NSF Geospace Update

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Section Head, Geospace
Division of Atmospheric and Geospace Sciences
National Science Foundation

Division of Atmospheric and Geospace Sciences (AGS)

Geospace Section

Candace Major
Division Director

Tai-Yin Huang

Data Infrastructure
Aeronomy (AER)

Chia-Lin Huang

Magnetospheric
Physics (MAG)

Roman Makarevich

Geospace Facilities
(GF)

Section Head
Geospace

Mangala Sharma

Space Weather Research
(SWR)

Lisa Winter

Solar-Terrestrial
Research (STR)

?

Aeronomy (AER)

Name: Taylor Lightner
Institution: Virginia Tech
Mentor: Dr. Mangala Sharma
Evaluating student involvement in CubeSat proposals

Name: Victoria Gomez
Institutions: University of Texas at San Antonio (current), University of Louisiana at Lafayette
Mentors: Dr. Tai-Yin Huang, Dr. Chia-Lin Huang
Intern program: HACU National Internship Program
Reviewing Data Management Plans in awards to better understand how the FAIR (Findable, Accessible, Interoperable, Reusable) data principles have been adopted and implemented.

Quick Facts about FY21

- Overall spending in GS was $55.9M, including ARP fund, up 6.3% from FY20 $52.6M*

AER	MAG	STR	SWR	GF
11.9M	10.5M	10.3M	4.4M	18.8M

- Additional facts about AER, MAG, STR, SWR grants in FY21
  - 70 new award actions
  - Vast majority of new awards are standard grants
  - Section mortgage rate is low

