

# NEWSLINE

# 2014 YEAR IN REVIEW



LAWRENCE LIVERMORE NATIONAL LABORATORY



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This issue of *Newsline* was produced by the Public Affairs Office. It represents a sample of the science and technology, people and operations highlights of the year. It is available on the [LLNL website](#).

**On the cover: Top stories of the year.**

Lawrence Livermore National Laboratory is operated by Lawrence Livermore National Security, LLC, for the U.S. Department of Energy, National Nuclear Security Administration under Contract DE-AC52-07NA27344 LLNL-WEB-458451



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# Top 10 science and technology stories of 2014



In 2014, Lawrence Livermore National Laboratory (LLNL) built on a 62-year tradition of translating basic science into technologies that ensure national security, address pressing real world problems and expand the boundaries of fundamental science.

The top stories of the year are a reflection of the Laboratory's ability to apply its core national security competencies to a broad set of rapidly evolving national and global challenges, including: energy, climate change, biodefense and detection, forensic science, high performance computing and materials science.

The capabilities developed and applied to this research, such as high performance computing (HPC) and additive manufacturing, also serve to enhance the nation's economic vitality and global competitiveness.

Because evaluating the long-term impact of recent scientific developments on a field of study or science in general is difficult at best, the following advances are not listed in order of scientific importance. These represent only a sampling of the science and technology produced at Lawrence Livermore during the 2014 calendar year.

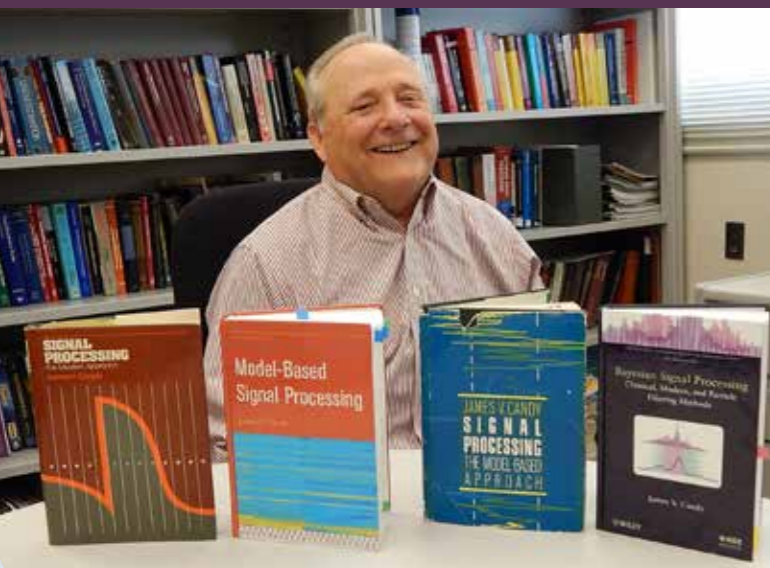
**1** The National Ignition Facility, the world's largest and most energetic laser, reached a major "fuel gain" milestone critical to ignition, the "holy grail" of inertial confinement fusion science. Ignition is the process of releasing fusion energy equal to or greater than the amount of energy used to confine the fuel. [Read more](#)

**2** World renowned for its High Performance Computing (HPC) capabilities, Lawrence Livermore announced a contract with IBM to bring Sierra, a next-generation supercomputer to the Lab. HPC is critical to LLNL's national security

mission as well as to addressing other national and global challenges such as energy and climate change. [Read more](#) LLNL's Sequoia supercomputer was ranked No. 1 on the Graph500 list, a measure of a system's ability to perform data analytics, released at the 2014 Supercomputing Conference on Nov. 18. [Read more](#)

**3** Mark Hart, a scientist and engineer in Lawrence Livermore's Defense Technologies Division, was awarded the 2015 Surety Transformation Initiative (STI) Award from the National Nuclear Security





**Engineering Directorate's chief scientist Jim Candy has made a significant impact on Lawrence Livermore in his four decades of groundbreaking research.**

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Administration's (NNSA) Enhanced Surety Program for developing a code all but impossible to crack.

[Read more](#)

**4** The Department of Defense's Defense Advanced Research Projects Agency (DARPA) awarded Lawrence Livermore up to \$2.5 million to develop an implantable neural device with the ability to record and stimulate neurons within the brain to help restore memory. [Read more](#) In directly related research, scientists are developing an electrode array technology for monitoring brain activity as part of a collaborative research project with UC San Francisco to better understand how the neural circuitry of the brain works during memory retrieval.

[Read more](#)

**5** A biological detection technology developed by Lawrence Livermore scientists can detect bacterial pathogens in the wounds of U.S. soldiers that have previously been missed by other technologies. This advance may, in time, allow an improvement in how soldiers' wounds are treated. [Read more](#)

**6** Lawrence Livermore researchers announced development of an efficient method to measure residual stress in metal parts produced by powder-bed fusion additive manufacturing. This 3D printing process produces metal parts layer by layer using a high-energy laser beam to fuse metal powder particles. [Read more](#)

**7** A microbe detection array technology developed by LLNL scientists could provide a new rapid method for public health authorities to conduct

## “ Quotables

*I've never worked a day in my life, I love what I do. My job is just plain fun.*

– Engineering Directorate's chief scientist Jim Candy, on whether he plans to retire soon

surveillance for emerging viral diseases. [Read more](#)

**8** LLNL researchers have developed a material that is 10 times stronger and stiffer than traditional aerogels of the same density. This ultralow-density, ultrahigh surface area bulk material with an interconnected nanotubular makeup could be used in catalysis, energy storage and conversion, thermal insulation, shock energy absorption and high energy density physics. [Read more](#)

**9** A team of Livermore scientists are using mini-satellites to help control traffic in space. The scientists used a series of six images over a 60-hour period taken from a ground-based satellite to prove that it is possible to refine the orbit of another satellite in low Earth orbit. [Read more](#)

**10** Using satellite observations and a large suite of climate models, Lawrence Livermore scientists have found that long-term ocean warming in the





**The interior of the target chamber at the National Ignition Facility at Lawrence Livermore National Laboratory. The object entering from the left is the target positioner, on which a millimeter-scale target is mounted. Researchers recently used NIF to study the interior state of giant planets.**

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upper 700 meters of Southern Hemisphere oceans has likely been underestimated. [Read more](#) In another climate research development, Livermore scientists joined forces with eight other labs and the National Center for Atmospheric Research to use high performance computing to create the most complete climate and Earth system models designed to address the most challenging climate change issues. [Read more](#)

Additional research worthy of mention, and garnering international attention, includes LLNL research published about planetary formation. Livermore scientists for the first time experimentally re-created the conditions that exist deep inside giant planets, such as Jupiter, Uranus and many of the planets recently discovered outside of our solar system. [Read more](#)



## Quotables

*A lot of engineering capabilities, while they have a huge impact on the Lab's mission space, are largely unknown outside of our square mile. It's very important to get the word out about our one-of-a-kind expertise.*

— Anantha Krishnan  
in an all-hands address to Engineering

## A month-by-month recap of 2014 events at Lawrence Livermore

*Lawrence Livermore's Newsline month-by-month highlights from 2014 are listed on the following pages. Listings are in four categories: Science and technology; People; Operations; and Recognition and awards. This 2014 Year-in-Review appears only electronically; there is no print edition. The Web-based format offers the advantage of providing links to the referenced Newsline articles, press releases or the LLNL Report.*

### JANUARY 2014

#### Science & technology

Space weathering, a process similar to geological erosion on the Earth, produces water in the rims of tiny particles of interplanetary dust. The discovery may have implications on the origins of life and sources of water throughout the galaxy. [Read more](#)





**Lawrence Livermore chemist Sarah Baker and engineer Josh Stolaroff examine an enzyme that they plan to use as a catalyst to convert methane to liquid fuel.**

A team of LLNL scientists are using mini-satellites that help control traffic in space. The scientists use a series of six images over a 60-hour period taken from a ground-based satellite to prove that it is possible to refine the orbit of another satellite in low Earth orbit.

[Read more](#)

Lab researchers discover an important source of decoherence noise affecting the usability of superconducting circuits as quantum bits (qubits) for quantum computers. Increasing coherence time in superconducting circuits for use as qubits is an active area of research in the quest to create a practical scalable quantum computer. [Read more](#)

In an effort to put to good use natural gas (methane) that might otherwise become pollution, LLNL collaborates with start-up company Calysta Energy on a new technology to convert natural gas to liquid fuel.

[Read more](#)

The world's most advanced instrument for directly imaging and analyzing planets orbiting around other stars is pointing skyward and collecting light from distant worlds. For the past decade, LLNL has led a multi-institutional team in the design, engineering, building and optimization of the instrument, called the Gemini Planet Imager.

[Read more](#)

LLNL researchers begin to develop a technique that provides a practical approach for looking into the complex physical and chemical processes that occur

## “ Quotables

*With this technology, we would have a small portable reactor that would convert natural gas to a liquid fuel. The liquid is much more valuable, and transportable, than natural gas in its gaseous form. If the technology works well, it could give the United States a new option for using our large reserves of natural gas.*

– LLNL engineer Joshua Stolaroff, who co-leads the project with chemist Sarah Baker

during fallout formation following a nuclear detonation.

[Read more](#)

A team of LLNL scientists conduct a study of the phase stability of vanadium metal (a hard, silvery gray, ductile and malleable transition metal) and vanadium-chromium alloys at high temperatures and pressures.

[Read more](#)

Using deep sea corals gathered near the Hawaiian Islands, an LLNL scientist, in collaboration with UC Santa Cruz colleagues, determines that a long-term shift in nitrogen content in the Pacific Ocean has occurred as a result of climate change. The researchers look to ancient corals as a timekeeper for the changes in ocean chemistry. [Read more](#)

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**Patrice Turchi will become the 2014 vice president of The Minerals, Metals & Materials Society in February. His research focuses on computational materials science and condensed matter physics. Turchi will ascend to president in 2015.**

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A team of scientists from LLNL, the University of Minnesota and Ohio State University develop a novel geothermal power plant design that leverages unwanted, captured carbon dioxide to boost both output and efficiency compared to conventional geothermal plants. [Read more](#)

## People

Trish Damkroger, LLNL deputy associate director for Computation, is named one of the "People to Watch" in High Performance Computing (HPC) for 2014 by *HPCWire*, the online news service covering supercomputing. Damkroger was the chair for the Supercomputing Conference 2014. [Read more](#)

Patrice Turchi, a Distinguished Member of the Technical Staff at LLNL, will be installed as the 2014 vice president of The Minerals, Metals & Materials Society (TMS) in February. Turchi is the group leader of LLNL's Condensed Matter and Materials Division of the Physical and Life Sciences Directorate. [Read more](#)

Lab employee Alicia Williams develops technology to strengthen America's security and build homes to provide low-income families with affordable housing. Williams is a Habitat for Humanity volunteer who spends her Saturdays laboring on rooftops, where she installs siding, nails in frames and puts in decks to build inexpensive homes in the Bay Area, an expensive region. [Read more](#)

LaDoris "Dot" Harris, director of the Department of Energy's Office of Economic Impact and Diversity,

## “ Quotables

*I was drawn to the organization because I think the cost of good housing is a huge challenge for many working families. Plus, I get to do some work with my hands, which is a refreshing change from spending the day on the computer.*

– Lab mechanical engineer Alicia Williams, who volunteers with Habitat for Humanity

evokes the legacy of Martin Luther King Jr. to encourage LLNL employees to champion diversity.

[Read more](#)

Four engineers from LLNL's Engineering Directorate attend a specialized certificate program at the Massachusetts Institute of Technology to develop high-level systems engineering skills and knowledge.

[Read more](#)

## Operations

Starting in February 2014, the envelopes used to exchange dosimeters have a new look. Instead of one envelope being used both to receive and return your dosimeter, the new system will use two envelopes, with a smaller return envelope being provided inside a larger envelope. [Read more](#)





**The High Repetition-Rate Advanced Petawatt Laser System, or HAPLS, is being designed, developed, assembled and tested at Lawrence Livermore. It will be transferred to the ELI Beamlines facility in 2016, where it will be commissioned for use by the international scientific community.**

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Sandia California will relocate visitor badging operations from Vasco/East Avenue and the General Access Area/Livermore Valley Open Campus badge desk in Bldg. 903, to the kiosk known as Post 17, near the Combustion Research Facility. [Read more](#)

Gov. Jerry Brown announces a state of emergency for drought conditions and asks Californians to voluntarily reduce water use by 20 percent, stating: "We're facing perhaps the worst drought that California has ever seen since records began being kept about 100 years ago." [Read more](#)

The Director's Office reminds all employees of the Lab's existing policies and procedures regarding interactions with federal agency and congressional offices. Acting Director Brett Knapp issues a memo to Laboratory senior members along with a copy of the Lab's policy. [Read more](#)

The Search Committee for the next director of LLNL meets to hear input from former Lab directors, employee focus groups and the Livermore Field Office manager. [Read more](#)

The current LLNL National Security Leadership Fellows return from Texas A&M University where they attended a series of events at the Bush School of Government and Public Service that included a breakfast meeting with Lt. Gen. Brent Scowcroft, USAF (Ret.). [Read more](#)

## “ Quotables

*It is important that we respond to this historic California drought in a way that is significant, protects the Lab's investment in landscaping and establishes a long-term path forward.*

– Mark Martinez,  
principal associate director of O&B

## FEBRUARY 2014

### Science & technology

Using the Lab's supercomputing facilities, a team of researchers simulates the interaction between an intense laser and a solid aluminum target, and discovers an important role of the part of the laser light reflected from the surface. The research is featured on the cover of the Dec. 13, 2013 issue of *Physical Review Letters*. [Read more](#)

LLNL awards a major subcontract to FEMTOLASERS Produktions GmbH (based in Vienna, Austria) as part of the construction of a revolutionary high-power laser system for the European ELI-Beamlines science facility in the Czech Republic. LLNL is constructing the "High Repetition-Rate Advanced Petawatt Laser System" for the ELI-Beamlines facility. [Read more](#)





**This DNA molecule is wrapped twice around a histone octamer, the major structural protein of chromosomes. New studies show they play a role in preserving biological memory when cells divide. Image courtesy of Memorial University of Newfoundland.**

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An LLNL physicist and his colleagues find a new application for the tools and mathematics typically used in physics to help solve problems in biology.

