



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

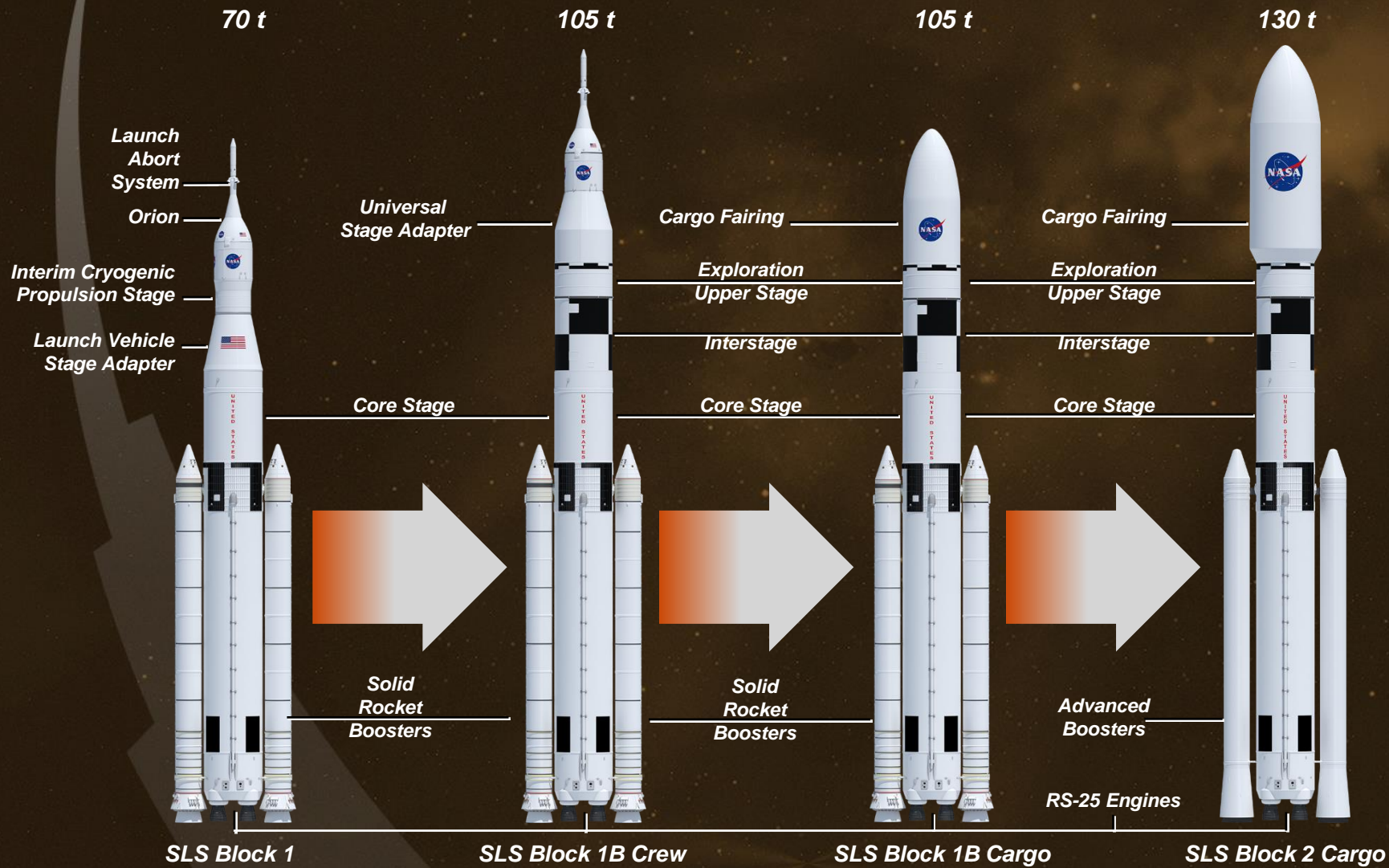
# SPACE LAUNCH SYSTEM

MISSION