Laboratory for Atmospheric and Space Physics
University of Colorado **Boulder**

LASP Mechanical Engineer Group Capabilities

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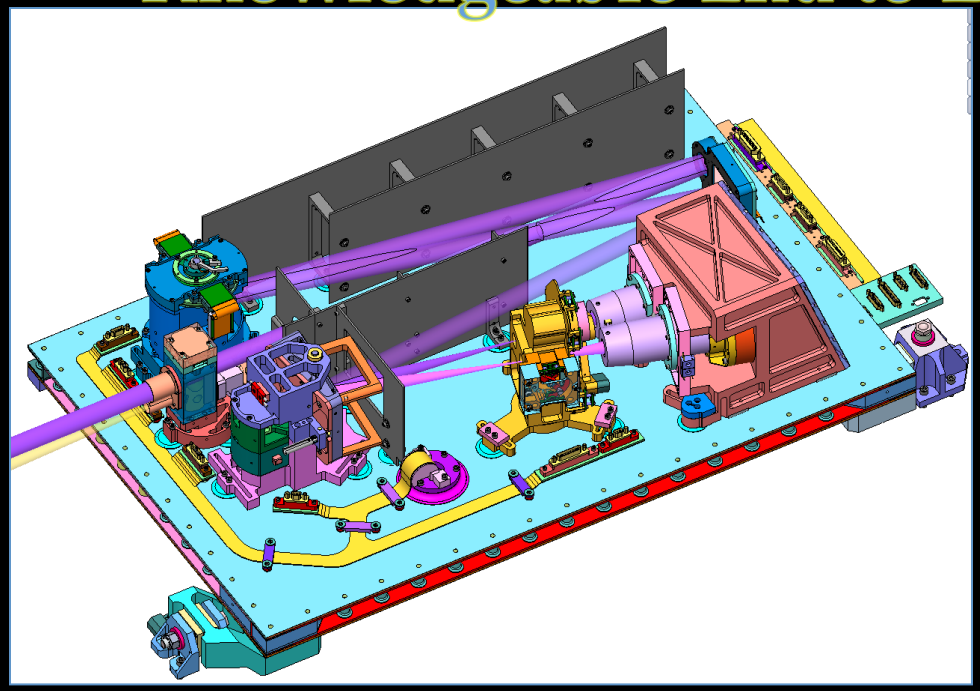
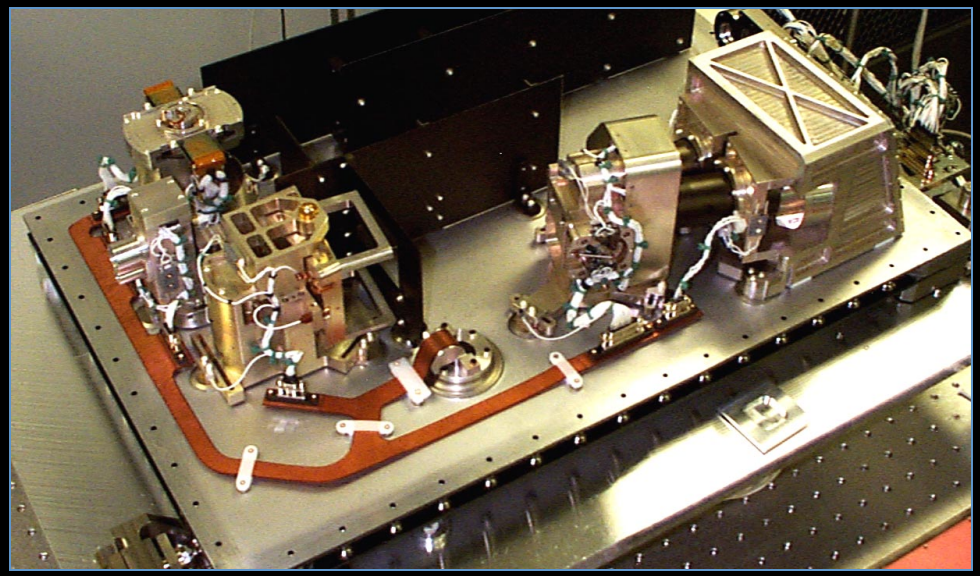
The 29th annual National Space Symposium
April 8-12

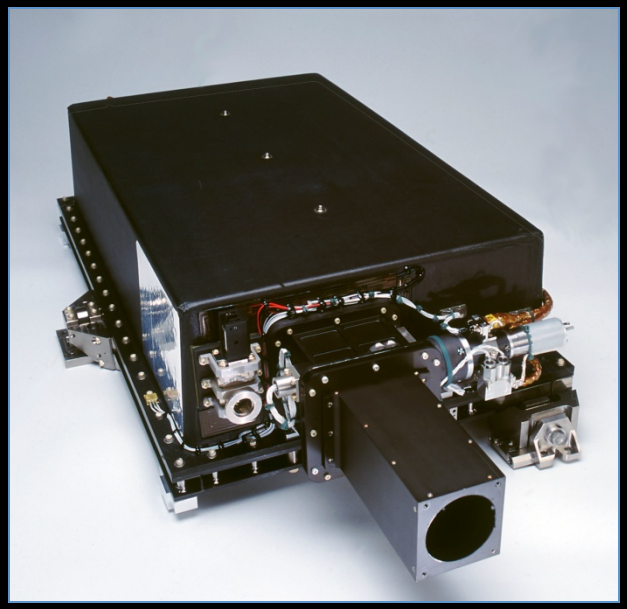
Knowledgeable End to End Instrument Design



