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LLNL



The Community Newsletter of Lawrence Livermore National Laboratory

Summer 2009

Lab's National Ignition Facility dedicated

With more than 3,000 invited guests and Lab employees in attendance, the National Ignition Facility (NIF) was officially dedicated on May 29, setting into motion the next chapter of one of the country's greatest scientific assets.

Gov. Arnold Schwarzenegger, U.S. Sen. Dianne Feinstein, NNSA Administrator Tom D'Agostino and Congressional Reps. Ellen Tauscher, Jerry McNerney and Zoe Lofgren were among the headline speakers at the dedication ceremony.

NIF, the world's highest-energy laser system, consists of 192 laser beamlines that will focus nearly two million joules of energy and create temperatures and pressures that exist in the cores of stars and giant planets. By harnessing the massive power generated by its lasers, NIF will be able to create conditions and conduct a wide range of experiments never before possible on Earth.

NIF's ignition experiments will focus its laser beams on a tiny target filled with frozen isotopes of hydrogen. The heat

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Sen. Dianne Feinstein discusses the future energy possibilities of the National Ignition Facility at a post-dedication press conference as NIF Director Ed Moses and LLNL Director George Miller look on.



National Atmospheric Release Advisory Center marks 30 years of service

The National Nuclear Security Administration marked the 30th anniversary of LLNL's National Atmospheric Release Advisory Center, also known as NARAC, in March.

NARAC provides near-real-time computer predictions of the transport and deposition of hazardous airborne materials.

NARAC opened in 1979, when the Department of Energy and LLNL used the newly developed modeling system to generate predictions that helped guide federal and state measurement teams working to determine the impact of radiological material released from the Three Mile Island nuclear power plant.

Since then, NARAC has been used by decision makers and emergency responders to predict the impacts of hazardous atmospheric releases in order to protect lives and mitigate consequences.

NARAC modeling has been employed for the Chernobyl nuclear power plant accident, industrial chemical accidents as well as numerous other events.

The Department of Homeland Security's Interagency Modeling and Atmospheric Assessment Center, also known as IMAAC, uses NARAC as its primary resource for the coordination and dissemination of the federal government's hazard prediction models during an incident.



Maureen Alai, Ron Baskett and Matthew Simpson of the National Atmospheric Release Advisory Center (NARAC) monitor gases emitted from Kilauea, the youngest and southeastern-most volcano on the Big Island of Hawaii.



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and pressure created by NIF's lasers will force the hydrogen nuclei to fuse together and produce a controlled fusion reaction similar to that found in the sun.

"NIF's success will be a scientific breakthrough of historic significance — the first demonstration of fusion ignition in a laboratory setting, duplicating on Earth the processes that power the stars," said NIF Director Ed Moses.

"This laser system is an incredible success not just for California, but for our country and our world," Gov. Arnold Schwarzenegger said.

"The National Ignition Facility at Lawrence Livermore National Laboratory will further that leadership role in the 21st century and promises to blaze a new trail toward sustainable, carbon-free energy independence," said U.S. Sen. Dianne Feinstein.

The ceremony attracted news media from around the world. Researchers will begin laser experiments to fine tune NIF, with an eye to achieving ignition, possibly as soon as late 2010.



From top left: Gov. Arnold Schwarzenegger participated in a press conference after the NIF dedication ceremony. A number of local elected officials and guests attended the NIF dedication ceremony, including Dublin Mayor Tim Sbranti (left) and Livermore Mayor Marshall Kamena (right) with his wife Barbara; Rep. Ellen Tauscher and U.S. Sen. Dianne Feinstein confer with NIF Director Ed Moses near the NIF Target Chamber; Sandia Lab's President and Director Tom Hunter, Los Alamos Lab Director Mike Anastasio, Rep. Ellen Tauscher and LLNL Director George Miller. Below: A large, attentive audience appreciates the dedication ceremony.

