

NSF's Support of the Community Coordinated Modeling Center

Geospace Section
Division of Atmospheric and Geospace Sciences



CCMC Workshop, University of Maryland, June 6-10, 2022

CCMC: Funding History at NSF



Jacket	PI	Period	Amount	Primary Program	PO
9909921	Hesse	1999-2002	\$259,932	Magnetospheric Physics	Baker
0224475	Hesse	2002-2006	\$864,541	Magnetospheric Physics	Baker
0339467	Hesse	2004-2010	\$611,046	Solar-Terrestrial Research	Roussev
0937537	Kuznetsova	2009-2014	\$2,255,391	Geospace Facilities	Morris
1503389	Shim	2015-2020	\$1,000,000	Space Weather Research	Papitashvili
1503933	Kuznetsova	2015-2020	\$1,574,920	Space Weather Research	Papitashvili

CCMC: Current Award



Award 2140031 Community Coordinated Modeling Center: Facilitating Space Weather Research, Advancing Forecasting, and Providing Hands-On Opportunities for Education

Period: October 2021 – September 2026

Organization: Catholic University of America

PIs: Jia Yue, Robert Robinson, Maria Kuznetsova

Funds Obligated to Date: \$1,018,831

Primary Program: Geospace Facilities

PO: Roman Makarevich

The NSF funding level for CCMC has increased substantially over the years with the current funding >\$500K per year.

CCMC: The Objectives of Current Award



Objectives:

- (1) Improvement in ITM modeling capabilities, including the incorporation of the low and middle atmosphere, better model portability, and ease of upgrades
- (2) Installation of new model combinations that would couple the ITM system and the magnetosphere
- (3) Development of a new ITM component of CCMC software for model output access, interpolation, and post-processing and a new tool to study the relative importance of ITM drivers from above and below

CCMC: The Objectives of Current Award, Cont'd



- (4) Addition of metadata attributes for all ITM models and simulation results
- (5) Development of a new online system for ITM model evaluation projects and community-wide modeling challenges
- (6) provision of new services and tools to support NSF Geospace Facilities and Space Weather programs



GS-Supported Geospace Data Systems Infrastructure

In addition to CCMC, there are a few other data systems infrastructure that Geospace Section supports

- **Madrigal Database** (Millstone Hill): manages and serves archival and real-time data.
- **SuperMAG** (APL): provides easy access to validated ground magnetic field perturbations.
- **Summer Schools and Workshops**: provide students with a hands-on learning experience of data analysis and software tools.



AGS-Supported Data Systems Infrastructure

- **NCAR Geoscience Data Exchange (GDEX)**: public data repository
- **NCAR Climate Data Gateway (CDG)**: provides long-term stewardship for data assets related to geo- and helio-science model output that are generated as a result of NCAR research.
- **NCAR CISL and HAO**: CISL provides supercomputing, analysis and visualization resources, data storage, and curations. HAO provides data (MLSO and PFI) and models.

NSF Public Access Repository: Scholarly Publications and Datasets in the NSF-PAR.



Community's Data Infrastructure Needs

- Easy access to data.
- User-friendly interface;
- Documentation of data for record-keeping and end-users;
- A formal data policy for data citation and attribution;
- File and data standardization. Use a standard/universal format so that data can be readable by one readme file;
- Data access/usage reports to assess the data need
- Long-term data repositories. A single site or multiple sites.

Current Challenges at NSF

- The quality of the Data Management Plan (DMP) has not played a significant role in the merit review and proposal funding recommendation;
- Reporting the DMP performance is not required or enforced in the project reports;
- The GS has encouraged but not required the DMP to be in alignment with the FAIR principles.





Our Commitment to Open Science

To support the geoscience's data systems infrastructure for open science, the GS would consider

- establishing an active collaboration with other federal agencies to leverage resources;
- sponsoring a community workshop on Data Systems Infrastructure;
- developing a data policy in line with the FAIR principles;
- requesting PIs to report their DMP practices in the project reports.