[Read more](#)

Demonstrating the controlled fusing of hydrogen isotopes deuterium and tritium, such that more energy is produced than is used to create the fusions, is one of the stated goals of the National Ignition Facility (NIF). Two papers publish Feb. 5 in *Physical Review Letters* describing the "high-foot" series of experiments begun in spring 2013, which bring NIF closer to achieving this goal. [Read more](#)

An international team of researchers, including scientists from LLNL, demonstrate a new method for studying the structure of proteins that could lead to important advances in biology and other fields. [Read more](#)

At the 58th Annual Biophysical Society Meeting in San Francisco, Geoffrey Feld, an LLNL postdoctoral researcher, describes his work to uncover the secrets of the bacterium *Francisella tularensis*, which causes tularemia, also known as "rabbit fever." [Read more](#)

For the first time, an international team of astrophysicists, including LLNL scientists, unravel how stars blow up in supernovae explosions. [Read more](#)

Though ignition remains the ultimate goal, the milestone of achieving fuel gains greater than 1 is reached at the National Ignition Facility (NIF) for the first time ever on any facility. LLNL scientists detail a series of experiments on NIF that show an order of magnitude improvement in yield performance over

## “ Quotables

*What we've essentially done is produce the first two frames of a molecular movie showing photosystem II, one of the most important biomolecules involved in photosynthesis, in action.*

– LLNL physicist Matthias Frank

past experiments. [Read more](#)

Representatives from government, industry, research institutions and academia in the United States and Brazil meet at the Laboratory to establish a "platform" for collaborative science and technology projects that have the potential to benefit public health and the environment, and stimulate economic development. [Read more](#)

A study of the Pine Island Glacier, a major outlet of the West Antarctic Ice Sheet, could provide insight into the patterns and duration of glacial melt. New research by an international team including researchers from LLNL shows that this same glacier also experienced rapid thinning about 8,000 years ago. [Read more](#)





**From left: Jeff Wisoff and Her Royal Highness Princess Maha Chakri Sirindhorn of Thailand.**

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Volcanic eruptions in the early part of the 21st century have cooled the planet, according to a study led by LLNL. This cooling partly offset the warming produced by greenhouse gases. [Read more](#)

The Lab joins forces with two other national labs to deliver next generation supercomputers able to perform up to 200 peak petaflops (quadrillions of floating point operations per second), about 10 times faster than today's most powerful high performance computing systems. [Read more](#)

A new kind of geothermal power developed by a team of scientists from LLNL could sequester carbon dioxide (CO<sub>2</sub>) while boosting power generation by at least 10 times compared to existing geothermal energy approaches. [Read more](#)

## People

LLNL scientist Steve Payne is selected as a fellow of SPIE, an international professional society for optics and photonics. Payne's research interests include radiation detectors, materials, optics and lasers. [Read more](#)

Dona Crawford, LLNL's associate director for Computation, is selected as a member of the California Council on Science and Technology. [Read more](#)

Adm. Cecil Haney, commander, United States Strategic Command (USSTRATCOM), visits the Laboratory. Haney is responsible for the global command and control of U.S. strategic forces to meet decisive national security

## “ Quotables

*Fostering cooperation is the most efficient way to achieve peace through mutual understanding.*

*—Joao Alziro Herz Da Jornada, president of Brazil's National Institute of Metrology, Quality and Technology, during meeting on US-Brazil collaboration at LLNL*

objectives. [Read more](#)

In honor of Black History Month, the African-American Body of Laboratory Employees and the LLNL Office of Strategic Diversity Programs highlights the accomplishments of several members of the Lab's African American employee population. [Read more](#)

Mark Martinez is named the principal associate director for Operations & Business at LLNL. [Read more](#)

Her Royal Highness Princess Maha Chakri Sirindhorn from the Kingdom of Thailand visits the Laboratory, along with leaders of Thailand's science and technology agencies. [Read more](#)

Reinhart Poprawe, director of Germany's Fraunhofer Institute for Laser Technology, speaks to LLNL employees about advances in laser manufacturing





**Students receive hands-on experience in learning about how rising levels of greenhouse gases in the atmosphere are affecting life in our oceans in the “Greenhouse Gases: From the Tailpipe to the Oceans” workshop.**

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technologies as part of the Director’s Distinguished Lecturer Series. [Read more](#)

## Operations

Lawrence Livermore National Security, the entity that manages LLNL for the Department of Energy, donates \$60,000 to six organizations in support of STEM (science, technology, engineering and math) education. [Read more](#)

The new Livermore Electronic Access Portal (LEAP) software application for clearance and badging services is deployed. [Read more](#)

The Lab travel policy is updated to align with current federal travel regulations and new conference management guidelines. [Read more](#)

More than 300 girls, in grades 6 to 9, have a fun-filled Saturday when they attend the Tri-Valley Expanding Your Horizons Conference on the Los Positas College campus. The annual event is geared to increase interest and foster awareness of careers in math and science. [Read more](#)

LLNL welcomes more than 90 cadets and midshipmen from the U.S. Air Force, Army, Marines, Navy and Merchant Marines for the annual Reserve Officers’ Training Corps Day. The daylong event includes a Lab overview, briefings and tours. [Read more](#)



## Quotables

*By looking at differences between modern DNA and ancient DNA, we may be able to better understand the evolution of diseases and that could help us better understand future disease outbreaks.*

– LLNL biologist Crystal Jaing,  
on the Lab’s microbial detection array  
that detects plague in ancient human remains

## MARCH 2014

## Science & technology

Scientists who study past pandemics, such as the 14th century Black Death that devastated much of Europe, might soon be turning to an innovative biological detection technology for some extra help. The apparent first use of the technology, known as a microarray, for studying pathogens from ancient DNA, is reported by a team of





**LLNL researchers have taken a peak into the lower atmospheric layers of giant gas planets such as Saturn.**

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scientists in the daily online journal, *Scientific Reports*. [Read more](#)

The United Nations proclaims 2014 as the International Year of Crystallography as a way to mark the 400th anniversary of Kepler's observation of symmetry in ice crystals, which sparked the wider study of the role of symmetry in matter. [Read more](#)

Students from Georgetown University's Emergency and Disaster Management program spend a week at Lawrence Livermore to learn how emerging technologies are utilized to detect and predict the effects of terrorist threats. [Read more](#)

A monthly webinar series developed by LLNL's Industrial Partnership Office tries to match the Lab's innovations with commercial partners that see a need for them in their industry. [Read more](#)

Using the VUV Free-Electron Laser (FEL) FLASH at Deutsches Elektronen-Synchrotron (DESY) in Hamburg, Germany, Lawrence Livermore researchers are part of a team that took a sneak peek deep into the lower atmospheric layers of giant gas planets such as Jupiter or Saturn. [Read more](#)

A group of women from LLNL gather to participate in a Google+ Hangout, "Find Your STEM Role Model," and Twitter chat promoting women in STEM careers. The event is hosted by NASA and the Department of Energy, who team up to address the shortage of women and girls in STEM fields. [Read more](#)

## “ Quotables

*Our goal is to understand how these planetary systems have developed. If Beta Pictoris b is warping the disk, that helps us see how the planet-forming disk in our own solar system might have evolved long ago.*

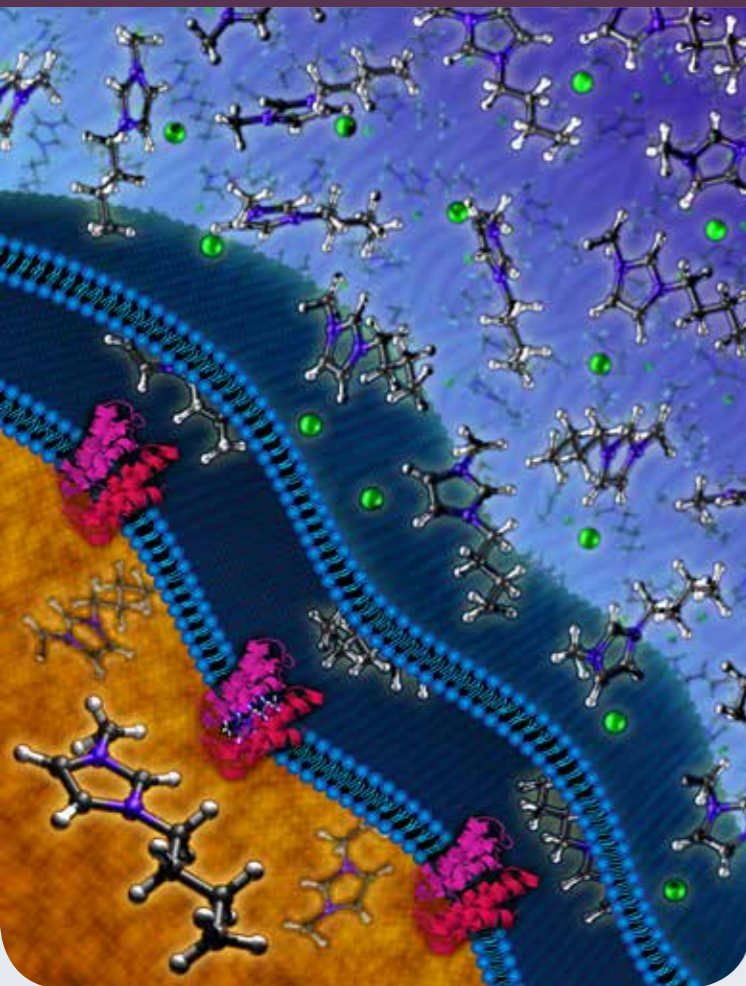
— Lisa Poyneer,  
an engineer who works in astrophysics

Lawrence Livermore scientists model actinide-based alloys, such as spent nuclear fuel, in an effort to predict the impact of evolving fuel chemistry on material performance. [Read more](#)

The Cleantech Open, the world's largest accelerator for clean technology startups, hosts a regional networking event to discuss the challenges and opportunities for investors and entrepreneurs to do business with Lawrence Livermore and Sandia national laboratories. [Read more](#)

Nearly 650 students from 72 schools participate in the Lawrence Livermore National Laboratory Alameda County Science and Engineering Fair held at the Alameda County Fairgrounds in Pleasanton.





**Ionic liquids (molten salts) are important solvents in the microbial production of biofuels, but can inhibit microbial growth. Lawrence Livermore researchers discovered a resistance mechanism in a rainforest soil bacterium that enables *E. coli* to grow and produce biofuel in the presence of ionic liquids at levels that otherwise would be toxic to native strains.**

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More than 480 separate projects are submitted by high school and middle school students from across Alameda County. [Read more](#)

New research by scientists from Lawrence Livermore, in conjunction with the Joint BioEnergy Institute, suggests that a type of bacterial resistance may provide more efficient production of biofuels. [Read more](#)

Two Lawrence Livermore scientists, who have studied the plutonium-gallium (Pu-Ga) alloy for more than a decade, confirm and explain the magnetic spin of the alloy by applying first-principle electronic structure calculations. [Read more](#)

## People

Congresswoman Zoe Lofgren and members of her district office staff visit Lawrence Livermore accompanied by students and faculty from the Franklin-McKinley School District's College Connection Academy middle school. [Read more](#)

UC President Janet Napolitano pledges to expand university collaboration with the Laboratory in a Director's Distinguished Lecturer Series (DDLS) address entitled "The Stars We Ignite." Napolitano says the University of California was built on the idea of "igniting stars" through students, faculty and research. [Read more](#)

Bill Goldstein is named the director of Lawrence Livermore National Laboratory. [Read more](#)



## Quotables

*The work highlights the interdisciplinary nature of modern molecular biology, in particular, how the tools and models from mathematics and physics can help clarify problems in biology.*

– LLNL physicist Ken Kim

National security expert Richard Danzig begins his Director's Distinguished Lecture Series presentation on cyber security by explaining the title he chose for his talk — "Surviving on a Diet of Poisoned Fruit." [Read more](#)

In celebration of Women's History Month, the Office of Economic Impact and Diversity at the Department of Energy (DOE), highlights the contributions of talented and dedicated employees from across the DOE complex in an online feature called "Women @ Energy: Innovators in Science, Technology, Engineering and Mathematics." Out of 170 profiles on the site, 47 of the DOE women are employees of Lawrence Livermore. [Read more](#)





**Rows of wind turbines line the hills east of the Livermore Lab, a sight that has become more common across the country in recent years. Wind power saw the highest energy gains from 2011 through 2013, according to the most recent U.S. energy flow charts released by Lawrence Livermore National Laboratory.**

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Lawrence Livermore welcomes the California Utilities Diversity Council to the Lab to hold its monthly meeting. [Read more](#)

## Operations

The Lab's Ombud Program adds 39 new ombuds across the Laboratory in 2013, bringing the current number of ombuds to 81. Since 1972, the peer program that began in the former Chemistry and Materials Science Directorate has been providing Lab employees with a mechanism for finding solutions to work-related issues and concerns, which can be discussed in an informal, neutral and confidential manner. [Read more](#)

LLNL celebrates the month of March as Women's History Month. The Lab has a long tradition of recognizing Women's History Month by showcasing and promoting women and their contributions. [Read more](#)

