



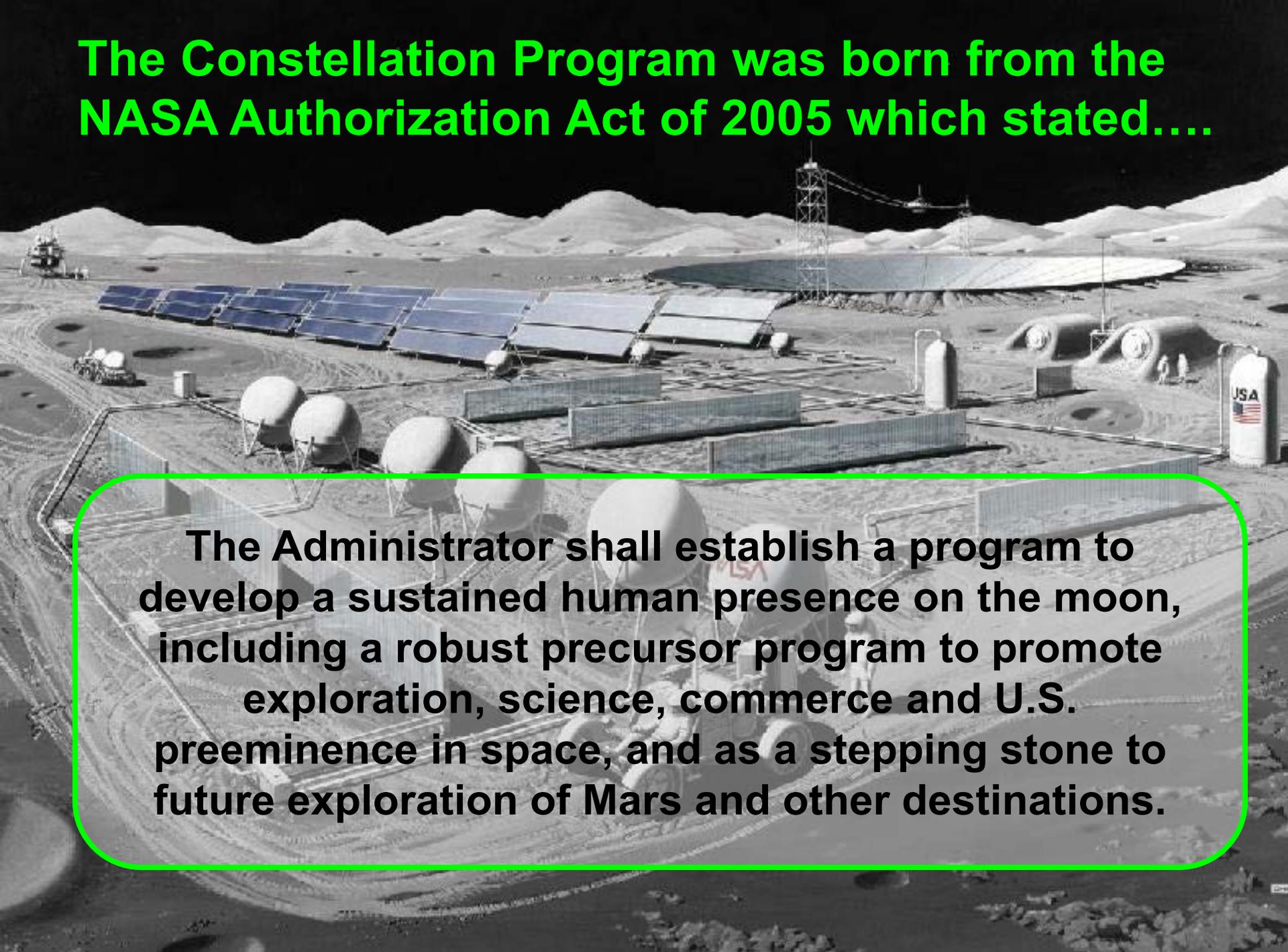
Constellation

A New Vision for Space Exploration

(Adopted from a Public Presentation by Michael Chandler
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The Constellation Program was born from the NASA Authorization Act of 2005 which stated....



The Administrator shall establish a program to develop a sustained human presence on the moon, including a robust precursor program to promote exploration, science, commerce and U.S. preeminence in space, and as a stepping stone to future exploration of Mars and other destinations.

