



# Building a Strong Foundation for Success: A Look at STEM Research and Education at Cal State LA



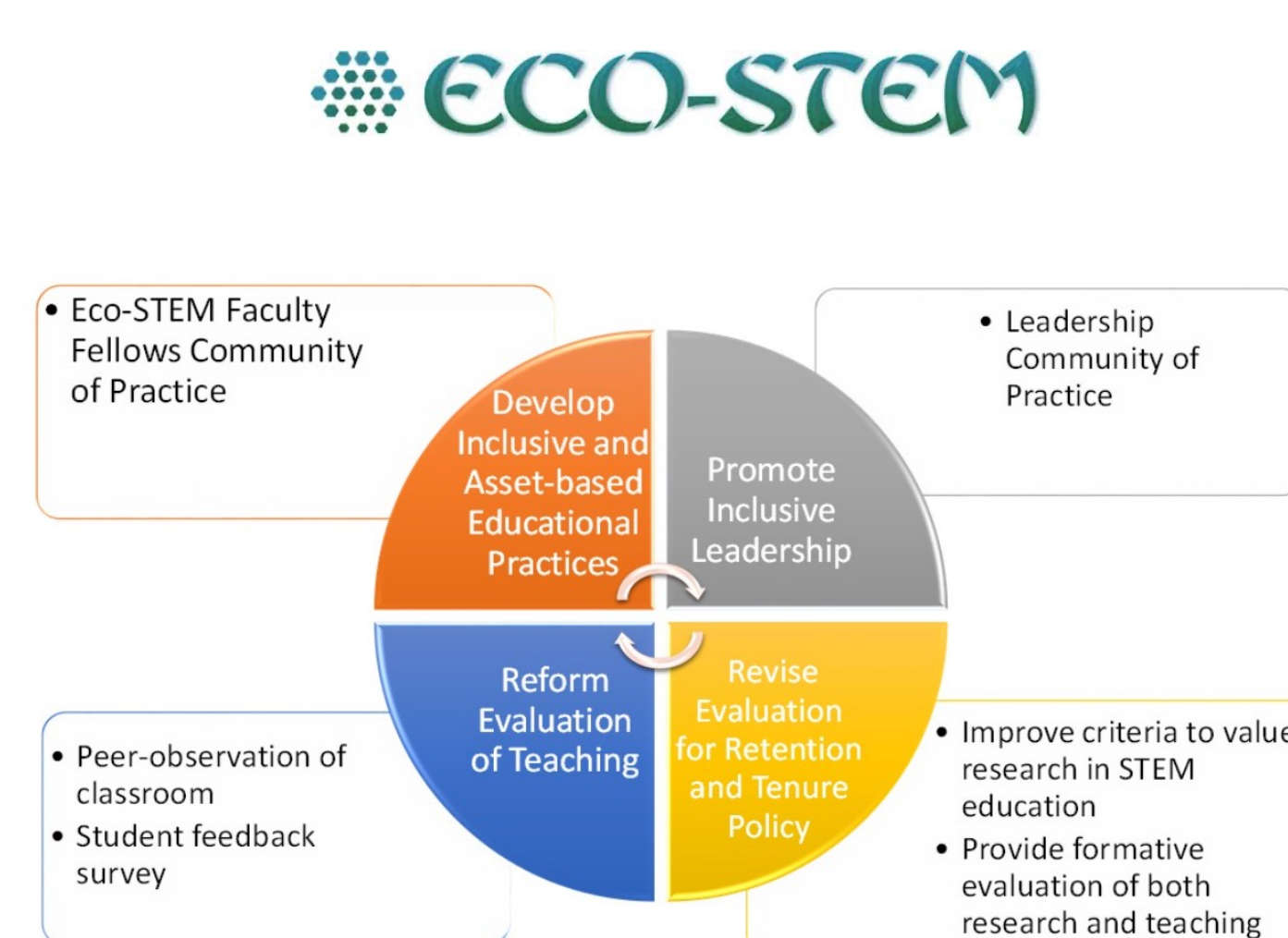
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## Overview

