Women of Color in the Planetary Science Workforce: General participation and membership within spacecraft mission teams

Women on science teams of Planetary robotic missions

- Most of the women on NASA mission science teams are white women.
- Planetary scientists have different career pipelines and trajectories than astronomers
  - May be trained as geologists, chemists, physicists, astronomers, and biologists
  - May work at universities, NASA centers, federally-funded research and development centers (such as JPL, APL, LPI), or non-profit institutes (such as SWRI, PSI, or Smithsonian).
- Membership on a robotic spacecraft science teams is one measure of success
  - Leads to new data, financial security, opportunities for major presentations and future missions
  - Initial membership can be difficult to attain, as flight experience is highly valued.

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

- 2001-2016, average percentage of women on teams is 15.8%

Conclusions

- Not only is there a pipeline problem for women in planetary science, there are additional barriers to success in the field even once women are in the field.
- Asian Americans are represented in planetary science at rates almost as high as whites.
- Women of Color (not including Asian women) are the most underrepresented group in science.
- White women are closer in representation to white men than to women of color
  - For every 3 white men that make it through the pipeline there is 1 white woman.
  - For every 20 white women that make it through there are only 1-2 women of color.
- More than 95% of potentially talented women of color are being left behind and kept out of the planetary science community.
- The low numbers of women of color in the field directly affects the number of women of color on spacecraft science teams.
- Purely gender-focused efforts are unlikely to sufficiently help women of color remain in the field.

Recommendations

- Future demographic studies of the Planetary Science workforce should consider and report race and gender simultaneously to determine the role of intersectionality on participation in planetary science.
- Recruitment and retention efforts need to focus on the groups that are the most underrepresented in planetary science: racial minority groups.
- More studies are needed into the barriers to equal representation along the entire pipeline, including within planetary science.

Women of Color (not including Asian women) are the most underrepresented group in science, with only 5-10% the success rate of white women

Planetary Scientist Pipeline

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?

<table>
<thead>
<tr>
<th></th>
<th>Success rate men</th>
<th>Success rate women</th>
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</thead>
<tbody>
<tr>
<td>White</td>
<td>100%</td>
<td>32%</td>
</tr>
<tr>
<td>Latina</td>
<td>5%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Black</td>
<td>5%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Asian</td>
<td>92%</td>
<td>30%</td>
</tr>
<tr>
<td>Other</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
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Numbers of planetary scientists are calculated based on [3]: Used total number of scientists contacted, response rate, and percentage that self-identify as planetary scientists to calculate 2356 total planetary scientists. Determined total numbers in each demographic based on reported percentages and assuming that percentage of women is constant across racial lines (percentages shown at left).

Our own count of Black and Latina planetary scientists shows that men do not significantly outnumber women as they do for white scientists. However, our count does agree that there are small numbers of planetary scientists from both groups. Assuming equal numbers of men and women, the success rate for Black and Latina women and men are all approximately 3%.

Demographics of the Planetary Science workforce do not match those of the US population