

# Engineering Capabilities



Laboratory for Atmospheric and Space Physics  
University of Colorado Boulder



## Quick Facts

LASP has built 23 instruments for 22 operating missions: AIM, CSIM, CUTE, Emirates Mars Mission, GOES-16 & 17, GOLD, MAVEN, MMS, New Horizons, Parker Solar Probe, SDO, THEMIS/ARTEMIS, TIMED, TSIS-1 SIM & TIM, Voyager I & II

LASP is developing 25 instruments for 21 missions: NASA: AEPEX, CIRBE, CLARREO Pathfinder, CTIM, DALI/EDA, ESCAPE, Europa Clipper SUDA, EVC-1 Libera, IMAP IDEX, INSPIRESat-1 DAXSS, INSPIRESat-4 OWLS, LSITP, SPRITE, TSIS-2; NOAA: GOES-T & U EXIS; NSF: CANVAS, VISORS; ESA: Daedalus / EFI

LASP has experience on NASA, NOAA, and Air Force contracts, as well as commercial partnerships.

LASP has launched 200 sub-orbital rocket experiments.

- Complex DSP and SoC FPGA design
- Custom low and high voltage power conversion
- Open-loop and precision closed-loop control

## Flight Software

- Embedded systems to control flight instruments and spacecraft
- Ground systems such as S/C simulator software, telemetry analysis software, and FPGA diagnostics software
- Custom time slice architecture and VX Works RTOS
- NPR 7150.2 A compliant

## Mechanical and Thermal Engineering

- Optical and electromagnetic fields instrument design, analysis, and test
- One-time and extended life mechanisms and gimballed platforms
- Thermal control design and testing of detector, payload, and spacecraft systems
- Spacecraft structures, kinematic mounts and vibration isolation, electronics packaging

## In-House Production Operations

- Workmanship certified assembly and polymerics technicians
- CNC machining with CMM verification capabilities

## Calibration and Testing

- Optical design and detector development for X-ray to infrared wavelengths
- Full characterization capability with NIST-traceable calibration standards
- Vacuum and thermal environmental testing facilities

## Industry products and services

- **Test Facilities**—Thermal vacuum and bake-out tanks are available to external customers (see BEMCO and BOT pages)
- **Astrolabe Spacecraft Bus**—highly configurable to support your mission needs (see Astrolabe page). Contact [pete.withnell@lasp.colorado.edu](mailto:pete.withnell@lasp.colorado.edu)

## Full Lifecycle Program Management

- Science requirements definition to publication of data
- Hardware and software design, build, test, and delivery
- Financial and schedule management

## Systems Engineering

- Requirements development and verification
- Interface control
- System analyses
- Resource tracking and management

## Quality Assurance

- ISO 9001:2008 compliant
- Inspections for compliance to NASA and industry standards
- Safety, ESD, and contamination control

## EEE Parts Engineering and Procurement

- Ensuring EEE part mission assurance requirements are met for design, quality, radiation and traceability

## Electrical Engineering

- Low noise, high-precision detector interface electronics