

All APS Discussion

20 July 2017

College Park, MD

STEP UP 4 Women

Supporting Teachers to Encourage Pursuit of Undergraduate Physics for Women

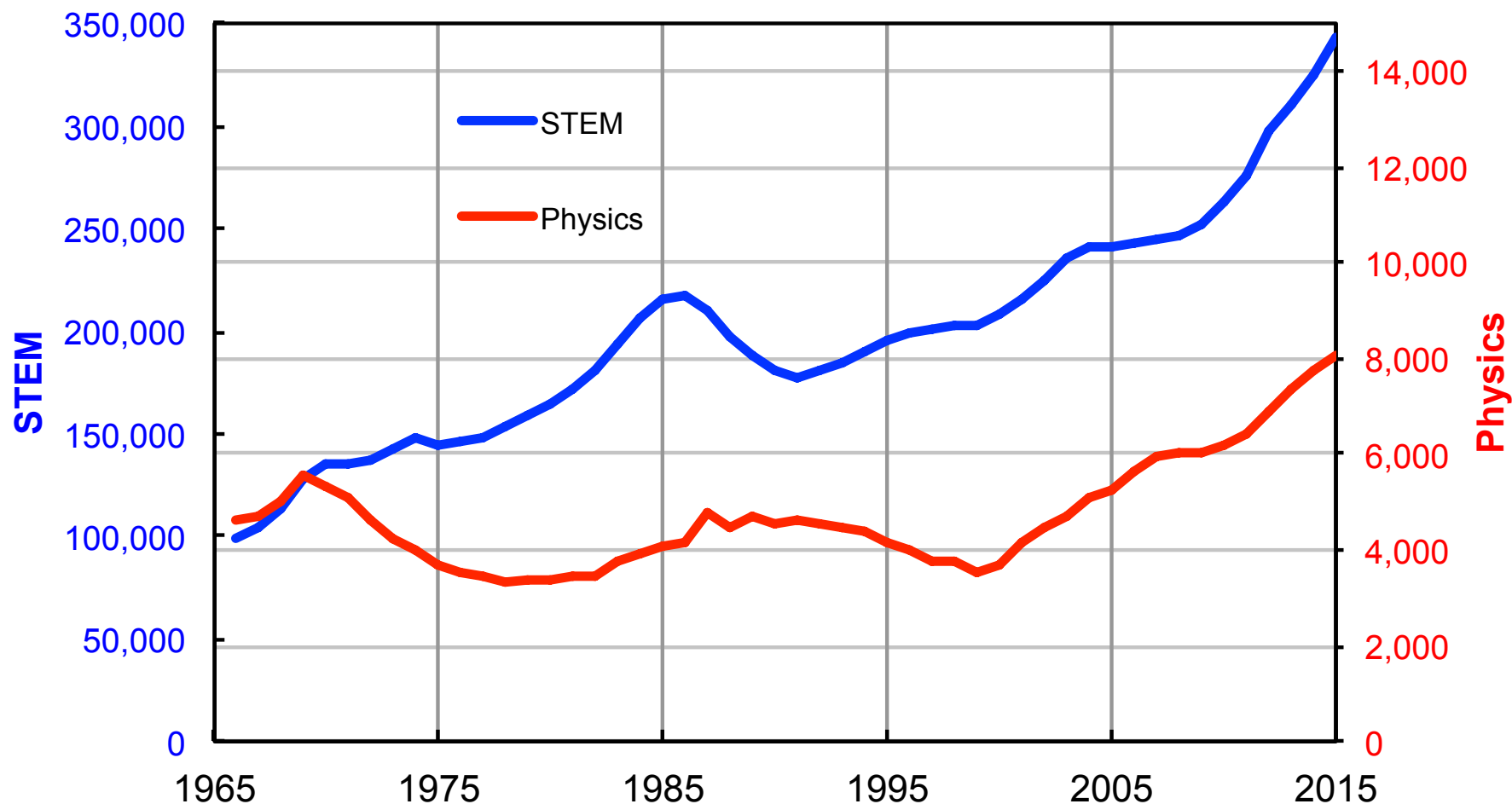
