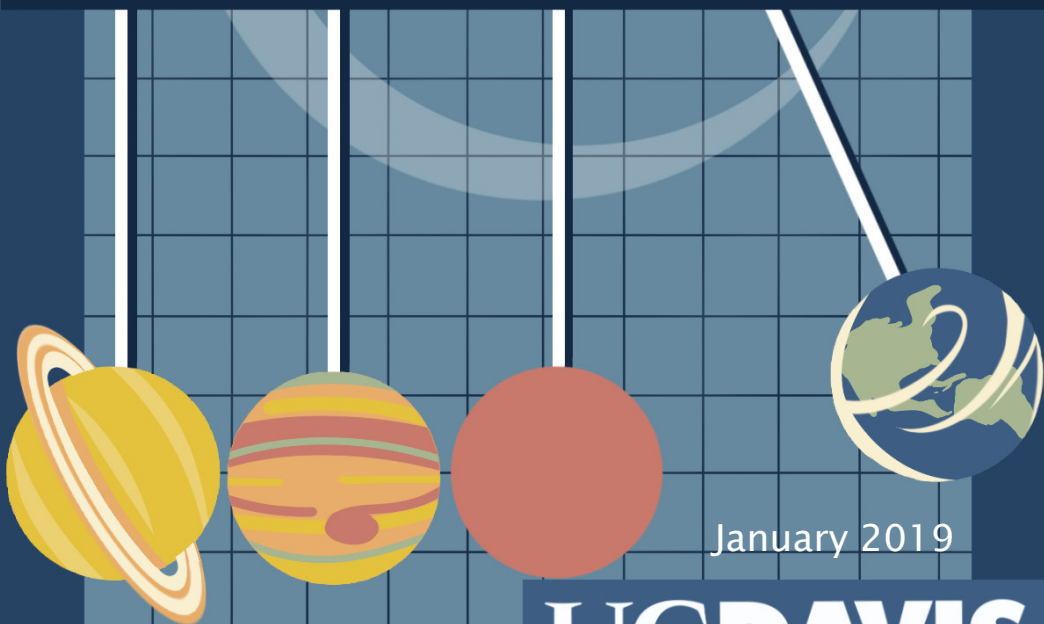


CUWiP

Conference for Undergraduate Women in Physics



January 2019

UCDAVIS

APS
physics



The American Physical Society sponsors CUWiP (Conferences for Undergraduate Women in Physics) annually across the U.S. and Canada. These conferences are designed to help undergraduates get involved in research, learn about networking, consider graduate school, and hear about careers that might be new to them. There are also opportunities for students to share their research at a poster session and informal social activities to network with other women in physics from different colleges and universities.

The UC Davis branch is hosted on the largest campus in the whole UC system, home to the UC Davis Arboretum and Public Garden, boasting a 3.6 mile walking path which showcases dozens of plants and animals tended to by students of the university. One thing you may notice during your visit here is the Egghead statue series, the work of Professor Robert Arneson, which includes 5 installations. Pictured above is “Bookhead,” an egghead which greets students at the entrance to the Peter J. Shields Library at the center of campus.

The UCD physics department has 48 faculty members engaged in diverse research alongside students. We are excited to host this conference and create a welcoming space for undergraduate women in physics to meet and learn.

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Schedule

1

Friday, January 18

1:00pm Check-in (until 5:00pm)

2:00pm Optional Lab Tours

4:00pm LGBTQ+ Meet and Greet

5:10pm Welcome and Introductions

5:40pm Talk by Desiré Whitmore

6:30pm Dinner

7:30pm Lynda Lovon's Science Cabaret

8:15pm Optional Social Activities

Saturday, January 19

6:30am Breakfast at Hotel (until 8:45)

