

# Diversity, Equity, and Inclusion in Nuclear and Particle Physics

Geraldine L. Cochran  
The Ohio State University

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# Diversity

- \*the state of being diverse; having variety
- \*The practice or quality of including or involving people from a range of different social and ethnic backgrounds and of different genders, sexual orientations, etc.

So, what difference makes a difference?

\*Definitions from Oxford Languages

# Diversity - Sociodemographic Identities

- Sociocultural markers – the ways that cultures are defined in a region – “language” is an example
- Sociopolitical markers – are often themes in the media and society that influence power and politics - within the US “race” is an example (Allen & Bagozzi, 2001)
- Sociohistorical markers – relate to privilege and position within a society and can be based on past or present laws and societal views – “gender” is an example within the US

This does not include difference related to preparation; though, sometimes there is overlap

# Othered

\*Other (verb) - view or treat (a person or group of people) as intrinsically different from and alien to oneself

\*Definitions from Oxford Languages

# Major Strategies for Increasing Diversity

- Recruitment strategies
  - Depicting organizational diversity in recruiting materials
  - Identity-blind practices and Identity-conscious practices
    - Self, W. T., Mitchell, G., Mellers, B. A., Tetlock, P. E., & Hildreth, J. A. D. (2015). Balancing fairness and efficiency: The impact of identity-blind and identity-conscious accountability on applicant screening. *PloS one*, 10(12), e0145208.
  - **\*Recruiter similarity is not a successful strategy**
    - Avery, D. R., Volpone, S. D., Stewart, R. W., Luksyte, A., Hernandez, M., McKay, P. F., & Hebl, M. M. R. (2013). Examining the draw of diversity: How diversity climate perceptions affect job-pursuit intentions. *Human Resource Management*, 52(2), 175-193.
    - McKay, P. F., & Avery, D. R. (2006). WHAT HAS RACE GOT TO DO WITH IT? UNRAVELING THE ROLE OF RACIOETHNICITY IN JOB SEEKERS'REACTIONS TO SITE VISITS. *Personnel Psychology*, 59(2), 395-429.
- Culturally Responsive Mentoring
- Creating More Inclusive Spaces Through Training

Kulik, C., & Roberson, L. (2008). Diversity initiative effectiveness: What organizations can (and cannot) expect from diversity recruitment, diversity training, and formal mentoring programs. In A. Brief (Ed.), *Diversity at Work* (Cambridge Companions to Management, pp. 265-317). Cambridge: Cambridge University Press. doi:10.1017/CBO9780511753725.010

# Challenges to Research on Diversity

- Unequal protection under the law makes it difficult to conduct studies
  - Langer-Osuna, Rowen, and Stafford (2021). Anti-Trans and Non-Binary Legislation: What NALP Members Should Know, *Bulletin of the National Association for Law Placement*
  - Atherton, T. J., Barthelemy, R. S., Deconinck, W., Falk, M. L., Garmon, S., Long, E., ... & Reeves, K. (2016). LGBT Climate in Physics: Building an Inclusive Community (American Physical Society, College Park, MD). URL: <https://www.aps.org/programs/lgbt/upload/LGBTClimateinPhysicsReport>. Pdf.
  - Barthelemy, R. S., Hughes, B. E., Swirtz, M., Mikota, M., & Atherton, T. J. (2022). Workplace climate for LGBT+ physicists: A view from students and professional physicists. *Physical Review Physics Education Research*, 18(1), 010147.
  - Barthelemy, R. S., Swirtz, M., Garmon, S., Simmons, E. H., Reeves, K., Falk, M. L., ... & Atherton, T. J. (2022). LGBT+ physicists: Harassment, persistence, and uneven support. *Physical Review Physics Education Research*, 18(1), 010124.
  - Barthelemy, R. S. (2020). LGBT+ physicists qualitative experiences of exclusionary behavior and harassment. *European Journal of Physics*, 41(6), 065703.
  - Traxler, A. L., Cid, X. C., Blue, J., & Barthelemy, R. (2016). Enriching gender in physics education research: A binary past and a complex future. *Physical Review Physics Education Research*, 12(2), 020114.
- Ever changing political landscape
  - Affirmative Action
  - Anti-trans legislature <https://translegislation.com/>

