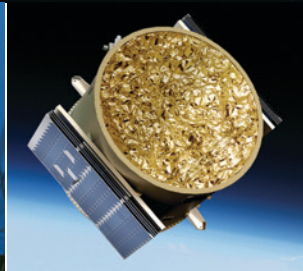
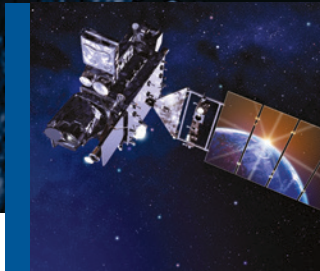


SPACE



SPACE

REVOLUTIONIZING
THE WAY TO SPACE

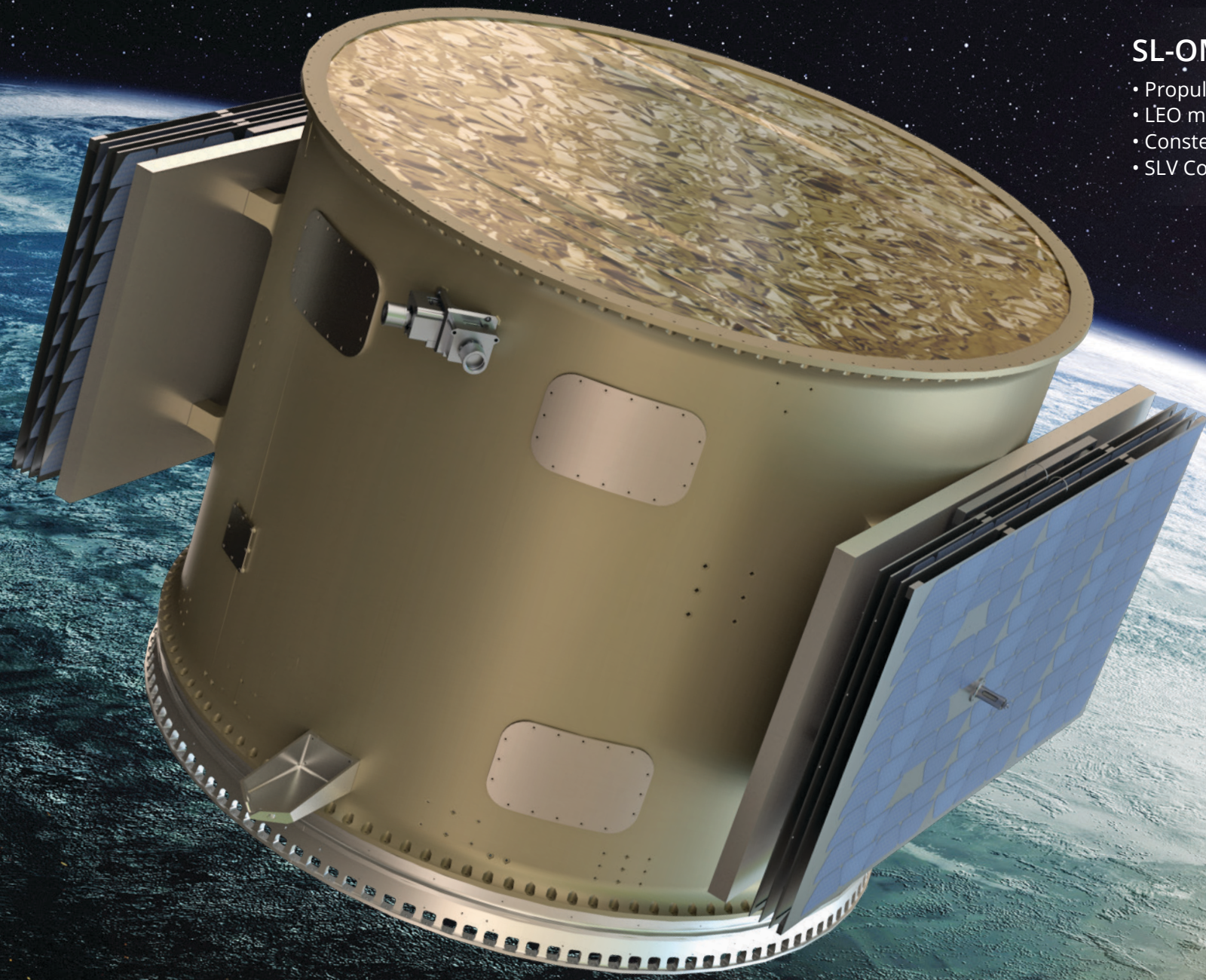
MOOG

SPACE VEHICLES

Moog offers a variety of Space Vehicles that can fit your unique payload and launch needs. Our spacecraft platforms and tugs leverage decades of experience in spacecraft avionics, flight software, propulsion, and structures. Novel configurations offer flexibility to tackle challenging missions of nearly any flight profile or mission type.