Theodore Hodapp

APS Director of Project Development

Kathryne Woodle

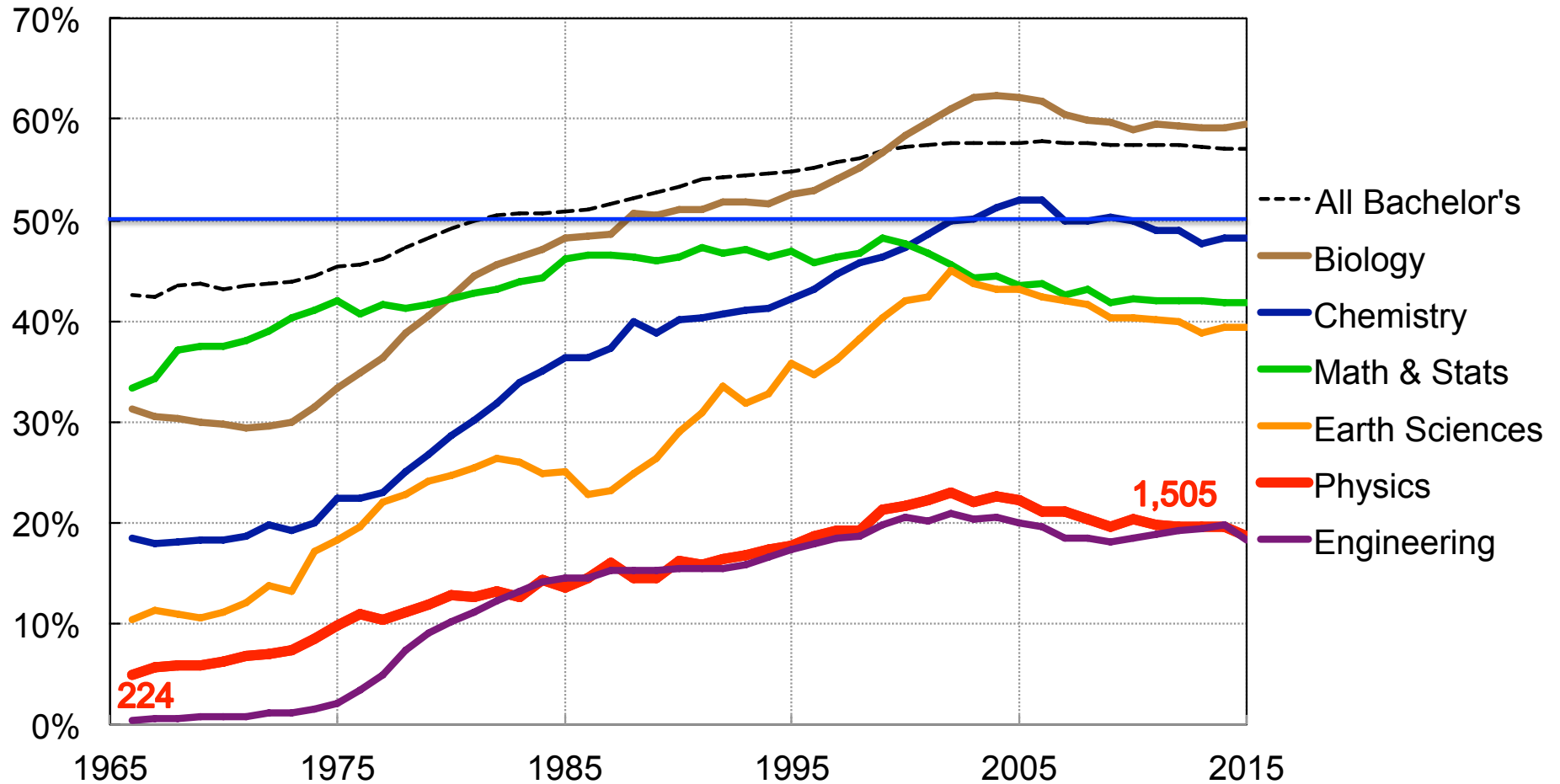
Education and Diversity Program Manager