7:45am Underrepresented Minority
Physicists Breakfast

9:00am Announcements

9:15am Group Photo

9:30am Workshop Session 1

10:30am Coffee Break

11:00am National Speaker, Fabiola
Gianotti

Location

①

See Pg. 4

④

②

②

①

⑤

See Pg. 15

Hyatt
Lobby

②

See Pg. 11

①

②

Schedule

2

Saturday, January 19

12:40pm Science Cafe Lunch

2:20pm Career Panel

4:00pm Student Poster Session

5:00pm Workshop Session 2

6:15pm Banquet, Speaker Risa Wechsler

8:00pm Optional Social Activities

Sunday, January 20

6:30am Breakfast at Hotel

9:00am Workshop Session 3

10:00am Coffee Break

10:30am Workshop Session 4

11:40am Talk by Monica Moya

12:30pm Lunch, Physics Opportunity Expo

2:30pm Closing Remarks

Key to Locations:

① Physics Building Atrium

② Roessler Hall, Room 66

③ UC Davis Conference Center

④ Physics Building, Room 181

⑤ Peter A. Rock Hall

Location

③

②

①

See Pg. 12

③

See Pg. 15

See Pg. 13

①

See Pg. 14

②

①

Code of Conduct 3

It is the policy of the American Physical Society (APS) that all participants, including attendees, vendors, APS staff, volunteers, and all other stakeholders at APS meetings will conduct themselves in a professional manner that is welcoming to all participants and free from any form of discrimination, harassment, or retaliation. Participants will treat each other with respect and consideration to create a collegial, inclusive, and professional environment at APS Meetings. Creating a supportive environment to enable scientific discourse at APS meetings is the responsibility of all participants.

Participants will avoid any inappropriate actions or statements based on individual characteristics such as age, race, ethnicity, sexual orientation, gender identity, gender expression, marital status, nationality, political affiliation, ability status, educational background, or any other characteristic protected by law. Disruptive or harassing behavior of any kind will not be tolerated. Harassment includes but is not limited to inappropriate or intimidating behavior and language, unwelcome jokes or comments, unwanted touching or attention, offensive images, photography without permission, and stalking.

Violations of this code of conduct policy should be reported to meeting organizers, APS staff, or the APS Director of Meetings. Sanctions may range from verbal warning, to ejection from the meeting without refund, to notifying appropriate authorities. Retaliation for complaints of inappropriate conduct will not be tolerated. If a participant observes inappropriate comments or actions and personal intervention seems appropriate and safe, they should be considerate of all parties before intervening.

Lab Tours 4

Students who arrive by early afternoon Friday have the option of touring several local facilities. Some will also be open to visits on Saturday or Sunday. The meeting point for all tours is in the main atrium of the Physics Building.

A: Shockwave, Xenon, and STM Labs

Giant cannons used to recreate pressures and temperatures in the Earth's core and mantle; detectors for neutrinos and dark matter; low-temperature and sub-atomic resolution for quantum states of electrons. Start times 2 PM and 3:30 PM, lasts 70 minutes.

B: NMR, Surface Microscopy, and Optics Labs

Equipment for performing nuclear magnetic resonance experiments at low temperatures and high pressures; microscopy for atomic-scale visualization of surfaces; laser probes of magnetism, thin film defects, and possible pharmaceuticals. Start times 2 PM and 3:30 PM, lasts 70 minutes.

C: Material Synthesis, Interconnect, and Low Temperature Labs

See where crystals of new materials are grown; bonding techniques for assembling particle detectors; refrigerators for cooling below 50 milliKelvin to study quantum behaviors. Start times 2 PM and 3:30 PM, lasts 70 minutes.

D: McClellan Nuclear Research Center

A high point of the tour is looking into the reactor and seeing the blue glow from Cerenkov radiation. Carpools to McClellan will leave UC Davis at 1:15 PM and 2:15 PM. (Meet in atrium 10 minutes before this.) The tour itself is one hour, and the expected return times to Davis are 3:30 PM and 4:45 PM, respectively.

Lab Tours

5

E: Crocker Cyclotron

A physics research machine, repurposed to treat eye tumors and test satellite parts. One-hour tour starting 3:20 PM.

