

National Aeronautics and Space Administration

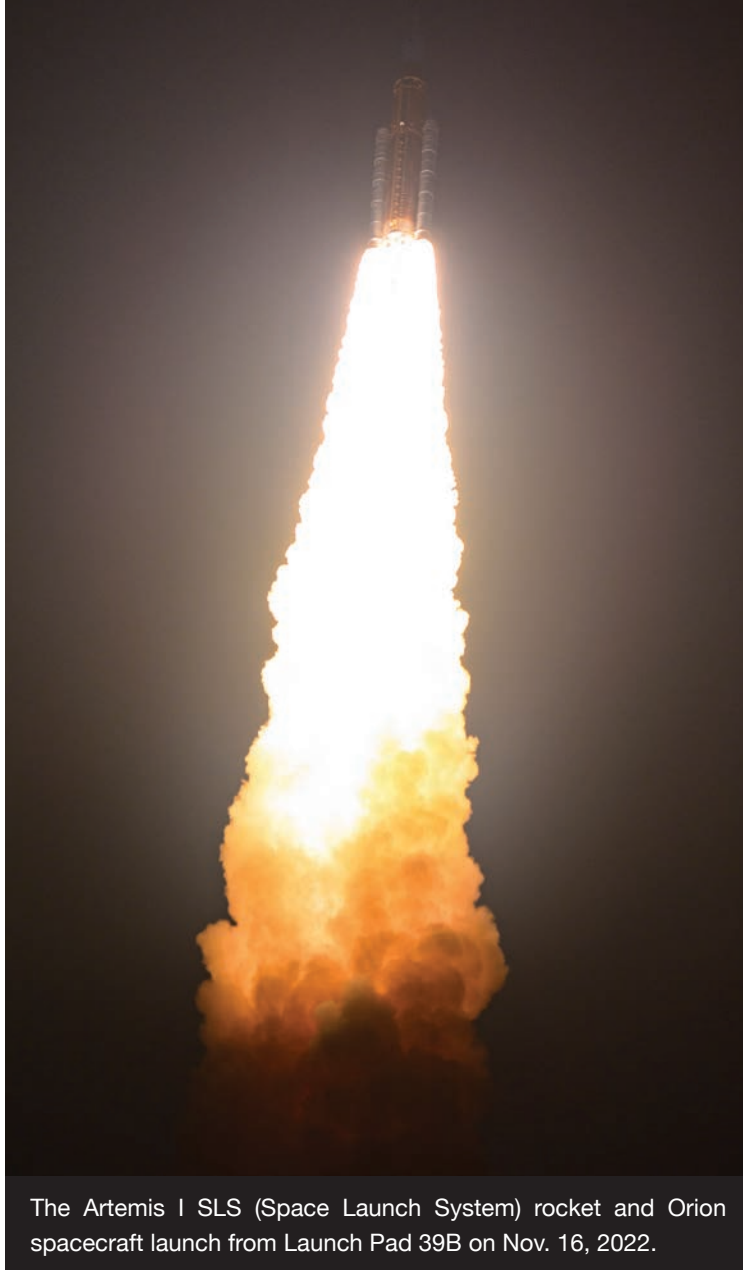


SPACE LAUNCH SYSTEM

OCT 2022 – MAR 2023

LAUNCHING A NEW ERA

LIFTOFF! NASA'S ARTEMIS I MEGA ROCKET LAUNCHES ORION TO MOON



The Artemis I SLS (Space Launch System) rocket and Orion spacecraft launch from Launch Pad 39B on Nov. 16, 2022.



A long exposure view of the Artemis I launch on Nov. 16, 2022, shows the rocket and spacecraft's trajectory as they break the chains of Earth's gravity and head to space.



Members of the launch control team monitor the health of the Artemis I SLS, Orion spacecraft, and ground systems during the successful launch countdown on Nov. 16, 2022.

