Conferences for Undergraduate Women in Physics

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Past chair, CUWiP National Organizing Committee
http://www.aps.org/cuwip
Outline

• Motivation
• History
• Conference Formats
• National Structure
• Challenges
• The Future
Motivation

- US Producing 7000 Physics Bachelor’s per year.
- Fraction of female Bachelor’s degrees about 20%
- Number of female Bachelor’s rising, but not as fast as males.

Motivation

Credit: APS/Source: IPEDS Completion Survey & NSF-NIH Survey of Graduate Students & Postdoctorates in Science and Engineering
Motivation

• Female students often isolated.
  – 43% of all Bachelor’s from institutions with ≤5 degrees/year.
  – At Ph.D. granting institutions, median number of all degree recipients is 12.

• Few female faculty mentors
  – 43% of four-year schools have no female faculty
  – 40% of Ph.D. granting institutions have 0 or 1 female physics faculty

<table>
<thead>
<tr>
<th>Percentage of Physics Faculty Members Who Are Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>by Academic Rank</td>
</tr>
<tr>
<td>1998</td>
</tr>
<tr>
<td>Full Professor</td>
</tr>
<tr>
<td>Associate Professor</td>
</tr>
<tr>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Instructor / Adjunct</td>
</tr>
<tr>
<td>Other ranks</td>
</tr>
<tr>
<td>by Highest Degree Offered by Department</td>
</tr>
<tr>
<td>1998</td>
</tr>
<tr>
<td>PhD</td>
</tr>
<tr>
<td>Master’s</td>
</tr>
<tr>
<td>Bachelor’s</td>
</tr>
<tr>
<td>OVERALL</td>
</tr>
</tbody>
</table>

The year in the table refers to the spring semester; for example, 2010 represents the 2009-10 academic year.

* These data were not collected in this survey year.

http://www.aip.org/statistics
Why care about diversity?

1. Studies show that a more diverse cohort:
   a. Will be more productive.
   b. Will generate higher quality ideas.
   c. Are better at solving problems.
   d. Example: startups with female execs succeed more often.

2. Studies also show that minority participants:
   a. Get less credit for similar achievements.
   b. Feel more pressure to perform. (stereotype threat)
   c. Are less confident
   d. Feel exclusion, isolation, alienation (microaggressions, microinequities)

3. Industry wants us to train a more diverse workforce
CUWiP Goals

The primary goal of the Conferences for Undergraduate Women in Physics (CUWiP) is to increase recruitment and retention of undergraduate women in physics by

• communicating the breadth of education and career paths open to physics majors;

• disseminating information and advice on applying for summer research, graduate school and professional employment;

• providing opportunities to share experiences, advice and ideas with women at different stages of their education or career paths.
CUWiP History

Female Physics Degrees

CUWiP Attendance

Data from APS and IPEDS (compiled by Ted Hodapp).
CUWiP History

- First conferences at Southern Cal in 2006 & 2007
- Yale also heavily involved in early years.
- Growth due to:
  - Better advertising [especially 2012 (APS) & 2013 (SPS)]
  - Better regional coverage
  - Word of mouth
  - Repeat attendees
2015 Purdue Conference

2014 University of Maryland Conference
Conference Timing/Schedule

• Conferences held the weekend of Martin Luther King, Jr. holiday

• Typical schedule:
  – Students arrive, Friday (Jan 16, 2015)
    • Check in, welcome
    • Some talks/panels Friday evening
    • Some sites have lab/facility tours on Friday
  – Conference continues all day Saturday
  – Conference concludes Sunday mid-afternoon.

• Many benefits to the mid-January weekend
  – Fall semester can be used for organization/applications
  – Winter term not yet in full swing

• Downside is weather may affect travel.
Conference Format

• Each site determines format, agenda

• Agendas have evolved, more workshops and panels, fewer talks.

