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LLNL



The Community Newsletter of Lawrence Livermore National Laboratory

Fall 2010

## Lab researchers win six R&D 100 Awards

Livermore Laboratory researchers are the recipients of six awards recognizing the top 100 industrial innovations worldwide in 2009.

The technologies honored by the trade journal *R&D Magazine* were developed by six teams of LLNL scientists and engineers. They worked with three universities, four industrial firms, two other national labs and the U.S. Department of Homeland Security's Domestic Nuclear Detection Office.

The winning of an R&D 100 award provides a mark of excellence known to industry, government and academia, and represents one of the most innovative ideas of the year.

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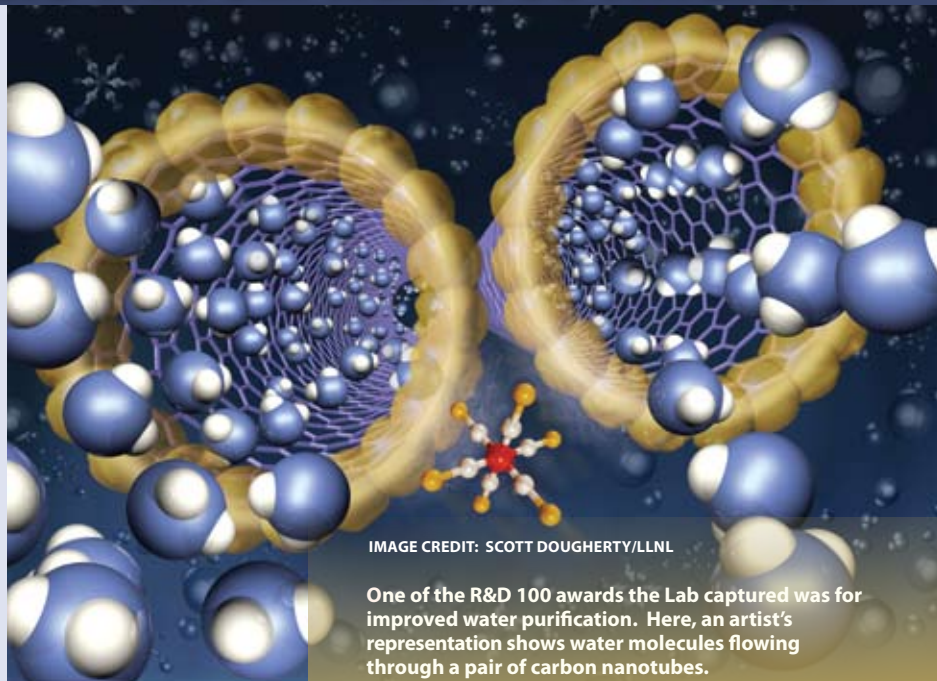


IMAGE CREDIT: SCOTT DOUGHERTY/LLNL

One of the R&D 100 awards the Lab captured was for improved water purification. Here, an artist's representation shows water molecules flowing through a pair of carbon nanotubes.

## Leadership changes at Lab for operations, science and technology areas



Tom Gioconda, left, is congratulated by Lab Director George Miller during a meeting announcing Gioconda's appointment as the Lab's new deputy director.

Livermore Laboratory has two new deputy directors. In June, LLNL Director George Miller announced the selection of Tom Gioconda as the Laboratory's new deputy director. Gioconda comes to LLNL from the Washington D.C office of Bechtel National (BNI), where he led BNI's business development and operations activities with the Department of Energy/National Nuclear Security Administration (DOE/NNSA), Department of Defense (DoD), and other U.S. government sectors.

Former Deputy Director Steve Liedle left the Laboratory to take

a senior position with BNI in Oak Ridge, Tenn.

A retired Air Force brigadier general, Gioconda holds a master's of business administration degree from the University of Montana, a master's of education in education administration from Seton Hall University and a bachelor of arts degree in history from St. Joseph's University. He also is a graduate of the Air War College, Air Command and Staff College, and Air Force Squadron Officer School, as well as several missile and space technical programs.

