Discover LLNL

The Community Newsletter of Lawrence Livermore National Laboratory ◆ ◆ ◆ Winter 2006

Homeland Security Chief visits Lab

U.S. Department of Homeland Security Secretary Michael Chertoff visited LLNL for the first time in July. Introducing Chertoff to local media during a press conference, Lab Director Michael Anastasio said "we have been showing the Secretary how we at Lawrence Livermore and Sandia National Laboratories are working aggressively to assist the Department of Homeland Security in winning the war on terrorism."

Chertoff spoke with scientists and interns from the Lab's Homeland Security department, saw security detection technologies, and inspected a Lab-designed Department of Homeland Security Mobile Van, which contains state-of-the-art radiation detectors and an explosives detection system.

From left: LLNL's Allen Christian shows a biodetection device to Scott Weber of the U.S. Department of Homeland Security, Department of Homeland Security Secretary Michael Chertoff, and Laboratory Director Michael Anastasio.

Calling LLNL a "tremendous national resource," Chertoff said the Lab has a lot to offer in terms of enhancing homeland security. "When you spend some time at the Lab, you see the enormous capabilities we bring to bear on some of the challenging threats the country faces from potential terrorist acts." ◆

Department of Energy Leader comes to Livermore

U.S. Department of Energy Secretary Samuel Bodman made his first visit to the Laboratory in August. Bodman, who is an engineer, said he "has come to revere the people who created the Lab—Ernest Lawrence, Edward Teller and the many leaders of this Laboratory."

Bodman visited several DOE sites across the country "to get to know the people at DOE labs and facilities." During his full day in Livermore, Bodman was briefed on national security programs and toured research facilities including the National Ignition Facility and the Terascale Simulation Facility.

Samuel Bodman

"This Laboratory is one of the department's most important resources," Bodman noted. ◆

Lab researchers develop armor to protect U.S. convoys in Iraq

Gun truck armor kits developed by LLNL researchers are now providing convoy protection for American troops on the roads of Iraq.

A gun truck, with an armor kit developed by Laboratory researchers and engineers, was struck by an improvised explosive device southwest of Fallujah, Iraq. All seven U.S. soldiers in the vehicle at the time of the attack walked away unharmed.

Under funding from the Defense Advanced Research Projects Agency, and in collaboration with

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LLNL supercomputing is tops

In October, the Department of Energy/National Nuclear Security Administration helped the Laboratory celebrate the fulfillment of a DOE/NNSA initiative to increase computing power one million fold over a 10-year period. This initiative was accomplished through the successful installation and application of the BlueGene/L and Advanced Simulation and Computing Program (ASC) Purple machines housed in the Laboratory's TeraScale Simulation Facility.

The BlueGene/L and ASC Purple machines will serve NNSA's Stockpile Stewardship Program, which helps maintain the nation's aging nuclear stockpile in the absence of actual weapons testing.

To date, BlueGene/L has been able to perform 280.6 trillion operations per second (teraflops), which puts it well atop the Top500 list of the world's fastest supercomputers. At peak performance it will be able to reach 360 teraflops. ASC Purple will be able to achieve 100 teraflops at peak performance.

Michel McCoy, second from left, of the Lab's Computation Directorate, leads visitors on a tour of the computer rooms in the Terascale Simulation Facility.

Laboratory Director Michael Anastasio noted that the ASC Program has dominated supercomputing since the program's founding in 1995. "Purple and BlueGene/L are symbols of more than the computing capability they represent," stated Anastasio. "Purple symbolizes the ability of NNSA to deliver on a grand vision, and BlueGene/L is an icon for the future." ◆

Armor

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the U.S. Army, Livermore researchers have created a modular, easy-to-assemble armor protection kit that, with the addition of several machine guns, allows the military to convert five-ton supply trucks into gun trucks to protect convoys.

To date, some 71 trucks have been outfitted with the armor protection kits and are being used in convoys on Iraqi roads,with plans for the assembly of about 85 more gun truck kits in the near future.

Each gun truck kit, which consists of readily available and low-cost armor steel and ballistic fiberglass panels, provides a wall of protection around the back of the truck and for the truck cab. Each side wall is topped by two-foot by two-foot sections of transparent armor to protect machine gun operators. (Gun trucks usually carry two to four machine guns). In addition to having a simple design and ample ballistic protection, the kits are relatively inexpensive ($40,000), can be assembled by a team within five hours, and are easy to repair.

"We have sought to protect the truck occupants from the initial blast and give them stronger convoy protection." said Milt Finger, former head of Department of Defense programs at LLNL, who managed the project for the Lab.