CAPABILITIES FOR EXPLORATION

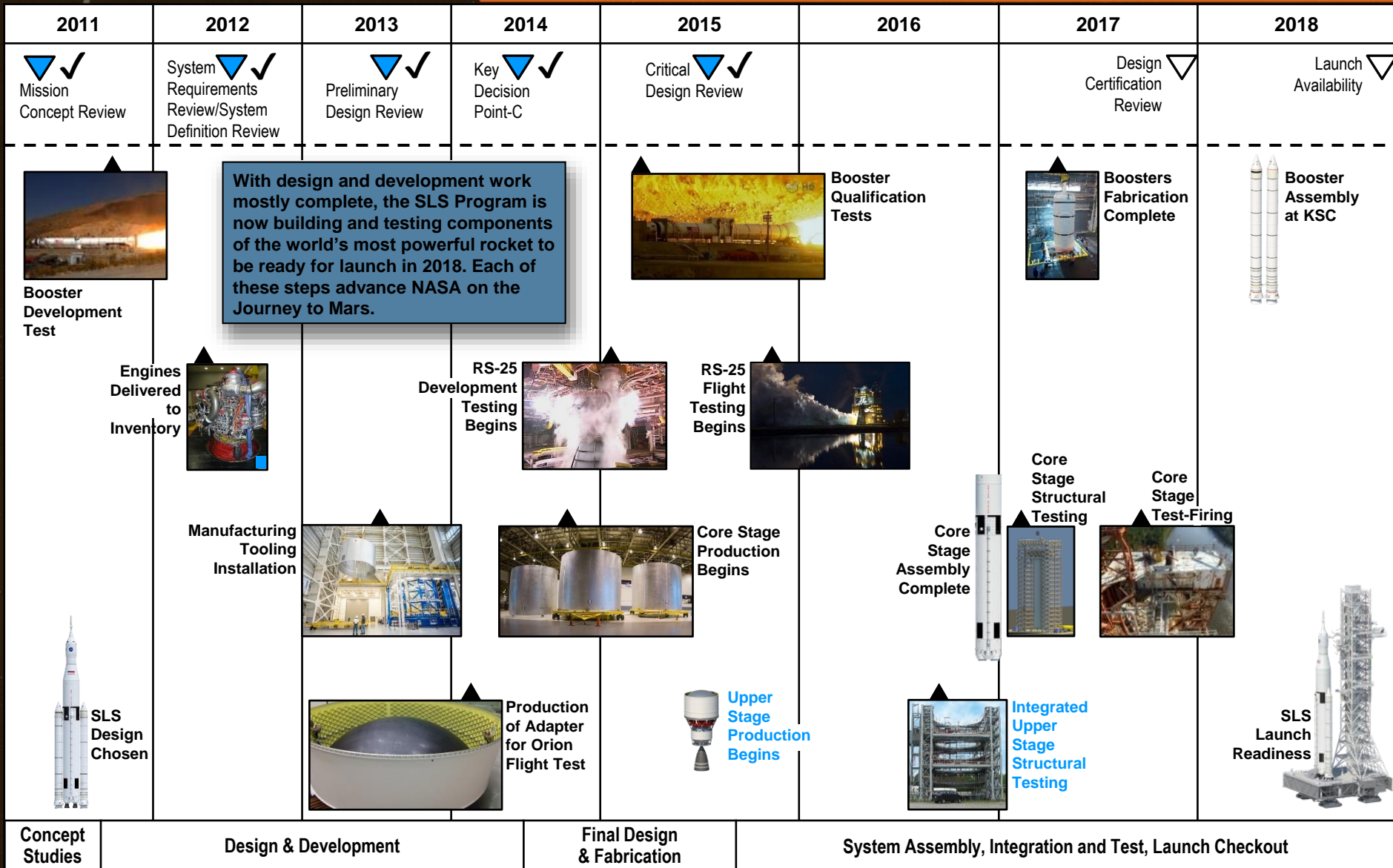
**Stephen D. Creech**  
Space Launch System Program



