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## National Conferences for Undergraduate Women in Physics Celebrates 15 Years!

*Maria J. Rodriguez*

Conferences for Undergraduate Women in Physics (CUWiP) offers yearly all undergraduate women in physics across the nation the opportunity to spend three days networking and developing leadership skills.

The first Conferences for Undergraduate Women in Physics (CUWiP) was held in 2006. Two graduate students at the University of Southern California founded the conference to level the playing field after they realized that only 21 percent of US undergraduates in physics were women. In the 15 years since then, the percentage of undergraduate physics degrees going to women in the US has not grown [1], but CUWiP has. What began as one conference with 27 attendees has developed into a string of conferences held at sites across the country. In 2011, the American Physi-

cal Society became the institutional home of CUWiP. Since then the number of participants has grown every year (Fig 1). The conference is also now being held in Canada and the UK.

CUWiP, are three-day regional conferences for undergraduate physics majors. The conference is held simultaneously at multiple sites throughout the United States. The goal is to help undergraduates and gender minorities continue in physics through participation in a conference focused on their development as scientists and showcasing options for their educational and professional futures. Student attendees leave with a

*continued on page 3*



Figure 2: CUWiP event, hosting 154 undergraduate physics students at Utah State University in 2019.

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## Women in Physics Groups Provide Local Support

*Kristen Burson, Beth McCarry, Elyssa Hofgard*

**H**ow can the physics community better support women in physics? Act locally! Women in physics groups can play an important role in advancing the mission of recruiting and retaining women in physics at the undergraduate level by acting locally to support participation of women in their departments. Since 2015, the APS Committee on the Status of Women in Physics (CSWP) has supported women in physics (WiP) groups through the group grants program. Here, WiP group leaders Beth McCarry and Elyssa Hofgard share the work that their groups have pursued since receiving the grant.

### University of Oregon

Since its inception in 2016, the University of Oregon Women in Physics (UOWiP) group has formed a community of women and other gender minorities within the department, helped guide undergraduates through the physics major, and played an integral role in recruiting a diverse graduate student population. Building an inclusive, engaging, and pluralistic community in the physics department is an important mission of UOWiP, helped in part by funding through APS.

The group has created several high-impact programs on their campus, UOWiP president Beth McCarry explains:

“Our Mentorship for Undergraduate Women in Physics ( $\mu$ WiP) program, whose goal is to increase retention rates of physics majors by providing them with one-on-one support, creates an opportunity for undergraduate students to form personal connections with graduate students and senior undergraduate mentors in their research field(s) of interest. Our annual Undergraduate Research Fair introduces undergraduates to different research areas and research opportunities available to them, including advice from professors and graduate students on being a successful scientist and researcher.

In 2017-2018, officers and members of UOWiP organized the Pacific Northwest Regional Conference for Undergraduate Women in Physics at UO. Around 200 undergraduate women attended talks and workshops focused on professional development, research science, and personal well-being. UOWiP’s involvement was integral in bringing national attention to the UO physics department’s commitment to diversity and equality.”

### Stanford

Physics Undergraduate Women and Gender Minorities at Stanford (PUWMAS) was founded in the spring of 2017. It is the first undergraduate group at Stanford dedicated to uplifting women and gender minorities in physics, and strives to provide a supportive environment for any student interested in physics. They also provide opportunities for personal, academic, and career development through their Community Development, Professional Development, and Diversity and Education branches.

Students involved have reported that PUWMAS provides the community and support crucial to their success and retention in physics. PUWMAS Co-President Elyssa Hofgard explains how their group has benefited from the grant: “Our group received a Women in Physics APS group grant in 2018. This grant allowed us to expand and improve PUWMAS programming

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**“Our mentees benefited from guidance and advice, and many of our mentorship pairs developed friendships that will last beyond their undergrad years. We also applied our WiP grant to valuable professional development and educational events including a faculty lunch, a resume workshop, and an informational panel with graduate and postdoc students.”**

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and outreach. We applied much of the WiP grant to our 2018-2019 mentorship program, which paired underclass students with upperclass students in physics. Our mentees benefited from guidance and advice, and many of our mentorship pairs developed friendships that will last beyond their undergrad years. We also applied our WiP grant to valuable professional development and educational events including a faculty lunch, a resume workshop, and an informational panel with graduate and postdoc students. We are grateful for the support provided by the APS WiP grant, and we will strive to further improve our physics community in the years to come.”