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# Lab technologies capture technology transfer awards

**A** Livermore Laboratory partnership that developed an environmental sampler that allows researchers to conduct biological analyses remotely in real time, and a Laboratory technology that can detect more than 2,000 viruses and 900 bacteria in 24 hours, have garnered two technology transfer awards in the Federal Laboratory Consortium's (FLC) Far West Region competition.

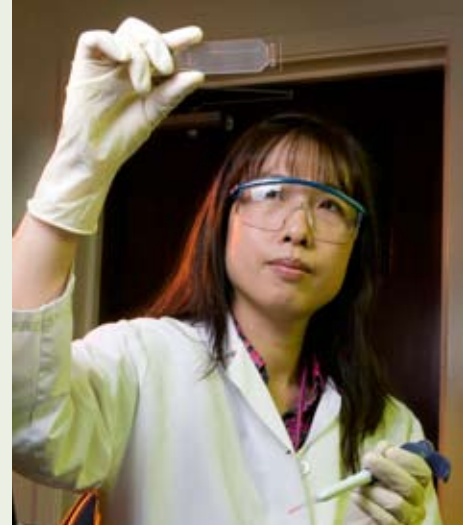
The Environmental Sampler Processor (ESP) involved Laboratory scientists who worked in conjunction with researchers at the Monterey Bay Aquarium Research Institute, the National Oceanic & Atmospheric Administration/National Ocean Service Marine Biotoxins Laboratory and other partners. The ESP allows the use of DNA

and quantitative polymerase chain reaction techniques for rapid analyses in remote locations.

The Lawrence Livermore Microbial Detection Array (LLMDA) has shown value for applications in detecting bioterrorism events, product safety and diagnostics. This device consists of probes fitted onto a one-inch-by-three-inch glass slide. Each probe tests for a particular sequence of DNA.

The LLMDA team worked with the Sausalito-based Marine Mammal Center to diagnose diseases that have struck California sea lions and harbor seals.

The FLC is a nationwide network of federal laboratories that provides a forum to develop strategies and opportunities for linking laboratory mission technologies and expertise with the marketplace.



Lab biologist Crystal Jaing

# National Ignition Facility receives international award

**C**iting groundbreaking technical achievement and exemplary management, Livermore Laboratory's National Ignition Facility (NIF), the first laser expected to achieve fusion ignition in a laboratory setting, has been awarded the Project Management Institute's (PMI's) 2010 Project of the Year. The award, presented in October during a special ceremony in Washington, D.C., recognizes the year's most innovative and successful project. PMI is the world's leading not-for-profit membership association for the project management profession, with more than half a million members and credential holders in 185 countries.

"The NIF project was accomplished by a worldwide partnership among

governments, academia and our many industrial partners," said Laboratory Director George Miller, who attended the awards ceremony. "NIF's success can be attributed to its excellent team of scientists, engineers, technicians and support personnel; to the rigorous application of best-practice project management standards, processes and techniques; and to highly productive teamwork with the National Nuclear Security Administration, the Department of Energy and our partners."

"NIF is an engineering and physics marvel, and it could not have been done without the thousands of people who have been a part of this team," added Ed Moses, director of NIF.

Located at LLNL, NIF is the world's

largest and most energetic laser, focusing 192 beams on a capsule the size of a pencil eraser. Inside that capsule a fuel pellet, made from isotopes of hydrogen, is heated to temperatures hotter than the sun's core, fusing the hydrogen atoms' nuclei and producing more energy than the laser energy required to spark the reaction. The result is ignition — the same process that powers the sun and the stars.

Funded by the Department of Energy's National Nuclear Security Administration, NIF will be used to assure the safety and security of the nuclear weapons stockpile, provide a path to a carbon-free and virtually limitless source of energy, and expand frontiers in astrophysics, materials science, medicine and basic science.