# SLS Evolution Overview



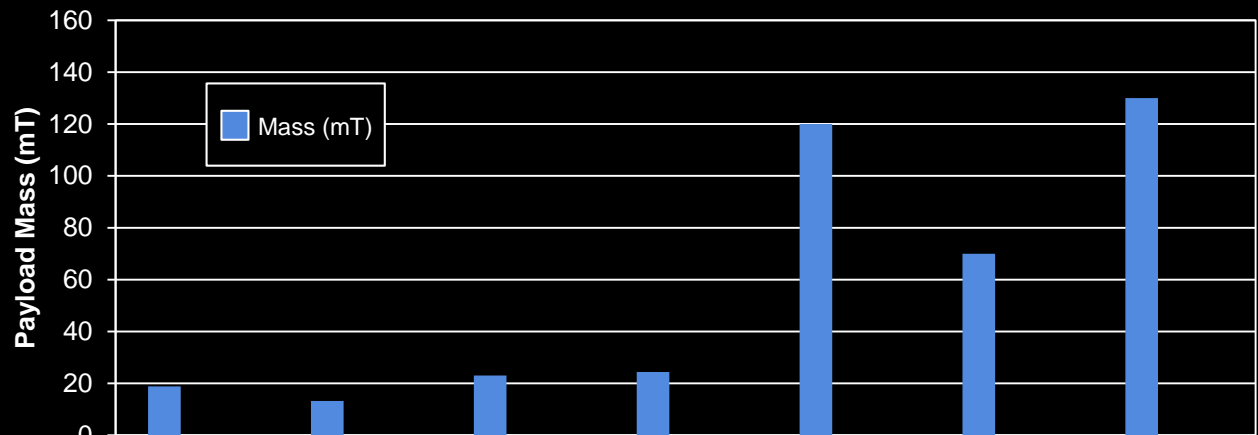
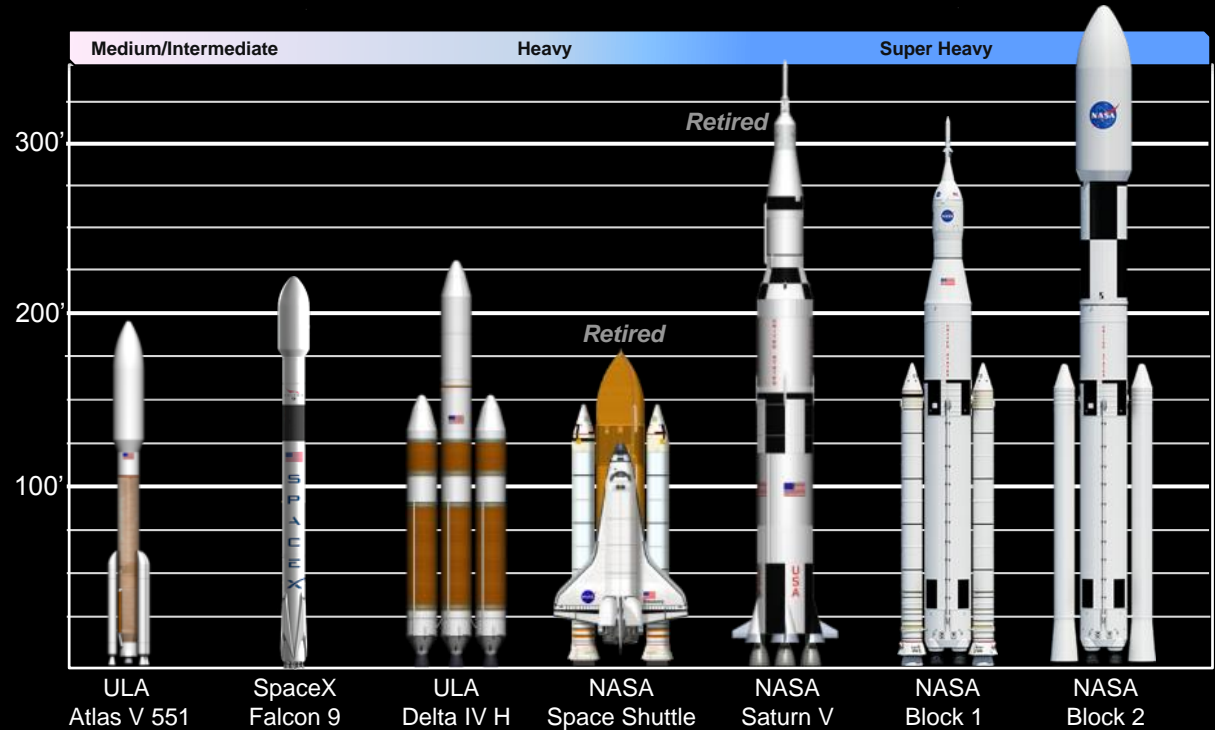
# THE SPACE LAUNCH SYSTEM'S PATH TO THE PAD



