

# A Multi-point Measurement Opportunity for STEREO: Solar Energetic Particles Observed in HEO

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# High Linear-Energy Transfer Instrument

## •Science:

- Solar energetic particle composition
- Trapped heavy ions from anomalous cosmic rays and SEPs
- Heavy ions responsible for single-event effects in microelectronics
- Trapped protons and electrons in the slot and outer edge of the inner radiation belt

## •New technology

- Caltech PHASIC 16-channel amplifier chips (x3)
- Micron Semiconductor Ltd. solid-state detectors (20, 50, & 1000 micron)

## •Protons and electrons detected separately with a dedicated dE/dX versus E telescope

•Mass: 1.3 kg

•Power: 2.3 w

•Telemetry: 3.2 kbps

•High electronic thresholds on heavy-ion sensor to measure C-Fe

•Separate proton/alpha/electron telescope with smaller geometry factor

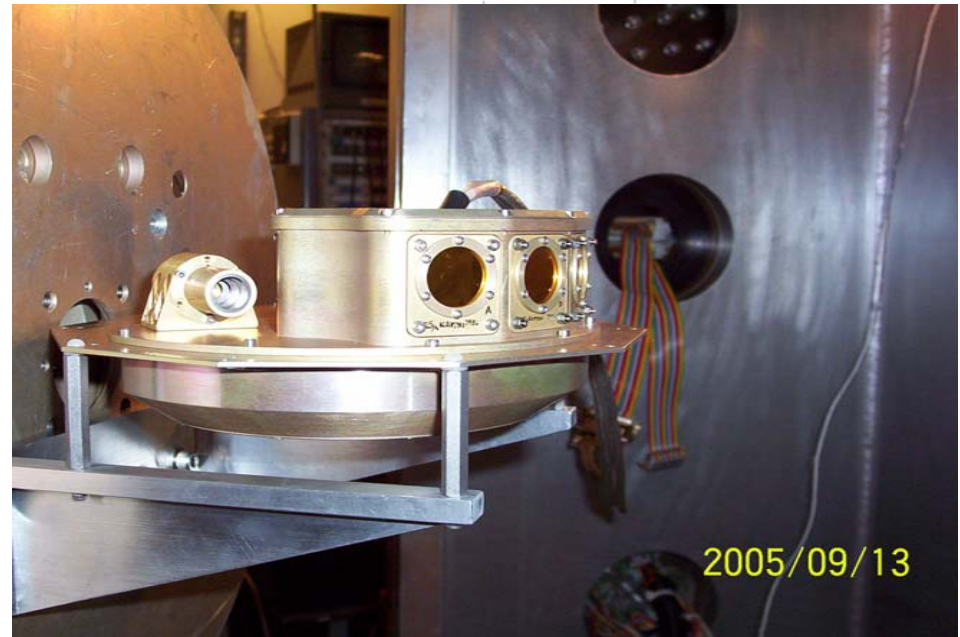
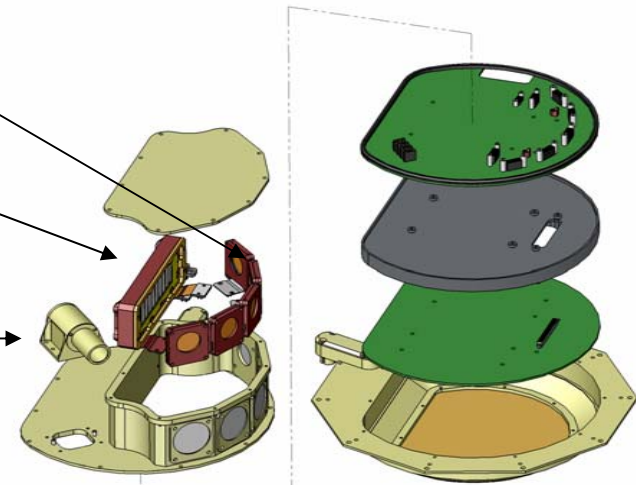
L1 (~25 $\mu$ ) x5

L2 (50 $\mu$ )

L3A&B (1000 $\mu$  ea.)

