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Contributing to a Better Community

Lawrence Livermore National Laboratory

Making History
Making a Difference

1952-2002

Lawrence Livermore National Laboratory

The Livermore branch of the University of California Radiation Laboratory opened in 1952 at a deactivated Naval Air Station.

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Introduction

The Lawrence Livermore National Laboratory (LLNL) is a highly visible public entity in the San Francisco Bay Area that conducts some of the nation's most innovative science and technology. We are making important contributions in national security, energy, environment, and bioscience to help solve pressing national problems. With an annual budget of $1.5 billion and a job base of some 8,100 people, the Laboratory has a significant impact on the local and regional economy through its payroll and direct purchases of goods and services. The Laboratory is committed to enhancing community welfare, quality of life, and educational excellence. We are an active participant in Bay Area economic development efforts, diversity programs, educational outreach, charitable events and volunteer services. Externally, the Laboratory strives to be perceived as an intellectual asset and a helpful neighbor. We want the communities around us to be proud that we are here.

Lawrence Livermore National Laboratory.

This document highlights our principal outreach efforts to the community. These efforts, which are considerable, include the use of informational and participatory processes to assure community concerns about the environment and public health are considered in the Laboratory's planning processes. It is important that issues related to LLNL programs and operations are discussed with the community in an effective and timely manner, and that we meet all applicable legal and regulatory requirements for environmental public participation and public information. Community outreach is an explicit requirement for the Laboratory under our Prime Contract Clause I.079, Community Commitment. Additional resources about our community outreach are available on the Web sites listed in Appendix A.

About the Lab

LLNL is a premier applied-science national security laboratory and a world leader in four broad research areas:

- nuclear science and technology,
- advanced lasers and electro-optics,
- materials science, and
- high-performance scientific computing.

National resource for science and technology.

The Laboratory is managed and operated by the University of California (UC) for the U.S. Department of Energy (DOE) National Nuclear Security Administration (NNSA). Established in 1952 to help ensure national security through the design, development, and stewardship of nuclear weapons, the Laboratory made major advances in nuclear weapons safety and performance throughout the Cold War. Although the threats to our nation have changed dramatically over the past 50 years, LLNL has been making history and making a difference through multidisciplinary, large-scale research and development. We have continually changed to address the challenges of the day and anticipate future needs, keeping a central focus on national security.

Now—as much as 50 years ago—innovative application of advanced science and technology is needed to cope with the threats that the world faces.

Today, our primary mission is to ensure that the nation's nuclear weapons remain safe, secure, and reliable and to prevent the spread and use of nuclear weapons and materials worldwide. Our principal responsibilities include:

• Stewardship of the nation's nuclear weapons stockpile.

• Stemming the proliferation of weapons of mass destruction.

• Responding to other important national security needs through the application of Livermore's science and technology.

Gov. Gray Davis, flanked by Ron Cochran, Lab Executive Officer, (left) and Bill Wattenburg, unveil the Truck Stopping Device to the press.

Other major projects that enable us to make unique and valuable contributions that respond to broader national needs within the missions of the DOE include:

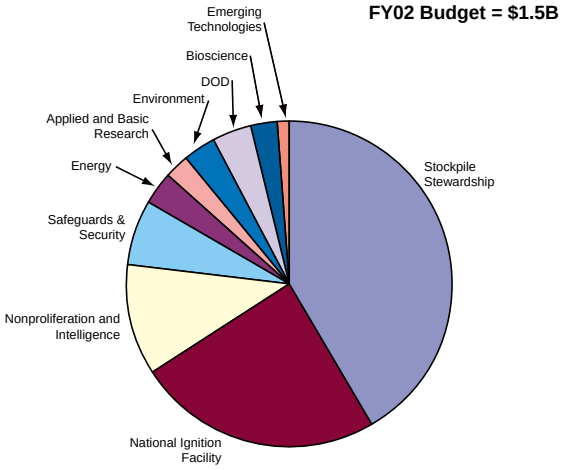
• Energy security and long-term energy needs.

• Environmental assessment and management.

• Bioscience advances to improve human health.

• Fundamental science and technology.

National security programs represent about 83% of the Laboratory's budget. The NNSA Stockpile Stewardship Program, including the National Ignition Facility, accounts for over half of our resources. We receive most of our funding from the NNSA Office of Defense Programs. Funding also comes from the NNSA Office of Defense Nuclear Nonproliferation, various Department of Defense (DoD) sponsors and other federal agencies for national security work.



Much of our work is executed in partnership with industry, academic institutions, and other laboratories. Partnering activities span a wide range—from very large-scale strategic alliances to licensing of individual technologies, academic research, educational outreach, and support for the small business community. Often partnerships and collaborations are the most cost-effective

way for us to accomplish programmatic goals. In addition, LLNL has a responsibility to move appropriate technologies developed in the course of our mission work into the marketplace, where the advances can have the maximum positive impact on the U.S. economy or other important national priorities.

The Laboratory's Main Site is situated on the eastern edge of the City of Livermore, about 80-highway km (50 miles) southeast of the City of San Francisco. The surrounding region is generally referred to as the Tri-Valley area (composed of the Livermore, Amador, and San Ramon Valleys). Sandia National Laboratories/California is located immediately south of LLNL. Approximately 32-km (20 miles) east lies the City of Tracy in San Joaquin County. Nestled in the hills between the Cities of Livermore and Tracy is LLNL's Site 300 Experimental Test Site. Both the Stanford Linear Accelerator Center and Lawrence Berkeley National Laboratory, two other DOE national laboratories, are also in the greater San Francisco Bay Area.

