National Aeronautics and Space Administration

CUBESATS ON NASA'S SPACE LAUNCH SYSTEM

NASA's Space Launch System (SLS) is the largest and most powerful rocket ever built, designed to return astronauts to the Moon in the Orion spacecraft and to send transformative science missions deep into the solar system. The vehicle can also accommodate 6U and 12U CubeSats, providing smallsats with access to deep space for exciting science and technology missions.

Artemis I will be the first flight of SLS, and will send an uncrewed Orion spacecraft into lunar orbit, a major step in a new era of exploration. The mission will also transport a fleet of 10 6U CubeSats to deep space destinations, where they will gather data valuable for humanity's return to the Moon and eventual exploration of Mars. Future flights will offer additional opportunities for NASA and its international, industry and academic partners to send CubeSats to the Moon and beyond.

FLY WITH SLS

With the Artemis Program, NASA has its sights firmly on going forward to the Moon. This time, the Agency will leverage capabilities and partnerships with international space agencies, industry and academia to emplace infrastructure that will enable humanity to go to the Moon, and prepare for missions to Mars.

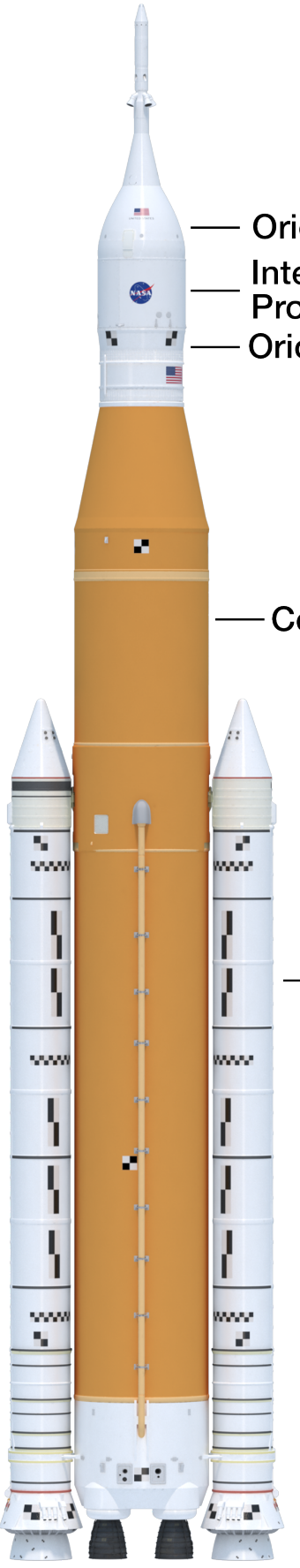
NASA selects CubeSats to ride along on SLS deep space missions based on their ability to return data or test technologies that will address the Agency's Strategic Knowledge Gaps (SKGs) related to exploration of the Moon and Mars.

CubeSats can play a key role in the Artemis missions by gaining knowledge and demonstrating potential technologies that reduce risk, increase effectiveness and improve the design of robotic and human space exploration missions.

SLS BLOCK 1 ACCOMMODATIONS

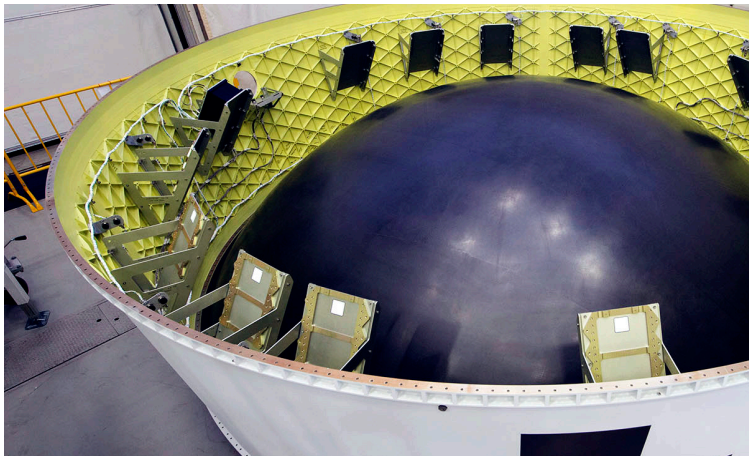
The initial SLS flights will use the Block 1 vehicle, which houses CubeSats in the Orion stage adapter, a ring that attaches the interim cryogenic propulsion stage to Orion's spacecraft adapter. The volume can potentially accommodate up to 17 CubeSat slots in a combination of 6U and 12U form factors, plus the SLS Program-supplied avionics unit. Payloads will deploy on a heliocentric trajectory toward the Moon after the vehicle safely separates from Orion.