Bachelor's Degrees Awarded



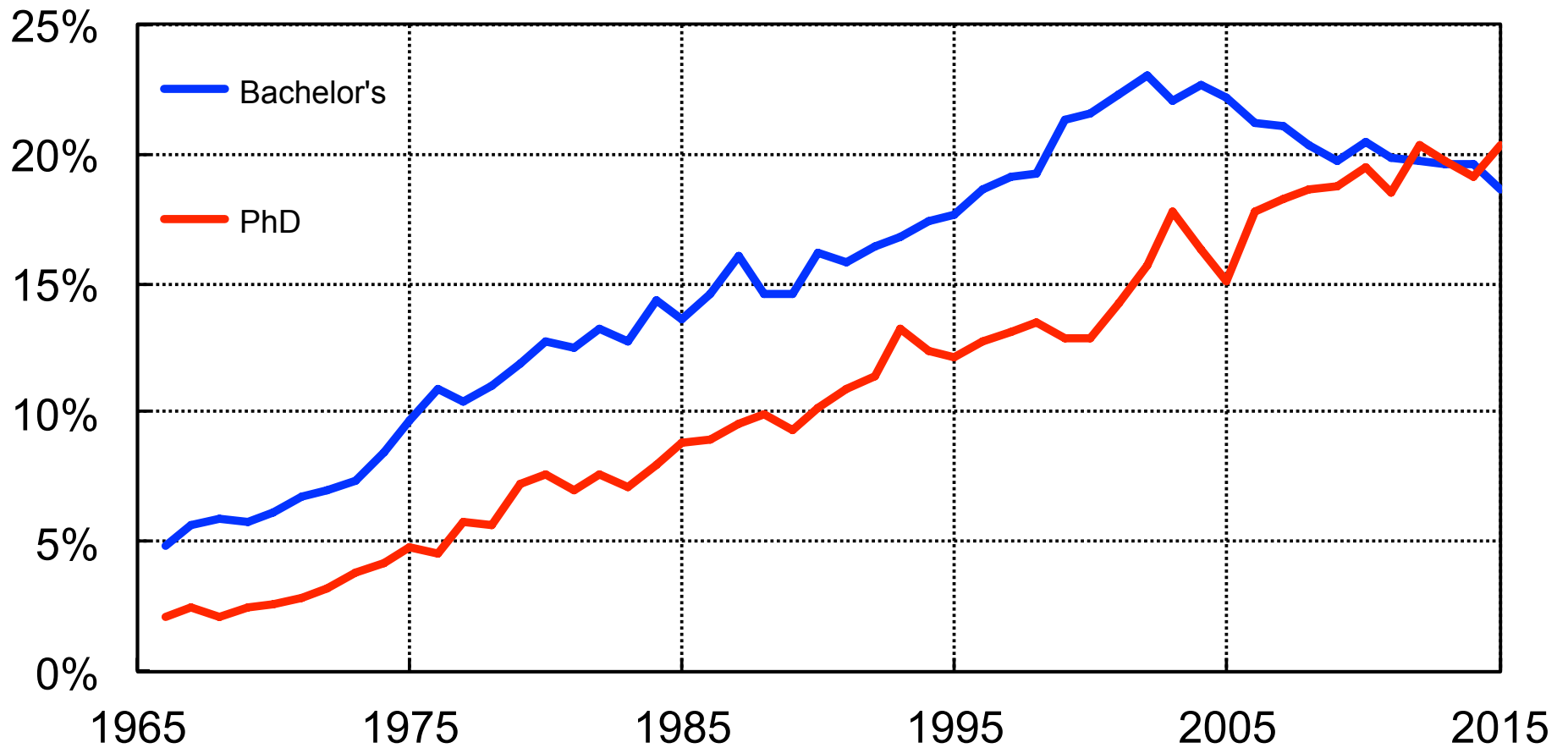
Source: National Center for Education Statistics and APS
www.aps.org/programs/education/statistics