Constellation Workforce – NASA Centers

Ames Research Center



Glenn Research Center



Goddard Space Flight Center



Jet Propulsion Laboratory



Dryden Flight Research Center



Langley Research Center



White Sands Missile Range



Marshall Space Flight Center



Michoud Assembly Facility



Stennis Space Center



Johnson Space Center

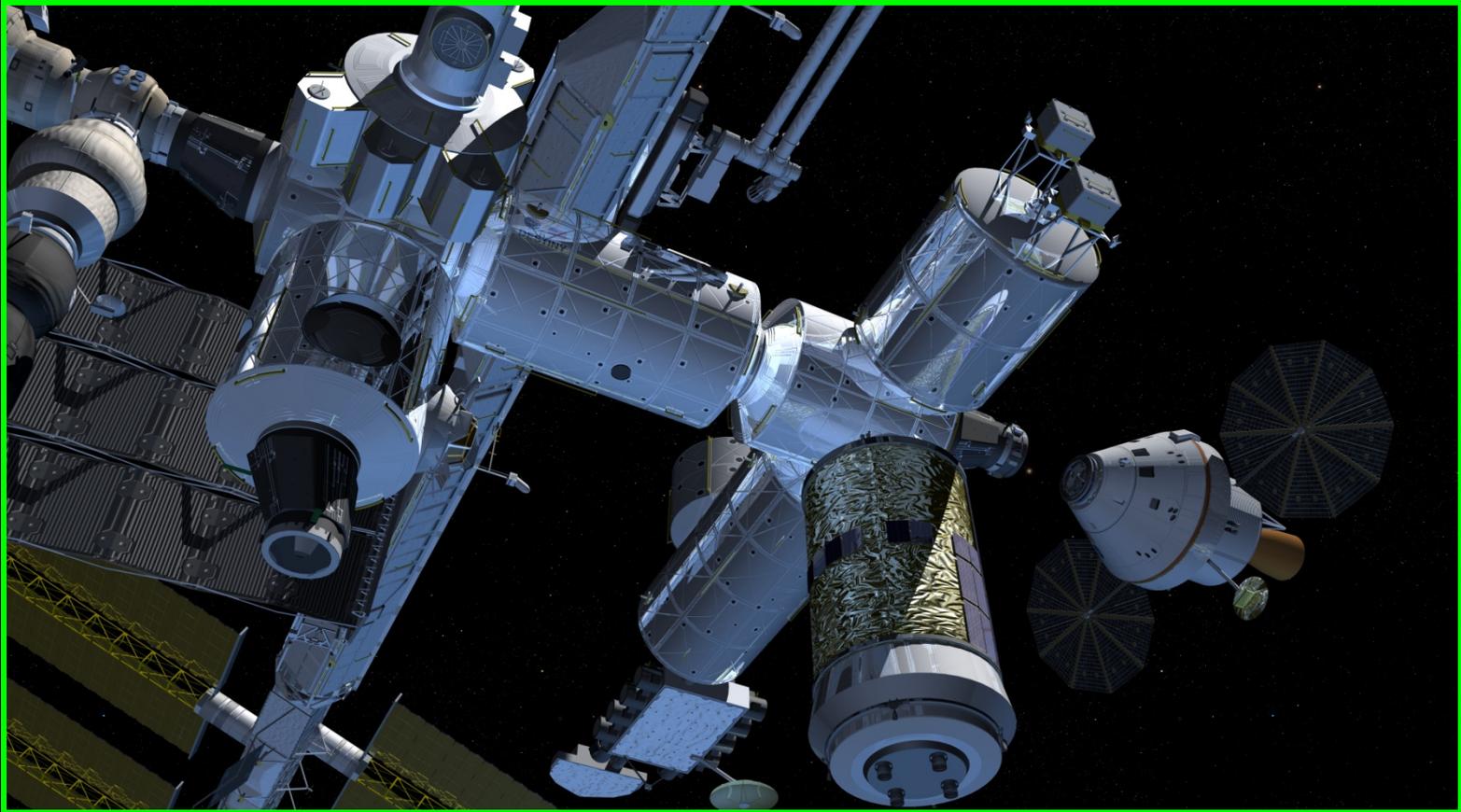


Kennedy Space Center



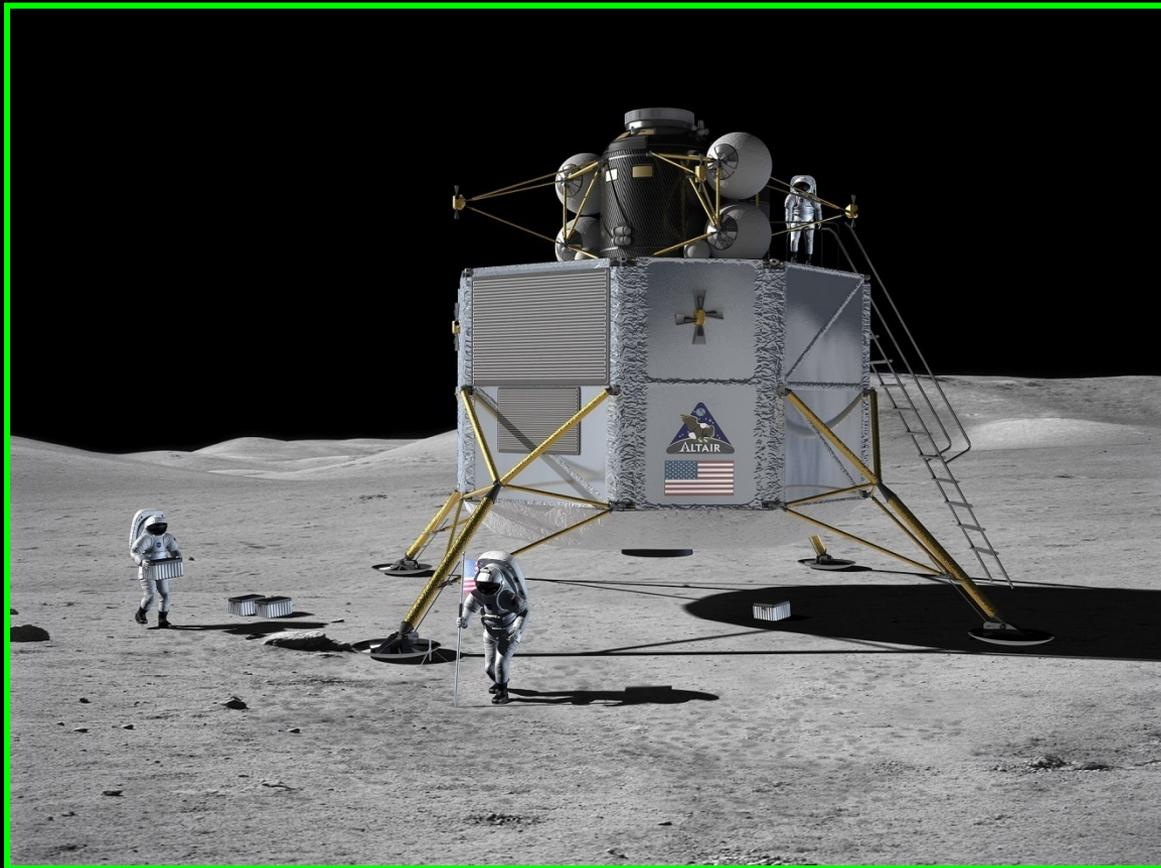
Constellation Capabilities

Initial Capability will provide the capability to transport crew and cargo to the International Space Station

