

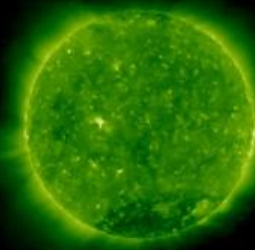
# Goddard Heliophysics and Space Weather

Holly Gilbert and Antti Pulkkinen

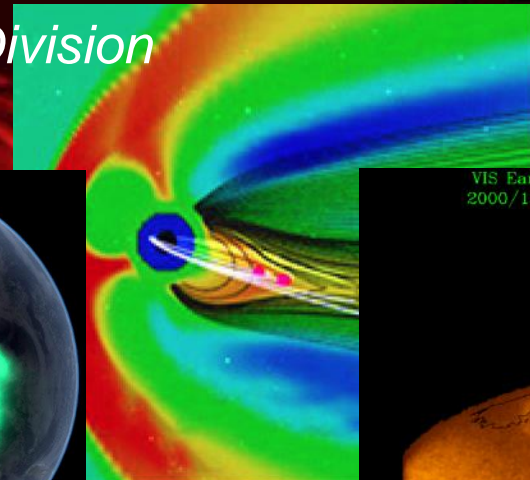
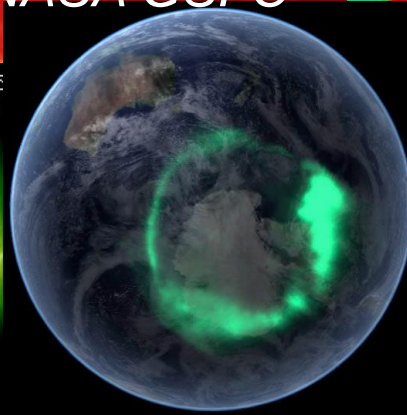
*Heliophysics Science Division*