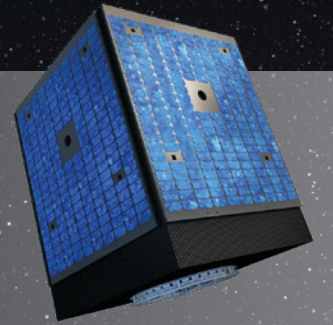
METEOR

METEOR is a Medium Class Spacecraft Bus used for a variety of missions in LEO including High LEO (1,000 to 1,200 km). It is ideal for pathfinder constellation missions or other disaggregated mission types and leverages the same core avionics from Moog's Space Vehicle family that have been demonstrated in missions from LEO to the Moon. The hydrazine propulsion system provides enough capability for a controlled deorbit from High LEO. The relatively high thrust can be used for collision avoidance or other rapid orbit changes. The simple and robust all-aluminum structure derived from Moog's ESPA provides radiation shielding and can support a range of payload configurations.



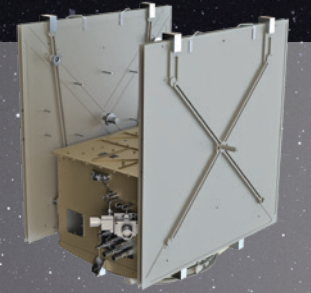
ASTEROID

- ESPA Grande Class Bus
- 3-5 years in low LEO (< 600 km)
- Ideal for EO and Scientific Imager Payloads
- Ø36" x 54" hollow internal volume



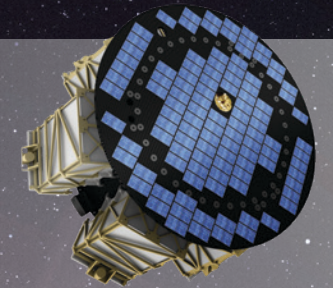
METEORITE

- ESPA Class Bus
- 3-5 years in High LEO (1000-1200 km)
- Constellation and Pathfinder Missions
- SLV and ESPA Compatible with Green Propellant