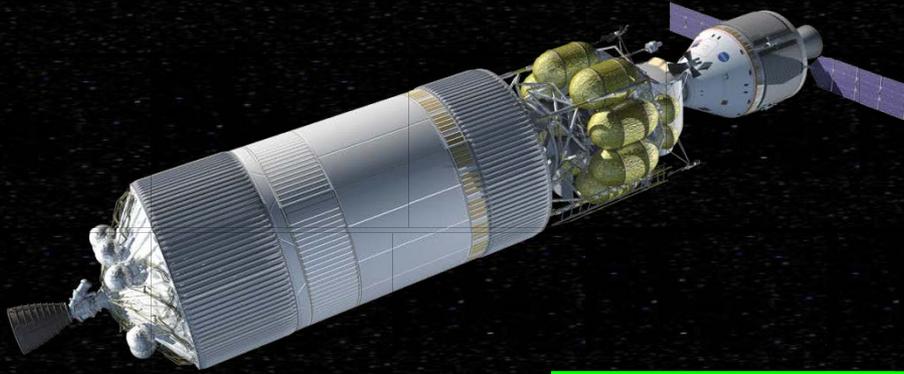


Constellation Capabilities

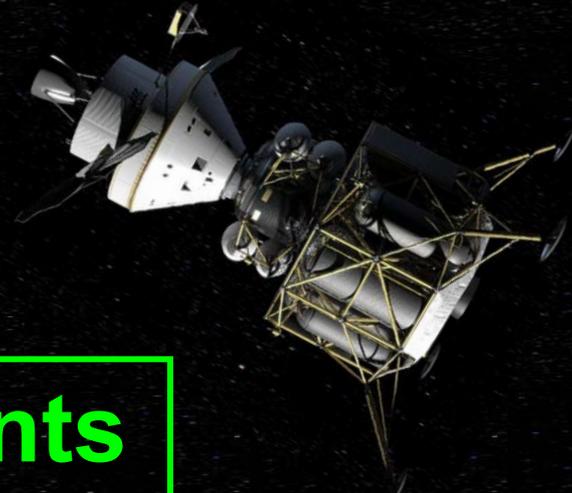
Lunar Capability will provide the capability to transport crew and cargo beyond low Earth orbit to the Moon for exploration, resource utilization and scientific research



Earth Departure Stage

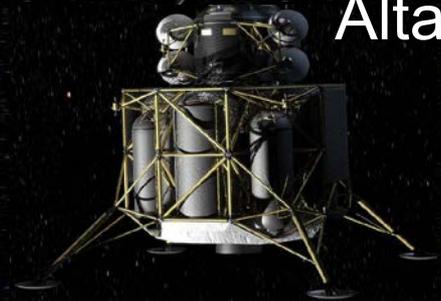


Orion



**Components
of the
Constellation
Program**

Altair



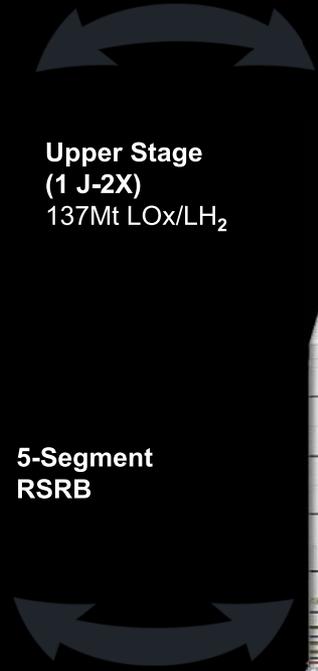
Overall Vehicle Height in Meters

Space Shuttle



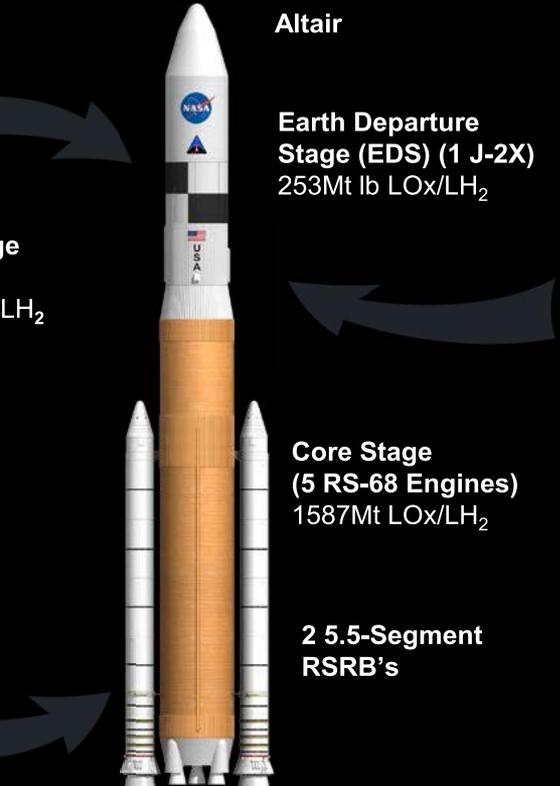
Height: 56m
Gross Liftoff Mass: 2040Mt
25Mt to LEO

Ares I



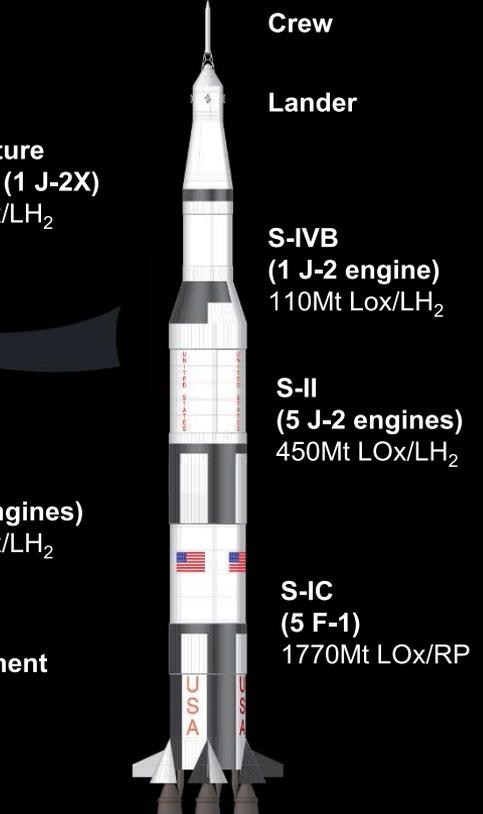
Height: 99m
Gross Liftoff Mass: 927Mt
26Mt to LEO