F: Hutchinson Observatory

A 14-inch telescope and associated control equipment. Starts 3:50 PM, lasts 40 minutes.

G: Chaos Lab

Visualize chaotic attractors in electronic circuits. Start times 2PM to 4PM, lasts 30 minutes.

H: Remote Observing Facility

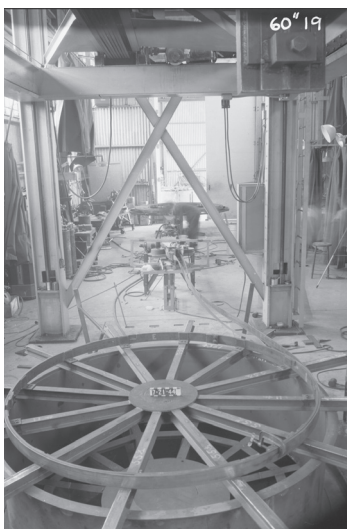
Communication with the Keck Telescope in Hawaii. Start times 2 PM to 4 PM, lasts 30 minutes.



Top Left: The Keck Telescopes in Hawaii



Bottom Left: The UC Davis Physics Department, where many of our labs are located



Right: An early picture of the Crocker Cyclotron in production

Speakers

6

Desiré Whitmore: The Academic Adventures of a Laserchick



A Southern California native, Desiré Whitmore, aka “Laserchick,” attended Antelope Valley College and earned an A.S. in Physical Science before transferring to UCLA for a B.S. in Chemical Engineering. Desiré then went to UC Irvine to study Chemical and Material Physics, earning a M.S. and a Ph.D. Her dissertation research focused on developing very fast laser systems coupled to high-power microscopes that could capture molecules vibrating and rotating in real time. After her postdoc, Dr. Whitmore worked with the Learning Design Group (LDG) at the Lawrence Hall of Science to create an all-digital K-8 science curriculum (Amplify Science) which aligned with the Next Generation Science Standards. Currently, Dr. Whitmore is the Senior Physics Educator for the Teacher Institute at the Exploratorium in San Francisco, where she works to support middle and high school teachers with developing hands-on, inquiry-driven lessons for their classrooms.

Lynda Williams: Science Cabaret

Lynda Williams is physicist and performance artist who teaches physics at Santa Rosa Junior College and performs science musicals in her cabaret act, The Physics Chanteuse. Lynda has entertained audiences at events for APS, AAPT, AAAS, AAS, CERN, UCB, UCLA, CALTECH, MIT and at universities and conferences around the world. Lynda will be sharing her new work in progress, a musical history of Women in Science.



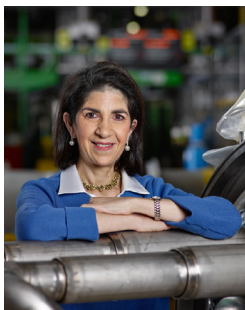
“Every scientist dreams of seducing people with the beauty and wonder of the natural world. But few take it as far as Lynda Williams - the Physics Chanteuse - who puts her microphone where her mouth is.” -KC Cole of the LA Times

For more information check out her website: <http://lyndalovon.blogspot.com/>

Speakers

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Fabiola Gianotti: National Speaker



Fabiola Gianotti is the Keynote Speaker for the 2019 CU-WiP conferences. She received a Ph.D. in experimental particle physics from the University of Milan in 1989. Since 1994 she has been a research physicist at CERN, the European Organisation for Nuclear Research, working on detector development and construction, software development, and data analysis. From 2009 to 2013 she led the ATLAS collaboration of 3000 physicists, and in 2012 she presented the ATLAS results on the Higgs boson search and discovery.

Her awards include several honorary degrees, the Special Breakthrough Prize in Fundamental Physics, and the Enrico Fermi Prize of the Italian Physical Society. In 2016 she became Director-General of CERN, the first woman to hold that position.