*NASA GSFC*

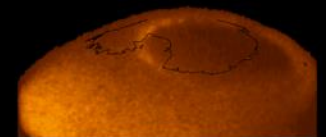
STEREO Behind EUVI 195



2008-03-17 19:55:50



VIS Earth Camera  
2000/131 21:47 UT

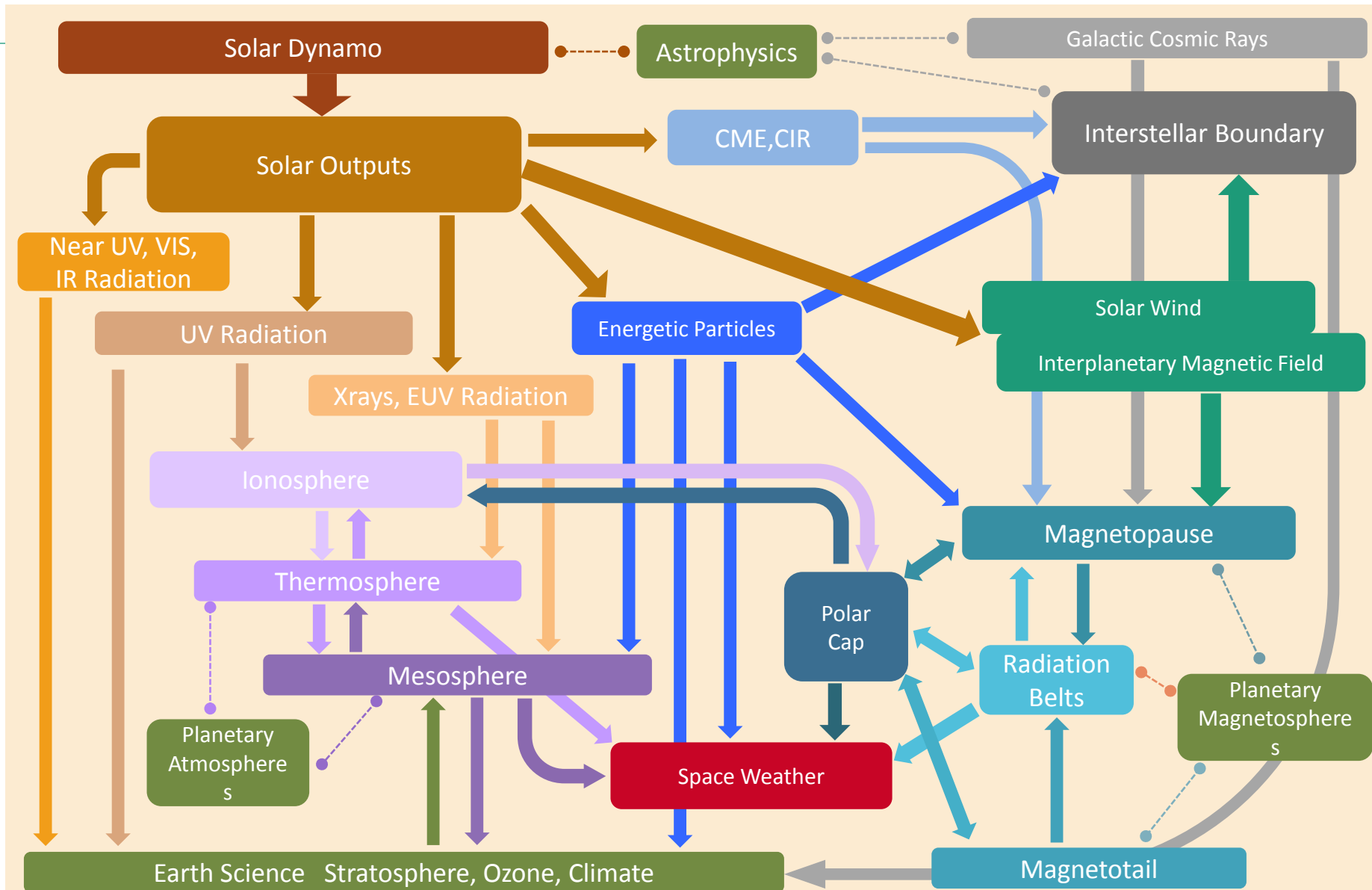


Visible Imaging System/POLAR  
The University of Iowa





# The Heliophysics System (from Peg Luce, NASA HQ)







# Goddard's Heliophysics Science Division

---



- Instrument development
- Mission development
- Mission Project Scientists
- Modelers
- CCMC
- Data Centers
- Data analysts
- Large EPO team