Ares V



Height: 116m
Gross Liftoff Mass: 3705Mt
71Mt to TLI
63Mt to TLI in Dual-Launch Mode with Ares I
188Mt to LEO

Saturn V



Height: 111m
Gross Liftoff Mass: 2950Mt
45Mt to TLI
119Mt to LEO

Ares I

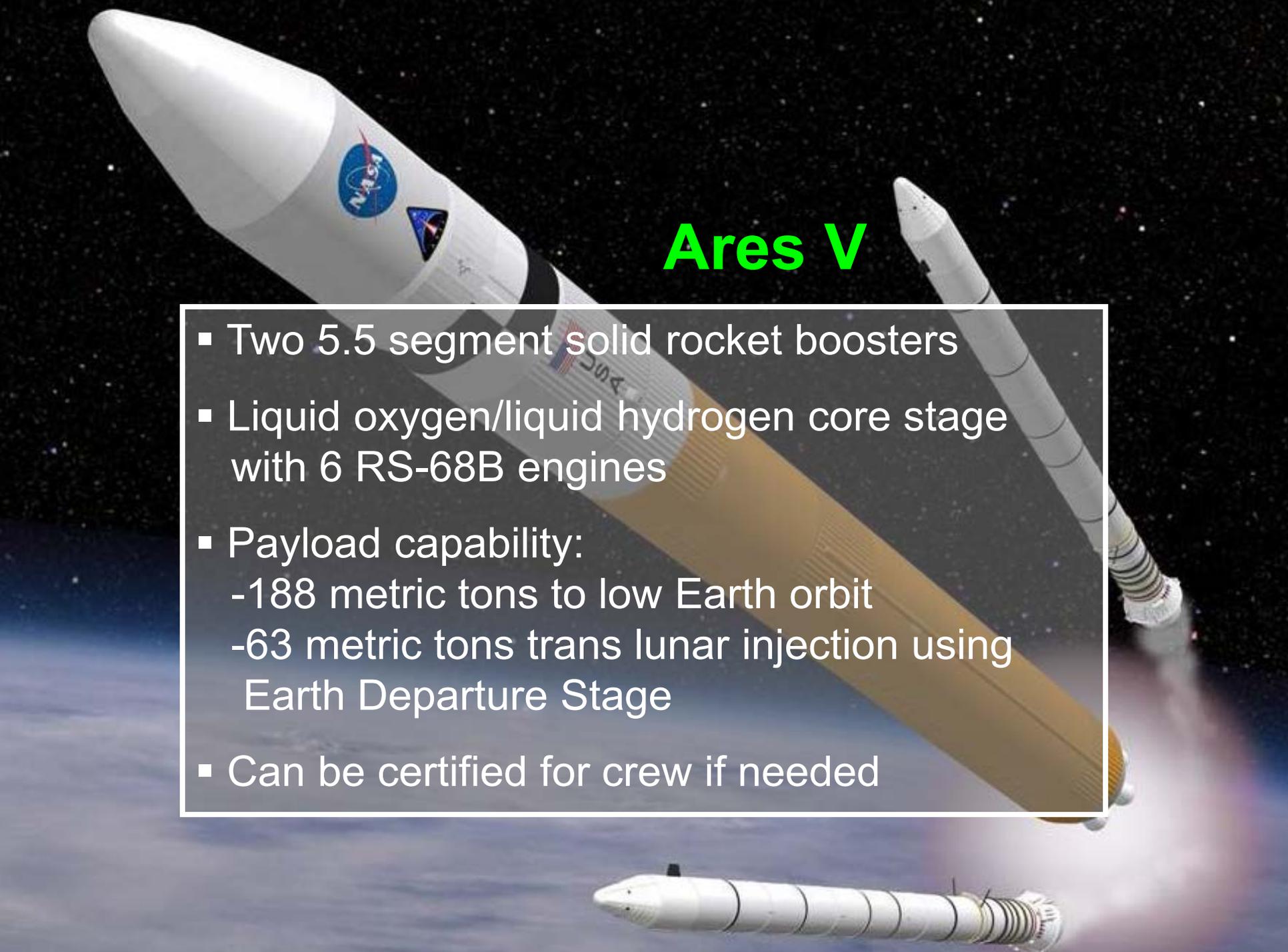
- Serves as long term crew launch capability for the U.S.
- 5 - segment shuttle derived solid rocket booster
- New liquid oxygen/liquid hydrogen upper stage using J-2X engine
- Developed concurrently with Ares V



