



5...4...3...2...1...

SPACE LAUNCH SYSTEM

DEEP-SPACE DEPLOYMENT FOR SMALLSATS

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SLS CAPABILITY AVAILABILITY

SLS Block 1 As Early As 2019

Provides

Initial Heavy-Lift Capability

Enables

Orion Test

SmallSats to Deep Space



SLS Block 1B Crew As Early As 2022

Provides

105 t lift capability via Exploration Upper Stage

Co-manifested payload capability in Universal Stage Adapter

Enables

Deep Space Gateway

Larger CubeSat- and ESPA-Class Payloads



SLS Block 1B Cargo As Early As 2022

Provides

8.4-meter fairings for primary payloads

Regular flight cadence for additional launches

Enables

Europa Clipper/Lander

Deep Space Transport

Large-Aperture Space Telescopes

Ice or Ocean Worlds Missions

Interstellar Medium



SLS Block 2 As Early As 2028

Provides

130 t lift capability via advanced boosters

10-meter fairings for primary payloads

Enables

Crewed Mars Orbit Missions

Crewed Mars Surface Missions



SLS BLOCK 1 CONFIGURATION

Overview

- Initial configuration of vehicle optimized for near-term heavy-lift capability
- Completed Critical Design Review in July 2015

SLS Block 1

Capability: >70 metric tons

Height: 322 feet (98 meters)

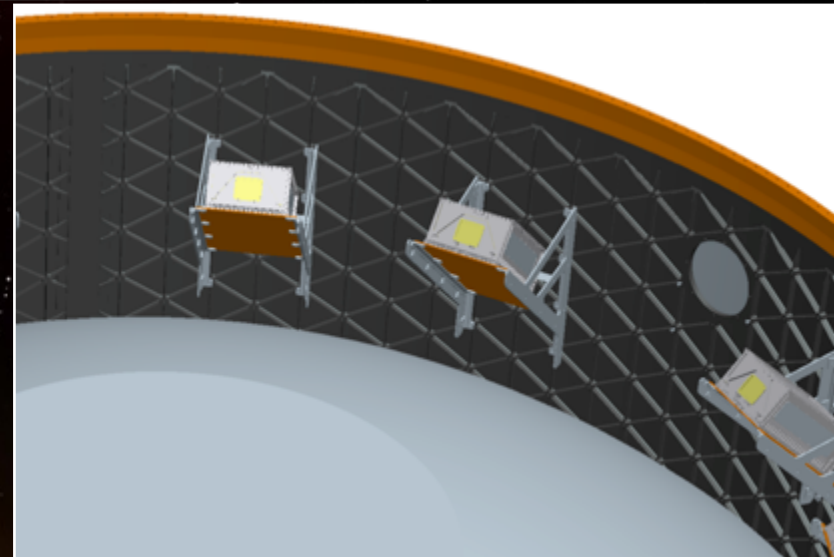
Weight: 5.75 million pounds
(2.6 million kg)

Thrust: 8.8 million pounds
(39.1 million Newtons)

Available: 2019

Secondary Payloads

On Exploration Mission-1, SLS will include thirteen 6U payload locations of up to 14kg per CubeSat



CubeSat
Deployers

ONE LAUNCH, MULTIPLE DISCIPLINES

Moon

- Lunar Flashlight (NASA)
- Lunar IceCube (Morehead State University)
- LunaH-Map (Arizona State University)
- OMOTENASHI (JAXA)

Earth

- EQUULEUS (JAXA)
- LunIR (Lockheed Martin)

Asteroid

- NEA Scout (NASA)