Aerial view of LLNL's Main Site in Livermore, CA.

Although the Laboratory is located in the County of Alameda, LLNL's workforce extends to three neighboring counties: Contra Costa, San Joaquin, and Stanislaus. Most employees reside in the Livermore-Amador Valley area and live in the City of Livermore. The next largest employee population resides in the City of Tracy in San Joaquin County.

The Laboratory's principal product is scientific and technical information, which we disseminate as broadly as possible. We maintain an extensive, award-winning public home page on the Internet that provides information on our programs, operations, employment opportunities, collaborations and partnerships, and outreach programs. We also provide Internet access to our institutional publications, which are designed to be useful to a broad audience. Where practicable, we are becoming more accessible through open information networks.

Stories on Laboratory scientific advances appear in major national daily newspapers, as well as local newspapers, and can also be found in prominent science publications. LLNL science and technology (S&T) have been highlighted on major broadcast networks, both radio and television. The Laboratory also continually seeks to improve communications with the general public and regional audiences. Our senior managers frequently serve as ambassadors for our programs and operations, meet regularly with national, state, and local officials, participate in community events, and spearhead our numerous outreach programs.

CNN's Chuck Afferback interviews Page Stoutland, of the Non-proliferation, Arms Control, and International Security directorate, (right) on technologies to combat bioterrorism. Lab counterterrorism programs have been a popular subject of media reports since the Sept. 11 attacks.

Our wealth of knowledge and state-of-the-art research facilities are shared with the community through our extensive array of formal and informal educational outreach programs at the K-14 and college/university levels, diversity-related outreach programs, business partnerships, and economic development activities. The Laboratory has agreements with various universities, colleges, and community colleges to support industry-driven workforce training in support of U.S. high-technology industry needs, minorities and women in science and engineering, and the missions of the Laboratory.

LLNL employees are active in a broad range of civic and professional organizations at the local, regional, state and national level. They also give generously to the community through their extensive volunteerism and active

The Undergraduate Summer Institute in Applied Science brings college science and engineering students to LLNL for a rare opportunity to study "big science" at one of the world's pre-eminent applied science research centers.

involvement in charitable giving. LLNL ranks as one of the single largest charitable contributors in the Tri-Valley. Our annual charity drive, the HOME (Helping Others More Effectively) Campaign, has raised more than $1 million annually for the past four years.

The Laboratory is a national resource center of applied science and technology. In this role, we serve diverse customers and strive to meet the needs of many stakeholders. These interactions range from the broad scientific community and the leaders of the federal government to our own local community and employees. A core value of the Laboratory is to assure "honest, open interactions with all customers and team members — within the Laboratory, in the communities we serve, and with our partners." Public outreach plays an important role in establishing and maintaining such interactions. While outreach efforts occur at all levels throughout the Laboratory, it is central to the mission of several key LLNL organizations. These organizations and their principal outreach activities are highlighted in this document.

Economic Impact

As a federally funded laboratory, nearly all of our $1.5 billion in funding comes from outside the region. Roughly $1 billion of this funding is spent within California. Money spent institutionally by LLNL is re-spent again in California's economy by our employees, contract workers, and the businesses that receive it. Whether its dollars spent or jobs created, the Laboratory is a significant contributor to the region's economic well-being and quality of life.

LLNL plays a major role in the economy of the San Francisco Bay Area. We employ some 8,100 people and have a payroll base of nearly $690 million. LLNL is the largest employer in the City of Livermore and the third largest in Alameda County. We provide stable employment and top-quality benefits to our employees and their families. Historically our rate of employment has been fairly steady since the Laboratory is generally buffered from normal commercial economic downturns.

The Laboratory's economic impact also extends to the way we buy things. In fiscal year 2001, LLNL purchased over $568 million in goods and services from outside sources of supply. Of that amount:

- Over $348 million was spent in California
- Nearly $142 million was spent in the Bay Area

Downtown Livermore.

The Laboratory's Small Business Program Office in Procurement & Materiel strives to help Small Business Enterprises, Small Disadvantaged Businesses, and Small Woman-Owned Businesses at both the state and federal level become competitive and land LLNL subcontracts. In fiscal year 2001, nearly $169 million in procurements went to small business. Nearly $45 million went to small disadvantaged business. Over $25 million went to women-owned small business. Outreach activities, interactions with various agencies, memberships, and participation in numerous conferences are listed below.

- Annual Jet Propulsion Laboratory "High-Tech" Small Business Conference
- Hoopa and Navajo Tribal Council Meeting
- Industry Council for Small Business Development
- National Association of Women Business Owners Bi-Monthly Meeting
- Northern California Supplier Development Council and Annual Trade Fair

- Professional Businesswomen of California Conference
- Small Business Administration (SBA) 8(a) Association Monthly Meetings
- SBA San Francisco 8(a) Showcase
- UC Berkeley's Small Business Trade Fair
- Women Business Owners
- Women's Technical and Professional Symposium

Procurement & Materiel (P&M) has established a supplier management program that has a database of hundreds of Small Business Enterprises, Small Disadvantaged Businesses, and Small Woman-Owned Businesses (SBEs, DBEs and WBEs) from the local area as well as nationally. In support of DOE's policy to fully integrate SBEs, DBEs, and WBEs, and Historically Underutilized Business Zone (HUBZone) business concerns in DOE's core mission and programs, P&M negotiates annual goals in prescribed socioeconomic categories. Using a sophisticated forecasting model and working in concert with resource analysts from around the Laboratory, P&M develops annual socioeconomic goals that are both reasonable and attainable. The goals, carefully monitored and compared to actual procurements throughout the fiscal year, may be adjusted at mid-year, depending on changes to individual program spending plans or the Laboratory budget at large.