# Organizational structure

Solar Physics Lab

Chief: Dr. Nick Arge

Heliospheric Physics Lab

Chief: Dr. Adam Szabo

Space Weather Lab

Chief: Dr. Judy Karpen

Geospace Physics Lab

Chief: Dr. Eftyhia Zesta

Ionospheric Thermospheric  
Mesospheric Physics Lab

NEW

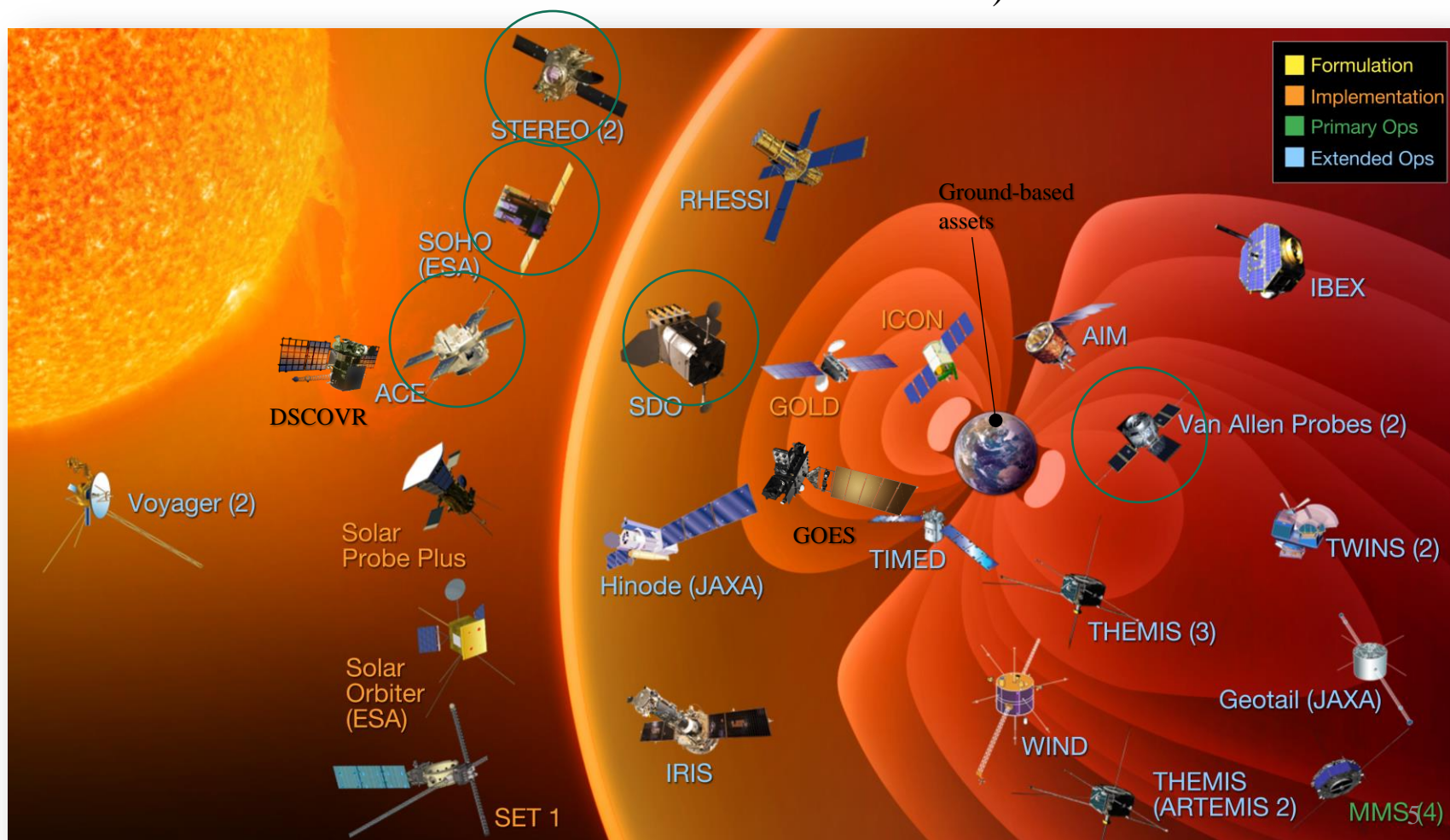


# Heliophysics missions



Real-time  
(NASA – ESA)

Operational (NOAA –  
Air Force)