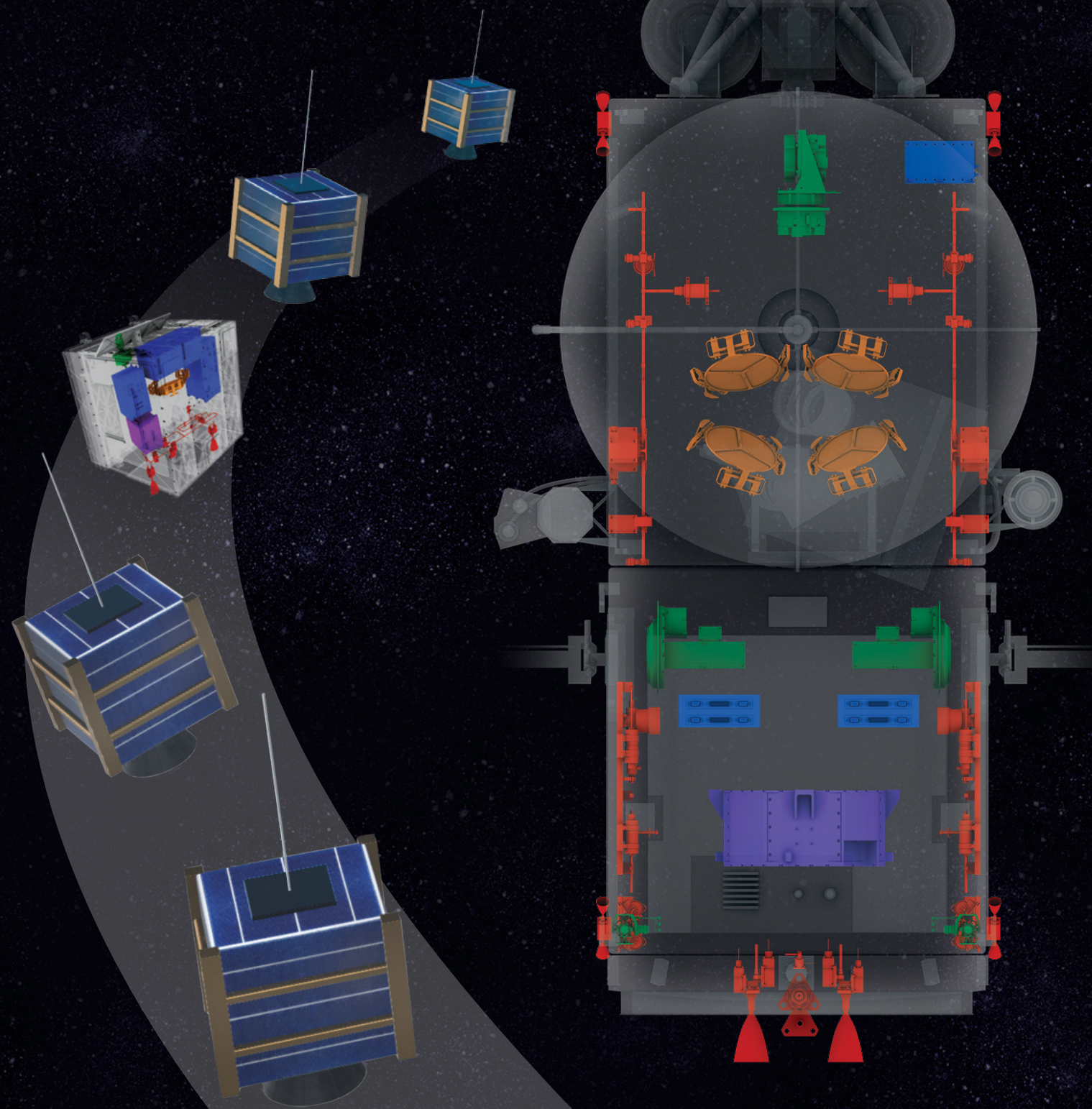
SL-OMV

- Propulsive Tug for CubeSat missions
- LEO missions
- Constellation Deployments
- SLV Compatible with Green Propellant



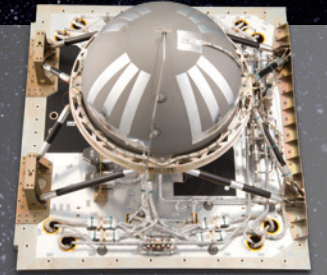
SPACECRAFT TECHNOLOGIES

Moog is a proven leader in components, subsystems, and systems for spacecraft of all sizes, from smallsats to GEO spacecraft. Moog has been successfully providing spacecraft controls, in-space propulsion, and major subsystems for science, military, and commercial operations for more than 60 years.



● PROPULSION

- Components and subsystems
- Chemical, electric, cold gas, and green propulsion
- Station keeping and attitude control thrusters from 1N to 500N



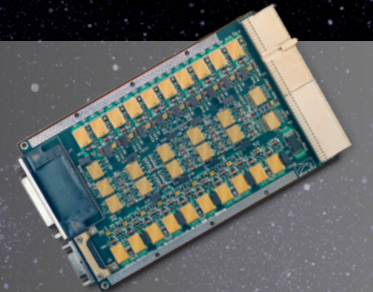
● AVIONICS

- High performance and radiation-tolerant avionics
- Command and data handling, power control/distribution, and motor controllers
- Payload processing, data storage, and GPS receivers
- Onboard computing, artificial intelligence and machine learning



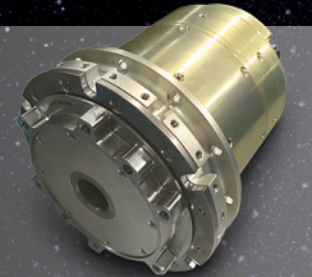
● POWER SYSTEMS

- High-power control systems
- Power for telemetry, solar array, and battery management
- DC converters and switching