Ares I-X



- Ares I-X is the first integrated stack flight demonstration in the Constellation Flight Test Campaign
- Ares I-X is an uncrewed, sub-orbital development flight test
- Ares I-X will provide opportunity to test ground facilities and operations at NASA's Kennedy Space Center
- Ares I-X is on track for a 2009 launch date

The image shows a large white rocket with a yellow core stage, identified as the Ares V, in space. The rocket is oriented diagonally from the top left towards the bottom right. It features the NASA logo and a triangular mission patch on its white upper section. A smaller, similar rocket is visible in the background to the right. The background is a dark space filled with stars, with a thin blue and white horizon line of Earth visible at the bottom. The text 'Ares V' is written in a bright green, bold font in the upper right quadrant. A white-bordered box containing a bulleted list is overlaid on the lower left portion of the rocket.

Ares V

- Two 5.5 segment solid rocket boosters
- Liquid oxygen/liquid hydrogen core stage with 6 RS-68B engines
- Payload capability:
 - 188 metric tons to low Earth orbit
 - 63 metric tons trans lunar injection using Earth Departure Stage
- Can be certified for crew if needed

- Transport up to 6 crew members to ISS and Mars
- 210 day stay time in Earth or lunar orbit
- Emergency lifeboat for entire ISS crew
- Deliver pressurized cargo for ISS re-supply
- Transport up to 4 crew members for lunar missions

Orion

The image shows the Orion spacecraft in space, positioned next to a large, cylindrical, gold-colored thermal blanket. The spacecraft is white with a blue stripe and a large orange nose cone. It is surrounded by large, multi-paned solar arrays. The background is a dark, starry space.

Launch Abort System



The boilerplate Orion crew module for the Orion Launch Abort System Pad Abort-1 flight test undergoes moment-of-inertia testing at Dryden's Flight Loads Lab