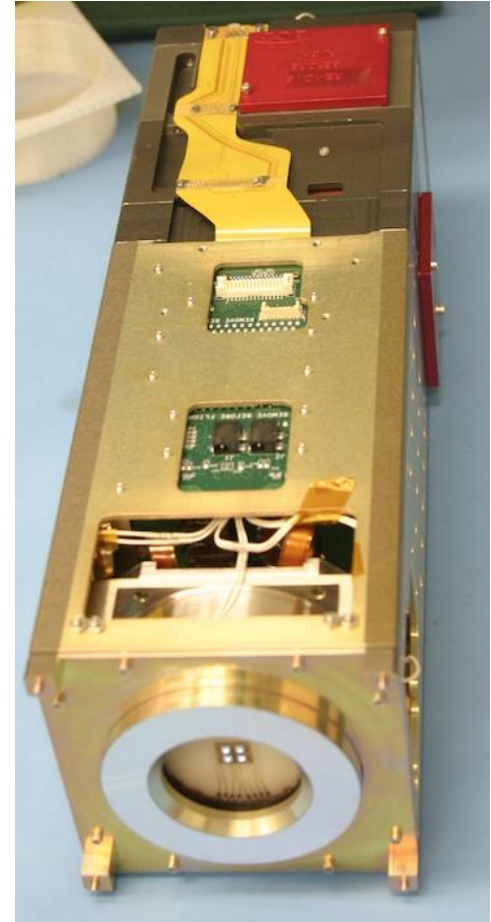
# Cubesats- CeREs

First fully NASA SMD funded CubeSat currently scheduled to launch in May 2018

**\*\*Radiation belt energization and loss electron spectra and microbursts**

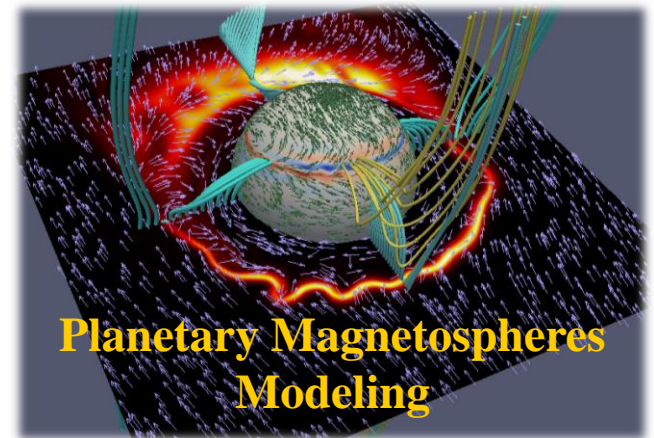
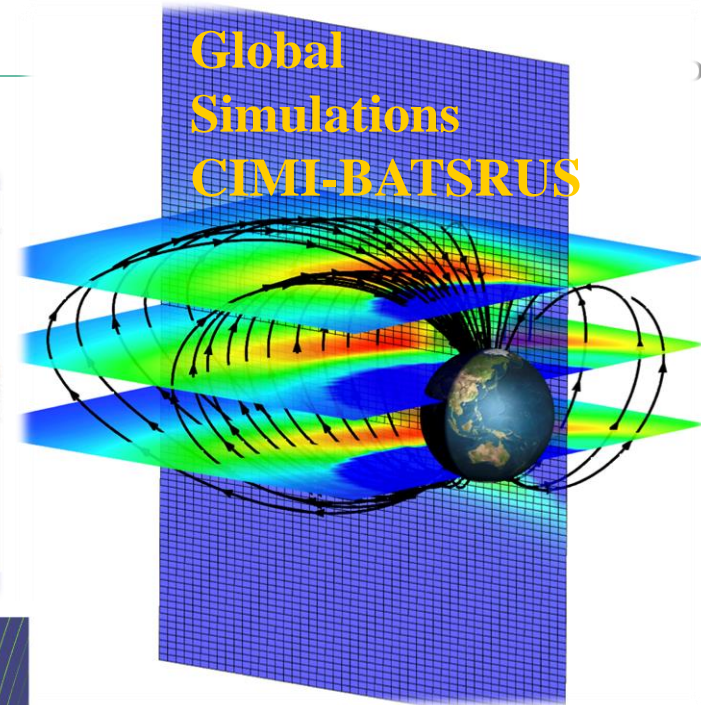
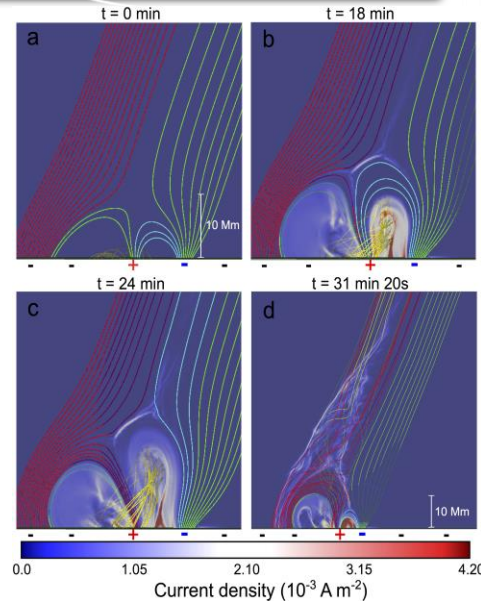
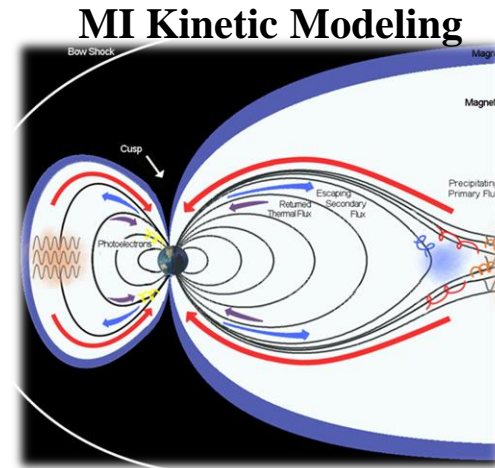
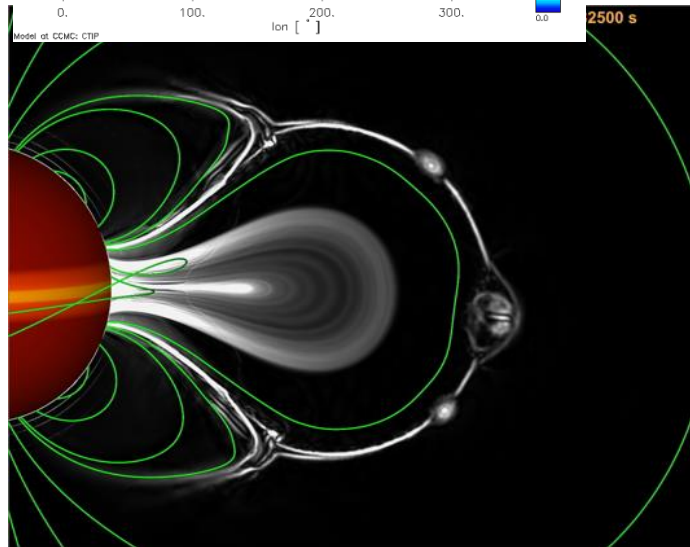
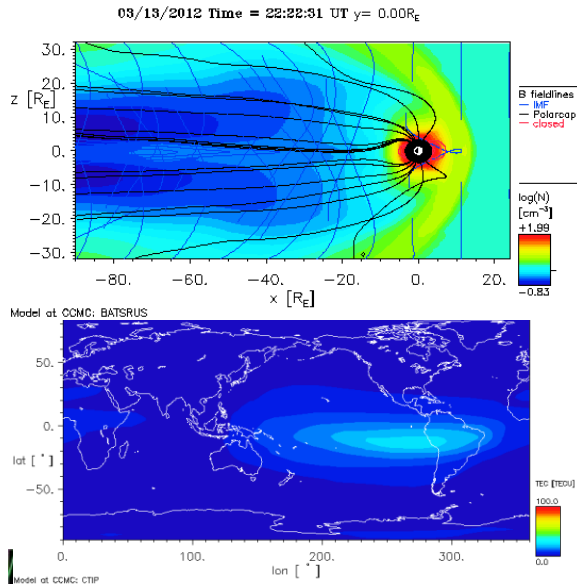
Carries onboard an innovative instrument, **MERiT (Miniaturized Electron pRoton Telescope)**, which measures electrons with high time resolution of a few ms over a wide energy range from few keV to few MeV