Tomás Díaz de la Rubia

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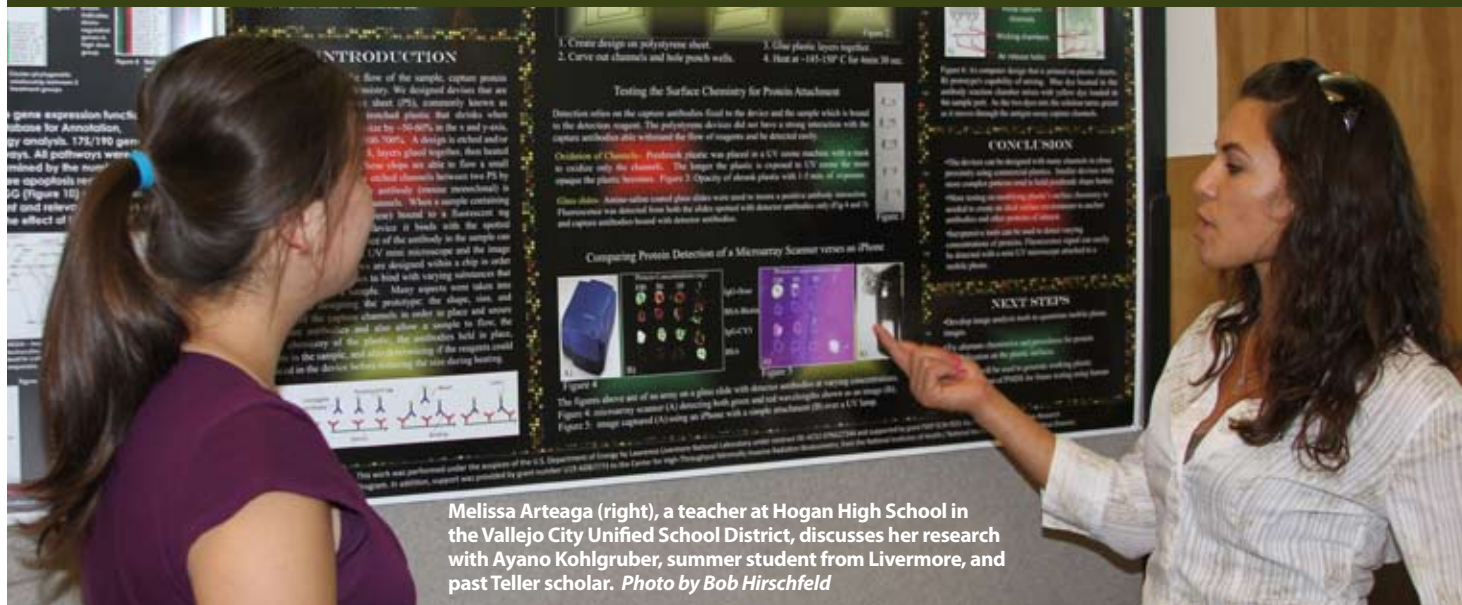
Also in June, Director Miller appointed Tomás Díaz de la Rubia as the Deputy Director for Science & Technology (S&T) to steward the continued long-term health of science, technology and engineering at the Laboratory.

Díaz de la Rubia has served as an Associate Director for Chemistry, Materials and Life Sciences, and since June 2009 had been the acting S&T Principal Associate Director and Laboratory Chief Research and

Development Officer.

Díaz de la Rubia joined the Laboratory as a postdoc in 1989 and since 2002 has held a variety of senior management positions. He was elected a fellow of the American Physical Society in 2002 and a fellow of the American Association for the Advancement of Science in 2007. He holds both a bachelor of science degree (summa cum laude) and a Ph.D. in physics from The State University of New York, Albany.

# What science teachers did on their summer vacation



Melissa Arteaga (right), a teacher at Hogan High School in the Vallejo City Unified School District, discusses her research with Ayano Kohlgruber, summer student from Livermore, and past Teller scholar. Photo by Bob Hirschfeld

More than 80 science teachers from across California and Hawaii, as well as students enrolled in credential programs to become teachers, took part in a poster session at the Robert Livermore Community Center in August. Members of the community and staff from the Lawrence Livermore National Laboratory and neighboring school districts viewed the teachers' projects and heard about their research.

Thirty of the teachers completed an eight-week summer

research experience working as members of teams at the Laboratory in one of three teacher development programs: Teacher Research Academy, Department of Energy Academies Creating Teacher Scientists, and Science Teacher and Researchers. These programs enable middle and high school science teachers to develop and maintain mastery in their scientific fields.

The California State University, Science Teacher and Researcher program and the Laboratory's Science Education Program hosted the poster session.

