



Discover LLNL

The Community Newsletter of Lawrence Livermore National Laboratory

• Summer 2007

LLNL to partner on bioenergy research center

Secretary of Energy Samuel Bodman announced in June that a partnership of three national laboratories — including Lawrence Livermore National Laboratory — and three research universities in the San Francisco Bay Area has been chosen to host one of three new national bioenergy research centers.

This new center will be known as the Department of Energy Joint BioEnergy Institute (JBEI) and is expected to receive \$125 million in DOE funding over a five-year period.

The JBEI's six partners are the Lawrence Berkeley National Laboratory, the Sandia National Laboratories, LLNL, the UC campuses of Berkeley and Davis, and Stanford University. Plans call for



the JBEI to be headquartered in the East Bay, central to all partners. Initial work will take place at the Berkeley West Biocenter in Berkeley.

The other two DOE bioenergy research centers will be located at Oak Ridge National Laboratory in Tennessee and at the University of Wisconsin in Madison. Michigan State University will be a close collaborator on the Wisconsin center.

"These centers will provide the transformational science needed for bioenergy breakthroughs to advance

President Bush's goal of making cellulosic ethanol cost-competitive with gasoline by 2012, and assist in reducing America's gasoline consumption by 20 percent in 10 years," Bodman said.

Research at the JBEI will focus on biofuels — liquid fuels derived from the energy stored in plant biomass. Harnessing even a tiny fraction of this energy could meet much of the nation's annual transportation energy needs.

LLNL will undertake studies of the genetics and metabolism of microbes that produce long-chain hydrocarbons to explore the possibility of developing practical sources of non-ethanol liquid fuels.

For additional information about the JBEI, go to the Web at <http://www.jbei.org>.

Laboratory researchers win five R&D 100 awards

Livermore Laboratory researchers garnered five R&D 100 Awards (sometimes called the "Oscars of Invention") this year for developing cutting-edge technologies with commercial potential.

The five teams of LLNL scientists and engineers won the awards from the trade journal *R&D Magazine* for developing advances among the top 100 industrial inventions worldwide for 2006. The researchers worked with five universities, four industrial collaborators and another national laboratory.

With this year's awards, the Laboratory has captured a total of 118 R&D 100 Awards since 1978.



The pneumothorax detector was one of the Laboratory's R&D 100 award winners.

Protecting vision

Livermore researchers have helped develop a new instrument that could revolutionize retinal imaging, providing eye doctors with the capability to more successfully detect, diagnose and treat blinding retinal diseases.

A pneumothorax detector

LLNL engineers have developed a new medical diagnostic device to detect pneumothorax, a medical condition caused by having air trapped in the space between the wall of the chest cavity and the lung.

An optics breakthrough

LLNL laser scientists have developed continuous-phase plate

optics that are an important breakthrough for the Laboratory's National Ignition Facility and allow the laser's 192 beams to be optimally coupled to its targets.

Detecting nuclear materials

For the third year in a row, Livermore scientists and engineers have won an R&D 100 Award for developing an advanced radiation detection system — this time, for the Large Area Imager.

About the size of two large desks and often carried in a trailer, the Large Area Imager provides several important advances for detecting and interdicting illegal nuclear materials.

hypr-Active software speeds supercomputing

Laboratory computer scientists have developed a software library called hypr that allows researchers to more effectively use supercomputers to conduct larger, more detailed simulations faster than ever before.

High school seniors receive Edward Teller Science Scholarships

Two Livermore students recently won the Laboratory's prestigious Edward Teller Science Scholarship. This year's award winners are Ayano Kohlguber of Livermore High School and Ann Rosa of Granada High School.

The awards, instituted in 2004 in honor of the late Dr. Teller, renowned physicist and Lab co-founder, are given by the Laboratory to graduating seniors selected by the school district who excel in science. Each student will receive a \$1,000 scholarship and is eligible for a paid internship at the

Lab when they complete their first year of college.

