National Aeronautics and Space Administration

NASA's Space Launch System:
An Enabling Capability for Discovery

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Space Launch System (SLS) Program
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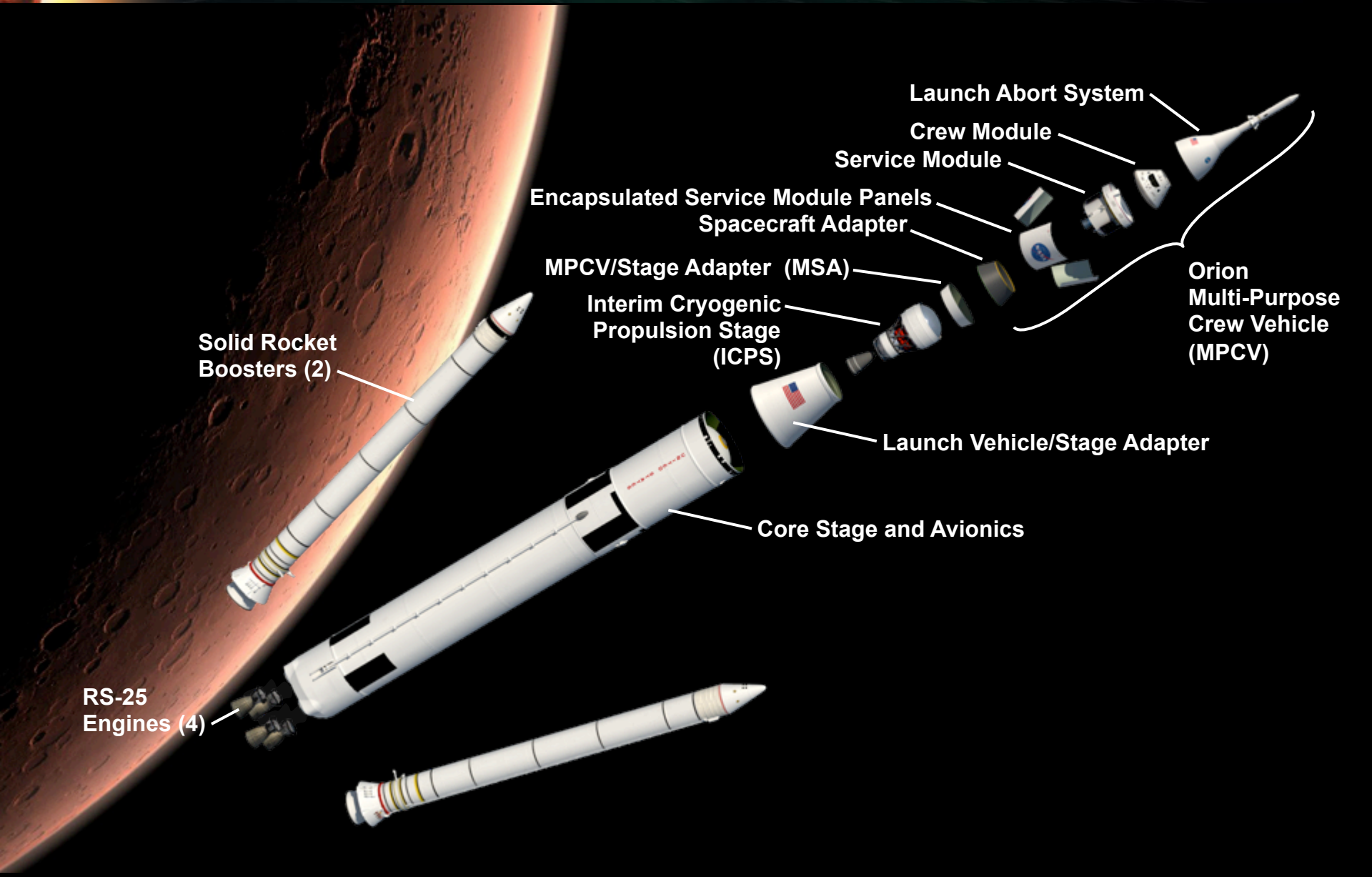
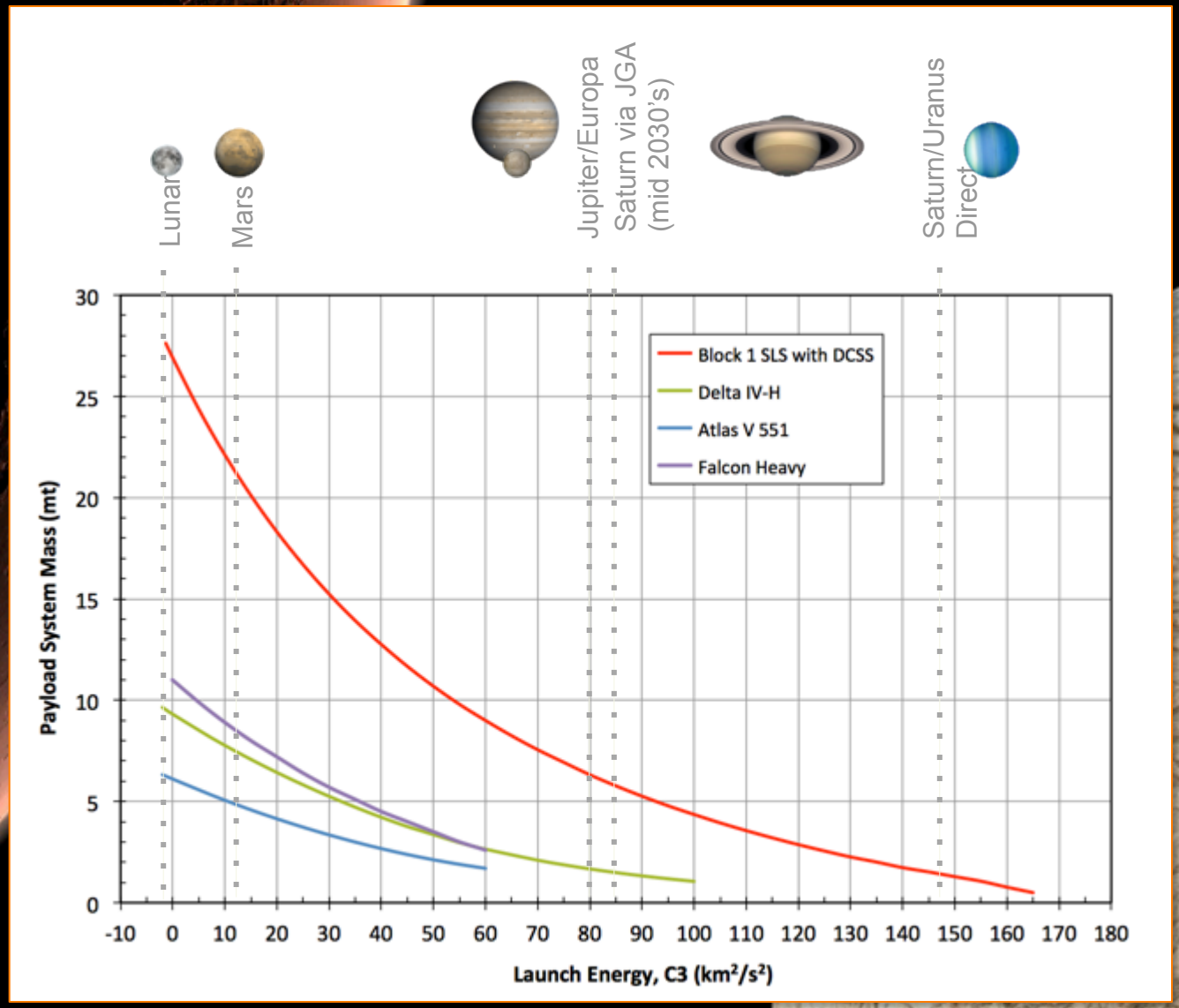
Space Launch System