Fraction of Women Earning Undergraduate STEM Degrees



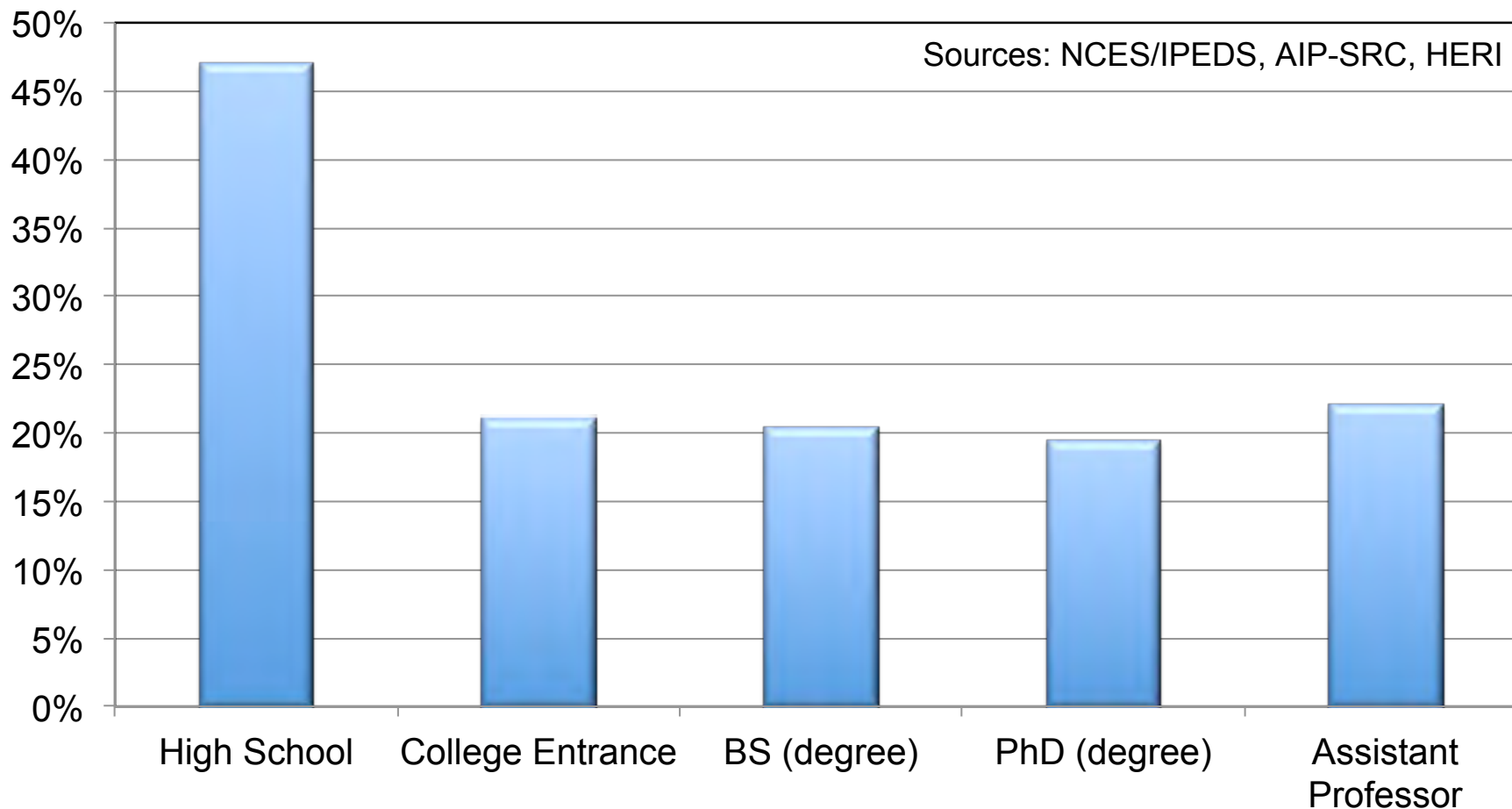
Source: National Center for Education Statistics and APS