SORCE-SOLSTICE Instrument

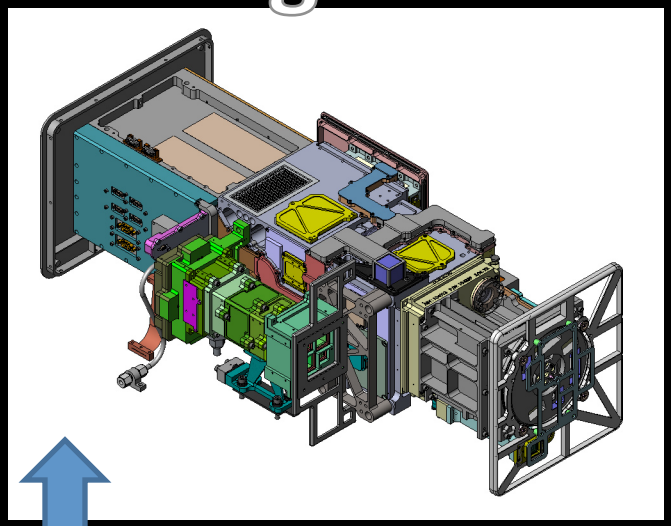
Greater Than 10 Years of Successful Operation On Orbit.

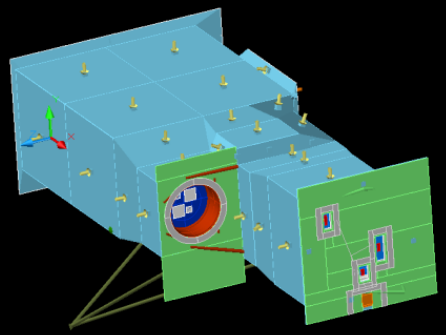




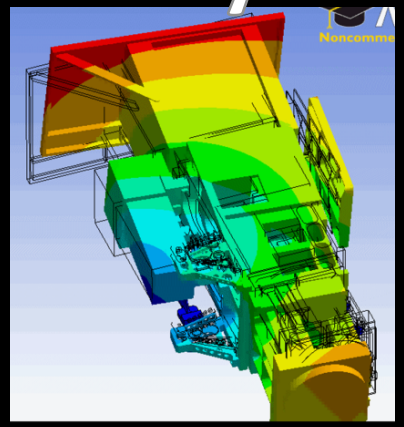
Proficient Engineering Throughout All Development Phases

