



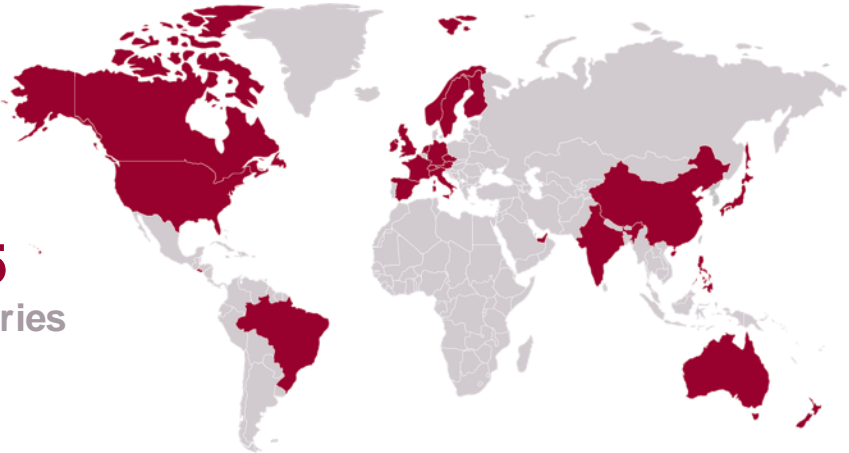
# SPACE DIVISION OVERVIEW

JANUARY 2024

MOOG

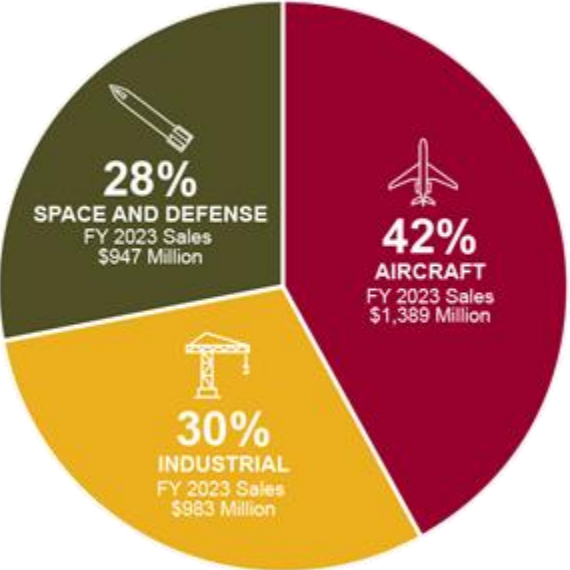
# Moog At-A-Glance

World leader in high-performance motion controls solutions for mission-critical applications

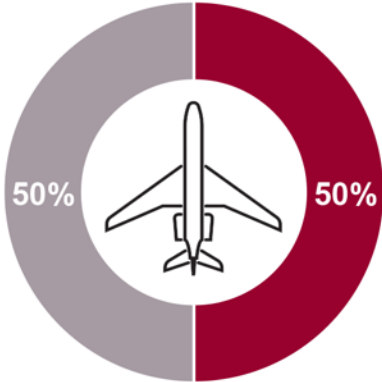


**1951** | **14,000** | **\$3.3 B** | **70+ YEARS** | **25**  
Founded by Bill Moog | Employees | FY 2023 Revenue | Controls Heritage | Countries

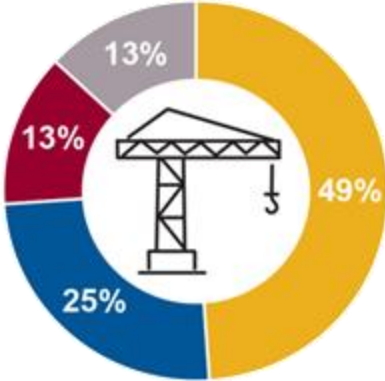
## FY 23 Revenue



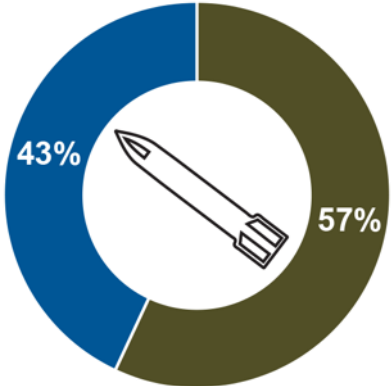
## Business Segments



- Military Aircraft
- Commercial Aircraft



- Industrial Automation
- Medical
- Energy
- Simulation and Test



- Defense
- Space

# Space Division At-A-Glance

Moog technology has been to every planet in our solar system, supporting civil, commercial, and national security space missions since the inception of spaceflight.

