



Geospace Science Update

M. Wiltberger
Geospace Section Head
mwiltber@nsf.gov
703-292-4690



Outline

- Section Update
 - Staffing
 - Call for rotator
- FY17 Science Highlights
 - Highlight 1
 - Highlight 2
- FY18 Activities
 - Budgets
 - 10 Big Ideas
 - Facilities
 - CEDAR, GEM, SHINE
 - Cubesats
- Broader Impacts



Geospace Section Staff



Section Head
Michael Wiltberger



Program Specialist
Larissa Petrella



Solar Terrestrial Research
Ilia Roussev



Aeronomy
Ruth Lieberman



Magnetospheric Physics
Carrie Black (Acting)



Space Weather Research
S. Irfan Azeem



Geospace Facilities
John Meriwether



Geospace Expert
Sunanda Basu



Initial Reshuffling



Section Head
Michael Wiltberger



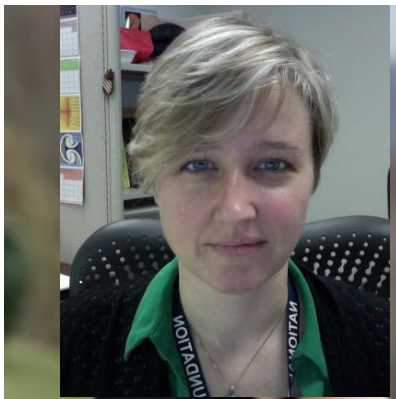
Program Specialist
Larissa Petrella



Solar Terrestrial Research
Ilia Roussev



Aeronomy
Aeronomy
We need you!
Ruth Lieberman



MAG - Lisa
Geospace Facilities
Winter
Carrie Black



Space Weather Research
S. Irfan Azeem



Geospace Facilities
John Meriwether

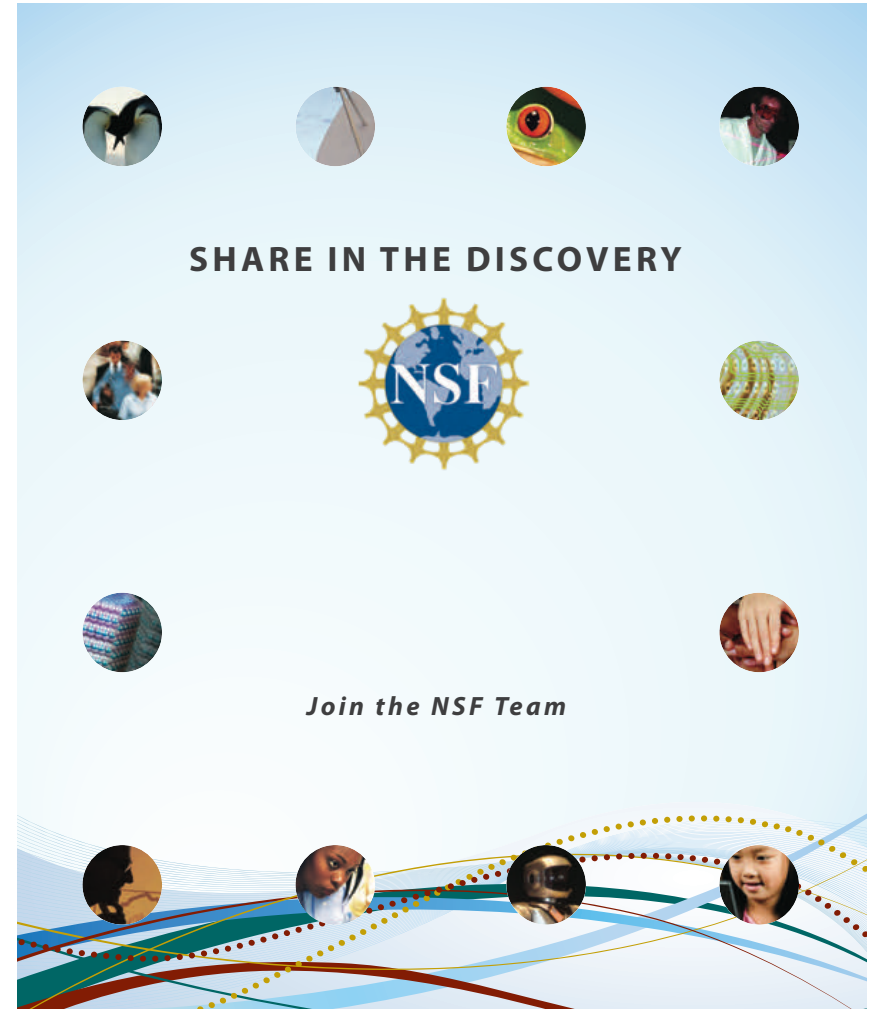


Geospace Expert
Sunanda Basu



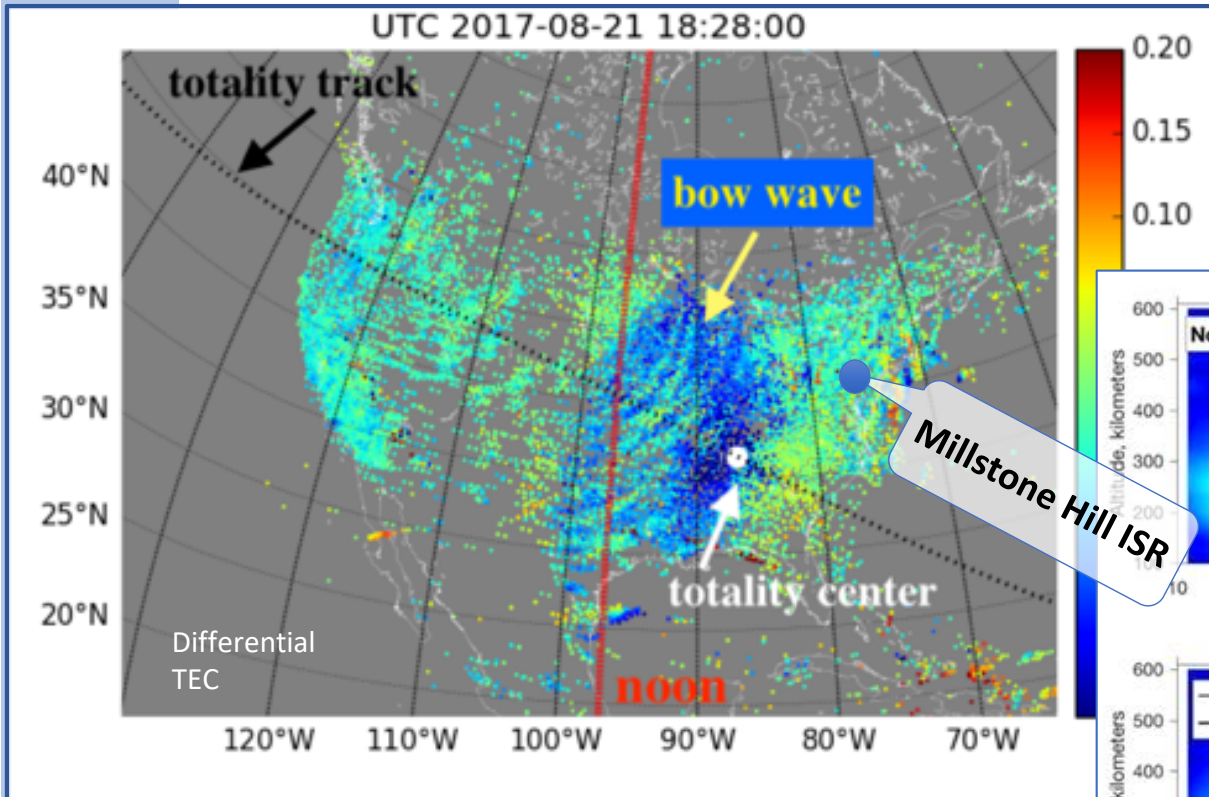
Call for rotators

- Need to fill in remaining position with IPA rotators
 - Initial term is 1 year with options for up to 4 years in total
 - Checkout
 - DCL – [AGS 18-002](#)
 - Google [NSF Rotators](#) for more information
- Looking for scientists with expertise Aeronomy
- Seek out me or any GS PO for more information