Physics Degrees Awarded to Women

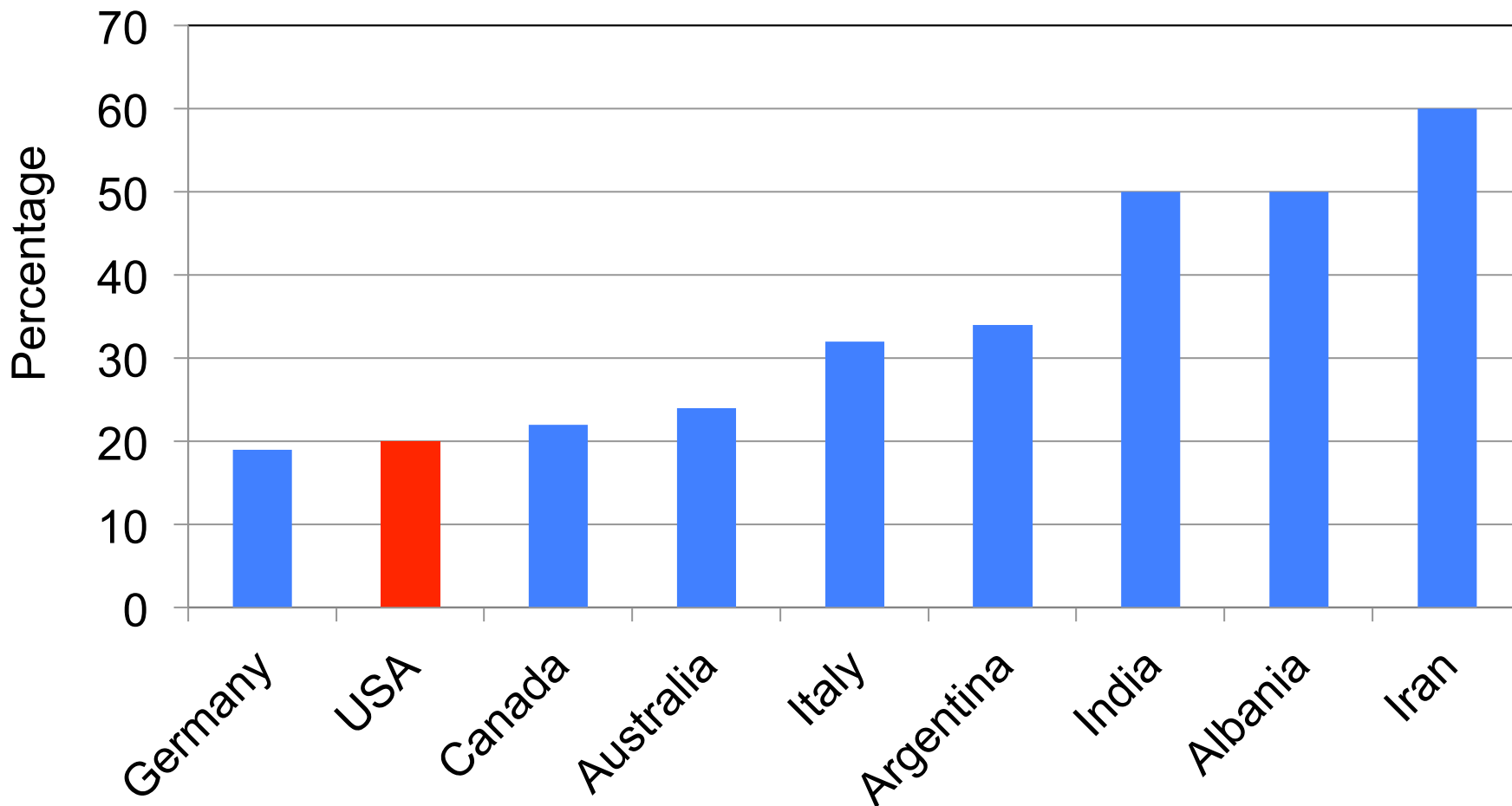


Source: National Center for Education Statistics and APS

Percentage of Women in Physics

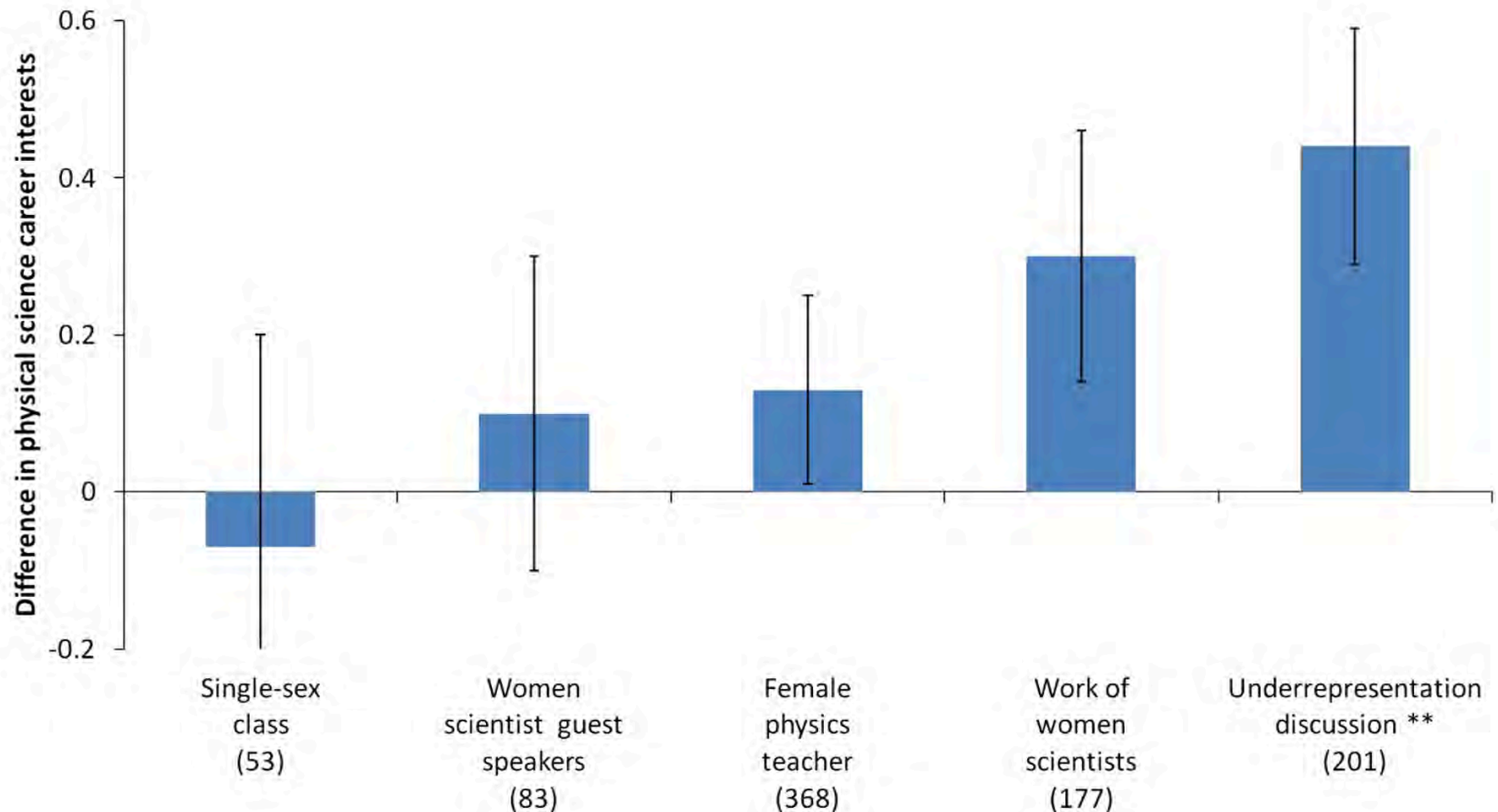


Undergraduate Physics Degrees Awarded to Women



IUPAP International Conference on Women in Physics Proceedings (2005-2013)

Effects of Interventions



Hazari, Potvin, Lock, Lung, Sonnert, and Sadler, "Factors that affect the physical science career interest of female students: Testing five common hypotheses," PRST PER 9 020115 (2013)

- **Increase the fraction of women in physics** by increasing the number who enroll in and complete undergraduate physics degrees.
- **Understand and implement solutions for gender specific issues** such as stereotype threat, unconscious bias, and impostor syndrome that impact careers of all physicists.
- **Enhance professional development** opportunities for women including negotiation skills, mentoring, and mentor training.
- **Encourage research into fundamental causes**, assess policies, and advocate actions to remedy issues that impact gender inequality in physics.

NSF funding received May 2017 (\$3M)

- Zahra Hazari, Geoff Potvin, Laird Kramer (FIU)
- Robynne Lock (TAMUC)
- Rebecca Vieyra (AAPT)
- Kathryne Woodle, Ted Hodapp, Crystal Bailey (APS)



