



# Challenges and Opportunities for Geospace Science at NSF

Ilia I. Roussev  
Program Director



# Outline

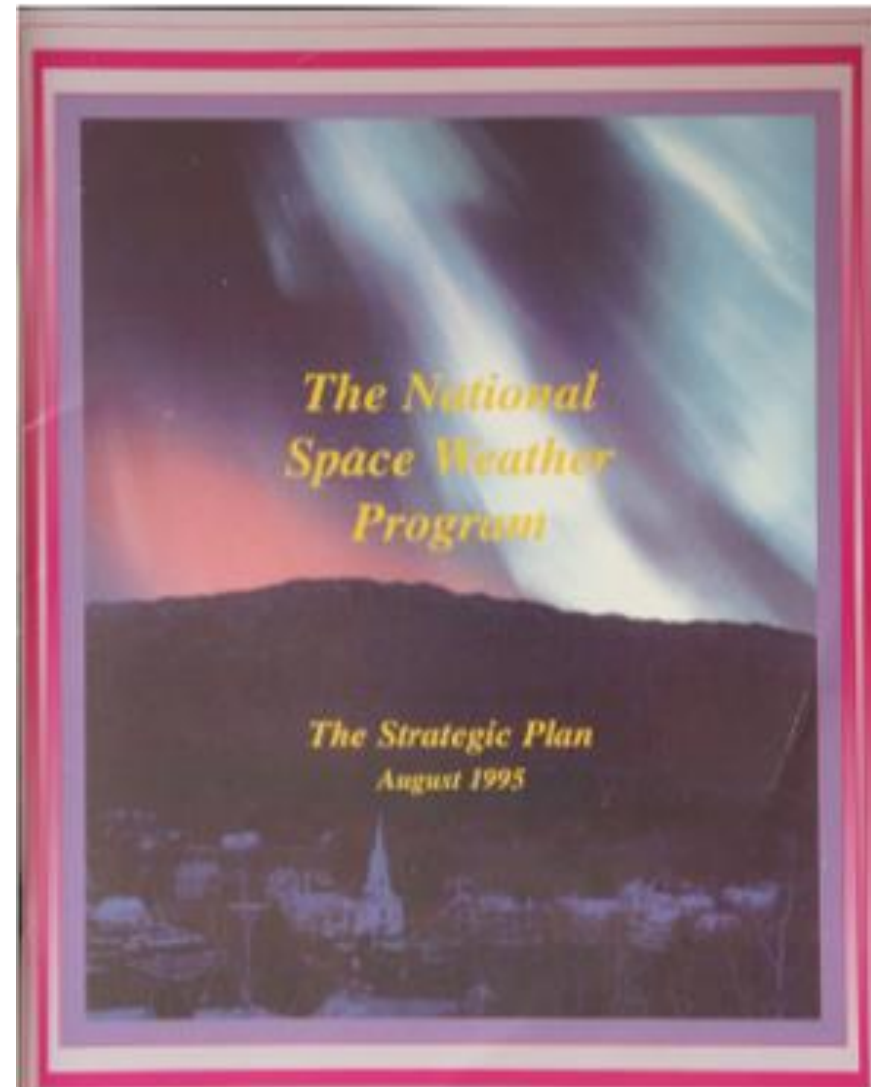
- Section Update
  - Staffing
  - Job opportunities
- FY17 Quick Review
  - Program budgets
  - Science Highlights
- FY18 Activities
  - Budgets and the 10 Big Ideas
  - Facilities Update
  - Update on CEDAR, GEM, SHINE Solicitations
  - SWORM
  - Collaborations with other agencies
  - CubeSats, Arecibo, and Sondrestrom
  - DASI Planning



# Importance of GS

## History of Space Weather (1994-present)

- George Siscoe, Ernie Hildner, Tim Killeen, Bill Lotko and Lou Lanzerotti visit NSF.
  - Idea to treat *Sun-Earth* as a *system*.
  - Make predictions of impacts of solar storms on Earth.
- Presented idea to NASA, but little interest at the time.
- *NSF's GS very interested!*
- Workshop to develop idea further.
- First *Strategic Plan for National Space Weather Program* published in 1995.