Group grant applications are accepted annually in November and funds can be used to support the creation of a new WiP group, expand an existing group, or improve sustainability within a group. ■

## National Conferences for Undergraduate Women in Physics Celebrates 15 Years! *continued* from page 1

greater sense of community, identify themselves more as physicists, become more aware of gender issues in physics, and feel valued and respected in their field. Participants accomplish this through talks, workshops and panels featuring accomplished female physicists in a broad range of professions. Keynote speakers for CUWiP include Fabiola Gianotti, CERN Director (CUWiP 2019), Gabriela Gonzalez, Louisiana State University (CUWiP 2015), and Mildred Dresselhaus, MIT (CUWiP 2008).

At the 2018 conference held at Utah State University, Hope Marks, physics student, participated in a workshop in which she wrote a letter to her high school physics teacher, who she says really ignited her interest in the science, and presented a conference poster about her research on black holes.

The conferences are supported by the National Science Foundation, the Department of Energy and the host institutions (see a complete listing of CUWiP sites [2]). Sponsorships have allowed conference organizers to keep registration fees down. Conference fees include great programming, meals and accommodation for the conference. Most student transportation to the conferences is almost covered by the students home institutions. In addition, local organizing committees contribute a significant volunteer effort. APS provides organizational support, institutional memory, and a home for the external financial support necessary to operate and continually improve CUWiP events.

The National Organizing Committee is currently led by Chair Evangeline J. Downie, “CUWiP is one of the most rewarding and exciting things I have ever participated in. For many of the students, this is the first time they will have experienced a concentrated group of women physicists, or had a chance to have extended discussions with senior women in the field. We work hard to make the conferences fun, interactive, full of physics, but also about physicists. We aim

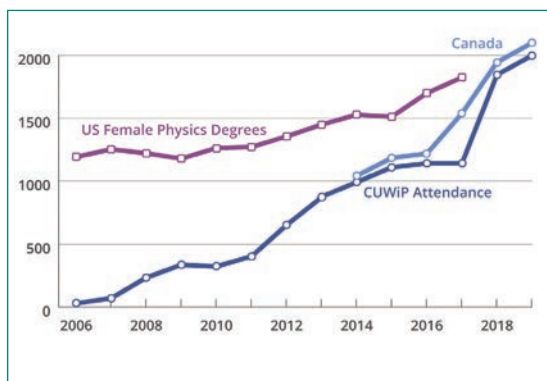


Figure 1: Number of CUWiP participants throughout the 15 years

to make CUWiP an experience that informs, inspires and entuses the students in a way that helps them to persist in physics, and feel included in the broader community of physicists, even in situations where they may be the only woman in their class. “

The hope is also to address broader issues of diversity and inclusion, Downie says, working to minimize socioeconomic barriers to participation, and address issues of relevance to underrepresented students, and the LGBTQ+ community.

### Interested in hosting a future conference?

The application process for future sites are due yearly November 1. More details about the Host Site Application Process can be found here [3]. ■

### References:

- [1] [aps.org/programs/education/statistics/womenstem.cfm](https://aps.org/programs/education/statistics/womenstem.cfm)
- [2] [aps.org/programs/women/workshops/cuwiphistory.cfm](https://aps.org/programs/women/workshops/cuwiphistory.cfm)
- [3] [aps.org/programs/women/workshops/cuwip-host.cfm](https://aps.org/programs/women/workshops/cuwip-host.cfm)

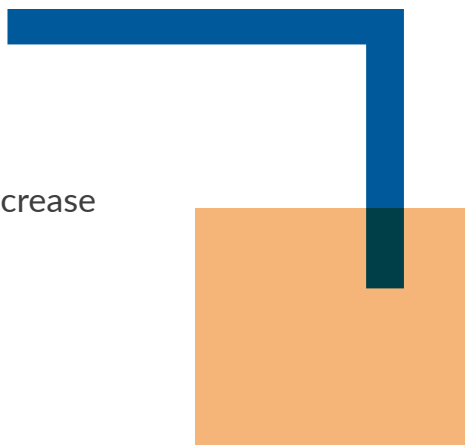
Student attendees leave with a greater sense of community, identify themselves more as physicists, become more aware of gender issues in physics, and feel valued and respected in their field.



