Clean Energy Bridge to Research Summer Program

Clean Energy Bridge to Research (CEBR) is a summer research program sponsored by the Clean Energy Institute (CEI) at the University of Washington (UW). It supports a select group of undergraduates and community college teachers to participate in authentic research in solar, energy storage, and grid technologies under the mentorship of UW's world-class faculty and graduate students.

Full Research Session / June 18–August 17, 2018
For: Students who have completed their second year of college
A nine-week immersive research project in a single lab leading to an abstract and poster. This session provides a stipend of $4,000, on-campus housing, $500 for food, and a $500 travel allowance.

Exploratory Session / June 18–July 18, 2018
For: Rising sophomores at community colleges
A four-week early research experience where students will receive training, then complete a mini research project under the tutelage of a graduate student and create an educational product related to their work. Exploratory fellows may apply for the Full Research Session the following year. This session provides a stipend of $2,000.

Research Experience For Teachers / June 18–July 18, 2018
For: Community college teachers
A four-week session is designed for teachers working with students who have the goal of integrating clean energy research into their curriculum. This session provides a stipend of $4,000.

The CEBR program is open to U.S. citizens or permanent residents.

PROGRAM GOALS

- Encourage students to pursue STEM careers.
- Provide exposure to research at a hands-on level.
- Improve student knowledge about the nature of research including ambiguity, evolving understanding, and open endedness.
- Develop student skills in: formulating research questions, designing experiments, analyzing data, communicating results, and planning future steps.
- Impart relevant, state of the art content in photovoltaics, energy storage, and smart grids in the domains of physics, chemistry, materials science, and electrical engineering.

IMPORTANT DATES

- Application deadline: February 16, 2018 (apply online at www.cei.washington.edu/cebr)
- Program start: June 18, 2018

University of Washington Clean Energy Institute | www.cei.washington.edu/cebr | uwece@uw.edu | 206-685-2029
CEBR is funded by National Science Foundation (NSF 1609767)
Clean Energy Bridge to Research Summer Program

The Clean Energy Institute invites undergraduate students and community college teachers to apply for a research experience at the University of Washington in Seattle.

Program overview

Participating students will have the opportunity to explore research that has the potential to revolutionize the field of clean energy. CEBR is a multidisciplinary program offering research experiences in a variety of scientific disciplines including chemistry, physics, materials science and engineering, and electrical engineering.

Participants may select research projects across a broad range of topics and research areas. Students can choose to work on the theory that drives the development of new molecules for trapping solar energy, new electrode materials and chemistry for batteries, or models for grid management of renewable energy. Other labs work on integrating these new materials into devices at both the nano- and macro-scale.

Students and community college teachers will also participate in CEBR seminars, social activities, and field trips that provide them with networking and learning opportunities. They may join other enrichment and outreach activities sponsored by the Clean Energy Institute designed to acculturize the student and contextualize the CEBR experience within the field of clean energy and more broadly within those of science and engineering. These activities include technical content and career seminars, as well as workshops designed to teach students how to effectively present scientific research. Some students may be eligible to receive academic credit and be provided with the opportunity to attend professional conferences to share their work and learn from others.

By the end of the summer, students will be familiar with lab research and the technical, social, and cultural skills necessary to succeed in industry and academia. Students' research activities may include literature search, experimental design, bench work and lab notebook management, mathematical modeling, instrumental characterization, computer/software control and analysis, lab safety, as well as communication, organizational and interpersonal skills.

Expectations of CEBR participants

Full Research Session: Students are expected to work in their designated laboratory 40 hours per week for 9 weeks and complete an academically appropriate research project designed in conjunction with their advisor. By the end of the nine-week session, students are expected to complete an abstract or summary of their work, a poster, and a presentation. Other assignments may be required.

Exploratory Session: Students will conduct a focused research task in a lab 40 hours per week for 4 weeks and produce an educational product that helps translate the research to a non-technical audience. Students will have the opportunity to visit several labs and research settings as they establish relationships and build awareness. Students who excel in the exploratory session may be invited to continue their research during their sophomore year the following summer.

Research Experience For Teachers Session: Community college teachers will participate in the exploratory experience with the goal of creating curricula that they can use to prepare students for clean energy content and research.
THE PROGRAM

The Mentoring Summer Research Internship Program (MSRIP) offers undergraduate students with outstanding academic potential the opportunity to work closely with faculty and graduate students on a research project. The objective of this program is to help prepare, motivate, encourage and support those students who aspire to obtain a PhD and pursue a career in teaching and research.

