The Planetary Science Workforce: Who is missing?

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Demographics of the Planetary Science workforce do not match US demographics


Who succeeds in Planetary Science?

- Participation on spacecraft science team is one measure of career success [4-6]
- Since 2001, percentage of women on missions has remained flat (best fit slope = 0.07), despite an increase in the number of women in planetary science [shown by dashed line] [4-6]
- 2001-2016, average percentage of women on teams 15.8%
- Of the 15.8% of women on teams, most are white women

Has the Pipeline changed?

- The percentage of Black students earning physical science bachelor's degrees has remained constant for the past 20 years [7]
- The percentage of Latinx students earning physical science bachelor's degrees has begun to increase again after remaining constant for ~10 years [7]
  - However, the percentage of Latinx in the population continues to increase, likely surpassing the increases in degrees earned
- Percentage of degrees earned by Native Americans has also remained flat at ~0.6% [8]
- Percentage of degrees earned by women has remained flat at ~40% [9]

Conclusions

The planetary science workforce is not nearly as diverse as the society from which membership is drawn and the majority of our funding comes [10].

- Women (of all races) remain underrepresented in spacecraft science teams.
- Racial minorities (other than Asian) are, and have been, the most underrepresented group in planetary science.
- More than 95% of scientists of color are not retained in the planetary science community.
- White women are much closer in representation to white men than to women of color.
- Gender- or colorblind approaches do not work. Beliefs in "innate talent" or meritocracy can yield more unequal access and participation [e.g., 11-14]

Once in the workforce, there are further barriers to success for underrepresented groups [10]

- In particular, the low numbers of women of color in the field directly affects the number of women of color on spacecraft science teams.

Who in the field? - Planetary Scientist Pipeline

<table>
<thead>
<tr>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>1661</td>
</tr>
<tr>
<td>Latinx</td>
<td>382</td>
</tr>
<tr>
<td>Black</td>
<td>355</td>
</tr>
<tr>
<td>Asian</td>
<td>146</td>
</tr>
<tr>
<td>Other</td>
<td>62</td>
</tr>
</tbody>
</table>

Who's going into the pipeline?

Assumptions:
1. Demographics of the group going into the pipeline matches the 2010 US census distribution
2. Number of white men going in = number coming out.

What percentage of each group makes it from the US population, through the pipeline, to become planetary scientists?

- Women of Color (not including Asian women) are the most underrepresented group in science, being more underrepresented than white women by a factor of 10.
- The representation of other racial identities, such as indigenous peoples, were so low that they were not included in this analysis, a testament to gross underrepresentation in the field.

Recruitment Recommendations

More recruitment and retention efforts need to focus on the groups that are the most underrepresented in planetary science: racial minority groups. In addition to continued gender-focused efforts, we suggest:
1. Focused recruitment from Minority Serving Institutions, such as HBCUs, HSIs, and tribal colleges
2. Developing mentorship networks such as those that support women in STEM
3. Targeting internships, scholarships, fellowships, summer schools, etc. to scientists of color

What can you do?

- Learn about issues affecting members of our community who are also members of underrepresented groups.
- Pay attention to who you work with. Who is missing from your collaborations? E.g., If most of your collaborators are men, pay attention to the work of women scientists. If most are white, pay attention to work by scientists of color. Invite their participation.
- Also, pay attention to who is included in meeting organization, speakers [15], award nominees, etc.
- Actively seek out collaborations with professors from minority serving institutions on NASA-funded projects
- Attend Bystander Intervention Training (by Moses Milazzo, see poster on Thursday [16])
- Fill out demographic information requested by professional organizations and the NASA NSPIRES system

References:
1. White, et. al. 2011 [http://epa.colorado.edu/home/map/planetary/2011_on_project.html]
5. Rathbun, J. A. (2016) DPS, 332.01
15. Klein, et al., 2017, Nature Immunology, 18, 475-476