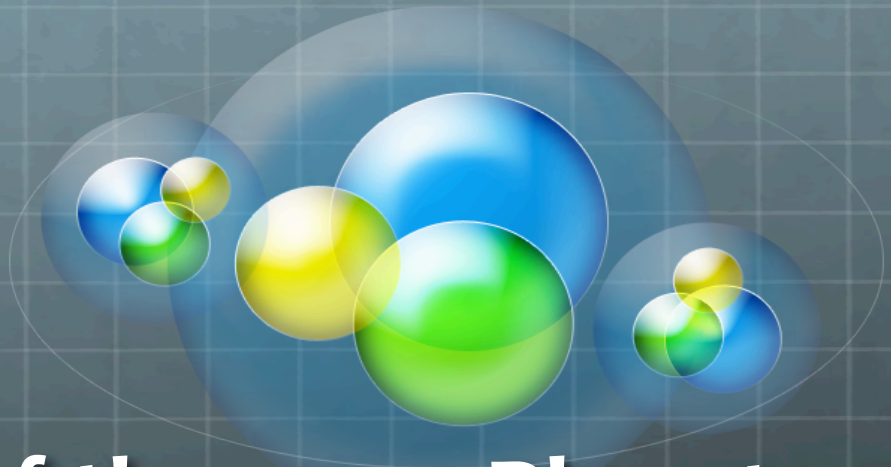

Results of the 2020 Planetary Science Workforce Survey

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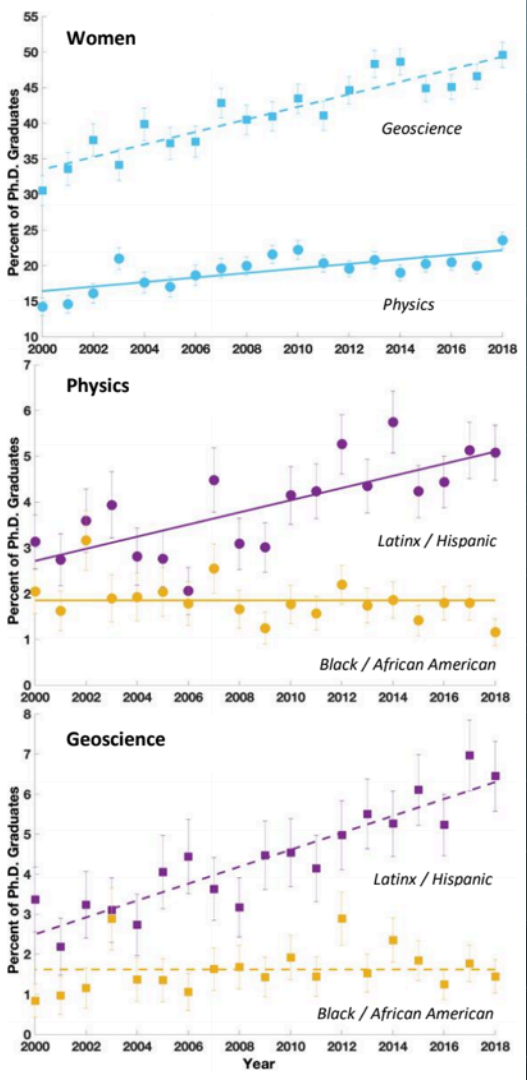
Background

- DPS surveyed its members in 1989, 1995, 2005, and 2010 (only included DPS members)
- 2011 Planetary Science Workforce Survey initiated by Fran Bagenal and used AIP to administer the survey
  - Sent to members of DPS and AGU (planetary division) and to LPSC email list
  - Found that DPS members were ~27% of community
- 2020 DPS combined its members survey with a wider workforce survey
  - Sent to members of DPS, GSA (planetary division) and to LPSC email list
  - Questions based on previous DPS surveys, previous AAS surveys, and the 2011 workforce survey
  - Like the 2011 survey, administered by the AIP
  - Sent to 4965 members of the community
    - 48% response rate, 38% of respondents members of DPS

While diversity has increased, lack of gains in race/ethnicity

- Increasing percentage of planetary scientists that identify as women, non-binary, LGBTQ+ but all remain below parity with the US population and studies show all these communities still face increased barriers (such as harassment [1-3])
  - Percentage of scientists identifying as Hispanic/ Latinx has also increased, but NOT in proportion to their increase in US population
  - Percentage of scientists identifying as Black/ African-American has remained flat over last 4-5 decades.
  - More data in [4] (ex: NCLF →)



Lack of diversity (cont.)