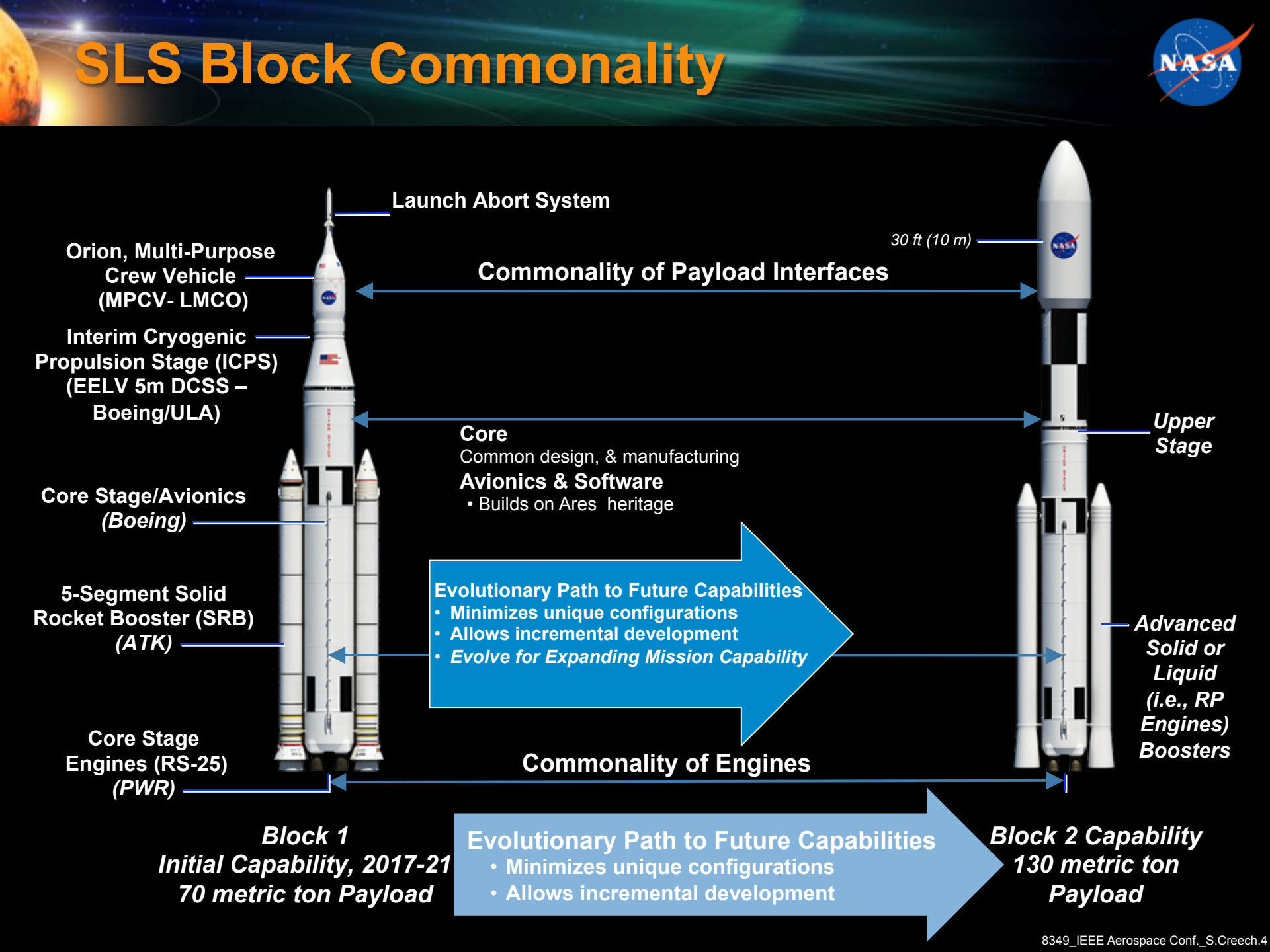
SLS Initial Configuration



SLS Initial Configuration Performance

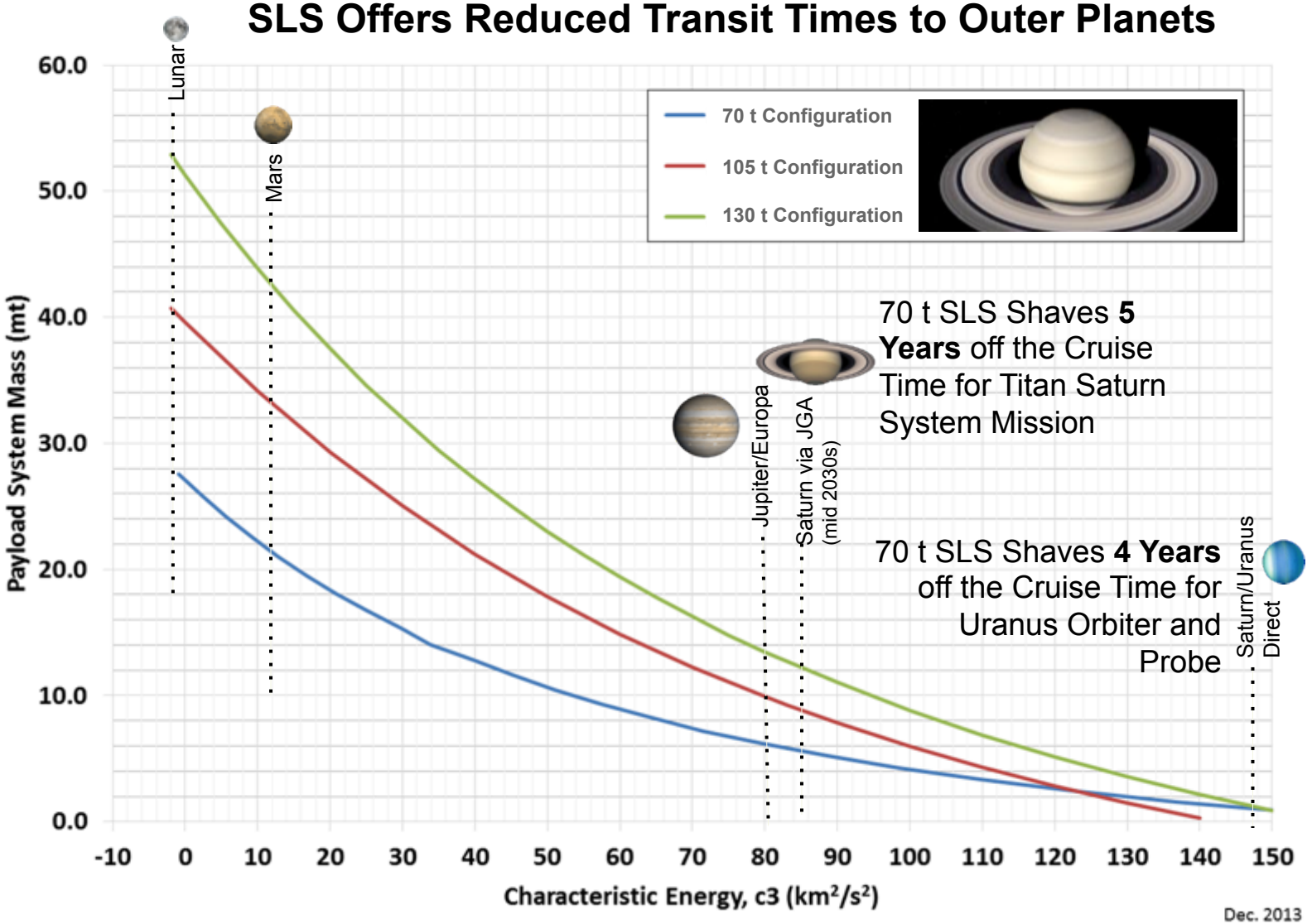


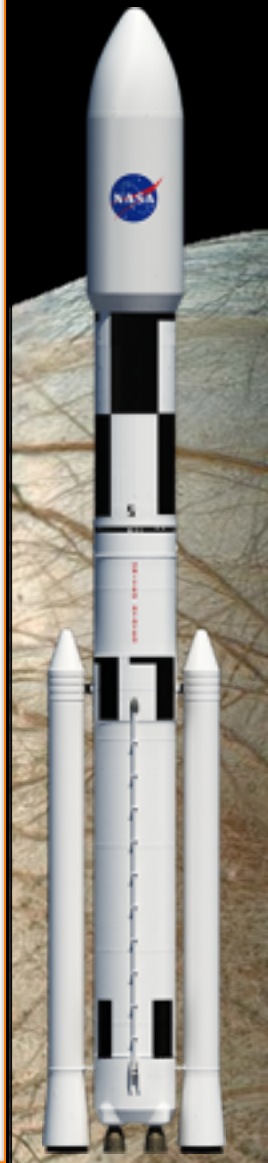
SLS Block Commonality



SLS Evolved Performance

SLS Offers Reduced Transit Times to Outer Planets





SLS Offers Unrivaled Payload Volume

- SLS is investigating utilizing existing fairings for early cargo flights, offering payload envelope compatibility with design for current EELVs
