Center for Advanced STEM Education (CASE)

Pathways to Science

Dr. Hsiu-Ping Liu
Lori Taylor, Program Manager
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Benefits of an Undergraduate Research Experience

• Building relationships

• Gaining hands-on research experiences

• Mastering content knowledge

• Developing skills

• Learning about graduate and/or professional educational opportunities
  • It is a fantastic investment.
  • It can make a graduate school application stand out.
  • Value letter of recommendation from undergraduate research faculty
We are looking for the brightest young engineers and applied scientists interested in pursuing a Ph.D. in engineering or applied science disciplines to attend an all-expense-paid weekend in New York City for the Columbia Engineering EngAGE program.

Who is Eligible?
Priority will be given to college juniors from historically underrepresented groups. Columbia University is committed to creating and supporting a community diverse in every way.

When is the event?
The annual Columbia Engineering EngAGE weekend will be held February 1-3.

What’s included?
In addition to an all-expense-paid-weekend in New York City, you will meet with our admissions staff and learn how to prepare a competitive graduate school application.
EngAge
Engineering Achievers in Graduate Education

How do I apply?
Deadline: December 22, 2017
Online Application: https://columbiaengineering.wufoo.com/forms/z1irdhc914jo651/

Application Requirements:
• Complete and submit the Columbia Engineering EngAge Application. Online: https://columbiaengineering.wufoo.com/forms/z1irdhc914jo651/
• Transcripts
• Statement of Purpose
• Resume
• One Letter of Recommendation should be emailed directly to kg2581@columbia.edu by the recommendation provider.
The WAVE Fellows program provides support for talented undergraduates intent on pursuing a Ph.D. to conduct a 10-week summer research project at Caltech.

The program aims to foster diversity by increasing the participation of underrepresented students in science and engineering Ph.D. programs. The program is extended, but not limited, to underrepresented minorities, women, first-generation college students, geographically underrepresented students, educationally or financially disadvantaged students, and students with disabilities.

Deadline: Jan 12, 2017
Online Application: http://www.sfp.caltech.edu/programs/wavefellows

Application are evaluated based on
• Student has sufficient academic preparation to undertake a research project at Caltech/JPL
• Student’s prior research experience
• Application provides a clear description of the student’s research interests, what the student has done to foster his/her interests, and student’s academic and career goals
• References are supportive
• Student’s research interests are aligned with those of a mentor at Caltech or JPL
• Student is interested in pursuing a Ph.D.
COSTA RICA
Research Experience for Undergraduates (REU)

Are you curious about the natural world?

We are looking for undergraduate African Americans, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, and Native Pacific Islanders, who are curious about the natural world, and also:
- are adventurous
- are willing to invest their summer months doing original research in the tropical forests of Costa Rica
- are willing to integrate their research experience into their future careers by presenting their results
- are willing to make new friends and scientific contacts from across the globe
- are willing to work hard, and take full advantage of this stupendous opportunity that is truly a stepping stone towards a scientific career.

What is REU?
REU is a summer opportunity for undergraduate African Americans, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, and Native Pacific Islanders students to complete ecological research. It takes place at the OTS La Selva Research Station and OTS Las Cruces Research Station, through support of the NSF Louis Stokes Alliances for Minority Participation Program (LSAMP). Summer funding allows student interns to complete an original research project while guided by experienced researchers.

For program dates, deadlines and detailed information, please visit: www.tropicalstudies.org/reu

REU Highlights
- Design and carry out original scientific research in a tropical rain forest.
- Introduction to tropical biodiversity and ecology.
- Ideal conditions for research on forest fragmentation, restoration ecology, water quality, tropical biodiversity, and climate change.
- Daily contact with experienced scientists from a variety of biological disciplines.
- Presentation of results in the internet-broadcast REU symposium.
Ten reasons why you should apply to REU if you are African American, Hispanic American, American Indian, Alaska Native, Native Hawaiian, or Native Pacific Islander

1. REU is an opportunity to immerse yourself in your own scientific research project.
2. Participating students come from similar, but diverse cultural backgrounds.
3. Each year, REU students come from many educational backgrounds including isolated community colleges, tribal colleges, and other LSAMP institutions.
4. Summer activities include instruction in research methods, tropical ecology, statistical analysis and scientific writing.
5. One-on-one mentoring during your individual research project.
6. This paid 9-week summer internship covers all travel and basic living expenses in addition to giving you a stipend.
7. Make life-time contacts with scientists outside of your home institution.
8. Gain international experience.
9. The program is adaptable to your interests, skills, and abilities, as you can either develop a novel independent project from conception to presentation or you can collect and present data from an important piece of an ongoing research project.
10. Lack of experience does not limit participation and completion of REU.