SLS Block 1 will return astronauts to the Moon and offer CubeSats access to deep space.



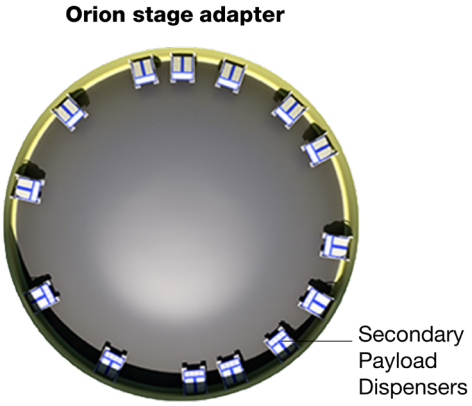
Secondary Payload Deployment System

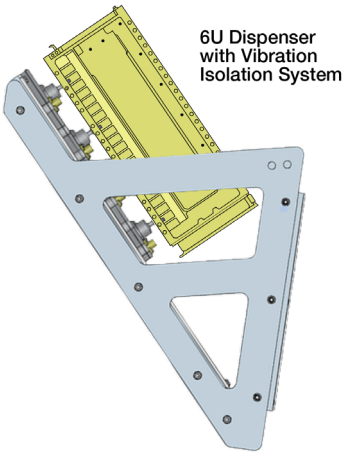
The SLS Program provides a comprehensive secondary payload deployment system, including mounting brackets for commercial off-the-shelf (COTS) dispensers, cable harnesses, a vibration isolation system and an avionics unit. The entire system is tested prior to shipping from Marshall Space Flight Center in Huntsville, Alabama, and again when it's received at Kennedy Space Center in Florida, where the vehicle is stacked and launched.

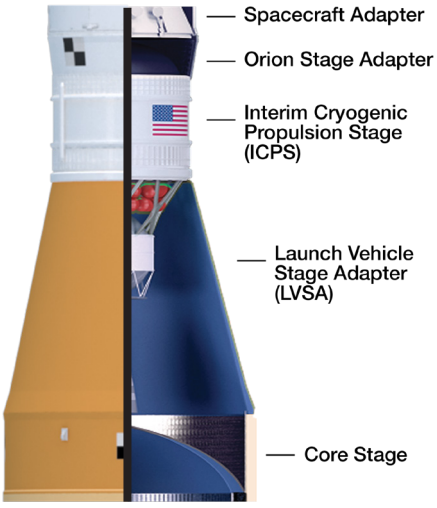


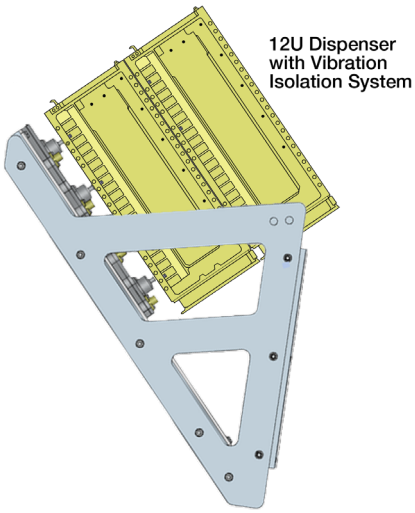
The secondary payload deployment system installed in the Orion stage adapter for the first SLS flight.

