

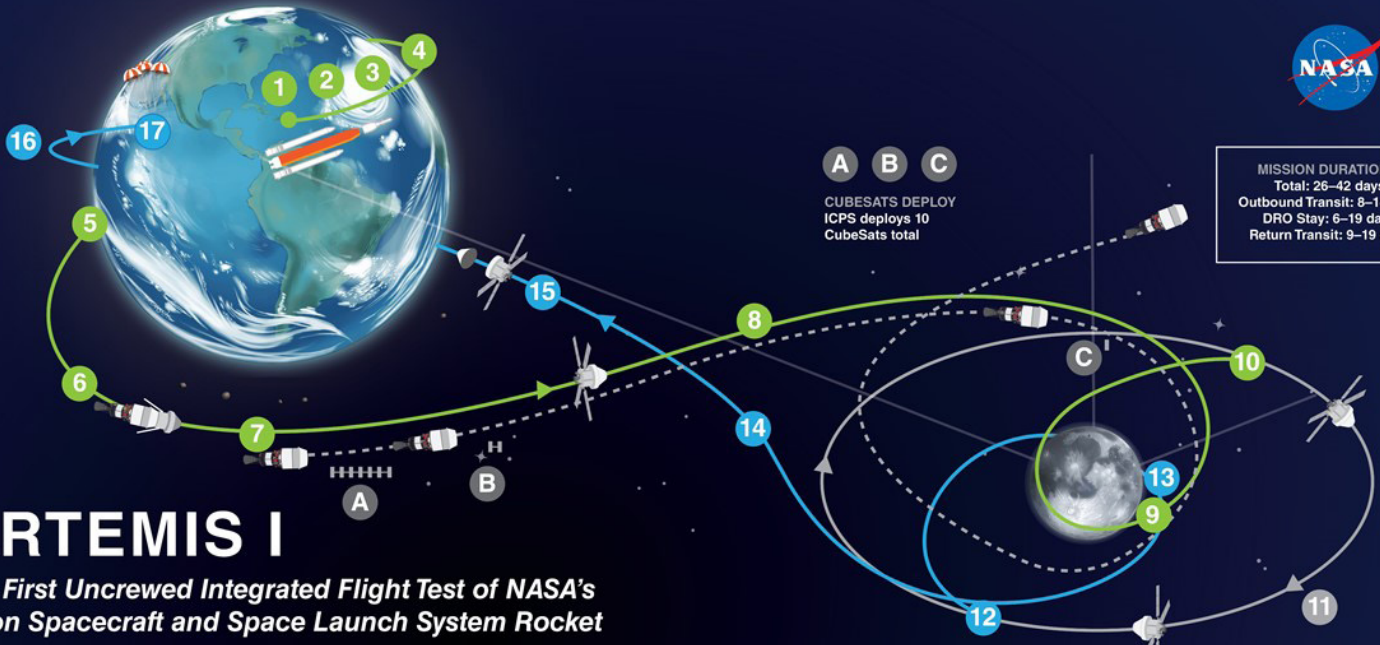


# NASA'S ORION SPACECRAFT

NASA is building a sustainable presence on and around the Moon as part of the Artemis Program. The journey begins with the Orion spacecraft – NASA's next generation spaceship that will launch atop the world's most powerful rocket to take astronauts on a journey of exploration to the Moon and on to Mars. Orion is part of NASA's backbone for deep space exploration, along with the Space Launch System rocket and the lunar Gateway.

To protect astronauts on these long-duration missions and return them safely to Earth, Orion engineers have woven innovative technology, advanced systems and state-of-the-art thermal protection into the fabric of the spacecraft. The team behind Orion has built upon the past 50 years of space exploration experience in human spaceflight, launch operations, robotic precursor missions, in-space construction and mission management.





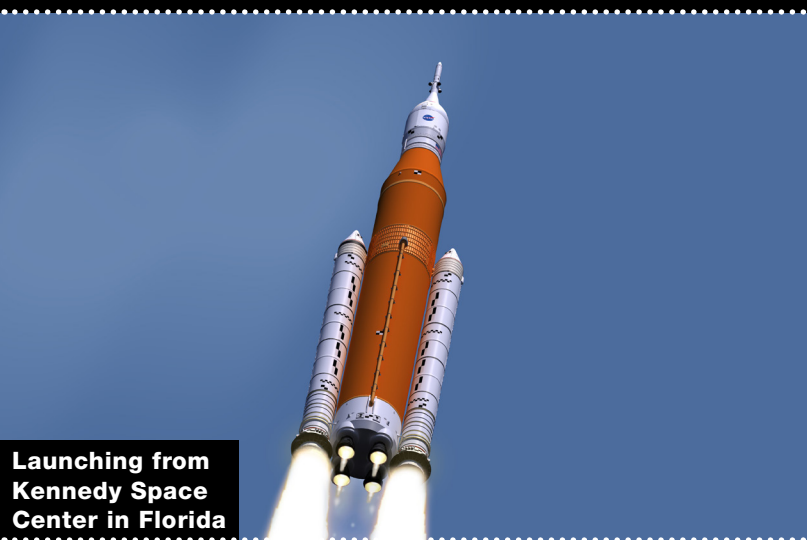
**A B C**  
 CUBESATS DEPLOY  
 ICPS deploys 10  
 CubeSats total