As a federally funded research and development facility, the Laboratory is home to a broad and rich source of technologies that would be difficult to develop solely with private funds. By partnering with U.S. industry we are able to transfer LLNL-developed technologies to the marketplace, thus benefiting the U.S. economy. Our Industrial Partnerships and Commercialization (IPAC) Office helps Laboratory programs enter into partnerships with industry on behalf of the UC and the DOE. A prime example of IPAC's industrial outreach with the surrounding community is the Tri-Valley Technology Enterprise Center (TTEC), a collaborative effort involving the Tri-Valley Business Council, Sandia National Laboratories, PG&E, Congresswoman Ellen Tauscher, the City of Livermore, and various business leaders in the community. The TTEC is a business incubator that provides offices and administrative and management support to start-up companies and facilitates technology commercialization and transfer programs at the national labs. The TTEC is housed in a 4,400-square-foot, 16-room building loaned by the Laboratory.

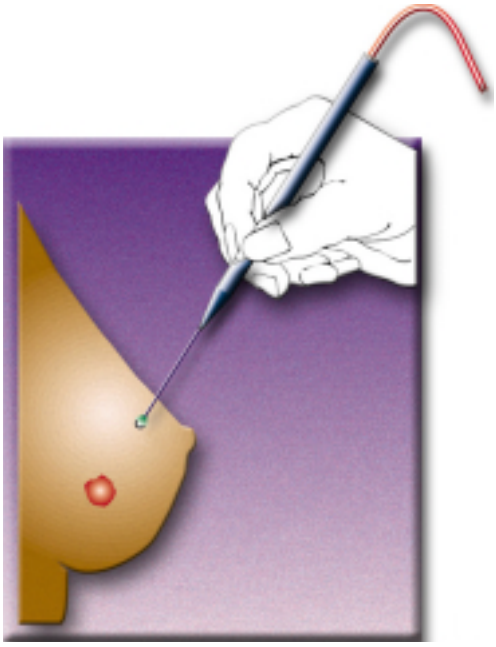
Alameda County Supervisor Scott Haggerty (at the podium) praised TTEC for the boost it will provide to the Tri-Valley. Local officials joined Haggerty for the ceremony.

LLNL supports small business partnerships because these projects help us act as a responsible member of our community and apply our valuable resources where they can make a major difference. A majority of our industrial partnerships are with small businesses and start-up companies. The Laboratory also has numerous informal relationships with local and state organizations that benefit the state and community, including those listed below:

- Alameda County Economic Development Alliance for Business
- Bay Area Economic Forum
- Bay Area Regional Technology Alliance
- Berkeley Roundtable on the International Economy, University of California Berkeley
- California Environmental Business Council
- Diablo Venture Alliance
- East Bay Conversion and Reinvestment Commission

- Pacific Incubator Network
- Silicon Valley Space Defense Consortium
- Tri-Valley Business Council

LLNL is among the leading DOE labs in collaborating with small businesses receiving awards under the DOE Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs. In addition, LLNL actively participates in the SBIR/STTR programs of other federal agencies. LLNL also actively supports small businesses through Collaborative Research and Development Agreements (CRADAs). On average about 60% of our CRADAs and amendments over the past several years have been with small businesses. The Laboratory also seeks to patent and license its intellectual property to promote commercialization and application of LLNL inventions. We currently have 84 active patent and copyright licenses. Of these, 35 are with California companies.



The “Smart Probe” makes real-time measurements of multiple parameters for breast cancer diagnosis.

The East Bay has rapidly become a new center for high-tech businesses, and the Tri-Valley is a core of this growth, with nearly 20% of its work force in tech jobs. This percentage is second in the Bay Area only behind Silicon Valley at 40%. LLNL technologies have been utilized to start several high-tech Bay Area companies, some of which are located in the East Bay. Examples follow:

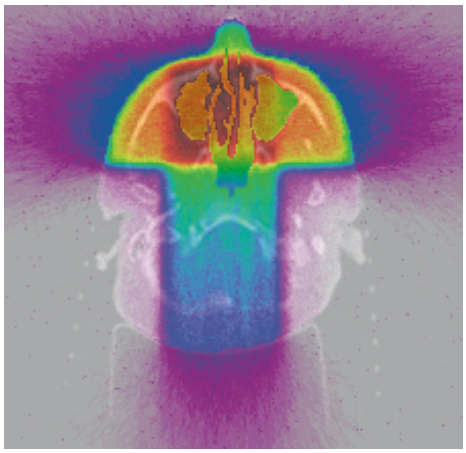
- Valid Logic (Sunnyvale, CA), formed in 1981 by two LLNL scientists, is often credited, along with two other companies, with pioneering the electronic design automation industry. Valid Logic’s initial products were based on the SCALD (Structured Computer-Aided Logic Design) software developed at LLNL in the mid 1970s. SCALD allowed the nearly complete automated design, manufacturing and testing of high-performance digital circuits, drastically reducing the time and cost to design computers and digital circuits. Valid Logic reached a market capitalization of $250 million, considered a huge value for a start-up company in the 1980s, and was later bought by Cadence Design Systems. This impressive contribution to technology was acknowledged by the IEEE Computer Society which granted the two LLNL scientists the coveted W. Wallace McDowell Award in 1984, the second time this award was ever given to government-sponsored research.
- PowerStor Corporation (Dublin, CA) is an independent and privately-held company that has developed a new class of supercapacitor called the Aerogel Capacitor. This patented product is a unique, ultra-high capacitance device that utilizes a novel material called carbon aerogel that was developed at LLNL. The Aerogel Capacitor’s breakthrough low-resistance enables its use in pulse-power and electronic circuitry applications, which other types of supercapacitors cannot address. PowerStor Corporation was recently acquired by Cooper Industries, a Fortune 500 company.
- BioLuminate (Dublin, CA) is a private, developmental-stage start-up company. It is developing, in collaboration with NASA/Ames and LLNL, a smart probe that provides real-time breast cancer detection data to physicians, and may serve as a cancer treatment delivery device, when cancer is found. BioLuminate has been collaborating with LLNL to develop our optical imaging and probing technology for cancer detection applications.
- Ocellus (Livermore, CA) is an independent and privately-held company that has developed silica and carbon aerogels based on LLNL and its own proprietary technology for a number of high-end applications.

