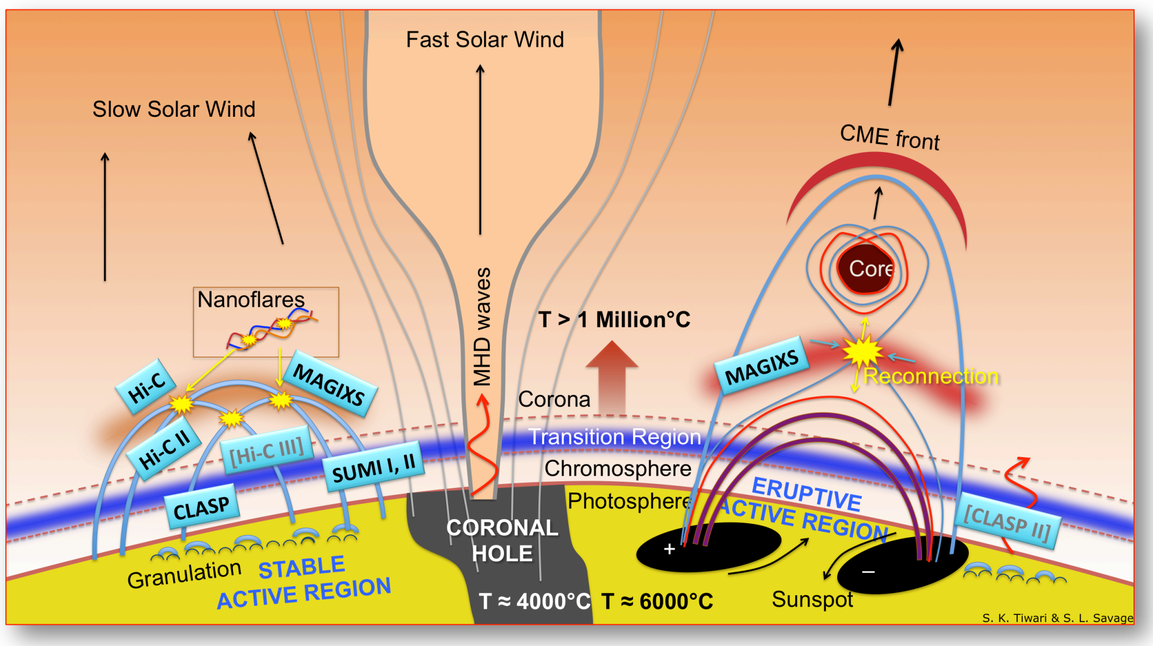
Heliophysics Sounding Rocket Program

NASA Marshall Space Flight Center ❖ Smithsonian Astrophysical Observatory

Program: NASA/MSFC and SAO, along with vital support from international and domestic partners, have advanced the field of Heliophysics through five sounding rocket technology demonstrations, beginning with the inaugural flight of the SUMI instrument in 2010. The instrument detection capabilities span the high energy wavelength spectrum from Ultraviolet to Soft X-Rays through a broad use of technological designs, including spectropolarimetry, spectroscopy, and high-resolution imaging.

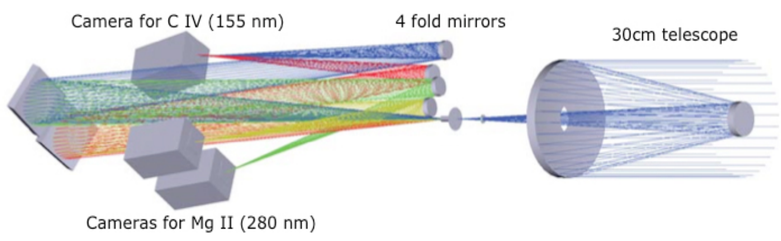


The scientific objectives of the rocket programs are based on furthering our understanding of the physical origins of space weather. The instruments are designed to observe active region heating and dynamic sources of small-scale energy release occurring throughout the solar atmosphere.

All of the missions are awarded and funded through NASA's Low Cost Access to Space program and launch out of the White Sands Missile Range in New Mexico.

