

Emerging Technologies for Mars Exploration: Mars Ascent Vehicle

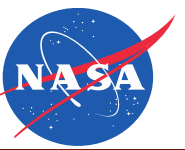
Darius Yaghoubi

IEEE Aerospace Conference

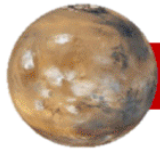
March 11, 2020



What is MAV? How does it fit into the Mars Sample Return Architecture?



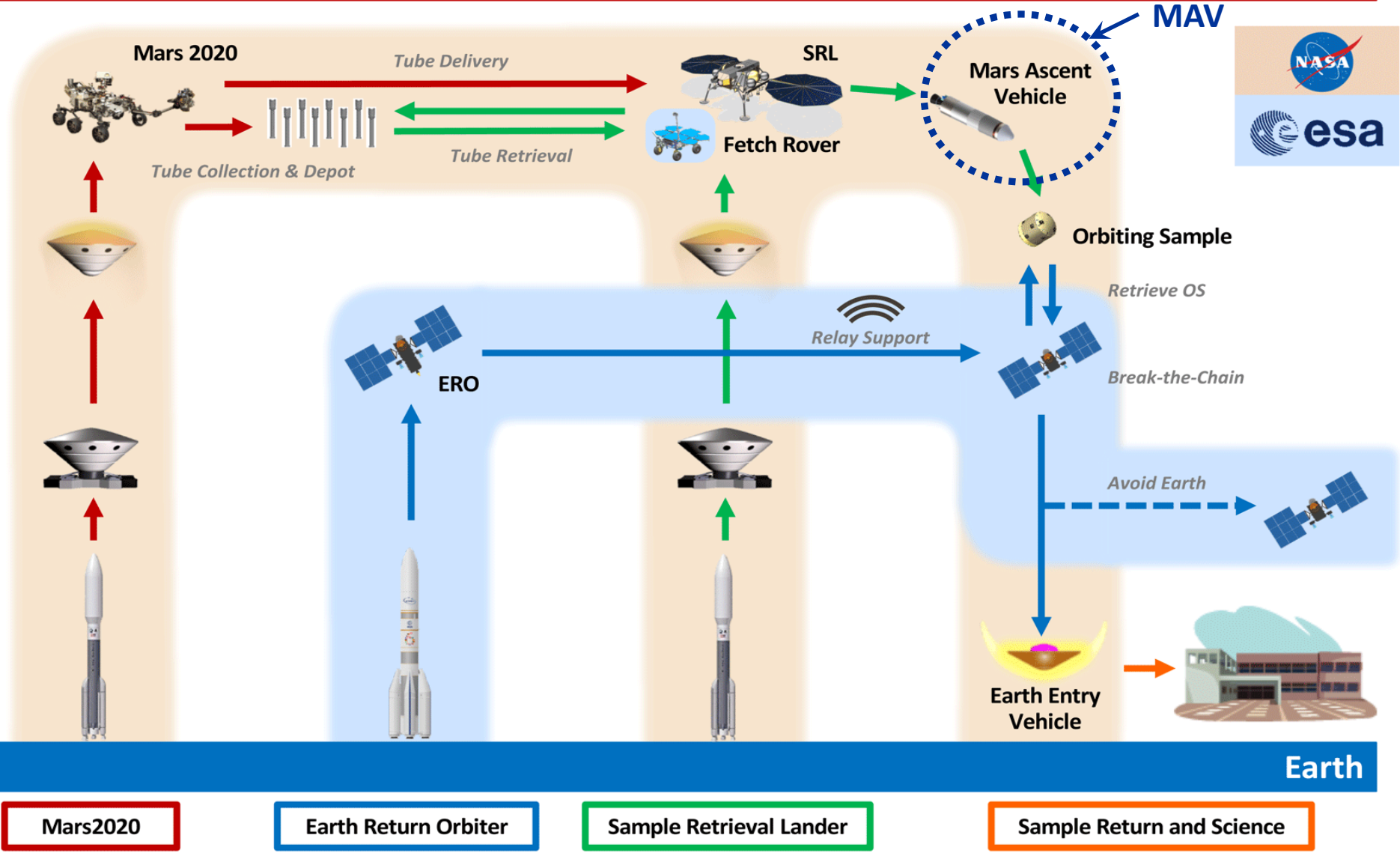
Mars Ascent Vehicle



Mars



Earth



Mars2020

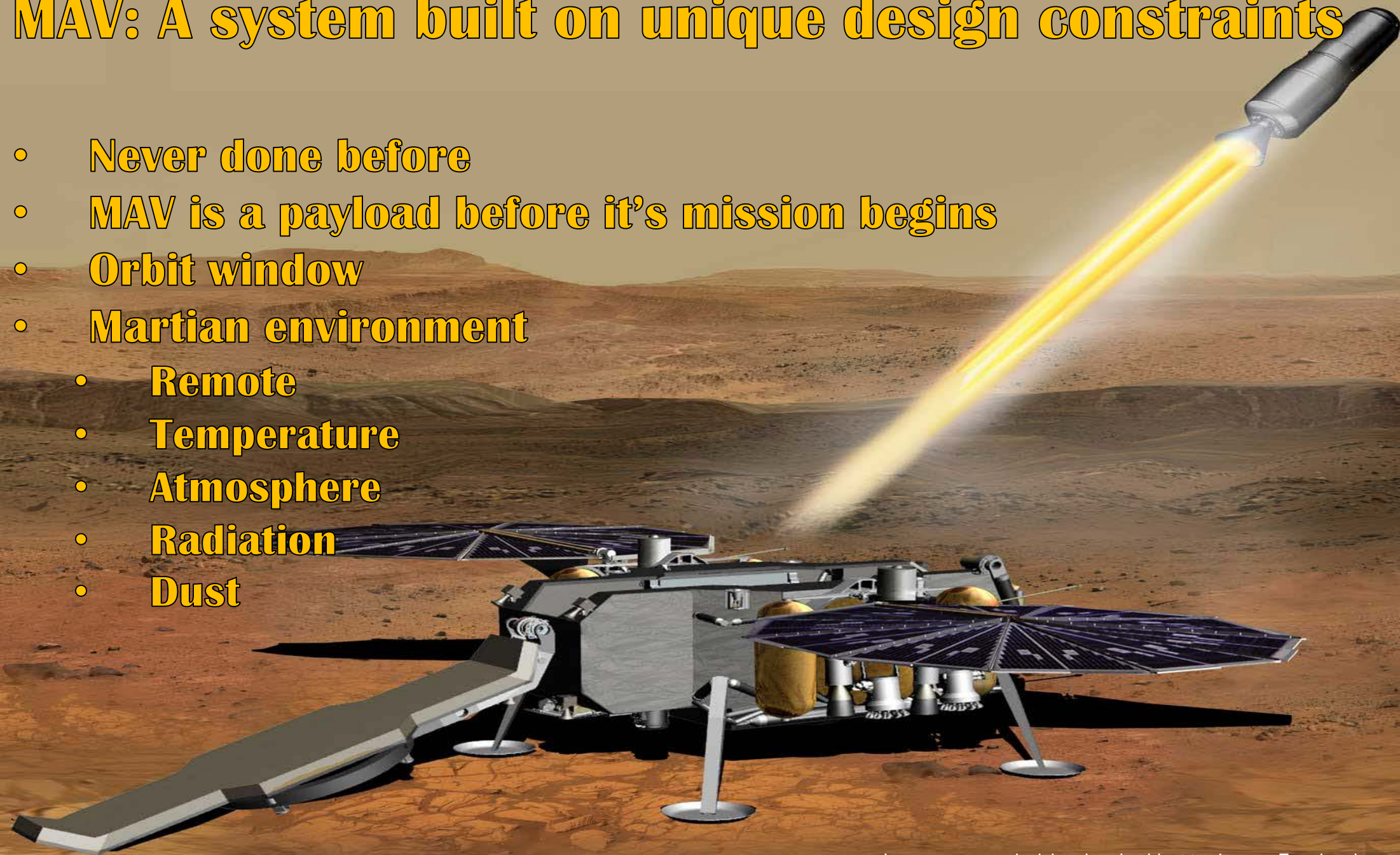
Earth Return Orbiter

Sample Retrieval Lander

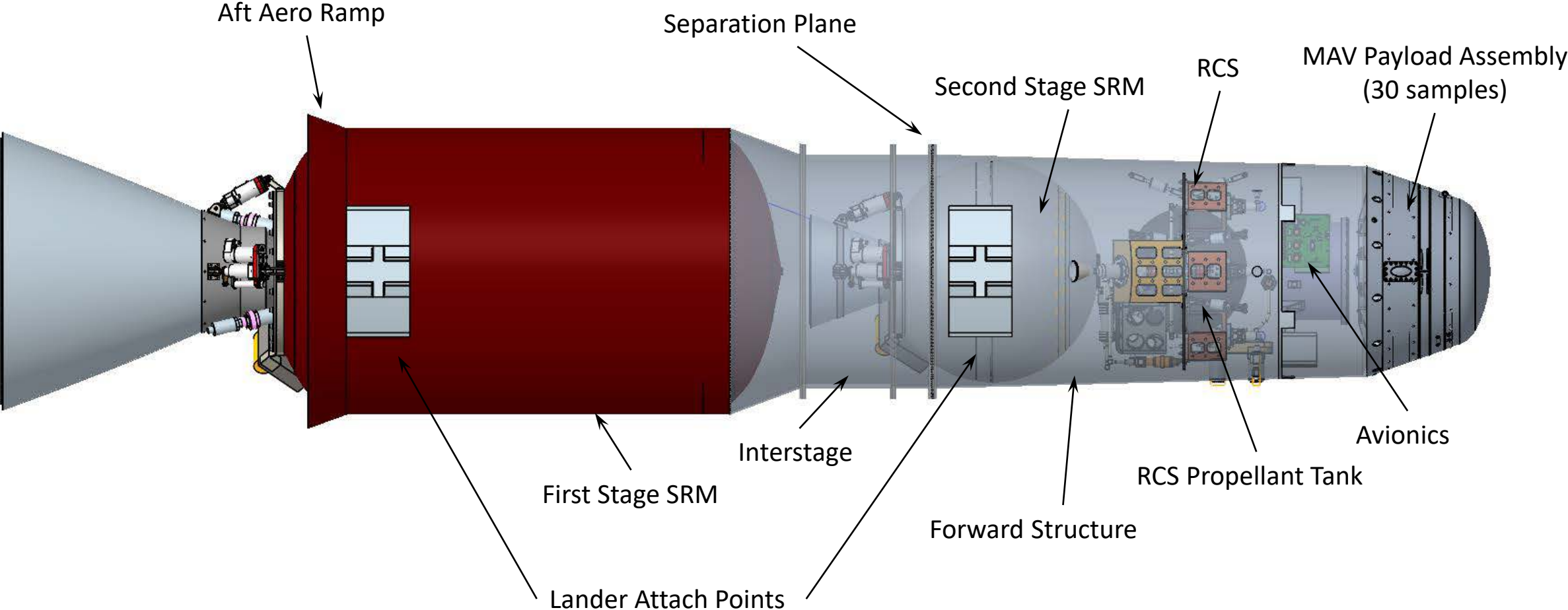
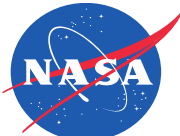
Sample Return and Science

MAV: A system built on unique design constraints

- Never done before
- MAV is a payload before it's mission begins
- Orbit window
- Martian environment
 - Remote
 - Temperature
 - Atmosphere
 - Radiation
 - Dust



MAV Overall Design (January 2020)