Design

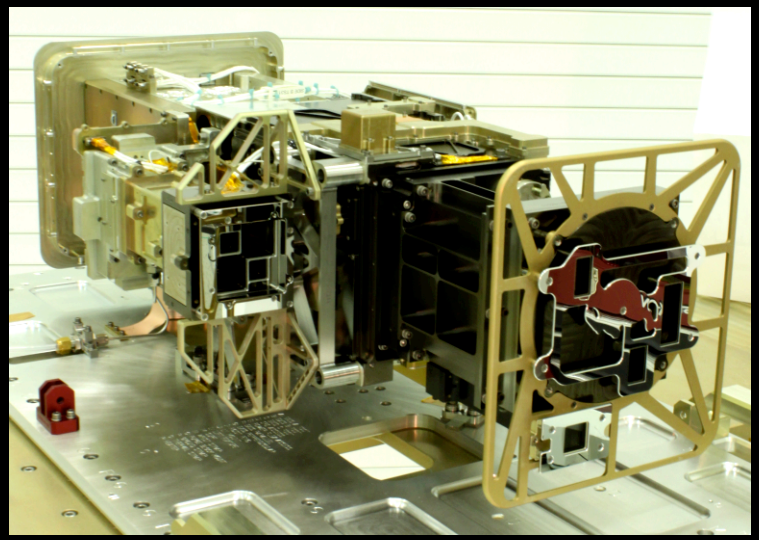




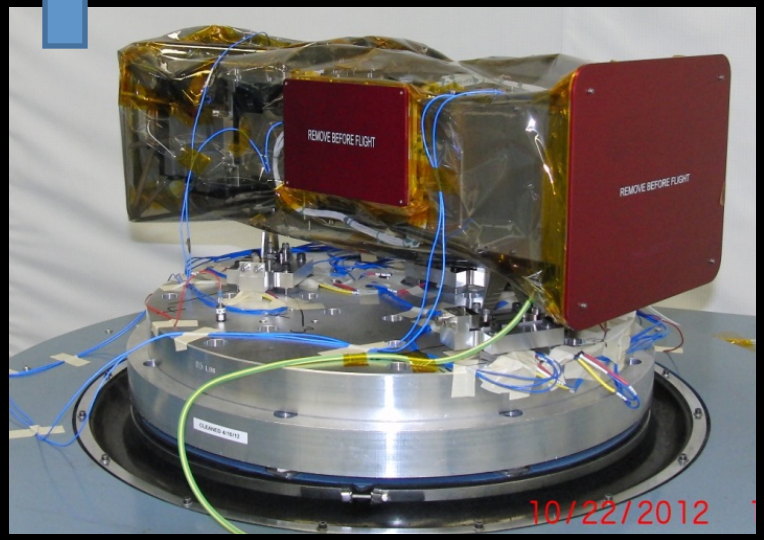
Analyze



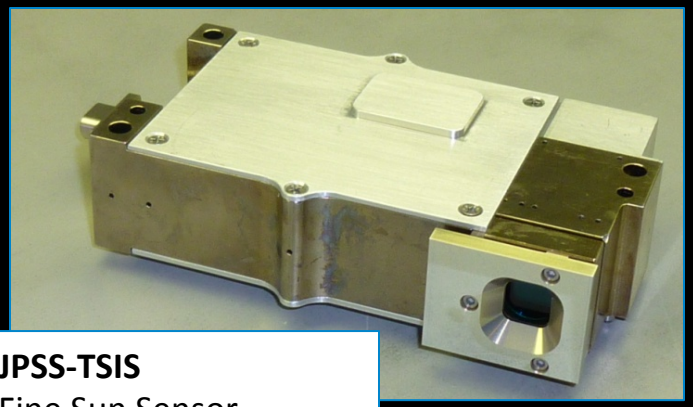
Build



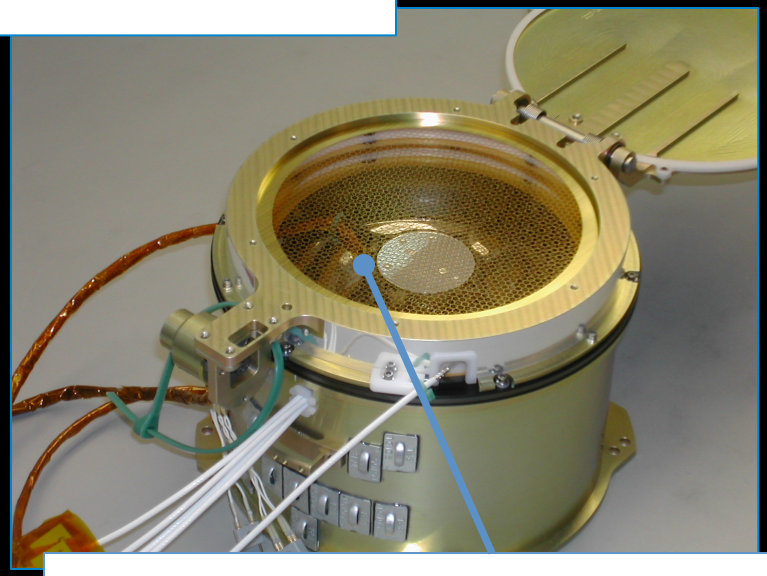
Test



Compact And Light Weight Spaceflight Instrument Design



JPSS-TSIS
Fine Sun Sensor
(.25Kg)



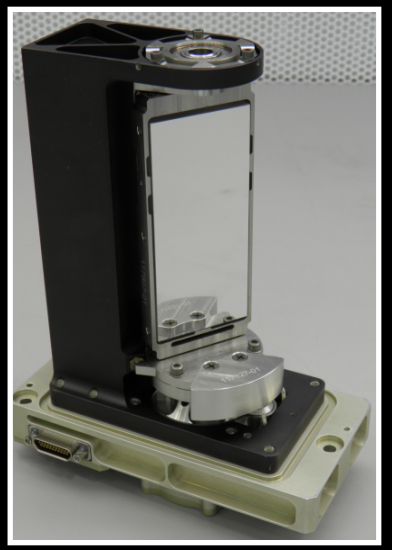
LADEE-LDEX
Gold-plated chem-etched Solar Wind Screens

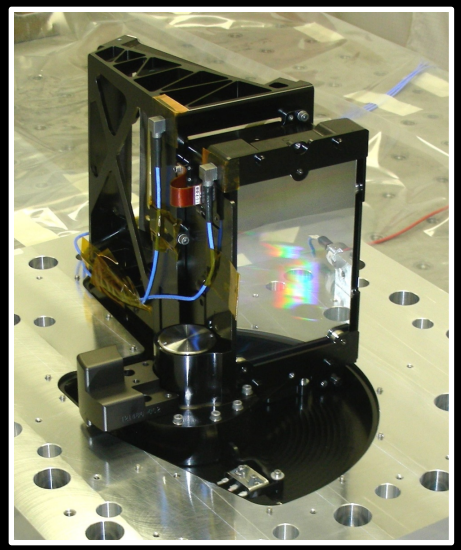
MESSENGER-MASCS
Mercury Atmospheric and Surface Composition Spectrometer
(2.9 Kg)

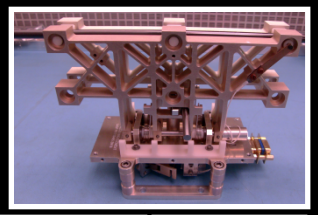
Over 40 Unique Spaceflight Mechanisms Since 1998

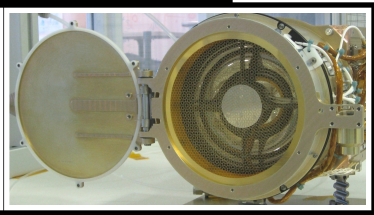
Extensive mechanism expertise

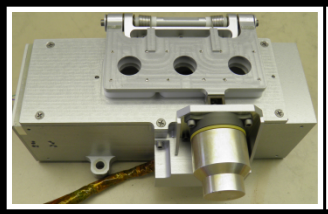
- Sub arc-second scan
- Aperture cover
- Vacuum Door
- Bi-stable devices
- Filter wheels
- Shutters

