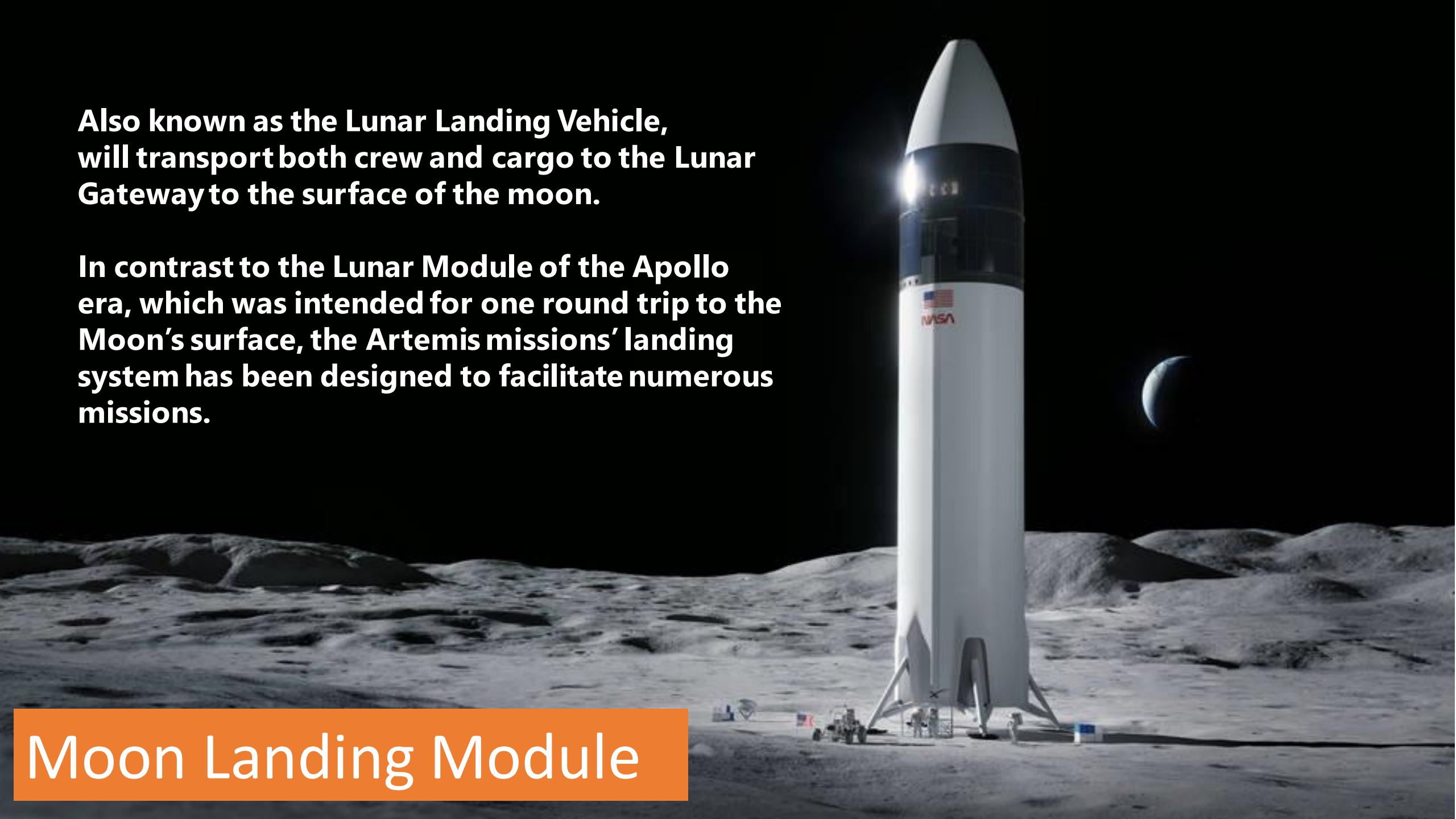
The Cosmic Cliffs

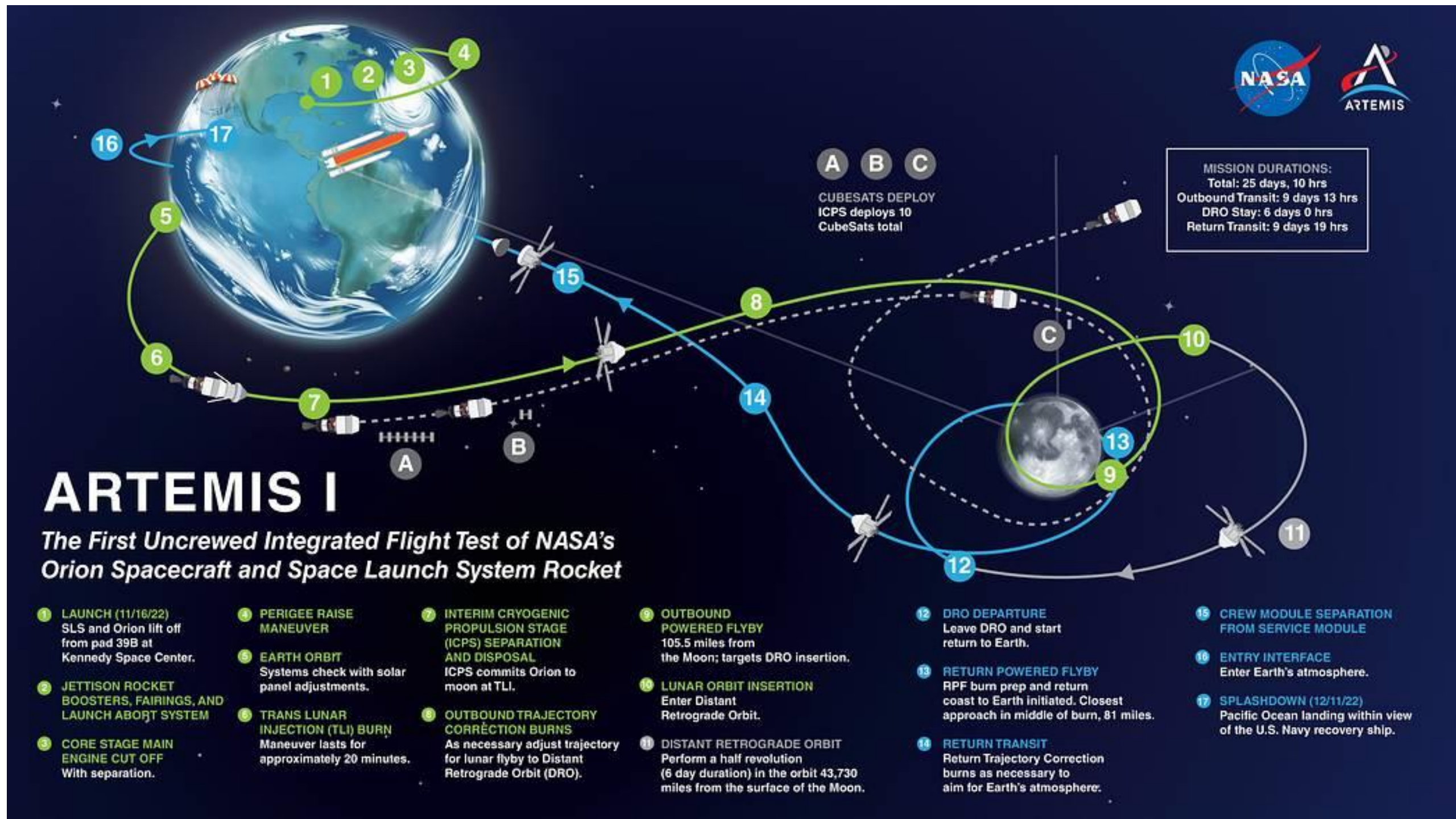


Also known as the Lunar Landing Vehicle, will transport both crew and cargo to the Lunar Gateway to the surface of the moon.

In contrast to the Lunar Module of the Apollo era, which was intended for one round trip to the Moon's surface, the Artemis missions' landing system has been designed to facilitate numerous missions.