Earth Departure Stage



Ares V

Altair

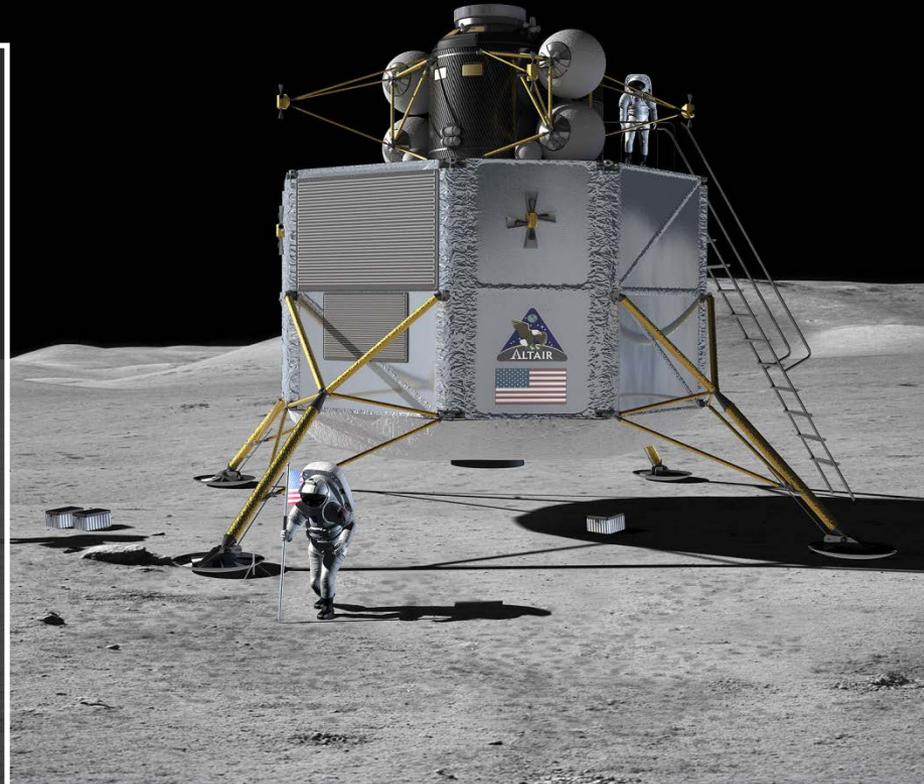
Orion

Orion and Altair – Journey to the Moon

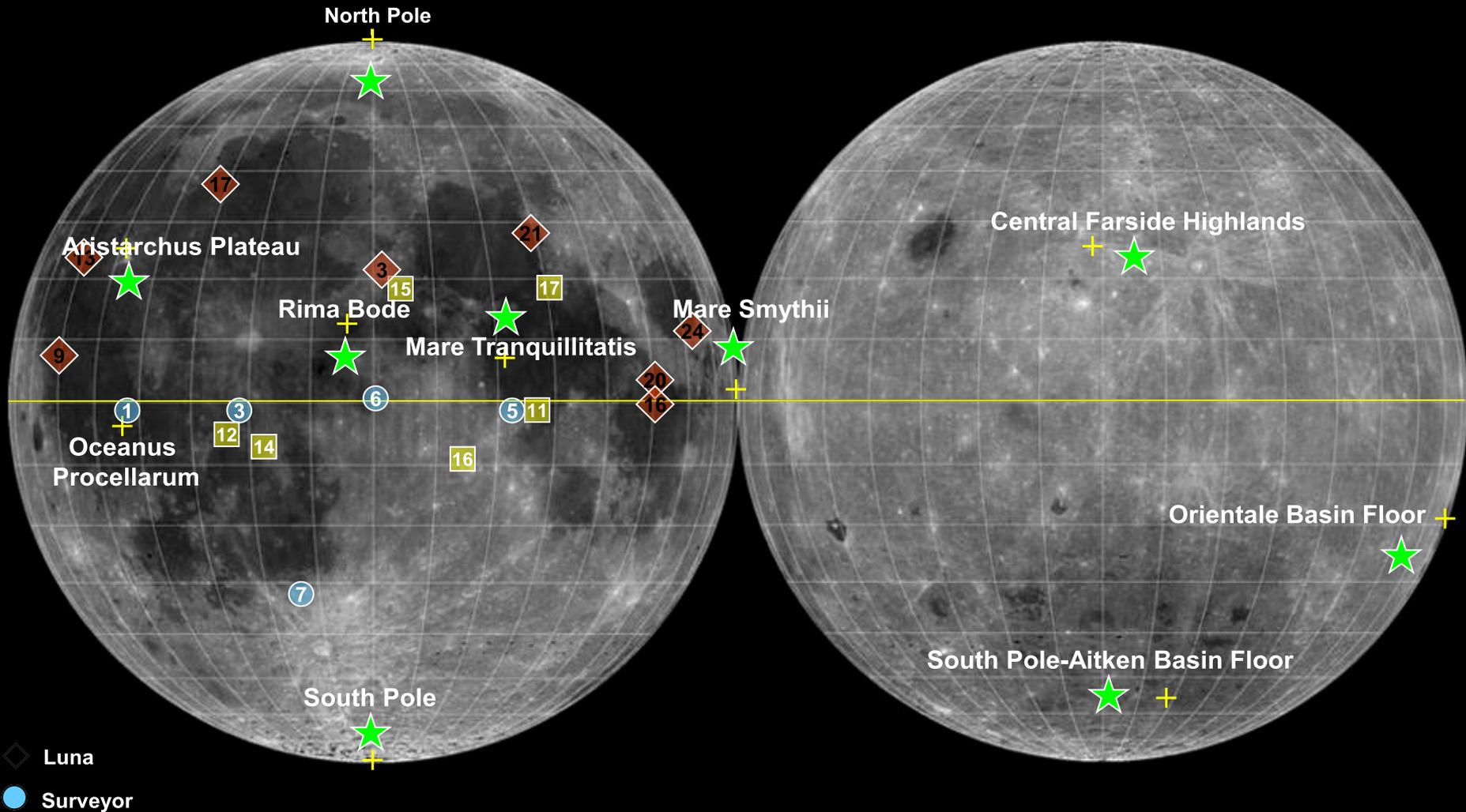


Altair

- Transports crew and cargo to and from the surface of the moon
- Consists of Descent Module and Ascent Module
- After lunar mission, returns the crew to orbit and Orion for Earth return