How to apply
Click on the Apply Now button on the program page and follow the online instructions to fill out the application on-line. At the end of the application you will be required to upload the following documents in pdf format:

- A letter of recommendation from your Home Mentor (download the mentor recommendation form)
- A letter of recommendation from a Science Professor (download the science recommendation form)
- Official transcripts

Questions?
Please contact:
kattia.mendez@tropicalstudies.org
www.tropicalstudies.org/reu
Creating a Winning Application

Cover the basics
• Meet deadlines with time to spare
• Demonstrate that you can follow directions - please answer questions

Pay attention to details
• Double check for spelling and grammar errors
• Make sure your email, phone & address will be active
• Check your email regularly

Use your resume, essays and personal narrative to show who you are
• Show interest, enthusiasm, and motivation
• Demonstrate relevant skills or experience

Demonstrate strong writing skills and show proficiency in the English language
• Use Career and Writing Center

Know how to get strong letters of reference
• Choose references carefully – your skills, ambition and work ethic
Writing Strong Essays and Personal Statements

Use your own voice and make a case for yourself
• Pseudo-interview

Convey information that the selection committee will find compelling in making its decision about your application
• Why the opportunity you are applying for is important to you
• How it fits into your aspirations
• How it will help you achieve academic ambitions and professional goals

Provide the opportunity to address what might appear to be gaps or weaknesses in your application
• Turn weakness into strengths
Writing Strong Essays and Personal Statements

Developing the content, addresses the questions asked, and ends with polishing the spelling, grammar and formatting to perfection

Start early, plan well, and give yourself the luxury of enough time

- Why are you interested in the particular opportunity or institution to which you are applying?
- What are your academic or research interests?
- How did you become interested in this field or research?
- What kind of activities or experiences have you had that have contributed toward your interest in, preparation for, or understanding of this field or research area?
- What are your aspirations?
Research Experience for Undergraduates

National Science Foundation - Research Experience for Undergraduates
https://www.nsf.gov/crssprgm/reu/reu_search.jsp

Search for an REU Site
Astronomical Sciences
Atmospheric and Geospace Sciences
Biological Sciences
Chemistry
Computer and Information Science and Engineering
Cyberinfrastructure
Department of Defense (DoD)
Earth Sciences
Education and Human Resources
Engineering
Ethics and Values Studies
International Science and Engineering
Materials Research
Mathematical Sciences
Ocean Sciences
Physics
Polar Programs
Small Business Innovation Research (SBIR)
Social, Behavioral, and Economic Sciences

SEARCH BY RESEARCH AREAS/KEYWORDS:
Enter full or partial research areas/keywords separated by commas:
(e.g. geophysics, ecology, nano, robot, ethics)

And/Or State:
All

Search  Clear
CO-WY AMP

CO-WY AMP Summer Research Initiative (SRI)
http://www.coamp.colostate.edu/sri.shtml
Application Deadline is January 15, 2018

CO-WY AMP Summer Research Initiative (SRI) Partners
http://www.coamp.colostate.edu/docs/SRI_opportunities.pdf