**MISSION DURATIONS:**  
 Total: 26-42 days  
 Outbound Transit: 8-14 days  
 DRO Stay: 6-19 days  
 Return Transit: 9-19 days

# ARTEMIS I

*The First Uncrewed Integrated Flight Test of NASA's Orion Spacecraft and Space Launch System Rocket*

- 1 LAUNCH**  
SLS and Orion lift off from pad 39B at Kennedy Space Center.
- 2 JETTISON ROCKET BOOSTERS, FAIRINGS, AND LAUNCH ABORT SYSTEM**
- 3 CORE STAGE MAIN ENGINE CUT OFF**  
With separation.
- 4 PERIGEE RAISE MANEUVER**
- 5 EARTH ORBIT**  
Systems check with solar panel adjustments.
- 6 TRANS LUNAR INJECTION (TLI) BURN**  
Maneuver lasts for approximately 20 minutes.
- 7 INTERIM CRYOGENIC PROPULSION STAGE (ICPS) SEPARATION AND DISPOSAL**  
ICPS commits Orion to moon at TLI.
- 8 OUTBOUND TRAJECTORY CORRECTION (OTC) BURNS**  
As necessary adjust trajectory for lunar flyby to Distant Retrograde Orbit (DRO).
- 9 OUTBOUND POWERED FLYBY (OPF)**  
60 nmi from the Moon; targets DRO insertion.
- 10 LUNAR ORBIT INSERTION**  
Enter Distant Retrograde Orbit.
- 11 DISTANT RETROGRADE ORBIT**  
Perform half or one and a half revolutions in the orbit period 38,000 nmi from the surface of the Moon.
- 12 DRO DEPARTURE**  
Leave DRO and start return to Earth.
- 13 RETURN POWERED FLYBY (RPF)**  
RPF burn prep and return coast to Earth initiated.
- 14 RETURN TRANSIT**  
Return Trajectory Correction (RTC) burns as necessary to aim for Earth's atmosphere.
- 15 CREW MODULE SEPARATION FROM SERVICE MODULE**
- 16 ENTRY INTERFACE (EI)**  
Enter Earth's atmosphere.
- 17 SPLASHDOWN**  
Pacific Ocean landing within view of the U.S. Navy recovery ship.