**60+ YEARS**  
Spaceflight Heritage

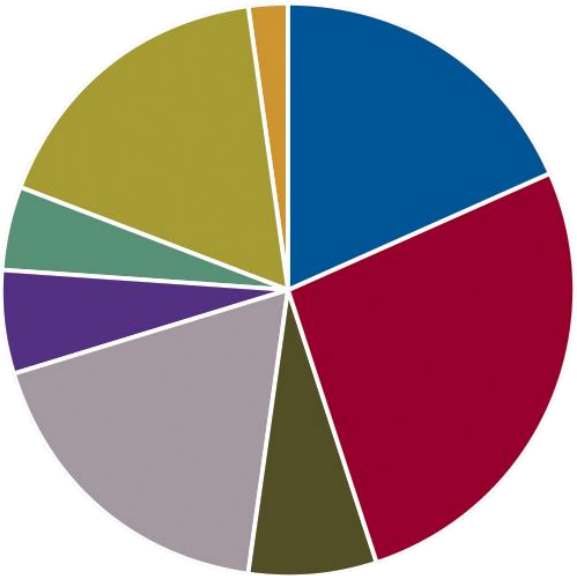
**1,200**  
Space Employees

**\$407 M**  
FY 2023 Revenue

**1X / WEEK**  
Average Number of Moog Hardware Launches into Space



—FY 23 Space Division Revenue—



Business Segments

- Actuation, Electronics and Power
- Fluid Controls: Propulsion and ECLSS
- Thrusters
- Avionics
- Spacecraft Mechanisms
- Payload Adapters and Isolation
- Space Vehicles

# Solutions for Every Stage of a Space Mission

## Applications

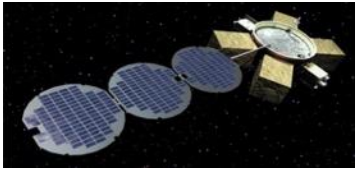
Hypersonic Glide Bodies,  
Reentry Vehicles &  
Interceptors