- Therma-Wave (Fremont, CA), formed in 1982 by Lab employees and leveraging LLNL technology, commercialized products that revolutionized ion implant measurement and film thickness measurement, enabling quantum leaps in semiconductor manufacture. The company is now a worldwide leader in process control metrology systems that are used in semiconductor manufacturing. By 2001, after its 2000 initial public offering, Therma-Wave had grown to 630 people with about $200 million in annual revenues.
- Cepheid (Sunnyvale, CA) is developing fully integrated portable instruments and laboratory systems that can be used to detect infectious disease agents, human genes, and industrial and environmental contaminants quickly and accurately. Cepheid, which obtained its first license from LLNL as a small start-up, completed its initial public offering in June 2000, raising over $36 million. In 1997, Cepheid obtained a license to specific applications of LLNL patents covering work on micro-fabricated chemical reaction chambers developed at the Lab and funded in part by the Department of Defense.

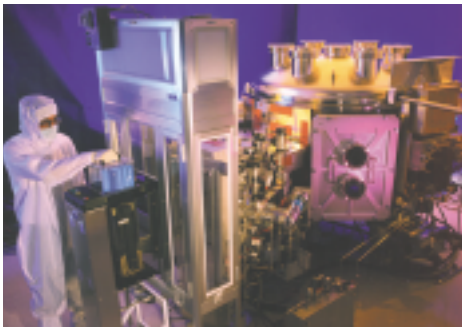
By 2000, close to 1,000 people were employed by Bay Area companies that started with products based on Lab technologies. These companies generated over $200 million in revenues. Many other companies outside the immediate area are also based on or use LLNL technology. A few examples follow:

- Nomos (Pennsylvania) provides advanced radiation therapy solutions in the fight against cancer. It is the exclusive licensee for LLNL's Peregrine™ technology, which uses Monte Carlo statistical techniques to predict accurately the radiation dose to tumors and other structures within the patient's body during a radiation treatment.
- Cytomation (Colorado), a start-up company, specializes in high-performance modular flow cytometers, analyzers, sorters, accessories and upgrades. During the early 1980s, a team of LLNL researchers built a high-speed flow cytometer and successfully used it to sort human chromosomes in what became the Human Genome Project. In 1994, Cytomation introduced the MoFlo® cytometer, a commercial version of the high-speed cell sorter developed by LLNL. This system increased the sorting speeds of commercially available sorters from 5,000 cells per second to 50,000+ cells per second. Cytomation was recently recognized on Inc. Magazine's list of the 500 fastest growing prviate companies.
- Endress+Hauser (E+H) is a world leader in area of measurement and automation. The company manufactures a level measurement device for bulk solid applications that is based on LLNL's micro-power impulse radar technology. Endress+Hauser's operations in the United States consist of more than 400 employees, including E+H USA in Indiana, as well as at Endress+Hauser Systems and Gauging, Inc. in Georgia.
- Interlogix-Sentrol (Oregon) is in the security and life safety business. It manufactures motion sensors for industrial and home security and has developed an advanced system based on LLNL's micro-power impulse radar technology.
- Vysis, Inc. (Illinois) has an exclusive license to LLNL's chromosome painting technology which, by permitting the detection of DNA abnormalities in a single cell, enables the evaluation and management of certain genetic diseases, potentially allowing treatments customized to each patient's specific needs. With five products already through the FDA approval process, Vysis was the first genomic company to turn a profit (2000). As a sign of its success, it was acquired by industry leader, Abbott Laboratories, a global health care company, in 2001.

Optic-Probe 5240 Film Thickness Metrology System produced by Therma-Wave.



Drawing on 40 years of expertise in radiation physics, researchers at LLNL have developed PEREGRINE, a highly accurate computer system for calculating where and how much radiation is absorbed in the body during radiation treatment for cancer and other diseases.



Extreme ultraviolet lithography technology developed by a virtual national laboratory composed of LLNL, SNL, and LBNL.

- In addition to companies already using LLNL technologies, the Lab has numerous commercialization partnerships. The largest of these, the EUVL (Extreme Ultraviolet Lithography) project, is with a consortium of chip manufacturers (including Intel, AMD, Motorola, IBM, Infineon), and represents the largest investment ever made by private industry in a DOE CRADA. This CRADA, valued at over $250 million, is being conducted jointly with Lawrence Berkeley National Laboratory (LBNL) and Sandia National Laboratories (SNL). The new technology will enable microprocessors to become 100 times more powerful and memory chips to store 1,000 times more information than is now possible.