Following a successful launch of SLS, the agency's Orion spacecraft was on its way to the Moon as part of the Artemis program. Carrying an uncrewed Orion, SLS lifted off for its flight test debut at 1:47 a.m. EST Wednesday, Nov. 16 from Launch Pad 39B at NASA's Kennedy Space Center in Florida. The launch was the first leg of a mission in which Orion traveled approximately 40,000 miles beyond the Moon and returned to Earth over the course of 25.5 days. Known as [Artemis I](#), the mission was a critical part of NASA's Moon to Mars exploration approach, in which the agency explores for the benefit of humanity. It was an important test for the agency before flying astronauts on the [Artemis II](#) mission.

Read more: go.nasa.gov/3AkSS9t

DATA FROM THE FIRST SLS FLIGHT TO PREPARE NASA FOR FUTURE ARTEMIS MISSIONS

NASA continues to evaluate data and learn more about the SLS rocket's debut performance during the agency's Nov. 16 Artemis I launch. Following an [initial data assessment](#) and review that determined the SLS rocket met or exceeded all performance expectations, SLS engineers are now taking a closer look at the Moon rocket's performance to prepare for the first crewed Artemis missions. Building off the assessment conducted shortly after launch, the preliminary post-flight data indicates that all SLS systems performed exceptionally and that the designs are ready to support a crewed flight on [Artemis II](#). The post-flight analysis team will continue reviewing data and conducting final reports.

Ahead of launch, teams established benchmarks for the rocket's performance through a series of pre-flight simulations and test campaigns. As the rocket launched and ascended to space, it experienced dynamic phases, like extreme forces and temperatures, that influenced its operations. The Artemis I flight test was the only way to gather real data on how the rocket performed during events like booster separation.

Engineers in the SLS Engineering and Support Center at NASA's Marshall Space Flight Center in Huntsville, Alabama, collected more than four terabytes of data and on-board imagery from SLS during pre-launch and launch phases. In addition, a total of roughly 31 terabytes of imagery data alone was collected from ground cameras, cameras on the rocket, and aerial cameras that were focused on SLS. By comparison, the Library of Congress' printed material is roughly 20 terabytes.

Read more: go.nasa.gov/3VoVeO4



The Artemis I SLS rocket and Orion spacecraft launch from Launch Pad 39B on Nov. 16, 2022.

VIEW THE BEST IMAGES FROM NASA'S ARTEMIS I MISSION

During Artemis I, SLS roared into the night sky and sent the Orion spacecraft on a 1.4-million-mile journey beyond the Moon and back. The uncrewed flight test was the first in a series of increasingly complex missions that will set the stage for the first woman and first person of color to step foot on the lunar surface, and for a long-term presence at the Moon that will enable future crewed missions to Mars.

From before its launch on Nov. 16, 2022, to splashdown on Dec. 11, NASA photographers and even the cameras onboard Orion captured stunning images, helping bring the public along for the mission.

Read more: go.nasa.gov/42cxf6H

The Artemis I SLS rocket and Orion spacecraft launch from Launch Pad 39B on Nov. 16, 2022.



NASA CONNECTS ALL MAJOR STRUCTURES OF ARTEMIS II MOON ROCKET CORE STAGE



Teams at NASA's Michoud Assembly Facility in New Orleans have fully integrated all five major structures of the SLS core stage for Artemis II, the first crewed Artemis mission that will send four astronauts around the Moon and return them home. Technicians joined the engine section to the rest of the rocket stage March 17. Next, teams will integrate the four RS-25 engines to the engine section to complete the stage.

Located at the bottom of the 212-foot-tall core stage, the engine section is the most complex and intricate part of the rocket stage, helping to power Artemis missions to the Moon. In addition to its miles of cabling and hundreds of sensors, the engine section is a crucial attachment point for the RS-25 engines and two solid rocket boosters that produce a combined 8.8 million pounds of thrust at liftoff. It houses the engines and includes vital systems for mounting, controlling, and delivering fuel from the propellant tanks to the engines.