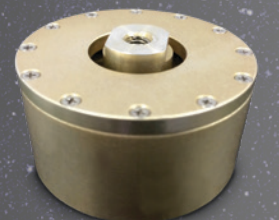
● MECHANISMS

- Rotary and linear actuators for spacecraft motion control
- Solar array drives, gimbals, and antenna pointing mechanisms
- Control electronics and specialty positioners



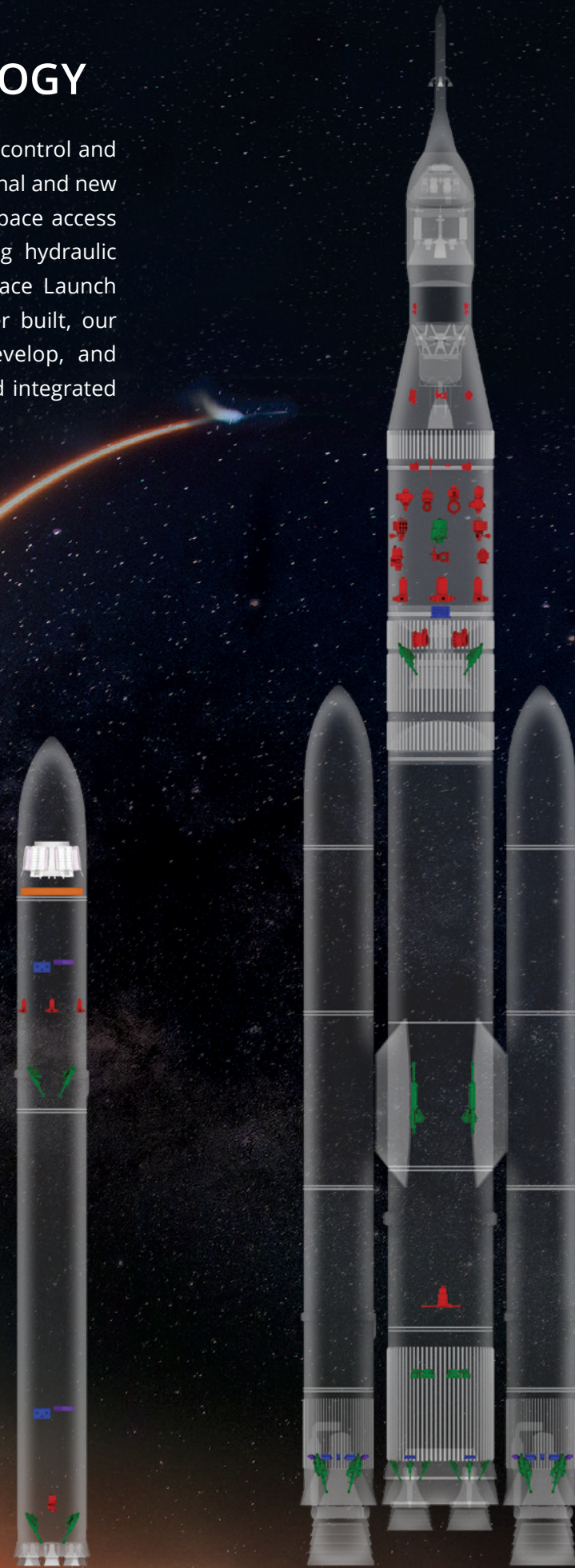
● PAYLOAD ADAPTERS, SHOCK AND VIBRATION CONTROL

- Vibration and shock isolation solutions
- SoftRide and ShockWave products
- Payload adapters and ESPA ring



SPACE ACCESS TECHNOLOGY

Moog is a provider of precision fluid and motion control and vibration and shock isolation solutions for traditional and new space applications. We have served the global space access market since the 1950s with the original Moog hydraulic servovalve. From small launchers to NASA's Space Launch System, which is the most powerful rocket ever built, our team has extensive experience to design, develop, and manufacture your components, subsystems, and integrated systems that will assist your journey to space.