Risa Wechsler: Lighting up the Dark: Explorations of the Universe and Making Space in Science



Risa Wechsler's work in cosmology has laid the foundation for connecting the invisible dark matter to the formation of galaxies and is helping scientists close in on the even more mysterious dark energy. Over the past decade she has played a leading role in designing, simulating, and analyzing the largest galaxy surveys, which are mapping out tens of billions of galaxies over more than 13 billion years of the Universe's history.

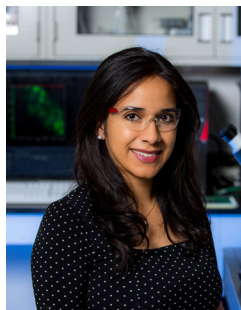
Professor Wechsler did her undergraduate work at the Massachusetts Institute of Technology, received her PhD

from the University of California at Santa Cruz, and held postdoctoral fellowships at the University of Michigan and at the University of Chicago. She joined the faculty at Stanford University and SLAC National Accelerator Laboratory in 2006, drawn by the formation of a new institute in astrophysics, the Kavli Institute for Particle Astrophysics and Cosmology (KIPAC) at Stanford and SLAC. In September 2018, she became the Director of KIPAC. In addition to her scientific publications she has written about and discussed science in numerous public venues, from Teen Vogue to NPR, and is an active advocate for a more inclusive and equitable science community.

Speakers

8

Monica Moya: Bioprinting: Bringing Life to 3D Printing



Monica Moya is a biomedical engineer researcher in the Materials Engineering Division at Lawrence Livermore National Laboratory. Currently she works as the principal investigator and as a technical lead on three bioengineering projects. Her research interests include 3D bioprinting, organ-on-a-chip and integrating engineering and biology. She received her Bachelors of Science from Northwestern University and her Ph.D. in biomedical engineering from Illinois Institute of Technology. A native of the LA area, she returned to the west coast to do her postdoctoral research

at UC Irvine as a National Institutes of Health (NIH) Ruth Kirschstein-NRSA Fellow. Her research has resulted in 22 peer review publications, 2 book chapters and numerous national and international conference presentations.

Career Panel

9

At 2:20pm on Saturday, a panel of physicists from diverse fields will talk about different career options physics students have after university.

Barbara Jones

Panelist Barbara Jones is a theoretical and computational physicist at IBM Research Almaden. She received an A.B. (physics) from Harvard University; MS (Applied Mathematics) from The University of Cambridge (Churchill Scholar); MS and PhD in Physics from Cornell University. After a postdoc at Harvard, she joined IBM at the Almaden Research Center in 1989.. Currently she has joint interests in quantum computing and biophysics.

Carolyn MacKenzie

Carolyn MacKenzie has her Masters in Biophysics from UC Davis and is a board-certified Health Physicist. She is currently working for the University of California, Center of Excellence in Radiation Safety where she leads a project to replace Cesium-137 irradiators used in medicine and research with alternative technologies for the University system-wide. She has previously served as the Radiation Safety Officer for the University of California, Berkeley and Davis campuses, and has worked in international radioactive source security for ~18 years at Lawrence Livermore National Laboratory. She led efforts in 2004-7 in radioactive source search and secure globally for the International Atomic Energy Agency based in Vienna, Austria and developed a radiation warning symbol for international use. She has served as a lead trainer for the Comprehensive Test Ban Treaty inspectors in how to locate a possible detonated nuclear weapon test.

Cassandra Paul

Cassandra Paul earned her PhD in Physics from UC Davis in 2012 and is currently an Associate Professor of Physics and Astronomy at San Jose State University. She is also a member of the Science Education Program there. Because she teaches in both departments, she teaches a variety of courses to both undergraduate science majors and current high school science teachers. She practices active learning pedagogies in all of her classes, allowing her students to experience science learning in a collaborative environment. Her area of expertise is Physics Education Research (PER) and her current research interests include assessment practices in college physics courses, and how these practices promote or thwart equitable learning spaces and outcomes for all students. Cassandra is also mother to two young children and a strong believer in maintaining a balanced lifestyle.

