



# THE NEED FOR GREATER DIVERSITY AND WAYS TO INCREASE DIVERSITY IN HPC/AI

Hyperion HPC User Forum

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# PANELISTS

- ▶ Dorian Arnold, Emory University
- ▶ Candy Culhane, Los Alamos National Lab
- ▶ Kathryn Kelley, CASC
- ▶ Jay Lofstead, Sandia National Lab
- ▶ Melyssa Fratkin, TACC (Moderator)



# QUICK REVIEW

- ▶ The state of the HPC Workforce -- what's in the data?
- ▶ Filling the pipeline – Recruiting & Readiness
  - ▶ Appealing to the next generation
- ▶ Retention – how to keep people from leaving
- ▶ Action items – things you can do now
- ▶ Discussion: What constitutes success? What can the HPC User Forum do?

# NOT MANY WOMEN IN HPC

- ▶ Women make up ~19% of our community
- ▶ Female attendance peaked at **16% for SC19**
- ▶ SC22: 13% Female, 0.5% non-binary or other gender identity
- ▶ SC23: 14% Female, 0.5% non-binary or other gender identity\*
- ▶ First paper on female participation in HPC conferences:
  - ▶ Women represent only 10% of all HPC authors



# NOT MUCH DIVERSITY EITHER

- ▶ Black people make up 12% of the US workforce but only 8 percent of employees in tech jobs, and just 3% of technology executives in the C-suite are Black.
- ▶ Black students earned only 7% of STEM bachelor's degrees in 2018, compared with 10% of all bachelor's degrees
- ▶ At Intel, 28% of Intel employees are women, while 72% are men. The most common ethnicity at Intel is White (52%). 19% of Intel employees are Asian
- ▶ At Dell, 34% of employees are women (2% better than 2021). 10% of employees are Hispanic or Latino, 15% Asian, 6% Black.

Increasing diverse participation  
is not a women's issue or an  
issue that is *only* relevant to  
underrepresented groups



# WE HAVE A PIPELINE PROBLEM

- ▶ “Addressing Diversity” is a multi-level challenge
  - ▶ Teenagers (or younger): sponsor summer camps & offer paid internships, apprenticeships
    - ▶ *Only 5% of HS students in Texas take CS*
- ▶ In a recent study, 62% of middle and high school students would consider a future career in biotechnology (26%), AI (25%), financial technology (22%), internet networks (15%), or semiconductors (11%),



# RECRUITING & READINESS

## ▶ Outreach and Education Initiatives: workshops, summer camps, internships



### ▶ CODE@TACC (high school)

<https://tacc.utexas.edu/education/k-12-students/>

### ▶ Project Lead the Way (STEM Educators)

<https://www.pltw.org/>

### ▶ EPIC – WeTeach\_CS (CS Teachers)

### ▶ ARPA-E INTEREST Program - Inspiring **N**ew **T**ransformations in **E**nergy **R**esearch by **E**merging **S**cientists and **T**echnologists (**INTEREST**), [https://arpa- e.energy.gov/career/msi-summer-internships](https://arpa-e.energy.gov/career/msi-summer-internships)





# RECRUITING & READINESS

- ▶ **Scholarships and Fellowships:** specifically for underrepresented minorities and women to remove financial barriers
  - ▶ SIGHPC Fellowships  
<https://www.sighpc.org/opportunities/fellowships>
  - ▶ DOE Computational Science Graduate Fellowships  
<https://www.energy.gov/doe-stem/events/doe-computational-science-graduate-fellowship-doe-csgf>
  - ▶ Frontera Fellowships  
<https://frontera-portal.tacc.utexas.edu/fellowship/>
  - ▶ NSF Research Experiences for Undergrads  
<https://www.nsf.gov/crssprgm/reu/>



# RECRUITING: HOW TO ATTRACT DIVERSE TALENT

- Have a Diverse talent acquisition team
- Ensure inclusive wording in job descriptions
- Anonymized Resume Screening
- Emphasize value-based hiring
- Give a sample work test
- Standardize interviews
- N8 CIR Checklist



<https://n8cir.org.uk/news/diversity-checklist/>

# WHERE TO FIND TALENT:

- Society of Women Engineers - <http://societyofwomenengineers.swe.org/>
- National Society of Black Engineers - <http://www.nsbe.org/home.aspx>
- MAES – Latinos in Science & Engineering <http://mymaes.org/>
- National Girls Collaborative Project <https://ngcproject.org/>
- Girls Who Code – <http://www.girlswhocode.com>
- Diversify Tech - <https://www.diversifytech.com/>
- Women in HPC job listings: <https://womeninhpc.org/community/jobs>
- Broaden your recruiting & collaborations to include HBCUs, MSIs, Tribal Colleges in your area

# READINESS: CAREER DEVELOPMENT

- ▶ How can we make people more ready?
  - ▶ Internships & fellowships
- ▶ First experiences can shape careers
  - ▶ Gen Z is 57% more likely to say that diversity, culture, and environment are important, and they're willing to give up a higher salary to get it.
- ▶ Career development: What skills do they need to achieve their goal?