Read more: go.nasa.gov/3oYgjmc

PROGRESS UNDERWAY ON MOON ROCKETS FOR NASA'S CREWED ARTEMIS MISSIONS



All the booster motors for the two solid rocket boosters on the SLS rocket for Artemis II are complete and will be readied for shipment from Northrop Grumman's facilities in Utah to NASA's Kennedy Space Center in Florida later this year.

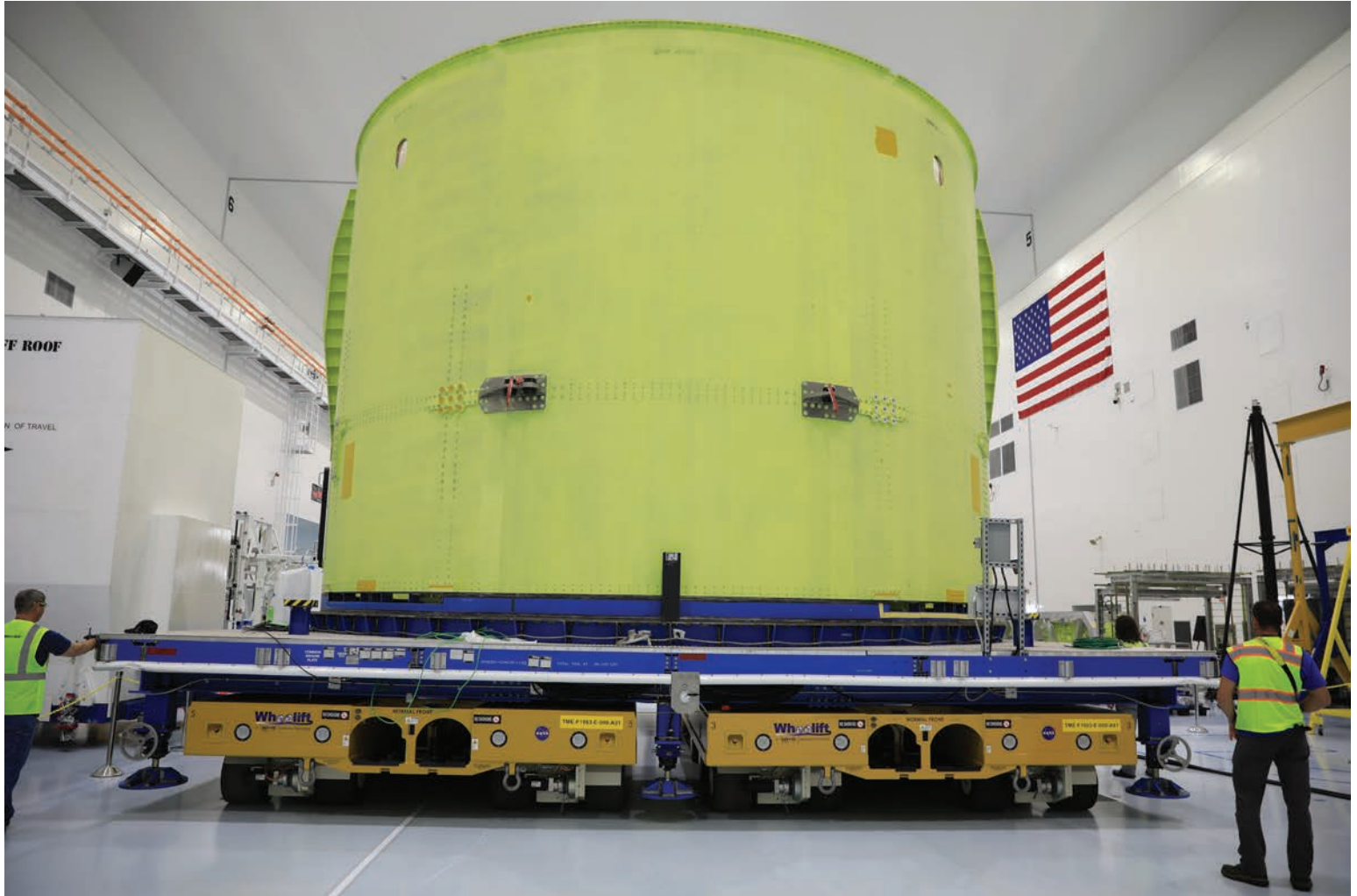
NASA and its partners across the country are continuing to make progress on the crewed Artemis missions with hardware for SLS rockets for Artemis II, III, and IV already in various phases of production, assembly, and testing.