Cal State LA (California State University, Los Angeles) offers a range of STEM programs that provide students with valuable opportunities to engage in research, gain practical experience, and develop their skills in various fields. The REU program in chemistry and biochemistry and the PREC computational workshop provide students with opportunities to work on cutting-edge research projects and learn from experienced instructors. The LAUNCHPAD program offers high school girls mentorship and hands-on experiences to explore their interests in STEM. The SPROUT program provides students with opportunities to work on interdisciplinary projects and collaborate with peers from different disciplines. The Urban Hydrology program offers students the chance to learn about water management and environmental science. Together, these programs showcase the breadth and depth of STEM opportunities available at Cal State LA.

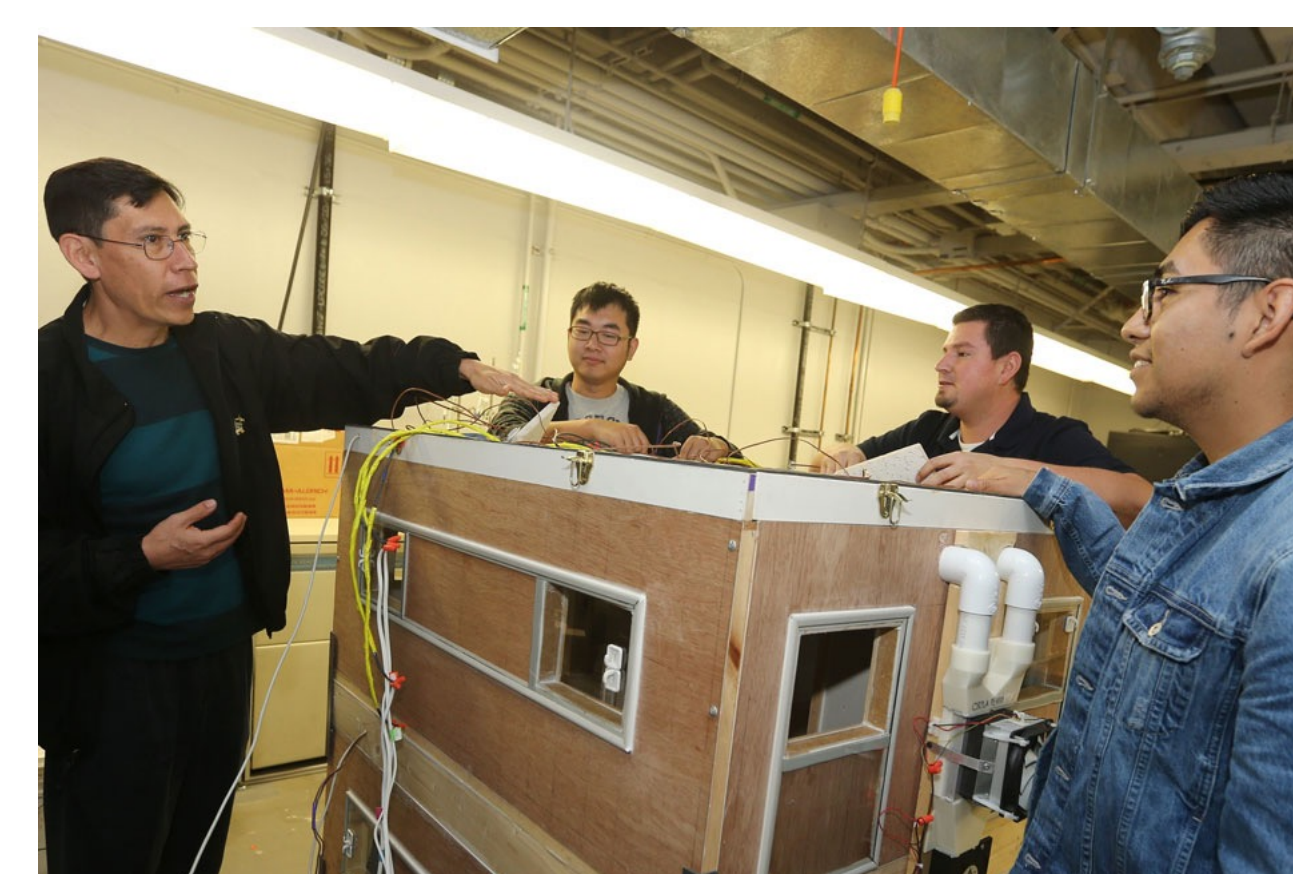
## Eco-STEM

The overarching goal of the Eco-STEM project is to create a supportive and culturally responsive learning and working environment for all members of our community that utilizes their assets to enhance motivation, excellence, and success, thus making teaching and learning rewarding and fulfilling experiences.



## CREST Center for Advancement Toward Sustainable Urban Systems (CATSUS)

The new NSF CREST Center for Advancement toward Sustainable Urban Systems (CATSUS) will aim to advance research in environmentally sustainable energy and water resources for urban areas. The center will also train and mentor underrepresented students in the STEM fields to help meet the high demand for skilled diverse professionals and the need for more pathways to doctoral and postdoctoral research programs. The CREST-CATSUS faculty and student fellows will conduct research focusing on creating sustainable urban hubs.



CREST-CATSUS Professor instructing students in his mechanical engineering class

## Summer Research Programs: REU and SPROUT

Summer research programs at Cal State LA offer students a unique opportunity to dive into the world of research and innovation. These programs allow students to work closely with faculty mentors, collaborate with peers, and gain practical experience in their field of interest. From civil engineering to computational science, these programs provide students with diverse research opportunities to explore.



SPROUT program provides students with research experience and opportunities to present their scientific work.



SPROUT program poster session brings together talented students to showcase their research findings.

