

NASA GSFC Heliophysics Science Division view of space weather

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²Division Director

Heliophysics Science Division



Solve the Fundamental Mysteries of Heliophysics

Explore the physical processes in the space environment from the Sun to the Earth and throughout the solar system



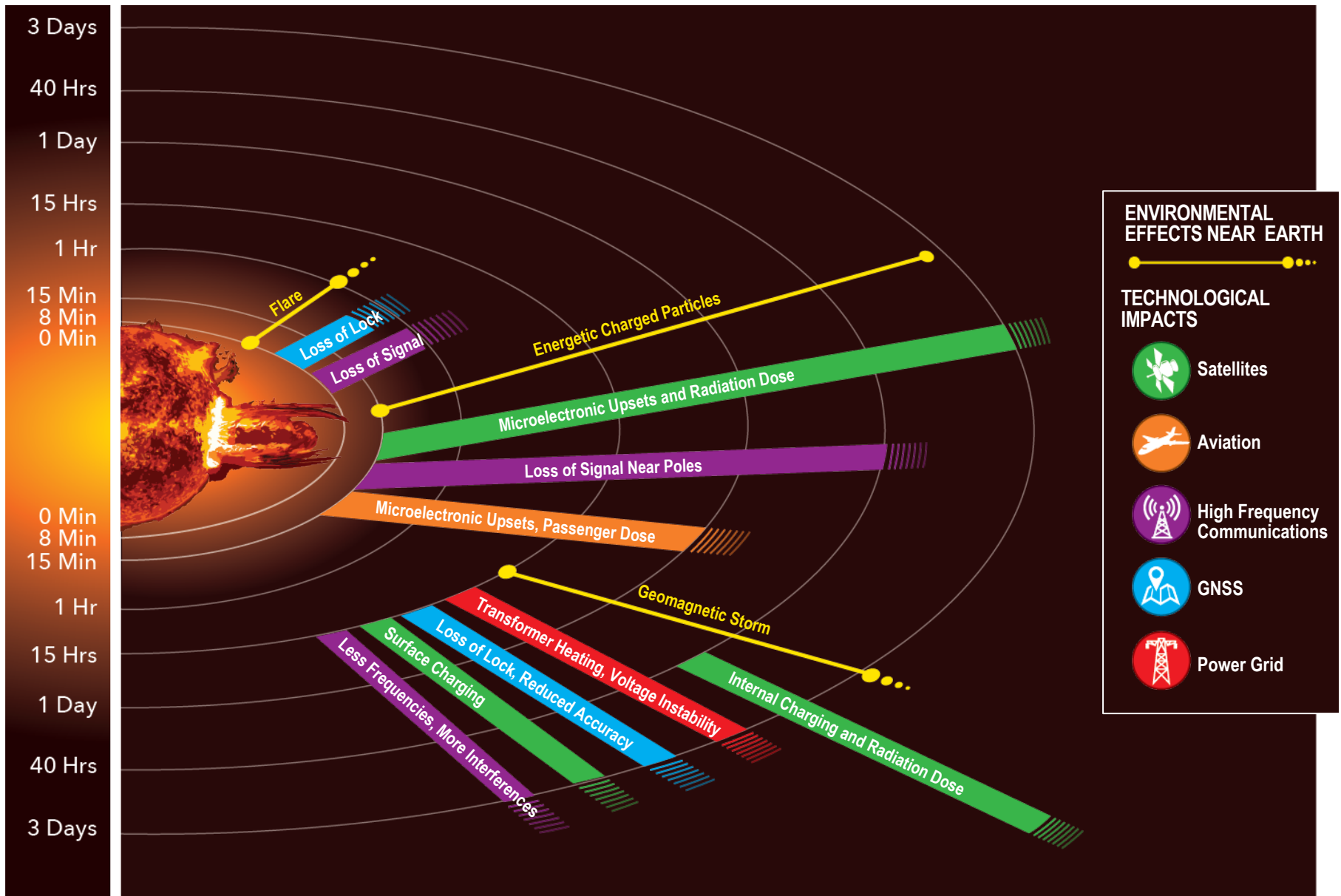
Understand the Nature of Our Home in Space

Advance our understanding of the connections that link the Sun, the Earth, planetary space environments, and the outer reaches of our solar system



