

The Science Academic System: Feedbacks Limiting Diversity and Driving Inequality

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Definitions and Acknowledgements

- URM, marginalized, minority, under-privileged refers to people with respect to STEM participation, not society.
 - BIPOC and women make up about 70% of US – White men only 31%
- Diversity efforts benefit all - our labs, departments, universities, and profession by bringing innovation, talent, and new perspectives
- Casey Miller (RIT) and Erin Cech (UM)
- DEI leadership colleagues @UM and AGU



IGEN

<http://www.igenetwork.org/>

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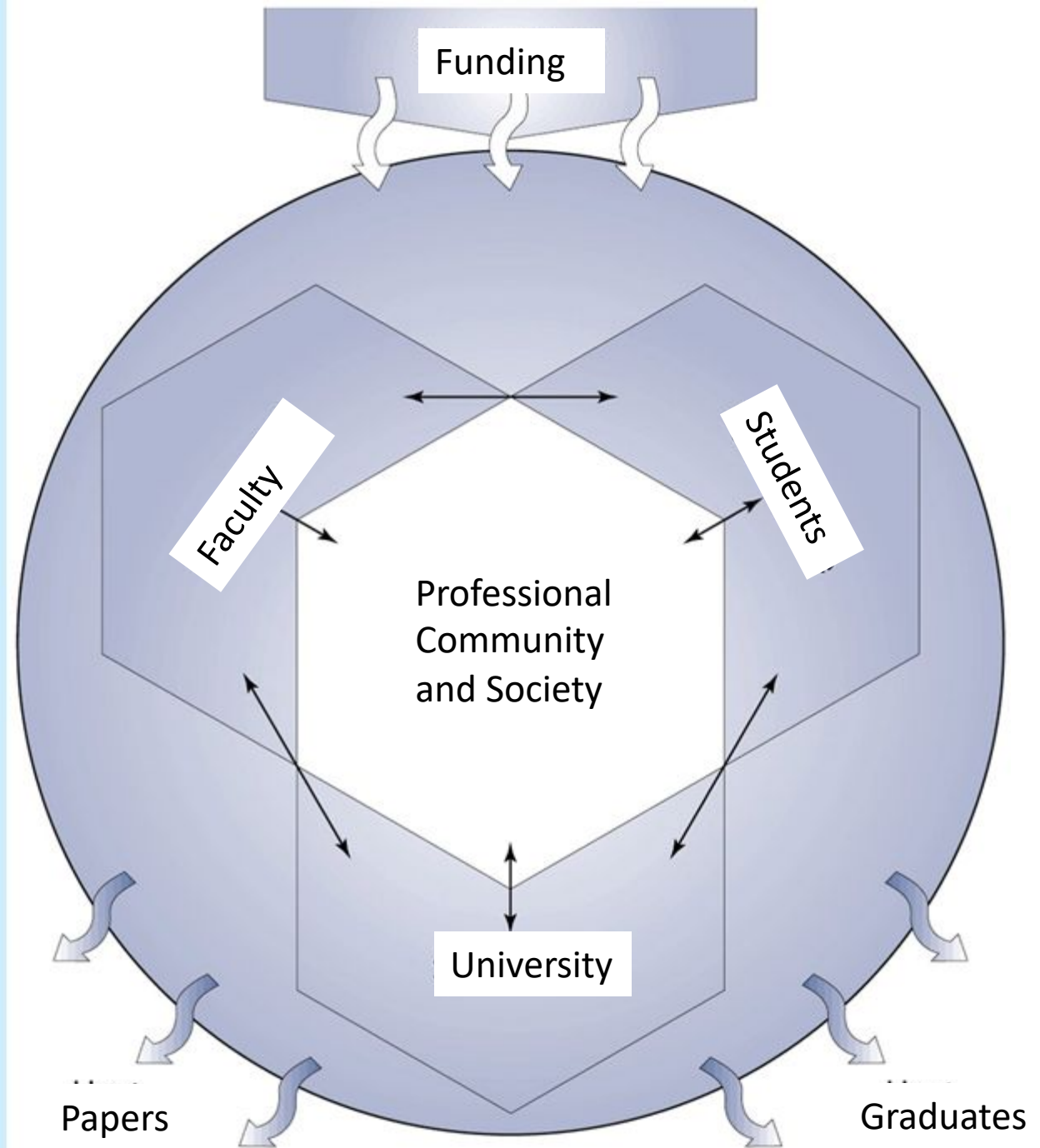
Inclusive Graduate Education Network

