EUV optics for *MANTIS - Monitoring Activity of Nearby sTars with uv Imaging and Spectroscopy -*

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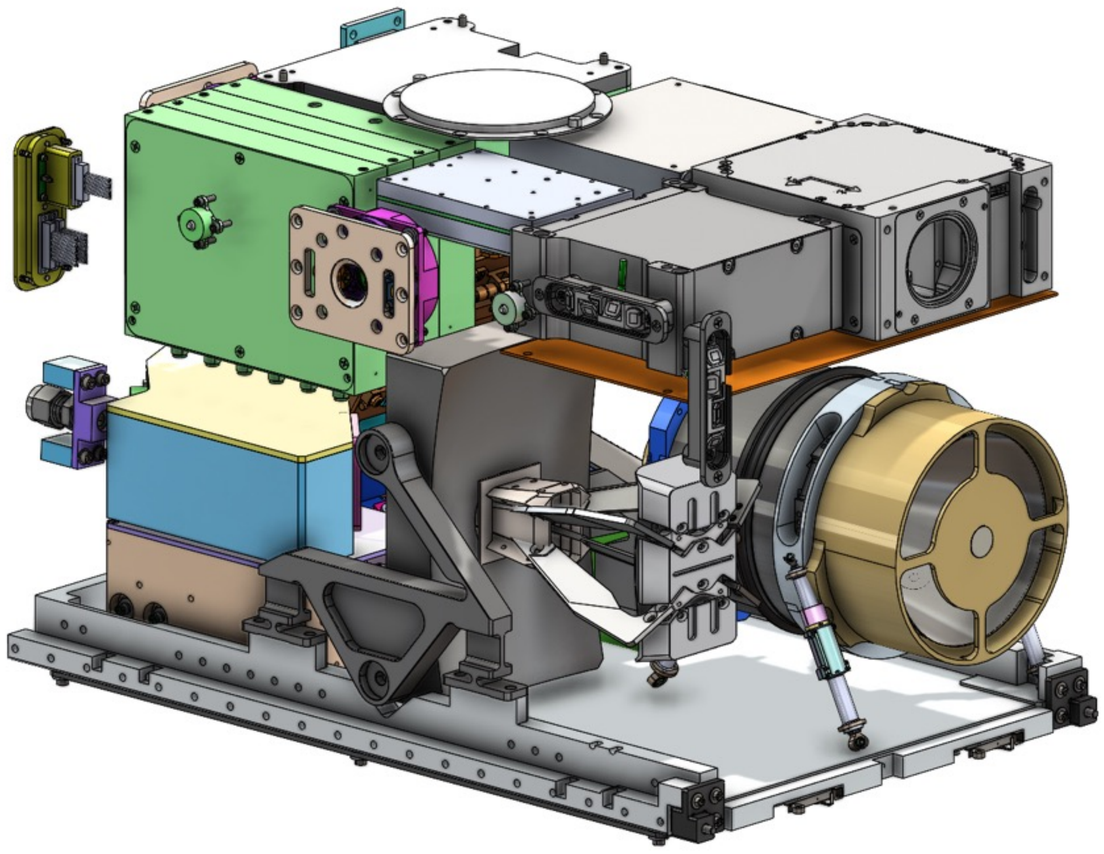
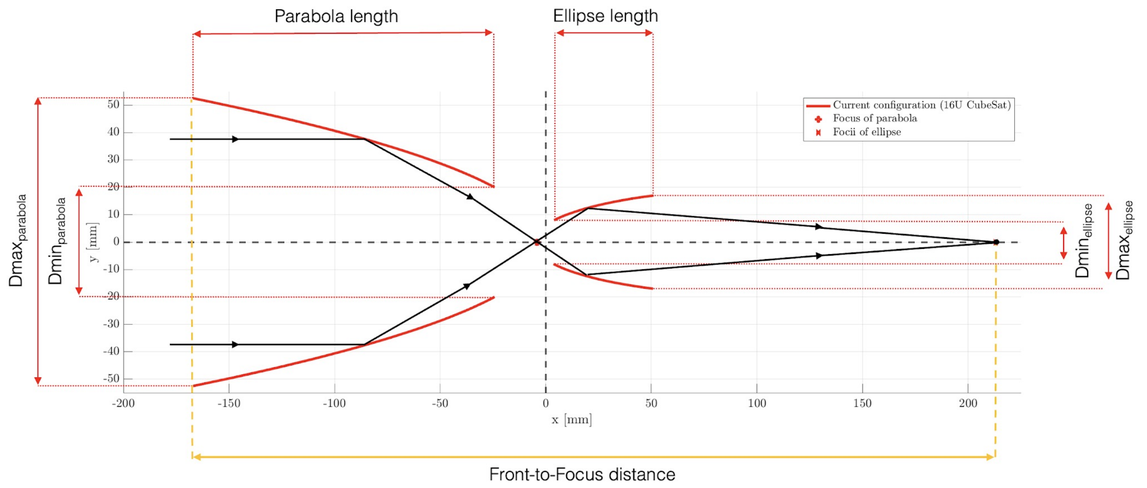
The Astro2020 Decadal Survey recommended the "Worlds and Suns in Context" as one of the key focus areas for astrophysics in the next two decades, highlighting the ***importance of a full-system approach to understanding star-planet systems****.*
Characterization and monitoring of the ultraviolet (UV) radiation from planet-hosting stars and their proxies was specifically called out as crucial for understanding habitable environments and interpreting spectra from the James Webb Space Telescope (JWST).