# Inclusion

- \*the action or state of including or of being included within a group or structure.
- \*the practice or policy of providing equal access to opportunities and resources for people who might otherwise be excluded or marginalized, such as those who have physical or intellectual disabilities and members of other minority groups

\*Definitions from Oxford Languages

# Inclusion

Inclusion - all people, regardless of their social identities, have **equal access to opportunity and advancement**, receive credit for their work, and are valued for more than just their membership in a social identity group (Cochran, 2018)

- Who feels they fit in the department or organization?
- Who feels discriminated against?
- Who have heard insensitive remarks and what groups were the remarks aimed at?
- Who feels they receive credit for their work? And feels their contributions to the organization are valued?
- Who feels they have opportunities for advancement?



# Implicit Bias

- Implicit Bias - relatively unconscious, relatively automatic features of prejudiced judgement and social behavior; also known as unconscious bias and implicit social cognition
- “30 years of findings from neurology and social and cognitive psychology showing that hidden biases operating largely under the scope of human consciousness influence the way we see and treat others, even when we are determined to be fair and objective”

Staats, C., Capatosto, K., Tenney, L., & Mamo, S. (2017). *State of the science: Implicit bias review 2017* (Vol. 5). Kirwan Institute for the Study of Race and Ethnicity, The Ohio State University

# What is Known about Implicit Bias?

- Unconscious and automatic
- Pervasive
- Do not always align with explicit beliefs
- Have real-world effects on behavior
- Are malleable
- There are six research-supported strategies for mitigating the impact of implicit bias

# Mitigating the Impact of Implicit

- Counter-stereotypic training
- Expose to counter-stereotypic individuals
- Engaging in deliberative processing
- Having a sense of accountability
- Taking the perspective of others
- Education efforts aimed at raising awareness about implicit bias

# Micro-aggressions

## Three major kinds of micro-aggressions

- Micro-assaults - an explicit racial derogations characterized primarily by a verbal or nonverbal attack. meant to hurt the intended victim through name-calling, avoidant behavior, or purposeful discriminatory
- Microinsults – demeans a person's racial heritage or identity
- Microinvalidations – excludes or negates a person's thoughts or feelings

(Clark, Anderson, Clark, & Williams, 1999; Dovidio, 2001; Salvatore & Shelton, 2007; Sue, 2010; Sue, Capodilupo, & Holder, 2008; Forrest-Bank, & Jenson, 2015; King, 1991)

# Stances associated with micro-aggressions

- Colorblindness – invalidates the thoughts, feelings, and experiences of People of Color
- Dysconscious racism - an uncritical habit of mind (including perceptions, attitudes, assumptions, and beliefs) that justifies inequity and exploitation by accepting the existing order of things as given

(Clark, Anderson, Clark, & Williams, 1999; Dovidio, 2001; Salvatore & Shelton, 2007; Sue, 2010; Sue, Capodilupo, & Holder, 2008; Forrest-Bank, & Jenson, 2015; King, 1991)

# Equity

- \*the quality of being fair and impartial.
- a redistribution of power and access to make situations and circumstances more just or fair (Atwater, 1999)

\*Definitions from Oxford Languages

# Historical inequities and injustice in education

- Benjamin Roberts (1849)
- Plessy v Ferguson(1898)
- Lemon Grove Incident (1930)
- Mendez v Wesminster (1946)
- Universal secondary schooling for Black students (1968)

# Current Inequities and Injustice in Education

- Parents Involved in Community Schools vs Seattle Public Schools (2007) – racial tie breakers unconstitutional
- Gratz vs Bollinger (2003) – roll back of Affirmative Action
- Suspensions and expulsions at the Pre-K-12 level
- Access to curriculum - AP courses and honor courses
- Williams Case in CA
- Funding disparities

(Ladson Billings, 2006)

• [https://www.youtube.com/watch?v=ofB\\_t1oTYhl](https://www.youtube.com/watch?v=ofB_t1oTYhl)