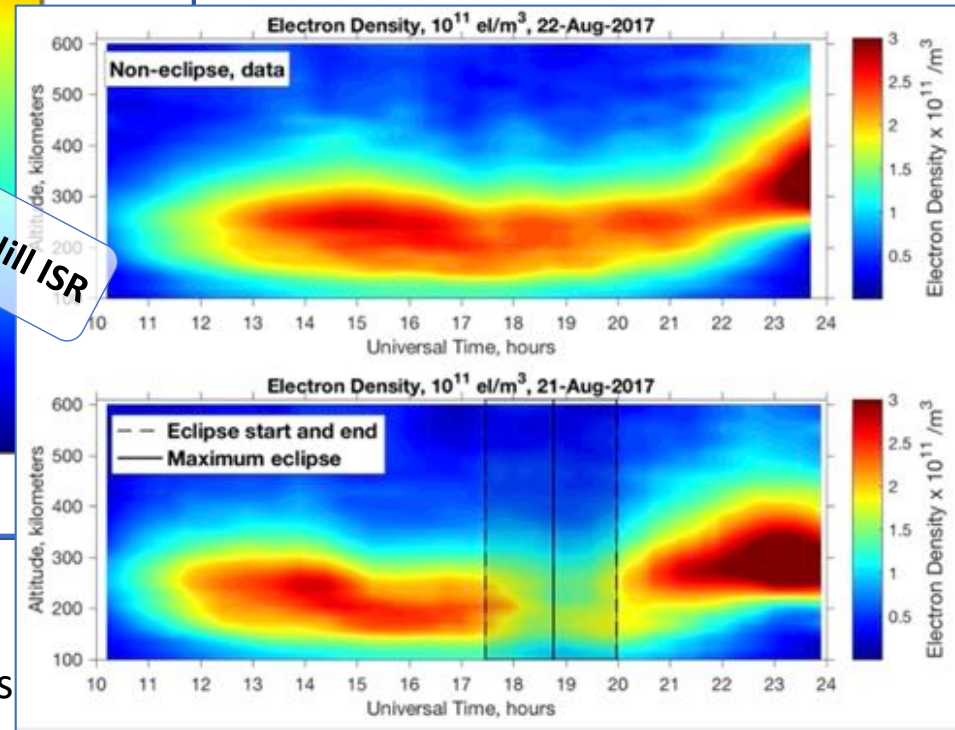




Observations of the Great American Eclipse



Below: Millstone Hill ISR measured electron density depletion throughout ionospheric E & F regions, indicating substantial photochemical and dynamic changes in the IT system.



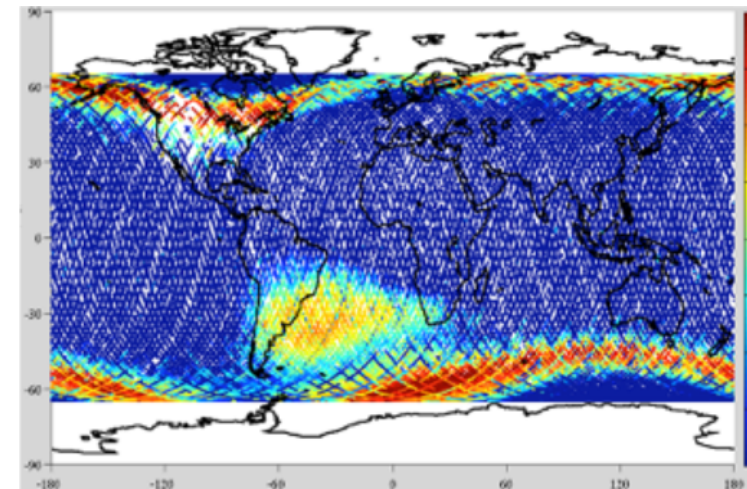
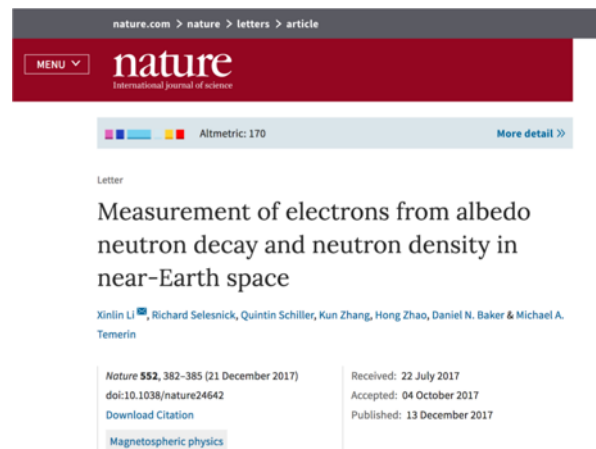
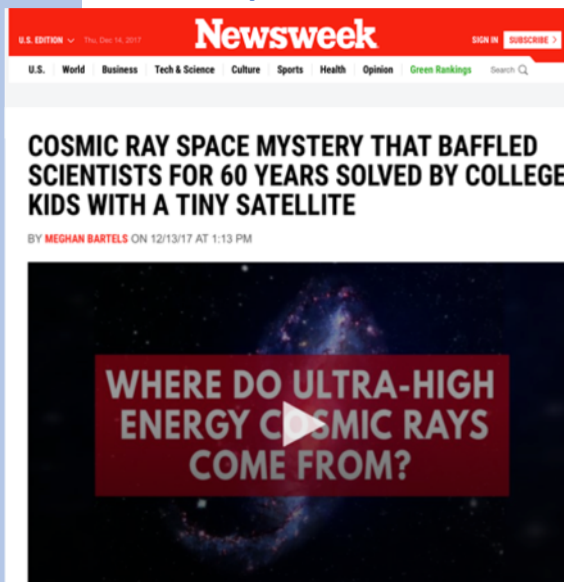
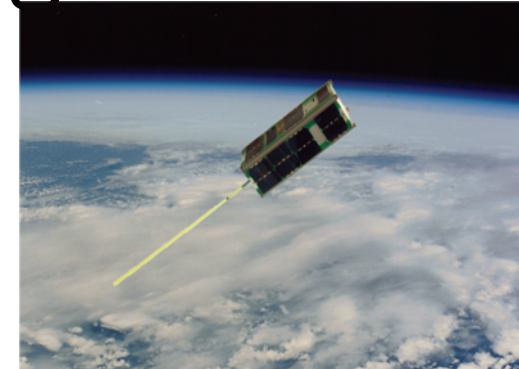
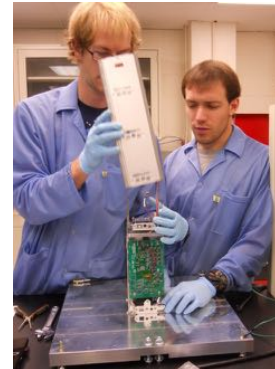
Dense distribution of GNSS receivers unambiguously resolved for the first time **ionospheric bow wave fronts** (seen in differential TEC above), caused by IT disturbances associated with the supersonic velocity moon shadow.