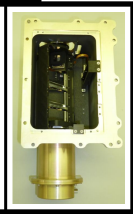


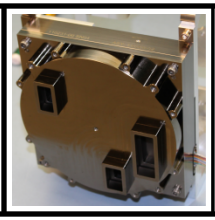


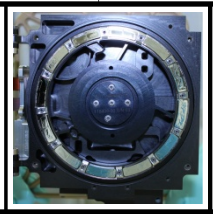


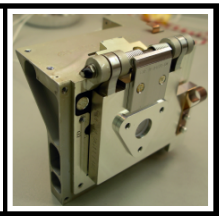


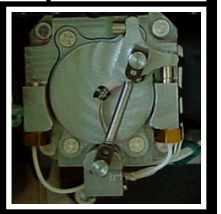


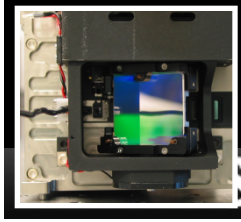


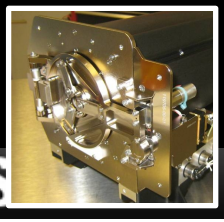


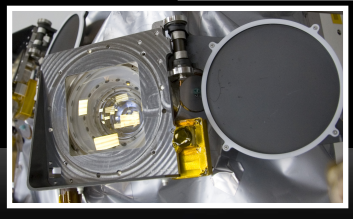


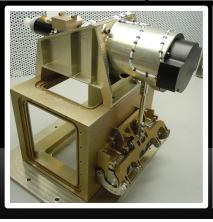


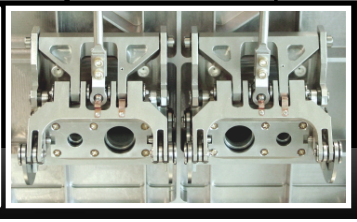


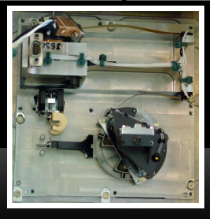


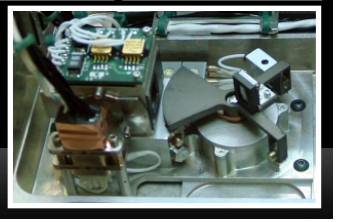








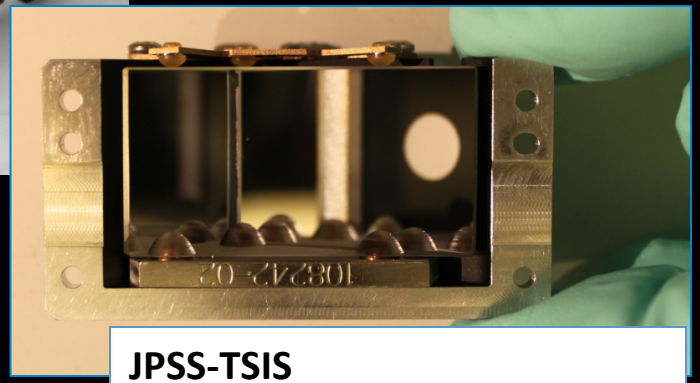




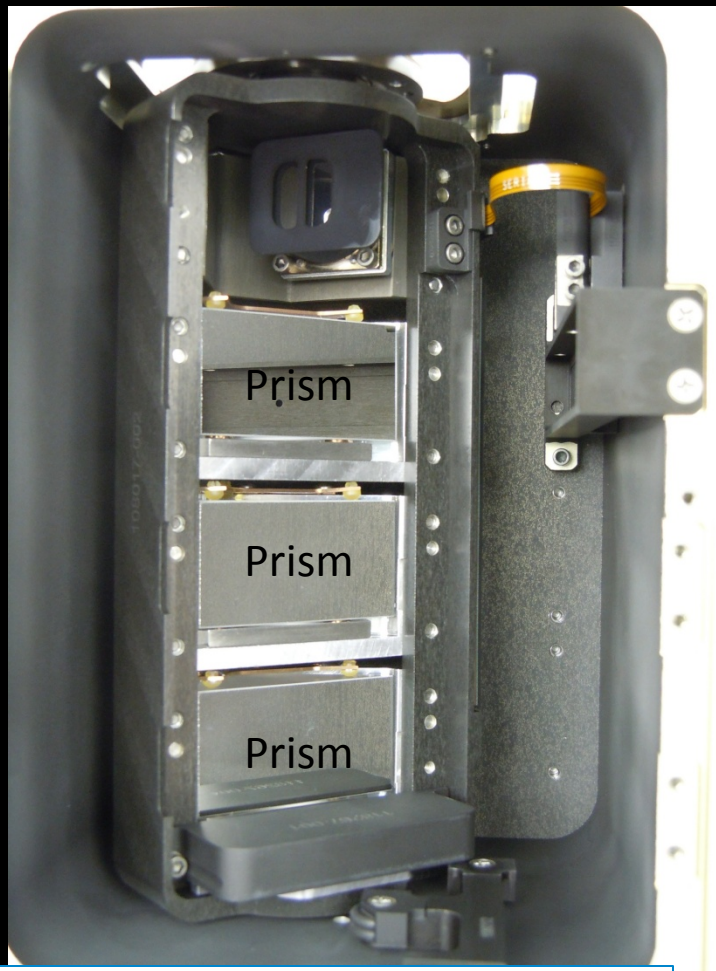
Expertise in Precision Optical-mechanical Mounting

Precision Optical Mounting

- Low Stress
- Stability over a wide temperature range
- Precision Adjustability
- Optical Cavity Clean