The Unclassified Syncplicity File Sync and Sharing Service, managed by the ITSD Collaboration Services Group, offer licenses for customers that would like to take advantage of this high-availability, on-premise cloud data storage environment. [Read more](#)

The @Messaging service replaces the well-known @pager.llnl.gov (email-to-pager) service with functionality that provides email-to-messaging capabilities. [Read more](#)

“

## Quotables

*Gas plants are cheaper than coal plants. Natural gas is going to be a winner into the foreseeable future.*

– A.J. Simon,  
on Americans' energy use

## APRIL 2014

## Science & technology

Americans use more renewable, fossil and nuclear energy in 2013, according to the most recent energy flow charts released by Lawrence Livermore National Laboratory. [Read more](#)

Lawrence Livermore scientists find that carbon nanotubes can help with tissue healing and repair. [Read more](#)

Researchers at LLNL create a technique called light-directed electrophoretic deposition, which uses photoconductive electrodes and DC electrical fields to dynamically pattern surface material. [Read more](#)





**Former LLNL researcher Dylan Rood performs geology field work in eastern Greenland. Rood took dirt samples and analyzed them to determine that an ancient landscape millions of years old is preserved underneath the Greenland Ice Sheet.**

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The Department of Energy's Office of Science and the National Nuclear Security Administration issue a request for proposals to further develop "extreme scale" supercomputer technology. [Read more](#)

Mark Zelinka, a researcher in the Program for Climate Model Diagnosis and Intercomparison, delves into research on how climate change affects cloud properties and vice versa. [Read more](#)

An international team of researchers, including a former scientist from LLNL, discover that ancient dirt in Greenland was cryogenically frozen for millions of years under nearly two miles of ice. [Read more](#)

Using an ultrafast laser system, a group in Physical and Life Sciences subject iron to extremely rapid dynamic compression and show that the transition from one crystal structure to another can take place in less than 100 trillionths of a second after the compression begins. [Read more](#)

LLNL enters into a technology development partnership with FATHOM, a company specializing in 3D printing and additive manufacturing. The collaboration combines FATHOM's advanced industry knowledge with LLNL's unique research and development capabilities and broad domain expertise in applied science and engineering to commercialize new additive manufacturing technologies. [Read more](#)

## People

Former LLNL scientists Lloyd Hackel and Brent Dane find a way to improve laser peening and

## “ Quotables

*At Lawrence Livermore, we are not only applying additive manufacturing to our core mission of national security, but seeking ways to accelerate the process and create new materials. We look forward to collaborating with FATHOM to explore new advances in this area.*

*– Diane Chinn, division leader of Materials Engineering, on agreement with FATHOM*

commercialize it, enabling the aviation industry to manufacture wings and engines blades that are more fuel efficient and fatigue resistant. This technology saves the industry hundreds of millions of dollars and improves passenger safety. [Read more](#)

Daniel Tortorelli, an engineering professor at the University of Illinois Urbana-Champaign, completes a nine-week sabbatical at Lawrence Livermore, where his research on structural optimization is put to use in the Engineering Directorate's additive manufacturing lab. [Read more](#)

Carol Meyers, who has loved mathematics since she was young, discusses how it has helped her succeed as a researcher in Lawrence Livermore's Computational Engineering Division. [Read more](#)





**During her visit, Sen. Dianne Feinstein, with Director Bill Goldstein (center), enjoy a presentation by Chris Spadaccini on the Lab's work in additive manufacturing.**

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Kimberly Budil is appointed by the University of California (UC) as vice president for Laboratory Management in the UC Office of the President and as an executive committee governor on the LANS and LLNS Boards of Governors. [Read more](#)

Antioch Mayor Wade Harper; Gary Darling, the general manager of the Delta Diablo Sanitation District; and Steve Duran, the Antioch city manager, visit the Lab for briefings and tours. [Read more](#)

State legislators affiliated with a group called the New Democrats Caucus visit LLNL. [Read more](#)

The Republic of Korea's Consul General in San Francisco Dongman Han visits the Lab. [Read more](#)

U.S. Sen. Dianne Feinstein visits the Laboratory to meet with Director Bill Goldstein and tour the Additive Manufacturing Laboratory. [Read more](#)

DOE Assistant Secretary David Danielson visits the Laboratory. [Read more](#)

Adam Schwartz, of Physics and Life Sciences, is named director of the Department of Energy's Ames Laboratory. [Read more](#)

Lt. Gen. Frank Klotz, United States Air Force (Ret.), is confirmed by the Senate as the Department of Energy's under secretary for nuclear security and

## “ Quotables

*It is an honor for us to help support the community where we live and work. I know the recipients appreciate our support and the impact of the services they provide is important for all of us.*

– Bill Goldstein, LLNS president and LLNL director

administrator for the National Nuclear Security Administration. [Read more](#)

## Operations

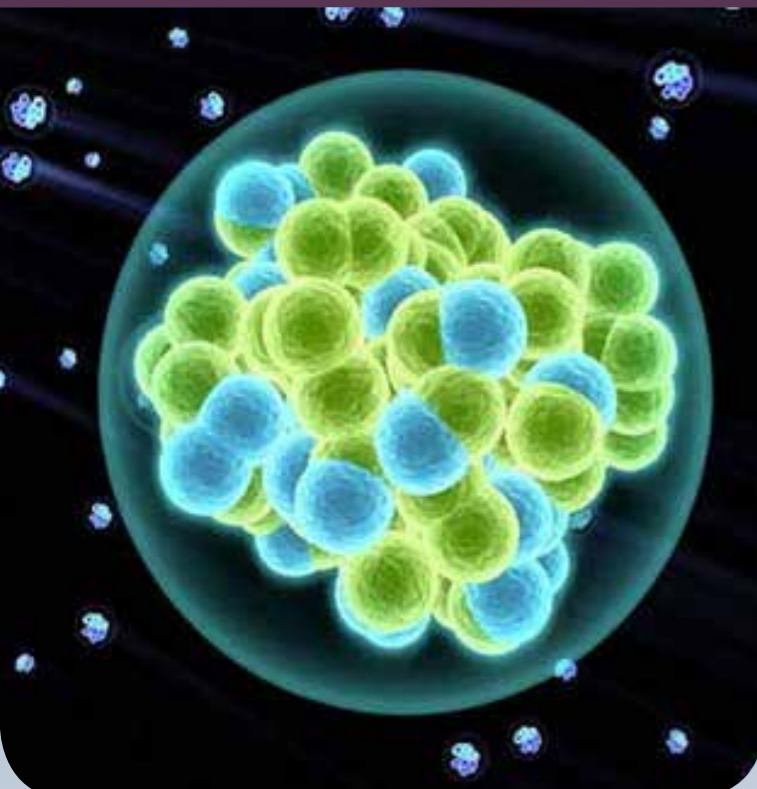
The Laboratory launches a pilot project to reduce potable water use by using treated groundwater to cool equipment and research facilities at the main site. [Read more](#)

The Lab launches a plug-in electric vehicle charging program for employees. [Read more](#)

Livermore Information Technology bids farewell to BlackBerry service. There are now fewer than 100 BlackBerry devices in use at LLNL. [Read more](#)

The Lawrence Livermore Laboratory Women's Association (LLLWA) Women in Science and Engineering (WISE) Group hosts Maya Gokhale and





**Element 117, first discovered by Lawrence Livermore researchers and Russian collaborators, is reproduced by an international consortium. The International Union of Pure and Applied Chemistry (IUPAC) must accept the confirmation before the element is named.**

## NOTE

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Juliana Hsu as speakers at its monthly brown bag lunch. This is one of the activities highlighted by the LLLWA in March honoring Women's History Month.

[Read more](#)

The Office of Federal Contract Compliance Programs issues new regulations for federal contractors regarding employment of individuals with disabilities and veterans. [Read more](#)

The West Cafe grand opening and celebration takes place. [Read more](#)

## MAY 2014

### Science & technology

Element 117, first discovered by Lawrence Livermore scientists and international collaborators in 2010, is one step closer to being named. The existence of element 117 and its decay chain to elements 115 and 113 are confirmed by a second international team led by scientists at GSI Helmholtz Centre for Heavy Ion Research, an accelerator laboratory located in Darmstadt, Germany.

[Read more](#)

Catalyst, a first-of-a-kind supercomputer, is made available to industry collaborators to test big data technologies, architectures and applications.

[Read more](#)

The U.S. Global Change Research Program issues the National Climate Assessment report explaining how California will have to deal with declining water

## “ Quotables

*I've always loved numbers. I like to think logically. Higher math allows me to formulate logical arguments and solve real-world problems by setting up equations.*

– Carol Meyers on why she loves math

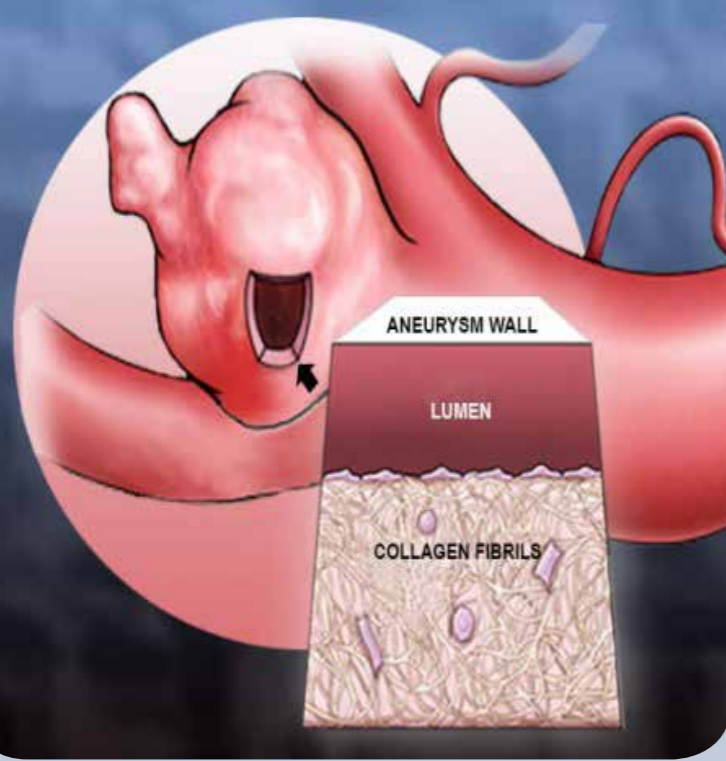
supplies, reduced agricultural yields, health impacts in cities due to heat and flooding and erosion in coastal areas. [Read more](#)

Using one of the world's largest telescopes, a Lawrence Livermore team and international collaborators track the orbit of a planet at least four times the size of Jupiter. The scientists identify the orbit of the exoplanet, Beta Pictoris b, which sits 63 light years from our solar system, by using the Gemini Planet Imager's next-generation, high-contrast adaptive optics system. [Read more](#)

The High Explosives Applications Facility celebrates a milestone: 25 years as a center of excellence for the research, development, synthesis, formulation and characterization of explosives. [Read more](#)

LLNL, the city of Livermore and the Livermore Valley Joint Unified School District host a day of events, both online and downtown, to celebrate the first anniversary of Livermorium Day. As part of the celebration, LLNL hosts its first ever Google+ Hangout. [Read more](#)





**A cerebral aneurysm is a blood-filled bulge formed in response to a weakness in the wall at branching brain arteries. If the bulge bursts, the person can undergo a brain hemorrhage, which is a subtype of stroke and a life-threatening condition.**

## NOTE

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The 18th annual Signal and Image Sciences Workshop, a signature event of the Engineering Directorate's Center for Advanced Signal and Image Sciences (CASIS), attracts more than 100 attendees. The workshop showcases R&D in signal and image sciences at Lawrence Livermore and Sandia national laboratories as well as local academic institutions and industries. [Read more](#)

New research by an international consortium, including a researcher from LLNL, helps physicians better understand the chronological development of a brain aneurysm and identify patients more likely to suffer from an aneurysm. [Read more](#)

A Lawrence Livermore research team led by electrical engineer Rebecca Nikolic demonstrates a miniaturized, solid-state detection system that fulfills the need for a far more efficient and compact neutron detector than existing devices. [Read more](#)

LLNL publishes its first electronic book, or e-book, titled "Strategic Latency and World Power: How Technology Is Changing Our Concepts of Security." The 139-page book is published by the Lab through its Center for Global Security Research (CGSR). [Read more](#)

## People

The Office of the Chief Information Officer and Livermore Information Technology hosts 60 students and teachers as part of the Department of Energy's IT Job Shadow Day to enlighten local high school

## “ Quotables

*Currently, there is no effective treatment for memory loss resulting from conditions like TBI (traumatic brain injury). This is a tremendous opportunity from DARPA to leverage Lawrence Livermore's advanced capabilities to develop cutting-edge medical devices that will change the health care landscape.*

