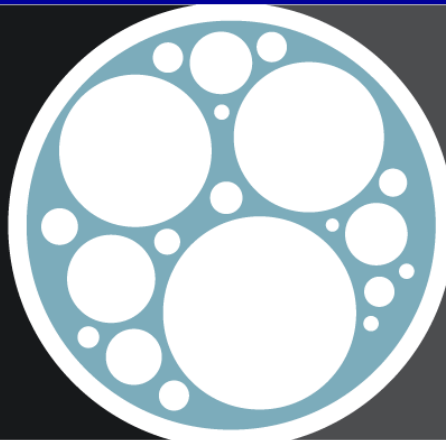


Education and Workforce Development at Lawrence Berkeley National Laboratory



CSEE
Center for Science and
Engineering Education

Susan Brady, CSEE Department Head
Community Advisory Group Meeting
9 Jan 2012

The Need



- California ranks 49th among states in science achievement scores in 8th grade
- 77% of White California 5th graders score “proficient” in science statewide test (compare to 45% Latino and 43% Black)
- 86% of Californians believe that science education should be a high priority
- 40% of elementary teachers teach less than 60 minutes of science per week (16% of Bay Area teachers report 0 minutes per week)
- 62% of districts report they do not have capacity or materials to deliver high quality science
- Over 60% of local public surveyed indicated that Berkeley Lab should play a larger role in science education

Recommendation

“Rebuild infrastructure that supports science education improvement.

This infrastructure should include support at the school, district, and county levels, as well as **explicit and strategic use of existing and potential capacity and infrastructure of science-rich institutions** such as institutions of higher education, science centers, museums, zoos, aquaria, and **national laboratories.**”

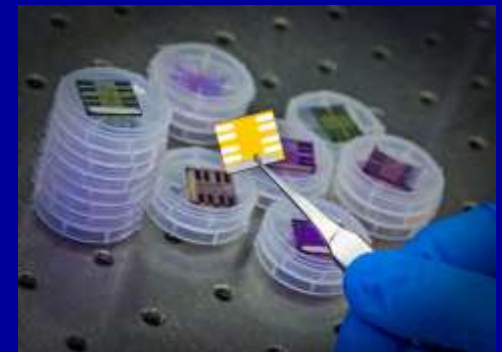
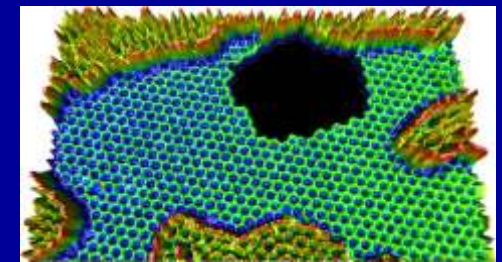




Berkeley Lab Mission

“Bringing Science Solutions to the World”

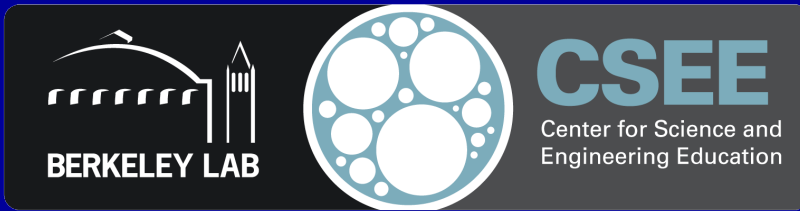
- **Solve major scientific and engineering problems**
 - Basic science for a secure energy future
 - Control living systems for environment, health, and energy
 - Understand matter and energy in the universe
- **Build and safely operate leading scientific facilities**
- **Prepare the next generation of scientists and engineers**





Center for Science and Engineering Education

- Established 1988
- Goals:
 - Promote equal access to careers
 - Improve quality of teaching
 - Increase numbers of scientists and engineers
 - Promote scientific literacy





Berkeley Lab's Education Outreach



Teacher Preparation and Professional Development



Classroom Visits by Lab Employees



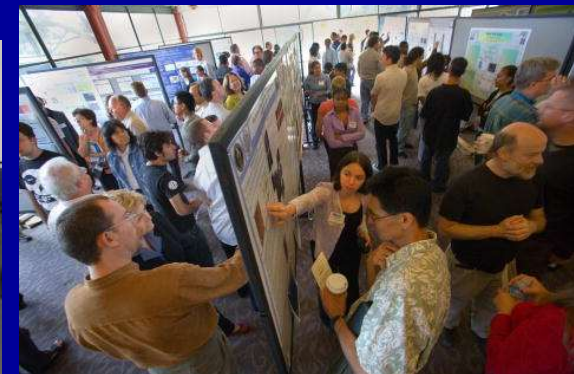
Visiting Faculty Research Collaborations



K-12 Workshops and Lab Tours



Science Bowl



Mentored Research Internships



CSEE Program Participants

- Teachers and those preparing to become teachers
- Precollege students – preschool through high school
- Undergraduate students – 2- and 4-year institutions
- University faculty members
- LBNL staff





Educational Visits

ALL INCLUDE:

- Hands-on workshops
- Tours of appropriate research labs
- LBNL researcher volunteers
- Customized for interests of group

Berkeley Lab Adventure Zone for Elementary Science (BLAZES)

Fifth grade students

Berkeley Lab Afterschool Science and Technology (BLAST)

Middle school students

Berkeley Lab Educational Visits (BLEV)