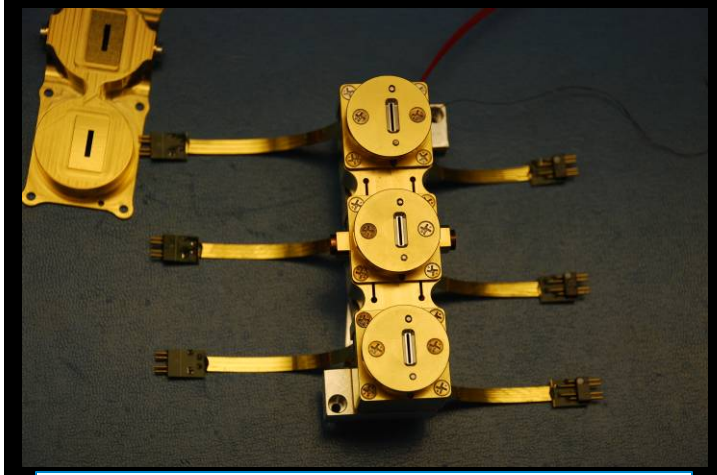


JPSS-TSIS
SIM Prism in carrier mount

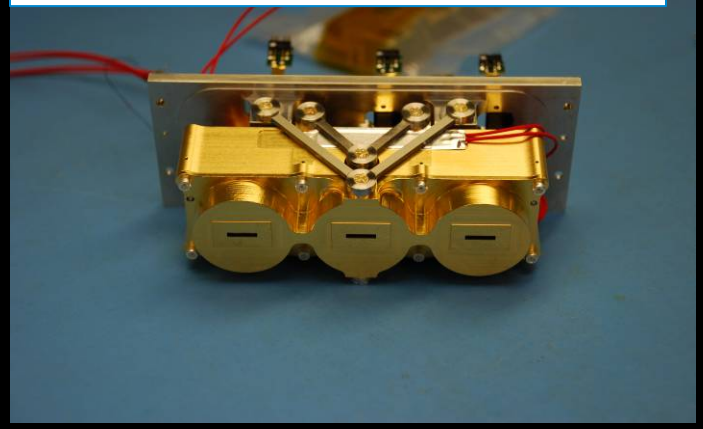


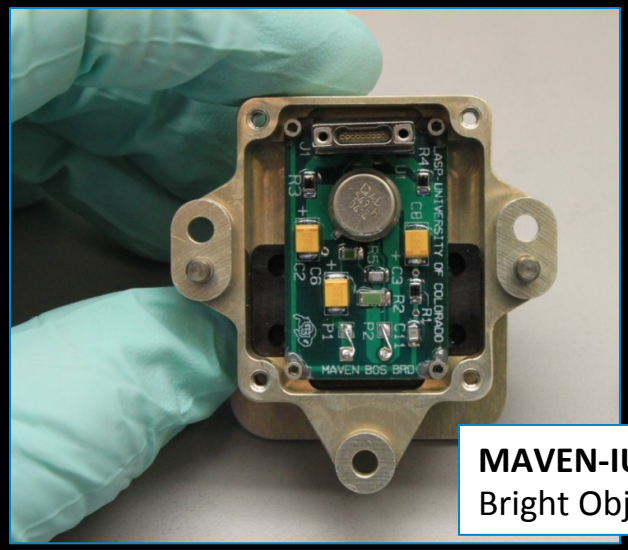
TSIS Spectral Irradiance Monitor (SIM)
4 optical elements
Sub arc-second pointing achieved

Innovative Electro-Mechanical Detector Designs

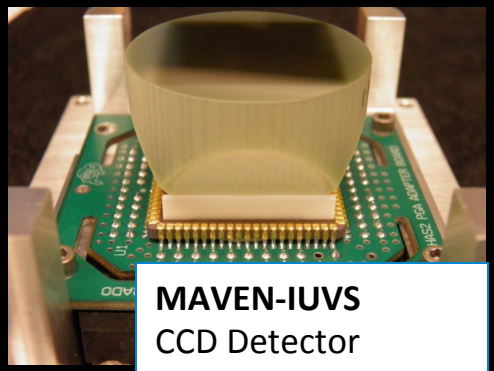


JPSS-TSIS Spectral Irradiance Monitor (SIM)
Electrical Substitution Radiometer (ESR)

