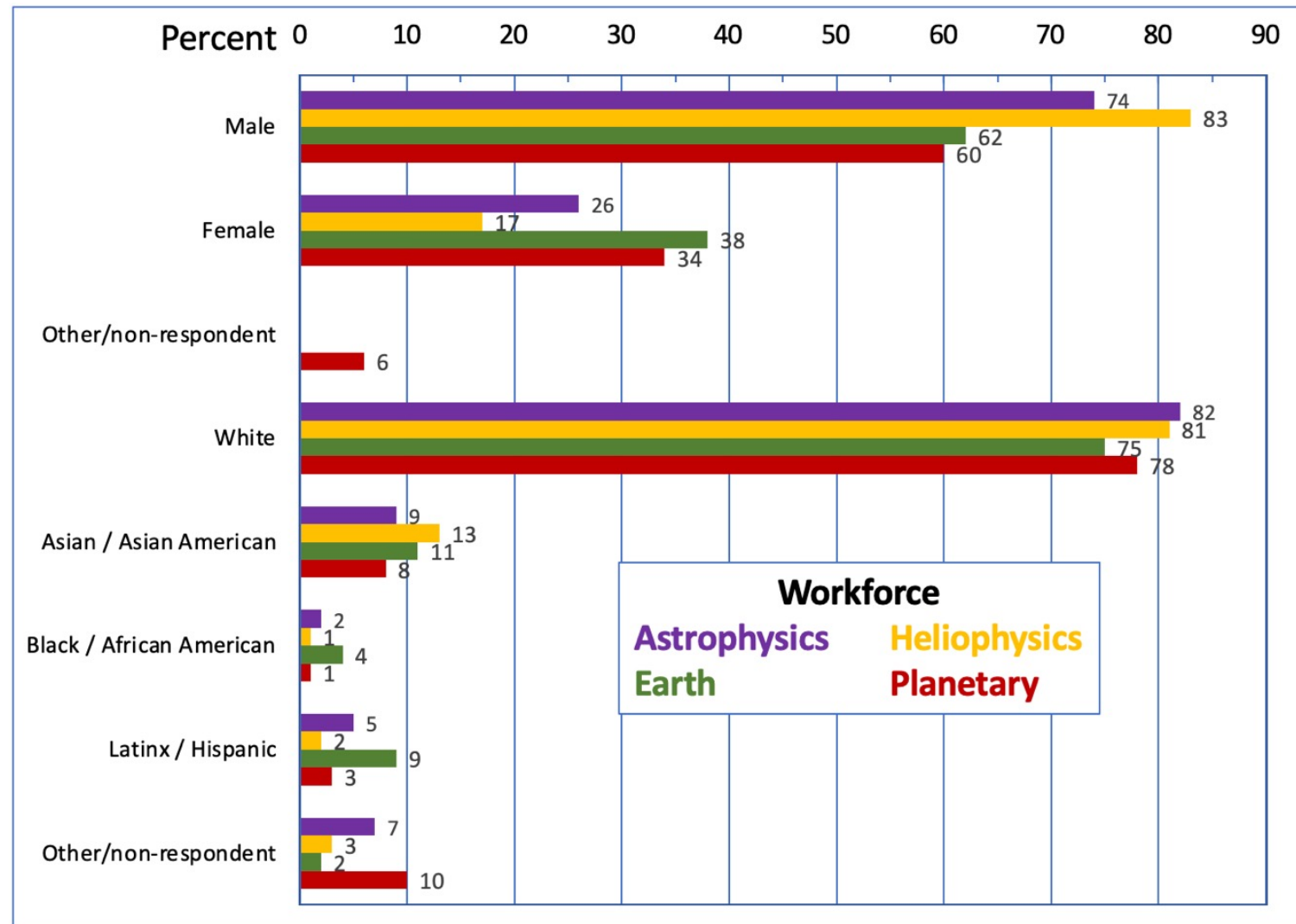


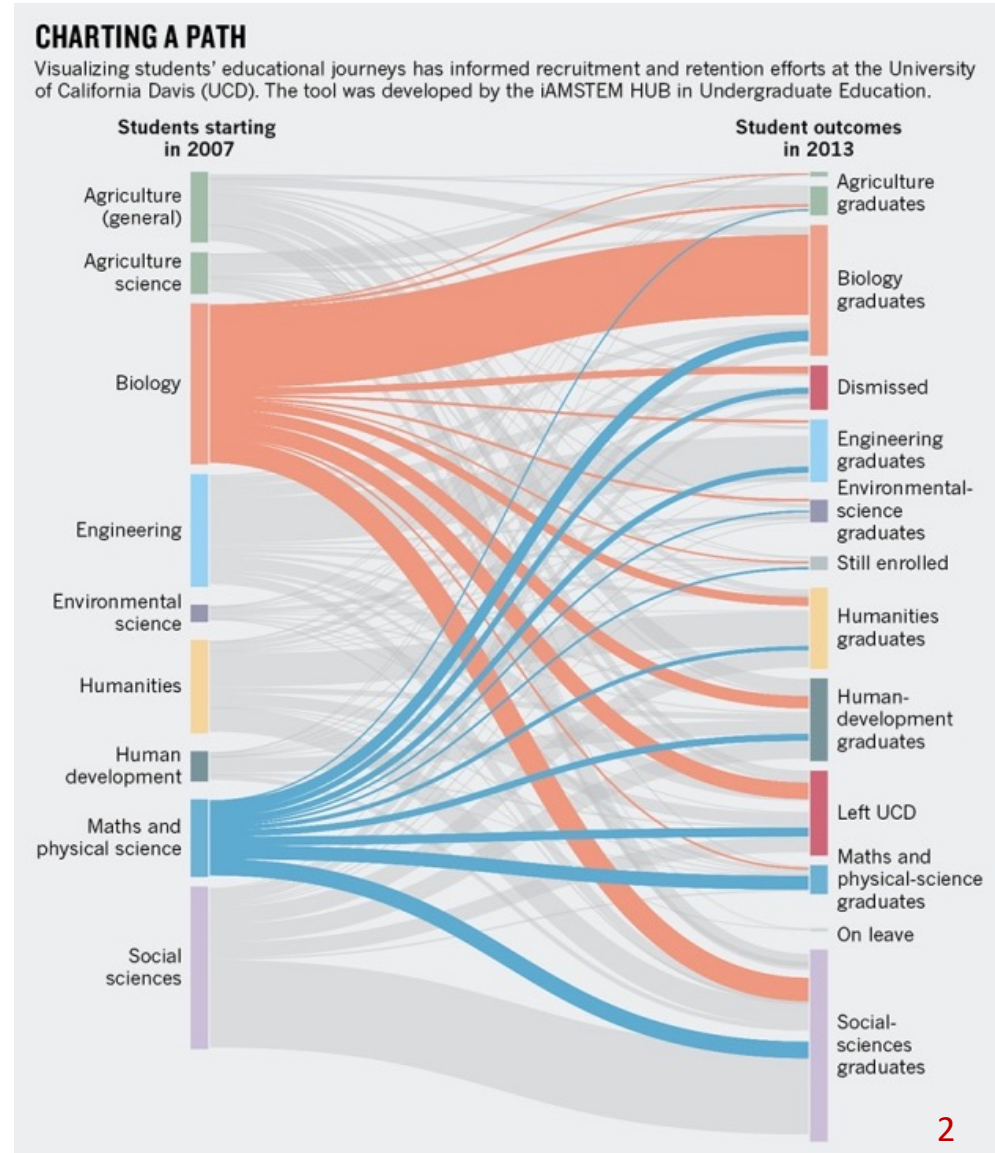
Demographics Space Sciences Workforce

- Women slowly catching up
- Non-White racial groups remain severely under-represented
- Why so low?
Why so slow?