- Phase A studies in work for 8.4m and 10 m fairing options

4m x 12m (100 m^3)

5m x 14m (200 m^3)

5m x 19m (300 m^3)

8.4m x 31m (1200 m^3)

10m x 31m (1800 m^3)

Global Exploration Roadmap

2013 2020 2030

International Space Station

General Research and Exploration
Preparatory Activities

Note: ISS partner agencies have agreed to use the ISS until at least 2020.

Commercial or Government Low-Earth Orbit Platforms and Missions

Robotic Missions to Discover and Prepare

LADEE
Luna-25
Chandrayaan-2
Luna-26
Luna 27
RESOLVE
SELENE-2
Luna 28/29
SELENE-3
Rosetta
Hayabusa2
OSIRIS-REx
Apophis
MAVEN
ISRO Mars
ExoMars
InSight
ExoMars
Mars 2020
JAXA Mars Precursor

Mars Sample Return and Precursor Opportunities

Human Missions Beyond Low-Earth Orbit

Explore Near-Earth Asteroid

Multiple Locations in the Lunar Vicinity

Extended Duration Crew Missions

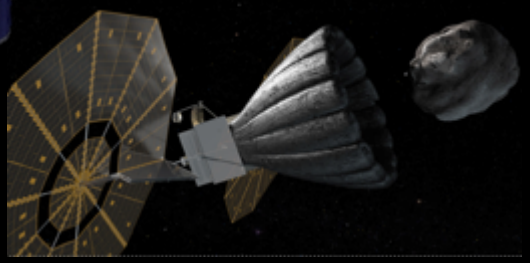
Humans to Lunar Surface

Missions to Deep Space and Mars System

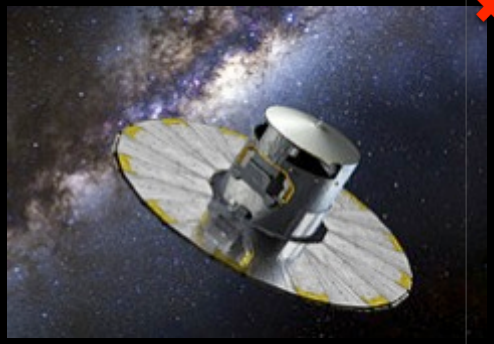
Sustainable Human Missions to Mars Surface