Build the Knowledge to Forecast Space Weather Throughout the Heliosphere

Develop the knowledge and capability to detect and predict extreme conditions in space to protect life and society and to safeguard human and robotic explorers beyond Earth



Solar Physics Lab

Chief: Dr. Nick Arge

Heliospheric Physics Lab

Chief: Dr. Adam Szabo

Space Weather Lab

Chief: Dr. Judy Karpen

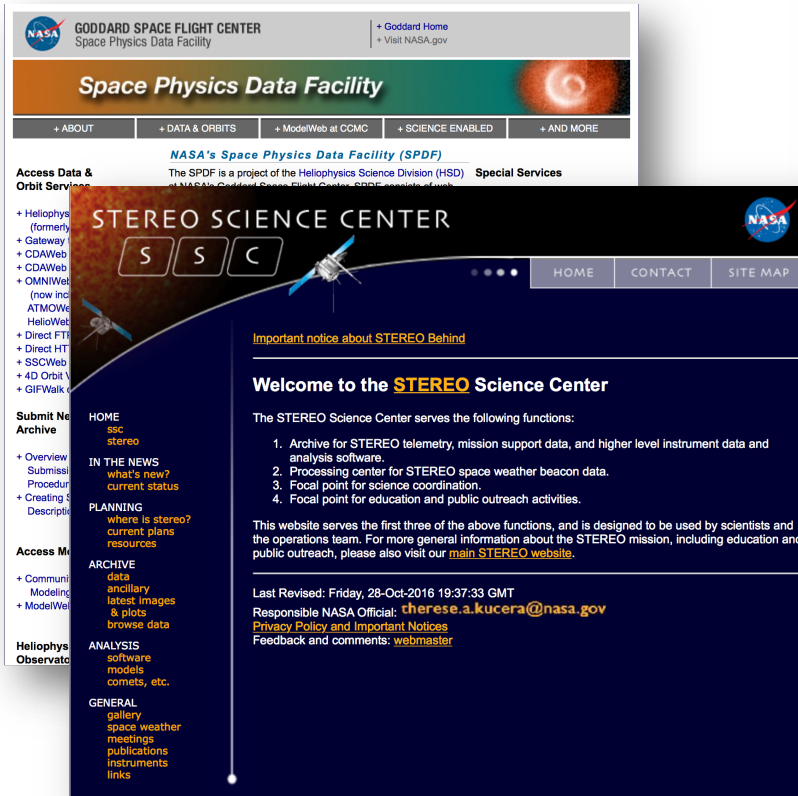
Geospace Physics Lab

Chief: Dr. Eftyhia Zesta

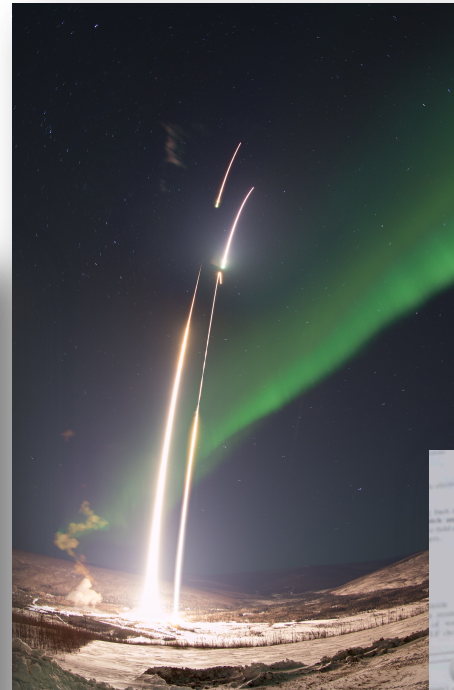
Ionospheric, Thermospheric,
Mesospheric Physics Lab