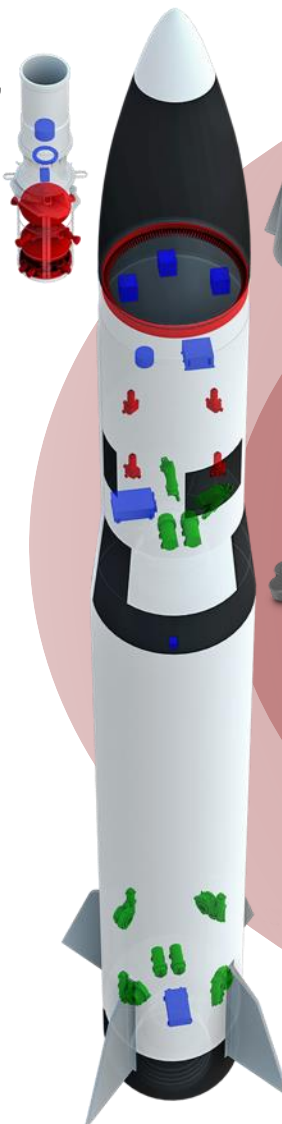
Missile Boosters



Classified DoD  
Spacecraft



Commercial  
Spacecraft



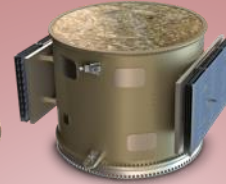
## Integrated Systems

### Technologies

Propulsion



Space Vehicles



Actuation



Fluid Control



Mechanisms



# MOOG

Payload  
Adapters



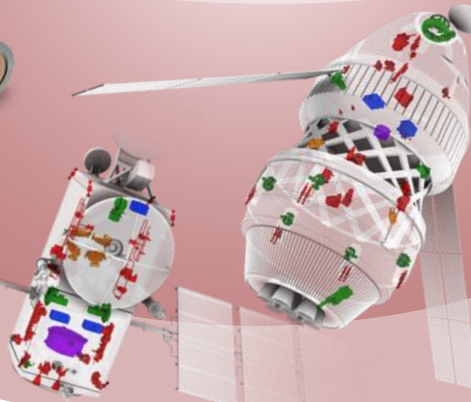
Power



Vibration  
Isolation



Avionics and  
Controllers

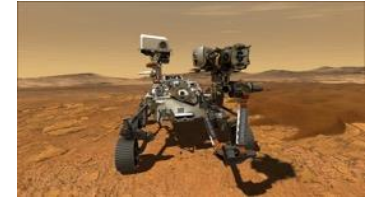


## Applications

Launch Vehicles



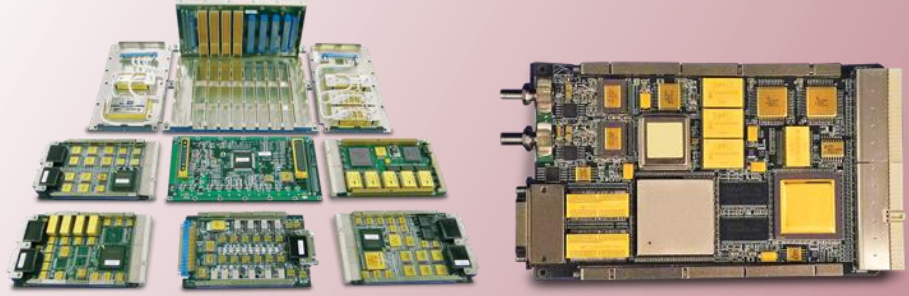
Civil – Exploration  
Space Vehicles



# Spacecraft Solutions

## Avionics

- Rad hard processing
- Flight computers
- Power management and C&DH
- Payload processors
- Data fusion and storage
- Edge computing



## Structures and Motion Control

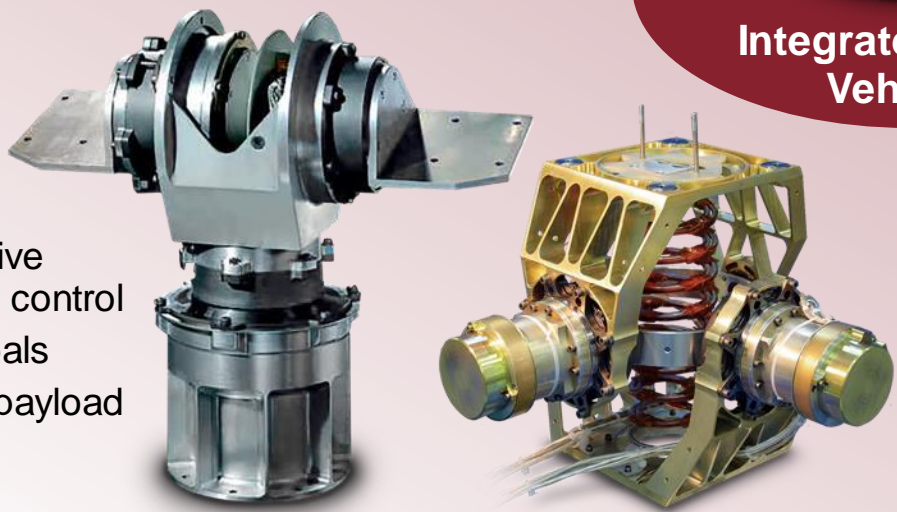
- ESPA and payload adapters
- SoftRide isolation
- Ground test – shock and random vibration



