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Title

Chemical engineering innovation incubator laboratory

Permalink

<https://escholarship.org/uc/item/1k73k23w>

ISBN

9781510818576

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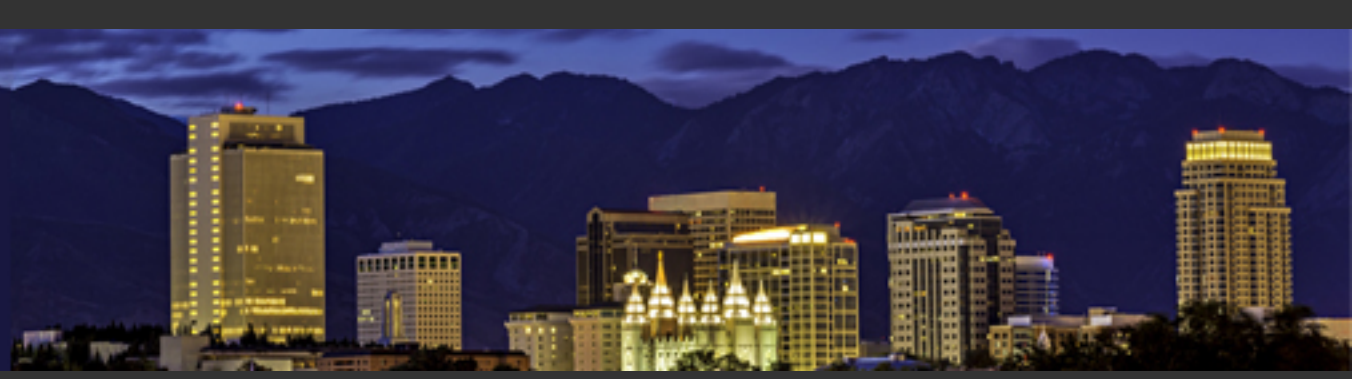
Publication Date

2015

Peer reviewed



2015 AIChE Annual Meeting
November 8 – 13, 2015
Salt Lake City, UT
www.aiche.org/annual



Wednesday, November 11, 2015: 12:55 PM

Alpine West (Hilton Salt Lake City Center)

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Innovation and creativity are crucial skills for the 21st century engineer. Major reports from the National Academy of Engineering (1) and the Royal Academy of Engineering (2) emphasize the importance of these skills for future engineering professionals to bridge the space between theory and a broad range of applications. Creating space in a highly constrained chemical engineering curriculum for students to develop these skills is important but challenging. Students can find opportunities in faculty research groups, industry internships, or ChemE car teams, but may graduate without pushing the limits of their own creativity as engineers.

The Chemical and Biomolecular Engineering Department at the University of California, Berkeley responded by creating the new Innovation Incubator Laboratory for undergraduates to explore student-directed chemical engineering projects. The Incubator encourages student entrepreneurship and creativity through an open proposal process, while providing supervision and consultancy in safety, technical aspects, and commercialization. The CBE Department affirms the importance of space for “tinkering”, hands-on applications of chemical engineering theory, and the entrepreneurial spirit of our students.

The Innovation Incubator is situated in the historic Glenn T. Seaborg laboratory in Gilman Hall. This is a historic landmark where plutonium was discovered as a new element in 1941. A generous gift of an alumnus allowed for a renovation of the space in January, 2015 to ready it for student project work. The laboratory contains standard basic equipment including glassware, oven, balances, fume hood, and personal protective equipment. Specialized equipment is added as needed and as funded for each student team. The student teams are supervised for safety by faculty, technical staff, or graduate student instructors.

Student teams may be multidisciplinary, but require a chemical engineering undergraduate majority. Each team must complete laboratory safety training, recruit a faculty sponsor, raise at least \$200 for project start-up costs, prepare a detailed standard operating procedure, and write a 5-10 page proposal to describe their goals and intended use of the laboratory space. Four teams submitted proposals for review in February, 2015. A team of department faculty and staff reviewed the proposals, and two student teams studying fermentation and emulsifiers began work in the space in March, 2015. Two additional teams investigating biofuels and fuel cells are expected to begin work in the space in August, 2015.

The initiation of the Innovation Incubator has contributed to a culture of creativity within the department, with many student initiatives beyond the formal Innovation Incubator proposals. We are also seeing the development of outward-looking skills among our students as they reach out to collaborators and potential funding sources beyond our campus. We anticipate a strong response to the call for Innovation Incubator proposals in the next semester, and look forward to supporting our students' explorations.

(1) Engineer of 2020, National Academy of Engineering, May 17, 2004.

(2) Educating Engineers for the 21st Century, Royal Academy of Engineering, June 2007.

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