Moon Landing Module

The Psyche Asteroid



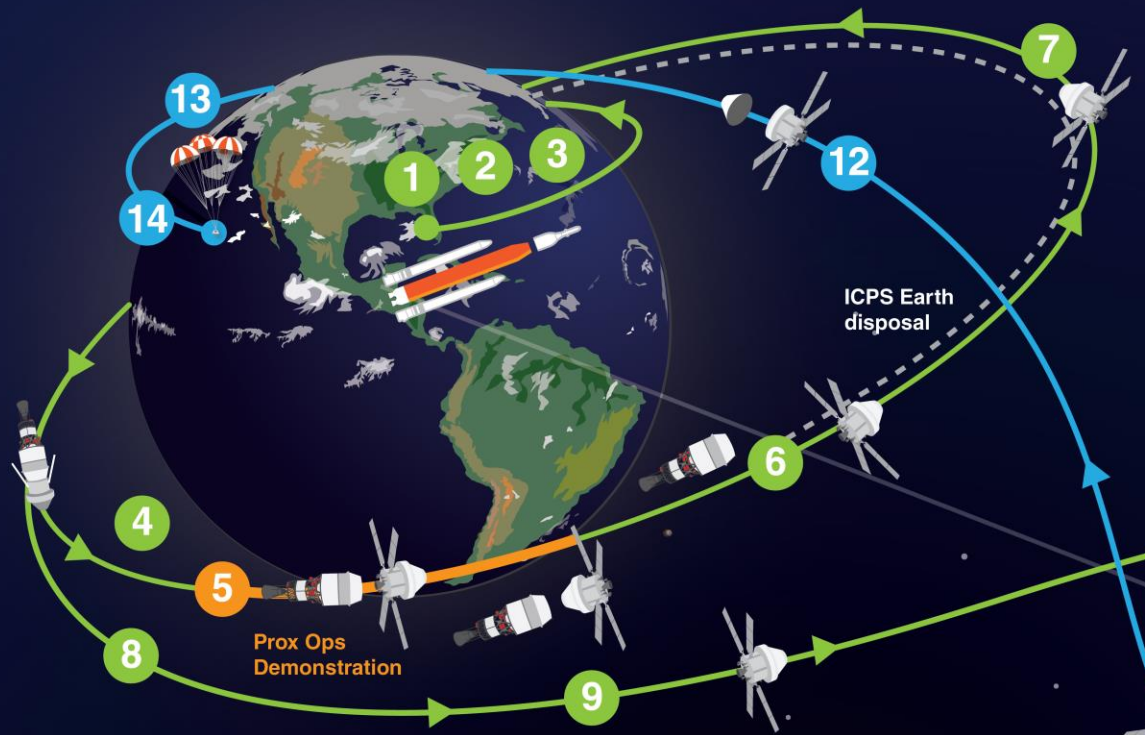
ARTEMIS I

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

1. **LAUNCH (11/16/22)**
   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 BURNS**
   As necessary adjust trajectory for lunar flyby to Distant Retrograde Orbit (DRO).
9. **OUTBOUND POWERED FLYBY**
   105.5 miles from the Moon; targets DRO insertion.
10. **LUNAR ORBIT INSERTION**
    Enter Distant Retrograde Orbit.
11. **DISTANT RETROGRADE ORBIT**
    Perform a half revolution (6 day duration) in the orbit 43,730 miles from the surface of the Moon.
12. **DRO DEPARTURE**
    Leave DRO and start return to Earth.
13. **RETURN POWERED FLYBY**
    RPF burn prep and return coast to Earth initiated. Closest approach in middle of burn, 81 miles.
14. **RETURN TRANSIT**
    Return Trajectory Correction burns as necessary to aim for Earth's atmosphere.
15. **CREW MODULE SEPARATION FROM SERVICE MODULE**
16. **ENTRY INTERFACE**
    Enter Earth's atmosphere.
17. **SPLASHDOWN (12/11/22)**
    Pacific Ocean landing within view of the U.S. Navy recovery ship.