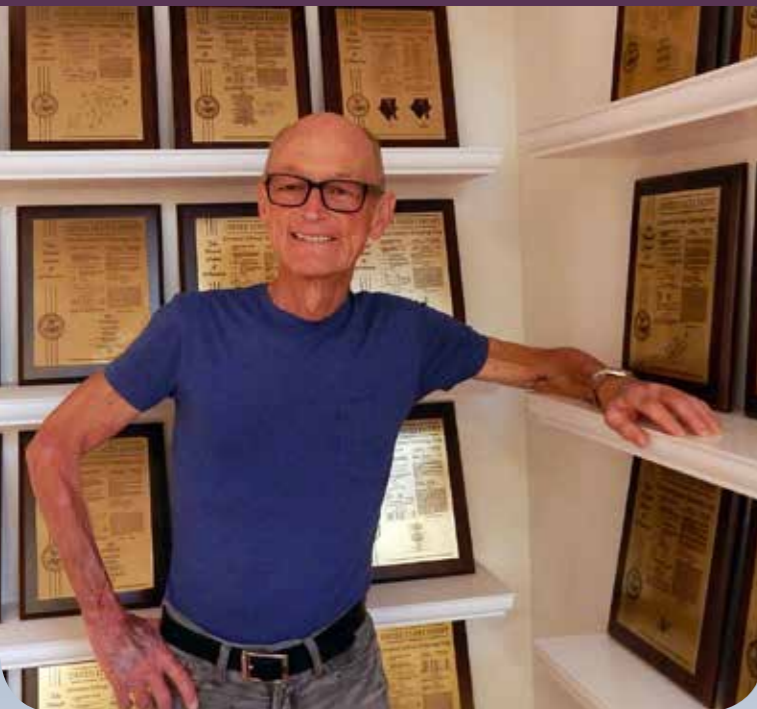
– LLNL's project leader Satinderpall Pannu, director of the LLNL's Center for Bioengineering

students about summer internships as well as careers in information technology at LLNL and other DOE facilities. [Read more](#)

UC Merced students from the university's STEM Resource Center visit LLNL. The purpose of the visit is for LLNL to strengthen its collaboration with the campus to provide students with internship and career opportunities. [Read more](#)

John Hallquist becomes one of the Lab's most successful entrepreneurs as the CEO of a multinational





**John Hallquist invented a computer code called DYNA3D, which has helped him become one of the Lab's most successful entrepreneurs as the CEO of a multinational corporation.**

## NOTE

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corporation for his invention of a small computer code designed to analyze the structures of bombs dropped by U.S. Air Force jets. [Read more](#)

LaDorris "Dot" Harris, director of the Office of Economic Impact and Diversity at the Department of Energy, is honored at the EmpowHer Institute's Girls to Greatness Luncheon, "Dream Big, Reach Higher," specifically because of her "incredible passion and commitment to bringing more awareness and engagement for women and girls in the area of science, technology, engineering and math (STEM)." [Read more](#)

LLNL celebrates Asian Pacific American Heritage Month during the month of May. The Asian Pacific American Council members sponsor a festival, speakers and activities for employees focusing on the theme, "Diverse Leadership + Expanding Opportunity: An Imperative for America." [Read more](#)

Ghaleb Abdulla from Computation serves as one of the guest editors of *Optical Engineering* in a special section entitled, "Optical and Hybrid Imaging and Processing (OHIP) for Big Data Problems." [Read more](#)

Gov. Jerry Brown appoints Steve Bohlen, LLNL program director for Nuclear and Domestic Security, as senior adviser for the State of California Initiatives for the Division of Oil, Gas and Geothermal Resources. [Read more](#)

Several Lab employees are elected or re-elected to the board of directors and supervisory committee of the UNCLE Credit Union. [Read more](#)



## Quotables

*It's very rewarding to see small businesses invest in commercializing Lab national security technologies.*

— Catherine Elizondo,  
IPO business development executive

The Lawrence Livermore Laboratory Women's Association (LLLWA) hosts the semiannual used book sale to benefit the LLLWA scholarship program and other LLLWA activities. [Read more](#)

## Operations

Lawrence Livermore National Security, LLC kicks off its annual Community Gift Program for 2014 to benefit local and surrounding area nonprofit organizations. [Read more](#)

The Environmental Restoration Department (ERD) conducts drilling operations at the Livermore site campus. The drilling is part of the ERD's ongoing efforts to clean up groundwater and soil contaminated during the early days of the Laboratory and the World War II Naval Air Station era. [Read more](#)





**The Lab turned to water-wise plants staged for planting at Bldg. 361 to address the ongoing state drought.**

## NOTE

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LLNL develops a long-term strategy to reduce irrigation sitewide by 13 million gallons. In light of the statewide drought emergency declared by Gov. Brown, the Lab commits to water conservation through its Environmental Management System with one area of focus to reduce water use for landscape irrigation, which accounts for 25 percent of the Lab's water use. [Read more](#)

The Lab begins the annual controlled burn at Site 300 [Read more](#)

The Laboratory kicks off the farmers market (Fresh@ the Labs) at the Sandia Open Campus. The farmers market is held the fourth Tuesday of the month from May through October. [Read more](#)

LLNL Director Bill Goldstein discusses his goals for the Laboratory at an all-hands meeting. [Read more](#)

The Lawrence Livermore Laboratory Armed Forces and Veterans Association holds a special ceremony in observance of Memorial Day. [Read more](#)

Livermore Information Technology introduces a new service that allows you to reset your Active Directory password (the one you use to log into your computer) if you've forgotten it, without having to call the 4-Help Service Desk. [Read more](#)

## “ Quotables

*I miss the adventure of starting out in the morning on the bike and seeing parts of the country for the first time. Each state was really beautiful in its own way, and it was exciting to experience the countryside at 10 mph.*

– Tom Ramos about his cross-country bicycle trip with his wife Rose to attend his 45th reunion at the U.S. Military Academy at West Point

## JUNE 2014

### Science & technology

An international team including researchers from Lawrence Livermore devises a method of studying supernova explosions in the laboratory instead of observing them in space. [Read more](#)

LLNL's additive manufacturing capabilities, including hardware expertise, materials science R&D and high-





**Lab scientists Nicholas Be (left) and Jonathan Allen examine the Lawrence Livermore Microbial Detection Array, which can be used in the treatment of wounded soldiers.**

## NOTE

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performance computing, are highlighted at a Silicon Valley forum held at the High Performance Computing Innovation Center at the Livermore Valley Open Campus. [Read more](#)

Lawrence Livermore engineering technical associate Pam Danforth applies 30 years of laser experience to bring new life to the University of California's Lick Observatory Laser Guide Star. [Read more](#)

LLNL receives \$5.6 million from the Department of Defense's Defense Advanced Research Projects Agency (DARPA) to develop an implantable neural interface with the ability to record and stimulate neurons within the brain for treating neuropsychiatric disorders. [Read more](#)

Laboratory researchers develop a new and more efficient approach to a challenging problem in additive manufacturing — using selective laser melting, namely, the selection of appropriate process parameters that result in parts with desired properties. [Read more](#)

Laboratory scientists develop a biological detection technology to detect bacterial pathogens in the wounds of U.S. soldiers that were previously missed by other technologies. [Read more](#)

LLNL and Massachusetts Institute of Technology researchers partner to develop a material with the same weight and density as aerogel — a material so light it's called 'frozen smoke' — but with 10,000 times more stiffness using additive micro-manufacturing processes. [Read more](#)

## “ Quotables

*The culture-based methods currently used to measure infection often do not detect bacteria that are difficult to grow in the lab. Better detection methods for microbes that impact the healing process could help surgeons make more informed predictions and decisions for improving patient care.*

— Nicholas Be, an LLNL biomedical scientist and postdoc

A \$1.2 million grant from the Department of Energy's Office of Energy Efficiency and Renewable Energy is given to Lawrence Livermore scientists to work on a project that will use particles considerably smaller than the size of a human hair to improve the storage capacity of hydrogen-powered vehicles. [Read more](#)

Lawrence Livermore scientists define, for the first time, a set of theoretical boundaries for the absorption of petawatt laser light. The absorption of petawatt ( $10^{15}$  watts) laser light by solid matter is a crucial problem that has been the subject of





**Lawrence Livermore physicist Hui Chen sets up targets for an experiment using petawatt laser technology at the Jupiter Laser Facility.**

## NOTE

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theoretical and experimental study for more than two decades. [Read more](#)

Lawrence Livermore researchers conduct radioisotope analysis at the Center for Accelerator Mass Spectrometry to date confiscated ivory to determine if it is from elephants slaughtered before or after the 1990 global ban on international ivory trade. [Read more](#)

Lawrence Livermore researchers aim to explain why sequestered CO<sub>2</sub> was moving surprisingly quickly through rock formations beneath the In Salah Central Processing Facility, a natural-gas extraction site in Algeria. [Read more](#)

Researchers at LLNL and Stanford University work on a new desalination method using porous carbon aerogel electrodes. [Read more](#)

LLNL researcher Stavros Demos develops the Vein-Eye, a non-contact near-infrared camera that provides enhanced visualization of veins when drawing blood or placing IVs in a patient's arm or hand, using intellectual property developed at Lawrence Livermore in collaboration with the City University of New York and Near Infrared Imaging Inc. [Read more](#)

Lawrence Livermore selects Ball Aerospace & Technologies Corp. to build the optics and support structure for the camera on the Large Synoptic Survey

## “ Quotables

*This is the largest ground-based telescope being built with U.S. federal funding in this decade. It's the No. 1 ranked project coming out of the decadal survey and now it's moving forward. It will be the world's premier astronomical survey facility for the next decade and beyond.*

—Scot Olivier,  
Livermore's lead on the Large Synoptic Survey Telescope

Telescope (LSST), which will sit atop the 8,800 foot-tall Cerro Pachon mountaintop in Chile. [Read more](#)

## People

Peter J.K. “Jeff” Wisoff is named the principal associate director for the Lab's National Ignition Facility & Photon Science directorate. [Read more](#)





**Jeff Wisoff is named the principal associate director for the National Ignition Facility (NIF) and Photon Science Directorate at Lawrence Livermore National Laboratory.**

The sixth class of LLNL's National Security Leadership Program is presented with certificates in National Security Affairs by Lab Director Bill Goldstein.

[Read more](#)

The African-American Body of Laboratory Employees (ABLE) and the Office of Strategic Diversity Programs hosts a barbecue and networking event in celebration of Juneteenth, also known as "Freedom Day" or "Emancipation Day," to raise funds for ABLE's scholarship program for students in the local community. [Read more](#)

Maha ElGenaidi, founder and first president of the Islamic Networks Group (ING), gives an educational cultural literacy presentation on Muslim traditions, sponsored by the Asian-Pacific American Council and the Office of Strategic Diversity Programs. [Read more](#)

## Operations

The Laboratory revises its smoking policy to prohibit the use of electronic cigarettes (e-cigarettes) in indoor work areas and vehicles. The basis for this revision is that e-cigarettes pose health risks that are not fully characterized, and there is a second-hand exposure risk to non-users. [Read more](#)

The Alameda County Fire Department personnel successfully complete the annual controlled burn at Site 300, encompassing approximately 1,537 acres of Site 300 property. The controlled burn involves careful burning along the site fenceline and parts of the

## “ Quotables

*If you are a student in an underserved community, you do not have many opportunities during the summer. Studies have shown that these kids tend to slide and fall behind.*

*—Monika Witte on the importance of the Bay Area Aim High program, which supports underserved children*

interior area to help prevent wildfires from spreading to or from the site. [Read more](#)

The Benefits Office offers a series of workshops to provide information intended to increase employees' awareness of programs available to enhance their future financial security. [Read more](#)

Livermore Information Technology announces a new procedure for clearing LLNL-owned or personally owned devices participating in the LLNL BYOD (bring your own device) program that have been contaminated. This new procedures allows for the device to be wiped instead of destroyed. [Read more](#)

## NOTE

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**Intrinsic Use Control uses the weapon's fluctuating radiation fields to create use control numbers, known only to the weapon, which would be able to protect the weapon and its components from unauthorized use.**

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The Public Affairs Office kicks off summer sessions of the popular Fun With Science Program. [Read more](#)

The Laboratory informs employees about its participation in the Deaf and Disabled Telecommunications Program (DDTP). DDTP is a public service mandated by the California State Legislature and administered by the California Public Utilities Commission (CPUC). This service is typically used by those who are hearing or speech impaired. [Read more](#)

The Laboratory updates Lock-out/Tag-out (LOTO) procedures, instituting new procedures and training requirements to ensure LOTO is done safely. [Read more](#)

The Laboratory hosts the annual Environment, Safety, Security and Health Fair, sponsored this year by WCI, the Director's Office, SHRM Work-Life Programs and LLESA. [Read more](#)

## JULY

### Science & technology

While the rest of their peers are on summer vacation, some teachers elect to continue learning through the summer months during the LLNL Teacher Research Academy, a summer-long series of professional development workshops for teachers that feature content developed from LLNL research in areas such as biotechnology, computational modeling and fusion and astrophysics. [Read more](#)

Measuring the extreme pressures and temperatures of

## “ Quotables

*Using the random process of nuclear radioactive decay is the gold standard of random number generators. You'd have a better chance of winning both Mega Millions and Powerball on the same day than getting control of IUC (intrinsic use controlled)-protected components.*

– Mark Hart on his work in nuclear weapons surety

hydrothermal systems in the Earth's crust is no easy feat. However, LLNL scientists make a new tool that allows them to probe pressures up to 20 kbar (20,000 Earth atmospheres of pressure). [Read more](#)

The Department of Defense's Defense Advanced Research Projects Agency awards LLNL up to \$2.5 million to develop an implantable neural device with the ability to record and stimulate neurons within the brain to help restore memory. [Read more](#)

A collaborative study between LLNL and the U.S. Army Corps of Engineers' Engineer Research and Development Center shows design standards for dams are effective for earthquakes. [Read more](#)





**Lawrence Livermore engineer Vanessa Tolosa holds up a flexible electrode array that gets implanted into animals to record brain signals, as part of a project that may help restore memory.**

## NOTE

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An international team of scientists, including researchers from LLNL, catches a central step of photosynthesis in action for the first time using the world's most powerful X-ray flashlight. [Read more](#)

Livermore scientists develop an electrode array technology for monitoring brain activity as part of a collaborative research project with UC San Francisco to better understand how the neural circuitry of the brain works during memory retrieval. [Read more](#)

Lawrence Livermore scientists for the first time experimentally re-create the conditions that exist deep inside giant planets, such as Jupiter, Uranus and many of the planets recently discovered outside our solar system. [Read more](#)

New research indicates that lithium-ion batteries could benefit from a theoretical model created at Lawrence Livermore National Laboratory and Rice University. [Read more](#)

Eight teams of cyber defenders from Lawrence Livermore, Sandia and Charleston High School gather to solve a series of challenges related to protecting a power plant supervisory control and data acquisition system. [Read more](#)

LLNL postdoctoral researchers and Livermore graduate scholars present their research at the seventh annual Institutional Poster Symposium. [Read more](#)

## “ Quotables

*Though neuroscientists have uncovered a lot about the brain in the last couple of decades, there is a pressing need for new technologies that will enable us to study more brain regions over longer periods of time.*

—Vanessa Tolosa,  
an engineer at LLNL's Center for Bioengineering  
who is a principal investigator on the project

## People

Joanna Albala is named the new education outreach manager within the University Relations and Science Education Program, where she will manage the Teacher Research Academies, Science on Saturday program and other STEM outreach. [Read more](#)

LLNL sponsors a four-week summer internship for Sam Weinstein, a student from Orion Academy, which





**Jeremy Taylor, an Army staff sergeant who served in Afghanistan, spends his summer learning how to manufacture cooling arms and other custom-engineered parts for the National Ignition Facility (NIF).**

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provides a college-preparatory program for secondary students whose academic success is compromised by a neurocognitive disability such as Asperger's syndrome or NLD (Non-verbal Learning Disorder).