NIF IN THE NEWS

Whether you read about it in the newspaper or on the internet, heard about it on the radio, or saw it on television, the National Ignition Facility (NIF) has been in the news recently. The completion and official dedication of NIF focused local, national and international news media attention on Livermore.

To view a sampling of these news reports visit the NIF website (<https://lasers.llnl.gov/>) and click on "News" then "In the News."



Pictured above: NIF opened its doors to friends and family during the Lab's Family Days the last weekend of May.

See more LLNL photos at <http://www.flickr.com/photos/llnl/>



'Dawn' of new era for Laboratory supercomputing partnership



Dimitri Kusnezov, director of NNSA's Office of Research and Development for National Security, Science and Technology, spoke at the Dawn dedication.

The Laboratory's newest supercomputer, Dawn, was recently dedicated in a ceremony attended by representatives from the National Nuclear Security Administration (NNSA), the three national weapons laboratories, Lawrence Berkeley National Laboratory, and IBM.

Lawrence Livermore, Los Alamos and Sandia National laboratories, in partnership with such industry leaders as IBM, has been a global leader in the development of high-performance computing (HPC) to meet challenges in national security, energy, climate change and basic science. Computer simulations of physical, chemical and biological phenomena have become an indispensable tool for scientific

discovery and an integral part of the scientific method – theory, experiment and, now, simulation. Computer simulation has played a critical role in ensuring the safety and reliability of the nation's deterrent without underground nuclear testing.

Dawn, which can crunch numbers at a top speed of 500 trillion floating operations per second (FLOP/s) – the equivalent power of at least 60,000 laptop computers – will lay the foundation for the gargantuan Sequoia supercomputer, which is being designed to reach speeds of 20 quadrillion FLOP/s. Sequoia is scheduled for delivery in 2011 and is expected to become the world's fastest supercomputer.

Lab greenhorns roped into rodeo competition



Bill Bruner, director of Government and External Relations at LLNL, gets ready to ride in the cattle penning competition during Livermore Rodeo week.

The annual event featured teams of cowboys and greenhorns competing to pen a cow in the shortest amount of time. The contest is sponsored by the Livermore Stockmen's Rodeo Association and is part of Livermore Rodeo week festivities.

Lawrence Livermore National Security (LLNS), LLC was a sponsor of this year's rodeo.

Teacher education sprouting at LLNL

Lawrence Livermore's Edward Teller Education Center (ETEC) is abuzz with activity as 32 teachers and students preparing to become teachers take part in summer internships at LLNL. Three programs are being offered to participants this year; a Department of Energy Academies Creating Teacher Scientists (ACTS) program; a California State University Science Teacher and Researcher (STAR) program; and the LLNL-UC Davis collaborative program Teacher Research Academy (TRA).

The ACTS program develops teacher leaders. This summer, local participants include teachers from the Livermore Valley Joint Unified School District, the Tracy Unified School District and the Chabot-Las Positas Community College District.

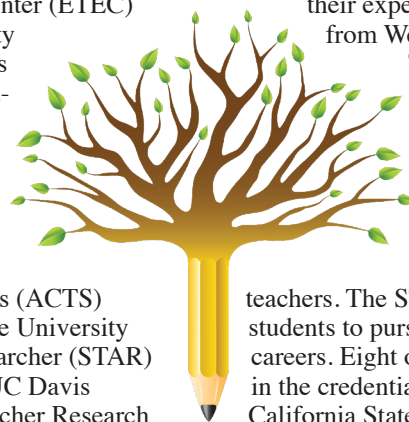
Two participants from Livermore High School are working together to develop curriculum in technical writing. Technical writing is a valuable skill for students, but is often not included in language arts instruction. This model will be offered to other teachers in the Livermore district and surrounding communities.

Two participants from Tracy High School are developing an energy and environmental science program. Their

research experience at LLNL will improve their expertise. A participant from West High School in Tracy is developing a biotechnology curriculum and will be sharing this experience with other teachers.