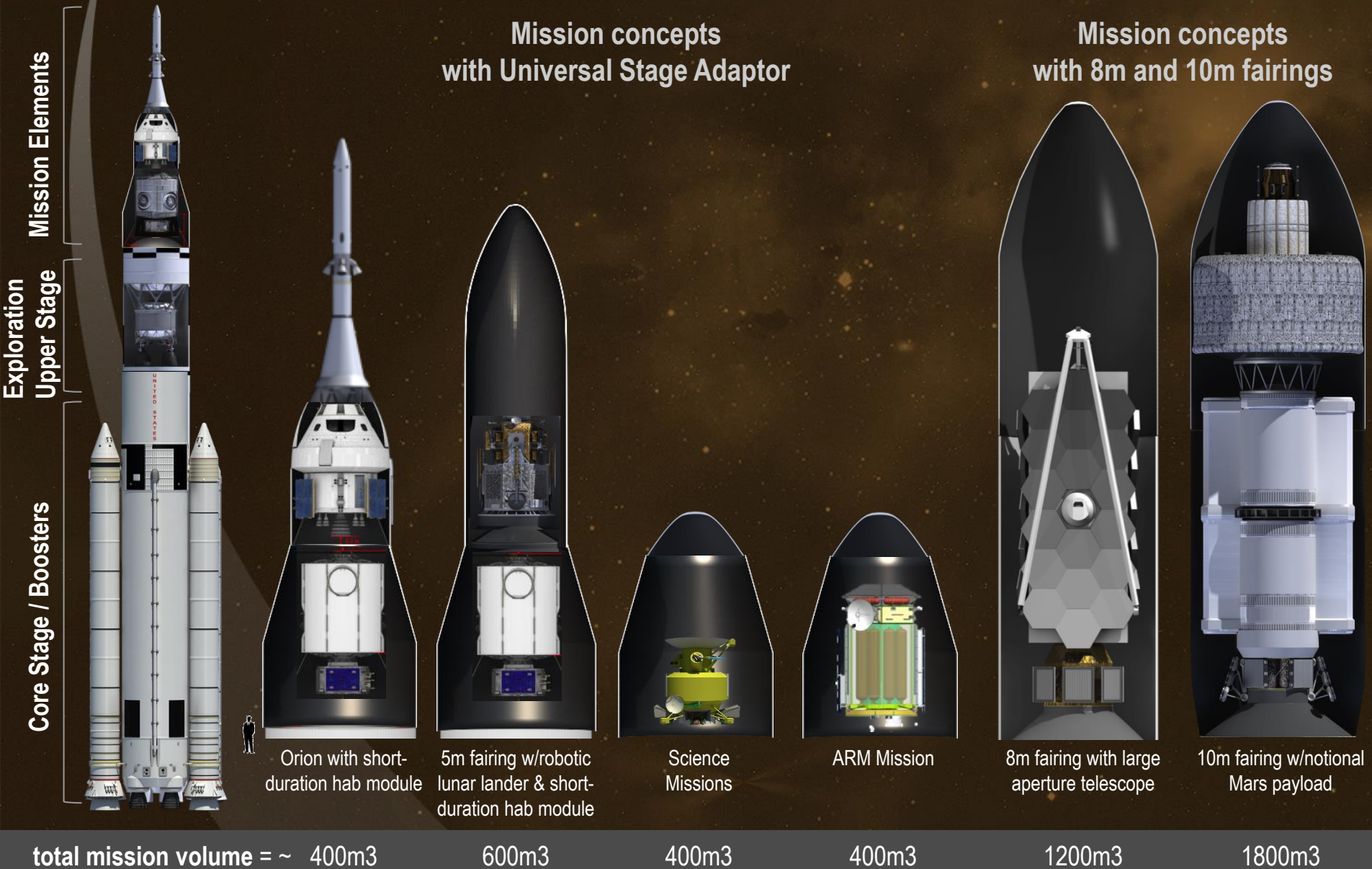


# SLS Mass Lift Capability

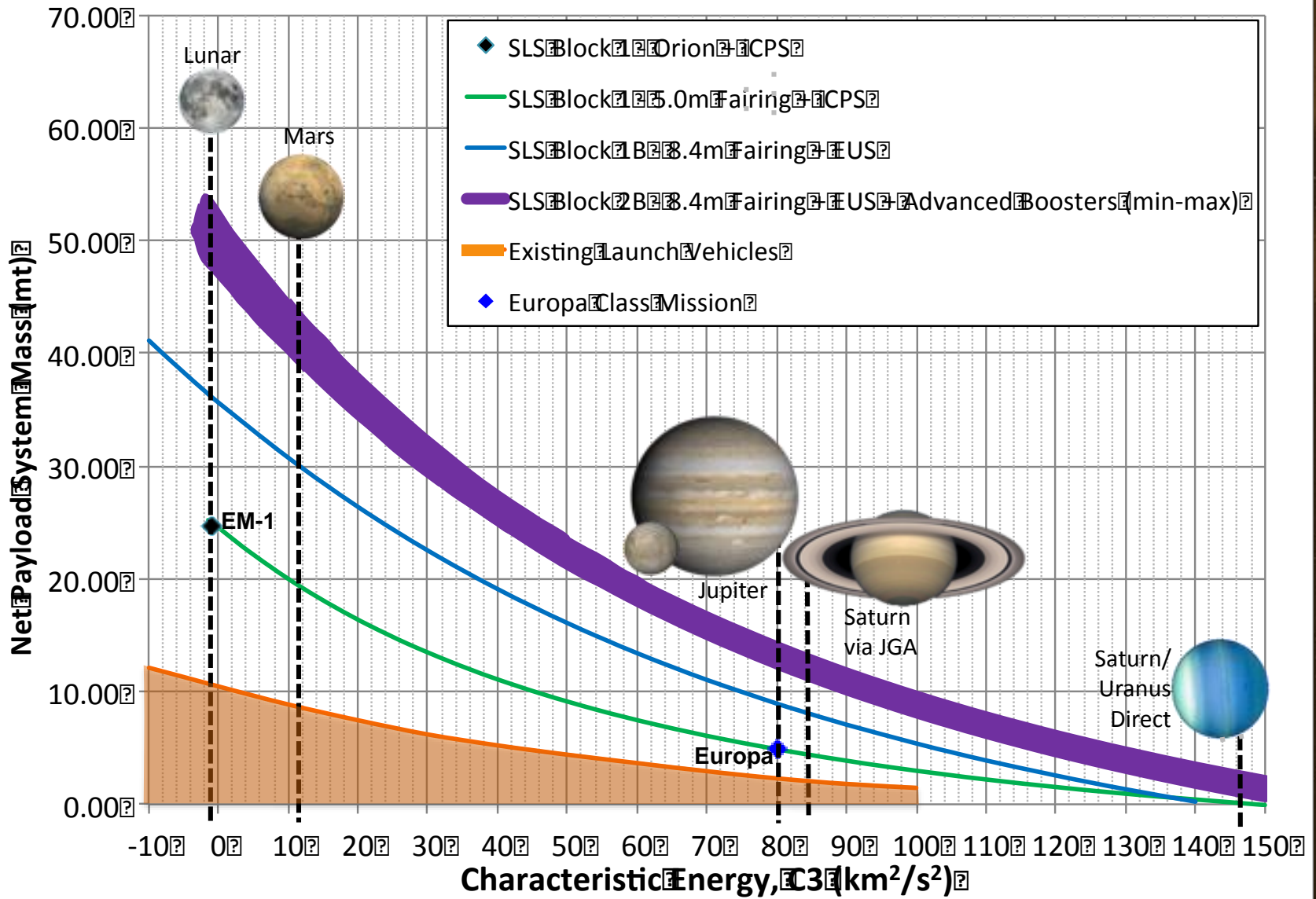
- SLS initial configuration offers Block 1 to LEO.
- Future configurations offer Block 1B and Block 2 to LEO.
- Mass capability benefits mean larger payloads to any destination.



