Women in physics in the United States: recruitment and retention

Nina Abramzon1, Patrice Benson3, Edmund Bertschinger2, Susan Blessing2, Geraldine Cochran4, Anne Cox6, Beth A. Cunningham8, Jessica Galbraith-Frew1, Jolene Johnson1, Leslie Kerby5, Elaine Lalanne4, Christine O’Donnell7, Sara Petty7, Sujatha Sampath3, Susan Seestrom1, Chandrakekha Singh6, Cherrill Spencer4, Kathryn Sparks Woolf5, Sherry Yennello4

1California Polytechnic University, Pomona, 2United States Military Academy, 3Massachusetts Institute of Technology, 4Florida State University, 5Rochester Institute of Technology, 6Eckerd College, 7American Association of Physics Teachers, 8University of Utah, 9St. Catherine University, 10University of Idaho, 11United States Navy, 12The Frank Batten School of Leadership & Public Policy at the University of Virginia, 13Virginia Polytechnic Institute and State University, 14University of Wisconsin-Milwaukee, 15Los Alamos National Laboratory, 16University of Pittsburgh, 17SLAC National Accelerator Laboratory, 18Pennsylvania State University-University Park, 19Texas A&M University

Summary

Although the numbers of women in physics in the US at all levels have been increasing, the fraction of women involved in physics is still low.

The issue of women in physics, as well as the broader issue of women in all science, technology, engineering, and math fields (STEM), is receiving coverage in the media and increasing attention from the general public.

Efforts to improve the recruitment and retention of women in physics in the US span a wide range of activities, from encouraging girls to consider a future in STEM to professional development for female academic physicists.

Here, we show data collected by the American Institute of Physics on students and faculty, descriptions of some of the programs for physicists in the US, and examples of media reports and programming.

Data on Women in the US

From the American Institute of Physics

The fraction of female physics degree earners has leveled off in the past five years, although the number of degree earners is increasing.

Newly-hired Assistant Professors

Although overall hiring is down, the number of new female assistant professors has remained approximately constant since 2006.

Two-thirds of US physics departments award only bachelor's degrees; they award about 42% of such degrees each year. 70% of them average 5 or fewer degrees per year.

Only about half of them have a female faculty member who can serve as a role model.

Expanding Your Horizons

Conferences

Early interventions are critical for encouraging girls to consider careers in STEM.

EYH are one-day conferences for girls aged 12 to 18, begun in 1976 and now held annually in about 85 cities in 37 US states and several other countries.

Engage girls in interesting and fun hands-on activities designed and led by women STEM professionals who share their enjoyment of their work.

Evaluations show that attending an EYH sparks girls’ interest in and overcomes their prejudices about STEM subjects.

See poster and talk by Cherrill Spencer

Conferences for Undergraduate

Women in Physics

Three-day regional conferences for undergraduate physics majors.

2008 – one site and 29 participants

2014 – eight sites and 1100 participants (about 25% of female undergrad physics majors in the US)

Networking and meeting other female physicists to combat isolation.

Provide information on graduate school, careers in physics, research, women in physics, lab tours, and a student poster session.

See talk by Susan Blessing

Professional Skills Development

Workshops for Women Faculty

Held at national meetings of the American Association of Physics Teachers and the American Physical Society.

Provide professional development and support in navigating careers in physics.

Information on gender differences in views on competition, strategies for engaging in successful negotiations, and suggestions for dealing with difficult people in the workplace.

Mass Media

“We Why are there still so few women in science?”

New York Times, October 2013

Solvay Conference 1927

“We Why Aren’t More Girls Attracted To Physics? Girls are more likely to take high school physics if they see women in their communities working in science, technology, engineering and math, a new study finds”

National Public Radio, August 2013

“We We know Physics is Largely White and Male, But Exactly How White and Male is Still Striking”

Smithsonian.com, July 14, 2014

USA Today, July 24, 2014

“We White, Asian men rule the roost at Twitter”

USA Today, July 29, 2014

“Jesse Jackson: Tech diversity is next civil rights step”

USA Today, July 29, 2014

“Voices: Top tech execs need to speak up on diversity”

USA Today, July 31, 2014

Physics Education Research and Gender Issues

PER gender studies investigate why female students choose to study or pursue careers in physics and how to help them be successful, including self-efficacy, physics identity, psychological interventions, classroom dynamics, pedagogical strategies, and other factors.