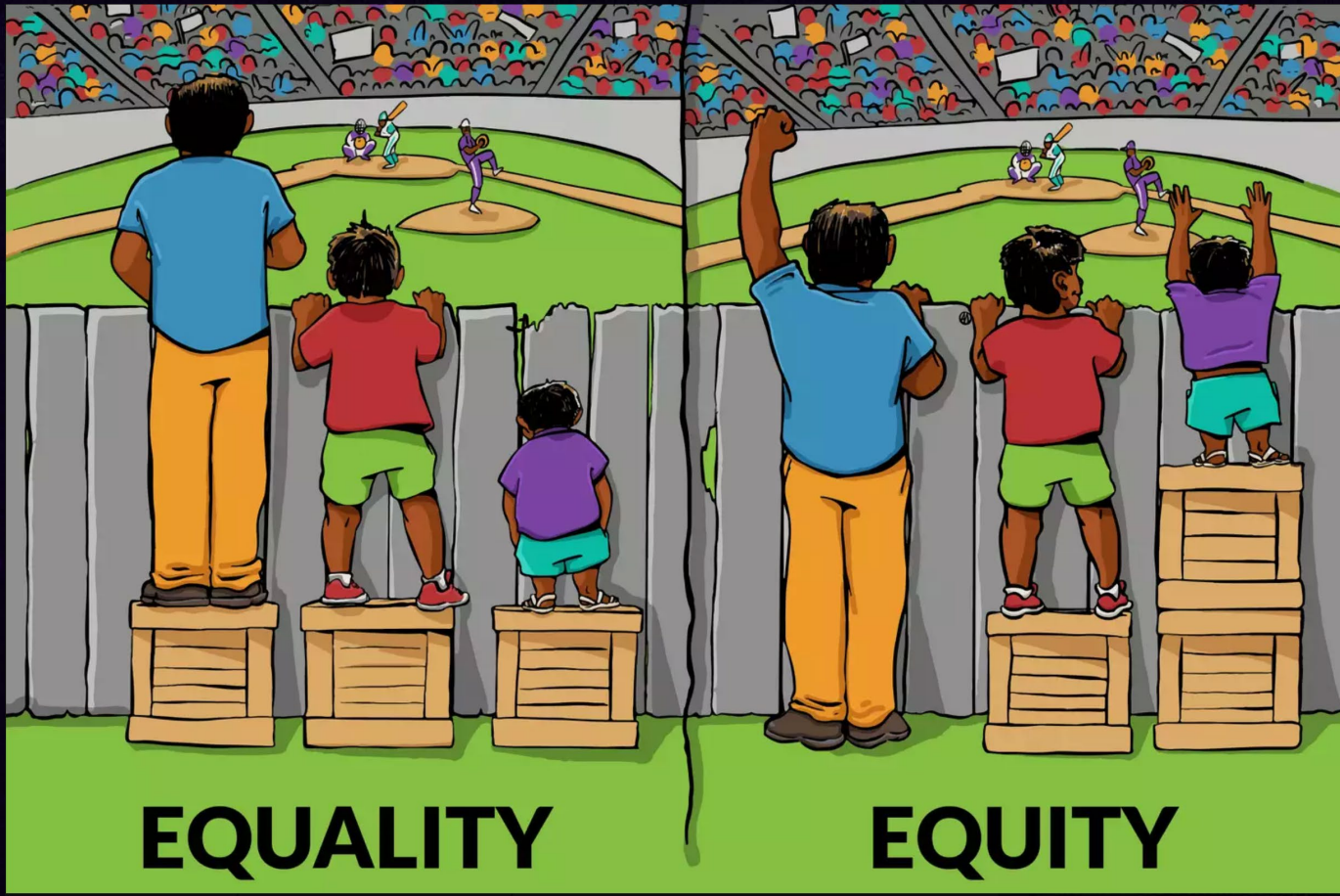


**THEY'RE HERE!...**

**NOW WHAT?**



# EQUITY IN THE WORKPLACE



INTERACTION INSTITUTE FOR SOCIAL CHANGE | ARTIST: ANGUS MAGUIRE

- ▶ Equality means that all employees have access to the same opportunities, resources, and treatment.
- ▶ **Equity** recognizes that each person has different circumstances and allocates the exact resources and opportunities needed to reach an equal outcome.
- ▶ Companies with highly engaged employees are more productive and more profitable.
- ▶ Equity improves retention and reduces burnout.