CO-WY AMP International Research Experience (IRE)
http://www.coamp.colostate.edu/ire.shtml
<table>
<thead>
<tr>
<th>REU Applications/</th>
<th>Institution</th>
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<th>Site Name</th>
<th>Site URL</th>
<th>Department</th>
<th>Research Topics/Keywords</th>
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<tbody>
<tr>
<td>early February 2018</td>
<td>CU Boulder</td>
<td>Boulder</td>
<td>An Interdisciplinary Undergraduate Research Experience in Solar and Space Physics: The University of Colorado and Its Consortium Partners</td>
<td><a href="http://flap.colorado.edu/cesi/">http://flap.colorado.edu/cesi/</a></td>
<td>Lab for Atmospheric and Space Physics</td>
<td>Solar physics, space physics, climate science, magnetosphere, heliosphere, upper atmosphere, Sun-Earth system, space weather. Participating institutions include ICAR, High Altitude Observatory, NOAA Space Environment Center (both in Boulder, CO), and Center for Integrated Space Weather Modeling (Boston, MA)</td>
</tr>
<tr>
<td>early February 2018</td>
<td>CU Boulder</td>
<td>Boulder</td>
<td>Materials Research Science and Engineering Center (MRSEC)*</td>
<td><a href="http://msec.colorado.edu/materials-research-science-and-engineering-center/">http://msec.colorado.edu/materials-research-science-and-engineering-center/</a></td>
<td>Liquid crystals, optical materials and devices; *No active agreement in place yet with CO-WY AMP</td>
<td></td>
</tr>
<tr>
<td>Not yet funded for 2018, will know in Jan/Feb</td>
<td>CU Boulder</td>
<td>Boulder</td>
<td>REU Site: Achieving heightened goals: Undergraduates Research in Ecology at the Mountain Research Station</td>
<td><a href="http://www.colorado.edu/web/REU/Project/Flyer/">http://www.colorado.edu/web/REU/Project/Flyer/</a></td>
<td>Institute of Arctic and Alpine Research, Mountain Research Station</td>
<td>Biology, ecology, evolution, behavior</td>
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<tr>
<td>early February 2018</td>
<td>CU Boulder</td>
<td>Boulder</td>
<td>REU Site: Physics/JILA*</td>
<td><a href="http://www.colorado.edu/physics/JILA/">http://www.colorado.edu/physics/JILA/</a></td>
<td>Physics</td>
<td>Atomic, Molecular, Optical and Condensed Matter Physics; *No active agreement in place yet with CO-WY AMP</td>
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<td>Not yet funded for 2018, will know in Jan/Feb</td>
<td>CU Boulder</td>
<td>Boulder</td>
<td>REU Site: Research Experience for Community College Students (RECCS) in Critical Zone Science*</td>
<td><a href="http://cces.colorado.edu/outreach/RECCS">http://cces.colorado.edu/outreach/RECCS</a></td>
<td>Cooperative Institute for Research in Environmental Science (CIRES)</td>
<td>Critical Zone Science; *Program is limited to community college students from Colorado.</td>
</tr>
<tr>
<td>12-month ongoing program</td>
<td>University Corporation for Atmospheric Research (UCAR)</td>
<td>Boulder</td>
<td>Significant Opportunities in Atmospheric Research and Science (SOARS)*</td>
<td><a href="http://soars.ucar.edu/">http://soars.ucar.edu/</a></td>
<td>National Center for Atmospheric Research</td>
<td>Atmospheric Science, solar physics, computational methods. *SOARS is not funded through the REU Site program, but encourages applications from members of underrepresented and disadvantaged groups. Ongoing 12 month program,</td>
</tr>
<tr>
<td>early April, 2018</td>
<td>UCSS</td>
<td>Colorado Springs</td>
<td>Machine Learning in Natural Language Processing and Computer Vision</td>
<td><a href="http://www.ucss.edu/~della/le/">http://www.ucss.edu/~della/le/</a></td>
<td>Computer Science Department</td>
<td>Natural language processing, syntax, semantics, information retrieval, computer vision, face recognition, incremental learning, large-scale learning, artificial neural networks, deep learning</td>
</tr>
<tr>
<td>early March 2018</td>
<td>CSU</td>
<td>Fort Collins</td>
<td>Integrative Agroecology and Sustainability Summer Research Fellowship Program 2017</td>
<td><a href="http://studentacademic.ucd.colorado.edu/fellows/integrating-agroecology-and-sustainability-summer-research-fellowship-program-2017/">http://studentacademic.ucd.colorado.edu/fellows/integrating-agroecology-and-sustainability-summer-research-fellowship-program-2017/</a></td>
<td>Agricultural Sciences</td>
<td>Successful applicants will have strong interest/experience in agroecology and sustainability research that is typically explored through Agricultural Sciences, Business, Environmental Sciences, Life Sciences, Natural Sciences, or Sustainability Sciences majors. Spend your summer conducting research that addresses complex challenges in global food security and environmental change. Get paid to explore your scientific, and cultural interests as you work side by side with leading scientists at Colorado State University.</td>
</tr>
<tr>
<td>early February 2018</td>
<td>CSU</td>
<td>Fort Collins</td>
<td>Research Experiences for Undergraduates in Climate Science at Colorado State University</td>
<td><a href="http://brief-atmos.colostate.edu/eruusal/">http://brief-atmos.colostate.edu/eruusal/</a></td>
<td>Atmospheric Science</td>
<td>Atmospheric science, atmospheric chemistry, air quality, severe storms, mesoscale meteorology, remote sensing, climate dynamics, climate modeling, atmospheric dynamics</td>
</tr>
</tbody>
</table>
# CO-WY AMP