[Read more](#)

Madelyn Creedon is confirmed by the Senate as the Department of Energy's principal deputy administrator for NNSA. [Read more](#)

Lt. Gen. Frank Klotz, DOE undersecretary for nuclear security and NNSA administrator, visits the Laboratory and gives an all-hands talk to employees. [Read more](#)

Stephen Johnson, a visiting fellow at Cranfield University, visits the Lab to speak about "Forensic Science at Cranfield University." [Read more](#)

## Operations

Lawrence Livermore National Security, LLC puts out a call for applications for its annual Community Gift Program to benefit local and surrounding area nonprofit organizations. [Read more](#)

LLNL, Alameda County Workforce Investment Board (WIB) and Las Positas College (LPC) establish a 24-month academic program to provide technical education and hands-on training for veterans. [Read more](#)

The Innovation forum explores opportunities for medical technology. [Read more](#)

## “ Quotables

*This program is a win-win situation for both the veterans who have passionately served our nation and employers such as Lawrence Livermore who want to hire vets and need a pipeline of qualified technicians.*

— Beth McCormick,  
an LLNL Strategic Human Resources Management manager

Computation welcomes its third-largest scholar program ever, hosting 131 students and faculty — 76 graduate students, 49 undergraduates, one high school student and five faculty — from 89 universities and eight countries. [Read more](#)

Lawrence Livermore puts out a call to employees for volunteers to work with local STEM organizations. [Read more](#)

Employees brave the heat and join Director Bill Goldstein and the senior management team for a summertime ice cream social. [Read more](#)





**Employees brave the heat and attend a summertime ice cream social.**

## NOTE

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The Lawrence Livermore Laboratory Women's Association sponsors an interactive networking workshop, WorkLife@LLNL. [Read more](#)

Livermore Information Technology announces a new LLNL "green" wireless network, providing a hot-spot type of environment allowing both guests and employees internet access. [Read more](#)

LLNL joins Bechtel BNI and Los Alamos National Laboratory for the Cyber Career Development Program, aiming to train a new class of cyber defense professionals to protect the nation's critical digital infrastructure. [Read more](#)

Global Security and Physical and Life Sciences host an External Review Committee to review the Laboratory's chemical and biological sciences and security programs. [Read more](#)

LLNL hosts a workshop on "Understanding New Challenges to Strategic Stability." Brad Roberts, who recently served as deputy assistant secretary of the Defense for Nuclear and Missile Defense Policy, leads the meeting jointly convened by Stanford University's Center for International Security and Cooperation, LLNL and Los Alamos National Laboratory. [Read more](#)

## AUGUST

### Science & technology

The University Relations and Science Education Program at LLNL hosts two summer workshops at

## “ Quotables

*... My hope is that by educating employees and gaining a better understanding of each other, we can celebrate our diverse backgrounds and foster mutual respect and inclusivity.*

*– Tony Baylis, director of the Office of Strategic Diversity Programs*

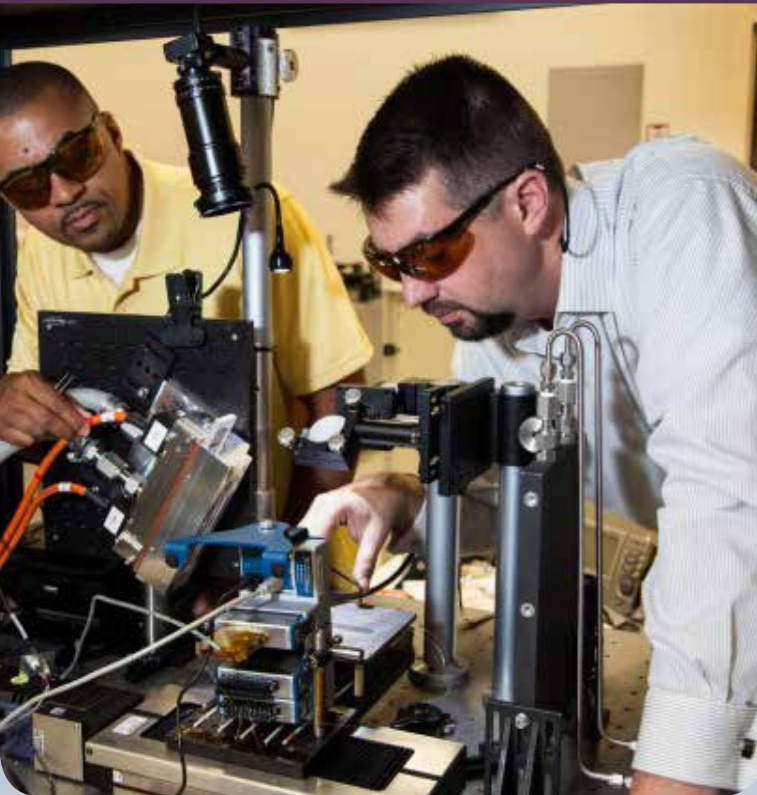
the Edward Teller Education Center for high school students and their teachers to delve into science through hands-on learning. [Read more](#)

Cmdr. Brad Baker, assistant professor of mechanical engineering at the United States Naval Academy, spends six weeks as a visiting scientist at LLNL, conducting research into diode laser-assisted friction stir welding. [Read more](#)

Lawrence Livermore researchers create a material that is 10 times stronger and stiffer than traditional aerogels of the same density. [Read more](#)

Eight national laboratories, including Lawrence Livermore, combine forces with the National Center





**Ibo Matthews (left) and Brad Baker study a plate of HY-80 steel for laser-assisted friction stir welding. Friction stir welding is a solid-state joining process used to fuse two metal surfaces.**

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for Atmospheric Research, four academic institutions and one private-sector company for the Accelerated Climate Modeling for Energy, designed to accelerate the development and application of fully coupled, state-of-the-science Earth system models for scientific and energy applications. [Read more](#)

Livermore researchers create engineered energy absorbing material. [Read more](#)

The National Science Foundation agrees to support the Association of Universities for Research in Astronomy to manage the construction of the Large Synoptic Survey Telescope. Lawrence Livermore has played a pivotal role in the LSST project over the last decade. [Read more](#)

Using a calculation originally proposed seven years ago to be performed on a petaflop computer, Lawrence Livermore researchers compute conditions that simulate the birth of the universe. [Read more](#)

LLNL synchs up with ELI Beamlines on its timing system. [Read more](#)

Two Lawrence Livermore scientists provide training and advanced technology for detecting foodborne pathogens to researchers in the Republic of Tajikistan. [Read more](#)

## People

A record 58 employees and students participate in Computation's summer hackathon, held at the High

## “ Quotables

*Laser peening is a great technology with a bright future that's affecting people's daily lives. Chances are that next time people fly on an airplane, it will be made from parts strengthened by laser peening.*

– Brent Dane, MIC's director of laser technology.

Performance Computing Innovation Center. [Read more](#)

Rebecca Dylla-Spears, a chemical engineer in the Physics and Life Sciences Directorate, is selected for a national engineering symposium. [Read more](#)

STEM women are part of a tri-lab team breaking boundaries. [Read more](#)

Jeannette Elizabeth Brown, an organic chemist, historian, author and mentor, visits the Lab and addresses employees with a talk entitled, "Chemistry Past, Present and Future: From Pioneer Times to Tomorrow's Breakthroughs." [Read more](#)





**Owen Alford, an engineering associate in the National Security Engineering Division, is passionate about two things: engineering and his faith. When he had the opportunity 15 years ago to share his faith with prisoners he believed could benefit from it, he embraced the challenge.**

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Mike Dunne, former director of Laser Fusion Energy in the NIF & Photon Science Directorate, gives the opening plenary session at SPIE Optics + Photonics to a standing-room-only audience with more than 650 attendees. [Read more](#)

Lt. Gen. Patrick O'Reilly, U.S. Army (retired) and senior fellow at the Atlantic Council, visits the Lab and speaks about "Future Defense Technology Challenges and Opportunities: the Missile Defense Example." [Read more](#)

More than 200 students and faculty participate in the 2014 Student Poster Symposium sponsored by Strategic Human Resources Management and the Institutional Education Committee. [Read more](#)

Lab mechanical designer Owen Alford provides insight into his double life as a researcher and minister at a state prison. [Read more](#)

Two high school physics teachers from Thailand complete levels one and two of the Laboratory's Teacher Research Academy in Fusion and Astrophysics. [Read more](#)

LLNL's Seaborg Institute welcomes a record 18 students this year to its hands-on nuclear forensics and environmental radiochemistry summer program. [Read more](#)

Distinguished author and lecturer Jonna Doolittle Hoppes visits the Laboratory to tell the story of

## “ Quotables

*After the hurricane we spent a month without electricity and water. I started reading about Isaac Newton and Albert Einstein in an encyclopedia of science. I had no exposure to science before that and I was fascinated. I started buying and reading books about science and I became obsessed with math as well. I knew then that I would devote my life to science.*

*—Physicist Miguel Morales, 2014 winner of a Presidential Early Career Award for Science and Engineering*

her grandfather, U.S. Air Force Gen. James Harold "Jimmy" Doolittle (1896-1993). [Read more](#)

## Operations

Featuring a proximity to an environment more conducive to innovation, i-GATE officially opens the





**Regina Soufli, Marie-Anne Descalle, postdoc Nicolai Brejnholt and LLNL colleagues and collaborators demonstrate that very short-period multilayer coatings deposited on super-polished substrates operate efficiently as reflective optics at photon energies.**

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doors to its new location in the heart of downtown Livermore. [Read more](#)

Lawrence Livermore signs a Strategic Partnership Agreement with the San Francisco Minority Business Development Agency Business Center that enables both sides to tap into resources to help develop minority-owned businesses. [Read more](#)

The Operations & Business Principal Directorate holds a barbecue with more than 700 employees attending. [Read more](#)

LLNL begins implementation of the Department of Homeland Security's REAL ID Act governing the forms of identification required for access to the site. [Read more](#)

The Security Organization dedicates its fitness facility in memory of Joe Segrest, who died in a biking accident. [Read more](#)

The annual Hiroshima Day protest at the Laboratory draws about 100 people and results in 30 arrests. [Read more](#)

More than 100 Laboratory students and faculty attend the annual "Meet the Director" presentation and reception. This annual event serves as an opportunity to learn more about the Laboratory, get acquainted with LLNL Director Bill Goldstein, ask questions and network with others. [Read more](#)

## “ Quotables

*The guys I ride with like to hammer me. They make me suffer. But the truth is that I kind of enjoy it.*

– Stan Terusaki of LLNL's Cycletrons on noontime rides

## SEPTEMBER

### Science & technology

LLNL postdoc Nicolai Brejnholt and colleagues from LLNL, the Technical University of Denmark and the European Synchrotron Radiation Facility demonstrate for the first time that very short-period multilayer coatings deposited on super-polished substrates operate efficiently as reflective optics above 0.6 milli-electron volts, nearly a factor of two higher than the previous record at 384 kilo-electron volts, set last year by this same group. [Read more](#)

The National Institutes of Health awards LLNL a grant to develop an electrode array system that will enable researchers to better understand how the brain works through unprecedented resolution and scale. [Read more](#)





**The Lab's Kim Cupps (left) discusses supercomputing with Energy Secretary Ernest Moniz and attendees at National Lab Day.**

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[Blue links](#) are accessible on both the internal and external Lab Web network.

LLNL seismologist Artie Rodgers and colleagues discuss new supercomputer simulations to better understand ground motion in the wake of the 6.0 South Napa Earthquake. [Read more](#)

Chris Spadaccini, Tom Anklam, Geoff Campbell, Mark Bronson, Daryl Boyer, Bill McLean and Diane Chinn are panelists in a discussion of additive manufacturing of uranium. [Read more](#)

Secretary of Energy Ernest Moniz joins Sen. Dick Durbin and Sen. Jim Risch for National Lab Day on the Hill, an event highlighting notable research projects from across the national laboratory system. [Read more](#)

Director Bill Goldstein and Georgetown President John DeGioia renew their institutional commitment by signing a memorandum of understanding for an additional five years to expand the collaborative work in the areas of cyber security, biosecurity, nonproliferation and global climate, energy and environmental sciences. [Read more](#)

Dozens of employees gather to celebrate two important milestones achieved by the NIF & Photon Science and Weapons and Complex Integration Directorates' Target Fabrication team. [Read more](#)

The Radiochemical Analysis of Gaseous Samples (RAGS) group, in a true trash to treasure story, turns debris from the National Ignition Facility's target



## Quotables

*These awards recognize the tremendous value of our national labs. Research and development at the national labs continues to help our nation address its energy challenges and pursue the scientific and technological innovations necessary to remain globally competitive.*

– Secretary of Energy Ernest Moniz

chamber into valuable data that helps to shape future experiments. [Read more](#)

## People

Anantha Krishnan is named the Laboratory's new associate director for Engineering. [Read more](#)

Robert Sharpe is appointed deputy associate director for Research & Development for Engineering.