# MAKING YOUR WORKPLACE MORE EQUITABLE

- ▶ **Hire for skills, not degrees.** Can a candidate prove their qualifications with experience and skills?
- ▶ **Accommodate health conditions or disabilities.** Remote work is just one possible accommodation. Every person is different, so this will vary based on individual needs.
- ▶ **Offer flexible work schedules.** What roles at your company could be accomplished with flexible hours?
- ▶ **Provide training during work hours.** Record presentations so any employees who can't attend the live session can watch the replay.

<https://insightglobal.com/blog/equity-in-workplace/>

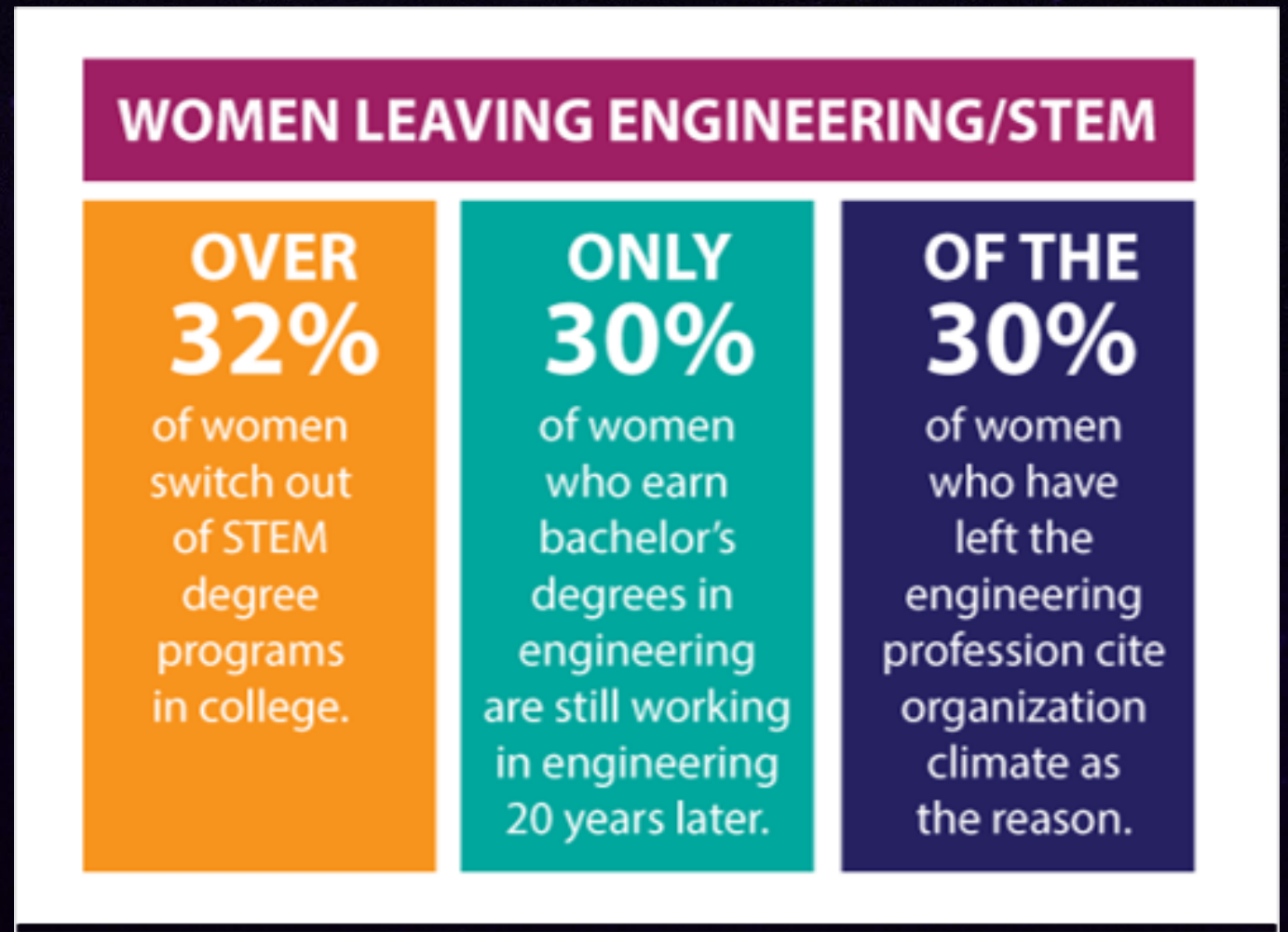
# RETENTION EFFORTS – MENTORS & SPONSORS

- ▶ A mentor is someone who shares knowledge and provides guidance. A sponsor is someone who actively promotes growth, provides access to opportunities at work, and/or advocates for career advancement
- ▶ Sponsoring someone's career means mentioning their name when projects or opportunities arise.
- ▶ It means advocating for someone to get a raise or to get sent a job description.