SUMI: Solar Ultraviolet Magnetograph

I: 2010 July 30
II: 2012 July 5

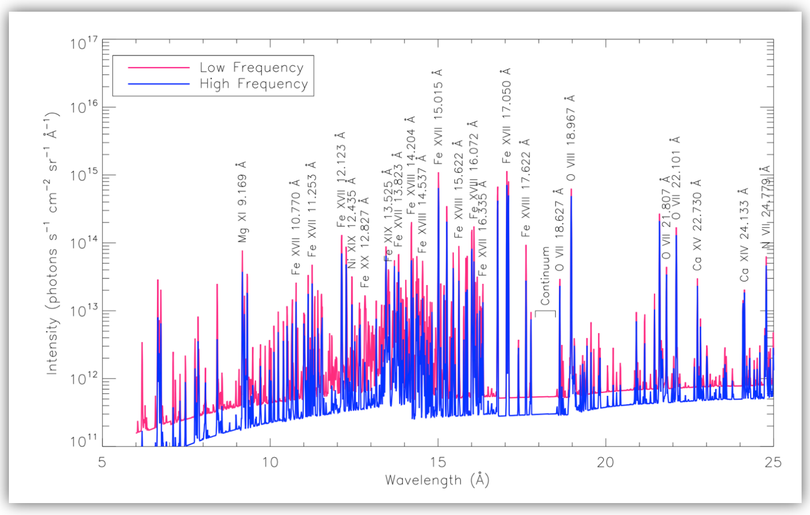


Primary Objective: Exploratory missions for obtaining polarization measurements in the ultraviolet in order to observe the magnetic field in the transition region.

Results: Feasibility of polarization capabilities confirmed with preliminary analysis of Stokes parameters. Led to advanced design for the CLASP instrument.

MaGIXS: Marshall Grazing Incidence X-ray Spectrometer

Scheduled for Summer of 2018 or 2019

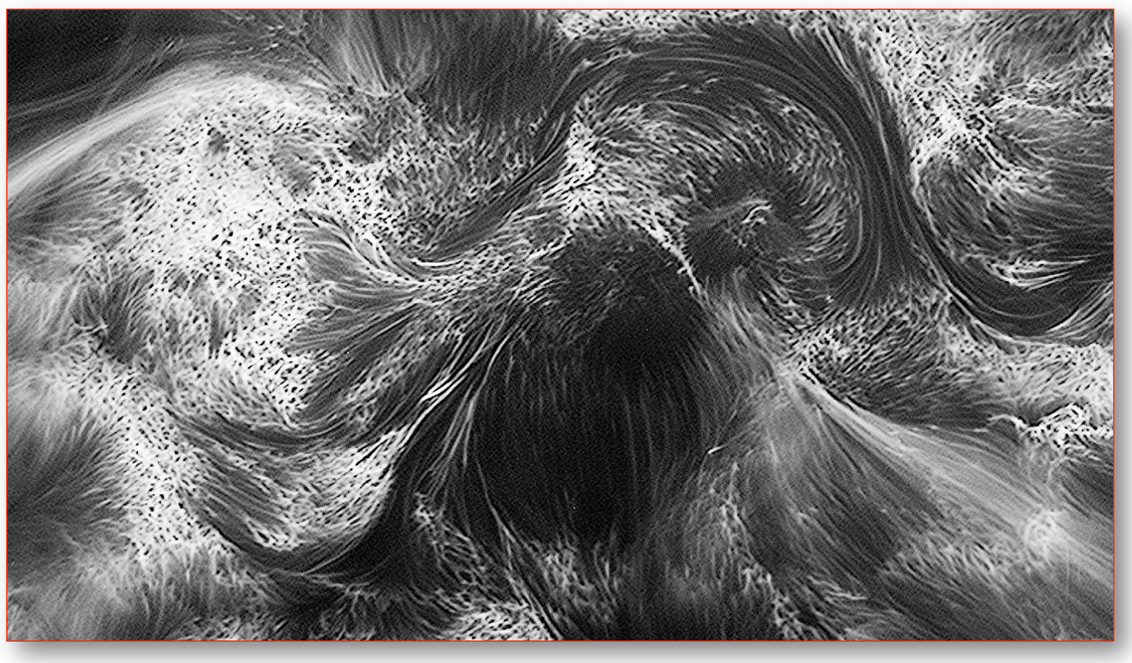


Primary Objective: Distinguish between high- and low-frequency sources of coronal loop footpoint heating, using a novel design for soft X-ray spectroscopy, in order to characterize the mechanism for heat transfer into the corona.