* Excluding Arecibo

Faculty Early Career Development Program (CAREER) 2021-2022

CAREER

Diana Loucks

UNITED STATES MILITARY ACADEMY WEST POINT

AER

Piyush Mehta

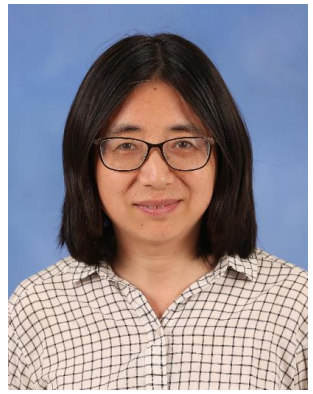
West Virginia University

AER

Yi-Hsin Liu

DARTMOUTH

MAG



Haihong Che

THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

STR

Satoshi Inoue

NJIT New Jersey Institute of Technology

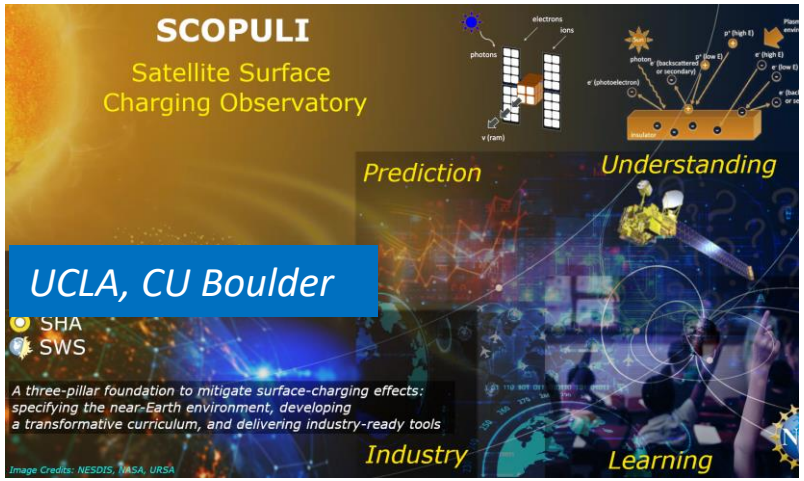
STR

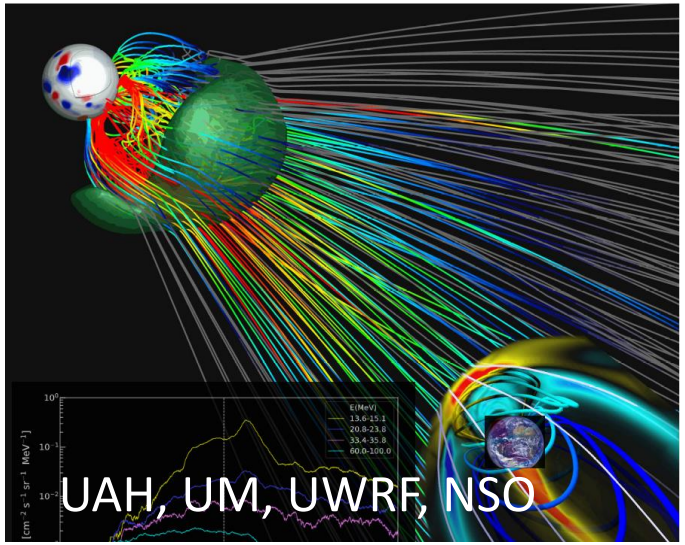
CAREER Proposal due July 27, 2022

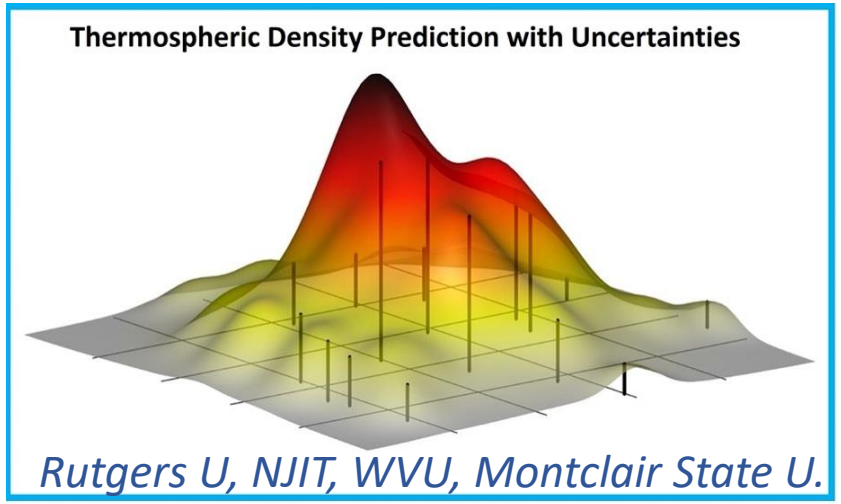
Proposals on Space Weather Research are welcome!

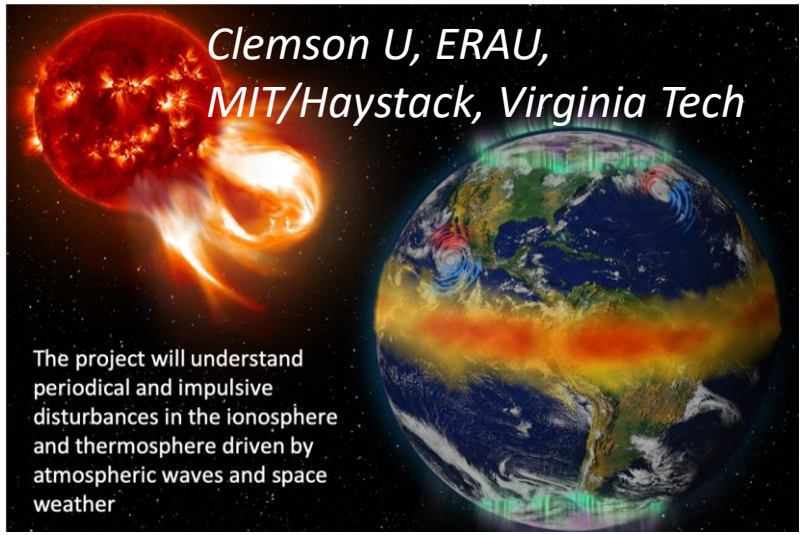
submit to any one of the three core programs: AER, MAG, STR

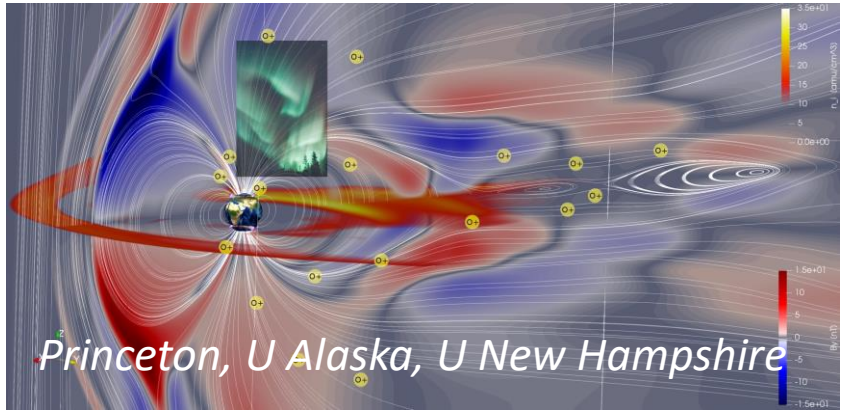
ANSWERS











Space Weather Research ANSWERS Awards:
7 projects, 17 institutions, $11.8M
Co-funded by all three GS core programs