A four-year suborbital-class research program to build, launch, and operate MANTIS (Monitoring Activity of Nearby sTars with uv Imaging and Spectroscopy) was proposed by the ***Laboratory for Atmospheric and Space Physics (LASP) at the University of Colorado Boulder*** *at the to NASA Research announcement NNH22ZDA001N-APRA (D.3 Astrophysics Research and Analysis)*

MANTIS has been funded *as a 12U CubeSat mission (recently extended to* ***16U CubeSat****) that will characterize the high-energy stellar radiation that drives atmospheric photochemistry and escape on extrasolar planets by conducting* ***simultaneous observations of exoplanet host stars*** *at extreme-ultraviolet (100–900 Å; EUV), far-ultraviolet (900–2000 Å; FUV), near-ultraviolet (2000–3200 Å; NUV), and visible (3200–10000 Å; VIS) wavelengths.*

The MANTIS design comprises a two-telescope science payload that enables simultaneous observations over EUV, FUV, NUV, and VIS bandpasses. ***An 10.5 cm diameter grazing incidence telescope contributed by The Italian National Institute for Astrophysics (INAF)*** *feeds a low-resolution EUV spectrograph. A 14x9cm rectangular Cassegrain telescope feeds a dichroic beamsplitter to divide the light into both an NUV/VIS and FUV channel. The FUV channel is folded onto the same photon-counting microchannel plate detector as the EUV channel, with a QE optimized for these higher-energy bands. The NUV/VIS channel is split by a low-resolution grating with both imaged on an NUV optimized CCD. The MANTIS design, detector systems, spacecraft bus and mission operations build off of the heritage of the CUTE and SPRITE CubeSats developed by the MANTIS team at CU-LASP.*





Milestone	Date	Notes
Initial Kickoff	December 2023	Completed
Redesign for 16U	Jan-May 2024	Completed
Final Prescription to INAF	May 2024	Completed
INAF preliminary design	May – November 2024	On-going
Telescope design review	November 2024	TBC
Optics and assembly fabrication	December 2024 – November 2025	TBC
Optical Testing	December 2025	TBC
Vibration Testing	January 2025	TBC
Demonstration	February 2025	TBC
Deliver to LASP	Spring 2026	TBC