Career Panel

10

Alison Saunders

Alison Saunders received a B.A. in physics in 2011 from Reed College and an M.A. in 2015 and Ph.D. in 2018 in physics from the University of California Berkeley. She currently studies materials as a postdoctoral researcher at Lawrence Livermore National Laboratory (LLNL). In graduate school, Alison wrote her thesis on high energy density plasmas and got to perform many experiments with large lasers at large laser facilities. Prior to beginning graduate school, Alison Saunders served as an accelerator systems and safety operator at SLAC for several years, which introduced her to the magnitude of expertise required to run large national laboratory facilities and motivated her to pursue a career as a national lab scientist.

Juilien Svoboda

Juilien Svoboda is a M.S. Medical physicist in North Valley, CA of Kaiser Permanente with focus on Radiation Therapy. She obtained her B.S. degree in physics from Taiwan Normal University and a M.S. degree in physics from University of California, Irvine. She received her Medical physics training from Louisiana state University in 2001 and has been working in Medical Physics since 2003. By making a career change from Physics research in AstroPhysics to Medical Physics, Juilien found professional success and satisfaction in helping treating patients. She has been coming to physics career seminar at UC Davis every year to help physics students with their career choices. Juilien enjoys a good happy hour with friends and family, YouTube binge watching Chinese talk shows, spending time in her garden, and seeking adventure in the outdoors.

Natasha Flowers

Natasha Flowers graduated from Carleton College with a Bachelor's degree in Physics in 2016. While at Carleton, she worked on research using gravimeters to test for Lorentz violation as a method of exploring extensions of the Standard Model. This project, along with programming-heavy summer research opportunities, helped her in the transition to a job as a Data and Policy Analyst at Acumen, LLC. She has found that the problem-solving skills she gained through undergraduate coursework and physics research have prepared her well for the complex issues that arise in analyzing real-world (i.e., messy and imperfect) data. When not at work, she can be found dancing either ballroom or West Coast Swing -- both of which also heavily utilize her physics background!

Workshops

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Session 1, Saturday 9:30am - 10:30am

How to Write a CV or Resume

Physics 148

The session leaders will explain the differences between a CV and a Resumé, discuss when each is appropriate, and provide examples of what may be included. If time allows, suggestions on how to improve a Personal Statement will be discussed.

Life in Grad School

Physics 130

So, you've been accepted to graduate school. What happens next? From choosing an advisor and getting involved in research, to first-year coursework, to teaching responsibilities, to figuring out what work-life balance is best for you--these and more topics will be discussed by our panel of current and recent graduate students. Much of the time will be for Q&A, so feel free to ask whatever you want to know about life in grad school.

Undergraduate Research Opportunities

Roessler 55

You can get involved in research as an undergraduate no matter what type of college or university you attend! This session will give an overview of the types of research opportunities available to undergraduates--from on-campus research at your home university to funded summer research programs at other institutions--as well as some practical tips how to apply and get involved.

Talking to Professors

Physics 432

There is no way around talking to professors, but it might be uncomfortable at first. Faculty panelists will discuss how and when is best to start conversation with them, what they look for in conversations depending on their nature and how to follow up. Undergraduate and graduate students will also be on the panel to share their experiences and tips. Feel free to ask for a live demo.

STEP UP 4 Women -- Direct Action to Increase Women in Physics

Physics 140

This interactive workshop invites participants to join a national movement to increase the number of women in physics by reaching high school physics teachers and enlisting them to inspire more women to pursue physics as undergraduates.

Workshops

12

Session 2, Saturday 5:00pm - 6:00pm

Introduction to Physics Research Areas

Physics 432

Two short presentations, each on the big questions in a particular subfield of physics. This session covers Astrophysics, and Atomic/Molecular/Optical Physics.

Applying to Grad School

Physics 130

This panel session will have a brief presentation on the components of a graduate school application followed by a Q&A for in-depth advice. Panelists will include both graduate students and faculty members.

Interdisciplinary Connections

Roessler 55

So you're a Physics major.... but you want to do undergraduate research outside physics or even continue with graduate studies in another discipline. What are your options? Panelists in this session will discuss their routes from physics to other fields and what ties they maintain with physics.