## Integrated Space Vehicles

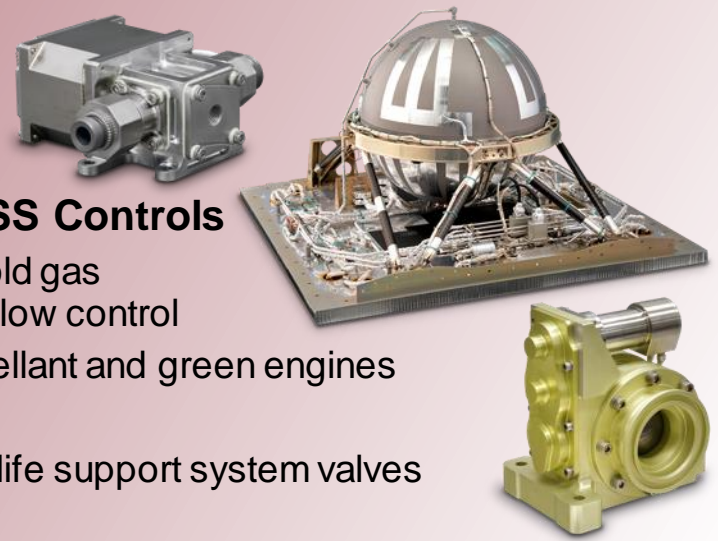
## Mechanisms

- Solar array drive assembly and control
- Thruster gimbals
- Antenna and payload pointing



## Propulsion and ECLSS Controls

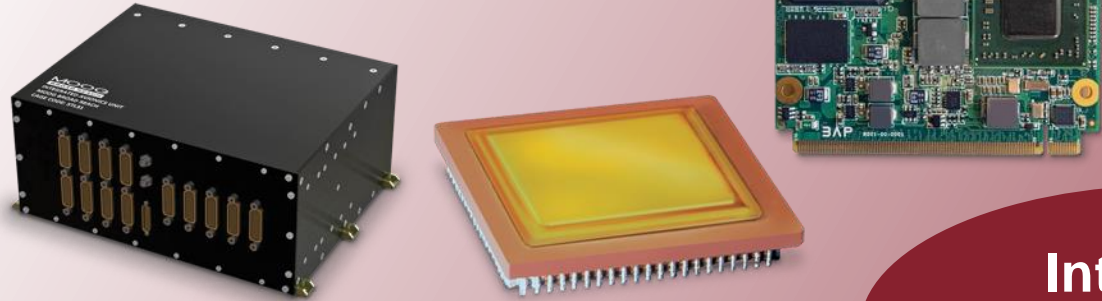
- Cryogenic, chemical, cold gas and electric propulsion flow control
- Monopropellant, bipropellant and green engines
- Complete systems
- Environmental control / life support system valves