Results: Stay tuned!

Hi-C: High-resolution Coronal Imager

I: 2012 July 11, II: 2016 July 19, III: Proposed

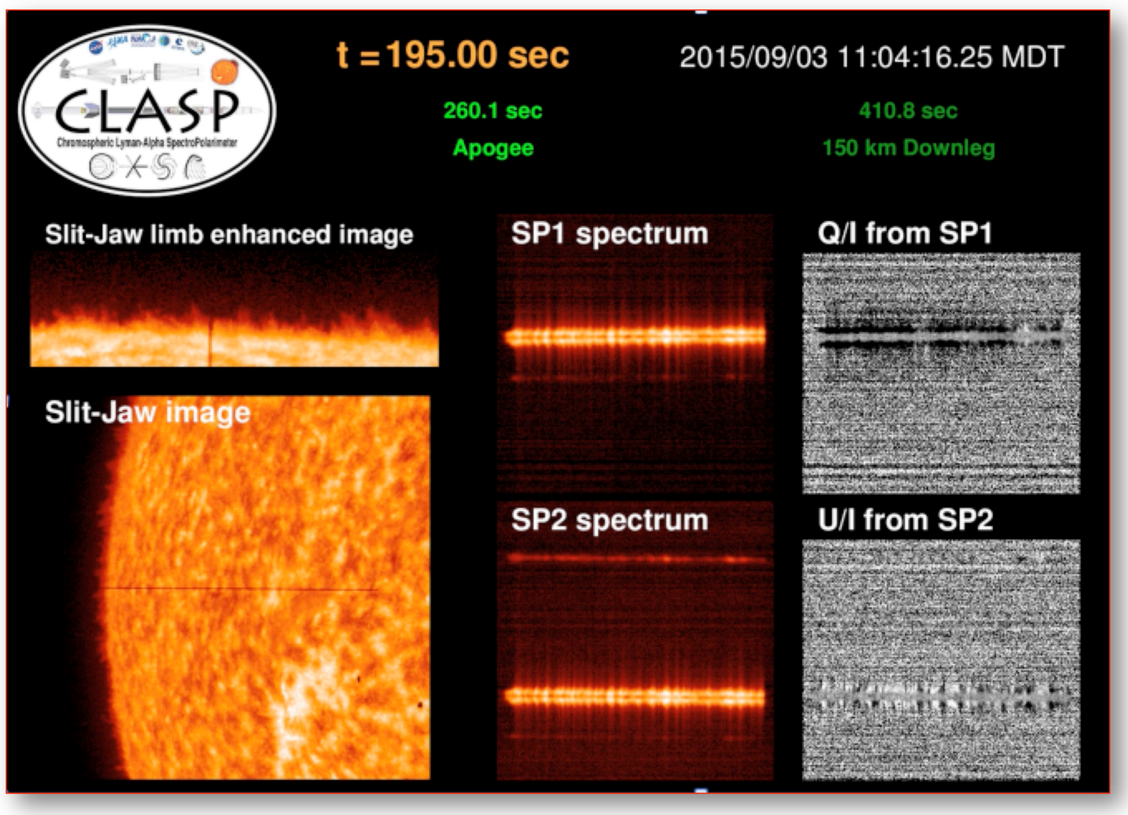


Primary Objective: Obtain the highest resolution images of the corona to date.

Results: Over 20 publications (and counting) spanning discovery space from reconnection via magnetic braiding to waves to dynamic moss to nanoflares. For more information, explore http://hic.msfc.nasa.gov.

CLASP: Chromospheric Lyman-Alpha SpectroPolarimeter

I: 2015 September 3, II: Proposed



Primary Objective: Infer the chromospheric thermal structure and magnetic field through polarization measurements.

Results: Advanced calibration techniques and theoretical modeling necessary for this cutting-edge research. First ever magnetic field measurements, using the Hanle effect, in the upper chromosphere and transition region.