# White Supremacy

- One component of white supremacy is to allow white individuals to be seen as individuals, but to group together People of Color in various ways
  - Asian American panethnicity (Espiritu, 1992)
  - Hispanic panethnicity (Mora, 2014)
  - African diaspora (Storr, 2009)
- “Despite the common challenges confronting African-American women as a group, individual Black women neither have identical experiences nor interpret experiences in a similar fashion...differences among individual Black women produce different patterns of experiential knowledge that in turn shape individual reactions.” (Hill Collins, 2000).
- Cabrera, N. L. (2014). Exposing whiteness in higher education: White male college students minimizing racism, claiming victimization, and recreating white supremacy. *Race Ethnicity and Education*, 17(1), 30-55.
- Morris, A., Allen, W., Maurrasse, D., & Gilbert, D. (1994). White supremacy and higher education: The Alabama higher education desegregation case. *Nat'l Black LJ*, 14, 59.
- Haynes, C. (2017). Dismantling the White Supremacy Embedded in Our Classrooms: White Faculty in Pursuit of More Equitable Educational Outcomes for Racially Minoritized Students. *International Journal of Teaching and Learning in Higher Education*, 29(1), 87-107

# Challenges for PER

- Changing Political Landscape and Study Design
- Demographics of studies
  - Kanim, S., & Cid, X. C. (2020). Demographics of physics education research. *Physical Review Physics Education Research*, 16(2), 020106.
- Broad Dissemination to Various Stakeholders

# Gender Representation in the Heavy Ion Collision Community

- **Overarching Goal:** Understand gender representation in the heavy ion collision community
- **Context:**
  - Gender is not a binary, Gender Minorities (women and nonbinary people)
  - Data is disaggregated by theorists and experimentalists
  - A subset of past and present the Relativistic Heavy Ion Collider Alternating Gradient Synchrotron Users' Executive Committee (RHICAGS – UEC) maintains a database of identifiable information.

Results Shared Under Approved IRB Protocol 2084570-1

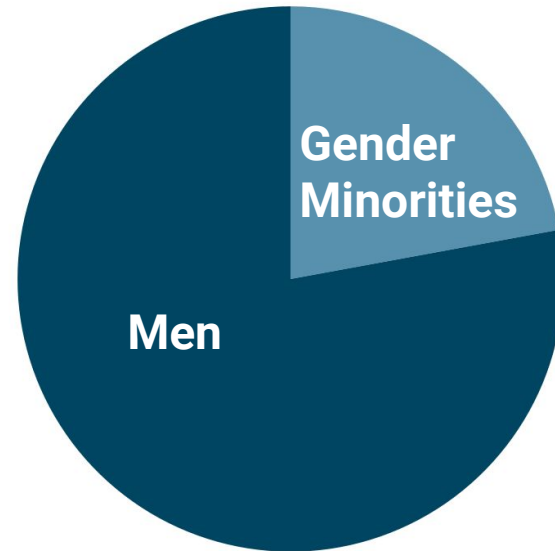
# Experimentalists

Collider	Detector	Collaborators
LHC	ALICE	1005
	CMS	~50
	ATLAS	~50
	LHCb	$\lesssim 50$
RHIC	PHENIX	104
	STAR	370

- We estimate 1500 unique experimentalists.
- The database included 1594 experimentalists.

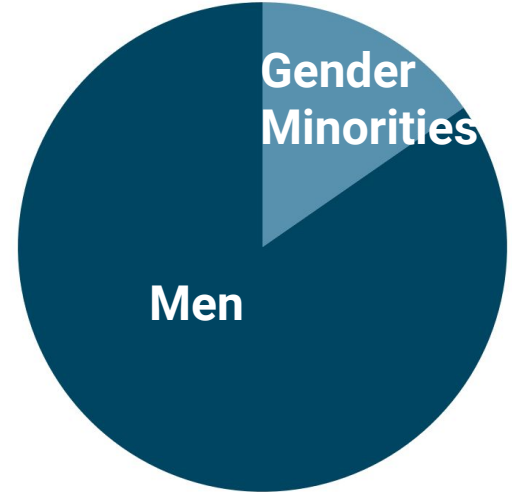
# Gender Representation Among Experimentalists

- 352 (22.1%) gender minorities
- 1240 (77.8%) men



# Gender Representation Among Theorists

- Much harder to estimate the number of theorists in the field. Members of the field estimated ~1000 theorists.
- The database included 1061 theorists
- 163 (15.4%) gender minorities
- 898 (84.6%) men



# Future Work

- Paper to come based on descriptive statistics of the heavy ion collision community
  - Conference participation (presentations)
- Understanding the experiences of gender minorities in the heavy ion collision community

Thank you!