- Will characterize electron microbursts with unprecedented spectral and temporal resolution
- Will study solar electrons and protons





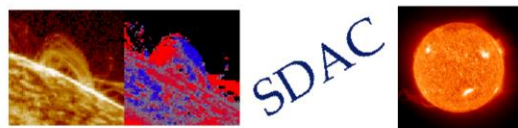
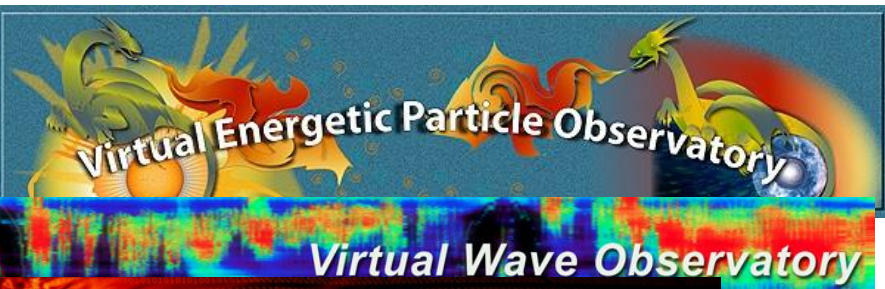
# Modeling





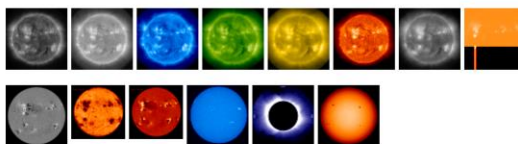


# Data and modeling centers



Welcome to the Solar Data Analysis Center at [NASA Goddard Space Flight Center](#) in Greenbelt, Maryland

## Current Solar Images



Click for [the latest ground- and space-based solar images in the SDAC archives.](#)

**GODDARD SPACE FLIGHT CENTER**  
Space Physics Data Facility

[Goddard Home](#) [Visit NASA.gov](#)

### Space Physics Data Facility

[ABOUT](#) [DATA & ORBITS](#) [ModelWeb at CCMC](#) [SCIENCE ENABLED](#) [AND MORE](#)

**Access Data & Orbit Services**

- + VSP0 - Virtual Space Physics Observatory
- + Gateway to Services
- + CDAWeb Plus
- + CDAWeb
- + CDAWeb via OPeNDAP
- + OMNIWeb Plus
- + COMOWeb
- + ATMOWeb
- + FTP Browser
- + Anonymous FTP
- + SSCWeb
- + 4D Orbit Viewer
- + GIFWalk data and orbit plots
- + HelioWeb