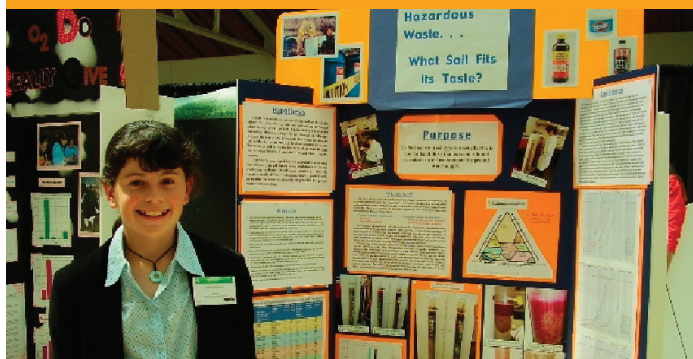
Kohlguber plans to attend UC Berkeley in the fall where she will study molecular and cell biology. Rosa will be attending Cal State University East Bay in the fall to study molecular biology and hopes to pursue a career in research or teaching.

A reception for the scholarship winners and their parents was held in June at the LLNL Discovery Center with special guest Erik Ridley, field representative for Congresswoman Ellen Tauscher, attending.



From left: Ayano Kohlguber and Anna Rosa.

Winning science at this year's Tri-Valley Science and Engineering Fair



Alison Burklund, a junior sweepstakes winner at the Tri-Valley fair, won first place in the Environmental Science category at the California State Science Fair.

Alison Burklund, a junior sweepstakes winner of the 2007 Tri-Valley Science and Engineering Fair (TVSEF) sponsored by the Lab in March, successfully competed in the California State Science Fair in Los Angeles, May 21-22.

An eighth-grade student from Valley Montessori School in Livermore, Burklund won first place and received a \$250 award in the Environmental Science category for her project

"Hazardous Waste: What Soil Fits its Taste?" Her process determines the best soil type for minimizing the impact of hazardous chemicals on groundwater.

In addition to her first-place award, Burklund also was one of three students statewide chosen to speak at a VIP reception at the event.

A total of 969 students in grades six through eight competed in the state fair this year.

The 2007 Tri-Valley Science and Engineering Fair's two senior sweepstakes winners won five awards at the Intel International Science and Engineering Fair held in Albuquerque in May.

Richard Li, an 11th grade student from Monte Vista High School in Danville picked up multiple awards at the Intel Fair for his project entitled, "A Novel Approach to Rapid Diagnosis of Cancer," that explains how a protein could diagnose cancer. The awards included: a \$500 prize for Best in Category; Fourth Place in Chemistry; a \$100 award from the American Association for Clinical Chemistry; a \$5,000 annual tuition scholarship and a paid summer internship from Albany College of Pharmacy at Union University, N.Y.; and a \$120,000

tuition scholarship from Drexel University.

Yuyang John Mei, also an 11th grade student from Monte Vista High School, received a paid summer internship sponsored by Agilent Technologies for his award-winning project entitled "A Novel Pathway for PTEN Chemo Sensitization," which unravels a protein that helps fight cancer.

The annual Intel International Science and Engineering Fair, now in its 58th year, brings together some of world's most accomplished high school science students. This year's event drew more than 1,500 students from more than 50 countries with more than 1,200 projects (students have the option of working in teams). Competition is difficult, with only 26 to 28 percent of the projects garnering awards.



Richard Li and Yuyang John Mei, Tri-Valley senior sweepstakes winners at the Intel fair, with Monte Vista High School science teacher Patti Carothers.

Lab's Dispatch Center now computer-aided system

The Alameda County Regional Emergency Communications Center (ACRECC), located at Lawrence Livermore National Laboratory, recently converted to a new computer-aided dispatch or CAD system. Created by the Intergraph Corporation, a 35-year-old provider of software and services, the new system replaces a 12-year-old text-based process.

