

# SUPPORTING DIVERSITY IN STEM

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WELCOME!



Have phone handy for polls  
(camera/QR code or browser)

Questions welcome at any time!

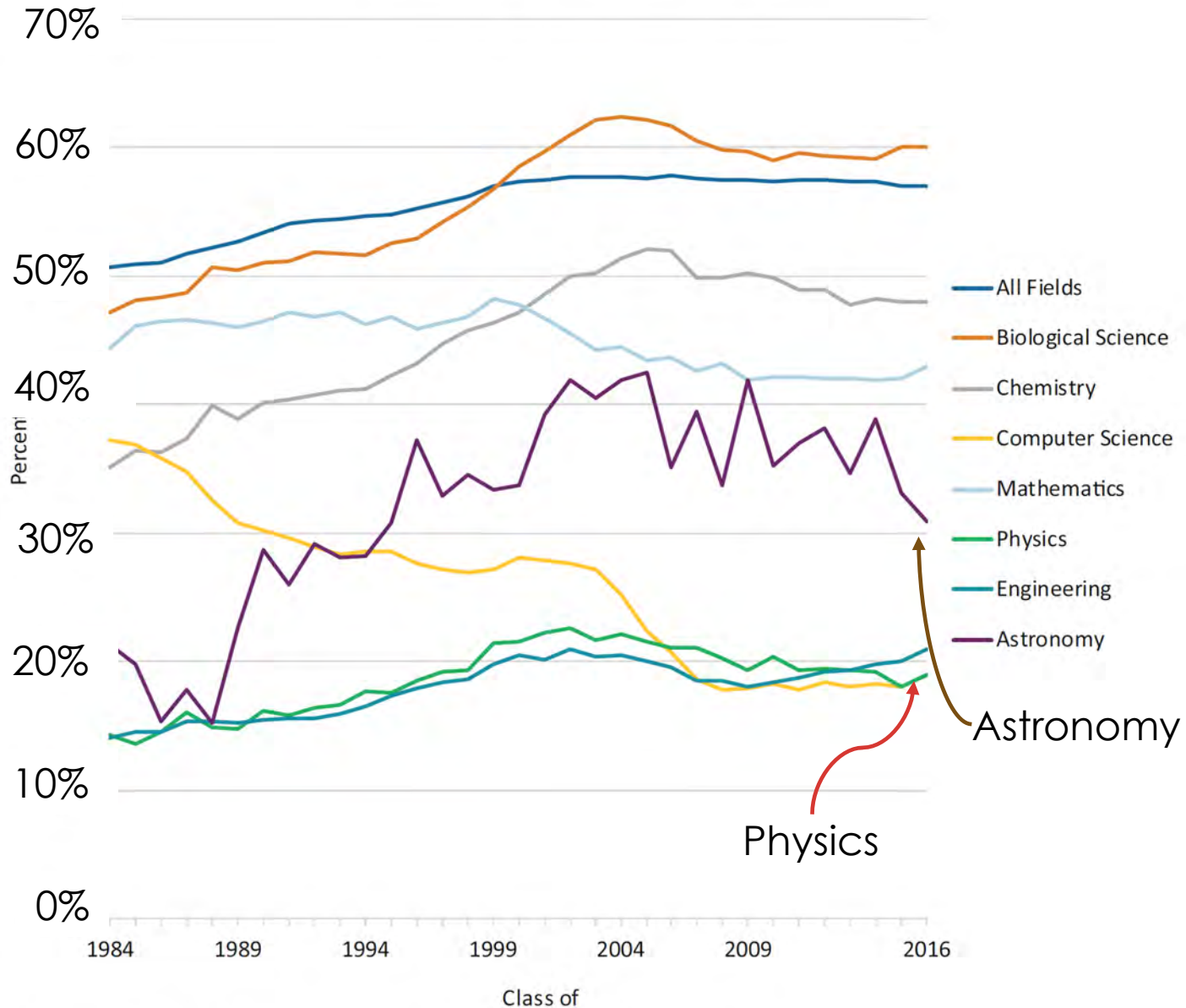
# DISCLAIMERS

- Topic can be uncomfortable
- Learning is uncomfortable!
- Happy to provide sources
- QR code on last slide—my website & these slides
- Focus on gender
- I love this topic = I talk fast!
- My biases



# WHY TALK ABOUT DIVERSITY AND STEM?

# Percent of Bachelor's Degrees Earned by Women in Selected Fields, Classes of 1981 through 2016





## Number of African American, Hispanic, and Native American Women Earning Bachelors in Physical Science Fields, 2003 and 2013

	Total Number of Degrees Earned		Degrees Earned by African American, Hispanic, and Native American Women	
	Degrees in 2013 (#)	Change '03-'13 (%)	Degrees in 2013 (#)	Change '03-'13 (%)
Earth Sciences	5,506	64	223	182
Atmospheric Sciences	760	25	19	111
Chemistry	14,886	50	1,307	41
Physics	6,760	59	118	40
Astronomy	413	33	11	-8
Oceanography	247	75	13	333
Other Physical Sciences	812	23	62	138
<b>All Physical Sciences</b>	<b>29,384</b>	<b>53</b>	<b>1,753</b>	<b>54</b>

2013 women bachelors physics: 1162  
astronomy: 128



OK, SO  
WHAT?





