New Faculty Workshop

28 October 2018
College Park, MD

Discovering the Resources for Solving Problems

Monica Plisch
Director of Education and Diversity
American Physical Society
APS Policy Statements

**Goal:** Advocate for physicists, and the broader community

**Topics:**  
- Education  
- Ethics and Values  
- Human Rights  
- Internal Policy  
- National Policy

**Education Statements:**  
- Undergraduate Research Statement  
- K-12 Education Statement  
- Career Options for Physicists  
- Advocacy for Science Education  
- Improving Education for Professional Ethics, Standards and Practices  
- Assessment and Science Research in Physics Education

**Coming soon:** Physics GRE

**URL:** [www.aps.org/policy/statements](http://www.aps.org/policy/statements)
Recent AAPT Policy Statements:

- Computational Physics
- Research Experiences for Undergraduates
- Research in Physics Education
- Teacher Education in Physics
- Safe Classrooms

Read more at aapt.org/Resources/policy
AIP Statistical Research Center - reports on the trends in education and employment of physicists and related scientists.

www.aip.org/statistics
Goal: Provide graphs and statistics on physics degrees
Strategy: Analyze IPEDS data and make results available in several formats. Collections include trends in degrees (all levels), women in physics, and minorities in physics. Compare Your Institution shows institution-specific data in comparison with national averages.
URL: www.aps.org/programs/education/statistics/
**Goal:** Provide effective practices and recommendations on topics relevant to physics departments

**SPIN-UP:** Increase number of majors – [www.aps.org/programs/education/undergrad/faculty/spinup/spinup-report.cfm](http://www.aps.org/programs/education/undergrad/faculty/spinup/spinup-report.cfm)

**T-TEP:** Improve teacher education – [www.phystec.org/webdocs/TaskForce.cfm](http://www.phystec.org/webdocs/TaskForce.cfm)

**Phys21:** Enhance career readiness of majors – [www.compadre.org/Phys21](http://www.compadre.org/Phys21)

**LGBT+:** Improve climate for LGBT physicists – [www.aps.org/programs/lgbt/](http://www.aps.org/programs/lgbt/)

**GradEd:** Improve graduate education – [www.aps.org/programs/education/graduate/conf2013/report.cfm](http://www.aps.org/programs/education/graduate/conf2013/report.cfm)
Effective Practices for Physics Programs (EP3) Project

**Goal:** Develop a working document to guide departmental review, assessment, and improvement

**Strategy:** National task force to design, write, vet, and disseminate a collection of effective practices and a guide for self-evaluation suitable for departmental review. The project will also train physics program leaders and reviewers in how to use the Guide through workshops and online communities.

**Contact:** Theodore Hodapp, hodapp@aps.org

**Support:** American Physical Society, NSF: 1738311, 1747563
Undergraduate Curriculum Taskforce
White Papers

**Product:** AAPT recommendations for the Undergraduate Physics Laboratory Curriculum

**Product:** AAPT recommendations for Computational Physics in the Undergraduate Physics Curriculum

**Source:** Both available on your USB drive

**Contact:** Ernie Behringer, ebehringe@emich.edu

**URL:** [www.aapt.org](http://www.aapt.org)
Partnership for Integrating Computation into UG Physics

**Goal:** Survey of the current usage of computational work in undergraduate physics programs. Annual Computational Physics Faculty Development Workshop. Computational Physics workshops at AAPT section meetings, and APS and AAPT national meetings

**Contact:** Bob Hilborn, rhilborn@aapt.org

**URL:** www.compadre.org/picup

**Support:** NSF: 1432363, 1524963, 1505278
Living Physics Portal: Physics for the Life Sciences

Goal: Transformative web site for sharing, testing, and disseminating materials for IPLS and related courses. Being developed by AAPT and eight colleges and universities. Up and running by late-2018