Chief: Dr. Doug Rowland

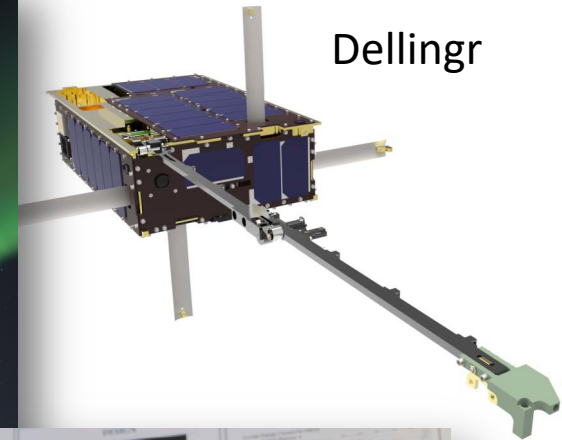
Space Physics Data Facility (Project Scientist: R. McGuire)



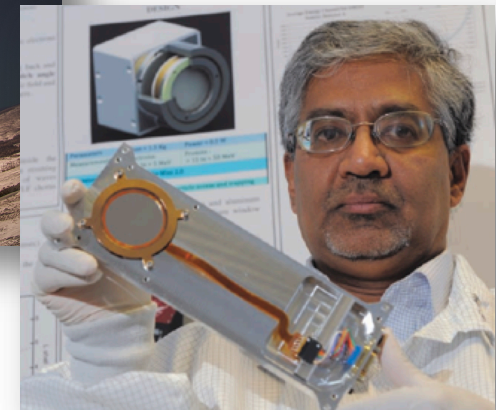
STEREO mission Science Center (Project Scientist: J. Gurman)



Auroral Arcs mission (PI R Pfaff)

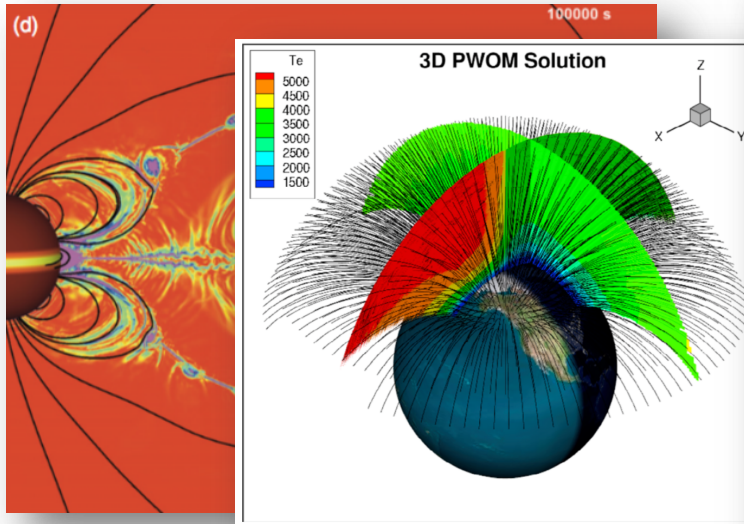


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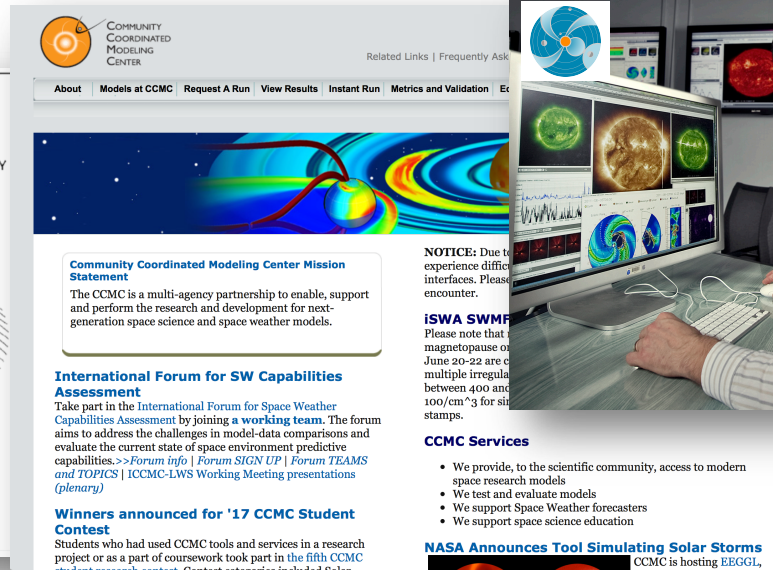
The Miniaturized Electron and Proton Telescope (PI S. Kanekal)

Solar eruption modeling (J. Karpen et al.)



Polar Wind Outflow Model (A. Glocer et al.)

