Solar Dynamics Observatory (SDO)

First Space Weather Research Network Mission in the Living With A Star (LWS) Program

Mission Specs:

- April 2008 launch: GTO to GEO
- Inclined Geosynchronous Orbit (semiannual eclipse seasons)
- 3-axis stabilized spacecraft
- Data transmission: continuous high rate data stream ~150 Mbps compressed data at Ka-Band
- Single ground station
- Mission development and management at GSFC

Key Spacecraft Technologies

- Ethernet Chipset
- Ka-Band Transmitter
- Active Pixel Star Tracker

Mission Science Objectives

The primary goal of the SDO mission is to understand, driving towards a predictive capability, the solar variations that influence life on Earth and humanity's technological systems by determining

- *How the Sun's magnetic field is generated and structured*
- *How this stored magnetic energy is converted and released into the heliosphere and geospace in the form of solar wind, energetic particles, and variations in the solar irradiance.*

Science Investigations

- **Helioseismic and Magnetic Imager (HMI)**
  PI Institution: Stanford University
  - Images the Sun's helioseismic, longitudinal and vector magnetic fields to understand the Sun's interior and magnetic activity

- **EUV Variability Experiment (EVE)**
  PI Institution: University of Colorado
  - Measures the solar extreme ultraviolet (EUV) spectral irradiance to understand variations on the timescales which influence Earth's climate and near-Earth space

- **Atmospheric Imaging Assembly (AIA)**
  PI Institution: Lockheed Martin Missiles & Space Advanced Technology Center
  - Images the solar atmosphere in multiple wavelengths to link changes to surface & interior changes

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