The REU in Chemistry and Biochemistry program aim is to introduce students to research opportunities in the many fields of chemistry and biochemistry. REU students work along side faculty and students, and attend several workshops throughout the summer that include *Dealing with Imposter Syndrome*, *Critical Reading of the Literature*, and *Ethics and the Responsible Conduct of Research*.



Exploring science and nature together! Chemistry and Biochemistry REU program directors and students take in the stunning views of Altadena, California.

The NSF REU: Response of Hydrological Systems in Urban Areas Due to Human Disturbance and Climate Change provide students with a research and cultural experience under the guidance and mentorship in water-related fields, such as hydrogeology, watershed analysis, and hydrologic modeling.



Learning by doing! REU students in the Urban Hydrology program explore the science of water management on a field visit.

## Partnerships for Research and Education in Chemistry (PREC)

Cal State LA and the Molecular Software Sciences Institute (MoSSI) at Virginia Tech collaborate to incorporate machine learning techniques in molecular simulation research and develop innovative pedagogical materials to train early-stage undergraduate students in computational science.



PREC computational workshop students represent the diversity and innovation of the future of computational research.



THE PREC program computational workshop teaches students the foundations of molecular science.

- Year-round computational molecular sciences research.
- Annual computational workshop for early-stage undergraduate students
- Mentored summer research experiences for undergraduate students



Partnership for Research and Education in Chemistry  
PATHWAY TO DIVERSITY PROGRAM

The Cal State LA - MoSSI Partnership for Research and Education in Chemistry Pathway to Diversity Program aims to significantly contribute to the recruitment and training of the next generation of molecular simulation scientists, who will require a deep understanding of physical and chemical principles and computational techniques.

## LAUNCHPAD

The Cal State LA, College of Engineering, Computer Science, and Technology (ECST) LAUNCHPAD Summer Program is a two-week in-person (LP) and virtual (LPX) summer program at Cal State LA, where middle school and high school students explore the fields of civil engineering, computer and electrical engineering, computer science, materials science, mechanical engineering, technology and discover how choosing to study in these majors looks like in a career after college.



Empowering the next generation of female scientists! High school girls participate in the LAUNCHPAD program.