The STAR program includes students and early service science teachers. The STAR program encourages students to pursue science teaching careers. Eight of the participants are in the credential program at various California State University campuses or are about to enter the credential programs. Two have completed their first year of teaching. LLNL has the largest group of teachers in STAR than any other national laboratory participating in the program.

TRA is the original internship program at LLNL. It is a model developed by teachers and LLNL staff to prepare teachers for internships. Ninety-eight teachers will participate in TRA workshops this summer. As a result of this program, several graduates have received large grants to expand the science curricula in schools and have won awards for their teaching. A recent success story for this program is David Menshew of Enochs High School in Modesto, who received a 2009 Genzyme-Life Technologies Biotech Educator Award.



Security posture strengthens at Laboratory

A recent review of security at Lawrence Livermore National Laboratory by the U.S. Department of Energy's (DOE) Office of Independent Oversight confirmed a strengthened security posture at the Laboratory.



The annual review, conducted by the oversight organization within DOE's Office of Health, Safety and Security, focused on physical security, the Lab's Protective Force, classified matter protection, control and program management.

"The Security Organization

really stepped up to the plate and demonstrated the kind of 'can do' spirit this Lab is known for in rapidly making security improvements at a time of limited resources. The best security operations are those that are constantly tested to identify where improvements can be made," said Dave Leary, director of LLNL's Security Organization. "These independent reviews are a complement to our own integrated safety and security approach based on continuous improvement. Cyber, information and physical security are continually assessed and tested by internal and external security experts

and security systems are strengthened to meet evolving threats."

In the annual force-on-force exercise, conducted in April, the Laboratory's special response team quickly repelled a simulated assault on a Livermore nuclear facility by a mock adversary team made up of highly trained security officers from DOE. Measures taken to enhance the effectiveness of the protective force include upgrades to communications systems, physical security, protective force weapons systems and training. Force-on-force exercises have been increased in frequency with more exercises conducted in the facilities containing nuclear materials.

COMMUNITY CONNECTIONS LAWRENCE LIVERMORE NATIONAL LABORATORY

Livermore Laboratory and its employees always have been active participants in surrounding communities in the Tri-Valley and San Joaquin County. These interactions run the gamut from civic to educational to business and philanthropic activities. For example, approximately 20,000 students and teachers are served by LLNL

education programs each year. The Laboratory's annual employee charitable fund-raising drive, the Helping Others More Effectively (HOME) Campaign, raises more than \$1 million each year for area nonprofit organizations. In 2008, Lawrence Livermore National Security, LLC (LLNS), the Laboratory's managing contractor, matched employee pledges with an additional \$1

million donation, making LLNL one of the largest charitable contributors in the region.

To learn more about the Lab's involvement in local communities, go to Community Connections on the Laboratory's Public Affairs Office Website (<https://publicaffairs.llnl.gov/>) located under Community.

LAB IMPACT ON THE COMMUNITY: BY THE NUMBERS

6,400
EMPLOYEES



Total LLNL employees. Approximately 3,300 live in Alameda County, 1,250 in San Joaquin County and 960 in Contra Costa County. (FY08)

\$1.6
BILLION



LLNL's budget for fiscal year 2008.

\$596
MILLION



Annual LLNL employee payroll base to the counties of Alameda, Contra Costa and San Joaquin (FY08).

715
UNITS



Blood donated by LLNL to American Red Cross in 2008. LLNL was the largest contributor in Northern California.

\$388
MILLION



Amount spent by LLNL on the procurement of goods and services. More than \$258 million in Alameda, Contra Costa, and San Joaquin counties (FY08).

20,000
STUDENTS & TEACHERS



Benefit from LLNL education outreach programs each year.

Discover LLNL is a publication of the Public Affairs Office at Lawrence Livermore National Laboratory. For more information, please contact Linda Lucchetti, lucchetti1@llnl.gov, or call (925) 422-5815. Lawrence Livermore National Laboratory is managed by Lawrence Livermore National Security, LLC for the U.S. Department of Energy's National Nuclear Security Administration. Work performed under Contract DE-AC52-07NA27344.