# GS Staff



SH: Michael  
Wiltberger



STR: Ilia Roussev



AER: Ruth  
Lieberman



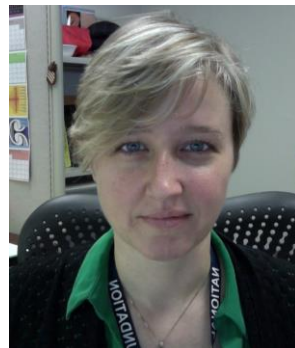
MAG: Search  
Underway



SW: S. Irfan Azeem



GF: John  
Meriwether



MAG (acting):  
Carrie Black



Expert: Sunanda  
Basu



PS: Larissa  
Petrella



# Job Opportunities at GS

**USAJOBS**

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## Physical Scientist (Program Director)

[National Science Foundation](#)

Overview

Locations

Duties

Requirements

Required Documents

Benefits

How to apply

### Overview

Help

#### Open & closing dates

🕒 04/05/2018 to 05/16/2018

#### Salary

\$133,689 to \$178,573 per year

#### Pay scale & grade

AD 04

#### Work schedule

Full-Time - Full-time.

#### Appointment type

Permanent - Permanent.

### This job is open to

Help



#### The public

U.S. citizens, nationals or those who owe allegiance to the U.S.

Apply

Print

Share

Save

### Location

Help

1 vacancy in the following location:

📍 Alexandria, VA

Relocation expenses reimbursed

#### Announcement number

AGS-2018-0009

#### Control number

495962200



# Quick Facts about FY17

- Overall spending in section was \$47.5M – up 5% from FY16
  - Support for interdisciplinary projects
  - Funds from division to pay down mortgage rates

AER 10.6M	MAG 8.1M	STR 7.8M	SWR 7.0M	FAC 13.6M
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- Additional facts about AER, MAG, STR grants in 2017
  - 178 Actions resulting 55 new awards
  - 25 CGIs and 30 standard grants
  - 52% average mortgage rate for the section



# NSF and AGS Budgets



- We have been operating on CR since start of the fiscal year
  - Presents numerous challenges
  - Recall President's request had NSF down **10%**
  - New Omnibus spending bill has NSF up **3.9%**
    - Focuses mainly on top level numbers RRA (+5%), MREFC, & AOAM
- On Feb 12, 2018, as part of the budget process, the NSF's FY2019 request was submitted to Congress

	FY17 Enacted	FY19 Request	Change
NSF	\$7,504M	\$7,472M	<b>-0.4%</b>
GEO	\$825M	\$852M	<b>+3.3%</b>
AGS	\$253M	\$239M	<b>-5.6%</b>

- Prior to congressional action on budget caps NSF was down **30%**
- GEO increase to support OOI and ARF in OCE
- Detailed information at <https://www.nsf.gov/about/budget/fy2019>



# NSF 10 Big Ideas



- FY19 Request includes \$282M to support the 10 Big Ideas
  - Origin of the 5% reductions in RRA activities within each directorate
- 6 Research Ideas each get \$30M for a total \$180M

Harnessing the Data Revolution	Navigating the New Arctic	Future of Work at Human Tech Frontier
The Quantum Leap	Understanding the Rules of Life	Windows on the Universe

- Process Ideas get \$102M total
  - Midscale Research Infrastructure \$60M
  - INCLUDES \$20M
  - Growing Convergence Research \$16M
  - NSF 2026 Fund \$6M
- [https://www.nsf.gov/news/special\\_reports/big\\_ideas/](https://www.nsf.gov/news/special_reports/big_ideas/)





# Revision of CEDAR, GEM, & SHINE

- Previously we had announced our intention to make CEDAR, GEM, and SHINE as targeted programs with no deadlines
  - Changes requested by NSF Policy office caused additional delay
- New solicitations for CEDAR and GEM released on Feb 28 and are now accepting proposals
  - Google [NSF CEDAR](#) or [NSF GEM](#) for details
  - PI's encouraged to contact PO before submission
- Not planning to release SHINE during FY18
  - Funding for STR program remains the same
  - RREF workshop held at NJIT during Mar 27-30, 2018, was part of community input for next SHINE solicitation



Due dates? We don't need no stinking due dates!