Contact: Bob Hilborn, rhilborn@aapt.org

URL: www.compadre.org/ipls/

Support: NSF: 1624185
Society of Physics Students (SPS) is open to all interested in physics and astronomy. 800+ chapters at two- & four-year institutions. www.spsnational.org

Director: Brad Conrad

National Initiatives & Local Impacts

• For undergraduates and their mentors
• Transform students → professional community

Professional development:
• Internships / Networking
• Communication skills / Leadership
• Career Toolbox

AIP | American Institute of Physics
**Goal:** Provide a careers-oriented hallway slideshow for recruitment

**Strategy:** Slideshow comes out twice per semester and features profiles of physicists in industry, national labs, and other non-academic (mostly) careers; focus on individuals without PhDs (students already get information on academic careers); editable to include local information; hundreds of slides available

**Contact:** Crystal Bailey, bailey@aps.org

**URL:** [www.aps.org/careers/insight](http://www.aps.org/careers/insight)

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**Physicist Profile**

Kate McAlpine (Physics BS)
Science Writer and Physics Rapper
CERN—Geneva, Switzerland

Kate began her adventure with Physics at Michigan State, where she studied to be a science writer.

Since then, Kate has been at the Large Hadron Collider (LHC) doing outreach writing, and managing the news website for ATLAS (one of the experiments running on the LHC).

Kate is also responsible for the infamous "LHC Rap", which has gained worldwide notoriety through the internet!

> "My goal is to explain scientific topics in a way that is relevant, interesting, and understandable," she says. "While accuracy is serious business, the science should still be fun."

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**25 Seconds of Physics**

**The Physics of Yoga**

Many people associate physics with complex technologies and far-out discoveries—but did you know physics is also an essential principle in yoga?

For every object, there is a point in space where you can imagine all of its mass is concentrated. This point is called the "center of mass" of the object.

In order for a yoga pose to be stable, the yogi’s center of mass must sit directly above the yogi’s point of contact with the ground—as though it was a heavy ball sitting on a support.

As a person moves, their center of mass shifts around in space.

So, mastering a pose involves carefully shifting one’s position so that their center of mass is balanced over their point of support—and that takes physics!
Council on Undergraduate Research

**Goal:** Advocating for faculty’s role in providing undergraduate research opportunities for students

**Strategy:** Develop faculty networks, develop tools and resources that support faculty, assess impact of undergraduate research, advocate and pilot new ways to engage students in research

**Contact:** Terry Oswalt (ERAU), terry.oswalt@erau.edu

**URL:** [www.cur.org](http://www.cur.org)
**Goal:** Help research mentors improve their mentoring skills

**Strategy:** Provide a guidebook and materials to facilitate a 10-week seminar for physics researchers. Includes guidance on how to run workshops, directed readings, and strategy tips

**Contact:** Monica Plisch, plisch@aps.org

**URL:** [www.aps.org/link/mentor-training](http://www.aps.org/link/mentor-training)
APS Conferences for Undergraduate Women in Physics (CUWiP)

Goal: Three-day regional conferences for undergraduate physics majors, to help women continue in physics by providing them with information about graduate school, professional career advice, and networking opportunities with other women in physics.

Contact: women@aps.org

Support: NSF: 1346627, 1622510; DOE: DE-SC0011076

URL: www.aps.org/cuwip

US Female Physics Degrees

Canada

CUWiP Attendance
Women in Physics Groups

**Goal:** Improve recruitment and/or retention of women in physics (WiP)

**Strategy:** Provide mini-grants (up to $1,000) to build, improve, or sustain WiP groups; collect and share ideas on activities

**Examples:** Workshops on careers, communication, negotiation, leadership, dealing with bias, other skills; high school or middle school classroom visits; lab tours or field trips; research expos; book club or journal club; group lunches, dinners, or social events

**Contact:** women@aps.org

**URL:** [www.womeninphysics.org](http://www.womeninphysics.org)
Goal: Increase the number of African American, Hispanic American, and Native American undergraduates obtaining physics bachelor’s degrees

Strategy: Connect students with local faculty mentors and provide support and resources. Emergency financial aid fund to mentees (BEAM Fund). National recognition of mentoring service (coming).