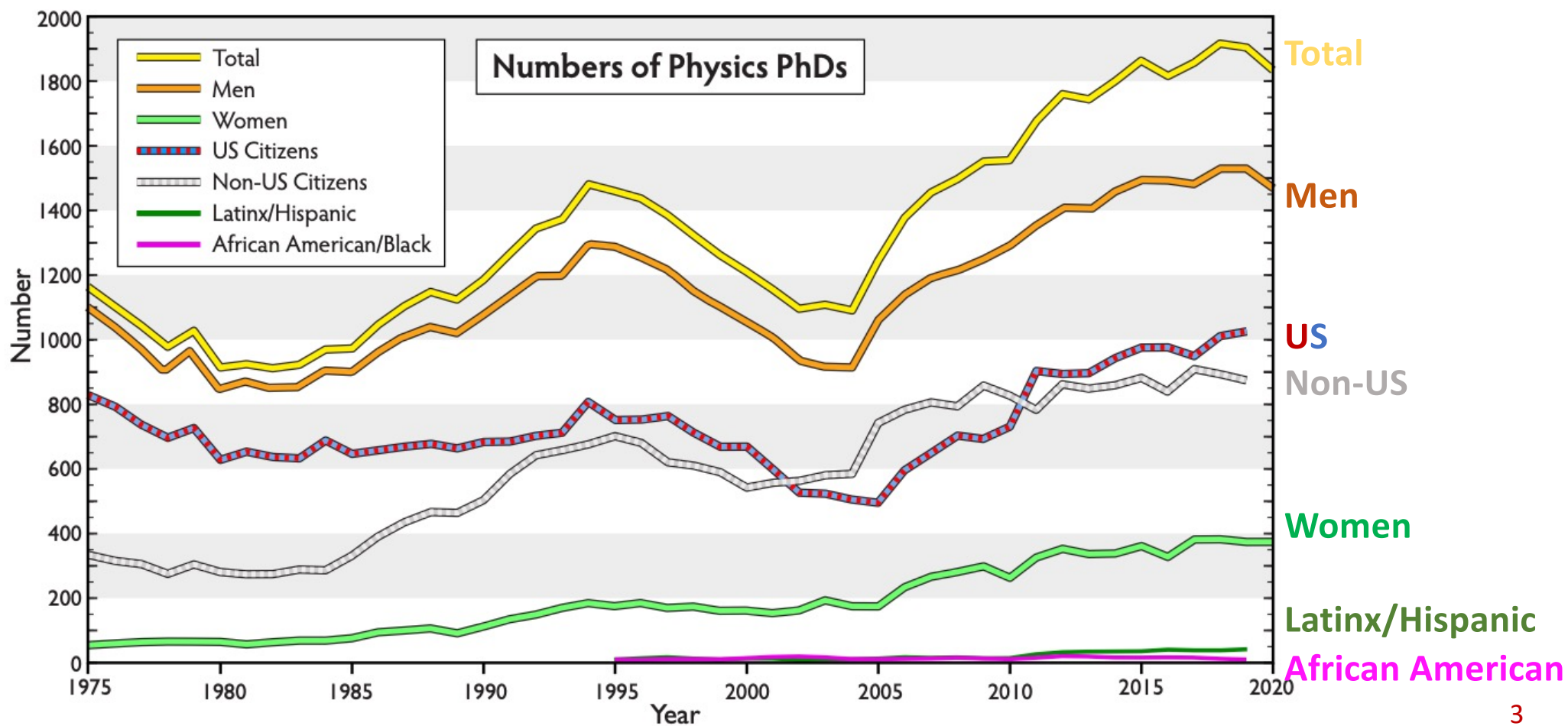


Key Drop Out Point

- Undergraduate math & physics courses
- Only 20% of all math & physical science UGs persist to graduation
- What's the story at your institution? Got data?!
- Read *Talking about Leaving Revisited*