LLNL manages and provides dispatch service at ACRECC under a mutual aid agreement with other agencies, including the Alameda County Fire Department, Lawrence Berkeley National Laboratory, City of Alameda Fire Department, Alameda County Emergency Medical Services Agency, Camp Parks Combat Support Training Center, Fremont Fire Department and the Union City Fire Department. The \$1.2 million conversion project was funded jointly by all members of the consortium.

The new system can address the diverse geography and demographics of Alameda County by seamlessly combining an interac-

tive, real-time map display with call handling, dispatching, records and information management, remote access and mobile data.

The key business benefits of the new system are reduced response times and

real-time information that is available to both the dispatcher at the Center and to responders in the field. Dispatcher effort is reduced because many elements are now available at the click of a mouse.



The new computer-aided dispatch system at Lawrence Livermore National Laboratory allows for reduced response times and real-time information.

LAWRENCE LIVERMORE NATIONAL LABORATORY • SITE 300

TAKE A TOUR — SEE THE SITES

Lawrence Livermore National Laboratory offers tours of both its main site in Livermore and Site 300, the Lab's experimental test facility located in the foothills southwest of Tracy.

Tour participants must be at least 18 years old. U.S. citizens need to register two weeks in advance. Non-U.S. citizens must register 60 days in advance. For more information or to sign up for a tour, see <http://www.llnl.gov/pao/com/tours.html>

UC proposal for biodefense facility does not advance in selection process

The U.S. Department of Homeland Security (DHS) in July announced the selection of five sites that will advance to the next phase of the site selection process for the proposed National Bio and Agro-Defense Facility, or NBAF.

The University of California (UC) and its partners, including LLNL, one of the 14 remaining bidders for the facility, were not chosen for this short list of candidate sites. NBAF is the proposed National Bio and Agro-Defense Facility that DHS plans to build to replace the Plum Island Animal Disease Center, an aging facility located just off the coast

NBAF

of New York. UC proposed the NBAF be sited at one of three locations at Site 300, Livermore Lab's experimental test facility southwest of Tracy.

The five finalist sites are located in the states of Mississippi, Kansas, Texas, North Carolina and Georgia. Each of these sites will undergo extensive environmental reviews. A final site is expected to be chosen by DHS in the latter part of 2008.

"The University of California is disappointed that its proposal for the National Bio and Agro-Defense Facility was not selected by the U.S. Department of Homeland Security for further review and consideration," said UC spokesperson Chris Harrington.

"The UC system is a leader in the field of biotechnology and brings a wealth of knowledge and expertise to the area of biosecurity research. We will continue to apply our premier scientific and technological expertise to the homeland security work of our nation, including in the areas of biology and agriculture."

Calling all fifth-grade classes

Take a Super Science Field Trip



Field trips to LLNL's Discovery Center for individual fifth-grade classes are available Monday through Friday mornings during the school year.

Students will enjoy science displays, group activities and interactive experiments. These activities are aligned with the California State Science Standards. Prior to the field trip, teachers receive a packet of information to motivate students. Follow-up lessons and resources are provided during the visit for classroom use. Field trips also are available for scout troops and science clubs.

Reservations are required. For more information, go to the Web at [http:// www.llnl.gov/pao/com/school_tours.html](http://www.llnl.gov/pao/com/school_tours.html) or call (925) 423-3272.

HERE'S WHAT STUDENTS AND TEACHERS ARE SAYING:

"The children's interest in science was truly sparked."

"We really loved the experiments. You taught us a lot of science facts."

"Thanks for teaching my class about the wonders of science and how they can be involved in it."

Discover LLNL is a publication of the Public Affairs Office at Lawrence Livermore National Laboratory. If you would like to be included in the distribution of Discover LLNL, please contact Linda Lucchetti, lucchetti1@llnl.gov, or call (925) 422-5815.

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