UCR provides internships in many disciplines such as humanities, biological and agricultural sciences, physical sciences and engineering and education. Disciplines may vary based on faculty availability.

ELIGIBILITY

- U.S. citizen or permanent resident
- Juniors, seniors; Master’s students enrolling at UCR fall 2018
- Interest in pursuing a graduate degree (i.e., masters, doctoral)
- First generation college, socioeconomic or other hardship which may have impeded your advancement in college
- Minimum 3.0 GPA
- Enrolled full-time student at four-year university or college

PROGRAM DATES AND INFORMATION

The program will begin June 25 and end August 17, 2018.
Program participants will receive a $3,000 stipend (minimum), GRE preparation classes and weekly seminars on the graduate application process. Social activities will also be provided.

APPLICATION PROCEDURES

1) Complete and sign summer program application
2) Submit unofficial college transcript(s)
3) Ask faculty to provide two letters of recommendation
4) Submit a Financial Aid award letter from your institution

The deadline for submission of all application materials is Monday, February 19, 2018

For further information please contact:

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Riverside, CA 92521-0208
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Email: gdivma@ucr.edu
Materials for Society

Materials science is the enabling technology behind everything from modern electronics to fashion, safe and recyclable packaging, faster and fuel-efficient vehicles, novel energy generation and storage, aerospace propulsion systems, affordable housing, medical engineering, sensors, nanotechnology, and micromachines. One of the most exciting directions in science and policy-making is sustainability, with its emphasis on energy conservation, storage, and renewable production.

The objective of this Research Experience for Undergraduates (REU) program at Boise State University is to provide an intensive research-team experience with state-of-the-art facilities while exploring activities within the theme “materials for society.” Mentors from various disciplines work with students to develop skills needed to excel in academic and industrial research environments, where interdisciplinary teams are standard. Students ultimately present their results at the annual summer research conference.

Cost for Students to Participate

There is no cost to REU Program participants! Students selected to participate in the REU receive a weekly stipend to cover meals and other expenses. Housing is provided on the Boise State campus.

Program Dates
End of May through July.
Apply online at coen.boisestate.edu/mse-reu by February 15.

- Interdisciplinary Research
- Team Building and Collaboration
- Professional Development
- Exploration

coen.boisestate.edu/mse-reu
REU in Materials for Society

Research Projects

The program strives to provide participants with genuine research experiences. Projects generally fall into one or more of four broad categories:

- Energy Generation
- Energy Storage
- Energy Conservation
- Societal challenges associated with materials processing/modeling(characterization)

Excellent Research Opportunities are Available in the REU for Materials and Energy Sustainability

Past Research Projects

Projects vary from year to year. Examples of research projects from past years include the following:

- Hybrid Perovskites for Photovoltaics
- Materials-by-Design for Thermoelectric Applications
- Nanostructured High Efficiency Thermoelectric Materials and Devices
- Thermal Energy Storage System Design and Measurement for Residential Buildings
- Understanding Nanostructure Electrode/Electrolyte Interfaces in Sodium Ion batteries
- Molecular Simulations for Engineering Sustainable Energy
- Carbon Nanomaterials for Nanoelectronics
- Magneto-Mechanics of Magnetic Shape Memory Alloys
- Fabrication, Characterization, and Testing of Surrogate Nuclear Fuel Assemblies
- Expanding Empirical Models of Perovskites to Include Small Cations
- Extending Empirical Models of Perovskites to Include Chemical Ordering

coen.boisestate.edu/mse-reu
Summer Internships at Michigan State University – Apply Today

Summer Research Opportunities Program (SPRO)
MSU SROP is an excellent venue for highly motivated students to receive research training and exposure to graduate studies. We are accepting applications from students interested in the Sciences, Mathematics, and Engineering fields as well as the Social Behavioral Sciences (Sociology, Psychology, Criminal Justice, Linguistics, Economics, Anthropology, etc.). The SROP program lasts for 10 weeks and travel, housing, and stipends are provided. We encourage applications from under-represented groups.
Applications are available November 1. Web: https://grad.msu.edu/srop Email: msusrop@ard.msu.edu