National Aeronautics and Space Administration

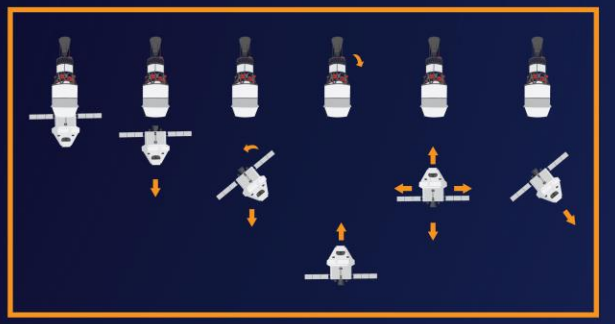
NASA



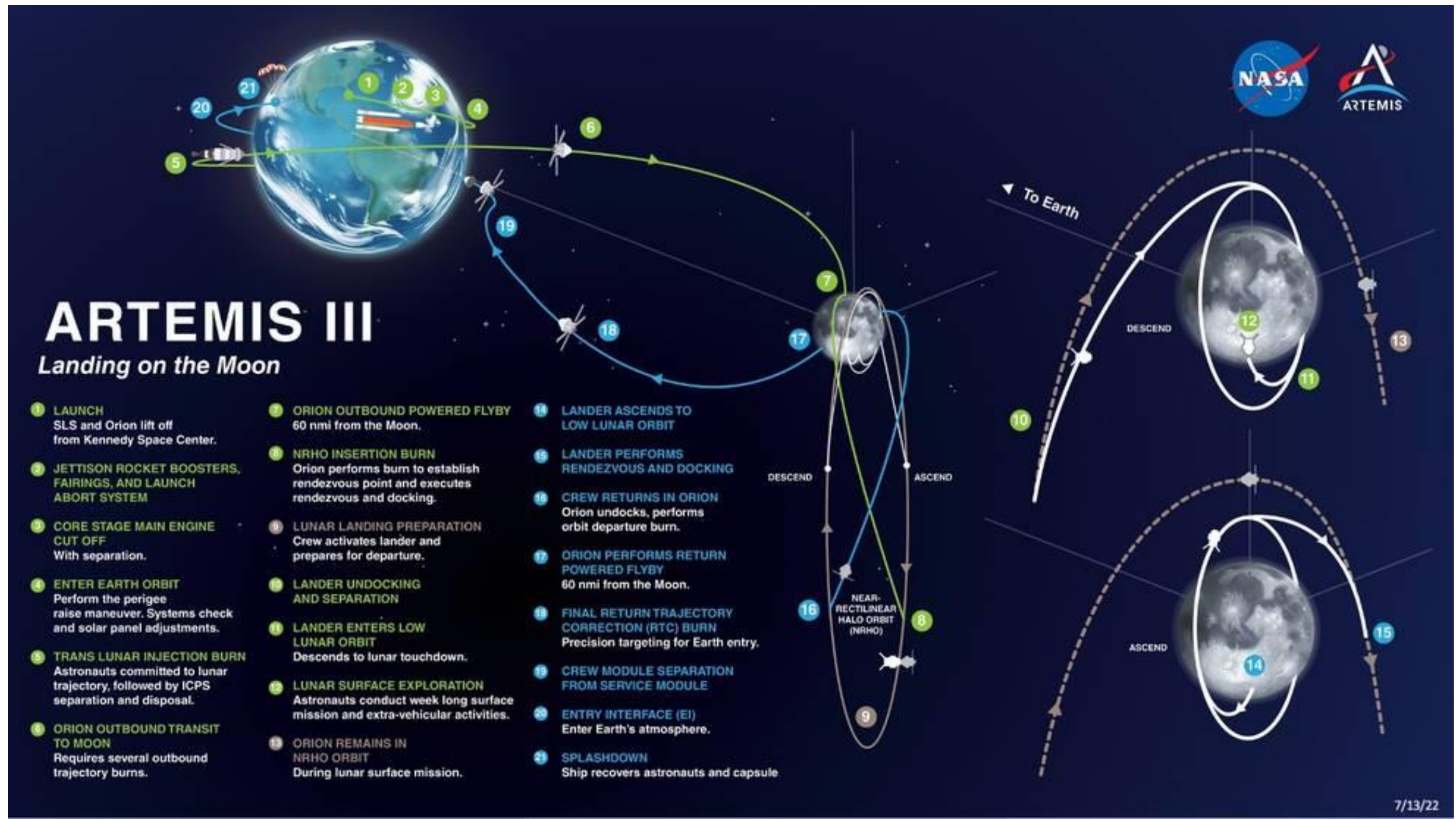
ARTEMIS II

Crewed Hybrid Free Return Trajectory, demonstrating astronaut flight and spacecraft systems performance beyond Low Earth Orbit.

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. **APOGEE RAISE BURN TO HIGH EARTH ORBIT**
   Life support, exercise, and habitation equipment evaluations. 42 hour checkout of spacecraft.
5. **PROX OPS DEMONSTRATION**
   Orion proximity operations demonstration and manual handling qualities assessment for up to 2 hours.
6. **INTERIM CRYOGENIC PROPULSION STAGE (ICPS) DISPOSAL BURN**
7. **ORION PERIGEE RAISE BURN**
8. **TRANS-LUNAR INJECTION (TLI) BY ORION'S MAIN ENGINE**
9. **OUTBOUND TRANSIT TO MOON**
   4 days outbound transit along free return trajectory.
10. **LUNAR FLYBY**
    4,000 nmi (mean) lunar farside altitude.
11. **TRANS-EARTH RETURN**
    Return Trajectory Correction (RTC) burns as necessary to aim for Earth's atmosphere; travel time approximately 4 days.
12. **CREW MODULE SEPARATION FROM SERVICE MODULE**
13. **ENTRY INTERFACE (EI)**
    Enter Earth's atmosphere.
14. **SPLASHDOWN**
    Pacific Ocean landing within view of the U.S. Navy recovery ship.



PROXIMITY OPERATIONS DEMONSTRATION SEQUENCE


NASA
ARTEMIS
ARTEMIS III
Landing on the Moon
1 LAUNCH
SLS and Orion lift off from Kennedy Space Center.