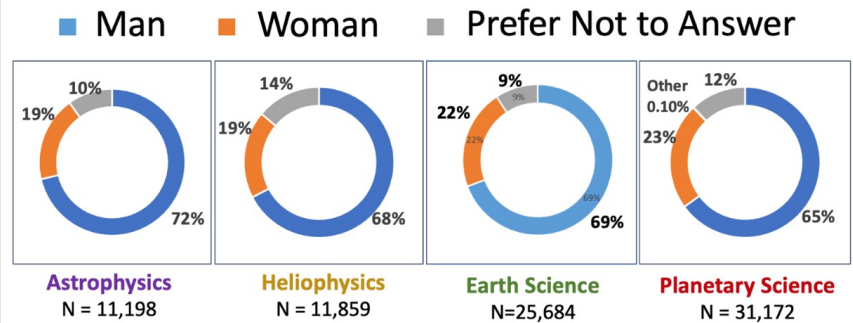
Demographics of PhDs



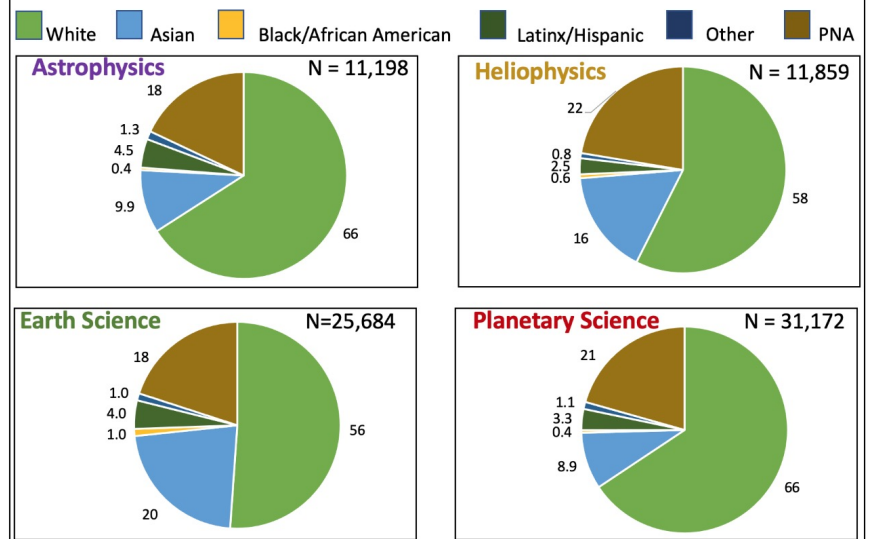
Demographics: NASA Proposals

- NSPIRES online submission asks for personal profiles
- High percentage of "Prefer not to answer"
- Limited options for gender and race/ethnicity
- Similar across SMD divisions
- Women 19-23%
- African American & Latinx/hispanic under-represented

NSPIRES Gender Participation:
All PIs & Co-Is 2014 - 2020



NSPIRES Race/Ethnicity Participation:
All PIs & Co-Is 2014 - 2020



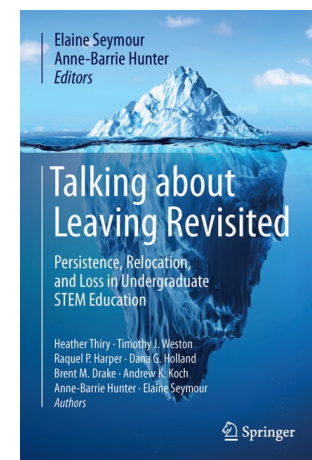
Fran's Thoughts

- Decadal Survey needs panel on State of the Profession
- NASA ROSES data on demographics needs work
- Compare/combine NASA ROSES & NSF demographic data
- Read AIP 2011 Solar, Space & Upper Atmospheric Physicists Survey – interesting reading!
- For DS employ AIP to do demographics survey of solar & space physics workforce – AGU, AAS-SPD, Space Weather Week, CEDAR, etc.
- How to diversify workforce all along career pathways?
- Read *Talking about Leaving Revisited* – 1st year math/physics key!!

References

Slide 1. Statistical Research Center of American Institute of Physics <https://www.aip.org/statistics> & NSF <https://www.nsf.gov/statistics/2018/nsf18304/>
Solar & Space Physics 2013 Workforce Survey <http://dx.doi.org/10.7302/25>

Slide 2. Bradforth et al. (2015) University learning: Improve undergraduate science education, *Nature* 523: 282-284, <https://doi.org/10.1038/523282a>
Talking about Leaving Revisited, Seymour, Hunter (eds), Springer 2020 – or all 528 pages online here: https://casa.colorado.edu/~dduncan/wp-content/uploads/2019_Book_TalkingAboutLeavingRevisited.pdf



Slide 3. Data from the Statistical Research Center of the American Institute of Physics <https://www.aip.org/statistics>

Slide 4. Office of the Chief Scientist, NASA Headquarters. Barbier, L., Wilson, C., SMD Summary Demographic Data. Presentation to the National Academies Committee on Increasing Diversity and Inclusion in the Leadership of Competed Missions. June 16, 2021

Also:

Soon to be released report from Committee on *Increasing Diversity and Inclusion in the Leadership of Competed Space Missions*, National Academies of Science, Engineering, Medicine
<https://www.nationalacademies.org/our-work/increasing-diversity-in-the-leadership-of-competed-space-missions>

SOARS Program

(<https://soars.ucar.edu/>)

Reasons for the Lack of Diversity in Geosciences include:

- Lack of awareness of career opportunities in the field.
- Lack of math and science preparedness in underserved secondary schools.
- Feelings of isolation, stereotype threat, and imposter syndrome.
- Implicit biases – including bias amongst race/gender in recommendation letters.
- Lack of a representation and a sense of belonging in the field
- Accumulation of disadvantages, and systemic racism.