• Typically:
  – Presentations from speakers (academia, industry)
    • Speakers asked to present at an undergrad level
    • Also asked to describe their career path
  – Workshops/Panels
    • Careers (experience, resumes, opportunities)
    • grad school (experience, applying)
    • undergrad research
    • balancing work/family
    • communicating/writing
  – Tours of facilities or campus research labs
  – Student research poster session
  – Informal discussions
  – Meals, breaks, fun events for networking

• National keynote talk ties the sites together
Social Media

Jessica Kirkpatrick @berkelejess Jan 18
Letting the women of physics know about jobs at @InstaEDU and in data!
#CUWiP pic.twitter.com/E4dziuzrb

Andre Bach @Nonnormalizable Jan 18
Letting the women of physics know about jobs at @Yammer and in data!
#CUWiP with @katandmousse & @berkelejess pic.twitter.com/PbZxEMYgT

Irene Vargas Salazar @irmlovesyou Jan 18
That moment when your research goes public. #astronomy #LSU #OMG #hehe
#cuwip instagram.com/pJ/F3Iiku32Z/

Leah Crane @DownhereonEarth Jan 18
This is a 52-foot deep steel pit that they put detectors down. It is very ominous.
#CUWiP pic.twitter.com/yZ8KINJXHT

Leah Crane @DownhereonEarth Jan 18
UCI is just too beautiful. #CUWiP pic.twitter.com/yk/mwxU66Yv

Brittany Moore @_bmcore Jan 18
Who knew scientists had to make such difficult decisions?! #macuwip #cuwip
#SciencePolicy @ College... instagram.com/pJ/u3MHk0kS/

Brittany Moore @_bmcore Jan 18
So many women in physics in one place!! #macuwip #cuwip
pic.twitter.com/WrV3nFh1qv

Mary Heintz @maryheintz Jan 18
Getting some good questions during the keynote. #cuwip
pic.twitter.com/GmCWUjZtvX
Financial Model

• Philosophy: student costs should be minimal
  • Financial considerations should never be a limitation to attendance.

• Support to students provides for:
  – Food
  – Lodging
  – Some travel expenses
    • Home departments have made a BIG contribution to this effort by sharing in travel support. THANKS! (more later)
  – Other expenses (facilities, speakers)

• Students pay $25 registration fee only.
  – Support available for students unable to afford fee.
Outline

• Motivation
• History
• Conference Formats
• **National Structure**
• Challenges
• The Future
National Structure

• Originally “grass roots”
  – Conferences fully run locally
  – No formal national organizing structure. Informal group of conference organizers.
  – Sites collaborated on DOE, NSF proposals
  – Regular phone calls to share information.

• In 2012, began working on a more formal collaborative structure
  – National Organizing Committee
  – Formal collaboration with APS
  – Formal procedure for site selection

• 2013-2014 (prepare for Jan 2014 conferences) first year for National Organizing Committee and formal APS Collaboration
2015-2016 Organization

- Pat Burchat, Stanford, super past chair
  - Instrumental in formalizing the NOC structure and the collaboration with APS
- Kevin Pitts, Illinois, past chair
- Mette Gaarde, Louisiana State, chair
- Kate Scholberg, Duke, chair elect
- APS
  - Ted Hodapp, APS
  - Renee Michelle Goertzen
  - Deanna Ratnikova, APS
- 2015 and 2016 site organizers
Benefits of APS Collaboration

• Opportunity to submit multi-year grant proposals. APS becomes the source of continuity.

• Centralize many functions such as application and registration.
  – Previously, each site responsible for setting up online application/registration system.

• APS brings a great deal of organizational insight and experience
  – Office of Education and Diversity incredibly knowledgeable

• Offers an opportunity to do fundraising across years and across sites.
Funding

• Sources: host institutions, donations, federal government.

• Our experience: host institutions willing to provide significant funding and in-kind contributions.

