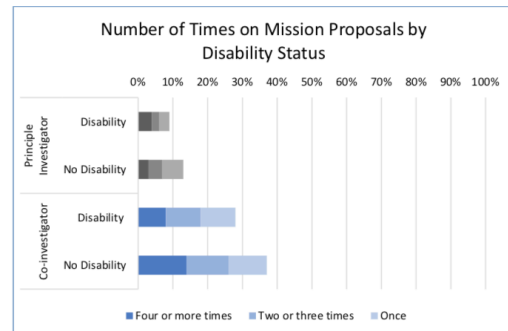


**DEIA IN PLANETARY SPACECRAFT MISSION SCIENCE TEAMS.** J. A. Rathbun<sup>1</sup> E. G. Rivera-Valentín<sup>2</sup>, L. C. Quick<sup>3</sup>, J. Bayron<sup>4</sup>, F. Rivera-Hernández<sup>5</sup>, E. P. Turtle<sup>6</sup>, <sup>1</sup>Planetary Science Institute ([Rathbun@psi.edu](mailto:Rathbun@psi.edu)), <sup>2</sup>Lunar and Planetary Science Institute (USRA), <sup>3</sup>NASA Goddard Space Flight Center, Greenbelt, MD, 20771 <sup>4</sup>American Museum of Natural History, <sup>5</sup>Georgia Tech, School of Earth & Atmospheric Sciences, <sup>6</sup>John Hopkins University Applied Physics Lab.

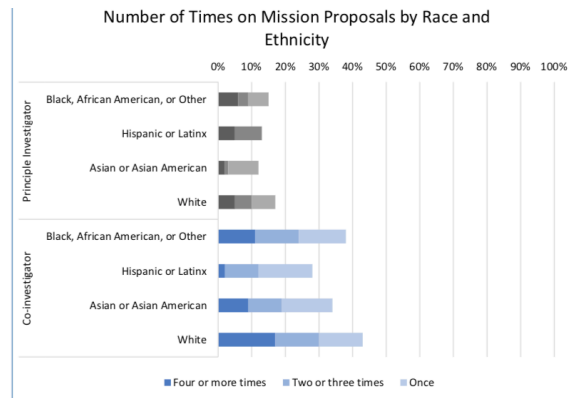
**Introduction:** Not only does the planetary science community lack diversity [1-3], the subset of the community that participates on planetary spacecraft mission science teams is even less diverse than the community as a whole [1, 4].

**Results of 2020 Workforce Survey:** The April 2020 survey of Planetary Scientists, which was conducted by the Statistical Research Center of the American Institute of Physics (AIP) and funded by the American Astronomical Society (AAS)’s Division of Planetary Science (DPS) asked participants how many times they had been involved in Research, Instrument, or Mission proposals as a Principal Investigator (PI) and, separately, as a Co-Investigator (CoI) [1]. They found that most respondents had been involved in a research proposal as a PI (93%) and CoI (93%) while fewer respondents had been involved in an instrument proposal (23% as PI, 39% as CoI) or mission proposal (16% as PI, 31% as CoI). Note: these numbers are based on preliminary data.

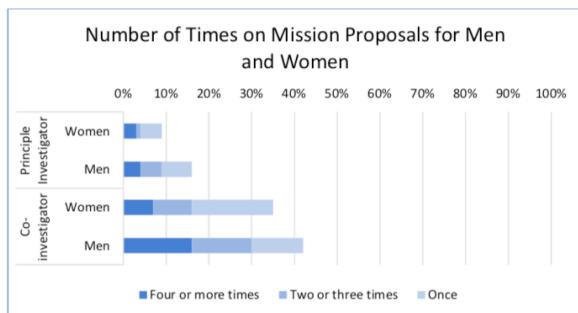
Answers to questions about mission involvement were correlated with answers to demographic questions and the results show that members of historically represented groups were more likely to be involved in spacecraft mission proposals than were non-white scientists, scientists who are disabled, members of the



