



An Undergraduate Experience Like No Other

Join New Mexico EPSCoR project participants for 10 weeks of hands-on field research

# STEM ADVANCEMENT PROGRAM

## Engaging undergraduates in EPSCoR-funded research

Thinking about a **Science, Technology, Engineering, and Math (STEM)** career? Interested in field research but unsure about what it takes? The New Mexico EPSCoR **STEM Advancement Program (STEMAP)** engages students from New Mexico regional universities, community colleges and tribal colleges in the research funded by NM EPSCoR. Each summer, as part of Energize New Mexico, 12 students will spend 10 weeks as a research scientist.



*Work hand-in-hand with NM EPSCoR research faculty and students around the state on cutting-edge research that is crucial to New Mexico.*

The students will first take part in a week of workshops at New Mexico Tech on Water, Energy, and the Environment, followed by nine weeks working with NM EPSCoR-funded faculty and students around the state on cutting-edge research important to New Mexico's future. Through strong academic, social, and financial support for students, STEMAP will encourage and facilitate the transition from students' undergraduate programs to their next academic level.

### Benefits after the summer

**Fellowships** Students will receive fellowships for an academic year during which they will work with a sponsoring faculty member to develop individual objectives that extend their experiences in STEM research.

**Workshops** NM EPSCoR will provide workshops for students in topics such as applying for an NSF Graduate Research Fellowship, developing effective science posters, and strategies for student success.

**Application Deadline: March 1, 2014**

Apply online at [nmepscor.org/workforce/stem-advancement-program-stemap](http://nmepscor.org/workforce/stem-advancement-program-stemap)



# STEMAP 2014 Research Project Descriptions

Full descriptions & requirements are listed on the application site: [nmepscor.org/workforce/stem-advancement-program-stemap](http://nmepscor.org/workforce/stem-advancement-program-stemap)

## ***Encapsulating Living Cells for Biofuel and Bioproducts***

**Location:** University of New Mexico (UNM), Main Campus

**Project Supervisors:** Linnea Ista (Center for Biomedical Engineering) and David Hanson (UNM Dept. of Biology)

**Brief Description:** Scientists in the UNM School of Engineering and the Biology Department in the College of Arts and Sciences are currently pursuing highly interdisciplinary research on novel ways to culture cells and microorganisms in solid matrices.

**Students will:** Culture algae in liquid and solid media; Conduct basic to advanced microscopy; Measure photosynthetic function; Learn basic biochemistry; Perform basic sol-gel encapsulation.

## ***Visualizing Function in Live Cells for Bioenergy Applications***

**Location:** Sandia National Laboratories (SNL) & the University of New Mexico

**Project Supervisors:** Jerilyn Timlin (Biosciences, SNL) and David Hanson (UNM Dept. of Biology)

**Brief Description:** Scientists at SNL and UNM Biology are collaborating to develop and use new methods for measuring physiological function of algae and plants in vivo using advanced microscopy.

**Students will:** Culture algae or grow plants; Conduct basic to advanced microscopy; Measure photosynthetic function; Use stable isotopes to assess physiological function; Learn basic biochemistry.

## ***Assessing Uranium Contamination on the Navajo Reservation***

**Location:** New Mexico Tech (NMT) and Diné College

**Project Supervisors:** Michael Pullin (NMT Chemistry), Bonnie Frey (New Mexico Bureau of Geology), and others

**Brief Description:** The Navajo Nation is home to many closed and/or abandoned uranium mines. The waste materials left at these mines represent a potential hazard to the citizens of the Navajo Nation, through groundwater, soil, and dust contamination.

**Students will:** Research the history and impact of uranium mining; Talk with local community members about their concerns; Collect and preserve well water, soil, and dust samples; Prepare and analyze samples for uranium, then report analysis results back to the local community.

## ***Solar Energy Research in New Mexico: Always in an Excited State!***

**Location:** New Mexico Tech and the University of New Mexico

**Project Supervisors:** Michael Heagy (NMT Chemistry), and Martin Kirk, Yang Qing, and John Grey (UNM Chemistry)

**Brief Description:** Solar energy is an important type of renewable energy. This goal of this project is to synthesize and test new, non-silicon materials for the collection of energy from sunlight.

**Students will:** Synthesize and test new molecules and materials; Learn and apply advanced spectroscopy techniques.

## ***Algae for Energy: Algal Cultivation and Extraction Research***

**Location:** New Mexico State University (NMSU), Main Campus

**Project Supervisors:** Shuguang Deng (Chemical Engineering) and Peter Lammers (Energy Research Laboratory)

**Brief Description:** Biofuels extracted and processed from cultivated algae hold promise as a renewable source of hydrocarbons. However, many details regarding the large scale cultivation of algae and the extraction and characterization of the resulting biomass need further research.

**Students will:** Help cultivate algae in a variety of conditions; Help develop and test a variety of biofuel extraction and characterization techniques.