The APS Bridge Program is an effort to increase the number of physics Ph.D.s awarded to underrepresented minority students.

**DEADLINE: MARCH 15, 2019**

APSBRIDGEPROGRAM.ORG



## APS Climate Site Visits

Laura McCullough, University of Wisconsin-Stout

For 30 years, the APS has offered physics departments the opportunity to have an outside assessment of their climate for women and other underrepresented groups. These site visits involve a team of experts visiting an organization, interviewing members, and providing recommendations and observations to the department in a final report. The APS also offers site visits for labs and collaborations, but the primary focus is on departments.

Since the APS site visit program began in 1990, the proportion of women in physics has increased, with bachelor degrees rising from 15% to 20% and PhDs doubling from 10% to 20%.<sup>1</sup> Yet the last decade has seen a plateau in the percentage of women earning undergraduate physics degrees, with little to no change. We clearly still have work to do.

Recently, the Committee on the Status of Women in Physics and the Committee on Minorities have worked together to redesign the site visits. Focusing on efforts to create lasting change through requiring greater involvement of the department, the new site visits will provide clear goals for improving departmental climate. Implementation of the new process will begin in 2020.

When a department wishes to have a site visit, the first step is for the department to create a team to work

on the site visit process. The team must include the department chair and must include at least one female faculty member. The department team will complete a short self-study collecting data on department demographics and policies. This self-study will go to the site evaluators, as well as results from an anonymous climate survey of the department.

The site evaluators will visit the department for a day to interview various stakeholder groups, separated by gender and, if requested, by other demographic criteria. Following the interviews, the site evaluators will use their interview data, the self-study, and the climate survey results to create a report for the department. The report includes a short summary of observations and a list of recommendations.

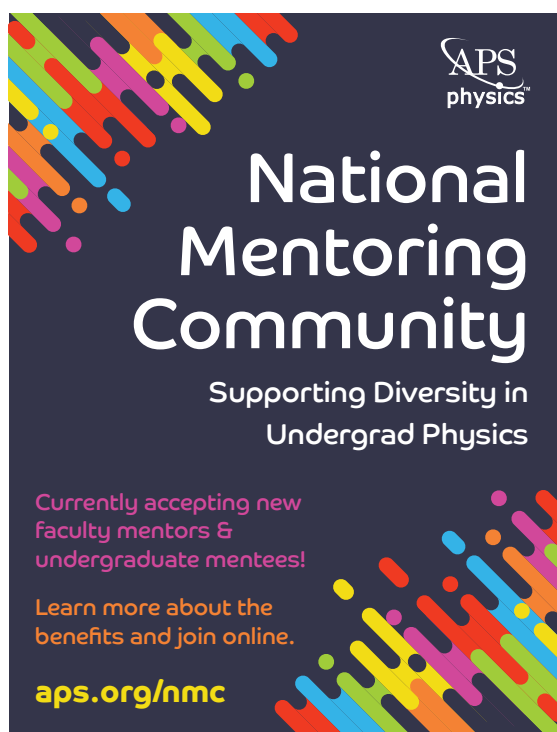
Based on the site evaluators' report, the department team will create a set of goals to address climate issues and work towards building a more inclusive environment. The goals will be sent to the APS, and one year after the site visit, the APS will request a follow-up report from the department on activities and achievements of goals.

The newly designed site visit program will continue the work of the past three decades in promoting the participation of women and other underrepresented groups in physics, with updates addressing current issues for underrepresented groups, theories on institutional change, and improvements to procedures.

Department chairs can request a site visit by visiting this site: [aps.org/programs/women/sitevisits/index.cfm](https://aps.org/programs/women/sitevisits/index.cfm). ■

<sup>1</sup> *Women in Physics and Astronomy 2019*. Anne Marie Porter, AIP Statistical Research Center. [aip.org/statistics/reports/women-physics-and-astronomy-2019](https://aip.org/statistics/reports/women-physics-and-astronomy-2019)

... the last decade has seen a plateau in the percentage of women earning undergraduate physics degrees, with little to no change. We clearly still have work to do.



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# National Mentoring Community

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# STEP UP

Are you a high school physics teacher, or do you know a high school physics teacher?