contact: Mangala Sharma msharma@nsf.gov

New CEDAR / GEM / SHINE Solicitations

Solicitation	Target Date
Coupling, Energetics, and Dynamics of Atmospheric Regions (CEDAR in AER)	5/20/2022, 1st Friday in May annually thereafter
Geospace Environment Modeling (GEM in MAG)	3/30/2022, 9/30 annually thereafter
Solar, Heliospheric, and INterplanetary Environment (SHINE in STR)	5/11/2022, 10/7 annually thereafter

proposal are being reviewed

Many many thanks to all reviewers!

We always need more reviewers. Please volunteer!

Geomagnetically Induced Currents and Power Systems Innovation Lab

September 19–23, 2022, Golden, Colorado

"It is increasingly urgent to understand and mitigate the impacts of space weather on human technology and society."

A 5-day residential Innovation Lab will be held to bring together researchers and operational industry leaders to envision new projects related to GICs and power grids, and to develop new research collaborations. We seek interdisciplinary-minded experts in the geomagnetic and geoelectric field, magnetospheric and ionospheric sciences, ground conductivity, power systems, and power grid operations.

To learn more or apply, please visit https://apply.hub.ki/gicspaceweather/

Application Deadline: July 15, 2022

Dear Colleague Letter: Geoscience Lessons for and from Other Worlds (GLOW)

(Image credit: PHL@UPR Arecibo)

Bring together researchers and experts to develop projects which:

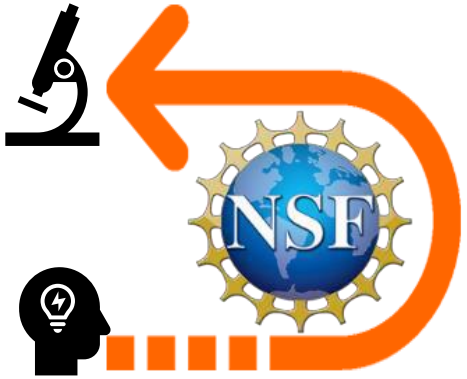
- use the study of other worlds to broaden and deepen our understanding of the Earth and its evolution
- use our geoscience knowledge to understand the environments of other worlds.

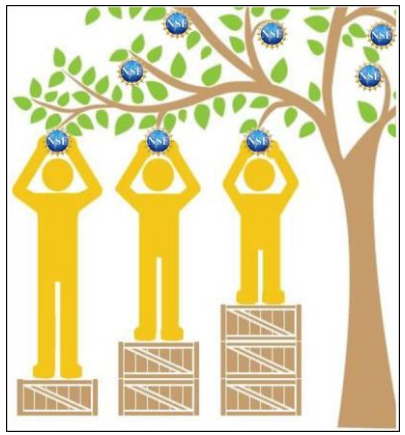
Participating Divisions:
Earth Sciences (EAR)
Atmospheric and Geospace Sciences (AGS)
Astronomical Sciences (AST)

GLOW

AGS – Opportunities for Mid-Career

Mid-Career





- Support meritorious research & promote equity/access that sustains a diverse community of mid-career scientists
  - Juggling research/teaching, services, life — "leaky pipeline" of talent
  - Disproportionately affects underrepresented groups
- Encourages investigators meeting one or more of the following criteria
  - No prior or recent NSF funding
  - On soft money support
  - At PUI, MSI, or community college
  - From underrepresented groups in AGS disciplines
- Search AGS Mid Career DCL

AGS Postdoctoral Research Fellowships

AGS PRF

- The AGS-PRF program supports highly qualified early career investigators independent research efforts
- Two years of support, $94K in year 1 and $96K in year 2 (being updated)
- Award made directly to PI, but need to identify a host institution
- Graduate student or less than 2 years since PhD can apply
- Require US citizenship/residency
- No deadlines

Broader Impacts

- Advance discovery and understanding while promoting teaching, training, and learning
- Broaden participation of under-represented groups
- Enhance infrastructure for research and education
- Broaden dissemination to enhance scientific and technological understanding
- Benefits to society

Solar and Space Physics Decadal Survey

Work with our agency partners at NASA and NOAA as well as participating NSF Programs from:

- Division of Atmospheric and Geospace Sciences
- Division of Astronomical Sciences
- Division of Physics
- Office of Polar Programs

NSF Decadal Priorities are to define:

- The **SCIENCE** Priorities
- The **INFRASTRUCTURE** needed to achieve the science
- Support for the diverse range of the **PEOPLE** we want to be engaged in science

Join the Town Hall Meeting on Wednesday at noon!

