,076
AI SOLUTIONS, INC.	38,700,546
ENGINEERING RESEARCH AND CONSULTING, INC.	30,615,564
CHENEGA GLOBAL PROTECTION, LLC	22,354,578
PCI PRODUCTIONS, LLC	18,862,984
HSG, LLC	17,209,049
ASTROTECH SPACE OPERATIONS, LLC	14,444,197
AMENTUM SERVICES, INC.	14,160,067
ARES TECHNICAL SERVICES CORPORATION	11,521,424
BOEING COMPANY, THE	10,316,965
FLORIDA POWER & LIGHT COMPANY	10,216,050
J.P. DONOVAN CONSTRUCTION, INC.	9,750,000
AIR LIQUIDE LARGE INDUSTRIES U.S. LP	7,748,751
ADVON CORPORATION	6,757,134
BREVARD ACHIEVEMENT CENTER, INC.	6,685,322
WRIGHT BROS., LLC	6,592,203
ADVANCED COOLING TECHNOLOGIES, INC.	6,172,820
A-P-T RESEARCH, INC.	5,615,326
ROCKET LAB USA, INC.	5,229,000
PRECISION MECHANICAL, INC.	5,185,381
BLUE ORIGIN FLORIDA, LLC	5,035,000
TOTAL	1,935,807,679

SpaceX Falcon Heavy rocket carrying the National Oceanic and Atmospheric Administration (NOAA) GOES-U (Geostationary Operational Environmental Satellite U) lifts off from Launch Complex 39A at NASA's Kennedy Space Center in Florida on June 25, 2024. Photo credit: SpaceX





National Aeronautics and Space Administration
John F. Kennedy Space Center
Kennedy Space Center, FL 32899
Public Affairs Directorate

www.nasa.gov