[Read more](#)

Former LLNL and LANL Director Michael Anastasio is elected to the LLNS and LANS Board of Governors.

[Read more](#)





**Newly graduated machinest Christian Oda uses a Taylor Hobson surface profilometer to measure a graded-density impactor for the JASPER Program (Joint Actinide Shock Physics Experimental Research).**

## NOTE

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Former NIF Principal Associate Director Ed Moses is tapped to lead the Giant Magellan Telescope organization. [Read more](#)

Cynthia Atkins-Duffin is appointed deputy principal associate director of Global Security.

[Read more](#)

Mark Herrmann from Sandia National Laboratories is selected as the new director of the Laboratory's National Ignition Facility. [Read more](#)

Lab engineer Monika Witte returns from six weeks off to volunteer at a local summer educational program, which aims to close the opportunity and achievement gaps for low-income middle school students by offering classroom instruction and academic enrichment activities. [Read more](#)

Hosted by Dona Crawford, associate director for Computation, the Laboratory welcomes 30 members of the prestigious Belizean Grove and Today's Already Rising Achievers. [Read more](#)

After four years of training as machinist apprentices, Christian Oda and Will Morton start to apply their trade. The two graduate from the Engineering Directorate's Machinist Apprentice Program. [Read more](#)

LLNL cyclist Stan Terusaki talks about his passion for biking and winning a national title. [Read more](#)

## “ Quotables

*I thought it was very inspiring. I saw all the diverse areas of science being put to work at Livermore. It really got me excited.*

- UC Merced senior Calvin Ogbuefi

Members and friends of the Lawrence Livermore Laboratory Women's Association gather for the annual membership and scholarship fundraising luncheon. [Read more](#)

A San Jose middle school is named for former astronaut and Lab engineer Jose Hernandez. [Read more](#)

Soprano Elena Galvan and Latin American lyric baritone Bernardo Bermudez, with the Livermore Valley Opera, wow LLNL employees with a special live performance. [Read more](#)

## Operations

Director Bill Goldstein realigns responsibility for the Laboratory's Inertial Confinement Fusion Program





**LLNL Sustainability Manager Michael Cowen, next to a reverse osmosis unit that recycles water for a Lab cooling tower, says the Lab's sensitivity to the state's drought led to some changes, including cutbacks of more than 10 percent of its normal water use.**

## NOTE

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from NIF & Photon Science to Weapons and Complex Integration. [Read more](#)

Six startups born out of Lawrence Livermore National Laboratory technologies make presentations at an entrepreneurial event to attract investors. [Read more](#)

LLNL's storied ham radio club finds a new home. Known as the WA6YHJ Amateur Radio Club, the group is registering with the Livermore Laboratory Employees Services Association to re-formalize as an official club. [Read more](#)

More than 100 men and women from early career to senior management attend the inaugural Lawrence Livermore National Laboratory "Meeting of the Minds" networking event at the Livermore Valley Open Campus (LVOC) High Performance Computing Innovation Center (HPCIC). [Read more](#)

As the flu season approaches, Health Services starts influenza shots. [Read more](#)

LLNL posts a Stockpile Stewardship video to YouTube. [Read more](#)

Bestselling author Hugh Howey offers tips on self-publishing during a presentation at the Lab. [Read more](#)

Lawrence Livermore hires AIG Benefits Solutions to provide efficient patient care and assist with the emergency evacuation of Lab personnel who work and travel overseas should a crisis occur. [Read more](#)

## “ Quotables

*Applying the innovative thinking that is so much a part of LLNL's science culture to operations ultimately helps science. We're putting water back into scientific research rather than into the arroyos.*

– Michael Cowen, LLNL sustainability manager on groundwater recycling at LLNL

## OCTOBER

### Science & technology

Lawrence Livermore is once again selected to support the development and construction of an ultra-intense laser system for the European Union's Extreme Light Infrastructure Beamlines in the Czech Republic. [Read more](#)

Using satellite observations and a large suite of climate models, Lawrence Livermore scientists announce they have found that long-term ocean warming in the upper





**LLNL researchers Monte LaBute (left) and Felice Lightstone were part of a Lab team that recently published an article in *PLOS ONE* detailing the use of supercomputers to link proteins to drug side effects.**

## NOTE

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700 meters of Southern Hemisphere oceans has likely been underestimated. [Read more](#)

Bio researchers receive a patent for producing antimicrobial compounds that degrade and destroy antibiotic-resistant bacteria by using the pathogen's own genes against it. The approach can be used to fight superbugs such as antibiotic-resistant *E. coli*, *Salmonella*, *Campylobacter*, Methicillin-resistant *Staphylococcus aureus* (MRSA), *Bacillus anthracis* and many others. [Read more](#)

The Lab and UC Davis partner to personalize cancer medications. [Read more](#)

LLNL researchers are involved in the design and testing of the NuSTAR X-ray optics that provide insight into the mystery of pulsars. [Read more](#)

Lawrence Livermore researchers report that they have turned to graphene aerogel for enhanced electrical energy storage that eventually could be used to smooth out power fluctuations in the energy grid. [Read more](#)

Lab researchers discover additional "coats," or layers, of a bacterium spore found in the human gut that may give clues to how this organism develops, spreads and survives in extreme conditions. [Read more](#)

The ninth Annual Computing Grand Challenge program awards more than 15 million central processing unit (CPU)-hours/week to projects that

## “ Quotables

*We need to do something to identify these side effects earlier in the drug development cycle to save lives and reduce costs.*

– Monte LaBute,  
a researcher from LLNL's Computational Engineering Division,  
on using high performance computing in drug development

address compelling, large-scale problems, push the envelope of capability computing and advance science. [Read more](#)

Lawrence Livermore researchers discover a high-tech method of using supercomputers to identify proteins that cause medications to have certain adverse drug reactions or side effects. [Read more](#)

LLNL announces that researchers in the NIF & Photon Science Directorate are working with NASA Ames Research Center at Moffet Field on the development of technology to simulate re-entry effects on the heat shield for the Orion spacecraft, NASA's next crewed spaceship. [Read more](#)

In an article published in the *Review of Scientific Instruments*, research teams led by scientists at





**A research team develop a technique for 3D-image processing of a high-speed photograph of a target, “freezing” its motion and revealing hidden secrets. Most of the experiments relevant to this research are conducted on the Janus system at Lawrence Livermore’s Jupiter Laser Facility.**

Lawrence Livermore describe a technique for 3D-image processing of a high-speed photograph of a target, “freezing” its motion and revealing hidden secrets.

[Read more](#)

Biological sample prep time for Accelerator Mass Spectrometry is cut dramatically. [Read more](#)

A team led by Lawrence Livermore scientists reports it has created a new kind of ion channel consisting of short carbon nanotubes, which can be inserted into synthetic bilayers and live cell membranes to form tiny pores that transport water, protons, small ions and DNA. [Read more](#)

Laboratory researchers, in collaboration with General Atomics and the University of Arizona, announce the development of an infrared and visible camera viewing system that’s able to produce wide-angle, tangential views of full poloidal (north-south direction of the magnetic field) cross-sections inside a tokamak. [Read more](#)

## People

Sat Pannu, director of LLNL’s Center for Bioengineering, is one of 50 researchers worldwide invited to attend a White House conference on the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative. [Read more](#)

Mike Dunne is named director of SLAC’s premier X-ray laser facility, the Linac Coherent Light Source (LCLS).

## “ Quotables

*Since the Laboratory’s inception in 1952, researchers have led the nation in understanding, synthesizing, formulating, testing and modeling the chemical high explosives that are an integral part of every nuclear weapon system. At HEAF, these researchers are all housed under one roof, strengthening collaborations and integrating all of the disparate high-explosives activity.*

– LLNL Energetic Materials Center Director Jon Maienschein

Dunne joined LLNL in 2010 as director for Laser Fusion Energy. [Read more](#)

LLNL nuclear engineer Susana Reyes assumes the 2014-15 chairmanship of the American Nuclear Society (ANS) Fusion Energy Division, following her election as vice chair in 2012. [Read more](#)

### NOTE

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**Lawrence Livermore National Security, LLC (LLNS), the contract manager for Lawrence Livermore National Laboratory (LLNL), announces the recipients for the 2014 LLNS Community Gift Program. These gifts, totaling \$100,000, reflect LLNS' commitment to local communities.**

## NOTE

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Parney Albright, former director of Lawrence Livermore, is named the president and chief executive officer of HRL Laboratories LLC. [Read more](#)

D.E. (Dori) Ellis, of the Director's Office, is appointed to lead the newly created Strategic Development Office. [Read more](#)

National Nuclear Security Administrator Lt. Gen. Frank Klotz and Nebraska Sen. Deb Fischer visit the Laboratory. [Read more](#)

Terry Land is selected as National Ignition Facility and Photon Science (NIF&PS) deputy principal associate director. Land has experience in a variety of technical areas and has worked across multiple organizations at the laboratory, including serving as operations manager for NIF and NIF site manager. [Read more](#)

Vanessa Tolosa, an engineer at LLNL's Center for Bioengineering, answers questions about her neural research on the popular social media site Reddit as part as of the Bay Area Science Festival. [Read more](#)

Amigos Unidos awards seven students a total of \$3,750 in scholarship funding. [Read more](#)

Tomas Morales, president of California State University, San Bernardino (CSUSB), along with other administrators, a faculty member and

## “ Quotables

*The nice thing about this challenge is that there are some lessons learned that apply to our lives and our jobs here at the Lab.*

*– Joe Galkowski, whose team won the most creative design award during “The Marshmallow Challenge”*

student, visit the Laboratory. [Read more](#)

## Operations

New Engineering Associate Director Anantha Krishnan communicates his vision for the directorate at an all-hands meeting. [Read more](#)

Nicole Nelson-Jean is named manager of NNSA's Livermore Field Office, where she is responsible for providing oversight of the national security missions at the Laboratory. [Read more](#)

LLNS, the contract manager for Lawrence Livermore, announces the recipients for the 2014 LLNS Community Gift Program. These gifts, totaling \$100,000, reflect LLNS' commitment to local communities. [Read more](#)





**Lawrence Livermore scientist Harold Rogers, presenting at AT&T Park on Discovery Day, explains how to make elephant toothpaste to an eager crowd.**

## NOTE

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Engineer Tom Anklam is selected as National Ignition Facility and Photon Science (NIF&PS) deputy principal associate director for Science and Technology [Read more](#)

Gen. Kevin Chilton (retired) is named as an independent governor on the LLNS Board of Governors. [Read more](#)

The Lab engages future biomedical engineers at UC Davis. [Read more](#)

Lab volunteers help make the Expanding Your Horizons conference at the University of Pacific (UOP) a great success in inspiring young women to pursue math and science. [Read more](#)

Engineers, technicians, designers and support staff from the Engineering Directorate participate in a team-building exercise known as "The Marshmallow Challenge," an instructive design exercise that encourages teams to experience simple but profound lessons in collaboration, innovation and creativity. [Read more](#)

The Laboratory reaches a major milestone in a multi-year effort to modernize its Web presence with the re-launch of an updated [www.llnl.gov](#). [Read more](#)

Culminating National Cyber Security Awareness Month (NCSAM), the Cyber Security Program (CSP) sponsors a CyberFest, featuring a vendor

## “ Quotables

*These Graph 500 results collectively demonstrate LLNL's preeminence as a full service data intensive high performance computing shop, from single server to a data intensive cluster to world class supercomputer.*

– Maya Gokhale,  
LLNL principal investigator for data-centric computing architectures, on LLNL Graph 500 success

expo and speaker's forum at the Livermore Valley Open Campus. [Read more](#)

The run for HOME celebrates four decades of giving and kicks off the 2014 campaign. [Read more](#)

## NOVEMBER 2014

### Science & technology

More than 30,000 people pack into AT&T Park for the San Francisco Bay Area Science Festival, a day of hands-on experiments, exhibits, games and shows. During the successful event, LLNL joins more than 150 exhibitors to bring science to the masses. [Read more](#)





**Sierra is the next in a long line of world class supercomputers at Lawrence Livermore National Laboratory.**

## NOTE

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Lawrence Livermore scientists and collaborators discover that xenon can be trapped in the subsurface of the Earth, shedding new insights into the long-standing mysteries of “missing xenon” in earth science. [Read more](#)

To capture and measure the vast amount of data generated during experiments, the National Ignition Facility is equipped with about 60 nuclear, optical and X-ray diagnostics. One of these diagnostics, the Near Backscatter Imager, receives an upgrade. [Read more](#)

The process of phase changes — those transitions between states of matter — is more complex than previously thought. A team of Lawrence Livermore researchers and colleagues find they may need to rethink one of science’s building blocks. [Read more](#)

Lawrence Livermore announces a contract with IBM to deliver a next-generation supercomputer in 2017. The system, to be called Sierra, will serve the National Nuclear Security Administration’s (NNSA) Advanced Simulation and Computing (ASC) program. [Read more](#)