Lunar Exploration Sites



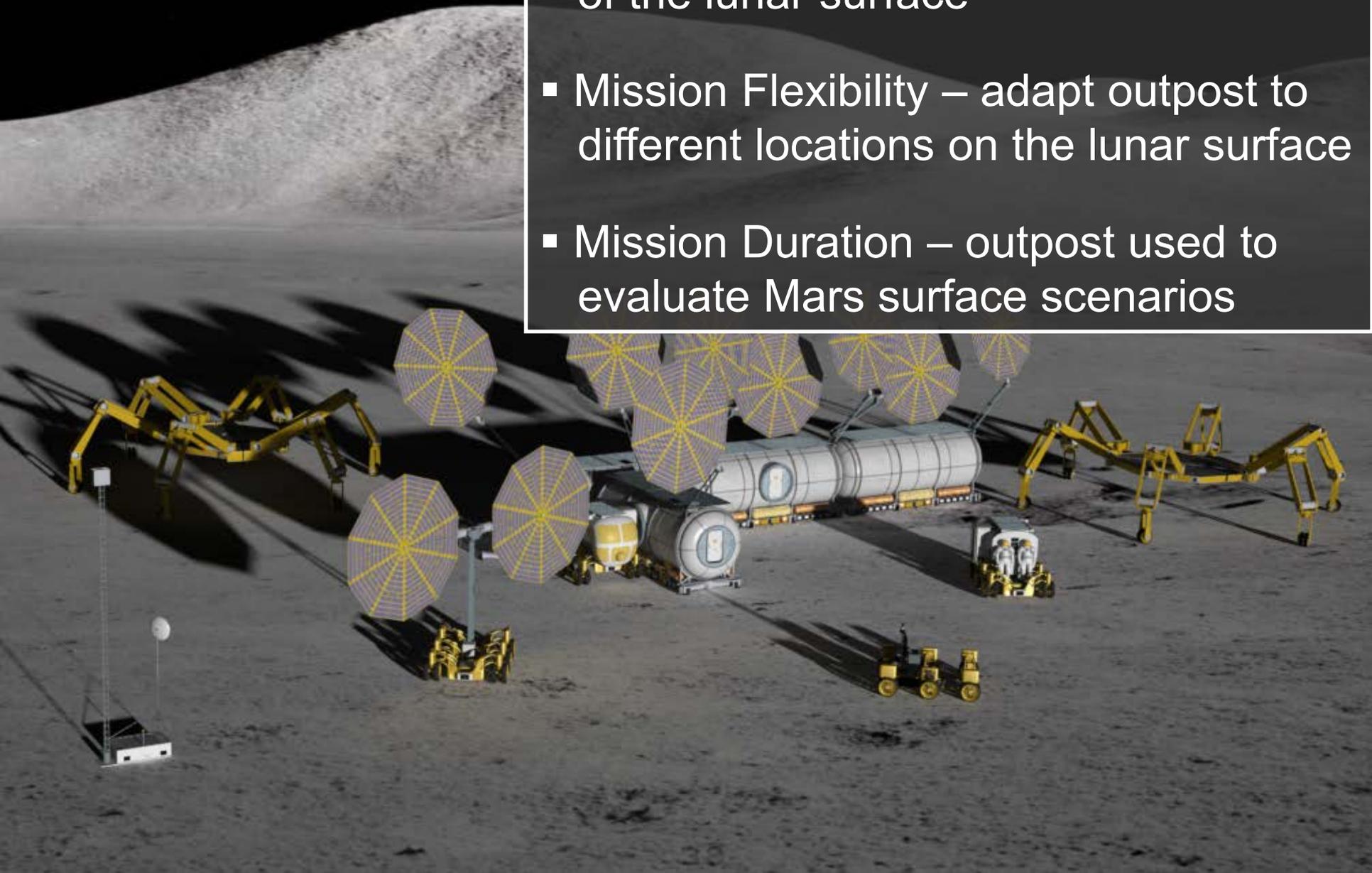
Near Side

Far Side

- ◇ Luna
- Surveyor
- Apollo
- ★ Potential Constellation Landing Sites

Lunar Outpost

- Surface Mobility – explore local areas of the lunar surface
- Mission Flexibility – adapt outpost to different locations on the lunar surface
- Mission Duration – outpost used to evaluate Mars surface scenarios



Lunar Exploration



The Moon will function as a test to prepare humans for further exploration to include Mars



Constellation: A View From The Stars

<http://www.explorationworkforce.com/draftmap>