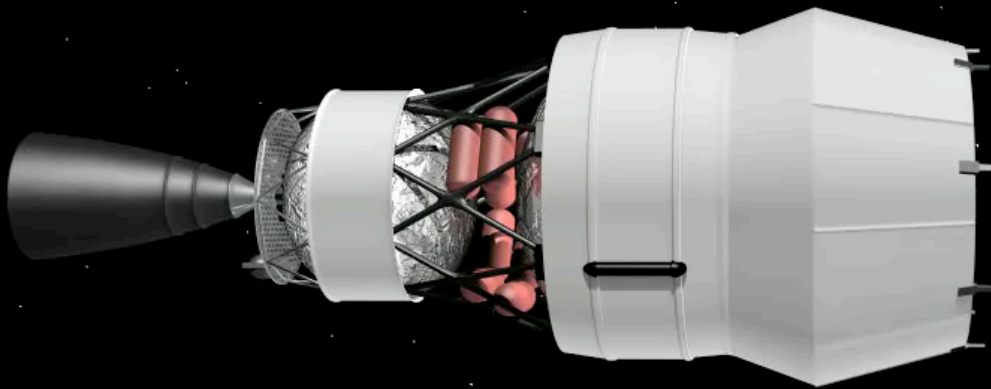
Sun

- CuSP (Southwest Research Institute)

And Beyond

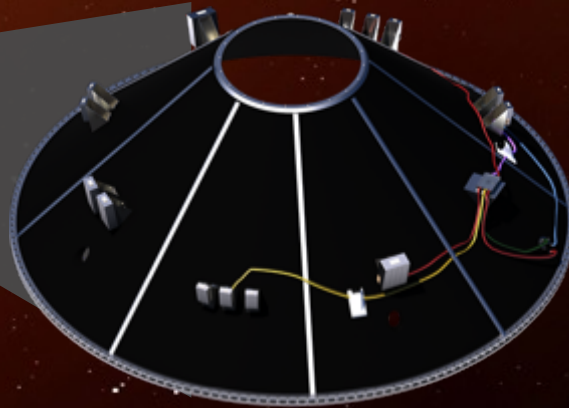
- Biosentinel (NASA)
- ArgoMoon (ESA/ASI)
- Cislunar Explorers (Cornell University)
- CU³ (University of Colorado Boulder)
- Team Miles (Fluid & Reason)

CUBESAT DEPLOYMENT

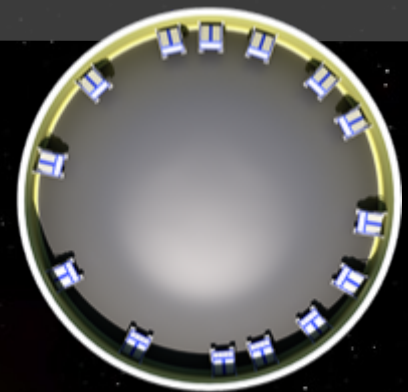
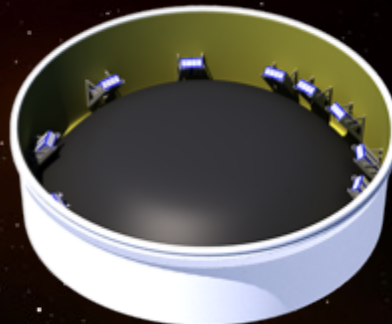