SPACE LAUNCH SYSTEM

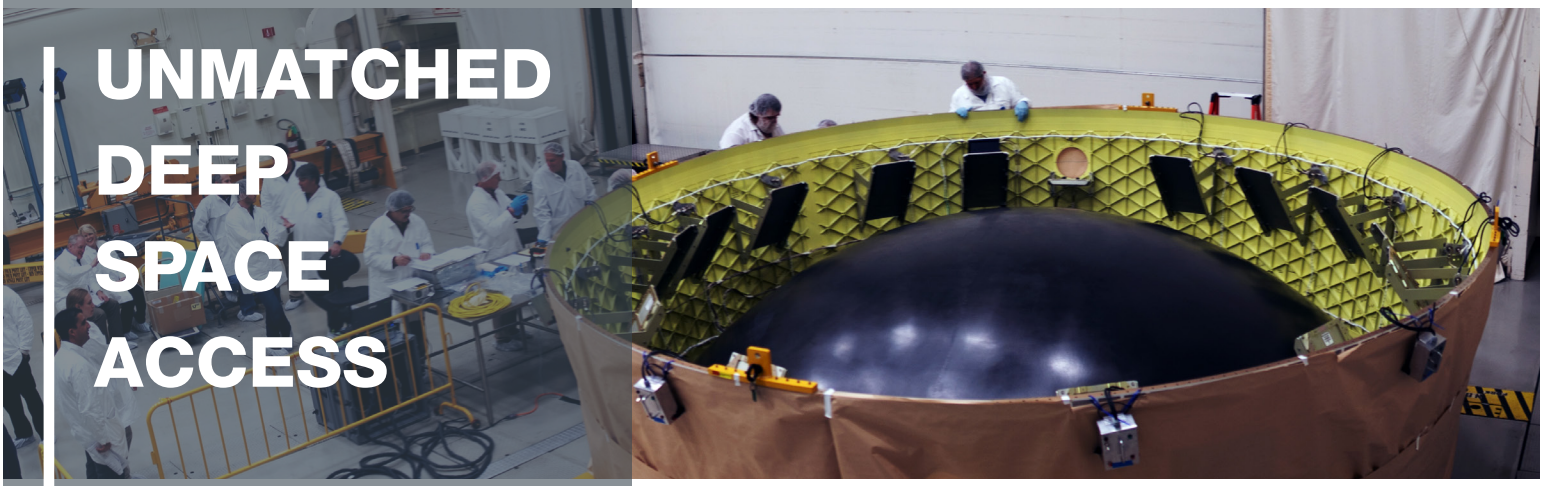








The Orion stage adapter, with volume for CubeSats, connects the SLS upper stage to the Orion Spacecraft.



UNMATCHED DEEP SPACE ACCESS

ARTEMIS I MANIFESTED PAYLOADS

MOON

Lunar IceCube – Morehead State University, Kentucky
Searching for water in all forms and other volatiles with an infrared spectrometer.

LunaH-Map – Arizona State University, Arizona
Creating higher-fidelity maps of near-surface hydrogen in craters and other permanently shadowed regions of the lunar South Pole with neutron spectrometers.

OMOTENASHI – JAXA, Japan
Developing world's smallest lunar lander and studying the lunar environment.

LunIR – Lockheed Martin, Colorado
Performing advanced infrared imaging of the lunar surface.

SUN

CuSP – Southwest Research Institute, Texas
Measuring particles and magnetic fields as a space weather station.

ASTEROID

NEA Scout – Marshall Space Flight Center, Alabama
Traveling by solar sail to a near-Earth asteroid and taking pictures and other characterizations of its surface.

EARTH

EQUULEUS – University of Tokyo/JAXA, Japan
Imaging the earth's plasmasphere for a better understanding of Earth's radiation environment from Earth-Moon L2 point.

OTHER MISSIONS

BioSentinel – Ames Research Center, California Using single-celled yeast to detect, measure and compare the impact of deep-space radiation on living organisms over a long period of time.

ArgoMoon – European Space Agency/ASI, ArgoTec, Italy
Observing the SLS interim cryogenic propulsion stage with advanced optics and software imaging system.

CENTENNIAL CHALLENGES

Team Miles – Miles Space, Florida
Demonstrating propulsion using plasma thrusters and competing in NASA's Deep Space Derby.

For more technical information on payload integration and launch environments, please refer to the *SLS Mission Planner's Guide, ESD 30000,* available for download. For more information, contact **nasa-slspayloads@mail.nasa.gov**