At LLNL we recognize the importance of close relationships with local neighbors, community leaders and groups, public officials, and the media. Our Public Affairs Office (PAO) fosters greater public awareness of the Laboratory through proactive and responsive community relationships that focus on the timely release of information to important audiences and seeking the concerns and comments of those audiences. In addition, we strive to be of general assistance to community members who want information about LLNL. Key elements of the Laboratory's community relations program are summarized below.

- PAO maintains close contact with the City of Livermore Mayor, City Manager and City Council members. Laboratory senior managers frequently meet with the Mayor and other City officials throughout the year. The Laboratory also maintains contact with the nearby cities of Pleasanton, Dublin, San Ramon, and Tracy. An electronic newsletter is distributed monthly to local elected officials, civic leaders and general community members to provide information on upcoming LLNL programs and issues.

Livermore's newly installed Mayor Marshall Kamena (left) is greeted on his first official visit to the Lab by Director Bruce Tarter (right) and Dave Leary, Public Affairs Director (center).

- On behalf of the Laboratory, PAO maintains active memberships in the Livermore, Pleasanton, San Ramon, Dublin, and Tracy Chambers of Commerce. PAO is in close contact with Chamber officers and executive staff, giving them heads-up calls about major issues at the Laboratory. PAO provides professional media training services for the Chamber of Commerce Leadership Programs in Livermore, Pleasanton and San Ramon Valley. These training classes are well received and have fostered excellent relationships between LLNL and community leaders.

- PAO is a member of the Valley Study Group, a local civic group made up of residents from the Tri-Valley area. An update on Laboratory activities is provided at each of the group's monthly meetings. The group is made up of community leaders, local residents, and LLNL retirees who serve as a liaison to the community. Laboratory managers are frequent invited speakers at the group's meetings. PAO also helps to strengthen the Laboratory's relations with other local clubs and organizations by securing speaking engagements for LLNL employees.

- The comprehensive Public Affairs Web page features the latest news and photos of the Laboratory and information about each of the three main areas of Public Affairs: Media Relations, Employee Communication, and Community Relations. Viewers can click on the latest press releases, search

archived press releases, find out how to sign up for upcoming community tours, and contact PAO. Viewers can also subscribe to the Lab's monthly electronic newsletter that shares timely information about upcoming events and recent news. In addition, reporters have the ability to be automatically added to the Lab's press release distribution process.

- PAO issues several news releases each week plus occasional tip sheets, media advisories and photos covering LLNL programs. On average about 40 inquiries each week come in from international, national, and regional media organizations. PAO hosts three to five media visits per week and makes extensive use of the Internet to distribute material to the news media.

- PAO operates the Laboratory's Visitors Center, which is open to the public every week day afternoon. Inside, visitors can see displays on the Laboratory's national security, lasers, chemistry, energy, and biosciences programs, as well as information on our history as one of the pioneers in national research and development. Throughout the year, touring displays from the DOE and other agencies are featured. Videos, including an overview of the Lab and highlights of major news stories about our scientific achievements, can also be viewed.

- PAO conducts Community Tours for the general public. Group tours for eight or more persons can be arranged. Online Internet tour registration is available. Special tours and events are hosted to bring community leaders and members to specific sites around the Laboratory. Web-based program tours are available on the Lab's public Web site.

- The Laboratory offers a weekly community television program in partnership with Sandia National Laboratories to bring important LLNL research to broad community audiences. In addition, we host an annual series of six community lectures, at local high schools and other community venues, on issues of interest to the general public. The speakers are from research institutions from throughout the U.S., as well as from LLNL. These lectures are videotaped and shown on the local cable televsion station, as well as used in high school and community college classrooms.

- The Laboratory's Family Days Open House, held every few years, provides an opportunity to feature LLNL capabilities and accomplishments. In addition to LLNL employees bringing their family and friends on site, there is a special guest day for community and education leaders.

Formal surveys are used periodically to gather internal/external input on major issues. The latest survey on external communications was the 2000 Charlton community survey to gauge public perception of the Laboratory, the fourth quantitative survey that has been conducted in the past ten years by Charlton Research Group of Walnut Creek, CA. The survey indicated that the Lab is seen as an important economic resource to the immediate community, one that is safe, well managed, protects national secrets, and is largely supported by its surrounding communities. The overall conclusion of the survey is that "the Lab is seen as a good neighbor and the community holds the Laboratory in high regard." In addition, the Laboratory is "known best for its scientific research and the revenue its employees put into the community." Survey results also indicated that the Laboratory's affiliation with the University of California contributes to LLNL's good standing.

LLNL Visitors Center off Greenville Road.

Space and Science Saturday, a special event hosted for the community by the Lab's Public Affairs Office.

Environmental Community Relations

Taking water samples on site.

Laboratory management places significant emphasis on timely, effective communications and interactions with the local community on matters related to environment, safety and health (ES&H). Primary responsibility for this communications effort rests with Environmental Community Relations (ECR) in our Environmental Protection Department. ECR meets applicable legal and regulatory requirements for LLNL environmental public participation and public information activities. Our "Policy on Public Participation on ES&H Issues," issued in 1994, is publicly available on the LLNL home page. The Laboratory's "Annual Site Environmental Report," prepared each year by the Environmental Protection Department and also available on the Web, summarizes the results of environmental monitoring and provides an assessment of the impact of Laboratory operations on the environment and the public.

In addition to our responsibilities to employees and neighboring communities, we must ensure compliance with the National Environmental Policy Act, the California Environmental Quality Act, and related federal and state requirements. Environmental protection efforts include environmental monitoring, risk assessment, and analysis, as well as major endeavors in environmental restoration–principally groundwater cleanup–and hazardous waste reduction and disposition.