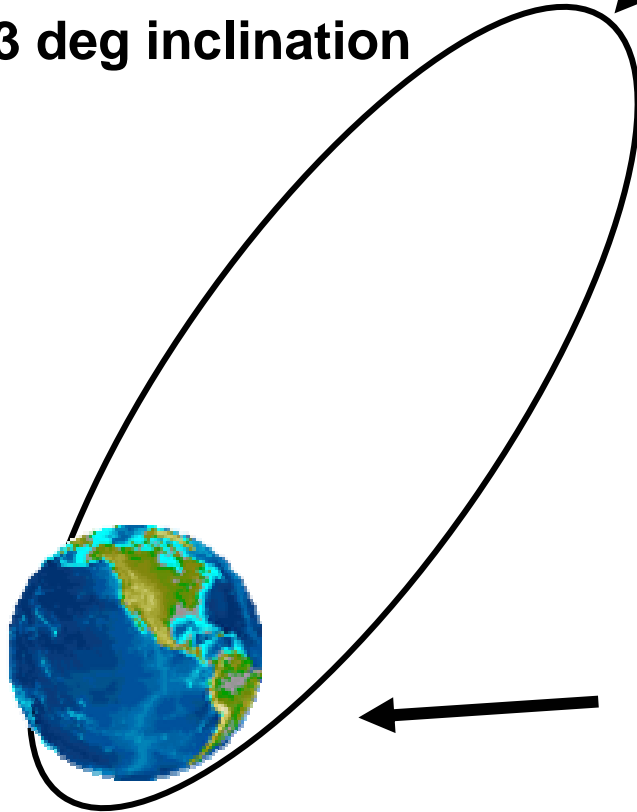
D1&2 (300 $\mu$  ea.)

D3&D4 (1000 $\mu$  ea.)

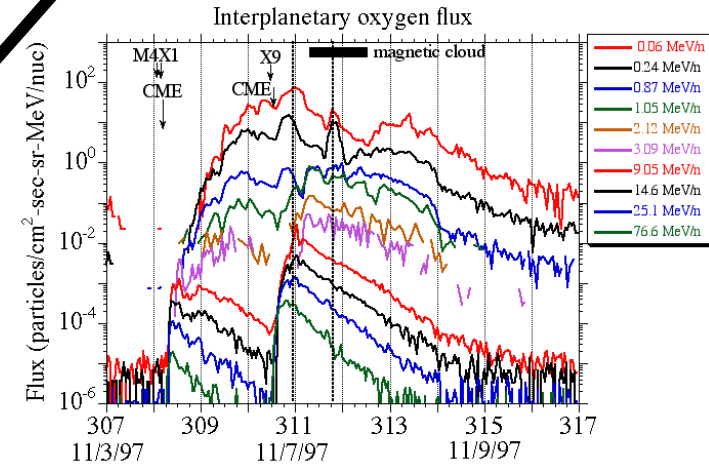


# HEO Orbit

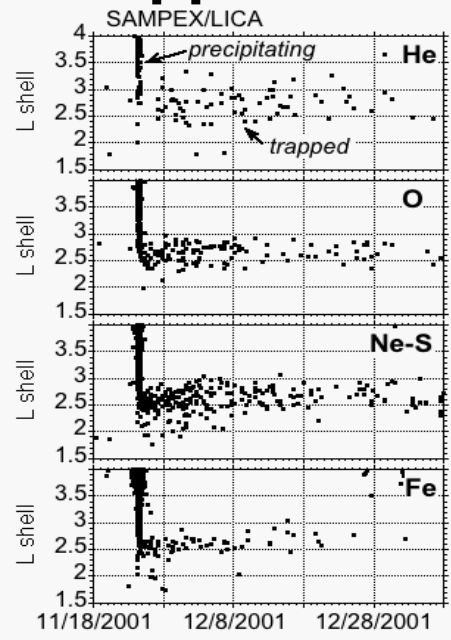
Apogee  $7R_E$   
Perigee 1000 km  
Period ~12 hours  
63 deg inclination



# Interplanetary ions



# Trapped ions



**Launch late 2006**  
**10 year nominal mission**  
**Data processed at Aerospace**

# DOS/SCM/HILET

## 88-inch Cyclotron BASE Facility

### 12-13 September 2005