Published by *Coster et al. (2017)*, *Goncharenko et al. (2018)* and *Zhang et al. (2017)* in *Geophys. Res. Lett.*



NSF/GEO CubeSat Program

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

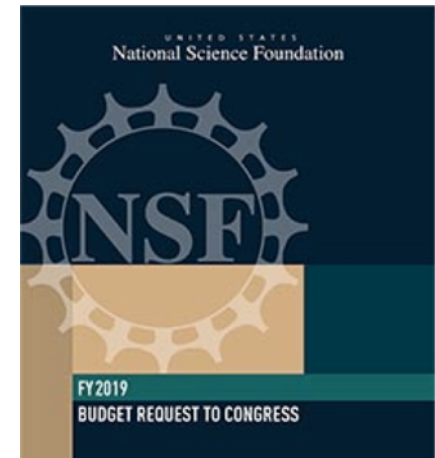




NSF and AGS Budgets

- Operated on CR from the beginning of the fiscal year until March 23

- 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, HER, & AOAM
- Nearly Final GS budget is \$48.5M up 2% from FY17



AER
10.0M

MAG
7.1M

STR
8.3M

SWR
7.2M

FAC
15.2M

- 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	-0.4%
GEO	\$825M	\$852M	+3.3%
AGS	\$253M	\$239M	-5.6%

- Prior to congressional action on budget caps NSF was down **30%**
- GEO increase to support OOI and ARF in OCE
- Google [NSF FY19 Budget](#) for detailed information



NSF's 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
- Google [NSF 10 Big Ideas](#) for more information



Arecibo Observatory Moving Forward

- NSF has selected a UCF – UMET – YEI consortium to operate AO for 5 years
 - Funding profile reduces to a total of \$2M per year by the end of the five year project period
 - Proposal included fund raising activities to help address this shortfall
 - They are currently operating AO and support GS related investigations
- Public Law 115-119 included \$14.3M in disaster relief funding for repairs to restore AO world class status
 - Initial tranche (\$2M) of includes generator repairs and new water pump
 - HF heater capability is operational, but waiting generator repairs for full return to operations
 - Repairing the 430MHz line feed is part of the plan
- ***NSF is welcomes proposals for science investigations at Arecibo.***