• Tremendous support from DOE Office of Science and National Science Foundation.
  – DOE Office of HEP, Office of Nuclear Physics, Fusion Science, Basic Energy Sciences
  – Previously: year to year proposals
  – Now: three year grants from both entities.
  – Federal funds used mostly for participant support (NSF funding supports assessment)

• Donations/other funding sources vary from site to site.
  – Collaborating universities
  – Travel support from students’ home institutions
  – Alumni
  – Industry
  – Labs, other facilities
Feedback/evaluation

• NSF supports conference evaluation.
  – Pre-conference surveys
  – Post-conference surveys
  – Focus groups

• Overall evaluation of the conferences is extremely positive
  □ 90-95% say the conferences met their expectations
  □ 80-85% say the conference helped improve their self-confidence

• Tremendous experience for student organizers.
Challenges (from 2014)

• Improving rapidly on all fronts, but still room to improve and grow.

• Geographic balance of sites
  – Some regions oversubscribed
  – Sufficient demand for 2 conferences in the Midwest and West

• Maintaining a good balance/emphasis between graduate school and broader career opportunities
  – Very easy for conferences to be too oriented to academia

• Growing pains associated with more sites and new APS collaboration

• Passing along experiences & best practices from year to year.
  – Annual (late May) meeting with past/future organizers a real game-changer

• Work to further improve diversity
  – URM participation good.

• Equitable disbursement of funds.

• Technology for keynote address

• Advertising
- Received 16 proposals this year (9 sites)
- Need new hosts.
- Need more sites to balance geography
External Funding

not including registration fees or “in kind” support

<table>
<thead>
<tr>
<th>Year and # of Sites</th>
<th>NSF/DOE</th>
<th>Local Funding</th>
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<tbody>
<tr>
<td>2006 (1)</td>
<td>$0k</td>
<td>$500k</td>
</tr>
<tr>
<td>2007 (1)</td>
<td>$0k</td>
<td>$500k</td>
</tr>
<tr>
<td>2008 (3)</td>
<td>$0k</td>
<td>$500k</td>
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<tr>
<td>2009 (3)</td>
<td>$0k</td>
<td>$500k</td>
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<tr>
<td>2010 (5)</td>
<td>$0k</td>
<td>$500k</td>
</tr>
<tr>
<td>2011 (5)</td>
<td>$0k</td>
<td>$500k</td>
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<tr>
<td>2012 (6)</td>
<td>$0k</td>
<td>$500k</td>
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<tr>
<td>2013 (6)</td>
<td>$0k</td>
<td>$500k</td>
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<tr>
<td>2014 (8)</td>
<td>$0k</td>
<td>$500k</td>
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<tr>
<td>2015 (8)</td>
<td>$0k</td>
<td>$500k</td>
</tr>
</tbody>
</table>
Future

• Conference size currently well-matched to demand.

• Continued growth anticipated due to word of mouth and better advertising

• To sustain, we’ll need new sites to host
Requests of chairs

1. **Forward the emails you get about the conferences!** *We are still limited by lack of student awareness!*

2. **Provide (if possible) travel funding for your students to attend.** If not possible, make sure your students understand that travel subsidies are available! *Food and lodging provided always.*

3. **Consider hosting a conference.** A great experience for your students. But needs a true champion in your department.
   - For Jan 2017:
     - EOI due Sept 1, 2015 (Not required)
     - Full proposal due Nov 1, 2015
     - Info available on CUWiP web page.

4. **Remember that we can’t rely only on members of underrepresented groups to improve diversity.**
Summary

• Conferences for Undergraduate Women in Physics are a **SUCCESS**
• The model is working, we are making a difference.
• We have momentum, we need to keep it going.
Growing internationally

• First CUWiP UK, March 2015
@CuWiP
Loving the solidarity with women physicists - we are each other’s greatest allies!

APS Conferences for Undergraduate Women in Physics (APS CUWiP)

January 15-17 2016
Applications open September 1

Financial assistance is available.

Black Hills State University
Georgia Institute of Technology
Ohio State University
Old Dominion University/Jefferson Lab
Oregon State University
Syracuse University
University of California, San Diego
University of Texas, San Antonio
Wesleyan University

www.aps.org/link/cuwip

Photos courtesy of Rutgers, the State University of New Jersey and the University of Mississippi