Physics REU:
During this 10-week program, which is funded by the National Science Foundation (NSF), National Superconducting Cyclotron Laboratory (NSCL) and Michigan State University (MSU), 15 undergraduate students will gain research experience in physics by carrying out specific projects under direct supervision of Physics & Astronomy faculty or National Superconducting Cyclotron staff. Experimental and theoretical projects are available in Accelerator Physics, Acoustics, Astronomy, Astrophysics, Atomic physics, Computational physics, Condensed Matter Physics, High Energy Physics, Low Temperature Physics, Materials science and Nuclear Physics. Web: http://www.pa.msu.edu/REU

Chemistry REU:
This REU funded by the National Science Foundation, Cross-Disciplinary Research in Sustainable Chemistry and Chemical Processes, will provide the opportunity for undergraduate research and education in the chemical sciences and engineering. Research projects in green synthesis and materials, inorganic coatings, membranes for water purification and contaminant removal, renewable energy-related materials, and advanced imaging and spectroscopy will be available to the student interns. This program lasts for 10 weeks.
Web: www.chemistry.msu.edu (REU link)

Kellogg Biological Station:
Twelve interns will be offered the following opportunities:
- Join a dynamic group of students and faculty for an authentic field research experience.
- Learn the process of research: reading the literature, formulating questions and hypotheses, designing a study, collecting and analyzing the data, and presenting the results as a paper, poster, and/or talk.
- Build references for your application to graduate school or other programs.
We invite applications from highly motivated individuals, and encourage applications from underrepresented groups in the sciences. You must be a U.S. citizen with undergraduate status to participate in the REU program.
Web: http://www.kbs.msu.edu/education/undergraduate-program/research-experiences-for-underapeutics-reu Email: KBSsummer@kbs.msu.edu

Engineering REU (EnSURE):
The intent of this program is to encourage students to consider pursuing graduate degrees and to provide them an early opportunity to become involved in research. Work with faculty mentors in one of six Engineering departments:
- Biosystems & Agricultural Engineering
- Chemical & Materials Science
- Civil & Environmental Engineering
- Computer Science & Engineering
- Electrical & Computer Engineering
- Mechanical Engineering
Applicants do not have to be US citizens.
Web: http://www.egr.msu.edu/undergraduate/resources/summer-research Email: colbyka@msu.edu

Physician-Scientist Program:
The MSU College of Osteopathic Medicine offers “SUPER”, a Summer Undergraduate Physician-scientist-training Education & Research program, to undergraduate students who are planning to pursue a career as a physician scientist. Students interested in combined DO-PhD training for a career as a biomedical researcher are offered an opportunity to conduct research, be exposed to clinical care and the excitement of an academic medical environment. Web: http://com.msu.edu/DO-PhD-Program/SUPER.htm

BRUSH Program: The Biomedical Research for University Students in Health Sciences at MSU is funded through the National Heart Lung and Blood Institute of the National Institutes of Health. The goal is to provide research opportunities for individuals who are from diverse backgrounds underrepresented in biomedical research. Students participating in this 12-week program will work on a research project under the mentorship of leading biomedical researchers in the fields of heart and lung diseases at Michigan State University. The research experience will be supplemented with seminars, workshops, and networking and presentation opportunities. Web: http://cvm.msu.edu/research/student-research/undergraduate-student-summer-research-program

Plant Genomics:
MSU is a leader in the Plant Sciences with over 100 faculty engaged in research spanning the discipline. Plant Genomics @ MSU recruits rising sophomores, juniors and seniors with a declared major in biology, biotechnology, biochemistry, chemistry or computer sciences. Participants will engage in a faculty mentored, 10-week research experience that utilizes either wet-lab or computational approaches to address fundamental questions in plant biology using various model and crop species or photosynthetic micro-organisms. Web: www.plantgenomics.msu.edu

AEA Summer Training Program:
The AEA Summer Training Program (AEASP) and Scholarship Program have increased diversity by preparing undergraduates for doctoral programs in economics and related disciplines. AEASP offers talented undergraduates seriously considering post-graduate studies in economics, the opportunity to develop and solidify their math and other technical skills to enable them to be successful.
Web: http://econ.msu.edu/aeasplaiestwelcome.php
SRQP
Summer Research Opportunity Program

Outstanding undergraduate students from other institutions with an interest in pursuing their Ph.D. can apply to SRQP upon entering or completing their junior year. Students have the opportunity to conduct full-time summer research under the mentorship of the country's leading engineering faculty members. The program culminates in a research symposium, oral or poster session.