After an initial gun truck armor kit was shipped to Iraq, the military requested 30 more gun truck kits, and those were shipped to Iraq, arriving in December 2004. Following that first prototype, the technology was transferred to U.S. companies for further production.

Gun trucks were used during the Vietnam War. In developing the new gun truck kits, the LLNL researchers used information from the Vietnam-era gun truck veterans and designed upgrades to reflect the differences in the Iraq war. ◆

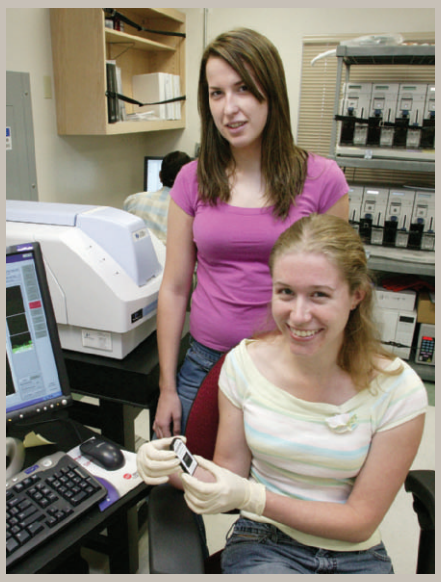
Students explore 'Frontiers of Physics'

Lab employee Stephane Terracol, right, makes ice cream using a liquid nitrogen process while fellow Lab employee Simon Labov, center, and visiting high school students look on at the Lab's "Frontiers of Physics" day, a day of science career discovery that brought more than 250 local high school students to the Lab in September.

Students heard from a distinguished line-up of LLNL and UC speakers on nanotechnology, astrophysics and laser fusion, and interacted with UC professors, recruiters and Lab scientists. In addition, they toured the National Ignition Facility.

The event was part of the Lab's "World Year of Physics" activities.

Teller scholars excel as LLNL interns



Undergraduates Lauren Tracy (left) of UC Berkeley and Nicole Sadler (right) of UC Davis, as the first recipients of LLNL's Edward Teller Science Scholars Award, spent their summer vacation interning in the Laboratory's Biosciences Directorate. Tracy, a Livermore High School alum, is currently pursuing a degree in biochemistry, and Sadler, a graduate of Granada High School, is studying genetics. They received their awards for outstanding achievement in high school science.

Upcoming Student Events

Tri-Valley Expanding Your Horizons Conference in Math and Science
Calling all young women in grades 6-12 to a fun-filled day that will change the way you look at math and science. You'll meet scientists and learn what they do, and also enjoy eye-opening hands-on activities. Be a part of the excitement on Saturday, Feb. 25, 2006, at the SBC Conference Center in San Ramon. Register on-line at http://www.llnl.gov/eyh/tv.eyh.html

Science on Saturday and Science Chat
On Saturdays from Feb. 25 through March 25, 2006, high school students and their teachers will have an exciting opportunity to exercise their minds and learn about subjects like lasers, crime scene investigations and the Big Bang. Students may also stay after class and chat with a participating scientist. Register now at http://education.llnl.gov/sos/ and http://education.llnl.gov/sciencechat/

Tri-Valley Science & Engineering Fair
Celebrating its 10th anniversary, this popular event is geared for science-savvy students in grades 7-12 from the Livermore, Pleasanton, Dublin, San Ramon and Sunol school districts. More than 200 fascinating projects will be on display for public viewing on March 30, 10 a.m.– 4 p.m.; March 31, 10 a.m. –7 p.m.; and April 1, 10 a.m.–noon at the Robert Livermore Community Center in Livermore. Students will be competing for cash prizes and awards. For more information or to learn how you can participate, go to http://tvsef.llnl.gov/

Come to the Discovery Center

The Discovery Center provides visitors with a window into the Laboratory's state-of-the-art science and technology research programs, computational capabilities and experimental tools.

New to the Discovery Center are fun hands-on exhibits from the San Francisco Exploratorium. These exhibits provide simulations of geothermal activity, cloud ring formation, pendulum motion and avalanches.

The Discovery Center, located off Greenville Road on East Gate Drive, is open to the public Tuesday through Friday from 1-4 p.m. Call (925) 423-3272 for more information.

To learn about tours of the Laboratory visit www.llnl.gov/llnl/community/, or call (925) 422-4599.

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 (Scott Wilson, wilson101@llnl.gov, or call (925) 423-3125.)

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