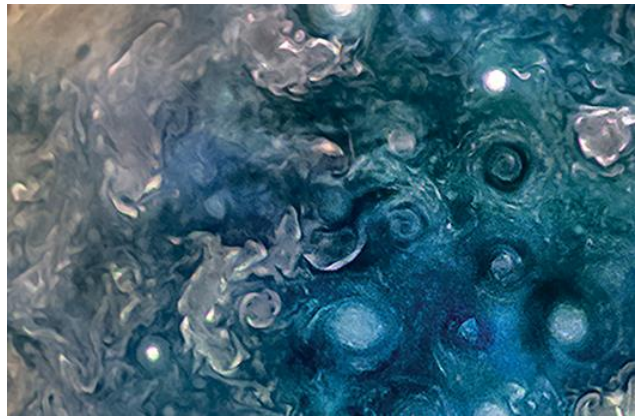
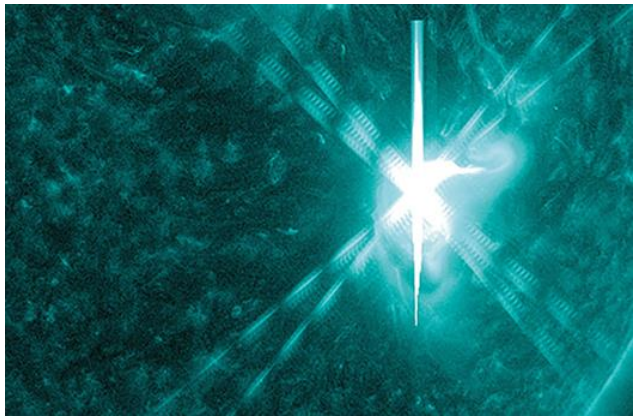
SCIENCE

National Aeronautics and Space Administration



MEETING OF THE HELIOPHYSICS ADVISORY COMMITTEE

SMD Actions and Research

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Excellence and Innovation

- Excellent and innovative teams require diverse opinions and perspectives
- In turn, such teams must foster a community where everyone feels safe
- Encouraging healthy behavior through actions is paramount
- Illuminating current behaviors is the first step in moving forward.

Understanding the Research & Analysis Programs

- Goal: Discover if there are any large-scale gender biases in SMD's grant proposal evaluation and selection processes.
- Approach:
  - Analyze the (inferred) genders of the *PIs* of proposals and awards from ROSES-2015 for both solicitations in aggregate and for each ROSES appendix (solicitation, program).
  - Used the webservice gender-api.com to infer the genders of the PIs.
  - Report the results using three possible inferred genders: inferred male, inferred female, and unknown.
    - Use "unknown" for names that gender-api returns a confidence of <95%.
  - It is important to note that the "inferred genders" used in this study are not "gender identity" nor do the possible values of inferred gender reflect the true range of human gender identification.

Analysis results

- Examined ~4,000 proposals. APD Guest Observer Programs excluded.
- Overall selection rate was 24.1%.
- Percentage of *inferred* female proposal PI's was 20.0%.
- Percentage of *inferred* female awardee PI's was 21.6%.
- No significant variation between science divisions.
- The solicitation, evaluation, and selection processes used by SMD do not appear to be grossly biased against applicants with female-sounding first names.
- No data to look at academic age or ethnicity/race/culture of proposers and awardees. OCS is collecting ethnicity/race/culture data as well as self-reported gender. Early analyses are consistent with this analysis.
- NOTE: PI demographics does *not* match PhD population demographics (20% vs. up to 40% female). Bottleneck?

Understanding PI-led Mission Programs

- Goal: Uncover the gender statistics of PI-led mission program proposal PI's.
- Approach:
  - Construct database of full mission proposals submitted to SMD AO's.
  - *Infer* genders of PI's through "open-source intelligence" approaches (≈cyber-stalking).
  - Look at programs in aggregate and by program line/division.

Analysis results

- Examined 344 proposals submitted between 2001 and 2018 to 19 AO'S across 5 mission lines (Explorer, Discovery, New Frontiers, Mars Scout, Earth Venture Missions) covering all four SMD science divisions.
- Less than 10% of PI's were female.
- Stark difference to the R&A Program.
- 88% of those PI's who were female applied to PSD solicitations (Discovery, New Frontiers, Mars Scout).
- What causes the divisional difference? Why the poor numbers in general?

Understanding Impact versus Risk

- Goal: Examine level of risk aversion in the R&A program
- Addresses NAS recommendation: "NASA needs to investigate appropriate mechanisms to ensure that high-risk/high-payoff fundamental research and advanced technology-development activities receive appropriate consideration during the review process." *Review of the Restructured Research and Analysis Programs of NASA's Planetary Science Division, 2017, p. 31.*
- Approach:
  - Ask peer reviewers to rate the potential impact and intellectual risk of each proposal (after Merit, *etc.,* scores have be finalized).

Definitions

- **IMPACT:** How large an effect on current thinki
  practice would this project have, if successful?
  - Three choices: high (H), medium (M), low (L)

NOTE: This is not implementation risk, *i.e.,* will the proposed approach work?

- **RISK:** To what extent would this proposal test novel and significant hypotheses, for which there is scant precedent or preliminary data or which run counter to the existing scientific consensus?
  - Three choices: A great extent (G), to some extent (S), little or none (L)

Analysis results

- Examined 1,577 proposals submitted to ROSES-2017 across all four Divisions.
- 10% of proposals were judged to be high-impact/high-risk.
- 24% of all proposals (regardless of risk or impact) were selected for funding.
- 35% of high-risk/high-impact proposals were selected for funding.
- Merit score driven by perceived impact regardless of perceived risk.
- Panel process seems agnostic to risk level for proposals judged to have high-to-moderate impact.

Translating Knowledge into Action

- Promoting diversity for both grants and PI-led missions through new language in ROSES and in AO's, including how to report discrimination and harassment.
- All review panels now include a discussion of cognitive (implicit) biases. Many are shown an OCS-produced video. Overall, this has been well-received.
- Providing resources to report concerns.
- Partnering with the Office of Diversity and Equal Opportunity.
- New detail position: Diversity and Inclusion Lead.
- Continued evaluation of impact and risk for grant proposals.
- Examining alternate means of soliciting high-risk/high-impact proposals. Consulted with Dr. Dan Kahneman.

More actions

- Working to implement new grant terms and conditions based on NSF's.
- Piloting a "Code of Conduct" for panelists to eliminate bullying, *etc*.
- Examining barriers to diversity and inclusion within NASA and the broader science community
  - Quantitative approaches: "PI Pathways Database" and analysis, evaluation of effectiveness of the NESSF program, evaluation of HOPE program
  - Qualitative approaches: PI Diversity Workshop with AAU, participating in OSBP's "Road Shows" at Clark Atlanta University and University of Hawai'i
  - Policy approaches: Streamlined Class D Missions & TMC evaluation guidelines, partnering with SOMA to create TMC evaluation standards