LLNL has numerous forums for public participation on ES&H issues. Key examples include, but are not limited to, the following:

- The Main Site Community Work Group (CWG), voluntarily created by LLNL, provides public input to LLNL on Main Site environmental restoration activities and priorities. Members represent broad sectors of the local community and representatives of regulatory agencies.

- The Community Review Panel, Site 300 Restoration, voluntarily created by LLNL, obtains community comments and concerns on Laboratory information concerning the Superfund cleanup. The Panel comments on information publications in draft form, informing the Laboratory about concerns and potential issues.

- Quarterly meetings, started voluntarily by the Laboratory, are conducted with Tri-Valley Communities Against a Radioactive Environment (CAREs) to obtain information on public concerns early on in the restoration process. The Tri-Valley CAREs is a recipient of Technical Assistance Grants from the Environmental Protection Agency. Tri-Valley CAREs is also represented on the Main Site Community Work Group and the Site 300 Community Review Panel. They are also invited to attend other ES&H-related public involvement and public participation activities.

- LLNL continues to participate in a public forum for discussing the community and public health concerns about Laboratory environmental restoration activities and operations, including contamination in Livermore's Big Trees Park, ground water, and Site 300 issues. This effort is part of a national program by which DOE funds the Agency for Toxic Substances and

The Western Burrowing Owl graces the cover of the Lab's "Environmental Report 2000."

Disease Registry (ATSDR) to conduct a public health assessment at Superfund sites. The "Livermore" team consists of some 20 people and includes representatives from the Laboratory, the City of Livermore, the California Department of Health Services, the Federal ATSDR, Tri-Valley CAREs, Western States Legal Foundation, and Physicians for Social Responsibility.

- Direct contact with regulatory agencies, including the U.S. Environmental Protection Agency, California Environmental Protection Agency, Department of Toxic Substances Control, and the regional water and air quality control boards, is maintained throughout the year. The Lab offers technical guidance and expertise on regulatory requirements and related compliance options, permitting issues, monitoring techniques and technologies, as well as provides 24-hour emergency response for environmental incidents.

- The Laboratory makes extensive use of public workshops and meetings to help local communities learn of the issues as well as proposed decisions and solutions related to Laboratory operations. We also use public notices to help focus public attention on key issues and documents that are made available through our public repositories. These notices are usually oversized, appear in multi-media, and are designed to meet regulatory requirements.

- The Laboratory communicates directly with neighbors living within about one-half mile of the main Livermore site and owning property near Site 300. Individual letters apprising neighbors of events or activities that could impact them are sent on a timely, as-needed basis. These letters also solicit any concerns about the Laboratory.

- Targeted, focused community outreach efforts directed at key local organizations (e.g., city officials and administrators, planning departments, media, realtors and developers) are maintained to determine and resolve environmental concerns. Periodic personal visits to receive any concerns are also undertaken.

- An Environmental Community Relations response telephone number is publicized to receive and deal with community concerns. In addition, the Laboratory provides and distributes an Environmental Community Letter as needed, but at least annually, to carry information about its environmental activities. It is also used to invite comment and concerns regarding LLNL activities.

- The Laboratory maintains a publicly accessible Environmental Information Repository, located at the Visitors Center, which contains a collection of documents of Main Site and Site 300 environmental review and compliance reports. We also maintain key documents at the Livermore and Tracy libraries. Our environmental information home page includes all public access documents as well as historical records, recent communications with stakeholders, and a Web link to encourage questions.

- LLNL environmental specialists contribute their expertise to a variety of city, county, regional, and state agency environmental and regulatory policy makers, such as those dealing with leaking underground fuel tanks and MTBE in gasoline and in groundwater. They also work cooperatively with other environmental specialists in private industry on matters of mutual concern.

Environmental technology developed by the Laboratory with funding from the DOE will clean a heavily contaminated industrial site in Visalia in a few years, not centuries, as would be required using conventional methods.

Site Planning & Conservation

The Amsinckia grandiflora (the Fiddleneck).

LLNL has rigorous, comprehensive and well documented site planning and environmental protection processes for both the Main Site and Site 300. We go to extraordinary lengths to protect the various species located within our boundaries and conserve our natural resources. In addition, we have an ongoing environmental restoration program actively investigating and remediating historical chemical releases to the environment.

- A key element of our site planning process is stakeholder participation. Plant Engineering (PE) staff interface on a regular basis with the planning departments of the Cities of Livermore and Tracy, Alameda and San Joaquin Counties, as well as the neighboring Sandia National Laboratories, on matters relating to the Main Site and Site 300. Issues are also coordinated with the other agencies, where necessary, that are impacted by Laboratory site plans. In preparing the "Comprehensive Site Plan," both public input and internal comments are collected, considered, and the appropriate issues are incorporated in the final document. PE staff and Site 300 management also work closely with both commercial and residential neighbors of Site 300 to maintain positive and harmonious relations. This involves reciprocal visits, briefings, and tours of the site, along with continuing personal initiatives.

- The Laboratory, in partnership with the DOE, is committed to protecting our environmental assets. At LLNL, we ensure that all of our programmatic activities incorporate species protection and wildlife monitoring measures, as necessary, so that these special environmental concerns are addressed. Under an agreement between the DOE and the U.S. Fish and Wildlife Service, 160 acres of Site 300 land have been designated as the Amsinckia grandiflora Reserve. The Amsinckia Reserve provides critical habitat for more than 300 species of plants and 95 species of mammals, birds, reptiles and amphibians. Plants in the reserve that will be protected include a portion of increasingly important native grasses. Part of the reserve also provides potential habitat for the endangered valley elderberry longhorn beetle. The reserve supports the threatened California red-legged frog, and may contain potential habitat for the threatened Alameda whipsnake.