Presentation Questions

- What is the Science Academic System?
- What are my stated assumptions of our current system?
- What parameters (Data) characterize our system?
- What feedbacks in our Science Cultural System limits Diversity?
- What we (and WSU) can do?

Schematic of Science Academic System showing interactions among its four components.

Adapted from Kump, Kasting & Crane 2010 "The Earth System"



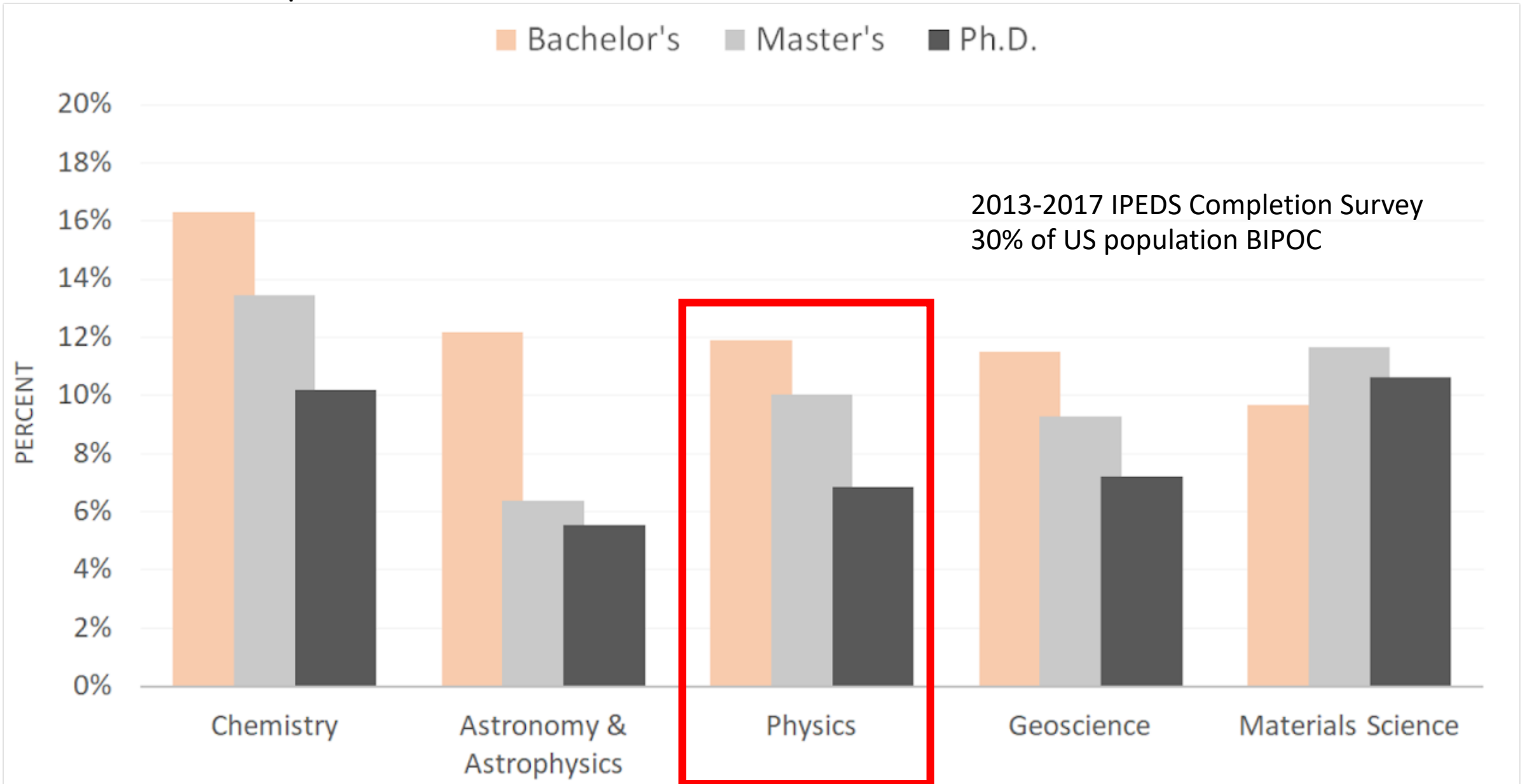
What are the feedbacks in this system that keeps us in our white-male-able-bodied-heterosexual-cisgendered dominant equilibrium?