Space weather services



COMMUNITY COORDINATED MODELING CENTER

Related Links | Frequently Asked Questions

About | Models at CCMC | Request A Run | View Results | Instant Run | Metrics and Validation | External Links

Community Coordinated Modeling Center Mission Statement
The CCMC is a multi-agency partnership to enable, support and perform the research and development for next-generation space science and space weather models.

International Forum for SW Capabilities Assessment
Take part in the International Forum for Space Weather Capabilities Assessment by joining a **working team**. The forum aims to address the challenges in model-data comparisons and evaluate the current state of space environment predictive capabilities. -> [Forum info](#) | [Forum SIGN UP](#) | [Forum TEAMS and TOPICS](#) | [ICCMC-LWS Working Meeting presentations \(plenary\)](#)

Winners announced for '17 CCMC Student Contest
Students who had used CCMC tools and services in a research project or as a part of coursework took part in the fifth CCMC Student Contest. Congratulations to the winners!

NOTICE: Due to experience difficulties with the interfaces, please encounter.

ISWA SWMF
Please note that the magnetopause on June 20-22 are multiple irregularities between 400 and 100/cm³ for six stamps.

CCMC Services

- We provide, to the scientific community, access to modern space research models
- We test and evaluate models
- We support Space Weather forecasters
- We support space science education

NASA Announces Tool Simulating Solar Storms
CCMC is hosting [EEGGL](#).

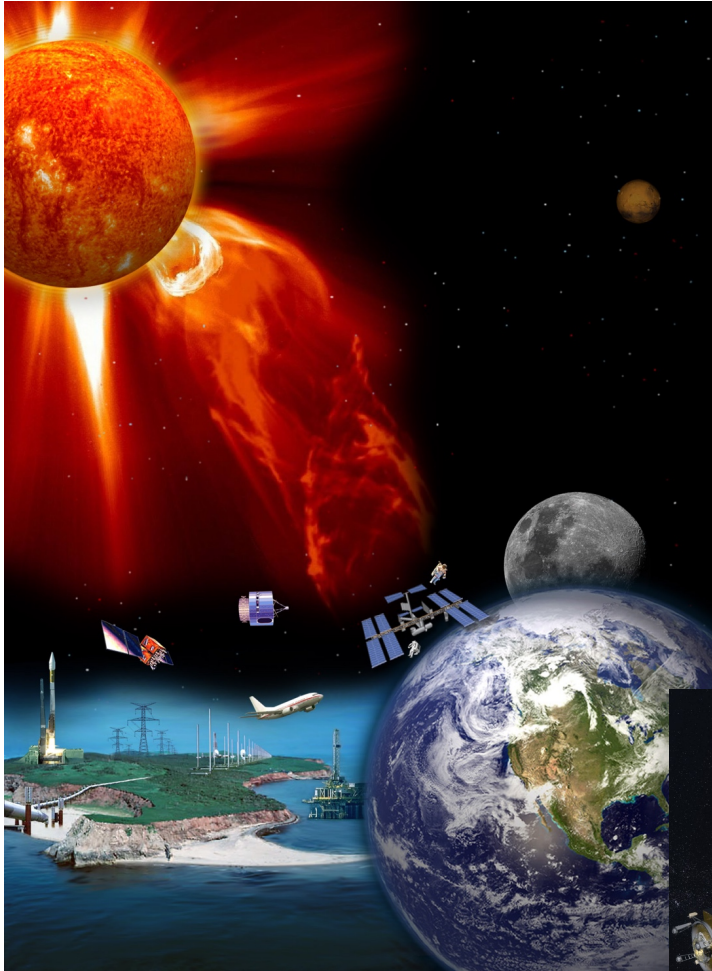


Community Coordinated Modeling Center (Director: M. Kuznetsova)



Examples only!