● ACTUATION

- Motion control for launch vehicles and space planes
- Electrohydraulic (EH), Electromechanical (EM), and Electrohydrostatic (EHA)
- Thrust vector, fin, flap, and engine control



● PROPULSION

- Earth-storable and cryogenic propulsion components and systems
- Fluid and pneumatic controls for engines
- Cold gas and Earth-storable thruster for roll control



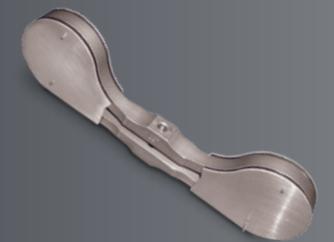
● AVIONICS AND POWER SYSTEMS

- Control and power for actuation systems
- Data acquisition and engine controls
- Inertial navigation sensors and integrated guidance, navigation, and control solutions
- Power distribution and management



● SHOCK AND VIBRATION CONTROL

- Shock and vibration isolation solutions
- Optimized for coupled payload and launch systems
- Significant reductions in launch environments
- More flexibility to maximize mission capabilities



● ESPA RING AND PAYLOAD ADAPTERS

- Industry standard for small satellite rideshare and bus structures
- ESPA is payload configurable
- Payload adapters for any mission scenario



DEEP SPACE EXPLORATION

Moog technology is radiation-hardened to play critical roles in power conversion and management, data control and handling, and much more, enabling human exploration to the Moon, Mars, and beyond. Moog stands the test of time, as our hardware has supported human operations on the International Space Station for more than 20 years. Current plans are to extend that human presence from low Earth orbit to the lunar surface. Our avionics and propulsion technology has been selected for critical applications on several unmanned landers and rovers.



ENVIRONMENTAL SYSTEMS

- Components and systems
- Valves, regulators, and quick disconnects
- Oxygen, nitrogen, water, and waste removal solutions
- High pressure, low pressure, and thermal regulation
- Applications: rovers, habitats, and deep space