**Access Models**

- + Community Coordinated Modeling Ctr. (CCMC)
- + HelioWeb at CCMC
- + HelioWeb at CCMC
- + HelioWeb at CCMC
- + HelioWeb at CCMC

**Special Services**

- + CDF/netCDF/FITS/ HDF/XML/ASCII Format Translations

**SPDF Web Service APIs**

- + CDAWeb
- + SSCWeb
- + Data Format Translations

**Software**

- + CDF (Common Data Format)
- + Space Physics use of CDF
- + CDF SKTEditor
- + CDAWeb/CDLFX (IDL)
- + VISBARD (visualization)
- + Sonification and XSonify

**Additional Databases**

- + Magnetospheric State Database
- + Multi-satellite Bow Shock Database
- + Multi-satellite Magnetopause Crossing Database

**Links**

- + SPDF Feedback
- + Heliospheric Physics Laboratory (672)
- + HelioPhysics Science Division (670)
- + NSSDC - National Space Science Data Center

**News & Announcements**

September 28, 2011: The SSCWeb systems and associated Web Services have been ported to a new and faster server. As always, please contact us if you experience any problems.

**New Missions Supported in CDAWeb and SSCWeb**

Data from all THEMIS instruments and the SWAVES experiments on STEREO A/B are now available via CDAWeb. THEMIS orbit data (including long range predictions) are now supported in SSCWeb. STEREO orbits are supported in both SSCWeb and HelioWeb.

**Trapped Radiation Data from NOAA MEPED Now Available**

Electron and proton measurements are now available on CDAWeb from the Medium Energy Proton and Electron Detectors (MEPEDs) on NOAA 5, 6, 7, 8, 10, 12, and 14 at one minute resolution. Data include count rates, pitch angles, perpendicular-to-magnetic field fluxes, omnidirectional fluxes and drift shell parameters for four pre-selected magnetic field models.

**Important Patches for IDL 6.1 and above users of CDF issued**

Please see the CDF page for details and installation instructions.

**TIMED Data in CDAWeb**

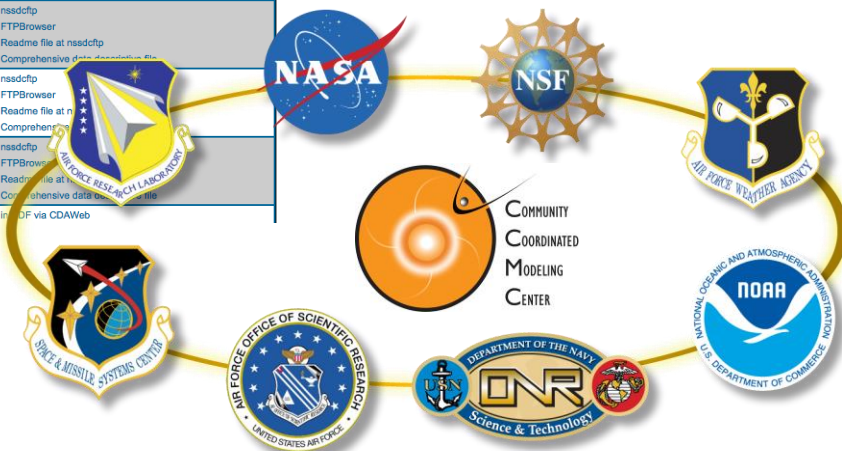
CDAWeb now supports GUVI Level-1C DISK (Airglow Fluxes) and EDP (Electron Density Profiles) data, SABER

**Products & SPASE descriptions**

#	Products & SPASE descriptions	Access Links
1	ISSE 1 LEPEDEA Ion and Electograms Spectrograms	<ul style="list-style-type: none"><li>- GIFs from U Iowa</li><li>- LEPEDEA Web site</li></ul>
2	IMP 8 CRNC hourly count rates of heavy nuclei	<ul style="list-style-type: none"><li>- nsdcdtp</li><li>- FTPBrowser</li><li>- Readme file at nsdcdtp</li><li>- Comprehensive data descriptive file</li></ul>
3	IMP 8 CRNC hourly energetic alpha particle fluxes	<ul style="list-style-type: none"><li>- nsdcdtp</li><li>- FTPBrowser</li><li>- Readme file at nsdcdtp</li><li>- Comprehensive data descriptive file</li></ul>
4	IMP 8 CRNC hourly energetic electron fluxes	<ul style="list-style-type: none"><li>- nsdcdtp</li><li>- FTPBrowser</li><li>- Readme file at nsdcdtp</li><li>- Comprehensive data descriptive file</li></ul>
5	IMP 8 CRNC hourly energetic proton fluxes	<ul style="list-style-type: none"><li>- nsdcdtp</li><li>- FTPBrowser</li><li>- Readme file at nsdcdtp</li><li>- Comprehensive data descriptive file</li></ul>