# Support for SWORM

- Goal 1 – Space Weather Benchmarks

- Initial estimates of 1 in 100 year and theoretical maxima event
- NSF and NASA are leading a Step Benchmarking activity
  - Finalizing SOW to support workshop and community report



- Goal 5 – Advance Understanding and Forecasting

- RFI to gather community input on research priorities for space weather was open until April 6, 2018

- Goal 6 – International Cooperation

- Participated in UN/USA ISWI Meeting
- Attending US/CAN Bilateral SWx Cooperation Meeting
- Space Weather as UN- COPUOS Thematic Priority 4



# Other Collaborations

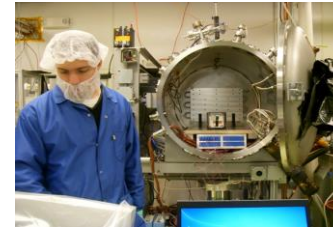
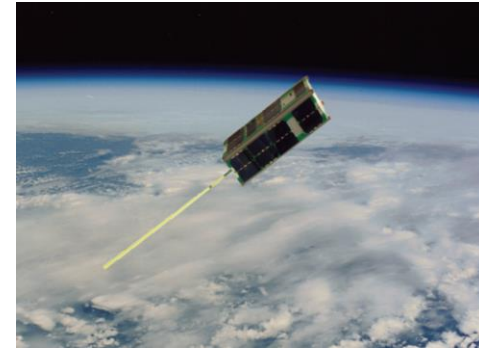
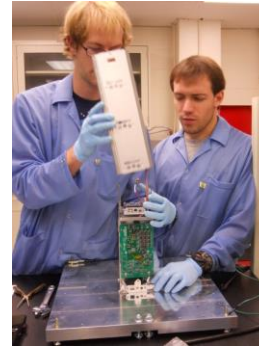


- Working with NASA on several initiatives
  - Developing NSCI-Space Weather pilot program (includes several divisions at NSF)
  - Support for coordination of ground, ICON and GOLD related research
  - Coordinating efforts on the DRIVE Science Centers
- Coordinating with NASA/NOAA on a tri-agency O2R pilot
  - NSF will accept proposals into the Core programs in AGS and AST
    - Grants for 1-year of funding only See DCL (NSF 18-052) for details
      - [Google NSF Space Weather O2R](#)
  - Beginning discussions with NASA and NOAA for MOU to support second phase
- Establishing an MOU with AFRL to support SuperDARN enhancements



# GS CubeSat Program

- 14 Missions and 20 CubeSats
  - Advance space weather research
  - Create educational opportunities
- Colorado Student Space Weather Explorer
  - Measurements of electrons & protons produced clear picture of global distribution of energetic particles in near Earth space
  - Over 19 peer reviewed publications



**COSMIC RAY SPACE MYSTERY THAT BAFFLED SCIENTISTS FOR 60 YEARS SOLVED BY COLLEGE KIDS WITH A TINY SATELLITE**

BY MEGHAN BARTELS ON 12/13/17 AT 1:13 PM



nature.com > nature > letters > article

MENU **nature**  
International journal of science

Altmetric: 170 [More detail >>](#)

Letter

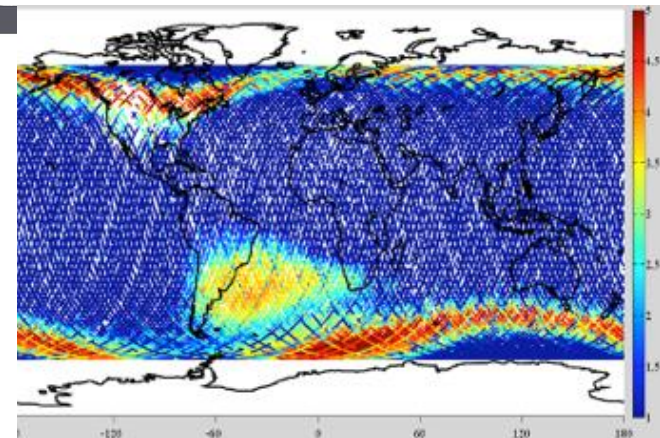
Measurement of electrons from albedo neutron decay and neutron density in near-Earth space

Xinlin Li, Richard Selesnick, Quintin Schiller, Kun Zhang, Hong Zhao, Daniel N. Baker & Michael A. Temerin

Nature 552, 382–385 (21 December 2017)  
doi:10.1038/nature24642  
[Download Citation](#)