# SLS Block 1B & Mission Element Concepts Under Study

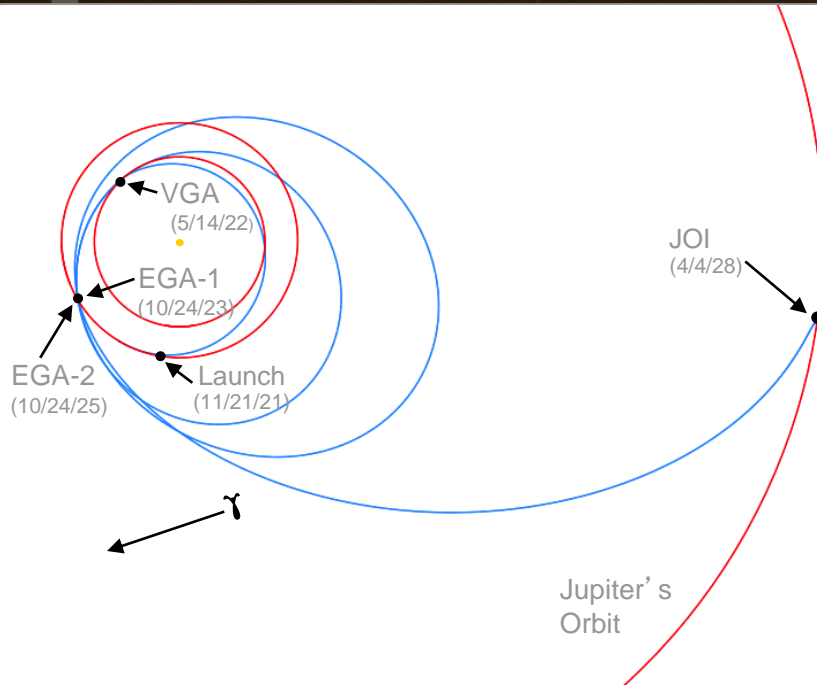


# SLS Characteristic Energy

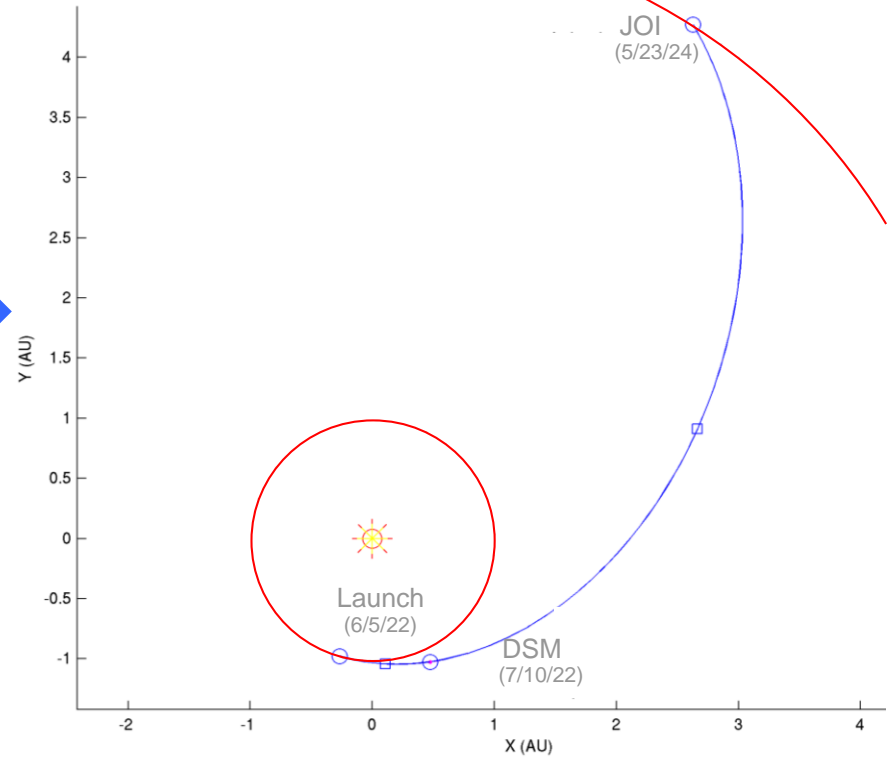


# Europa Trajectory Comparison

## Atlas V 551: VEEGA



## SLS: Direct

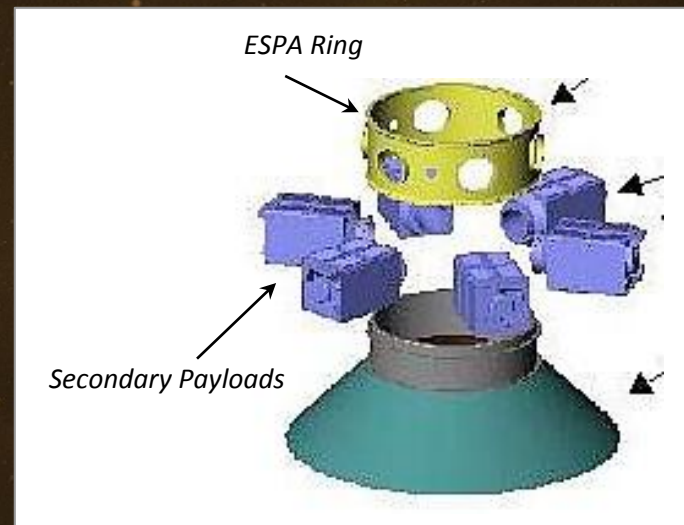
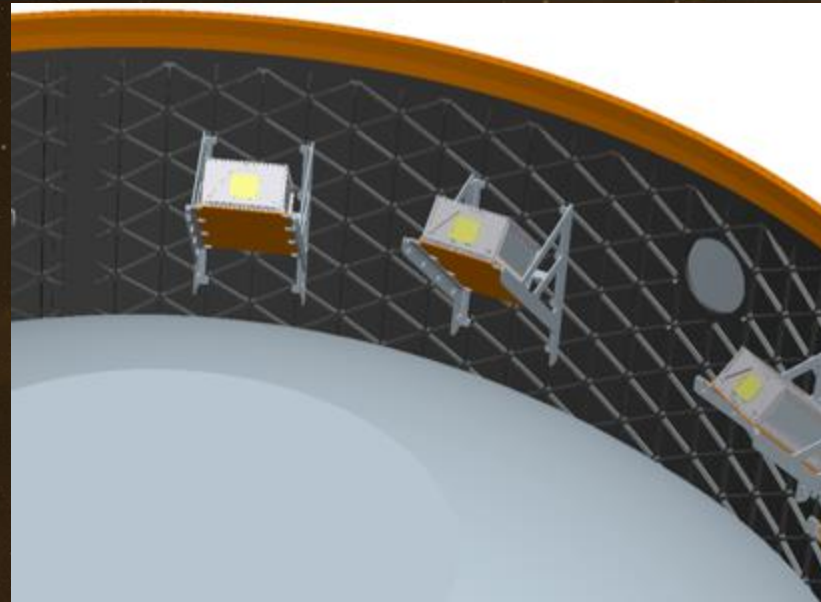