**CO-WY AMP Summer Research Initiative (SRI) Partners**  
Revised: 3/17/2017

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<th>Research Topics/Keywords</th>
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<td>early February 2018</td>
<td>CSU</td>
<td>Fort Collins</td>
<td>REU Site: Chemistry Applied to Real World Problems - Chemical Sciences at CSU</td>
<td><a href="http://www.chem.colostate.edu/reu/">http://www.chem.colostate.edu/reu/</a></td>
<td>Chemistry</td>
<td>Materials chemistry, atmospheric and environmental chemistry, polymer chemistry, inorganic chemistry, organic chemistry, physical chemistry, chemical biology</td>
</tr>
<tr>
<td>early February 2018</td>
<td>CSU</td>
<td>Fort Collins</td>
<td>REU SITE: Program in Molecular Biodefense</td>
<td><a href="http://www.chem.colostate.edu/undergraduate/REU/program-description/">http://www.chem.colostate.edu/undergraduate/REU/program-description/</a></td>
<td>Biochemistry and Molecular Biology</td>
<td>Biochemistry, neurobiology, cell biology, infectious diseases, structural biology, plant biology, cardiac biology, DNA repair, radiation biology, gene regulation, chromatin development</td>
</tr>
<tr>
<td>early February 2018</td>
<td>CSU</td>
<td>Fort Collins</td>
<td>Sustainable Urban Water Transdisciplinary Research Program for Undergraduates</td>
<td><a href="https://erasms.com/35W99/J1P/">https://erasms.com/35W99/J1P/</a></td>
<td>Environmental Sustainability</td>
<td>Environment and sustainability; U.S. National Park Service and spend a week in Grand Teton National Park and Yellowstone National Park; Involved with helping identify critical declines in pollinators for national parks</td>
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<tr>
<td>CSU</td>
<td>Varies</td>
<td>Golden</td>
<td>RNSA Summer Academy and pollinator hotshot crew</td>
<td><a href="http://www.montana.edu/education/reu/">http://www.montana.edu/education/reu/</a></td>
<td>Environmental Sustainability</td>
<td>Environment and sustainability; U.S. National Park Service and spend a week in Grand Teton National Park and Yellowstone National Park; Involved with helping identify critical declines in pollinators for national parks</td>
</tr>
<tr>
<td>early March 2018</td>
<td>Mines</td>
<td>Golden</td>
<td>REU Site: Research Experiences for Undergraduates in Renewable Energy</td>
<td><a href="http://www.mines.edu/education/reu/">http://www.mines.edu/education/reu/</a></td>
<td>Environmental Sustainability</td>
<td>Environment and sustainability; U.S. National Park Service and spend a week in Grand Teton National Park and Yellowstone National Park; Involved with helping identify critical declines in pollinators for national parks</td>
</tr>
<tr>
<td>early February 2018</td>
<td>Rocky Mountain Biological Laboratory</td>
<td>Golden</td>
<td>REU Site: Field Research in Ecology and Evolutionary Biology at the Rocky Mountain Biological Laboratory</td>
<td><a href="http://www.mbbi.org/">http://www.mbbi.org/</a></td>
<td>Field research, ecology, evolutionary biology, ecological genomics</td>
<td>Field research, ecology, evolutionary biology, ecological genomics</td>
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Questions? Comments?

- Center for Advanced STEM Education website
  www.msudenver.edu/case

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- Lori Taylor, ltaylo50@msudenver.edu
- Linda Sivertson, lsivert@msudenver.edu