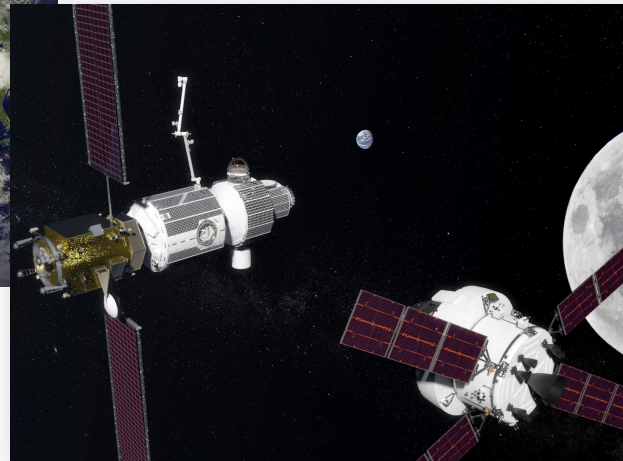
Heliophysics Science Division Peer Awards 2018



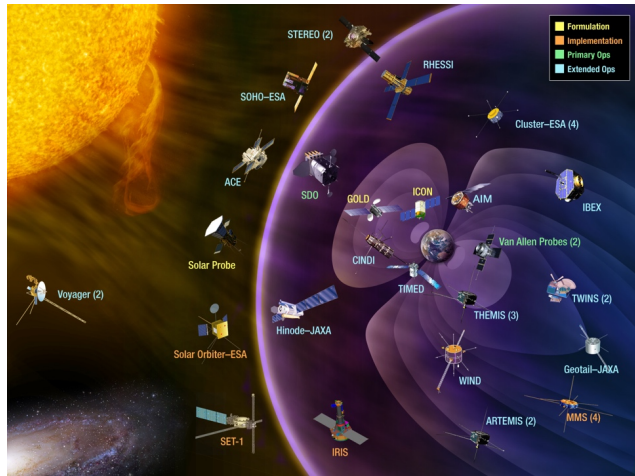
While low-inclination LEO (ISS orbit) is fairly benign from the space radiation perspective, deep space environment poses a much more significant challenge.

Consequently, human spaceflight missions to lunar environment and planetary targets require novel capabilities in terms of space weather monitoring, modeling and forecasting.

Lunar and Martian environments are also important targets for heliophysics science investigations, which presents a great opportunity to utilize heliophysics capabilities *both for science and safeguarding the crew.*

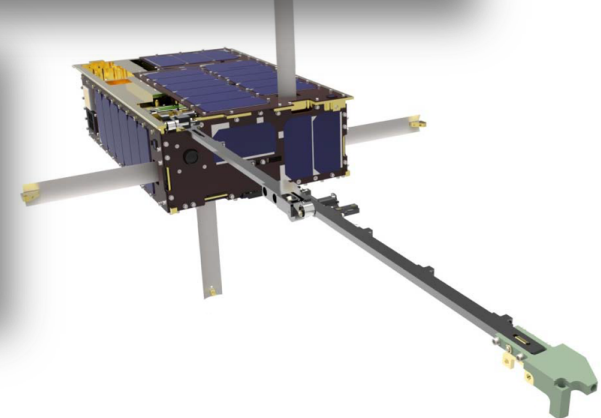
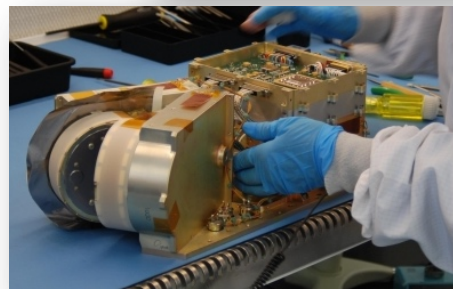
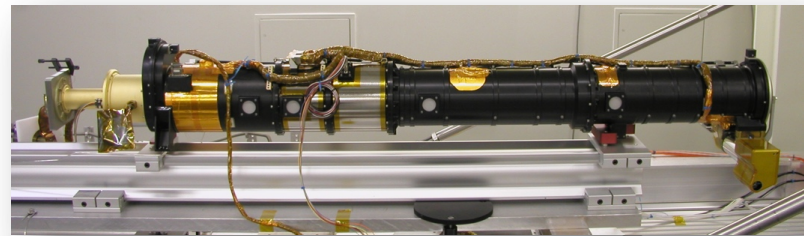


NASA GSFC provides unique end-to-end heliophysics capabilities that can support and leverage Artemis & Moon to Mars programs