- Waste of talent

- What ideas have been lost?
- How slowly have we made progress?
- How much energy has been diverted from science?
- How much money has been diverted from science?

- Moral issue

- Serious inequity in our culture
- Social justice issue
- Systemic racism, sexism, etc.

# HOW CAN WE CREATE A MORE INCLUSIVE STEM?

- Find out what helps
- Find out what hurts
- Build awareness
- Motivate people
- Offer strategies and actions
- Measure effects



# DEFINITIONS

- EQUALITY

- EQUITY

- JUSTICE

- DIVERSITY

- INCLUSION

- INTERSECTIONALITY

## Equality



The assumption is that everyone benefits from the same supports. This is equal treatment.

## Equity



Everyone gets the supports they need (this is the concept of "affirmative action"), thus producing equity.

## Justice



All 3 can see the game without supports or accommodations because the cause(s) of the inequity was addressed. The systemic barrier has been removed.



# DIVERSITY VS. INCLUSION

Diversity is inviting someone to the party. Inclusion is asking them to dance. –Verna Myers



# INTERSECTIONALITY



# THINGS THAT HELP

- Sense of belonging
- Self-identity as a scientist
- Talking about the topic
- Growth mindset



# THINGS THAT HURT

- Harassment\* (3/4 of undergrad physics women!)
- Stereotype threat\*\*
- Fixed mindset\*\*
- Microaggressions\*\*\*

\*Aycock, Hazari, Brewe, Clancy, Hodapp, Goertzen. PHYSICAL REVIEW PHYSICS EDUCATION RESEARCH 15, 010121 (2019)

\*\*[https://www.ted.com/talks/russell\\_mcclain\\_implicit\\_bias\\_stereotype\\_threat\\_and\\_higher\\_education](https://www.ted.com/talks/russell_mcclain_implicit_bias_stereotype_threat_and_higher_education)

\*\*\*Barthelemy, McCormick, Henderson doi:10.1119/perc.2014.pr.005

# IT'S ALL ABOUT THE BIAS

- Implicit/Unconscious/Unintentional/Unexamined bias
  - Growing up → culturally instilled values
  - Pervasive: everyone has them
  - Separate from explicit biases (can be same or different)
  - May differ from our declared beliefs
  - Tend to favor our own in-group
  - Malleable—thank goodness!



# REDUCING BIAS

- Awareness
- Motivation
- Actions



# ASSUMPTIONS

- Stereotypes and assumptions are mental shortcuts
- Can be very useful
- Can be problematic

Making assumptions...





# CHANGING OUR LANGUAGE

- Become aware
- Catch yourself afterwards
- Catch yourself beforehand
- Build habit of new words

# STOP, DROP, AND...THINK?

- Social media is great at misinformation
- Think about posts/memes/blogs
  - Facts or opinions?
  - Source?
  - Funny at the expense of someone?
  - Unnecessary information/identification?
- Pause before sharing



# CHANGING PERCEPTIONS

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in-group



The Physics Teacher Sept 2021

<https://aapt.scitation.org/doi/full/10.1119/10.0006470>

# AUTHENTICITY

- Inclusive environment is one where people bring their true, authentic self
- No need to hide parts of identity
- Changing culture starts with you
- Do you bring your authentic self to school/work?



# ALL THE FEELS!


- Emotional topic
- Emotion = Engagement


# PITFALLS/MISCONCEPTIONS

- You can become “woke” and be done
- Depression, anger, frustration without action
- Thinking you are a bad person because of unconscious bias
- Impatience with others
- Assuming intent instead of ignorance
- Focus on past mistakes
- Wanting immediate visible changes

# READY, SET, ACTION!

- Think about your daily routine
  - Where are places you are likely to make assumptions?
  - Where are places you are likely to be biased?

- 
- Think about one way you can be more authentic and true to yourself at school/work.

- 
- What is one action your club/study group can take to be more inclusive?
  - What is one action to make your classroom more inclusive?
  - What is one action to make a process more inclusive (hiring/tenure/performance evaluation)?



# KEEP GOING!

- Set a time to meet with others
- Start a reading group
- Find webinars, TED talks, podcasts, research
- Invite others to help
- Ally/affinity groups
- Get administrators involved

One final thought



Pause (k)

THANK YOU!

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