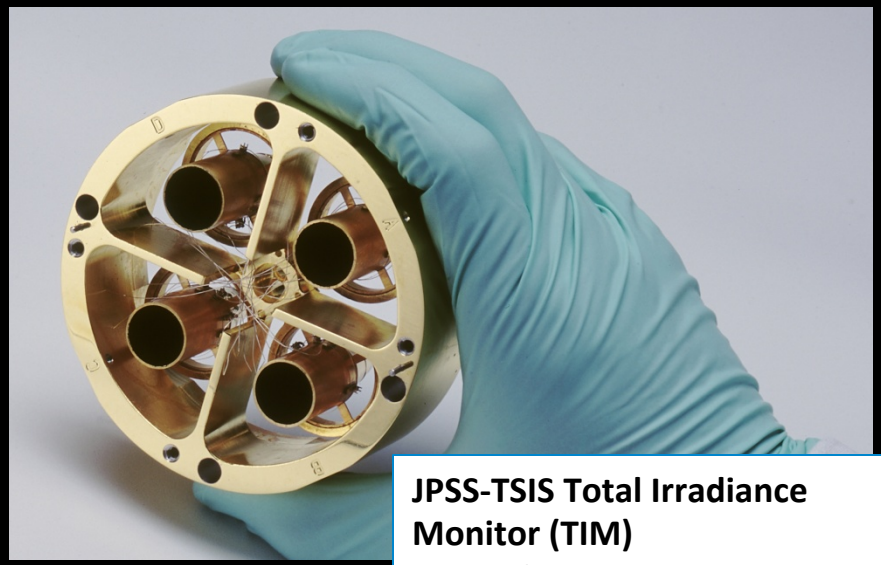




MAVEN-IUVS
Bright Object Sensor

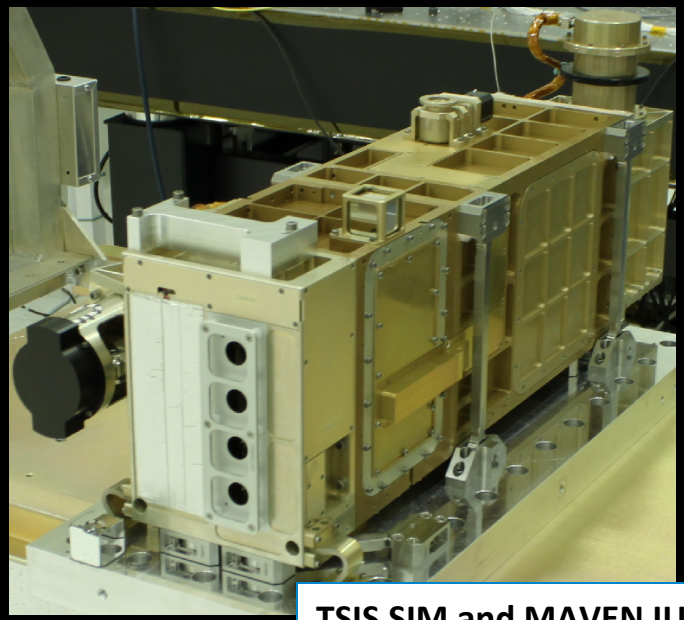


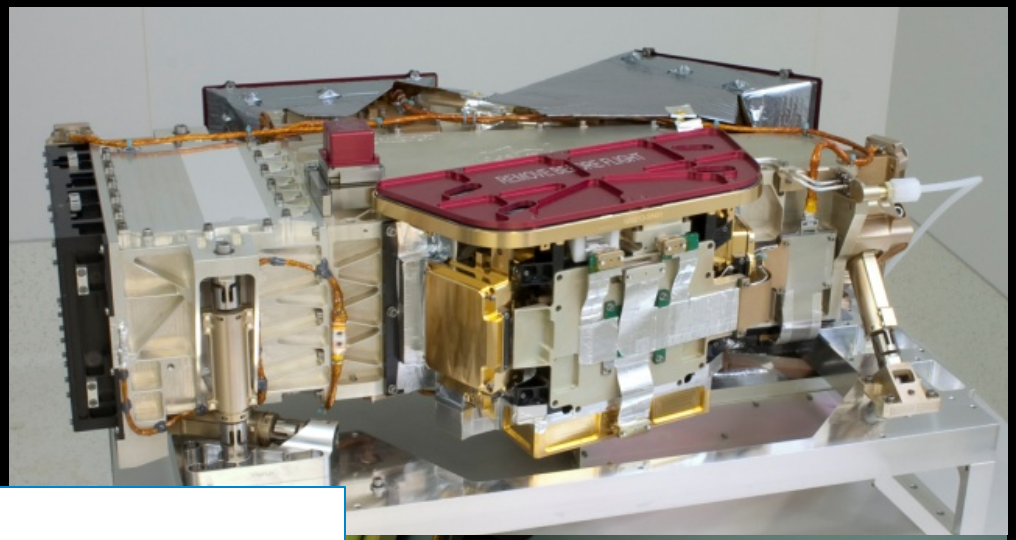
MAVEN-IUVS
CCD Detector



JPSS-TSIS Total Irradiance Monitor (TIM)
Internal Cavity

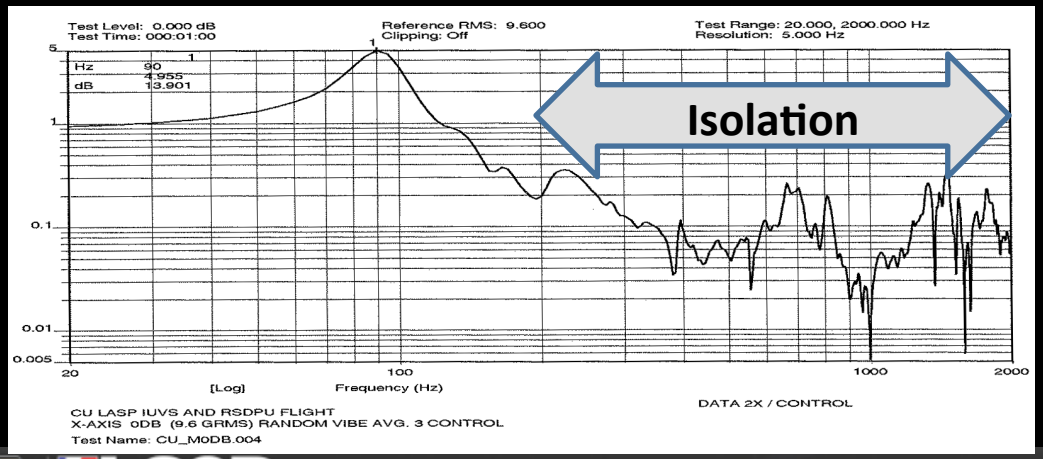
Vibration Damping Kinematic Mounts



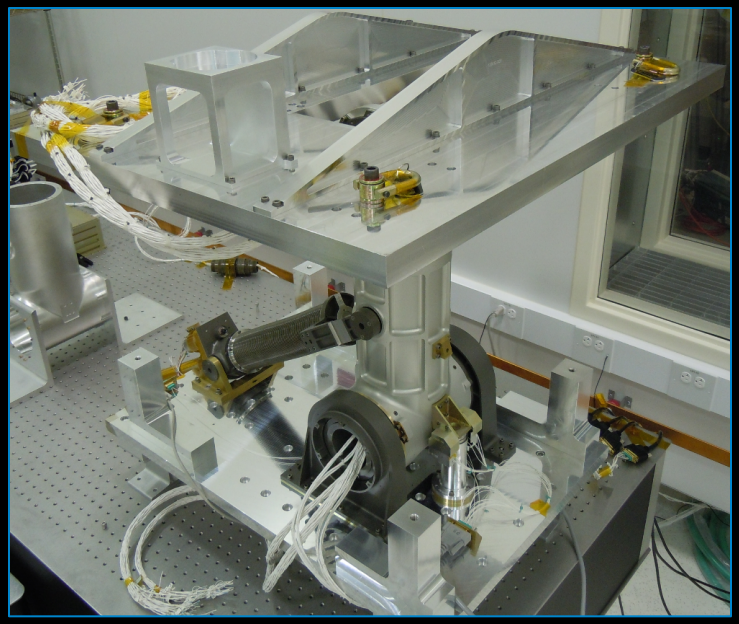


TSIS SIM and MAVEN IUVS
Vibration Damping Kinematic Mounts

Transmissibility Plot of Mars MAVEN
Visco-Elastic Damped Kinematic Mounts