The mega rocket's two solid rocket boosters and four RS-25 engines produced more than 8.8 million pounds of thrust at liftoff to send NASA's Orion spacecraft beyond the Moon and back on Artemis I. Data from the first flight of SLS is helping engineers build confidence in the rocket's systems to safely fly crew on future lunar missions.

Like Artemis I, the SLS rockets that will power the Artemis II and III missions to the Moon will use the Block 1 configuration with the interim cryogenic propulsion stage (ICPS). Beginning with Artemis IV, the SLS rocket will evolve into a more powerful configuration called Block 1B, which replaces the ICPS with the more dynamic Exploration Upper Stage (EUS) for in-space propulsion to send crew and large cargos to the Moon.

Read more: go.nasa.gov/3nl9YAO

ARTEMIS III CORE STAGE ENGINE SECTION ARRIVES AT KENNEDY



The Artemis III engine section is moved into Kennedy's Space Station Processing Facility following transportation on the Pegasus barge from Michoud.

Teams from Michoud delivered the SLS core stage engine section for Artemis III to Kennedy, Saturday, Dec 10. As NASA moves forward with SLS production and assembly for future Artemis missions, technicians at the spaceport are beginning some core stage assembly and outfitting activities beginning with the Artemis III Moon rocket. In tandem, teams at Michoud will continue to manufacture the remaining four other elements of the 212-foot-tall core stage.

Teams transferred the engine section from the Pegasus barge to the Kennedy center's Space Station Processing Facility where teams will begin processing operations ahead of final integration in the Vehicle Assembly Building.

Read more: go.nasa.gov/3LHUyQy

STENNIS CONTINUES PREPARATION FOR EXPLORATION UPPER STAGE TESTING

Crews at NASA's Stennis Space Center in Mississippi lift the 75-ton interstage simulator test component into place at the B-2 Test Stand on Dec. 15. The test component, 31 feet in diameter and 33 feet tall, will be used during Green Run testing of the new EUS, which will fly on future SLS missions as NASA continues its mission to explore the universe for the benefit of all. The lift exercise served multiple purposes for the Stennis test complex personnel. Overall, crews used the component as a "pathfinder" for the EUS unit, which helped train lift crews on best practices for moving and handling the actual flight hardware when it arrives. Although the simulator is not exactly the size of the EUS unit, lifting the component into place on the B-2 Test Stand allowed crews to simulate procedures and techniques for handling the flight hardware. The lift also allowed crews to check the test stand clearances to ensure all is configured as needed for the EUS unit.

Several key test stand elements must be nearly perfectly aligned for EUS. The simulator lift and install helped crews take precise measurements to ensure those elements are properly placed. Finally, the lift allowed operators to return the simulator to proper placement on the B-2 tarmac following its removal from the test stand on Dec. 16.

Read more: go.nasa.gov/3oYhq5m

Crews at Stennis lift the 75-ton interstage simulator test component into place at the B-2 Test Stand on Dec. 15.



NASA CONTINUES TEST SERIES FOR REDESIGNED ARTEMIS MOON ROCKET ENGINES



A mounted field camera offers a close-up view as NASA conducts an RS-25 hot fire test on the Fred Haise Test Stand at NASA's Stennis Space Center in south Mississippi on March 8, 2023.

NASA's testing for redesigned [RS-25](#) engines to be used on future SLS missions continued with a March 8 full duration hot fire at NASA's Stennis Space Center, near Bay St. Louis, Mississippi.