2 JETTISON ROCKET BOOSTERS, FAIRINGS, AND LAUNCH ABORT SYSTEM
3 CORE STAGE MAIN ENGINE CUT OFF
With separation.
4 ENTER EARTH ORBIT
Perform the perigee raise maneuver. Systems check and solar panel adjustments.
5 TRANS LUNAR INJECTION BURN
Astronauts committed to lunar trajectory, followed by ICPS separation and disposal.
6 ORION OUTBOUND TRANSIT TO MOON
Requires several outbound trajectory burns.
7 ORION OUTBOUND POWERED FLYBY
60 nmi from the Moon.
8 NRHO INSERTION BURN
Orion performs burn to establish rendezvous point and executes rendezvous and docking.
9 LUNAR LANDING PREPARATION
Crew activates lander and prepares for departure.
10 LANDER UNDOCKING AND SEPARATION
11 LANDER ENTERS LOW LUNAR ORBIT
Descends to lunar touchdown.
12 LUNAR SURFACE EXPLORATION
Astronauts conduct week long surface mission and extra-vehicular activities.
13 ORION REMAINS IN NRHO ORBIT
During lunar surface mission.
14 LANDER ASCENDS TO LOW LUNAR ORBIT
15 LANDER PERFORMS RENDEZVOUS AND DOCKING
16 CREW RETURNS IN ORION
Orion undocks, performs orbit departure burn.
17 ORION PERFORMS RETURN POWERED FLYBY
60 nmi from the Moon.
18 FINAL RETURN TRAJECTORY CORRECTION (RTC) BURN
Precision targeting for Earth entry.
19 CREW MODULE SEPARATION FROM SERVICE MODULE
20 ENTRY INTERFACE (EI)
Enter Earth's atmosphere.
21 SPLASHDOWN
Ship recovers astronauts and capsule
To Earth
DESCEND
ASCEND
NEAR-RECTILINEAR HALO ORBIT (NRHO)
7/13/22

Spaceship Neptune