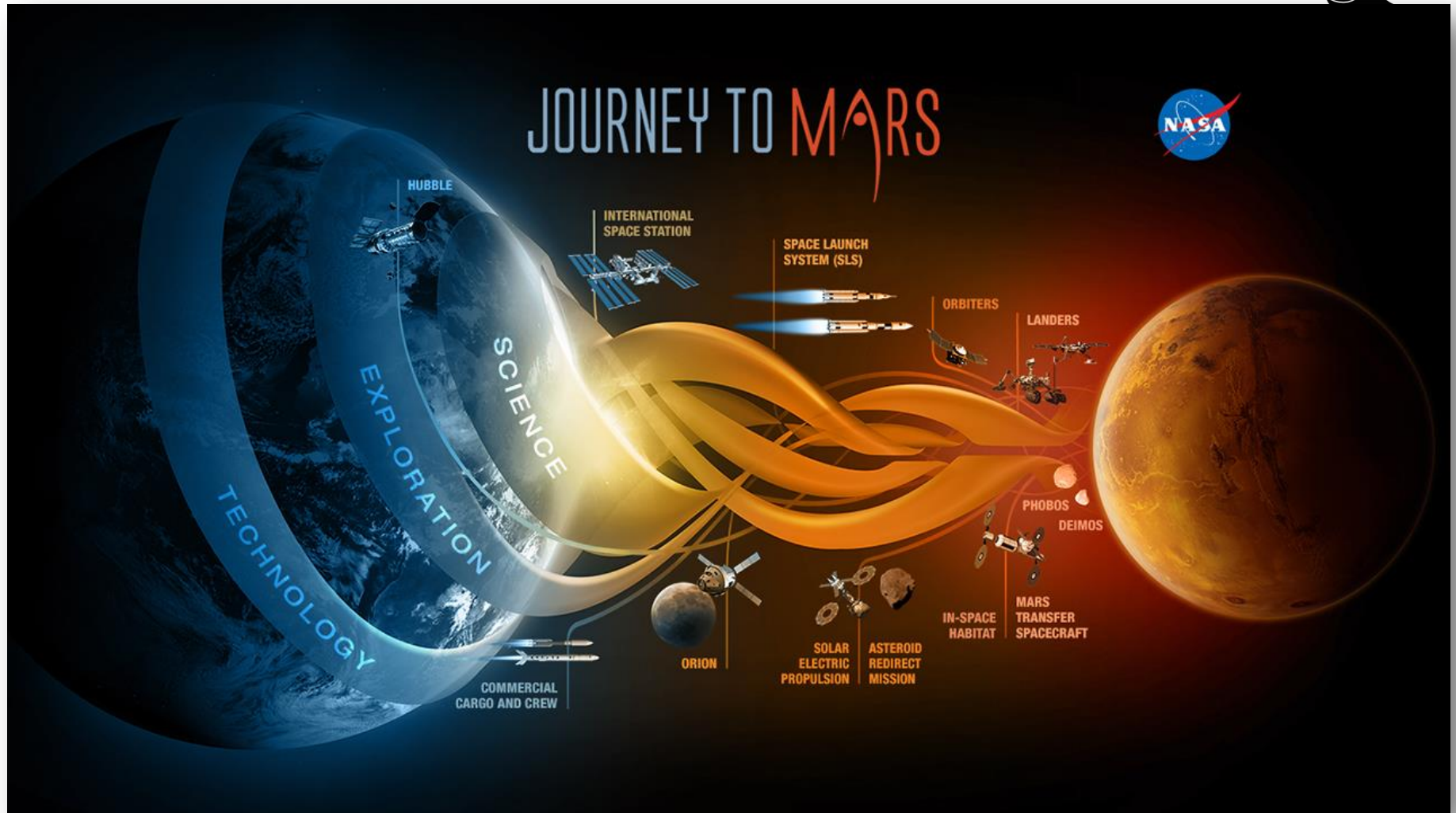
**Element Restriction**

Resource type (i) Measurement type (i) Observatory Group (i) Observatory (i) Instrument (i) Observed region (i) Spectral range (i) Cadence (i) Repository Name (i) Access rights (i) Format (i)