AUTOMATION AND ARTIFICIAL INTELLIGENCE

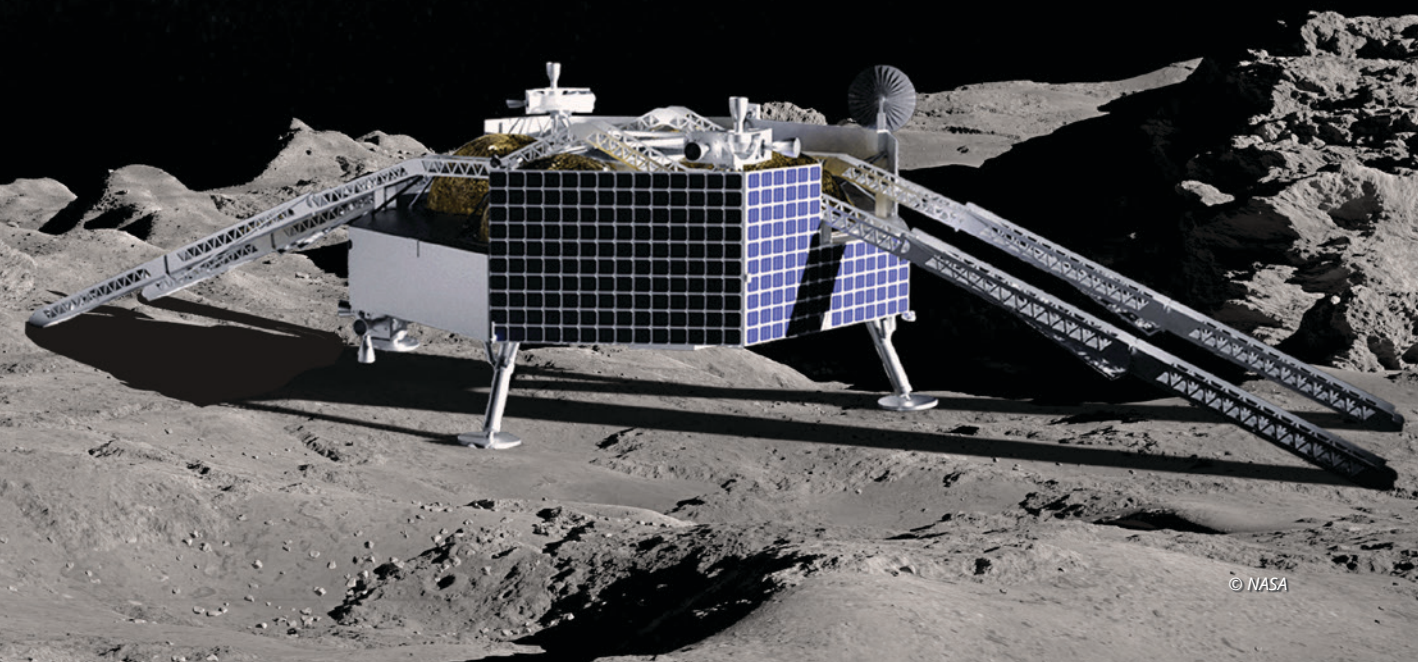
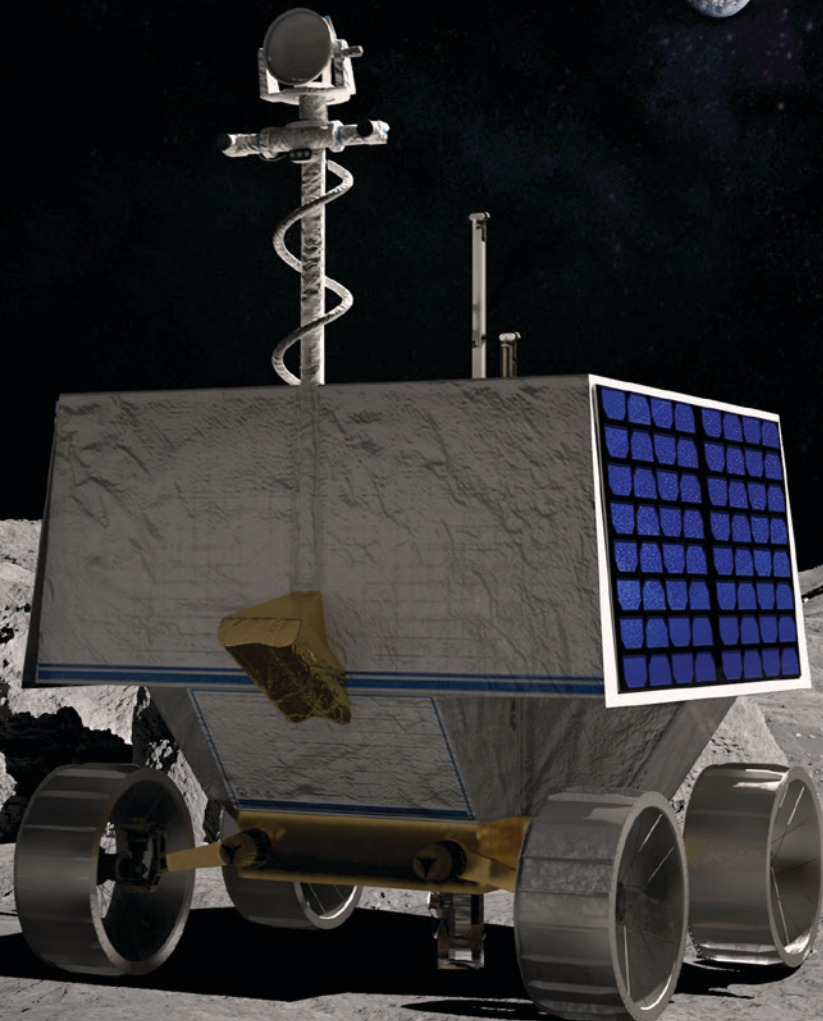
- Autonomous technology, actuation systems, and fluid transfer
- Enabling docking and in-orbit assembly
- Investments in edge processing, artificial intelligence, and machine learning

ELECTRIFICATION

- Components to complete systems
- Electric motors, mechanisms, and actuators
- Radiation-hardened computing, control systems, and power management and distribution
- Enabling electric platforms for a sustainable lunar presence

POWER MANAGEMENT AND CONVERSION

- Relevant solutions for solar and fission technologies
- Industry leading efficient (above 95%) high-power voltage converters and distribution systems

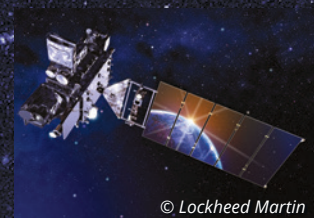


FLIGHT HISTORY

SPACECRAFT



AEHF



GOES-R



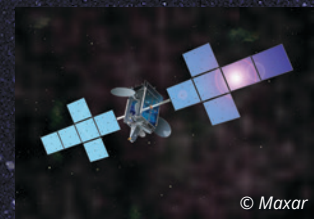
ORBCOMM Generation 2 (OG2)