Laboratory researchers develop an efficient method to measure residual stress in metal parts produced by powder-bed fusion additive manufacturing. [Read more](#)

In a showdown of black hole versus G2 — a cloud of gas and dust — it looks like G2 wins. Recent research shows that G2 came within 30 billion kilometers of the super-massive black hole at the

## “ Quotables

*Over the next decade, global data volume is forecasted to reach more than 35 zettabytes,” (a zettabyte is a trillion gigabytes). That enormous amount of unstructured data provides an opportunity. But how do we extract value and inform better decisions out of that wealth of raw information?*

– Fred Streitz, director of the High Performance Computing Innovation Center

center of our galaxy, yet managed to escape from the gravitational pull of the black hole. [Read more](#)

Lawrence Livermore scientists’ search for new ways to solve large complex national security problems leads to the top ranking on the Graph 500 and new techniques for solving large graph problems on small high performance computing (HPC) systems, all the way down to a single server. [Read more](#)

Using ocean observations and a large suite of climate models, Laboratory scientists find that long-term salinity changes have a stronger influence on regional sea level changes than previously thought. [Read more](#)





**Bret Knapp, who served as the Lab's interim director and held various positions in the defense divisions at Livermore and Los Alamos, passes away after a short battle with cancer.**

## NOTE

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One of NIF's most versatile and frequently-used diagnostics, the Velocity Interferometer System for Any Reflector, is used to measure shocks of enormous pressure – many millions of atmospheres in a few billionths of a second, providing vital information for future experiment design and calibration. [Read more](#)

The Laboratory and the RAND Corporation sign a memorandum of understanding that will provide a vehicle for the two organizations to explore the use of policy analysis methodologies with supercomputing applications to better inform decisions, especially where uncertainty of relations among actions, consequences and probabilities abound. [Read more](#)

Lawrence Livermore and the Swiss Federal Institute of Technology researchers develop a cost-effective and more efficient way to manufacture nanoporous metals over many scales, from nanoscale to macroscale. [Read more](#)

Lawrence Livermore researchers and their work are featured during the annual meeting of the American Physical Society's Division of Plasma Physics in New Orleans. More than 200 papers are presented during the meeting with LLNL lead or co-authors. [Read more](#)

Lawrence Livermore, Sandia National Laboratory, the U.S. Air Force and the U.S. Navy successfully test an advanced conventional warhead. The

## “ Quotables

*Bret (Knapp) had a far reaching impact and an open and honest communication style that fostered collaboration across the laboratories.*

*Bret was my close friend and colleague for more than 30 years and leaves an honored legacy of service to the nation. His loss is overwhelming. He will be missed greatly by many.*

– Charlie McMillan,  
Los Alamos National Laboratory director,  
in tribute to Bret Knapp

experiment is executed at Eglin Air Force Base in Florida with 100 percent of the diagnostics returning data. [Read more](#)

## People

Bret Knapp, who served as the Lab's interim director and held various positions in the defense divisions at Livermore and Los Alamos, passes away after a short





**Lab engineer Larry McMichael sits on the board of TurningWheels for Kids' Tri-Valley Chapter, one of the many nonprofits supported by LLNL's annual Helping Others More Effectively (HOME) Campaign.**

## NOTE

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battle with cancer. [Read more](#)

For the third straight year, Lawrence Livermore engineer Larry Michaels volunteers his time with the Tri-Valley Chapter of the nonprofit TurningWheels for Kids, one of many charities supported by the Lab's annual Helping Others More Effectively Campaign. [Read more](#)

Tom Ramos, a physicist at Lawrence Livermore, and his wife Rose, who retired last year after 47 years at LLNL, spend their summer traveling coast to coast across the United States. They don't take a plane, train, automobile, or motorcycle — they ride their bicycles. [Read more](#)

Computer scientist Lee Neely volunteers his time outside of work to help improve the lives of veterans, whether through fundraising, promoting the yearly Lab Ride or serving Veterans Day breakfast to residents at the Livermore VA Medical Center. [Read more](#)

Computer scientist Bill Oliver is an active supporter of the Lawrence Livermore Lab Armed Forces and Veterans Association and outside veterans' organizations. In 1979, Oliver left the U.S. Navy after completing five years as a nuclear submarine officer. As a veteran, he is passionate about helping other veterans. [Read more](#)

Videographer Cheryl Hernandez, analyst Stephanie Bates and manager Robyn Middleton are organizers and volunteer for Tri-Valley Stepping

## “ Quotables

*The simple act of riding their own bike — a childhood rite of passage — brings these children independence, confidence, a fun way to exercise and a sense of adventure that nothing else can quite match.*

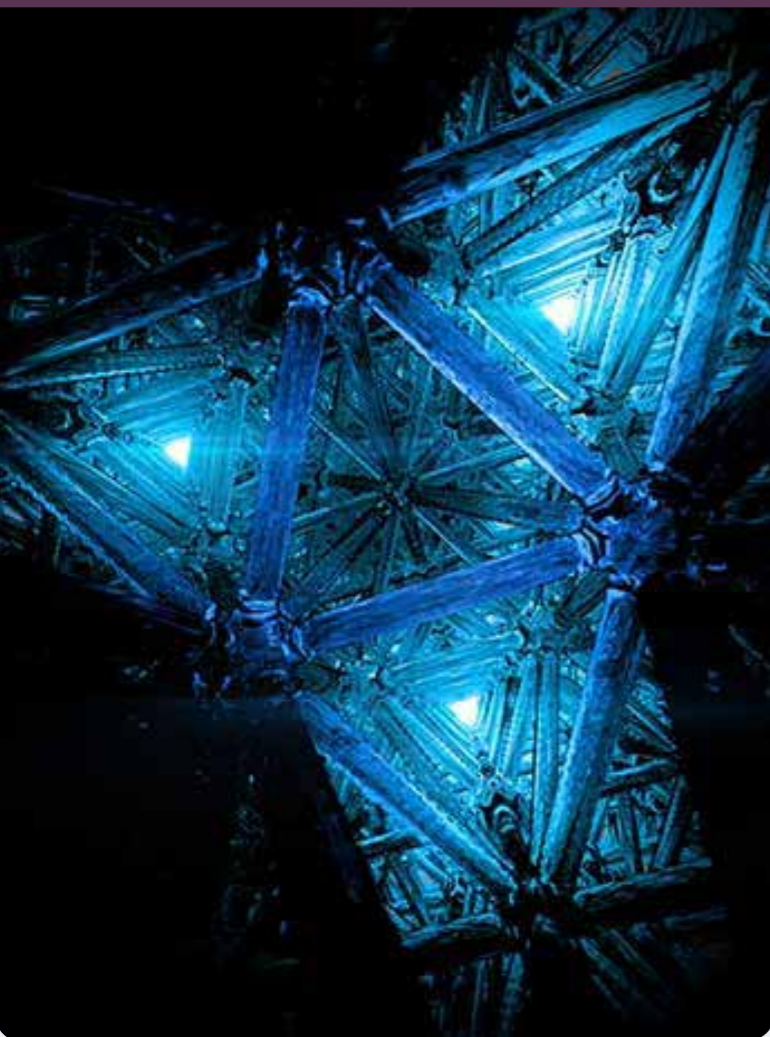
— Larry McMichael,  
a 16-year Lab veteran from the Computational Engineering  
Division, who volunteers for TurningWheels for Kids

Out for Cancer Kures (SOCKs) “Bras for a Cause” annual six-mile walk in Pleasanton. They hit the million-dollar-mark with \$1,085,000 worth of donations in nine years. [Read more](#)

Growing up, Jennifer Anthony had a passion for whale watching. Anthony, who supports the Target Fabrication Group in the NIF & Photon Science Directorate, says those childhood experiences sparked a love for animals that has grown with time and now encompasses causes that range from her backyard to all the way across the globe. [Read more](#)

HPCWire features an interview with LLNL's Trish Damkroger, chair of the 2014 edition of the Supercomputing Conference (SC14). [Read more](#)





**Ryan Chen's depiction of the additive manufacturing octet truss is a finalist at the National Science Foundation Visualization Challenge.**

## NOTE

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Don Cook, deputy administrator for Defense Programs at the National Nuclear Security Administration (NNSA), visits Lawrence Livermore to address the staff in an all-hands presentation and to present NNSA's Defense Programs Awards of Excellence. [Read more](#)

Students from Banta Elementary School in Tracy are treated with a special spooky Fun With Science presentation to celebrate Halloween. [Read more](#)

Massive amounts of information, or "big data" methods, have the potential to transform the way international monitoring for underground nuclear tests is performed. That's the assessment of Lab seismologist Steve Myers, who delivers a Director's Distinguished Lecturer Series talk to commemorate his 2013 E.O. Lawrence Award. [Read more](#)

Technical Information Department illustrator Ryan Chen's depiction of the additive manufacturing octet truss is chosen as one of 10 finalists in the illustration category of the National Science Foundation Visualization Challenge. [Read more](#)

The Polish-American Innovation Delegation visits the Lab for briefings and tours. Among the dignitaries are Under Secretary of the Ministry of Economy Grazyna Henclewska; Minister Counselor Pawel Pietrasienski; Otylia Trzaskaksja-Stroinska, deputy director of the Ministry of Economy of Poland; and Bozena Lublinska-Kasprzak, president of the Polish Agency for Enterprise Development. [Read more](#)

## “ Quotables

*We're in the infancy of using 'big data'. It's the people who are here doing basic research at the national labs who see the potential of the technology to change the way monitoring systems work.*

— Lab seismologist Steve Myers,  
who delivered a Director's Distinguished Lecturer Series talk

## Operations

New bikes arrive on site that are both simple to use and reliable. [Read more](#)

Due to overwhelmingly positive feedback, all employees are invited to attend the "Meeting of the Minds" event encore at the Livermore Valley Open Campus (LVOC) High Performance Computing Innovation Center (HPCIC). [Read more](#)

The Internal Revenue Service announces increases to the maximum contribution limits to the 401(k) plan for 2015. [Read more](#)





**The 2014 Run for HOME serves as the kickoff to the annual fundraising campaign.**

## NOTE

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About 90 motorcyclists trek to Site 300 from the Laboratory in Lab Ride 11, the annual barbecue and fundraiser in honor of Veterans Day. [Read more](#)

The 2014 HOME Campaign gets into full swing. The theme of the HOME Campaign is "Decades of Giving," in honor of the 40 years that LLNL employees have been generous with their time and monetary gifts in support of HOME. [Read more](#)

The HOME Campaign quickly surpasses the \$1 million in employee pledges. [Read more](#)

Each café is supplied with a media-scape area, which allows groups of employees to share digital content in a more effective fashion. [Read more](#)

The Laboratory hosts a two-day seminar on cross-domain deterrence, designed to foster discussion on the interplay between nuclear deterrence, advanced conventional weapons employment, cyber warfare and contested space, and the impact on the decision calculus of potential adversaries. [Read more](#)

A new law requires employers to collect Social Security Numbers (SSNs) for dependents that have not been previously obtained. [Read more](#)

The Laboratory receives DOE approval of the CY15 Compensation Increase Plan. Final preparations are under way to initiate the CY15 Salary Review process. [Read more](#)

## “ Quotables

*Most of us came to the Lab to make the world a better, safer place. The HOME Campaign is a wonderful opportunity to put our good conscience to action and to show our community that, in addition to being a leader in science and technology, we also are a caring neighbor.*

— Jeff Wisoff, on the HOME Campaign

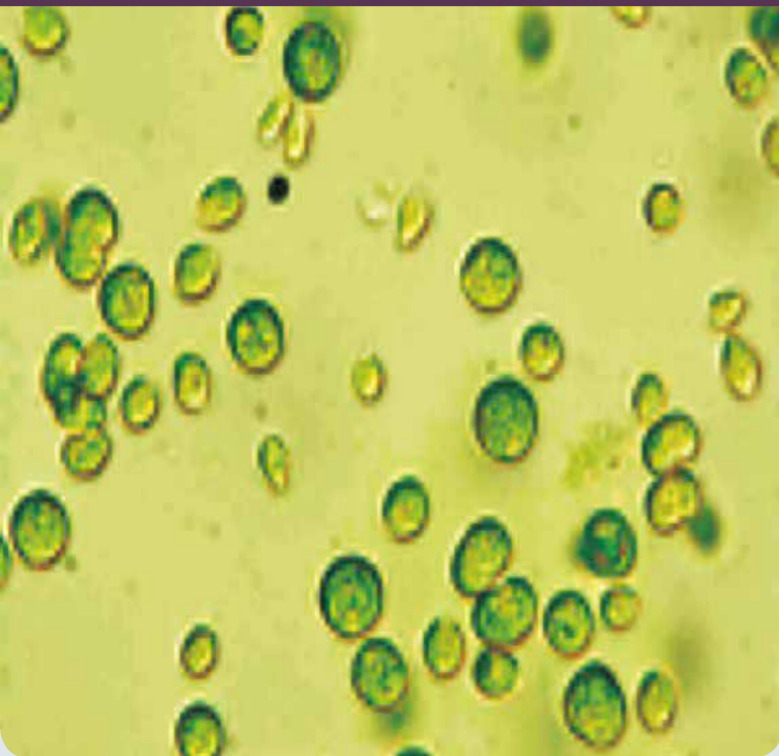
## DECEMBER

### Science & technology

As part of the Department of Energy's Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program, eight Lawrence Livermore National Laboratory (LLNL) researchers are awarded nearly 800 million core hours on two of America's fastest supercomputers dedicated to open science. [Read more](#)

An international team that includes researchers from Lawrence Livermore captures the highest-





**Lawrence Livermore researchers discover that cells of the alga *Chlamydomonas Reinhardtii* (seen under a microscope) build a “pantry” to store metal and maintain equilibrium. Nearly 40 percent of all cells in all organisms require metal ions such as zinc, copper, manganese or iron for activity.**