BLOCK 1 & BLOCK 1B COMPARISON

BLOCK 1B



BLOCK 1



BLOCK 1B SMALL PAYLOAD OPTIONS

VOLUME AND MASS RANGE



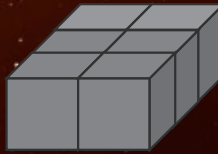
10
cm



1U



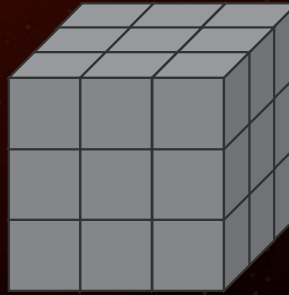
Football



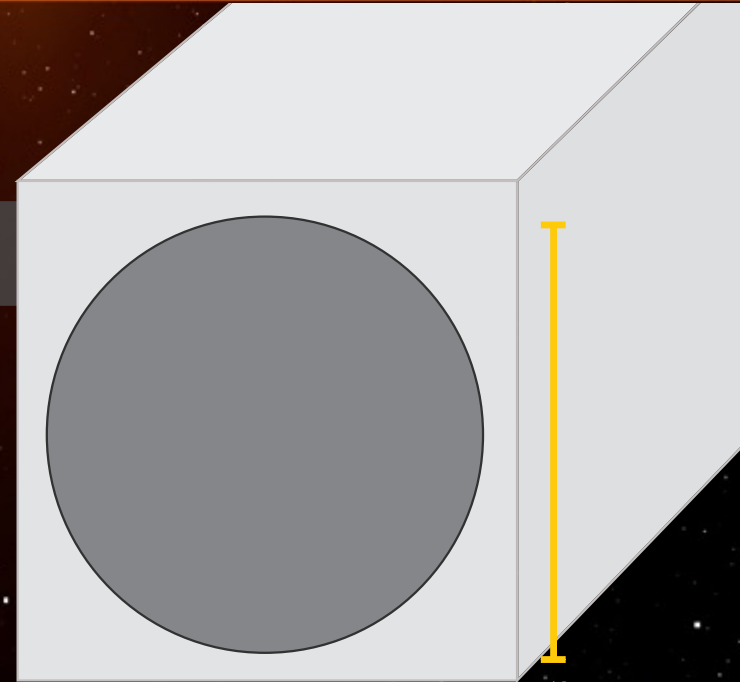
6U
14kg



12U
25kg

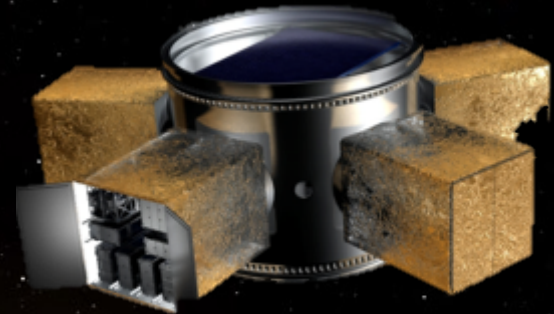
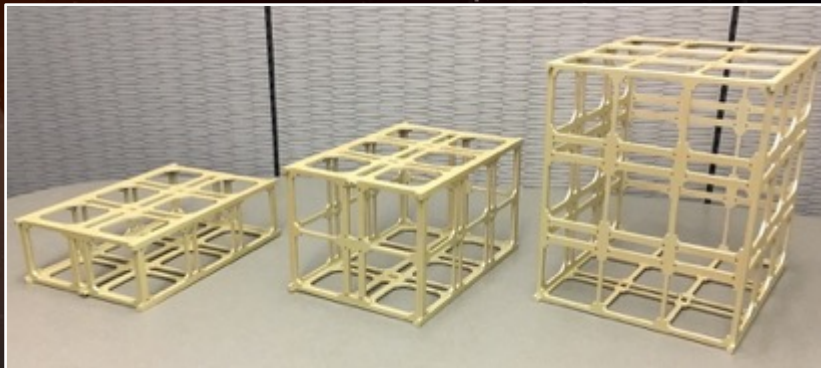


27U
54kg



Ring Payload Interface (Notional)
~180kg

~61
cm



Summary

- SLS provides a unique opportunity for the CubeSat/smallsat community
 - Enables access to Earth, Moon, Sun & Deep Space
 - Opportunity to manifest payloads from 6U/12U/27U to ESPA-Class
- First Flight (EM-1) hardware production in-progress
 - Block 1B initiating procurement/production activities

More Information

- SLS Mission Planner's Guide (ESD 30000)
 - Provides future payload developers/users with information to support preliminary SLS mission planning
 - Covers Block 1B (105mT*) & Block 2 (130mT*) configurations
 - Copies can be requested by email to:
NASA-slspayloads@mail.nasa.gov



* Payload Mass to Low Earth Orbit