Contact: David May nmc@aps.org

URL: www.aps.org/nmc
Students create profiles to reference later

- Compare saved schools
- Advertise your program
- Print and online

Only global graduate program network exclusively dedicated to the physics, astronomy and the physical sciences.
**APS Bridge Program**

**Goal:** Increase the number of underrepresented (URM) students earning a PhD in physics or astrophysics

**Strategy:** Collect applications from URM students not admitted, and make available to departments. Provide best-practices in admissions, mentoring, retention and support

**Contact:** Erika Brown, brown@aps.org

**URL:** www.apsbridgeprogram.org

**Support:** NSF-0958333, 1143070

![Graph showing student progression and achievement over years: 2013 to 2017.](image)
Climate Site Visits for Women and Minorities

**Goal:** Improve the climate for underrepresented individuals in physics departments

**Strategy:** 1-2 day site visits resulting in a formal report to the chair; 1-year follow up; focus on Research Universities, National Laboratories, Scientific Collaborations; 79 visits over last 25 years; best-practices in hiring, retention, climate, etc. available on the website; led by the APS Committee on the Status of Women in Physics (CSWP) and APS Committee on Minorities (COM)

**Contact:** women@aps.org

**URL:** www.womeninphysics.org
Professional Skills Development Workshops

**Goal:** Improve the negotiation and communication skills for women

**Strategy:** 1-day workshop at national APS meetings; facilitation by nationally recognized leaders in negotiation and communication strategies

**Contact:** women@aps.org

**Support:** NSF-0347210, 0752540, 1012585, 1419913

**URL:** www.womeninphysics.org
Who: Women and people who are gender and sexual minorities

What: An online space to share experiences, find resources, and report responses to bias

Why: Gender bias in physics means that many talented physicists end up leaving the field. We need to ensure that all physicists feel welcome.

Visit: genderbias.compadre.org
eAlliances: Mutual Mentoring

**Goal:** Enable women in physics and astronomy departments (particularly those who are isolated) to create their own eAlliance, a peer mentoring group of other women physicists or astronomers who share similar characteristics.

**Contact:** eAlliances@aapt.org

**URL:** ealliances.aapt.org

**Support:** NSF: 1500529
**Goal:** Increase the number of highly qualified high school physics teachers; Build a national coalition of universities engaged in this work

**Strategy:** Encourage and support physics departments to work proactively to recruit and educate future teachers. Provide best-practices and advocate for successful strategies (national meeting: 2-3 March 2019, Boston)

**Contact:** Monica Plisch, plisch@aps.org

**Support:** NSF-0108787, 0808790, 1646913, 1719518, 1707990

**URL:** [www.phystec.org](http://www.phystec.org)
**Goal**: Close the gender gap in undergraduate physics degrees

**Strategy**: Enlist large numbers of high school physics teachers to directly recruit women to pursue a physics degree

**Contact**: Kathryne Sparks Woodle, woodle@aps.org

**Support**: NSF: 1720810, 1720869, 1720917, 1721021

**URL**: www.stepup4women.org

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**Participation of Women in Physics**

- **High School**: 50%
- **College Entrance**: 40%
- **BS (degree)**: 30%
- **PhD (degree)**: 20%
- **Assistant Professor**: 10%

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**Careers with Physics Degrees**

- **UNDERREPRESENTATION OF WOMEN**
- **Lesson Plan Template**

**Empowering Women in Physics**
APS Public Outreach

**Goal:** Build excitement in populations beyond the physics/astronomy community for physics and science

**Strategy:** Mini-grants for outreach ($10,000); comic books, posters, and science kits for middle school classrooms (PhysicsQuest); blogs and social media posts on “cool” science

**Contact:** Becky Thompson, thompson@aps.org

**URL:** www.physicscentral.org