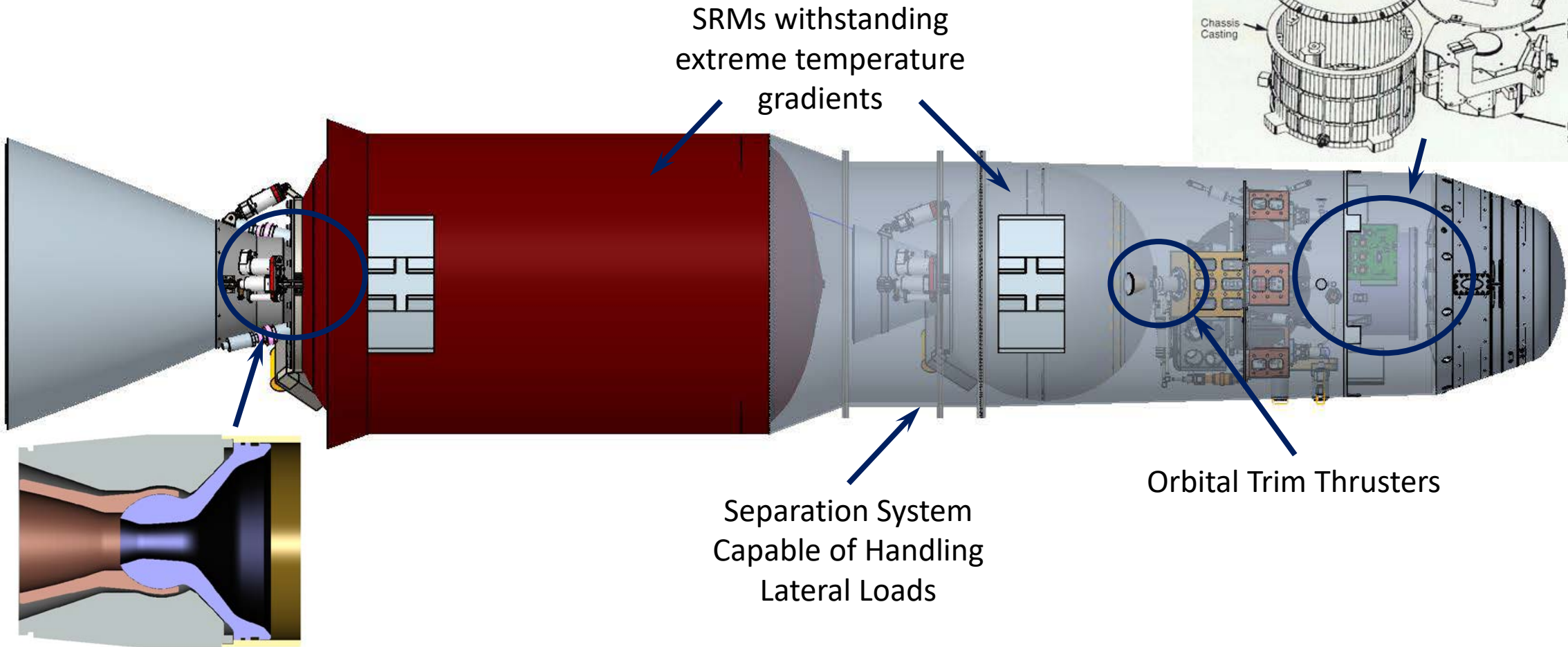
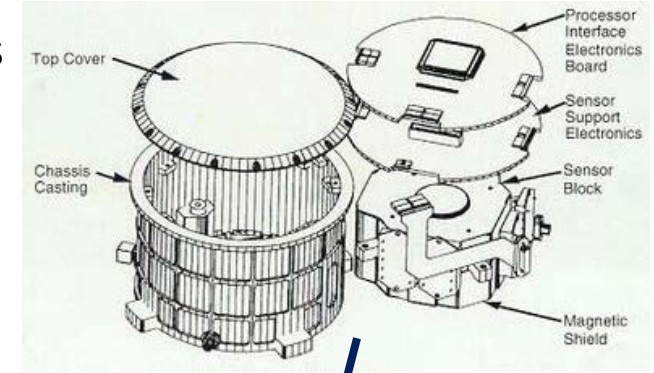
Emerging Technologies and Innovations



Mars Ascent Vehicle

Not pictured: Cabling and umbilical options

IMU Options



TVC Supersonic Splitline*

Looking to the future...