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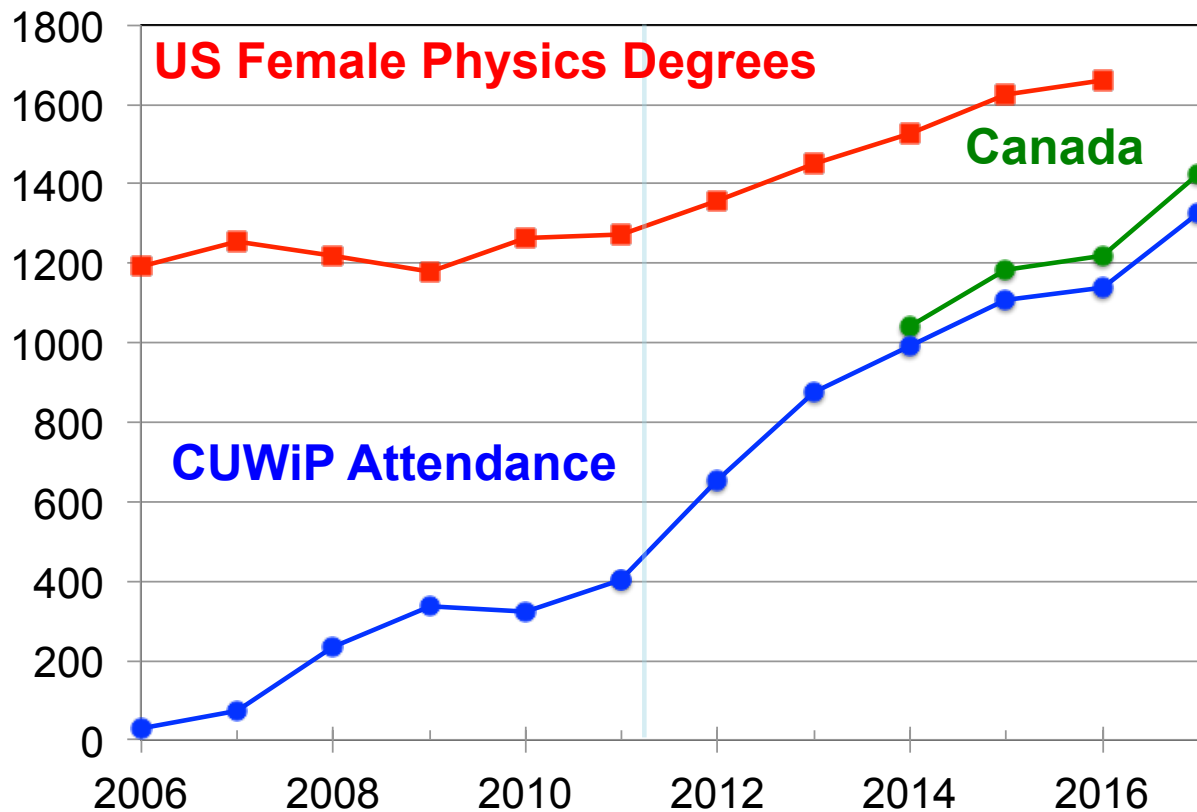
- 4+ year project; 3 Phases:
 - 2017-18: Pilot (10 Master teachers across the US)
 - 2018-19: Controlled study (26+ randomly selected in 3 states)
 - 2019-20: National rollout (15,000 teachers)
- Designing curriculum/classroom strategies for high school teachers to encourage women to study undergraduate physics:
 - Classroom strategies:
 - Personal recruiting
 - Public recognition of women in classroom
 - Lessons:
 - Discussion of underrepresentation
 - Discussion of careers in physics

- **Rollout (Phase 3):** Pilot ideas in 2017, 2018
 - CUWiP workshops and “challenges”
 - Women in Physics Groups
 - SPS Chapters
 - National, state, and regional meetings for science teachers
 - Establish teacher networks
 - Develop Professional Development “lessons”
 - Website: tools, video, resources
 - Assessment: rate of adoption, problems of implementation, etc.

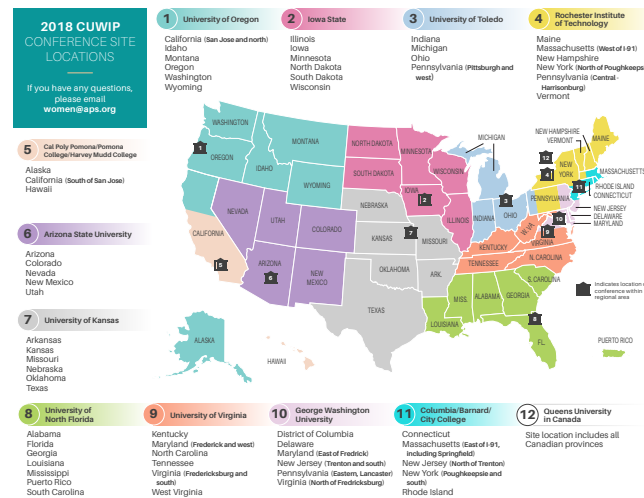
Quiz Time

- Think of one or more ideas to reach high school teachers with these ideas and lessons
 - 1) Idea
 - 2) Number of teachers who will adopt / year
 - 3) Cost?
 - 4) Will it continue to occur without prodding?