**REDUCES TRANSIT TIME TO EUROPA BY HALF**



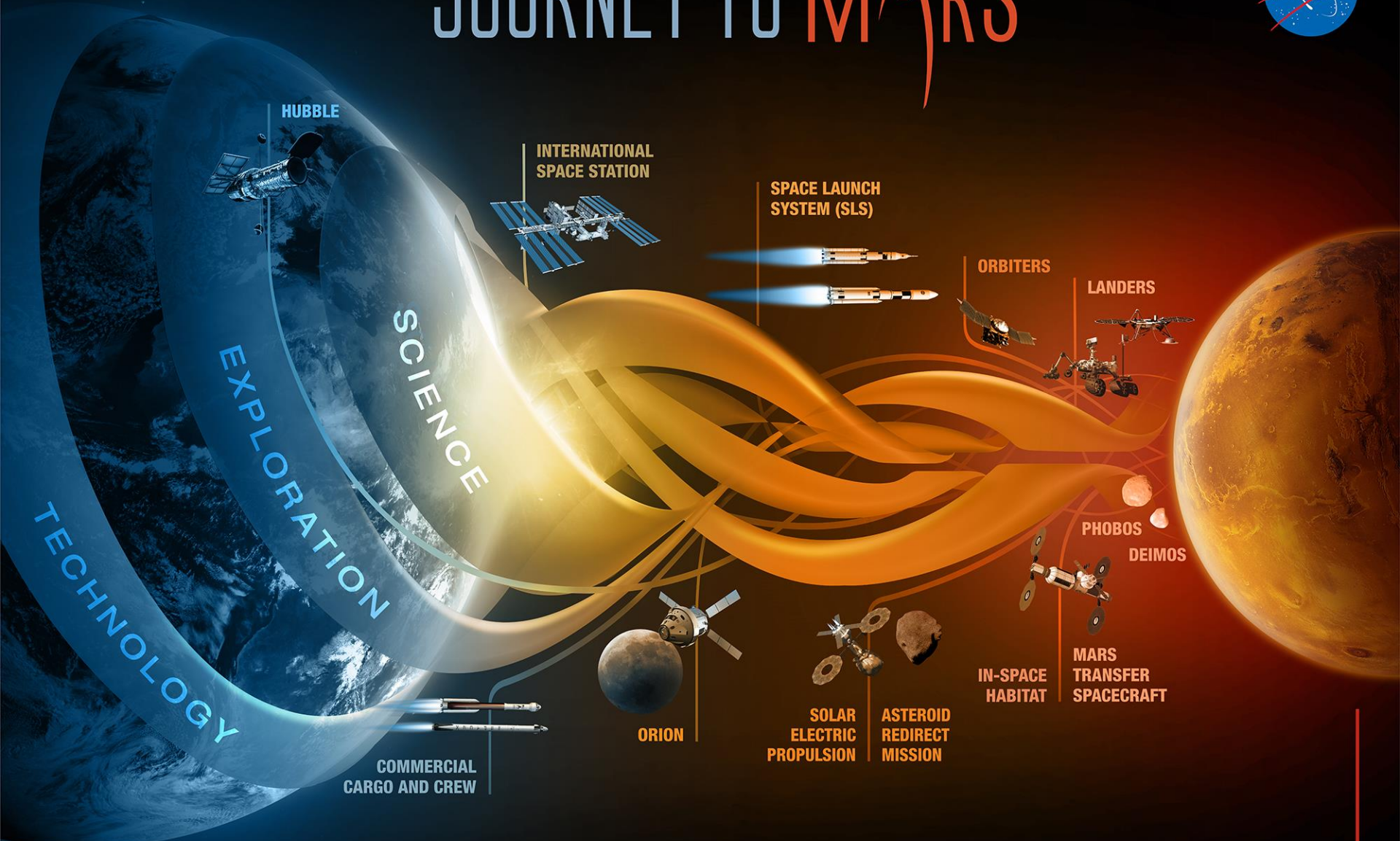
# Secondary Payload Capability

- Block 1 vehicle offers at least thirteen 6U payload locations
- 6U volume/mass is the current standard (14 kg payload mass)
- Payloads will be “off” from roll-out through Orion separation and payload deployment
- Payload Deployment System Sequencer; payload deployment will begin with pre-loaded sequence following MPCV separation and ICPS disposal burn
- Payload requirements captured in Interface Definition and Requirements Document
- Block 1B and 2 vehicles offer up to six larger, ESPA-class secondary payload ( >180 kg ) accommodations





# JOURNEY TO MARS



MISSIONS: 6-12 MONTHS  
RETURN: HOURS

EARTH RELIANT

MISSIONS: 1 TO 12 MONTHS  
RETURN: DAYS

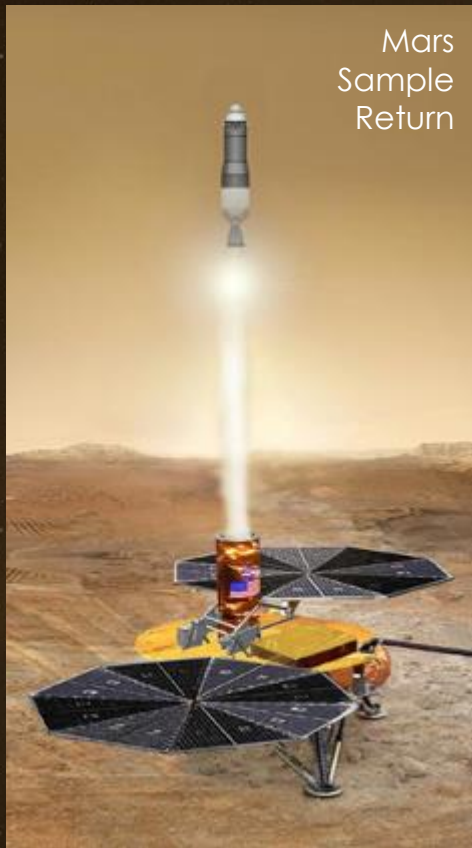
PROVING GROUND

MISSIONS: 2 TO 3 YEARS  
RETURN: MONTHS

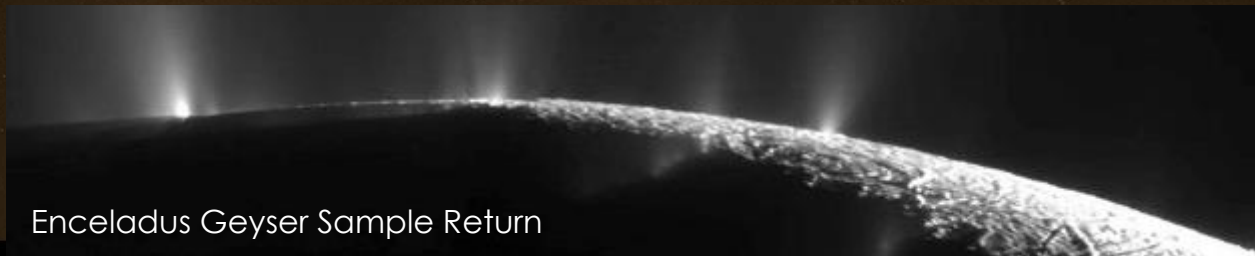
EARTH INDEPENDENT



# Game-changing Vehicle For Exploration



*NASA's Space Launch System*



# Summary

- **SLS provides capability for human exploration missions.**
  - Block 1 configuration enables initial flight tests.
  - Evolved configurations enable missions including humans to Mars.
- **SLS offers unrivaled benefits for a variety of missions.**
  - Block 1 provides greater mass lift than any contemporary launch vehicle; Block 2 offers greater lift than any launch vehicle, ever.
  - With 8.4m and 10m fairings, SLS will offer greater volume lift capability than any other vehicle.
  - Initial ICPS configuration and future evolution will offer highest-ever C3.
  - Updated Mission Planner's Guide provides capabilities information.
- **SLS is currently on schedule for first launch.**
  - Critical design review completed in July 2015; SLS is now in implementation.
  - Manufacture and testing are currently underway.
  - Hardware now exists representing all SLS elements.