# Launcher and Missile Solutions

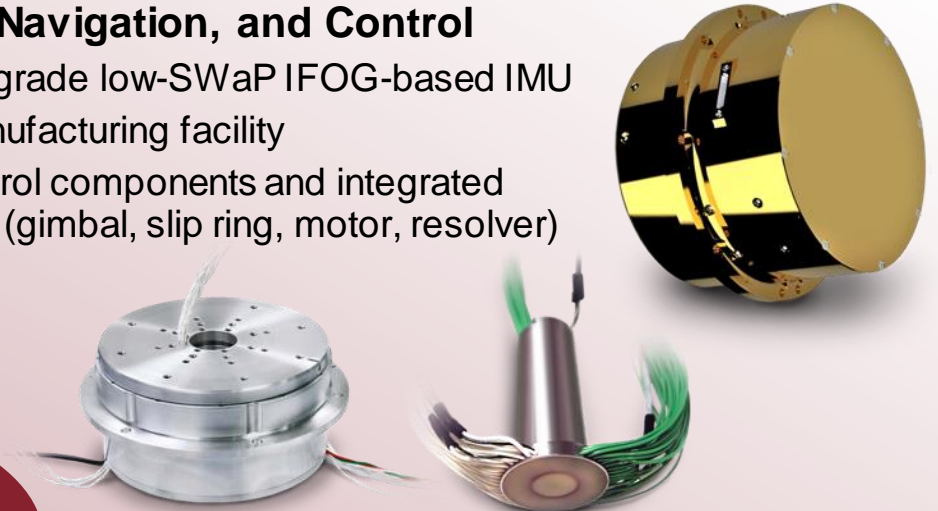
## Avionics

- Radiation hardened processing
- Flight computers
- Power management and C&DH



## Guidance, Navigation, and Control

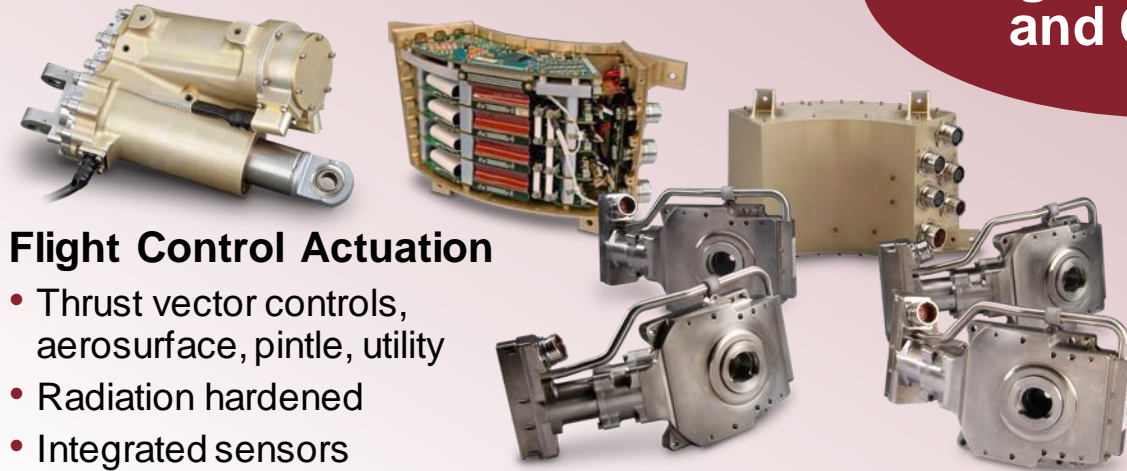
- Navigation-grade low-SWaP IFOG-based IMU
- Secure manufacturing facility
- Motion control components and integrated assemblies (gimbal, slip ring, motor, resolver)



## Integrated Navigation, Guidance and Controls

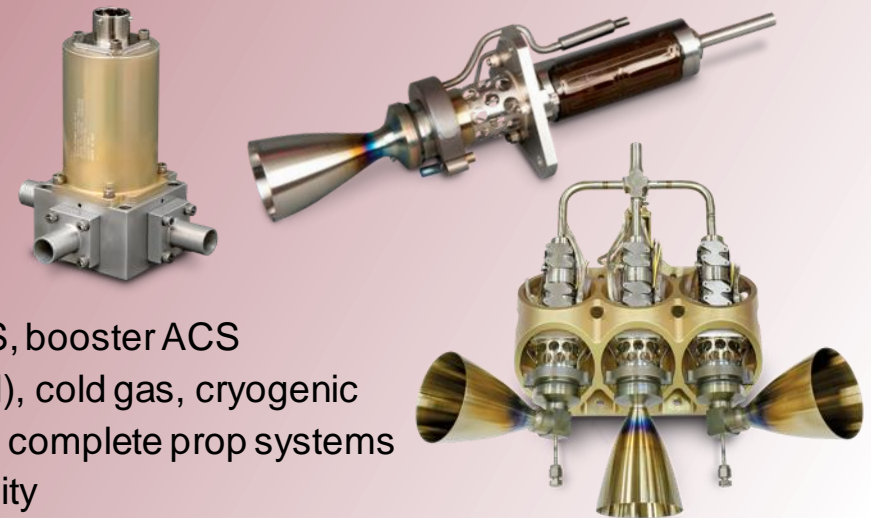
## Flight Control Actuation

- Thrust vector controls, aerosurface, pintle, utility
- Radiation hardened
- Integrated sensors
- Power source and management