LLNL environmental analysts design optimal wastewater retention tanks for environmental compliance.

- LLNL has an ongoing site restoration mission: identify and clean areas of contaminated soil and ground water. A number of test beds use innovative technologies designed to support the goals of the nation's Environmental Protection Agency (EPA). The EPA has recognized the Laboratory as a "champion of green government." Recycling materials from decontamination and demolition projects earned LLNL the EPA's Greening the Government Award for 2001 in recognition and appreciation of individuals and groups that go "above and beyond the call of duty in working to improve the environment."

- The Partnership for Environmental Technology Education (PETE) Program is a nonprofit organization initiated by the Laboratory to train qualified technical staff to work on environmental cleanup and pollution prevention. The PETE Program is connected with over 500 local technical, minority, junior and four-year colleges in the nation. This network is divided into five regions where each has a governing board to focus on the regional issues and courses germane to their needs.

- The Laboratory's Pollution Prevention Team in the Environmental Protection Department has a recycling program to dispose of medium to large amounts of nonhazardous single-use, Tyvek plastic-type lab coats, coveralls, booties or envelopes. Through an innovative contract with a recycling company, revenue from LLNL recycled nonhazardous Tyvek is given to a local charity.

- On a voluntary basis, employees from various LLNL organizations, including most notably Plant Engineering and the Environmental Protection Department, participate in educational outreach efforts to increase the awareness in Bay Area communities and schools about energy, water and wildlife conservation, and recycling.

- LLNL environmental specialists make numerous visits to schools from elementary to college level in the Bay Area, South Bay, and Central Valley of California providing insight to environmental careers, science, natural resources, environmental regulatory issues and environmental pollution.

- LLNL is an employer partner for the Bay Area Air Quality Management District's "Spare the Air" program. Acting as a good neighbor, the Laboratory requests that all employees turn off unnecessary electrical equipment and lights when we receive alerts from the California Independent System Operator, a nonprofit corporation that manages the flow of most power in the state. On a voluntary basis, LLNL, a major power user in the Tri-Valley area, has reduced energy use during these alerts by some seven to a ten percent.

- The Laboratory's Transportation Systems Management Program (TSMP) develops effective methods to reduce traffic-related air quality and congestion management problems at the Main Site and Site 300 and in the surrounding communities of the Tri-Valley, Bay Area, and Central Valley. An important part of TSMP activities is keeping employees informed about convenient and cost-effective commuting alternatives such as buses, carpools, and vanpools.

Air monitoring stations are part of LLNL's environmental surveillance network.

Mutual Aid

The Laboratory has mutual aid and automatic aid agreements for fire services with the cities of Livermore, Pleasanton, and Tracy, Alameda County, the California Division of Forestry, and the State of California. Our Emergency Management Division (EMD) is the dispatch center for Alameda County mutual aid for large-scale emergencies, and the LLNL Fire Chief serves as the County Mutual Aid Coordinator. We have Memorandums of Understanding with Eden Hospital and Valley Care Medical Center in Alameda County under which the Laboratory commits to annual refresher training of the hospital emergency room staff on treatment of contaminated patients. LLNL fire fighters teach and LLNL co-sponsors community and public school fire prevention programs. EMD also provides paramedic ambulance service when the Alameda County contract provider is unable to respond in a timely manner.

In the area of protective services, LLNL has mutual aid agreements with Livermore, Alameda County, San Joaquin County, the California Department of Parks and Recreation, the California Highway Patrol, the Federal Bureau of Investigation, and Sandia National Laboratories/California.

The Transportation System Management Program (TSMP) faire.

LLNL fire fighters.

The Laboratory participates in various emergency response exercises with other emergency services on an ongoing basis. Participants include local fire departments, the California Highway Patrol, local hospitals, and ambulance services. We also conduct an annual evacuation exercise during which all buildings are evacuated, our self-help program is activated, and self-help zone supervisors report status to the Emergency Management Center. Also tested is our ability to notify community partners about our emergency.

Education

As a part of the University of California and as a DOE national laboratory, LLNL shoulders significant science education responsibilities. We have long been committed to enhancing science education for the benefit of the nation. The Laboratory is home to several university-focused scientific research institutes and other unique facilities that support hundreds of ongoing projects with faculty, postdoctoral fellows, and graduate students. By making the Laboratory's research facilities and staff accessible to the academic and industrial communities, we provide valuable opportunities to visiting researchers while we strengthen our science and technology base. LLNL offers numerous student programs at the pre-college, undergraduate, graduate and Ph.D. levels to provide education that encourages careers as scientists and engineers and serves as a workforce pipeline for highly specialized skills.

LLNL collaborations with academia, in particular the University of California, are extensive and include, but are not limited to, the following:

LLNL provides recent Ph.D.s with opportunities to broaden their education, continue their training, and participate in leading-edge scientific research.

- Our University Relations Program (URP) encourages and expands research collaborations between LLNL and universities and other research organizations. By facilitating the flow of ideas and people between institutions and by making our unique facilities and expertise available to students and faculty, we hope to address problems that are of interest to the broad U. S. research community and to solve complex problems of importance to the nation. The URP oversees the Laboratory's five university research institutes, our prestigious Postdoctoral Fellowship Program, our sabbatical program, and the Science and Technology Education Program (STEP), among other activities.