Non-teaching Careers

Physics 148

A degree in physics is a starting point for a wide variety of careers. Data science, research and development, information, finance, science writing, science policy, patents and intellectual property -- these are just a small sample of the career options you have with a physics background. This session will include a panel comprised of speakers in these and related fields. Each speaker will discuss a bit about what they do and how physics is a part of their job before opening the floor to general Q&A.

STEP UP 4 Women -- Direct Action to Increase Women in Physics

Physics 140

This interactive workshop invites participants to join a national movement to increase the number of women in physics by reaching high school physics teachers and enlisting them to inspire more women to pursue physics as undergraduates.

Workshops

13

Session 3, Sunday 9:00am - 10:00am

Introduction to Physics Research Areas

Physics 432

Two short presentations, each on the big questions in a particular subfield of physics. This session covers Condensed Matter Physics and Accelerator Physics.

Non-teaching Careers

Roessler 55

A degree in physics is a starting point for a wide variety of careers. Data science, research and development, information, finance, science writing, science policy, patents and intellectual property -- these are just a small sample of the career options you have with a physics background. This session will include a panel comprised of speakers in these and related fields. Each speaker will discuss a bit about what they do and how physics is a part of their job before opening the floor to general Q&A.

Applying to Grad School

Physics 130

This panel session will have a brief presentation on the components of a graduate school application followed by a Q&A for in-depth advice. Panelists will include both graduate students and faculty members.

Transferring to a Four-Year College

Physics 140

Learn more about the switch from a community college to a 4-year program and what can be done to make the transition smoother. Also learn about scholarship and internship programs designed specifically for two-year college students.

Impostor Syndrome Workshop

Physics 148

Imposter syndrome is a common psychological pattern where individuals doubt their accomplishments. These individuals often battle a persistent fear of being exposed as a “fraud” in their area of expertise. Albert Einstein, Maya Angelou and Michelle Obama are among some of the more notable individuals who have talked about suffering from this internal struggle. During this workshop, we will discuss Imposter Syndrome generally, complete some interactive activities to become more familiar with the negative thoughts that can make individuals feel like imposters, and brainstorm methods for quelling imposter syndrome behaviors and thoughts.

Workshops

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Session 4, Sunday 10:30am - 11:30am

Undergraduate Research Opportunities

Roessler 55

You can get involved in research as an undergraduate no matter what type of college or university you attend! This session will give an overview of the types of research opportunities available to undergraduates--from on-campus research at your home university to funded summer research programs at other institutions--as well as some practical tips how to apply and get involved.

Teaching Careers

Physics 432

This panel session will include physics teachers from a variety of settings: high school, community college, four-year college and primarily research university. Each environment has its own rewards and challenges, and the panelists will address these. A general Q&A will follow brief presentations.

When Stuff Happens, What Can I Do?

Physics 130

Did you ever hear an inappropriate comment, see that someone present was upset, but not know how to help? How can you respond when you see something unfair happening? This workshop will give you a chance to think through several types of situations and practice different responses. You'll have these techniques to draw from the next time you encounter a real-life example.

Impostor Syndrome Workshop

Physics 148

Imposter syndrome is a common psychological pattern where individuals doubt their accomplishments. These individuals often battle a persistent fear of being exposed as a “fraud” in their area of expertise. During this workshop, we will discuss Imposter Syndrome generally, complete some interactive activities to become more familiar with the negative thoughts that can make individuals feel like imposters, and brainstorm methods for quelling imposter syndrome behaviors and thoughts.

STEP UP 4 Women -- Direct Action to Increase Women in Physics

Physics 140

This interactive workshop invites participants to join a national movement to increase the number of women in physics by reaching high school physics teachers and enlisting them to inspire more women to pursue physics as undergraduates.

Social Events

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On Friday and Saturday night, students will have the chance to kick back and socialize with other attendees with a number of optional social activities. All the activities listed will happen both nights, weather permitting.