STEP UP is a national community of physics teachers, researchers, and professional societies. We design high school physics lessons to empower teachers, create cultural change, and inspire young women to pursue physics in college.

Join the STEP UP community and help recruit physics teachers today!

[STEPUPphysics.org](https://STEPUPphysics.org)



# The STEP UP Project: Recruiting Teachers, Inspiring Future Physicists

Anne Kornahrens

STEP UP 4 Women, has grown since our last report in Spring 2018. We are now **STEP UP** and have a suite of research-driven materials that we're sharing with our 1700+ community members, including 900+ teachers. We are committed to the mission of recruiting and engaging more high school physics teachers and providing them with lessons shown to inspire young women to pursue physics in college. But we've made some changes and still need your help to reach our goal: 50% of bachelor's degrees earned by women by 2025. As we continue our journey in a new decade, **can you support us?**

Inspired by consultation with marketing experts and representatives from L'Oreal, STEP UP 4 Women underwent a rebranding in summer 2019, to become the "STEP UP" project with a new logo — ensuring that we can reach all teachers, since each of the 27,000 physics high school has a role to play in inspiring and welcoming students into physics. In learning that  $\frac{2}{3}$  of these teachers are male, you might realize that we have a great population of teachers that can inspire their students if we engage them in the STEP UP movement.

In addition, the STEP UP project has reached a new phase after 2 years of developing, piloting and testing the STEP UP materials. The final suite includes: a lesson on Careers in Physics, designed to inspire students to realize the many careers you can do with a physics degree and how their values are aligned with some of those options; a lesson on Women in Physics, which looks at the underrepresentation of women and other groups in physics and includes critical discussion of bias observed and felt in the students lives; and an Everyday Actions Guide, which provides the teachers with small behaviors they can model throughout the year in their classroom to make it a more inclusive environment. With these completed materials we entered the phase of the project dedicated to disseminating the



PHYSICS TOGETHER

*The STEP UP project, with its new branding, hopes to reach many of the 27,000 U.S. high school physics teachers*

materials widely across the country. This 'propagation' effort has included attendance at conferences and teacher-focused events, mass emailing with an external marketer, social media engagement and the launch of our Ambassador Program. The first cohort of 45 Ambassadors were welcomed to the project in Provo, UT in July 2019 and then held workshops throughout the country in the fall of 2019.

Recruiting our next cohort of Ambassadors includes another round of applications (Dec 2, 2019 to Jan 31, 2020) and final announcements on Feb 14, 2020. These new ambassadors will join those returning for another year at the STEP UP Summit to be held July 2020 in Grand Rapids, MI. Workshops will again be held throughout the year, with continued in-person and virtual training providing a cohesive Ambassador

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**We are committed to the mission of recruiting and engaging more high school physics teachers and providing them with lessons shown to inspire young women to pursue physics in college.**

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*continued on page 7*



*The 2019-2020 Ambassador cohort at the STEP UP Summit in Provo, UT (July 2019)*

## Returning to Physics

*Maria J. Rodriguez*



*Nicole Lloyd-Ronning*

**“The Blewett Fellowship made all the difference in my success returning to work.”**

*‘I am unbelievably grateful every day for the opportunity the Blewett fellowship afforded me to return to work after such a long absence (10 years!).’*

– Nicole Lloyd-Ronning, astrophysicist

Nicole Lloyd-Ronning, is currently on the faculty at University of New Mexico, Los Alamos where she teaches physics classes for undergraduates and leads the outreach effort at the Center for Theoretical Astrophysics at LANL. She received her Ph.D. in Physics from Stanford University in 2001, and was a Director’s Postdoctoral Fellow at Los Alamos National Laboratory. After a break in her career, Lloyd-Ronning, who then was a full time stay-at-home mom, applied to the M. Hildred Blewett Fellowship, a career reentry grant from the American Physical Society (APS). The Blewett Fellowship made all the difference in my success returning to work, she says. In 2015, with support from the Blewett Fellowship, Lloyd-Ronning returned to research at Los Alamos National Lab as guest scientist investigating particle acceleration and radiation in the context of relativistic shocks in gamma-ray bursts using particle-in-cell simulations.

The APS M. Hildred Blewett Fellowship was established in 2005 from a generous bequest from M. Hildred Blewett [1], an accelerator physicist who was passionate about physics and wanted to help women overcome obstacles. The aim of the one-year award is to enable women to return to physics research careers after having interruptions in their careers. Through these 15 years, the program has supported 44 different women to returning to physics research careers.