- Before rolling eyes or tuning out – it is often uncomfortable to have our identities called out. Understanding that there are cultural meanings, biases, assumptions, rules and realities that are different for our intersectional identities is a first step to inclusive practices (DiAngelo)
- Also understand that there are large **BENEFITS** of diverse groups - they increase productivity, improve creativity, promote innovation, improve engagement, reduces turnover/increases retention, improves institutional reputation, provides wider range of skills, and improves cultural insights enabling global competitiveness. (Mckinsey, 2015; Credit Suisse, 2012; Morgan Stanley, 2016; Hufhois et al. 2016; Nature Editorial/Review, 2018)
- 75% of STEM Faculty believe that DEI efforts are part of our role, though only 25% think that DEI efforts are valued (Cech et al., in prep)
- This presentation will provide a systems approach for our DEI efforts to enable positive feedback loops to move us out of our current equilibrium

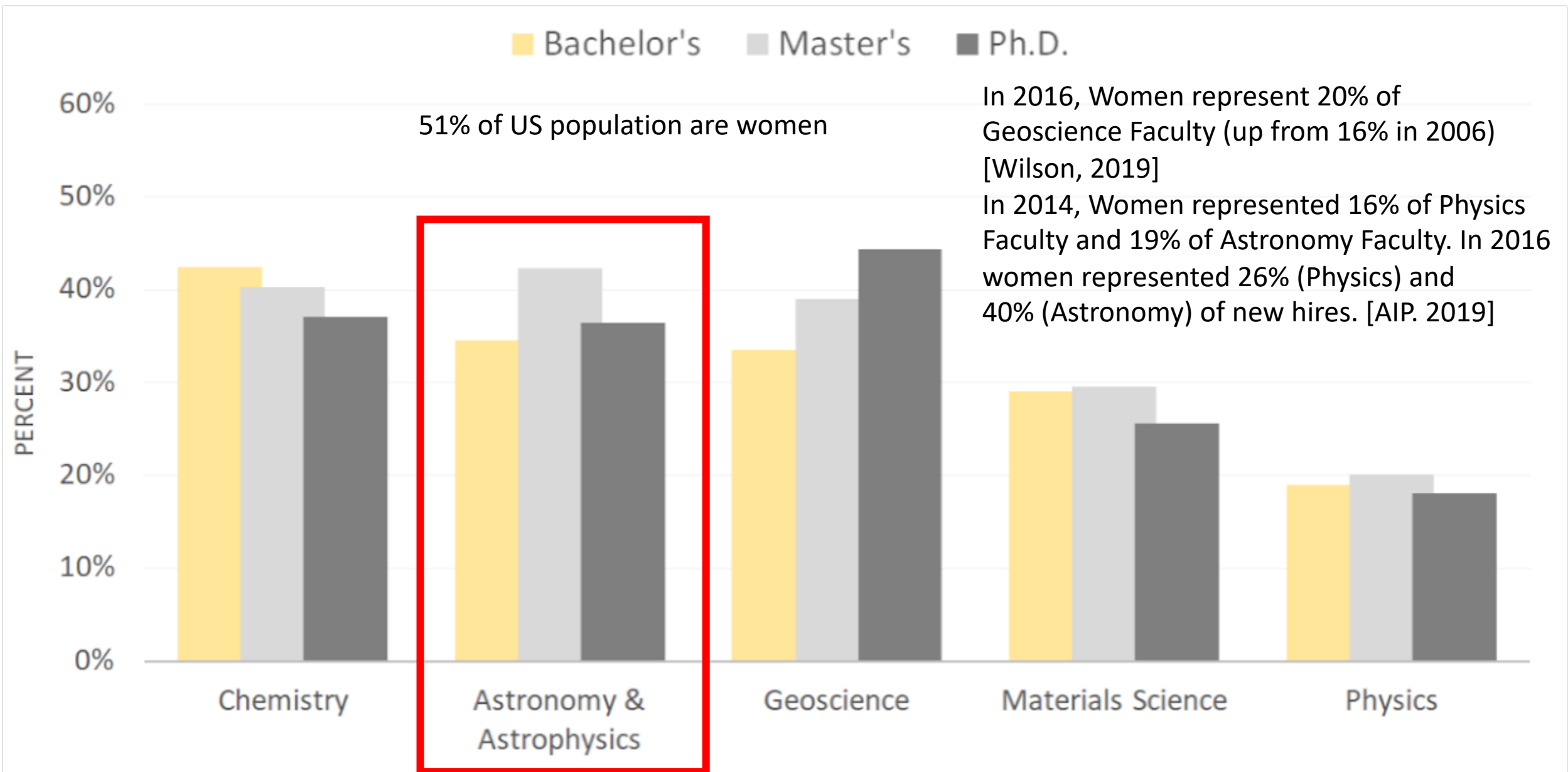
Statements

- Lack of progress is not due to a few “bad apples”
- Subtle beliefs and practices matter
- Positive change is not inevitable – requires work
- Dominant group members are not very good at assessing climate for POC and women
- Small disadvantages accumulate over time
- DEI efforts are not recognized as part of the research culture

Percentage of degrees obtained by Black/African Americans, Latinx/Hispanics, Native Americans/Alaskans



Percentage of degrees obtained by US women



Diversity Landscape

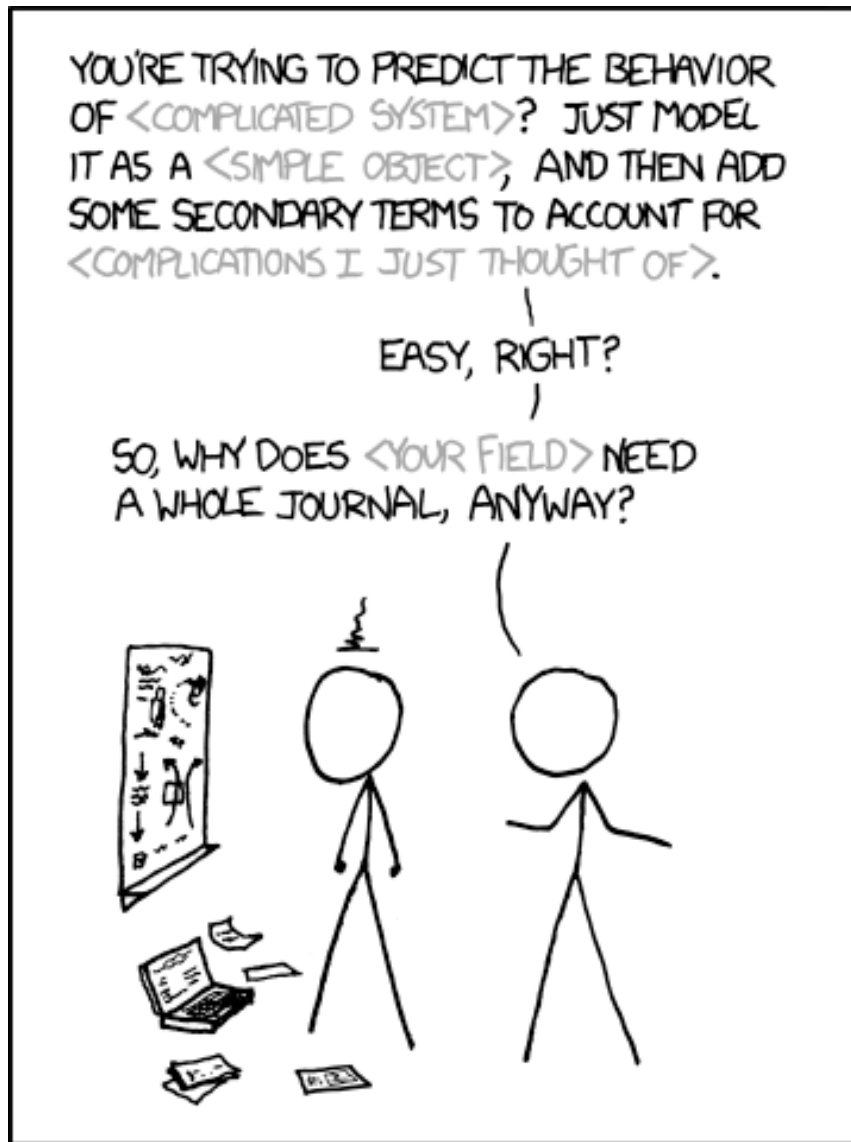
Percentage of Geosciences Graduate Degrees Awarded to US Citizens	By Race/Ethnicity (US)		To Women (40% total)
Am. Ind; Alaska Nat.	0.4%	(2.1%)	0.2%
Asian	3.9%	(5.6%)	1.6%
Black/African American	2.6%	(13%)	0.9%
Hispanic	6.4%	(30%)	2.9%
Nat. Hawaiian/Other Pac. Islander	0.1%	(0.36%)	0.0%
Other/ Unknown	5.8%		2.3%
Two or more races	2.4%	(1%)	1.2%
White	78.4%	(73%)	31%