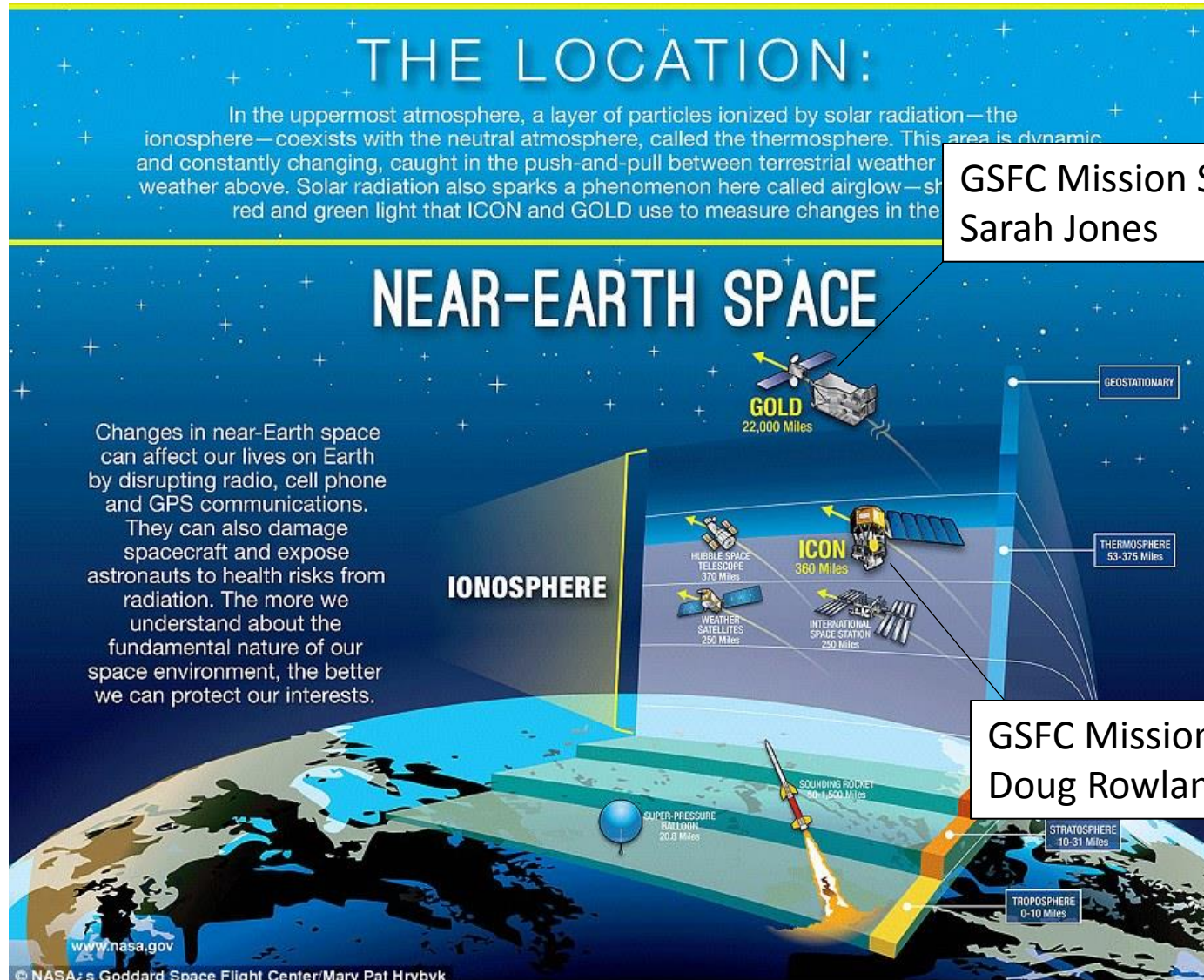


# Deep Space





# Back to Earth: ICON and GOLD



GSFC Mission Scientist:  
Sarah Jones

GSFC Mission Scientist:  
Doug Rowland





# Closing thoughts

---

- Space weather has grown in importance over the past several years, and we expect the trend to continue
- **Addressing the challenge requires not only Agency-level coordination but also close collaboration between government, academic and commercial entities**
- NASA GSFC Heliophysics Science Division looks forward to continue contributing to these collaborations!