SLS Mission Capabilities

Space Habitat



Asteroid Rendezvous



Deep Space Telescope

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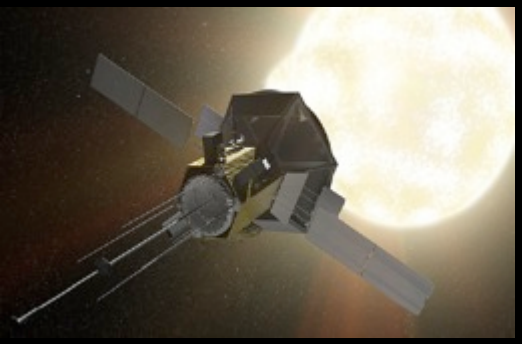
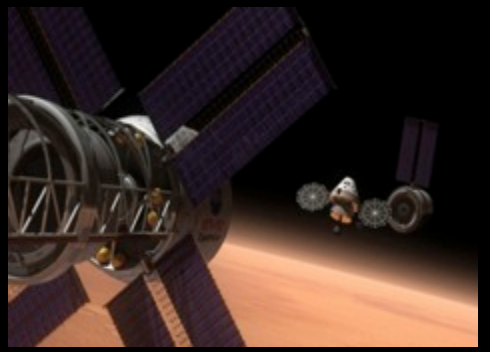
GEO Servicing



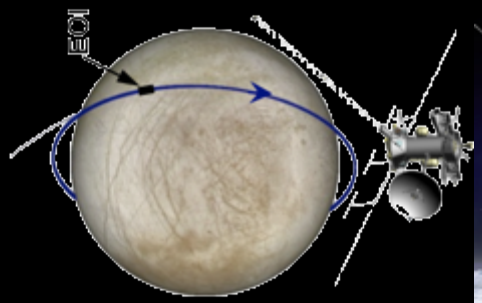
Solar Probe

Mars Sample Return

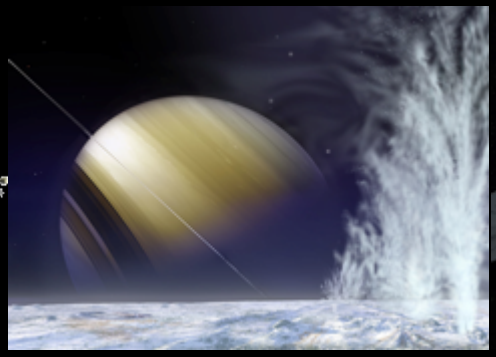
Mars Cargo Lander



Humans to Mars

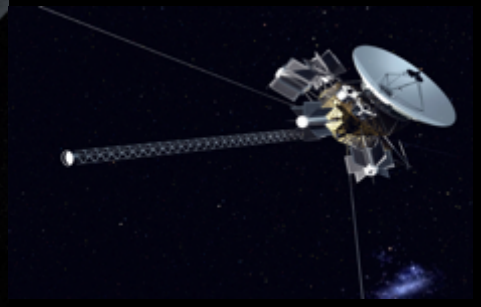


Europa Clipper



Enceladus Return

Uranus Spacecraft



Interstellar

SLS Benefits for Science Missions

- **SLS Being Developed to Enable Exploration**
  - **Volume and mass capability/margin required for complex deep-space human mission**
    - Increased design simplicity
    - Fewer origami-type payload designs needed to fit in the fairing
    - Simplifies on-orbit operations
    - Reduced risks and hazards
- **SLS investment can be leveraged for other missions requiring large volume or mass, or reduced trip times**
    - Deep Space Exploration
    - Planetary Landers
    - Human Habitats
    - Great Observatories
    - Space Solar Power
    - Outer Planet Missions
    - National Security Space Payloads

Manufacture and Testing Underway

Summary

- **SLS provides capability for human exploration missions.**
  - 70 t configuration enables EM-1 and EM-2 flight tests.
  - Evolved configurations enable missions including humans to Mars.
- **SLS offers unrivaled benefits for a variety of missions.**
  - 70 t provides greater mass lift than any contemporary launch vehicle; 130 t offers greater lift than any launch vehicle ever.
  - With 8.4m and 10m fairings, SLS will over greater volume lift capability than any other vehicle.
  - Initial ICPS configuration and future evolution will offer high C3 for beyond-Earth missions.
- **SLS is currently on schedule for first launch in December 2017.**
  - Preliminary design completed in July 2013; SLS is now in implementation.
  - Manufacture and testing are currently underway.
  - Hardware now exists representing all SLS elements.