Sondrestrom Research Facility

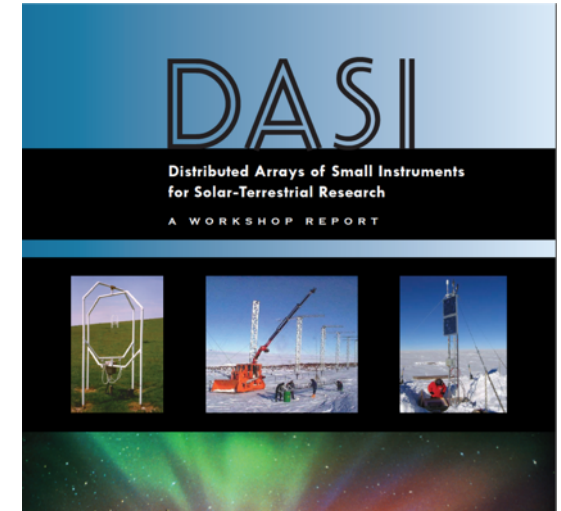
- After 35 years of exemplary science accomplishments
ISR operations ended on 3/31
- Management of the site is now being handled by CPS
 - Environmental and engineering assessment of the site currently underway
 - PIs being supported in retrieving their instruments over the summer
 - Site is being prepared for a winter without power
- Future of the site will be based upon PR recommendations, environmental and engineering assessment, and interactions with the Greenland Self-rule government
- Begun discussions with EISCAT for US utilization options





Pathway to New Facilities

- Distributed Array of Small Instruments
 - Engagement at CEDAR, GEM, SHINE will be essential
 - Internally discussing how to implement the DASI recommendations in the Geospace portfolio review
 - Planning for an initial call in FY19
- Innovation and Vitality Program
 - Support renovation and upgrade of existing facilities
 - Facilitate the development of new instrumentation
- Midscale Projects
 - NSF Big Idea supporting \$4-70M projects





Revision of CEDAR, GEM, & SHINE

- 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



- Planning to release a SHINE call in FY19
 - Funding for STR program remains the same
 - “Roadmap for Reliable Ensemble Forecasting of the Sun-Earth System” workshop (held at NJIT March 28-30, 2018) is part of community input for next SHINE solicitation



Cubesat Program

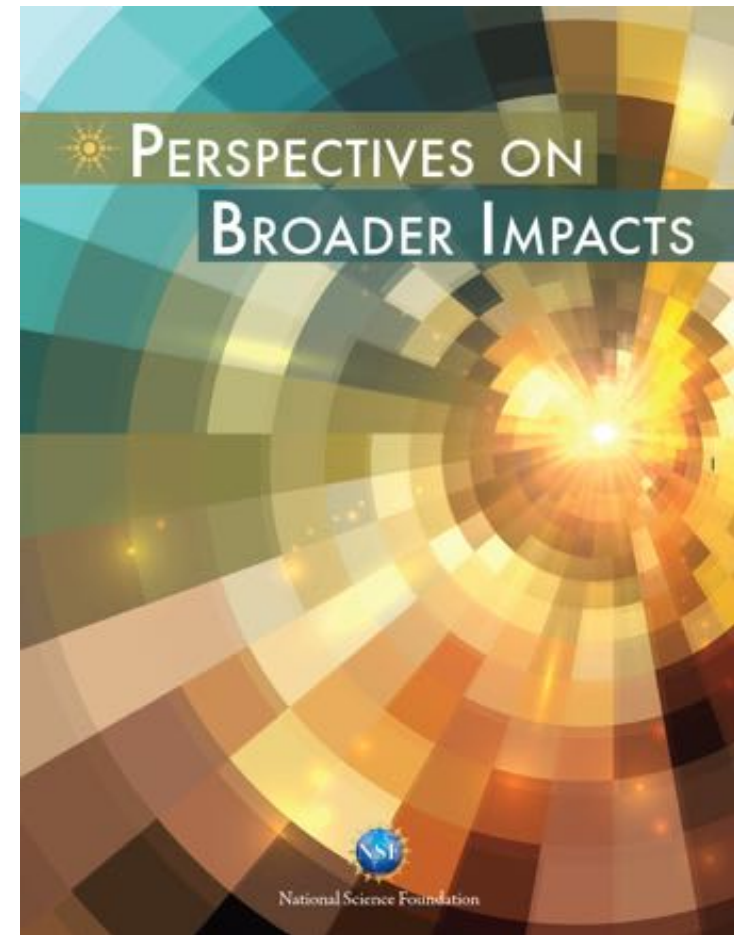
- Cubesat Solicitation Deadline
 - Submissions where due June 13th
 - Google [NSF CubeSat](#)
 - Support for 1-2 missions at total cost \$1.2M each
- CubeSat-Enabled Science and Engineering meeting has generated significant interest in collaborations with CISE/CNS and ENG/ECCS
 - Focused novel science applications of CubeSats and CubeSat constellations