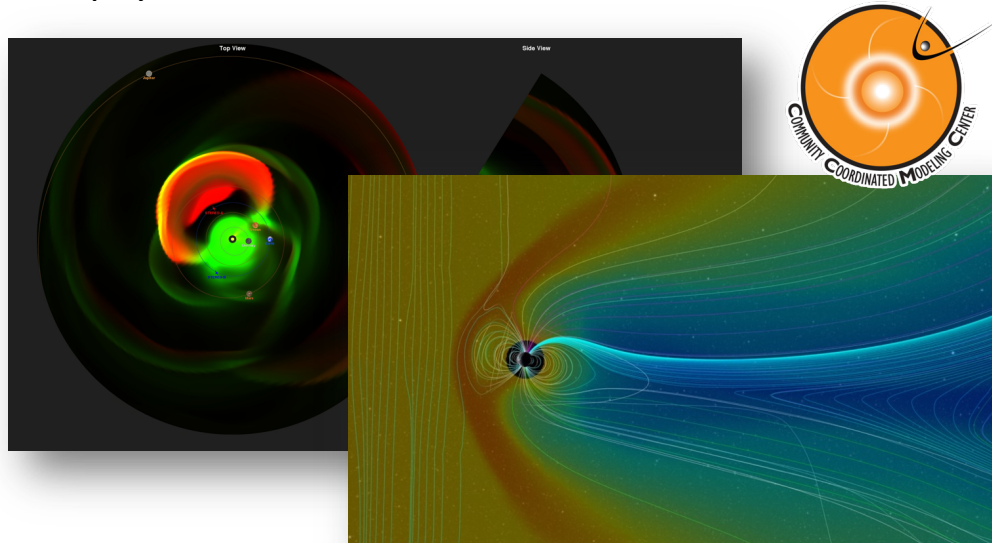
GSFC built and operates many of the missions in the existing Heliophysics Systems Observatory – observations are being used and will be used also for space weather purposes.

GSFC develops heliophysics missions and instruments that can provide the observational information needed for safeguarding the crew onboard lunar and Mars missions. The same instruments can be used also for science investigations.

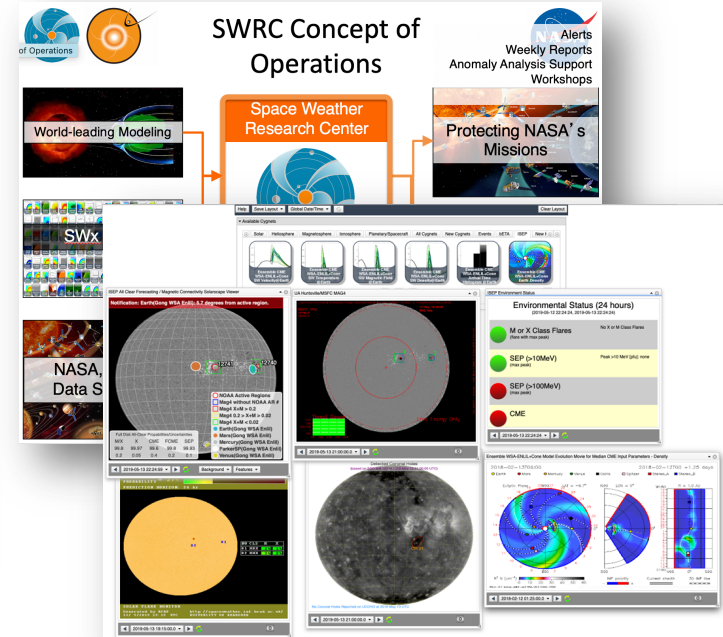


NASA GSFC provides unique end-to-end heliophysics capabilities that can support and leverage Artemis & Moon to Mars programs

GSFC heliophysicists develop models that are being used also for space weather forecasting purposes. Community Coordinated Modeling Center (CCMC) that hosts a very large collection of state-of-the-art heliophysics models resides at GSFC.



GSFC provides space weather services to NASA robotic missions operating across the solar system – the space weather team closely collaborates with JSC/SRAG that provides space weather services for human spaceflight activities.



- Space weather is growing in importance, and the trend applies also to human spaceflight activities.
- Addressing the space radiation challenge requires Agency-level coordination and close collaboration with government, academic and commercial entities.
- NASA GSFC Heliophysics Science Division looks forward to continue contributing to these collaborations!