JWST

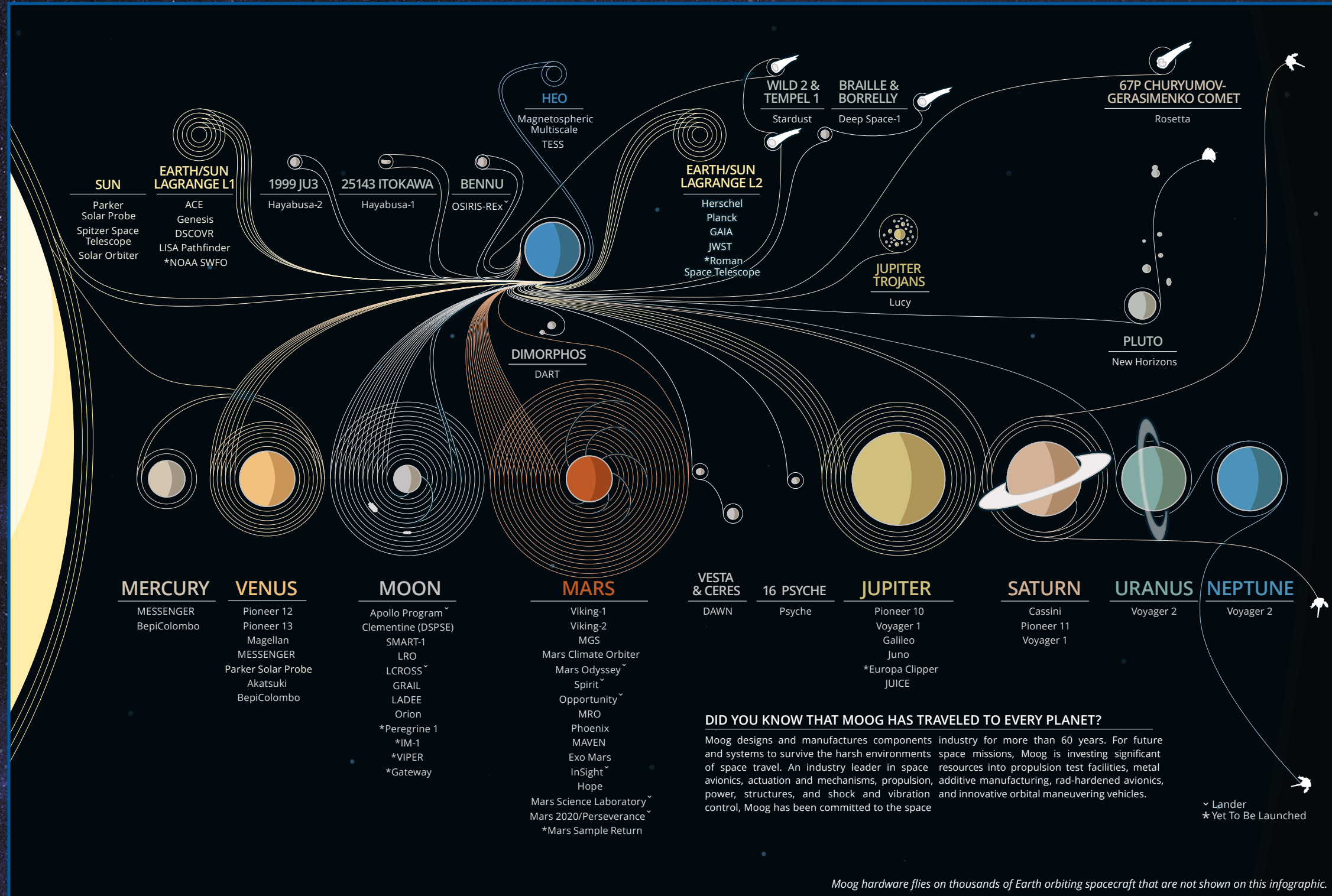


Galileo



1300

MOOG IN SPACE



Moog hardware flies on thousands of Earth orbiting spacecraft that are not shown on this infographic.

LAUNCH VEHICLES



Vulcan



New Glenn



Ariane 5



SLS



Falcon 9



Atlas V

MOOG

SPACE AND DEFENSE GROUP

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