Thank you for making CEDAR a Success!

Especially to the CEDAR Steering Committee, UCAR/CPAESS, Student representatives, and participants!

Our Goal is for CEDAR to be a Welcoming and Inclusive Environment that promotes CEDAR Science, provides learning and growth of students and early career scientists, and leads to new ideas and research directions.

Geospace Facilities: Update

Arecibo Observatory

- Current award ends Mar 2023
- Cleanup completed Jan 22
- Visitors center open Mar 2022
- Current investigations using optics/radio and historical ISR data

Millstone Hill Observatory

New I&V award in 2021

- Doubled sensitivity and extended lifetime
- Improved accessibility for education/public outreach
- Applications for SED, SAPS, Es, eclipse studies

Advanced Modular ISR

PFISR:

- Near-continuous remote operations for 7813 hours, 89.2% uptime in 2021

RISR-N:

- Limited operations in 2021
- New 2x400 kW generators
- 164 kW generator to be repaired

Jicamarca Radio Observatory

New O&M award in 2022

- 150-km and high-alt echoes
- Substorm effects
- Expanded educational opportunities

New I&V award 2022

- Measure to 10,000 km
- Medium-power ISR mode
- Solar corona experiments

NSF Updates

- **Aeronomy and CEDAR Programs**
- **Data Systems**

Tai-Yin Huang (thuang@nsf.gov)
Program Director, AGS/GS

CEDAR Workshop, Austin, Texas, June 21, 2022

Project Reporting

- Treat the final report like an annual report. Report only the activities in that year.
- For a collaborative project, PIs need only report the activities on their side; Include collaborators' activities only when they are related to the PI's activities.
- Collaborators and their institutions should be included in the report under **Participants/Organizations.**
- Submit Project Outcomes only when the award ends. If you are planning for a No Cost Extension, do not submit Project Outcomes.
- Submit reports by the due day to avoid delay of getting a new award, supplement, or receiving funding from a continuing grant.

In your correspondence to NSF, include your proposal/award number in the email subject title to expedite the process of retrieving the proposal/award information.

Data Management Plan

- **Products of Research:** the types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project
- **The standards to be used for data and metadata format and content** (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies)
- **Policies for access and sharing** including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements
- **Policies and provisions for re-use, re-distribution**, and the production of derivatives
- **Plans for archiving data**, samples, and other research products, and for preservation of access to them

NSF Funding Opportunities for Data Systems

Research Coordination Networks (RCN, NSF 17-594): supports development of community standards for data and meta-data.

Dear Colleague Letter: Effective Practices for Making Research Data Discoverable and Citable (Data Sharing) (NSF 22-055): describes and encourages effective practices for publicly sharing research data, including the use of persistent digital identifiers (PDIs).

Geoinformatics (GI) (NSF 21-583): supports development and implementation of sustainable funding models to preserve data and software products of value to Earth Science research. Deadline: Aug. 15, 2023.

Dear Colleague Letter: **Pilot Projects for Cyberinfrastructure Centers of Excellence (NSF 21-037**): CI CoEs are service-oriented hubs of expertise and innovation targeting specific areas, aspects, or stakeholder communities.

GS-Supported Data Systems Infrastructure

Madrigal Database (Millstone Hill): manages and serves archival and real-time data.

SuperMAG (APL): provides easy access to validated ground magnetic field perturbations.

Community Coordinated Modeling Center (with NASA): provides access to, tests and evaluates models; supports Space Weather forecasters; supports space science education.

Summer Schools and Workshops: provide students with a hands-on learning experience of 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, stores, and curates data sets. HAO provides data (MLSO and PFI) and models.

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.

We are reviewing DMPs and annual reports of active awards in the GS programs to identify what gaps and support would be needed for open science. An NSF summer intern, Victoria Gomez, is working on this project.

For questions/comments/suggestions/ideas on data systems infrastructure, email Tai-Yin Huang (thuang@nsf.gov) and Chia-Lin Huang (chihuang@nsf.gov)