Multiaxis Closed-Loop Pointing Systems

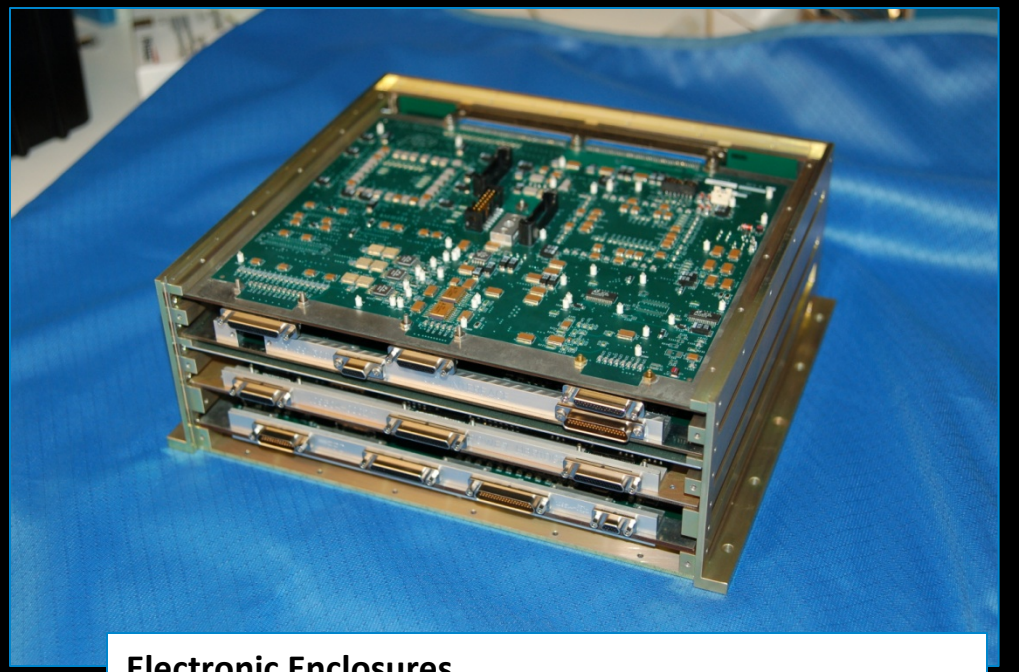


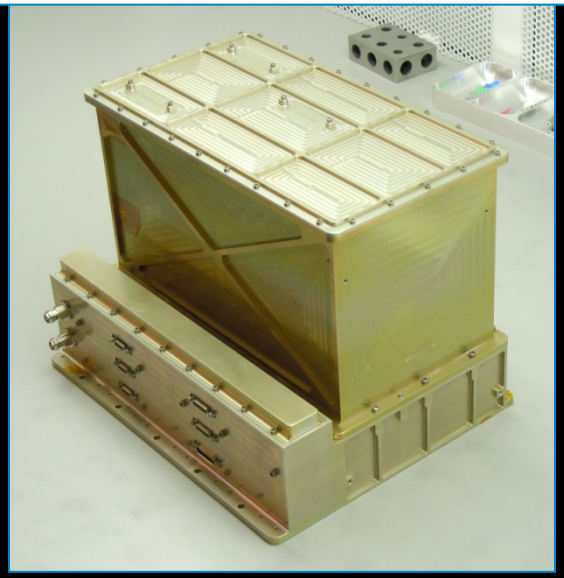
JPSS-TSIS Deployable 2-Axis Pointing Platform
2-Axis Gimbal Points Instrument Suite
75Kg deploy/re-stow capability over 75 degrees

GLORY-TIM
2-Axis Pointing System
Stepper Motor Biaxial Gimbal with twist capsules

Robust Spaceflight Electronics Packaging

Microprocessor Unit enclosures for four 6U Cards.





Electronic Enclosures

Decades of experience building enclosures for electrical boards.

