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## COLORADO CENTER FOR BIOREFINING AND BIOFUELS AWARDED \$336,534 FROM NSF FOR STUDENT RESEARCH

A joint renewable energy center of the University of Colorado at Boulder (CU), Colorado State University (CSU), Colorado School of Mines (Mines), the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) and industry has been awarded \$336,534 over a three-year period from the National Science Foundation for undergraduates to conduct research related to the conversion of biomass to fuels and chemicals.

The grant, awarded to the Colorado Center for Biorefining and Biofuels (C2B2), will allow students to pursue research investigations on feedstock science and engineering, biochemical conversions, thermo-chemical conversions, engineering reactions or separations, and solids-handling processes needed for biorefining applications. The project is part of NSF's Research Experience for Undergraduates (REU) program.

"Biofuels will be a key component of a new energy economy and 'biorefining' research is crucial to tomorrow's biofuels. The future production of fuels and products from biomass will require a complex series of steps to convert chemical compounds into fuels or materials," according to C2B2 executive director Alan Weimer, a professor in CU-Boulder's chemical and biological engineering department. "Research in these areas will help to define promising technologies, push them towards commercial-scale deployment and eventually to public use."

The C2B2 REU program is a 10-week summer program of research, educational seminars, and cultural programming. All features of the program were piloted during the 2008 and 2009 C2B2 REU summer programs which served a combined 28 undergraduate researchers. Program students performed research in laboratories at CU, CSU, Mines and NREL. One-time funding from the State of Colorado was secured for the trial versions of this program.

"The success of our state-funded trial C2B2 REU programs enabled us to demonstrate the need for the National Science Foundation to invest in additional renewable energy research and education in Colorado. In this case, the State of Colorado funding translated into roughly a 350% return on investment after only two years of running this program," says Ryan Gill, managing director of C2B2 and a professor in CU-Boulder's chemical and biological engineering department.

An additional focus of this REU site program will be ‘integration’ among research disciplines and among the four C2B2 institutions. “The program structure has been specifically designed to allow students to experience a cross-disciplinary environment in which to investigate problems that require collaboration to make meaningful progress,” says Weimer. REU undergraduates conduct hands-on laboratory research with professional researchers at CU, CSU, Mines and NREL. Additionally, participants are advised by professional scientists, faculty, and graduate mentors, engage in weekly research group meetings and participate in site visits to each C2B2 institution for seminars and other peer presentation forums.

C2B2 was founded in March 2007, as the first research center of the Colorado Renewable Energy Collaboratory. The Collaboratory is a consortium of CU-Boulder, CSU, Mines and NREL, facilitating cooperative research among the universities, public agencies and industry partners to develop renewable energy products and technologies for rapid transfer to the marketplace. Collaboratory centers support economic growth in renewable energy industries and work to educate existing professionals, as well as future scientists, engineers, and policy makers. The Collaboratory executive director is David Hiller.

“During the last three years of the C2B2-REU Program, the number of undergraduate student applicants has more than quadrupled from 60 to more than 260,” according to C2B2 Center Coordinator, Frannie Ray-Earle. “Student interest in renewable biofuel and biorefining technologies is growing exponentially and this NSF REU grant will enable our four partner institutions to continue to offer and strengthen renewable bioenergy education and research training for undergraduates.”

“Students want to pursue careers in renewable energy and C2B2’s industry sponsors show that this interest is well placed. Companies are looking to build a new energy economy by producing new biofuel products from biomass with energy efficient technologies and sustainable business practices. They will need our students as their future employees in order to stay on the cutting-edge,” says Ray-Earle.

C2B2 received some Colorado state funding in its first three years, but is currently funded solely through industry sponsor fees and the support of NREL and the three universities, says Gill. C2B2 has more than 20 industry sponsors, including such national and international corporations as Chevron, ConocoPhillips, General Motors, and Shell Global Solutions, as well as Colorado small businesses including Gevo, OpX Biotechnologies and ZeaChem. C2B2 has more industry sponsors than any other bioenergy research center in the nation.

For more information on C2B2-REU program and the NSF Site Program in Biorefining and Biofuels, please visit [www.C2B2web.org](http://www.C2B2web.org).

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