## NOTE

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resolution protein snapshots ever taken with an X-ray laser, revealing how a key protein in a photosynthetic bacterium changes shape when hit by light. [Read more](#)

*Physics World*, an international monthly magazine published by the Institute of Physics, names the National Ignition Facility’s achievement of fuel gain one of its top 10 breakthroughs of the year. [Read more](#)

Lawrence Livermore researchers, in conjunction with collaborators at University of California Los Angeles, find that some cells build intracellular compartments that allow the cell to store metals and maintain equilibrium. [Read more](#)

Entries are accepted for the 2015 R&D 100 awards competition. [Read more](#)

The Center for Global Security Research (CGSR) hosts a workshop on the technical and political dimensions of nuclear arms control agreements in world politics. The goal of the workshop is to facilitate dialogue between members of the academic and Laboratory communities working on issues related to nuclear proliferation. [Read more](#)

The NIF’s primary mission is to ensure the safety, security and effectiveness of the nuclear weapons stockpile. As part of this mission, the National Nuclear Security Administration prepares to use small quantities of plutonium at NIF to study the behavior of this material at the temperatures and pressures that occur in the nuclear phase of a weapon. [Read more](#)

## “ Quotables

*By storing the metal in a special intracellular compartment, the cell creates a bit of a pantry for itself and can better maintain its equilibrium.*

– LLNL researcher Jennifer Pett-Ridge

## People

Ruth Hawley, a process engineer in NIF’s Optics Processing Facility, volunteers for Fertile Groundworks “because growing organic food to feed hungry people in our local community is meaningful.” [Read more](#)

Due to the generosity of many employees, the NIF and Photon Science Principal Directorate collect enough items to assemble and donate 122 comfort kits to foster children through the nonprofit organization “Love ALL Our Kids.” [Read more](#)

Los Alamos National Laboratory opens a website for colleagues to share memories of Bret Knapp. [Read more](#)

Lab physicist Stefan Hau-Riege publishes the book “Nonrelativistic Quantum X-Ray Physics.” The book provides a solid theoretical background in photon-matter interaction and enables readers to understand





**Employees flock to the West and Central cafes for a holiday party.**

## NOTE

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experiments performed at X-ray free electron laser facilities and X-ray synchrotrons. [Read more](#)

Kimberly Danny, a 2014 student employee in Lawrence Livermore's Environmental Restoration Department, presents research at the American Indian Science and Engineering Society annual conference in Orlando, on her work involving reactive transport modeling of uranium in groundwater at Site 300. [Read more](#)

Employees flock to the West and Central cafes for a holiday party hosted by Director Bill Goldstein.

[Read more](#)

## Operations

The Security Organization reminds employees to be vigilant when going off site because the theft of Laboratory badges from employee vehicles is on the rise. [Read more](#)

Lawrence Livermore employees, along with Lawrence Livermore National Security, LLC raise \$3.4 million to give to charities within their surrounding communities. [Read more](#)

The Management Assurance System Organization's new Institutional Quality Program website provides an integration point for quality requirements, processes and resources. [Read more](#)

To help employees save money on commuting costs, Lawrence Livermore National Security offers a pre-tax transportation benefit. [Read more](#)

## “ Quotables

*This computer is a step toward keeping the U.S. at the forefront of science and technology, as well as helping to ensure our nation's safety and security.*

– Director Bill Goldstein on the announcement of Sierra

The success of Lawrence Livermore National Laboratory's Engineering Technology Program to educate veterans for technical careers inspires a statewide push to create an educational core curriculum to prepare junior college students for technical jobs at California's national labs. [Read more](#)

The annual salary review process gets under way. Employees are notified that they will receive salary notifications from their supervisors beginning Jan. 28. [Read more](#)

UNCLE Credit Union donates \$2,000 to help the Laboratory increase employee participation in the Helping Others More Effectively (HOME) Campaign. [Read more](#)

For the 2014 tax year, LLNS employees will have the option to receive their W-2 Form electronically through an online self-service process. [Read more](#)



## RECOGNITION AND AWARDS



**Rena Huerta** recently received an **IMPACT Award**, naming her “Knowledge Expert of the Year,” at the annual **IMPACT 2014 Knowledge Conference** in Orlando.

**Mark Hart**, a scientist and engineer in Lawrence Livermore’s Defense Technologies Division, is awarded the 2015 Surety Transformation Initiative Award from NNSA’s Enhanced Surety Program for his Intrinsic Use Control project. [Read more](#)

**Harold Conner Jr.**, associate director of Facilities and Infrastructure within the Operations and Business Principal Directorate, is presented with the Alumni Professional Achievement Award from his alma mater, the University of Tennessee, Knoxville. [Read more](#)

Lawrence Livermore researchers are awarded the NNSA’s Defense Programs Award of Excellence. The researchers are members of NNSA’s Advanced Manufacturing Roadmap Development Team (**AM**

**Team**), and were honored for work performed in 2014. [Read more](#)

**Rena Huerta**, a Lawrence Livermore computer associate working in Livermore Information Technology, receives an IMPACT Award naming her “Knowledge Expert of the Year” at the annual IMPACT 2014 Knowledge Conference in Orlando. [Read more](#)

Laboratory computational scientist **Amanda Randles** receives a Director’s Early Independence Award from the National Institutes of Health. [Read more](#)

Director Bill Goldstein gives out the **2014 S&T** awards to five project teams, conference

presenters, journal authors and individuals for their exceptional endeavors in science and technology. [Read more](#)

Lab engineer **Scott Couture** receives an award for Meritorious Civilian Service from the U.S. Air Force for his work as principal adviser for Nuclear Plans and Policies to the Under Secretary of the Air Force. [Read more](#)

**Radoslav Radev** receives the International Electrotechnical Commission “1906 Award” for his work on developing international standards for radiation detection instrumentation at an official ceremony at the U.S. National Committee Council meeting in Washington, D.C. [Read more](#)



## RECOGNITION AND AWARDS



LLNL materials scientist Natalia Zaitseva checks out a stilbene crystal. The technology for growing these crystals has been licensed to Inrad Optics, a New Jersey photonics manufacturer. Zaitseva and her fellow scientists received one of three regional Federal Laboratory Consortium awards for technology transfer won by LLNL.

Director Bill Goldstein recognizes 11 teams with the **2014 Director's Institutional Operational Excellence Awards**. [Read more](#)

**John Edwards**, program director for the Inertial Confinement Fusion Program, is a recipient of the Leadership Award from Fusion Power Associates' Board of Directors. [Read more](#)

Lawrence Livermore scientists receive three regional awards for technology transfer by the **Federal Laboratory Consortium**. [Read more](#)

Three **Lawrence Livermore researchers** receive the Department of Energy's 2014 Hydrogen Production R&D Award for developing a system that uses sunlight to split water molecules, producing hydrogen. [Read more](#)

The **LLESA We Be Dragon Team** wins third place in their division at the 19th International San Francisco Dragon Boat Festival held at Treasure Island, with a time of 1 minute, 37 seconds. [Read more](#)

**Zhi Liao**, a senior research scientist in NIF&PS, is named a senior member of the Optical Society of America, an international society for optics and photonics scientists, engineers, educators and business leaders. [Read more](#)

Technology developed by **LLNL research teams** helps two companies win the U.S. Small Business Administration's **Tibbetts Award** for economic impact. [Read more](#)

**Livermore researchers** are the recipients of four awards among the **top 100 industrial inventions** worldwide for 2013. [Read more](#)

Lawrence Livermore National Laboratory's prestigious Edward Teller Science Scholarship is awarded to five **local high school seniors** from Livermore and Tracy. [Read more](#)

LLNL awards **Michael Campanell, Eric Neuscamman and Tuan Anh Pham** the Lawrence Fellowship, a highly competitive postdoctoral position awarded to candidates with exceptional talent, scientific track records and potential for significant achievements. [Read more](#)

**LLNL** is named the fittest national lab, based on the **Active for Life** competition among seven national labs. LLNL had the highest average minutes/person/day, the greatest percent of



## RECOGNITION AND AWARDS



Lawrence Livermore scientist **Jennifer Pett-Ridge** will receive funding through the U.S. Department of Energy's Office of Science Early Career Research Program for her research in soil microbial communities and carbon cycling in the tropics.

participating workforce and the most participants of all the labs. [Read more](#)

**Three teams of Lawrence Livermore employees** are recognized for their efforts in implementing sustainability projects at the Laboratory. These projects receive **2013 Sustainability Awards** from NNSA for exemplary individual and team performance in advancing sustainability objectives through innovative and effective programs and projects that increase energy, water and fleet efficiency and reduce greenhouse gases, pollution and waste. [Read more](#)

LLNL scientists **Jennifer Pett-Ridge and Todd Gamblin** are selected by the U.S. Department of Energy's Office of Science Early Career Research Program to receive funding for proposed projects. [Read more](#)

A team of researchers led by **Andreas Kemp** receive a 2014 Leadership Computing Challenge award from the DOE Office of Advanced Scientific Computing Research to further pursue the study of short-pulse laser interactions with solid density plasmas using supercomputer simulations. [Read more](#)

**Two teams of Lab researchers and engineers** and two individuals are honored during the presentation of the **NNSA Defense Programs Awards of Excellence**. The awards honored work performed at LLNL in 2012. [Read more](#)

LLNL physicist **Miguel Morales** is selected for a 2014 Presidential Early Career Award for Science and Engineering for his leading-edge research in condensed matter physics. Morales studies materials at extreme pressure and

temperature on some of the world's most powerful supercomputers. [Read more](#)

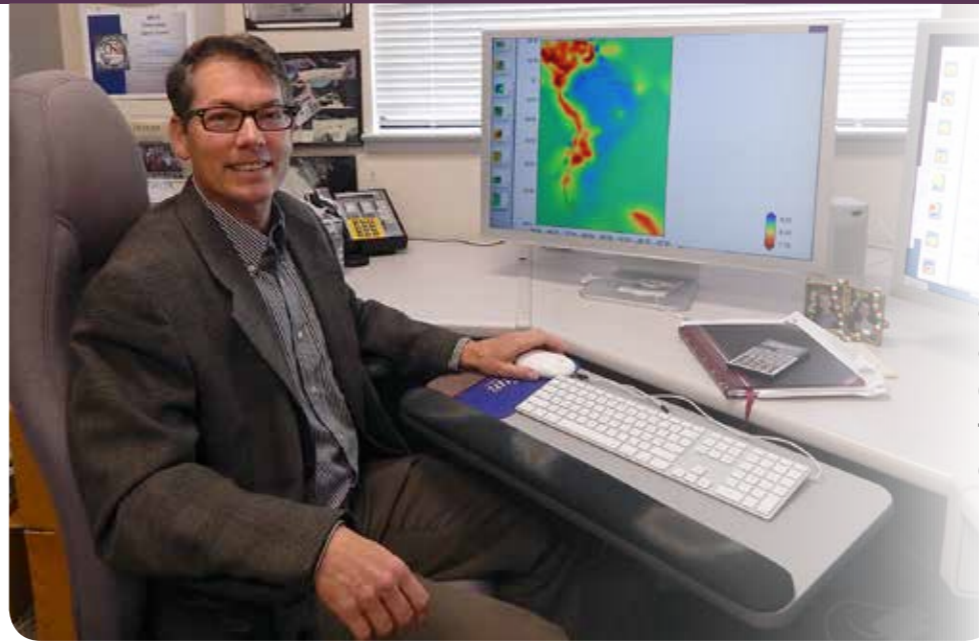
**Richard "Dick" Farnsworth** is honored at a Livermore Valley Joint Unified School District public Board meeting for his service and contributions to science education. [Read more](#)

The Precision Strike Association awards the 18th annual William J. Perry Award to the **BLU-129/B team**, which includes researchers from LLNL. [Read more](#)

**Leslie Positeri and Brian Molyneaux** are honored during a ceremony at the 2014 Global Skillsoft Perspectives user conference honoring companies for their notable efforts in learning, recognizing innovative ideas and inspiring leaders



## RECOGNITION AND AWARDS



**LLNL seismologist Stephen Myers won the E.O. Lawrence award for his work advancing national security and nonproliferation by developing seismic monitoring technologies to locate nuclear explosions.**

who are helping to transform the learning landscape. [Read more](#)

Lawrence Livermore scientists **Charles Westbrook and William Pitz** are named to the Thomson Reuters list of “The World’s Most Influential Scientific Minds.” [Read more](#)

Two Lawrence Livermore researchers, **Steven Myers and Siegfried Glenzer**, win the prestigious Ernest Orlando Lawrence Award for their contributions to DOE’s missions in science, energy and national security. [Read more](#)

In conclusion of Women’s History Month, the Lawrence Livermore Laboratory Women’s Association presents its annual **scholarship**

**awards** totaling \$8,200 to **seven employees** during a ceremony. [Read more](#)

The Global Security Principal Directorate holds its biannual **Gold Awards** to recognize outstanding contributions and one-time achievements that are above and beyond the demands of normal job performance. [Read more](#)

Computer scientist **Abhinav Bhatele** is recognized with a Young Achievers in Scalable Computing Award for his high performance computing (HPC) research by the IEEE Technical Committee on Scalable Computing. The award acknowledges individuals within five years of receiving their Ph.D. who have made outstanding, influential, and potentially long-lasting contribu-

tions to the field of scalable computing. [Read more](#)

The **partnership** that produced the first-of-a-kind **Catalyst supercomputer** is selected for an *HPCWire* “Best HPC Collaboration Between Government & Industry” award by readers and editors of the publication. [Read more](#)

Visit [www.llnl.gov](http://www.llnl.gov) for more news and events at LLNL.