**IMPORTANT DATES**

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<th>Application Deadline</th>
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<th>Program Dates</th>
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<td>January 15, 2018</td>
<td>March-April 2018</td>
<td>May 30-July 27, 2018</td>
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*SRQP participants are expected to participate full-time during the 8-week program. Participants may not enroll for classes, concurrent summer programs, or hold other employment during the period of the program. SRQP is held on the U-M Ann Arbor campus.

**BENEFITS**

- $4,000 stipend
- Roundtrip airfare or mileage
- Room and board in University housing facilities
- GRE preparation course at no additional cost
- Weekly seminars to help prepare for graduate school
- Networking and professional development opportunities
- Access to campus facilities such as libraries, computer labs, etc. (gym fees are extra)

**ELIGIBILITY**

Applicants must:
- Be a U.S. citizen, permanent resident, or non-U.S. citizen with DACA
- Be able to demonstrate that they are from a background that will contribute to the diversity of the community of scholars in SRQP. Students from racial or ethnic minority groups, low-income family backgrounds, first-generation U.S. citizens, and first-generation college students are especially encouraged to apply.
- Have a minimum overall 3.0 GPA (on a 4.0 scale). Students who have attained a GPA of 3.5 or above are strongly recommended.
- Be entering their junior or senior year in college (at a school other than the University of Michigan) and not scheduled to graduate before December 2017.
- Have an interest in pursuing a doctoral degree in one of the Rackham graduate programs. Please note that this does not include programs leading to professional degrees, e.g., Medical School (MD), Law School (JD), Business School (MBA).
- Have a genuine interest in academic research and/or teaching as a career.

**HOW TO APPLY**

For more information and to apply, visit our website at rackham.umich.edu/srqp

Have questions? Contact us at srqp.rackham@umich.edu
On December 18, 2010, just after 6 pm New Zealand time, seven austral summers of construction came to an end as the last sensor was lowered 2.5 kilometers deep into the ice. IceCube was complete nearly 25 years after the pioneering idea of detecting neutrinos in ice was first proposed.

A dedicated team of physicists, engineers, technicians, and IT professionals from around the world turned this idea into a successful experiment. They built IceCube on time, on budget, and exceeding performance expectations. The IceCube Neutrino Observatory is operated by the Wisconsin IceCube Particle Physics Laboratory at UW–Madison. An international collaboration of 300 scientists is responsible for the scientific research, providing exciting new information about our universe.

Kilometer-long cables bring data from each sensor to the IceCube Lab on Antarctica's surface. Data is then distributed by satellite to the IceCube Collaboration for analysis.

South Pole

Located atop the three-kilometer thick Antarctic ice sheet, the Amundsen-Scott South Pole Station is dedicated to research. The National Science Foundation-managed station includes astronomers, biomedical researchers, meteorologists, physicists, glaciologists, and support staff.

The IceCube Lab is located 800 meters away from the station across an ice runway. In this remote location, all supplies, fuel, and food have to be flown in on cargo planes when weather conditions permit. Outside temperatures have been recorded between −82.8 °C and −12.3 °C (−117 °F and 9.9°F). Around 40 brave souls winterover at the station to take care of the facilities and the scientific experiments during the dark, winter months at the Pole.
that are not presently understood yet. Our current understanding of the universe with the Fermi-parallel Observations which have revealed fascinating structures and led to new insights into the nature of dark matter and the properties of the neutrinoless decay of atomic nuclei suggests that these new observations could provide insights into the microscopic structure of dark matter.

Our universe is a vast and mysterious place, and we are only beginning to explore the depths of its mysteries. The Fermi-parallel Observations have revealed fascinating structures and led to new insights into the nature of dark matter and the properties of the neutrinoless decay of atomic nuclei. These new observations could provide insights into the microscopic structure of dark matter.

The image shows a very high-energy neutrino detected on December 2, 2012, with an energy of 2.6 EeV. The detection was modeled in a process called diffuse neutrino interactions with nuclei in the Earth's atmosphere. This neutrino was detected in the IceCube detector in the South Pole, which is the world's largest neutrino observatory.

Since the IceCube data, scientists have explored the possibility that these powerful cosmic-ray sources could be accelerating particles called cosmic rays to energies over one million times the energy of the highest-energy neutrino detected to date. This discovery, which has been made using a technique called the IceCube IceCube-Neutrino Observatory, is the first time that such high-energy neutrinos have been detected in the IceCube detector. This is a significant step forward in our understanding of the universe and the role of cosmic rays in shaping it.