- NASA (and others) programs aimed at increasing diversity currently concentrate on women (and girls) and MUST be focused on Black and Latinx populations
- Programs to increase diversity MUST work within an intersectional framework or they will only work on largest groups (see presentation by Elizabeth Cole to NASM study on Increasing Diversity and Inclusivity in the Leadership of Competed Missions)
- Consider other axes: Disability and Accessibility [5], LGBTQ+ [6], Mental Health [7]
- There are also issues specific to Native/Indigenous planetary scientists [8-9]. Furthermore, gender is NOT binary [10].

Many Planetary Scientists have unstable funding

- 31% are employed by a Research Institute, which are generally soft-money positions
  - 42% are primarily employed by a University or four-year college, but only 25% tenured
  - 10% are primarily employed by a NASA lab or other federal agency
  - Compare the 52% in likely funding stable positions to 68% for astronomy
- LGBTQ+ scientists more likely to be employed by a research institute (than non-LGBTQ+) and less likely by a University
- Women, LGBTQ+, Black/African-American and respondents with another or multiple race/ethnicity were less likely to work in tenured positions

Decadal Survey demographics differ from the planetary science field

- PSADS steering committee demographics do NOT reflect the field (lack input from most vulnerable)
  - ~50% at University (likely tenured), ~11% at NASA lab, ~22% at research institute, ~16% at for-profit or small LLC
- Recommendations from [11]:
  - Involve social scientists in SoP discussions
  - Ensure voices of underrepresented groups represented in final report (see DPS talk by Renee Horton)
  - Consider demographic diversity beyond gender

NASA Research and Analysis is primary funding source

- 64% have submitted at least one research proposal as PI
- 63% receive funding from NASA grants
- > ½ of non-faculty respondents receive the majority of their funding from NASA grants
- 43 % of non-faculty respondents receive the majority of their funding from NASA missions
- More information on R&A in [12-15]

Lack of diversity in mission leadership

- Vast majority of respondents have never been the PI of a mission (88%) or instrument (82%) proposal
- For each demographic group studied (race/ethnicity, gender, LGBTQ+ status, and disability status), members of the majority group were significantly more likely to be involved in missions as PI or Co-I than members of the underrepresented group.
- As a result, most mission PIs and Co-I are cis-gender, heterosexual, non-disabled, white, and male.
- Work on increasing diversity in leadership MUST use an intersectional framework.
- This committee MUST work with other NASEM committee so that improvements to the Planetary Science community are not lost

Work/Life balance is a huge problem

- 48% list balance between work and personal life as having a major negative impact on their career satisfaction (top item chosen from list)
  - Higher percentage for members of Underrepresented Minority Groups, women, and LGBTQ+ scientists (50-55%)
  - Highest for scientists identifying as a gender other than male or female (64%)
- Respondents who identify as women, LGBTQ+, or with a race/ethnicity other than white were significantly more likely to face limited opportunities for career progression, lack of career development, and lack of mentorship from senior colleagues.
- Also - 39% of respondents list level of success in obtaining funding as having a negative effect on their career satisfaction
- More information in [16-17]

Recommendation to increase NASA R&A funding

- In order to address negative impacts to career satisfaction selection rates and not total $ should be the guiding principle
- Low selection rates are likely to disproportionally affect members of underrepresented groups.
  - Members of these groups are less likely to have other sources of funding (e.g. tenured faculty or civil servant)
- R&A funds scientists at the institutions most likely to be diverse → Lower funding for R&A means a less diverse workforce
- NASA should increase funding to R&A to significantly increase selection rates, which should ideally be >30%