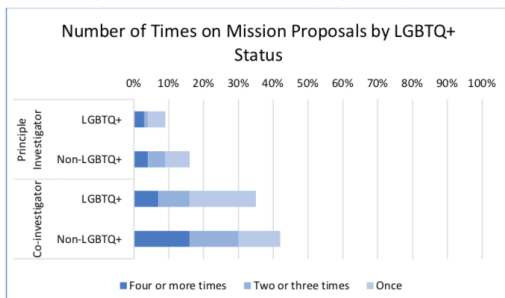
Findings shown in color were statistically significant,  $p < .05$ . Disability status did not include respondents over 60 years old, who also indicated they were deaf, hard of hearing, or had serious difficulty standing, walking, and climbing stairs.



Findings shown in color were statistically significant,  $p < .05$ . Other Race/Ethnicity included respondents who are Native American/Alaska Native, Native Hawaiian /Other Pacific Islander, or wrote in another Race/Ethnicity. These groups were too small to report separately and were combined for analysis.



Findings shown in color were statistically significant,  $p < .05$ .



Findings shown in color were statistically significant,  $p < .05$ . LGBTQ+ included respondents who identify as gay, lesbian, bisexual, transgender, another sexual orientation, or another gender identity.

LGBTQ+ community, or women [1]. The figures below show the correlated responses for four different axes of underrepresentation [1].

**Conclusion:** Being part of a planetary spacecraft mission science team is a career goal for many planetary scientists. With it comes access to brand new data, longer-term funding, and a sense of awe, exploration, and collaboration as part of a team. It can lead to a cascade of opportunities from publication, conference and public presentations, to membership in and leadership of subsequent mission teams, and prestige in the community [4]. As a result, participation in planetary spacecraft mission teams can be used a measure of success within the field. From the survey results, we see that members of historically excluded groups, even after they have overcome barriers to participating in the field, are still experiencing barriers to success within the field itself. For example, The au-

thors are aware of only two women of color who are original Co-Is on current planetary spacecraft mission sciences teams.

**Recommendations:** In order to increase the diversity of planetary spacecraft mission science teams, and therefore, to enable those teams to do the best science, NASA should (1) consider self-reported team diversity when selecting teams and make this as important a consideration as institutional diversity or programmatic balance. Proposal calls should make it clear that diversity along multiple axes (e.g., race, gender, LGBTQ+ status, career stage, etc.) is important and care should be taken to avoid exclusionary diversity practices such as colorless diversity efforts and efforts that only promote diversity along binary gender axes or tokenism; (2) require teams to work with DEIA (Diversity, Equity, Inclusion, and Accessibility) experts in order to do comprehensive studies of mission workplace climate including both surveys and interviews of team members; (3) allow PIs to request funding for a finite number of unnamed Co-Is who can be added to teams at a later time to ensure that expertise reflects scientific progress over time and that team demographics accurately reflect the U.S. population; (4) support programs to provide opportunities for early career scientists to gain experience during mission development and mission operational phases, as well as opportunities to progress in mission roles over time; and (5) make it easier for teams to remove known harassers, bullies, and those who practice discriminatory behavior. We believe that the requirement that teams proposing to the PRISM call include solid Inclusion Plans is an excellent first step to implementing the above recommendations.

**References:** [1] Porter, A. et al. (2020) AIP report [https://dps.aas.org/sites/dps.aas.org/files/reports/2020/Re-sults\\_from\\_the\\_2020\\_Survey\\_of\\_the\\_Planetary\\_Science\\_Workforce.pdf](https://dps.aas.org/sites/dps.aas.org/files/reports/2020/Re-sults_from_the_2020_Survey_of_the_Planetary_Science_Workforce.pdf) [2] Rathbun J. A. et al. (2021) *LPS LII*, #2094. [3] Rivera-Valentín E. G., et al. (2021) *LPS LII*, #2163. [4] Rathbun, J.A., 2017, *Nat. Ast.*, **1**, id 0148