Grades 6-16 students and teachers





Three-Year Summary of BLAZES Visits

Number of East Bay Classrooms

District	Per Fiscal Year			Three-Year Total
	FY09	FY10	FY11	
Albany	0	0	5	5
Berkeley	23	19	23	65
Oakland	12	12	14	38
West Contra Costa	5	7	8	20
TOTAL				128



Berkeley Lab In School Settings (BLISS)

BLISS Resource Center

- Launched in Oct 09
- Hands-on, engaging, scientifically-sound science
- Aligned to the California State Science Standards
- For use by Berkeley Lab employees in local schools
- CSEE provides prep workshops by LHS staff
- Over 195 employees involved to date





Cool Your School Initiative



- Set of interactive activities for 6th grade
- Web-based component for uploading student data
- Focus on heat transfer, cool materials, light reflectance and absorption
- Aligned with California State Science Standards
- Trial-testing in Berkeley Middle Schools during 2011-2012
- Planned launch in June 2012





2009-2011 Internship Program Participants

- 60 High School Students
- 46 Community College Students
- 275 Undergraduate Students
- 50 Teachers
- 15 Faculty Collaborators

TOTAL

- 446 Interns
- 264 Mentors





High School Internships

- Local high school juniors
- Summer, 7.5 weeks
- Research project
- Interns produce abstract and present poster
- Paid \$2000 stipend
- Online applications open 1 Dec

The logo for High School BLIPS (Berkeley Lab Internships for Precollegiate Scholars). It features the Berkeley Lab logo and the CSEE (Center for Science and Engineering Education) logo at the top. The text "High School BLIPS" is prominently displayed, with "Berkeley Lab Internships for Precollegiate Scholars" underneath. At the bottom, it says "Offering scientific research experiences for Bay Area high school juniors".



Teacher Internships



- Science teachers come to Lab for 1-2 summers via the IISME program
- Professional development opportunities
- Materials for classroom use

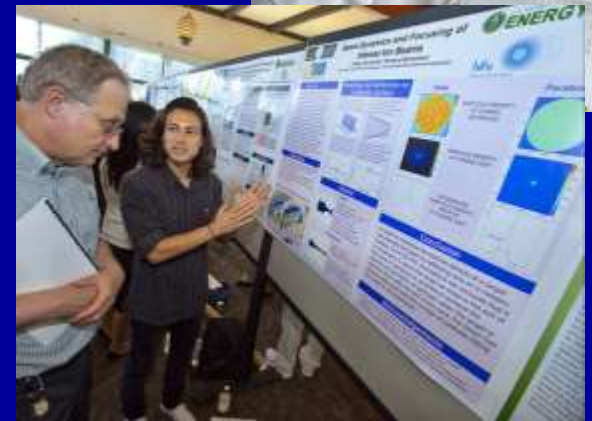
Goals

- Science teachers doing science research in a lab
- Science teachers becoming researchers in their classrooms
- Science teachers facilitating students becoming researchers



Undergraduate Internships

- Targets two-year (CCI) or four-year (SULI) institutions
- Ten-week mentored research/technical experience in summer (16 weeks in fall or spring)
- Weekly intern meetings, lab tours, seminars, lab group meetings
- Lab-wide Poster Session at end of program
- Interns produce abstract, paper, poster
- One summer for CCI (technical)
- Up to two semesters/summers for SULI (research)





Public Outreach: Science at the Theater

**BERKELEY LAB PRESENTS:
SCIENCE AT THE THEATER**

APRIL 26

Just say no to carbon emissions

Learn about three efforts our grandchildren may thank us for: cheap solar energy, storing carbon deep underground, and energy efficiency in China.

MAY 10

The house of the future

Get a sneak preview of tomorrow's zero-energy home, complete with cool roofs, smart windows, and computer-driven control systems.

FREE ADMISSION | 7-9 p.m. at Berkeley Repertory Theatre | Thrust Stage | 2025 Addison Street | Berkeley
friendsofberkeleylab.lbl.gov | twitter.com/BerkeleyLab | www.facebook.com/BerkeleyLab

- “Friends of Berkeley Lab” public event
- Average 6-8 per year
- Held downtown at Berkeley Rep Theater
- Provides access to LBNL science
- Informal, panel setting
- Filled to capacity
- **FREE!**

HOLLYWOOD SCIENCE BERKELEY LAB

BERKELEY LAB on Hollywood

These are a lot of cool innovations making the streets of Berkeley! What would you learn about the secret lives of bacteria in the Pacific Northwest from co-creator Jamie Foglia of SciFi TV's hit show "3000KA"?

EURKA

FREE ADMISSION

friendsofberkeleylab.lbl.gov

Science at the Theater

HOT TECHNOLOGY COOL SCIENCE

Great innovations start with bold ideas. Learn how Berkeley Lab scientists are devising practical solutions to everything from global warming to how you get to work.

MONDAY, MAY 11TH, 7:00 PM
ADMISSION FREE

BERKELEY REPERTORY THEATRE
2025 ADDISON STREET, BERKELEY, CA 94704

Join a roundtable conversation moderated by AT&T Chairman Ty J. Lee. Fellow Free Laureates Berkeley National Laboratory scientists will discuss how technologies they have developed are improving the world.



Berkeley Lab Local Education Impact

Over the past three years, the Lab has:

- Conducted science workshops and Lab visits for over 4,500 East Bay grade school students**
- Provided 74 scientist visits to East Bay classrooms**
- Provided 89 research internships for East Bay high school students, community college students and science teachers**
- Partnered with East Bay educational, scientific, and economic development organizations**