Magnetospheric physics

Received: 22 July 2017  
Accepted: 04 October 2017  
Published: 13 December 2017





# CubeSat Plans

- Geospace Portfolio Review recommended continuing CubeSat program and engaging with rest of NSF to expand program
- CubeSat solicitation was released on March 19, 2018
  - [Google NSF CubeSat](#)
  - Support for 1-2 missions at total cost \$1.2M each
  - Submissions are due June 12<sup>th</sup>
- CubeSat-Enabled Science and Engineering meeting has generated significant interest in collaborations with CISE/CNS and ENG/ECCS
  - Focused novel science applications of CubeSats and CubeSat constellations

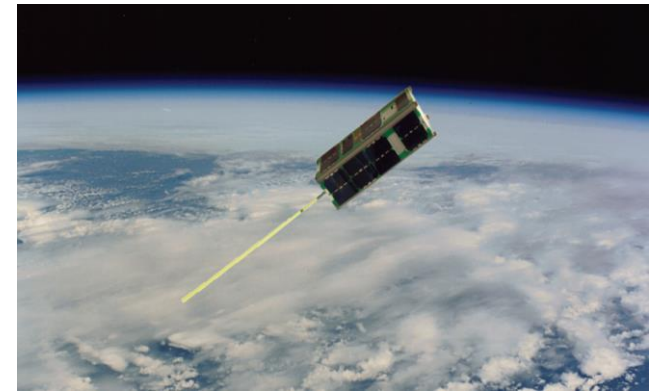


Illustration of CSSWE's CubeSat



# Arecibo Observatory

- NSF has selected a UCF – UMET – YEI consortium to operate AO for the next 5 years
  - New award started on April 1
  - Anticipate reduced funding over the life of this effort, to a total of \$2M per year by the end of the five-year project period (and pending availability of funds)
  - FY19 president's request is aligned with this plan
- The CR passed on Feb 9 (Public Law 115-119) included \$14.3M in disaster relief funding for repairs to AO
  - Repairing the 430MHz-line-feed is included in the spending plan for these funds





# Sondrestrom Research Facility

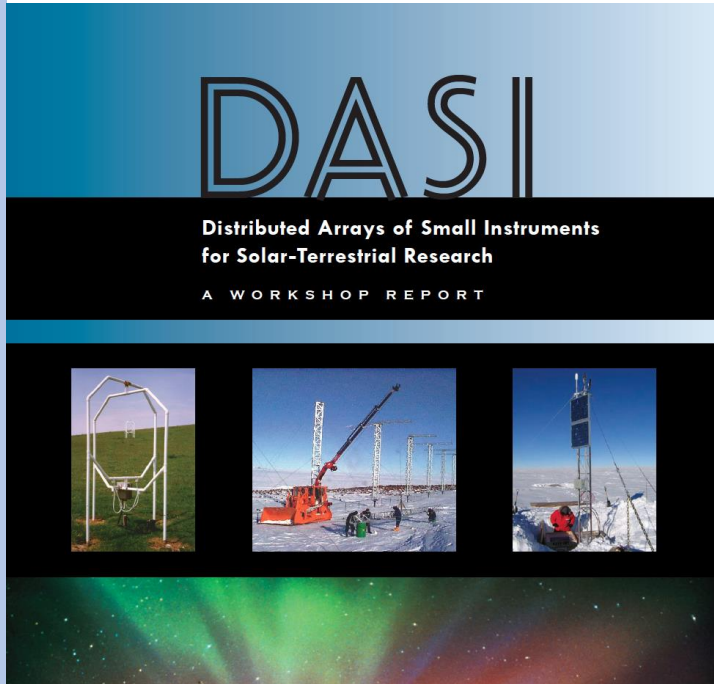
- Geospace Portfolio Review made 3 recommendations related to SRF
  - 7.2 – End ISR observations
  - 7.3 – Support ancillary observations from site
  - 7.4 – Investigate joining EISCAT
- Section is moving forward with these recommendations
  - Community input obtained in response to DCL
  - Support for ISR operations discontinued on Mar 31, 2018
  - Conducting an environmental and engineering assessment of site via CPS
  - Obtained information from EISCAT on levels of involvement



ISR and LIDAR at SRF



# Distributed Array of Small Instruments



- Section is beginning to consider how to implement the DASI recommendations in the geospace portfolio review
- Listening sessions at summer CEDAR, GEM, SHINE are also expected





# Questions?

Happy to answer, if I can!