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Science Academic Culture

- Cultures are meaning systems
- Part of training is “socialization” into our professional culture
- Cultural practices have biases

- We are a Science (Geo, Physics, Astro) Community with a set of shared “language”, assumptions, attitudes, training, experiences...



LIBERAL-ARTS MAJORS MAY BE ANNOYING SOMETIMES, BUT THERE'S *NOTHING* MORE OBNOXIOUS THAN A PHYSICIST FIRST ENCOUNTERING A NEW SUBJECT.

Physics Meme

- Jokes take advantage of our knowledge of culture, only funny to the community – they are used to reinforce shared bonds and acculturate our students.
- We live and work in our Science and Academic Culture
- Many assumptions, biases, concepts, attitudes and stereotypes

<https://xkcd.com/>

Systemic Academic Culture and Practices that Lead to Disadvantage, Inequity and Lack of Diversity

- Schemas of Scientific Excellence
 - Depoliticization
 - Meritocracy
-
- Cech, Blair-Loy, and Rogers, 2018; Cech, 2014; Moldwin and Liemohn, 2018

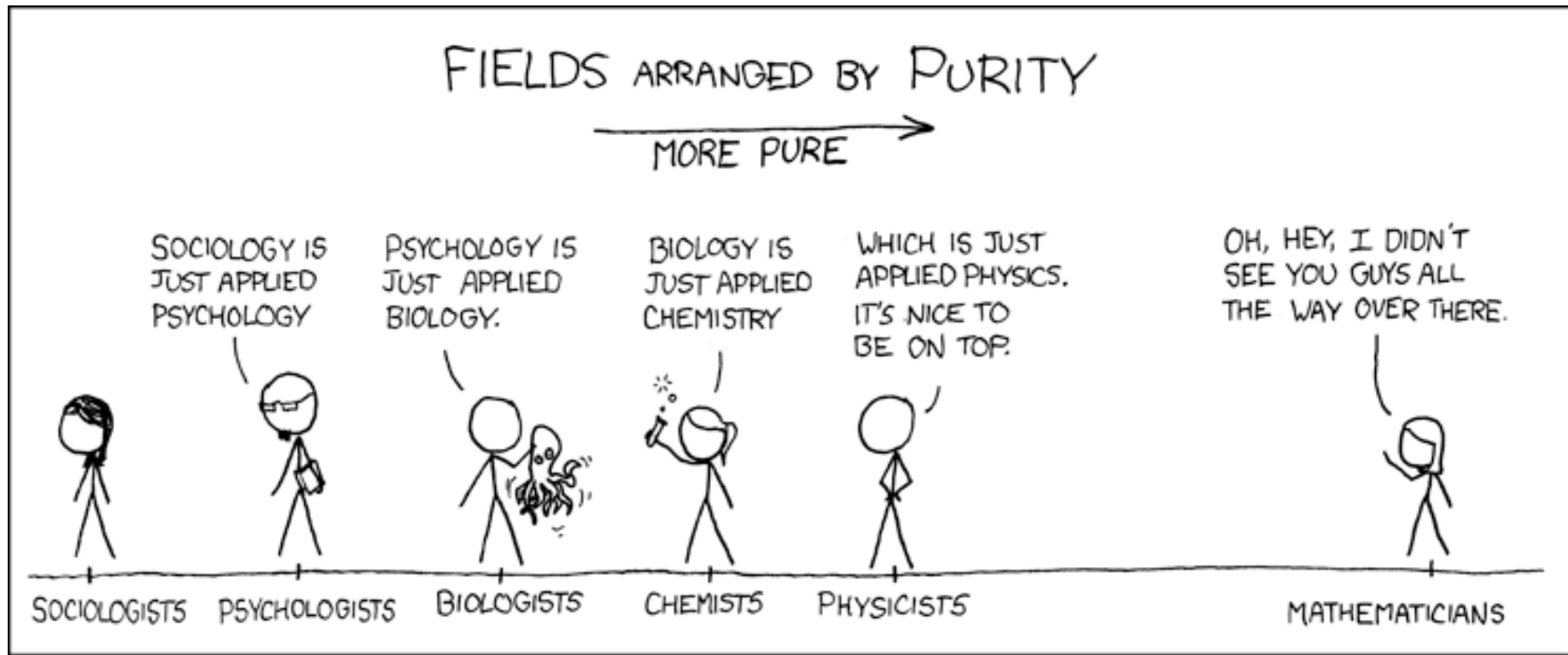
Schemas of Scientific Excellence

- Cultural yards sticks used to measure individuals for acceptance, hiring, promotion and awards.
- What are markers of scientific excellence in your department?
- Araúja et al., 2016; Blair-Loy and Cech, 2016; NRC/NAS, Advancement of Women in Science and Engineering, 2000

Bias and stereotypes

- How might social stereotypes get folded into the definition of excellence?

Depoliticization



Science and Society

- One would think that with climate change, natural hazards, energy systems, networks etc. within our scientific domain we would value those whose work directly connects to communities.
 - Read the AGU/APS Fellowship Criteria
- How are research areas evaluated in your department?
- How many are involved in Community Science? (e.g., AGU's Thriving Earth Exchange promotes and facilitates)
- Is "fit" part of your hiring and promotion discussions? What is the balance of your student's dissertation topics?

Meritocracy Ideology

- Success is the result of individual talent, training and motivation
- Inequalities are the fault of marginalized population, not social system