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With this year's awards, the Laboratory has now captured a total of 135 R&D awards since 1978. Department of Energy (DOE) labs received a total of 39 R&D 100 awards in this year's judging (some labs are joint winners on awards). Following are this year's LLNL R&D 100 awards.

### Helping homeland security

A new material — strontium-iodide doped with europium — developed by LLNL researchers and their partners for use in radiation detectors, enables high-resolution gamma-ray spectroscopy to identify nuclear materials for homeland security and other important applications.

### Improved water purification

LLNL scientists have developed a technology known as ultrapermeable carbon nanotube membranes, or simply nanotube membranes, that could play an

important role in producing clean water. The technology has been licensed by a Hayward-based company, Porifera Inc.

### Seeing the retina at the cellular level

A new clinical instrument, a micro-electromechanical systems-based Adaptive Optics Optical Coherence Tomography device, developed by researchers from LLNL and other institutions, permits ophthalmologists to see the eye's retina at the individual cell level. With this capability, doctors will be able to obtain early diagnoses and follow the progression of retinal diseases, as well as track the progress of genetic therapies that reverse such diseases.

### Detecting nuclear materials

LLNL researchers have developed the Statistical Radiation Detection System (SRaDS), a novel software

system that nonexperts can use to rapidly and accurately distinguish nuclear materials, such as plutonium and uranium, from other radioactive substances for homeland security uses.

### Capturing images of a tiny star

A new diagnostic system, the Grating Actuated Transient Optical Recorder (GATOR), developed by LLNL scientists and engineers, can acquire sequential images of X-rays or optical light in a trillionth of a second or faster from experiments on the National Ignition Facility.

### Measuring a photon beam

LLNL researchers have developed an instrument, or energy monitor, that measures the pulse-by-pulse energy of an X-ray free electron laser (XFEL) photon beam without being damaged by the beam or affecting beam quality.

## School superintendents visit Lab

Superintendent Kelly Bowers, of the Livermore Valley Joint Unified School District and Superintendent Parvin Ahmadi of the Pleasanton Unified School District, visited the Laboratory in August for tours and briefings about LLNL community and education programs available to their students and teachers.

LLNL employees were invited to meet the superintendents at an informal reception in the Laboratory's Discovery Center. Both superintendents were recently selected to their new positions of leadership in the community.



Superintendent Kelly Bowers (center) of the Livermore Valley Joint Unified School District and Superintendent Parvin Ahmadi (far right) of the Pleasanton Unified School District meet Laboratory employees in the Discovery Center during their visit.

## Feds Feed Families



LLNL Director George Miller and NNSA Livermore Site Office Manager Alice Williams show off a large check and some of the food collected for the "Feds Feed Families" food drive that will benefit the Tri-Valley Haven Food Pantry in Livermore.

LLNL and National Nuclear Security Administration's (NNSA) Livermore Site Office employees donated more than \$3,400 and 1,000 pounds of food to the Tri-Valley Haven Food Pantry in Livermore.

The food drive took place in August as part of a national effort by NNSA to partner with its contractors to benefit local communities. The Tri-Valley Haven Food Pantry, located at 418 Junction Ave. in Livermore, provides food to 1,200-1,800 people per month in the Tri-Valley area of Alameda County.

"I am extremely proud of our employees who have generously given to the local community yet again," LLNL Director George Miller said. "This is one of the many charitable organizations that have benefited from employee contributions year-round."

## WILL YOU BE THE LAB'S FRIEND?



The Laboratory now has an official Facebook presence. The Lab's Public Affairs Office maintains the Facebook page, which can be accessed offsite at this Website: [www.facebook.com/livermore.lab](http://www.facebook.com/livermore.lab). E-mail regarding the LLNL Facebook page should be sent to: [facebook@llnl.gov](mailto:facebook@llnl.gov).

Get an inside look at the latest scientific and technical advances, coverage in national media, current and historic photos and videos.

The Lab's other social media endeavors include: Flickr (photos) <http://www.flickr.com/photos/llnl>; YouTube (videos) <http://www.youtube.com/LivermoreLab>; Twitter (messaging) [http://twitter.com/Livermore\\_Lab](http://twitter.com/Livermore_Lab)