APS Conferences for Undergraduate Women in Physics (CUWiP)



2018 CUWiP CONFERENCE SITE LOCATIONS
 If you have any questions, please email women@aps.org



The experience of anxiety in a situation where a person has the potential to confirm a negative stereotype about their social group

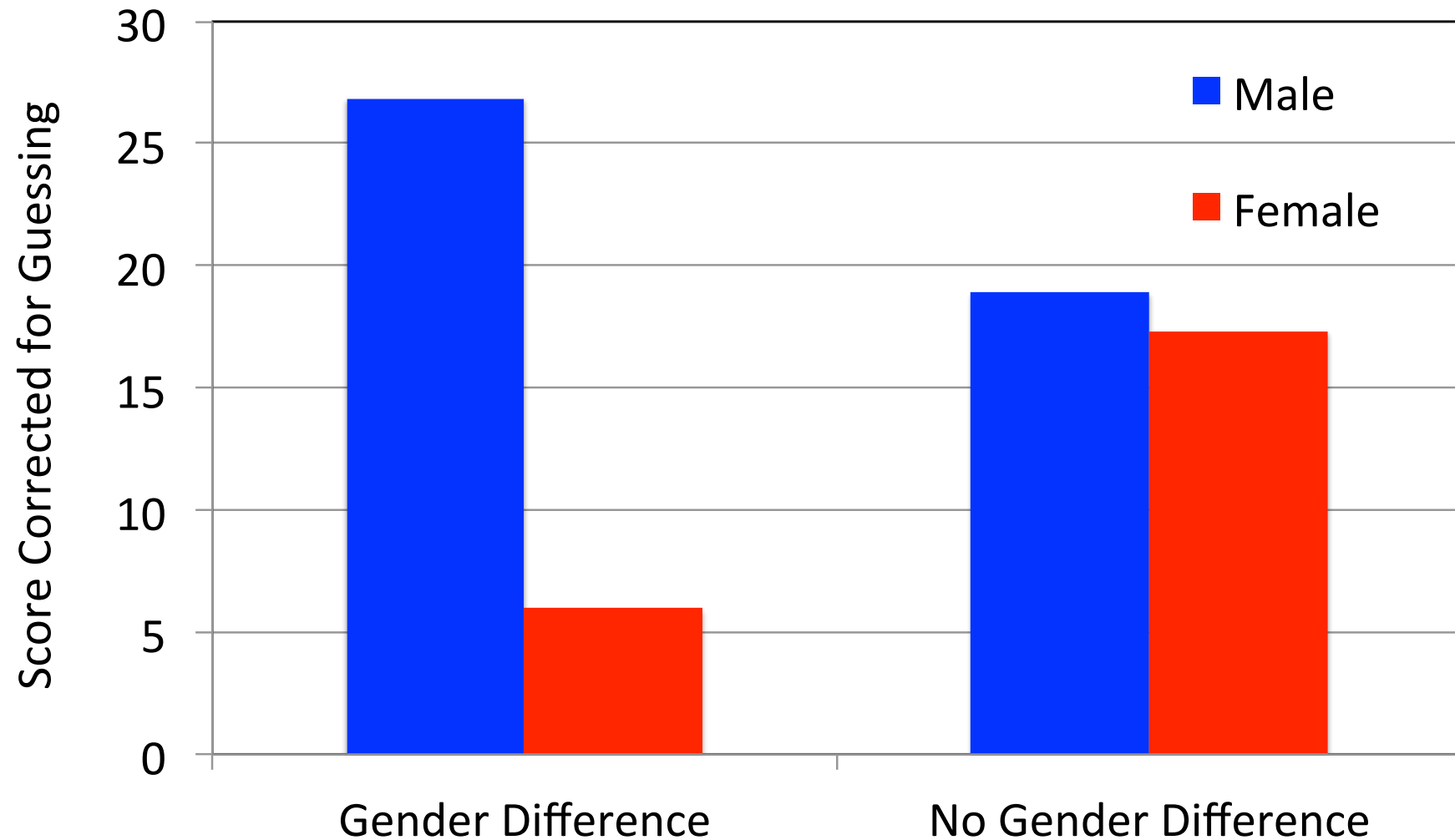
- Math performance (Male vs. Female)
- Intelligence (Black vs. White)
- Memory (old vs. young)

Gender in Perceived Math Ability

Female and Male students given a difficult math examination. All students have high math ability.

- Half told it produces gender differentiated scores
- Half told it does not produce gender differentiated scores

Gender in Perceived Math Ability



Spencer, Steel, and Quinn, *Journal of Experimental Social Psychology* **35**, 4–28 (1999)