Movie: Particle Fever

Roessler Hall 66

Particle Fever follows the inside story of six brilliant scientists seeking to unravel the mysteries of the universe, documenting the successes and setbacks in the planet's most significant and inspiring scientific breakthrough.

Games

Meeting at Physics Building

Bowling, board games, billiards, and video games will be available in Memorial Union, at the center of campus. A group will meet at the Physics Building at 8:00pm to guide attendees to Memorial Union.

Astronomy Viewings

Physics Building, roof

On the roof of the physics building (just above the 5th floor), telescopes will be set up for attendees to look at selected stars and planets.

Chill Time

Physics Building

Snacks and seating will be available in the Physics Building for attendees who just want to hang out and chat.



Pictured: Stone Poem, created by sculptor Steve Gillman in 1982

Sponsors

16

National Sponsors



Local Sponsors

Higgs (\$5000 and up)



W and Z (\$2500-\$4999)



Charm (\$1000 - \$2499)

The Educational Card Project

Positron (\$500 - \$999)



STITCH FIX

Resources

17

In the following pages of the program, we include some resources for students to learn about issues and opportunities we've talked about during the conference.

Implicit Bias

Implicit bias is our unconscious stereotyping, judgments, and the actions that follow. It can lead us to unintentionally harbor sexist, racist, homophobic, transphobic, etc. thoughts. The first step is to understand we learn these negative stereotypes from our society and it is our job to unlearn them and stop perpetuating inequalities.

<http://kirwaninstitute.osu.edu/research/understanding-implicit-bias/>

<https://www.pbs.org/video/pov-implicit-bias-peanut-butter-jelly-and-racism/>

Impostor Syndrome

Impostor syndrome is the feeling that the success in your life does not mean anything because you are secretly a fraud. This can lead to a lingering fear of someone possibly "finding out" that you were simply lucky rather than truly earning your accomplishments. These feelings of self-doubt are very common, and recognizing them is the first step to overcoming feelings of inadequacy.

<http://time.com/5312483/how-to-deal-with-impostor-syndrome/>

<https://www.scientificamerican.com/article/what-is-impostor-syndrome/>

Resources

18

Stereotype Threat

Stereotype threat is the worry that as an individual you will conform to negative stereotypes about a group you belong to. Although almost anyone can be affected by stereotype threat, people who are underrepresented in a field are especially vulnerable. The increased stress can cause anxiety and less working memory, leading to worse performance and feeling disengaged in the field. It can be difficult to combat stereotype threat as a student, but recognizing it as a problem that could affect you is an important step.

<https://www.apa.org/research/action/stereotype.aspx>

<https://diversity.nih.gov/sociocultural-factors/stereotype-threat>

Research Experience for Undergraduates

The National Science Foundation (NSF) funds dozens of Research Experience for Undergraduates (REU) programs that let students pursue full-time research over the summer, usually at an institution other than their usual college. Most REU programs are at major research universities, but a few are at smaller colleges or industry sites. The programs especially encourage applicants from colleges with limited research opportunities. Research is very different from coursework, so participating in a project can help a student decide whether to enroll in graduate school or what types of jobs to pursue. Since many students need summer income to help pay for college, physics REU programs usually provide housing and meals, plus an additional stipend of about \$5000. A typical REU program has 10-15 participants and lasts about 10 weeks.

https://www.nsf.gov/crssprgm/reu/list_result.jsp?unitid=69

Organizers

19

Notes

Rena Zieve -- Conference Chair

Pat Boeshaar

Rylai Davis

Rose Baunach

Emilija Pantic

Sarah Edwards

Jenna Samuel

Rachel Baarda

Grace Haza

Alexandra Jurgens

Victoria Norman

Victoria Strait

Ariadna Venegas-Li

Madhuri Kumari

Shirley Chiang

Marusa Bradac

Robin Erbacher

Veronika Hubeny

Mani Tripathi



Notes

Notes

First Floor, Physics Building