Rapid Sub-orbital Payload Development

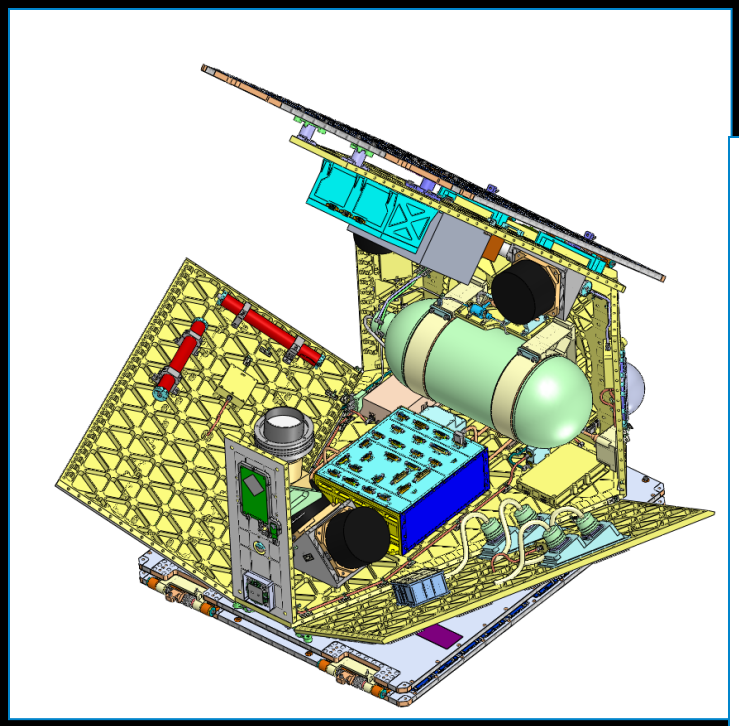
LASP

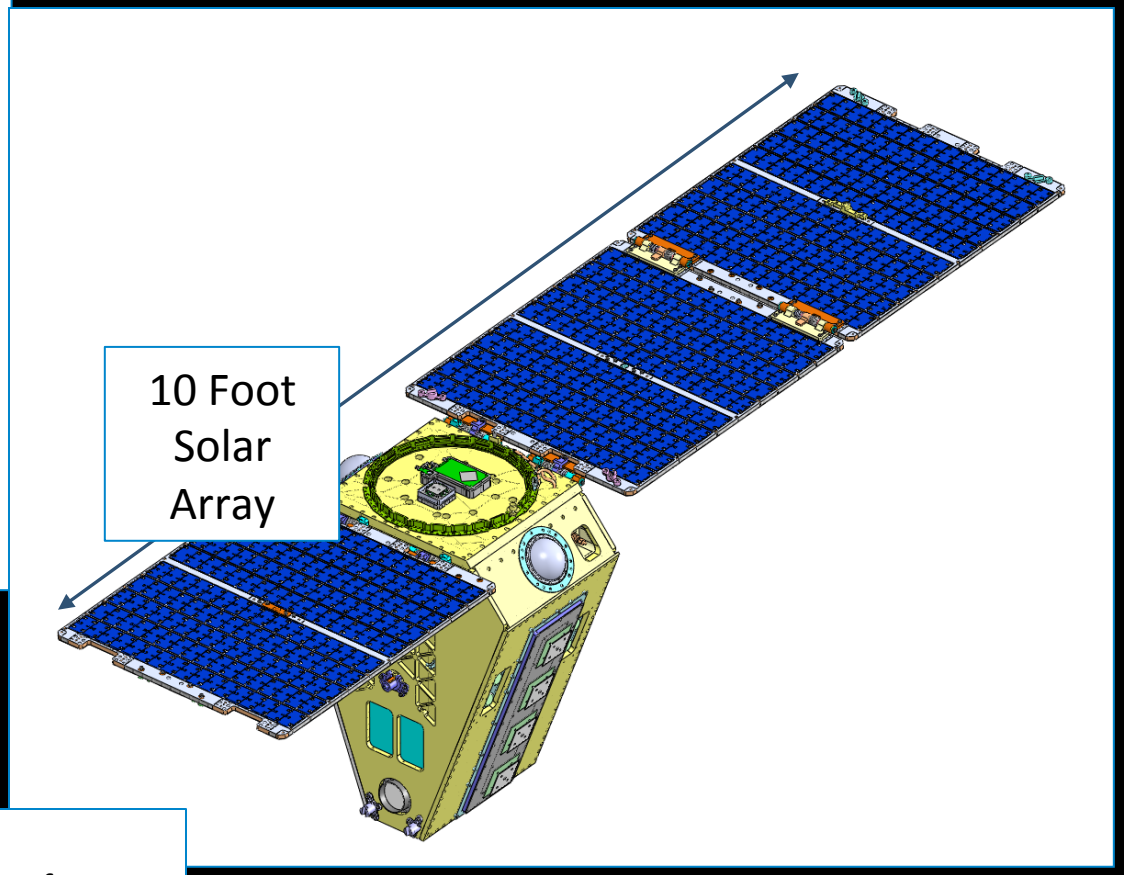
Light Collector for Spectrometer on NASA ER-2 Aircraft

HySICS

LASP Balloon Gondola with Wallops Arcsecond Pointing System (WASP) installed.

Cost Effective Spacecraft Development





CICERO

LASP Designed 3-Axis Stabilized Spacecraft
LEO Orbit
ESPA Ring Compatible

SNOE

LASP Designed Spin Stabilized Spacecraft
LEO Orbit
Pegasus Launched
6 Year Operational Life