Broader Impacts

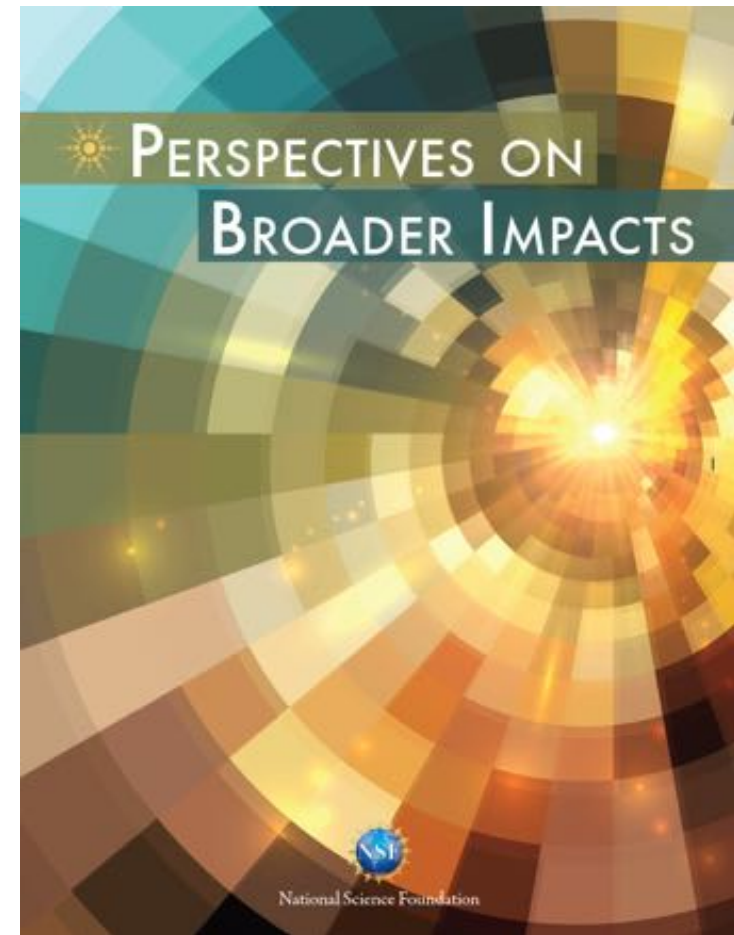
- The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired **societal outcomes**
- BI will depend upon many factors including size, duration, expertise, and field
- All proposals must address this evaluation criteria
 - PI has flexibility to chose the right fit for their project
 - Strong BI increases your chances for success





Broader Impacts

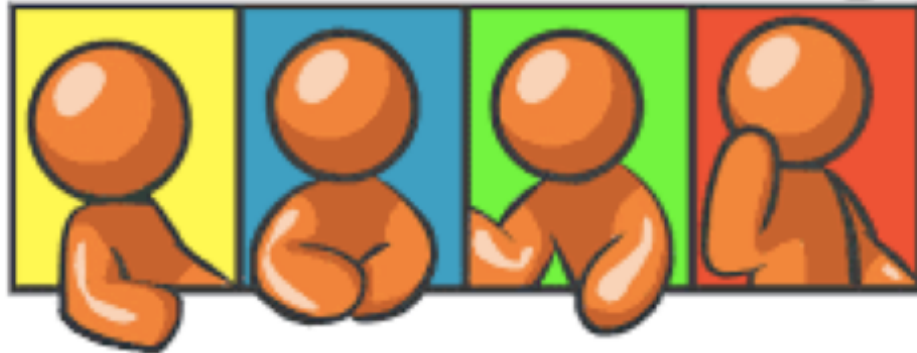
- Potential Broader Impacts
 - Increased participation of women, persons with disabilities, and underrepresented minorities in STEM
 - Improved STEM education at any level
 - Development of globally competitive STEM workforce
 - Increased public scientific literacy and public engagement with S&T
 - Increased partnerships between academia, industry, and others
 - Increased national security
 - Increased economic competitiveness of US
 - Enhanced infrastructure for research and education
- Not a checklist – remain open to other options





Further Discussions

Town Hall Meeting



- We will be participating in the CEDAR town hall session
 - Wed 12:30 -13:30 – Eldorado Zia
- Geospace Team will be around all week and looks forward to additional conversations



Questions

- Happy to provide answers 😊