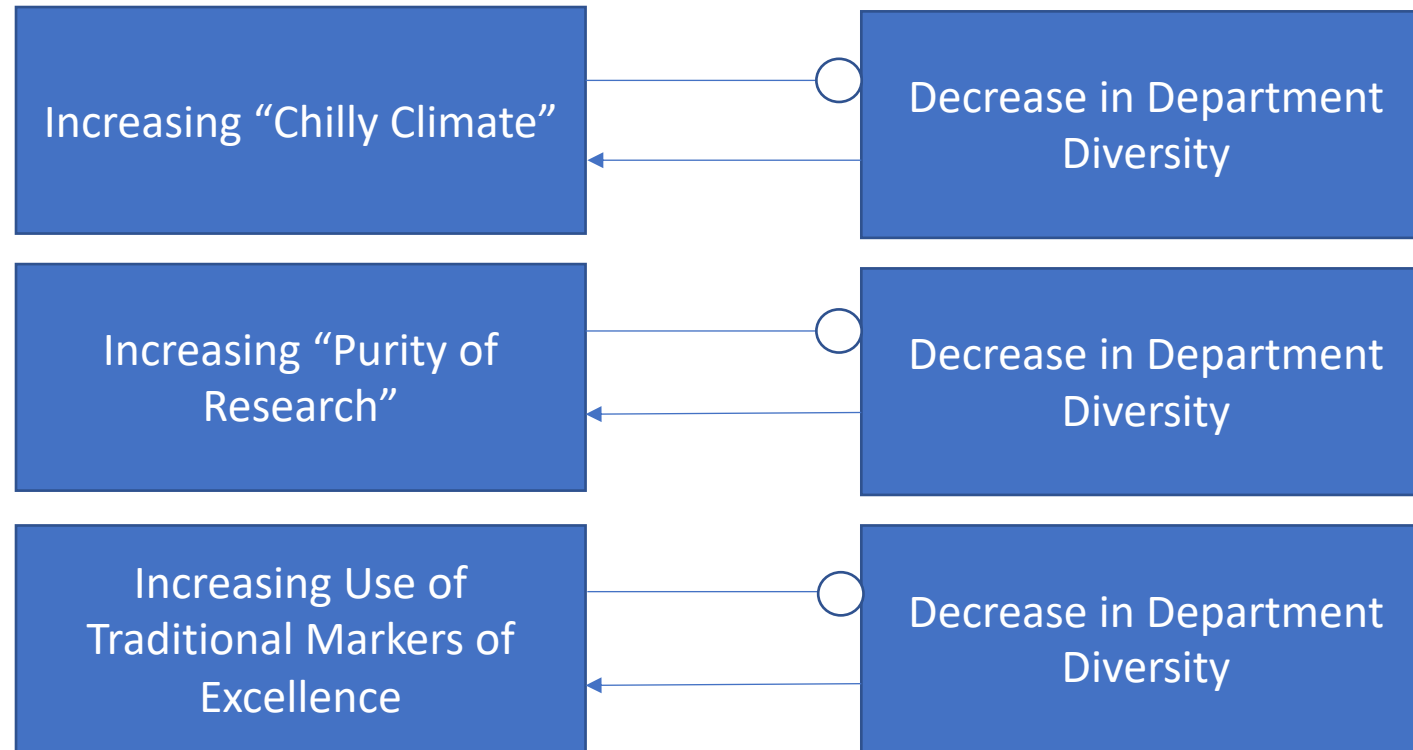
- Use of GRE, undergraduate institution, major in admissions
- Family-status, Disability, Gender, Socio-economic, nationality or BIPOC-blind Evaluation
- Discount or ignorance of impact of implicit bias

- Markovits, 2020; Cech and Blair-Loy, 2012

What can you do?

- DEI efforts should have a growth mindset rather than a fixed mindset (Dweck) → Learn about inclusive teaching, anti-racist practices, implicit bias, bystander intervention, ways to connect to broader communities, mentoring diverse groups, developing inclusive support mechanisms....
- Redefine your schema for excellence
- Understand the importance of society in our discipline and value work that directly addresses societal impacts and marginalized communities
- Recognize the barriers that support inequality and work to address these disparities in your own department, lab and classrooms.
- Learn more - https://serc.carleton.edu/advancegeo/resources/what_diversity.html
- What can WSU do to make a huge IMPACT?

Cultural Feedbacks





IP Hub Activities bit.ly/IGEN-IPhub

01

WORKSHOPS

Professional development centered around racial, ethnic, and gender equity in physical sciences graduate education

02

VIRTUAL JOURNAL CLUB

Engaging practitioners in discussions of current research that impacts equity & inclusion.

03

LIBRARY

Curated literature aimed at highlighting fundamental and supplemental knowledge of effective practices.

04

RESOURCES

Collection of resources, **data**, guides, and reports from organizations working on equity in graduate education