# RETENTION IS KEY

- ▶ In the American workforce, **Employers pay disproportionately more for long, inflexible hours.** Anyone who scales back for a time, or who is unavailable on weekends or evenings, is at a disadvantage.



*Society of Women Engineers, 2018*

# RETENTION: HPC CONFERENCES ARE NOT 'WELCOMING'



- ▶ People of different races, ethnicities, or genders have different inclusivity experiences at HPC conferences
- ▶ Perceptions of how welcoming HPC conferences and events were indicated a lack of understanding of the experiences of white women and women of color, as well as men of color.

▶ Different experiences of inclusivity at HPC conferences impact attendees' thoughts of ***leaving the HPC field***

▶ Paper on Inclusivity at HPC conferences: <https://dl.acm.org/doi/10.1145/3569951.3597580>

# BE THE PEBBLE IN THE SHOE

- ▶ If you feel strongly enough, be the pebble in the shoe. Advocate for diversity programs, modifications to hiring practices, and other activities to improve the workplace.
  - ▶ Figure out which angle resonates with management  
Is it financial? Is it competitive advantage? Planning for the future of the business?
- ▶ Be careful – sometimes the pebble has ripple effects, and sometimes it gets thrown away!



# READ, RESEARCH, LISTEN

- ▶ Newsletter: Ruchika Tulshyan – Inclusion is Leadership newsletter -- <https://www.rtulshyan.com/>
  - ▶ Her book is called *Inclusion on Purpose*
- ▶ BCG: How to Advance Gender Diversity in the Workplace
  - ▶ <https://www.bcg.com/featured-insights/how-to/advance-gender-diversity>
- ▶ Bizwomen.com
- ▶ WomeninHPC.org
- ▶ NCWIT – National Center for Women & IT – [ncwit.org](http://ncwit.org)

# I LOVE DIVERSITY

BECAUSE IT ALLOWS ME TO:

LEARN COOL THINGS

THIS IS A GAME FROM MY COUNTRY.




DISCOVER AMAZING NEW FOODS...



...AND MUSIC, BOOKS, MOVIES, DANCES, ART AND MORE



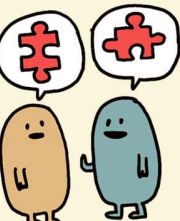
MEET NEW FRIENDS



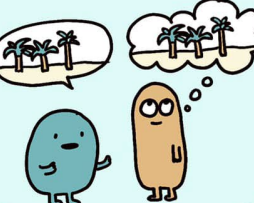
OPEN UP MY MIND TO NEW IDEAS



EXPAND MY KNOWLEDGE



TRAVEL WITHOUT LEAVING HOME



AND FIGURE OUT NEW WAYS TO EXPRESS MYSELF.



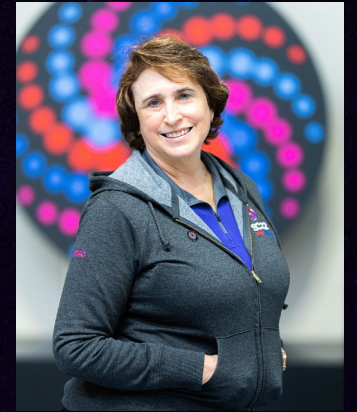
DIVERSITY IS A LOT MORE FUN!



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# PROGRAMS AT NATIONAL LABS



U.S. DEPARTMENT OF  
**ENERGY**

- ▶ Los Alamos Inclusion & Diversity Programs  
<https://lanl.jobs/creative/about-diversity>
- ▶ MSIP - DOE ASCR Minority Serving Institution Internship Program
- ▶ MSIPP - DOE NNSA version (Partnership Program)  
<https://www.energy.gov/nnsa/nnsa-minority-serving-institution-partnership-program-msipp>
- ▶ SHI SRP - Sustainable Research Pathways  
<https://shinstitute.org/sustainable-research-pathways-2022/>
- ▶ Grande CARES - The Rio Grande Consortium for Advanced Research on Exascale Simulation  
[https://newsreleases.sandia.gov/stem\\_employment/](https://newsreleases.sandia.gov/stem_employment/)

# DISCUSSION

- ▶ Action items – things you can do now
- ▶ Success stories – programs that can be replicated/shared
- ▶ How quickly can we change the pipeline?
- ▶ What constitutes success? What are the metrics?
- ▶ What can the HPC User Forum do?







<https://www.txwomeninhpc.org/>



<https://womeninhpc.org>

**Thank you!**