Lloyd-Ronning learned of the Blewett fellowship through APS emails and newsletters – she had retained APS membership during her career break. And as she recalls, the decision to apply was her own, although her family was supportive. Returning to research after an extended personal leave is possible, but it may not be straightforward. A few colleagues were neutral at best, Lloyd-Ronning recalls, and many did not know what the Blewett fellowship was. Yet, one external colleague (at another institution) was particularly support-

ive and she found his support particularly motivating.

After time away from the work force, when she first returned, many people/colleagues did not know what to do with her and she felt pretty marginalized. Looking forward she says, “I would love if more people in our field were open to those who have taken non-standard career paths and those who have chosen or have had to take a break are welcomed back a little more warmly.”

There were a couple of things that Lloyd-Ronning did during her career break that she realizes now were particularly helpful in making her transition back to work easier: a) keep up with the progress in the field by looking at the papers posted on arXiv.org every night – “I didn’t often read papers in their entirety, but I did at least read the abstracts of articles in my field so I could keep up with what was going on” she says. This proved to be hugely beneficial and made it easier to “catch up” when she returned. b) stay in touch with a couple of colleagues - not many and not often, but it was helpful to keep those connections and kept her on their radars in case opportunities arose. c) remain a member of the APS and AAS. This was helpful for general news and job postings in the field at large. d) attend a conference every now in then if at all possible. Even local conferences with small registration fees can be really wonderful to make or keep up connections and get involved in projects.

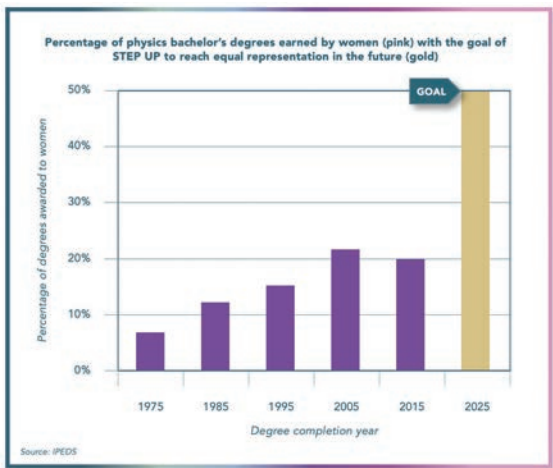
Lloyd-Ronning, too, as many women in physics, keep it as quiet as possible that they left the field for a few years. She was afraid nobody would take her seriously if they knew. But now, she tells it to anyone who is interested and willing to listen - not only to bring light to some of the ugly issues in our field that caused her to leave in the first place, but also to make it known that there are different paths to a career in physics!

Applications deadlines are typically in June each year. See [2] for more details. ■

### References

[1] [aps.org/programs/women/scholarships/blewett/blewett.cfm](https://aps.org/programs/women/scholarships/blewett/blewett.cfm)

[2] [aps.org/programs/women/scholarships/blewett/](https://aps.org/programs/women/scholarships/blewett/)



Percentage of physics bachelor's degrees earned by women (pink) with the goal of STEP UP to reach equal representation in the future (gold)

cohort and more community engagement across the full community.

What can you do to help? Sign up at our website to be kept in the loop and check our lesson materials at [STEPUPphysics.org](http://STEPUPphysics.org). Do you know a teacher that should be a part of STEP UP? Please direct them to our website to sign up and download the materials for their classroom. Do you know a venue where we should be presenting to teachers? Do you know a potential future ambassador? Do you have a new idea that the project could try? Email us at [STEPUPphysics@aps.org](mailto:STEPUPphysics@aps.org) with any suggestions.

This movement has grown due to the support of groups like the Committee on the Status of Women in Physics & the Committee on Minorities, as well as many APS members and volunteers. We can still use your help in spreading the word, supporting our Ambassadors and teachers, and helping to make sure that every young woman has the chance to be welcomed into physics. ■



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# Save the date for Conferences for Undergraduate Women in Physics

[aps.org/cuwip](http://aps.org/cuwip)  
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**January 15–17, 2021**

Applications open in September.

Financial assistance will be available.



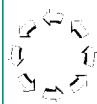
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