The Coronal Physics Investigator (CPI) Experiment for the International Space Station

John L. Kohl
Smithsonian Astrophysical Observatory
CPI is a next generation Ultraviolet Coronagraph Spectrometer with 100 times the sensitivity of UVCS/SOHO and a much broader wavelength range (25.7 – 126 nm)

- **1979–1995:** Rocket flights and Shuttle-deployed Spartan 201 laid groundwork.

- **1996–present:** The Ultraviolet Coronagraph Spectrometer (UVCS) measured plasma properties of coronal protons, ions, and electrons between 1.5 and 10 solar radii.

- In polar coronal holes, UVCS discovered strong preferential heating of O$^{5+}$ and Mg$^{9+}$ and pronounced kinetic anisotropies with $T_{\text{perp}} \gg T_{\text{par}}$. The outflow velocity of O$^{5+}$ was found to be greater than that of the protons.

- These results rekindled theoretical efforts to understand the heating of the extended corona by ion cyclotron resonance.
CPI Primary Scientific Goal

- Determine the physical processes that heat and accelerate both the major (proton, electron, helium) and minor (heavy ion) plasma components of the fast and slow solar wind.
- CPI will observe many ions never before observed in coronal holes above 1.4 solar radii.
CPI Team

Science
John Kohl: Principal Investigator, SAO
Steve Cranmer: Mission Scientist for Solar Wind Objectives, SAO
John Raymond: Mission Scientist for CME Objectives, SAO
Dan Reisenfeld: Project Scientist, UM
Paul Janzen: Instrument Scientist, UM
Aad van Ballegooijen: Co-I, SAO
Ben Chandran: Co-I, UNH
Terry Forbes: Co-I, UNH
Phil Isenberg: Co-I, UNH

Management and Engineering
Tim Norton: Project Manager, Harvard Smithsonian CfA
Paul Cucchiaro: Payload Manager, L-3 Com IOS
Brian Rider: Payload Systems Engineer, L-3 Com IOS
Alexander Panasyuk: Software and Science Operations Manager, SAO