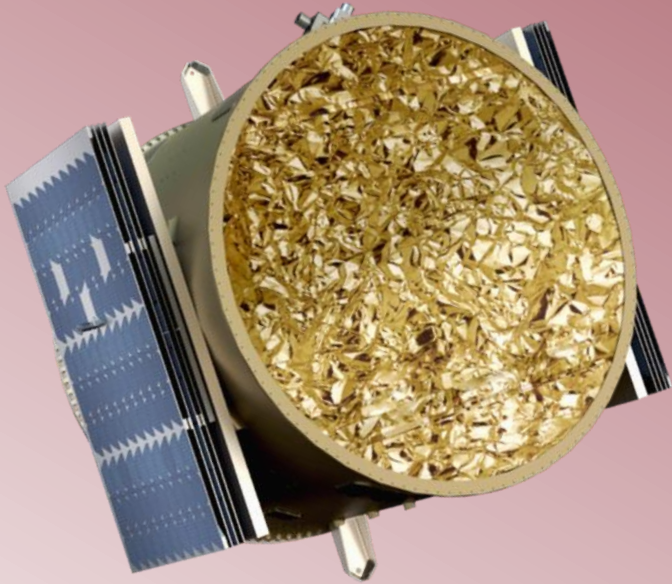


## Propulsion

- In-space, DACS, booster ACS
- Chemical (liquid), cold gas, cryogenic
- Components → complete prop systems
- Engine test facility

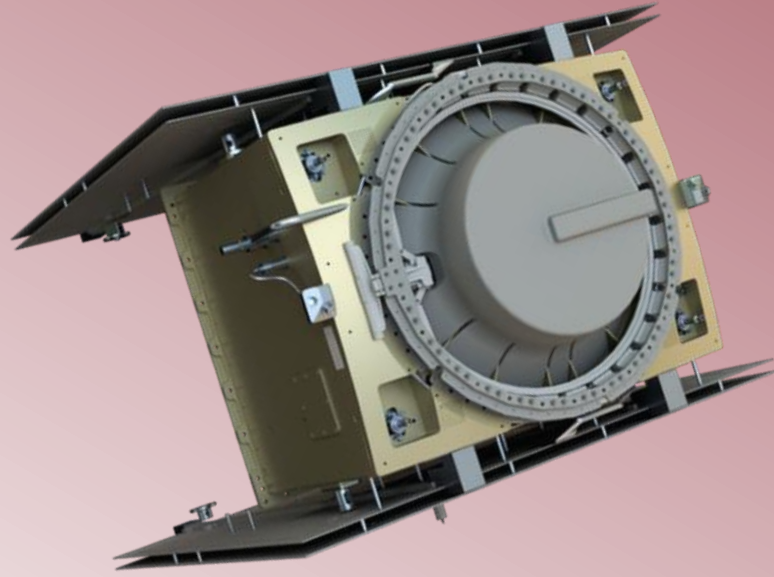


# Moog Space Vehicles Family



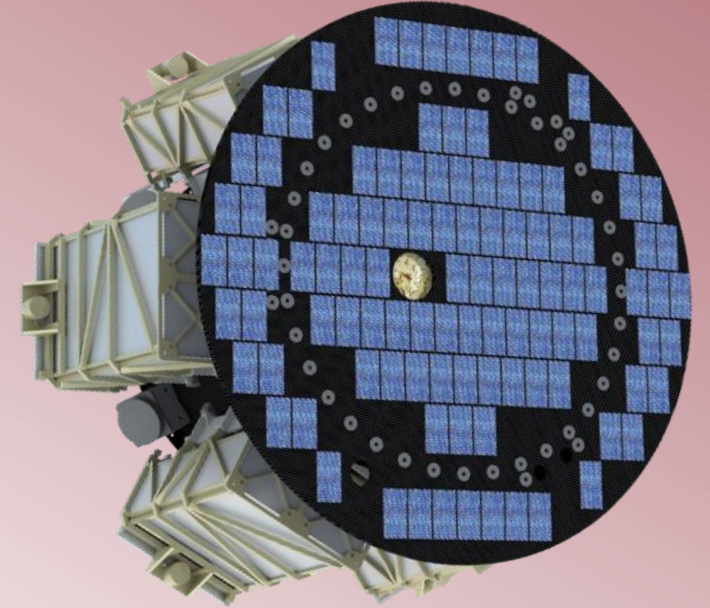
## METEOR

- Propulsive ESPA Bus
- 3 – 5 years in high LEO (1,000 – 1,200 km)
- Constellation and Pathfinder Missions
- Top or Side Mounted Payloads



## METEORITE

- ESPA Class Bus
- 3 – 5 years in high LEO (1,000 – 1,200 km)
- Constellation and Pathfinder Missions
- SLV and ESPA Compatible with Green Propellant



## SL-OMV

- Propulsive
- LEO missions
- Constellation Deployments
- SLV Compatible with Green Propellant