The test, conducted on the [Fred Haise Test Stand](#) at Stennis, was the third of the year and part of an ongoing certification hot fire series. It also was the third test since an upgraded nozzle was installed on the RS-25 engine just prior to a [Feb. 8 hot fire](#). The redesigned engines provided by lead SLS engines contractor Aerojet Rocketdyne will be used on future [Artemis](#) flights to the Moon, beginning with Artemis V, as NASA continues its mission to explore the secrets of the universe for the benefit of all.

Read more: go.nasa.gov/3oW63uE

WHAT'S NEW IN SLS SOCIAL MEDIA

ARTEMIS IS ENABLED BY ENTIRE COUNTRY

NASA's Artemis campaign is the most ambitious human space exploration program ever endeavored. SLS, Orion, and the Exploration Ground Systems are supported by and reliant upon support from companies from every state in the country. A new video series takes a look at companies in each of the 50 states.

Watch here: youtube.com/playlist?list=PLBEXDPatoWBmCVhhewFWCEiujbRESKDno



ROCKET SCIENCE IN 60 SECONDS: HOW IS PROPELLANT LOADED INTO NASA'S SLS MOON ROCKET?



In this episode of Rocket Science in 60 Seconds, NASA Michoud engineer Chandler Scheuermann explains how teams at Kennedy load more than 730,000 gallons of super cold propellant into the propellant tanks of NASA's Moon rocket on launch day.

Watch here: youtube.com/watch?v=bTvCr6K_GCI

SLS ON THE ROAD



SLS Program Manager John Honeycutt delivered the keynote at the National Space Club – Huntsville’s February breakfast on Feb. 28. Honeycutt shared preliminary results from the Artemis I mission, photos and video from the mission, and SLS hardware updates for the next missions that will launch astronauts to the Moon.



SLS Outreach Specialist Twila Schneider, center, led NASA Artemis’ participation in Kids Week 2023 at the Intrepid Sea, Air & Space Museum in New York City in February 2023. The SLS team, along with other Artemis team members, brought to life the complete story of humanity’s return to the Moon. During the three-day event, nearly 11,000 people visited the exhibit.

SPACEFLIGHT PARTNERS:

Ultimate Hydroforming, Inc.

LOCATION: *Sterling Heights, Michigan*

WHAT THEY DO FOR SLS:

Ultimate Hydroforming, Inc. is a 100% woman-owned business. President and CEO Shirley Klyn started UHI in 1979 and has guided her company's growth to an eight-plant campus. The UHI Team consists of 170 highly skilled team members in many and various disciplines. UHI's selection as the supplier of the core stage system tunnel cover assemblies was the culmination of three years of due diligence, tooling designs, and extensive virtual formability simulations. The accuracy of the forming simulations enabled confidence, with a great deal of certainty, that the designs would produce a robust product long before the actual construction of the cast iron form tooling was started. The UHI team continues to be involved in ongoing product design collaborations in an effort to reduce the number of details in each core stage assembly, including re-design of the tunnel cover for added strength with a simplified assembly and significant weight reduction.



GET THE LATEST SLS UPDATES SENT TO YOUR INBOX EACH MONTH!

The screenshot shows the top portion of a newsletter. At the top left is the 'SLS in 3.2.1' logo, and at the top right is the 'ARTEMIS' logo. Below the logos is the section 'Top Three Countdown' with the subtext 'What you need to know right now'. It lists three items: 3... Test series continues, 2. Suited for space travel, and 1. The right connection. Each item has a 'Read more' link. Below this is the 'Picture of the Month' section with the subtext 'We know how to wow'. It features a large image of a redesigned RS-25 engine being tested in a hot fire, with a bright orange glow and white smoke. Below the image is a caption: 'At NASA's Stennis Space Center in Mississippi, teams tested a redesigned RS-25 engine March 21, achieving a long duration hot fire of 10 minutes.'

Every day, the SLS rocket gets closer to launch. Get updates in your inbox each month by subscribing to [SLS in 3..2..1](#).



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