**Launching from Kennedy Space Center in Florida**



**Lunar Flyby**



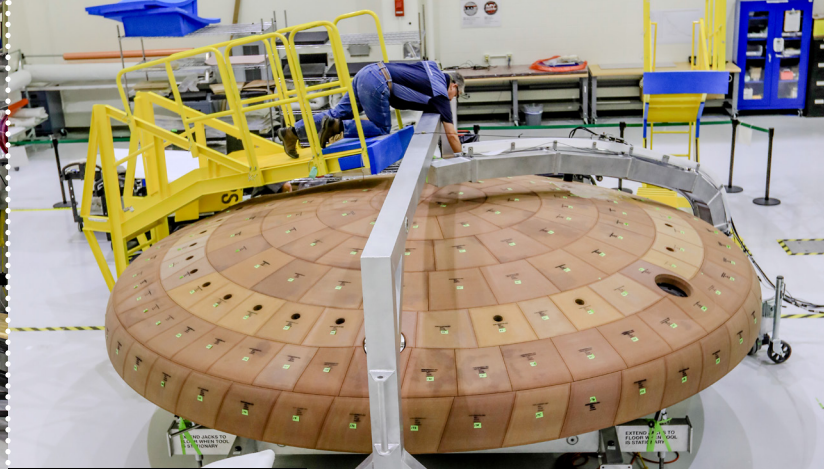
**Orion approaching the lunar Gateway**



**Returning to Earth at 25,000 MPH**



**Crew Module Pressure Vessel**  
Kennedy Space Center, Florida



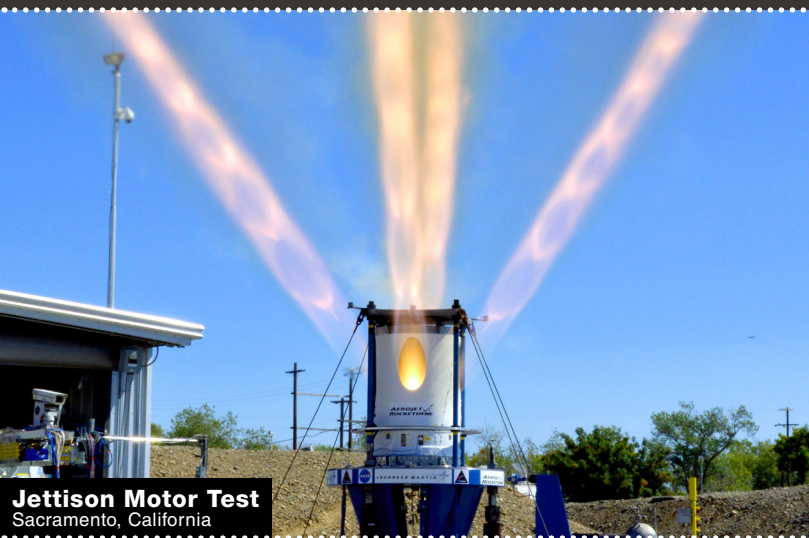
**Heat Shield**  
Kennedy Space Center, Florida

# Artemis I

The Space Launch System rocket with Orion atop is targeted to launch from Kennedy's Launch Pad 39B in 2022. Artemis I will send Orion on a path more than 40,000 miles beyond the moon over a course of three weeks, farther into space than human spaceflight has ever traveled before. The spacecraft will return to Earth and safely splash down in the Pacific Ocean off the coast of California. The mission will advance and validate capabilities required for human exploration of Mars.



**Service Module Structural Testing**  
Space Power Facility at NASA Glenn Research Center's Neil A. Armstrong Test Facility



**Jettison Motor Test**  
Sacramento, California



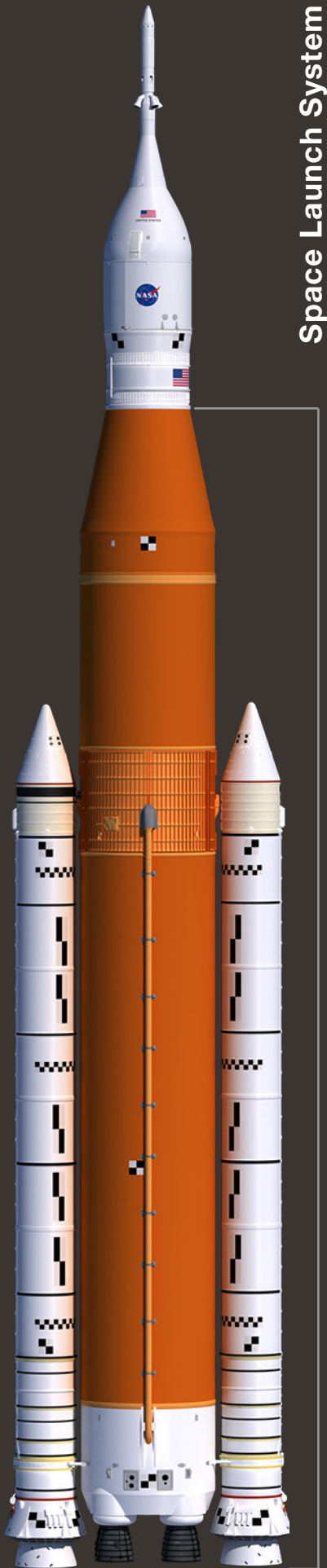
**Service Module Flight Article**  
Bremen, Germany



**Propulsion Qualification Module Testing**  
White Sands Test Facility, New Mexico



**Human Rating Parachutes**  
Yuma, Arizona



Space Launch System



Orion Spacecraft

## Space Launch System

The Space Launch System is a powerful launch vehicle, which will expand human presence to celestial destinations beyond low-Earth orbit and throughout the solar system. SLS is the only rocket that can send Orion, astronauts and supplies to the Moon on a single mission.

## Orion Spacecraft

### 1 Launch Abort System

The launch abort system, positioned on a tower atop the crew module, can activate within milliseconds to propel the vehicle to safety and position the crew module for a safe landing.

### 2 Crew Module

The crew module is capable of transporting four crew members beyond the moon, providing a safe habitat from launch through landing and recovery. Inside the familiar deep-space capsule shape are advances in life support, avionics, power systems, and advanced manufacturing techniques.

### 3 Service Module

Created in collaboration with ESA (European Space Agency), the service module provides support to the crew module from launch through separation prior to entry. It provides in-space propulsion for orbital transfer, power and thermal control, attitude control and high altitude ascent aborts. While mated with the crew module, it also provides water and air to support the crew.

## Connect With Us

 [Facebook.com/NASAO Orion](https://www.facebook.com/NASAO Orion)

 [Twitter.com/NASA\\_Orion](https://twitter.com/NASA_Orion)

 [Flickr.com/NASAO Orion](https://www.flickr.com/photos/NASAO Orion/)

 [NASAO Orion.Tumblr.com](https://www.tumblr.com/NASAO Orion/)