air • planet • people

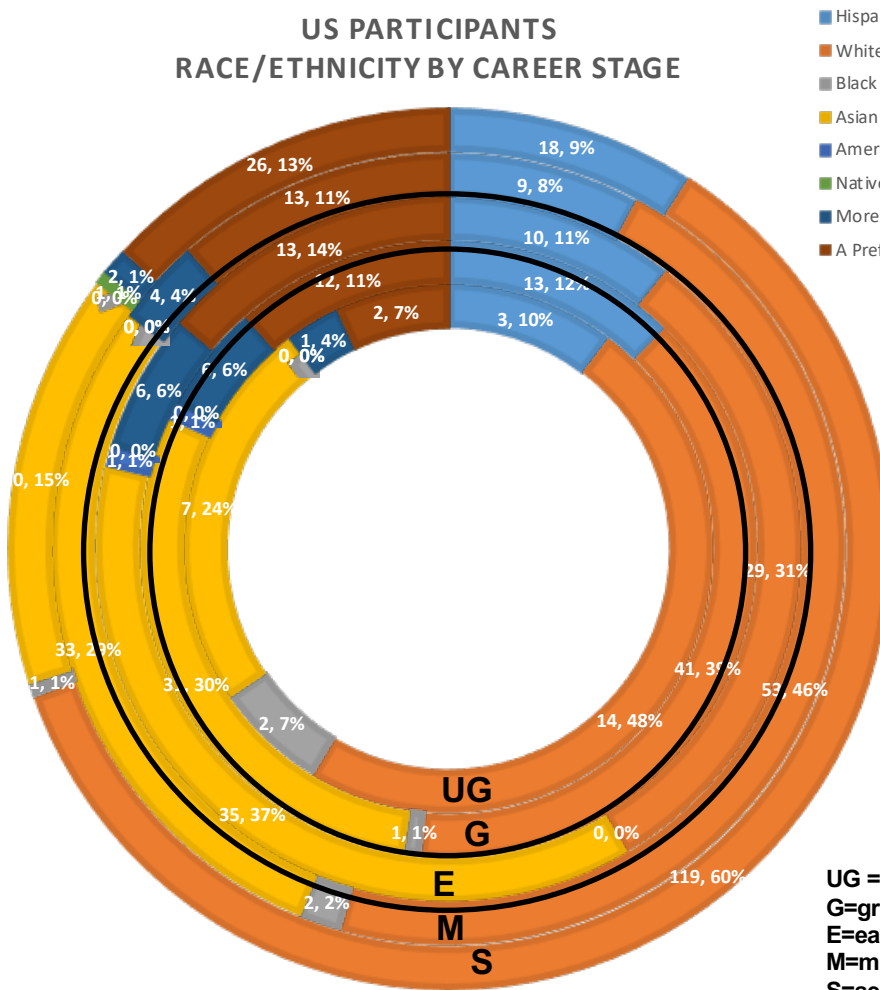
SOARS Applicants May Reflect the Following:

- Majors that are not in atmospheric sciences, and/or courses that are not fully-aligned with traditional atmospheric science degrees.
- Changes and/or interruptions during their academic pathways.
- Lower GPAs, especially in the first-year of college.
- Variable(biased) letters of recommendation.
- Students working while in school to support themselves and/or families.

Courtesy: SOARS Director Kadidia Thiero

CEDAR Demographics from 2021 VM vs. Special Report NSF 21-321

US PARTICIPANTS RACE/ETHNICITY BY CAREER STAGE



National Center for Science and Engineering Statistics | NSF 21-318

TABLE 4-9b

Geosciences, atmospheric sciences, and ocean sciences postdoctoral appointee and doctorate-holding nonfaculty researcher demographics and funding: 2019

(Number and percent)

Characteristic	Postdoctoral appointees	
	Number	Percent
Institutions	143	20.0
Schools	143	17.7
Units	266	1.3
All individuals	1,778	100.0
Male	1,099	61.8
Female	679	38.2
U.S. citizens and permanent residents ^a	871	
Hispanic or Latino	56	6.4
Not Hispanic or Latino		
American Indian or Alaska Native	1	0.1
Asian	90	10.3
Black or African American	15	1.7
Native Hawaiian or Other Pacific Islander	1	0.1
White	589	67.6
More than one race	29	3.3
Unknown ethnicity and race	90	10.3

Source: National Center for Science and Engineering Statistics. 2021. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2021*. Special Report NSF 21-321. Alexandria, VA: National Science Foundation Available at <https://ncses.nsf.gov/wmpd>.

People Perspectives panel 2022



“The best ERGs welcome employees from all backgrounds, and they cultivate cross-cultural relationships within and outside the organization. And the most effective ERG programs encourage cross-collaboration between and among affinity groups to take advantage of synergies, encourage knowledge transfer, and fuel business objectives.”