Recommendations to improve diversity (focusing on race)

- Why Race? (see Barbier OPAG presentation)
- See [18-19] for specific recommendations
  - DS report should explicitly recognize that current initiatives aren't helping members of underrepresented racial groups
  - NASA should create programs aimed specifically to members of underrepresented racial and ethnic minority groups, similar to the programs they currently have for women and girls
  - NASA should study ways to implement programs like the NIH's Pathway to Independence Program that enhance the number of PS&A faculty at MSIs.
  - NASA should revive and expand The Harriett G. Jenkins Pre-doctoral Fellowship Project (JPFP), which supported students from underrepresented communities
  - …

Recommendations to this group

- For future speakers (R&A, DEIA, social science)
  - Christina Richey (DEIA, Harassment, and R&A)
  - Julie Castillo (R&A)
  - Paul Byrne (R&A)
  - Edgard Rivera-Valentín (DEIA)
  - Moses Milazzo (DEIA)
  - Julie Rathbun (DEIA)
  - Elizabeth Cole (U. Michigan)
  - Someone on Importance of Language
  - Consult with other NASM committee for other possible social science speakers
- Complete the analysis of the 2020 Workforce Survey results
  - Can do other cross-correlations
  - Longitudinal comparison with 2011
  - Open-ended questions on barriers to success and what has helped with success
- Surveys can not give a complete picture, multiple social science techniques should be employed
- NASA should fund studies about the state of the profession
- Transparency – questions were raised at OPAG

Where to find more information

- A warning that the survey consists of 2 parts
  - The entire workforce (presented here)
  - Just DPS members
- Full report from AIP, raw version of questionnaire, and raw preliminary data are available at https://dps.aas.org/reports
- White paper by Hendrix, Rathbun, et al.
- For a 2-page summary of the results presented here, see https://www.hou.usra.edu/meetings/lpsc2021/pdf/2094.pdf

White Papers referenced

1. Recommendations from the CSWA Survey on Workplace Climate, Richey, et al.
2. The Preventing Harassment in Science Workshop: Summary and Recommendations of Best Practices for Planetary Science and Astrobiology, Bennett, et al.
3. Building safer and more inclusive field science, Richardson, et al.
4. Who is Missing in Planetary Science?: A demographic study of the planetary science workforce, Rivera-Valentín, et. al.
5. Breaking Down Barriers: Accessibility in Planetary Science, Piatek, et al.
6. Creating Inclusive, Supportive, and Safe Environments in Planetary Science for Members of the LGBTQ+ Community, Vander Kaaden, et al.
7. Addressing Mental Health in Planetary Science, Vance, et al.
8. Relationships First and Always: A Guide to Collaborations with Indigenous Communities, Gardner-Vandy and Scalice, et al.
9. Planetary Nomenclature and Indigenous Communities, Tiscareno, et al.
10. Nonbinary Systems: Looking to the future of gender equity in planetary science, Strauss, et al.
11. Ensuring Inclusivity in the 2023 Planetary Science and Astrobiology Decadal Survey, Rathbun, et al.
12. White Paper on Improvements to the NASA Research and Analysis Proposal and Review System, Bryne, et al.
13. NASA Research and Analysis: Status, Issues, and Recommendations for the Planetary Science and Astrobiology Decadal Survey Committee, Castillo-Rogez, et al.
14. Boldly Increase the Planetary Science Research & Analysis Budget by 50% Immediately, Retherford, et al.
15. NASA Planetary Research and Analysis: What is R&A? by Sykes, et al.
16. Enabling the Planetary Workforce to do the best science by funding work that is a service to the Profession by Rathbun, et al.
17. Professional development in the next decade: Supporting opportunities in all career paths and life events, Watkins, Zellner, and McAdam, et al.
18. Who is missing in Planetary Science?: Strategic Recommendations to Improve the Diversity of the Field, Rathbun, et al.
19. Diversity in action: Solutions for a more diverse and inclusive decade of planetary science and astrobiology, Britney Schmidt, et al.