- The Laboratory's five university research institutes include the Center for Accelerator Mass Spectrometry, the Institute of Geophysics and Planetary Physics, the Institute for Laser Science and Applications, the Institute for Scientific Computing Research, and the Materials Research Institute. These institutes foster collaborations between university faculty, staff, students, and LLNL staff; provide LLNL programs with input of new ideas, people, and contact with the large university community; foster top-quality research at LLNL in the more "basic" or "fundamental" aspects of fields that are important to LLNL programs; and provide a stimulating venue for LLNL scientists to broaden their research horizons.

- Also within the URP is the LLNL Research Collaborations Program for Historically Black Colleges and Universities (HBCUs) and other Minority Institutions (MIs). This program develops and promotes productive and mutually beneficial scientific collaborations between LLNL and the nation's

HBCUs and MIs. The collaborations link accomplished faculty and students from these institutions with LLNL principal investigators in research that supports LLNL and DOE programmatic missions. The professors and students in this program have made important contributions to basic and applied research efforts at LLNL. Also, a significant number of the undergraduate participants have entered graduate programs in the physical sciences. A major goal of the program is to increase the number of minority students entering science and technology careers, particularly in disciplines which are important to LLNL and DOE.

Director Emeritus Edward Teller teaching at the new Edward Teller Education Center.

- The UC Davis Department of Applied Sciences (DAS) enables the Lab to attract and train students in special S&T disciplines needed to pursue our mission. DAS allows students and university professors to work with the sophisticated resources of the Laboratory and engage the very large, difficult S&T challenges of our age. In March 2001, UC Davis, in collaboration with the UC Office of the President (UCOP), UC Merced and the Laboratory, announced the establishment of the Edward Teller Education Center adjacent to the UC Davis DAS at LLNL. The center, funded by UCOP and LLNL, provides opportunities for professional development for K-12 teachers working with participating school districts within the greater Livermore Tri-Valley area and the San Joaquin and Sacramento Valleys. In addition to UC Davis, UC Merced and LLNL, community colleges, state universities, industry and local school districts will be supporting and participating in center activities. The consortium's initial focus is on S&T instruction. This S&T focus combines the existing professional development outreach programs available from STEP and the teaching resources of DAS to leverage the scientific resources of the Laboratory.

- The University of California will be opening its tenth campus in Merced, California, in 2004. The new campus, which will eventually serve 25,000 students, is expected to have a close affiliation with the Lab. LLNL is helping to establish this new campus by contributing to the definition of its science and engineering programs, consulting on physical plant, helping plan programs for the UC Merced Sierra Nevada Research Institute, and serving on search committees for senior staff. Once the Merced campus is in operation, UC and the Laboratory expect to collaborate on research projects, student internship programs, and joint appointments that provide opportunities for LLNL personnel to teach. Over time, we expect UC Merced to become an important source for future Laboratory employees.

The Lab-UC Merced have signed an education pact. The memorandum of understanding signed by Ben Duran, President of Merced College, Carol Tomilson-Keasey, UC Merced Chancellor, and Lab Director Bruce Tarter will create science research projects for faculty and students.

- The Science & Technology Education Program (STEP) serves as a resource to students, teachers, and faculty through research opportunities with the Laboratory's world-class scientific facilities and staff. A common theme of the science education projects within STEP is the integration of education, research, and career options at all school levels—pre-college, undergraduate, and graduate school. These education projects, with a school-to-career goal, are important to the economic and national security of our nation so that the U.S. can compete successfully in the world marketplace and remain a major economic power. STEP supports the science educational needs of the local and regional communities surrounding LLNL. It supports the Lab's science education activities by educating future scientists through college research internships for students entering careers important to the intellectual capability required by LLNL's national security mission, and by improving the understanding of science through K-14 science outreach and educator

activities within the communities surrounding LLNL. STEP partners are extensive and include, but are not limited to, the organizations listed in Appendix B.

Student Research Academy sponsored by LLNL's Science and Technology Education Program, U.C. Davis—Department of Applied Sciences, and Sigma Xi Research Society.

– By offering college research internships, STEP facilitates partnerships and collaborations with the education community to help ensure a highly skilled, diverse workforce for the science and technology challenges within the national security mission needs of the DOE/NNSA. Individual internship projects fall within the Lab's Stockpile Stewardship Program and attract, place, and recruit students within four discipline skill areas: Computer Science/Math, Physics, Chemistry/Materials Science, and Engineering. Some 110 to 120 interns are placed each year in various national security projects.

– Through its science outreach and K-14 educator project, STEP motivates pre-college students to consider a college education as part of their future career choices. These pre-college science literacy activities play an important role in the creation of future scientists, engineers, and technicians by enlightening students to potential careers in science and technology, especially those of special interest to LLNL. STEP also stimulates greater interest among teachers and school administrators to encourage more students to pursue S&T careers after high school through local and regional education partnerships. Science outreach and educator projects typically engage over 10,000 participants – both students and teachers – annually in the projects identified in Appendix C.

• LLNL has developed a number of Memorandums of Agreement (MOA) with community colleges to support workforce training in response to U.S. high-technology industry needs and the missions of the Laboratory. These highly successful and innovative programs are addressing the critical U.S. shortage of skilled workforce personnel.

– LLNL and the Chabot-Las Positas Community College District (C-LPCCD) have a MOA that calls for LLNL and C-LPCCD to engage industry to provide a forum for collaborative efforts to evaluate future scientific, technical and industrial workforce skill needs; apply joint capabilities and resources and provide unique, innovative industry-driven technical training and retraining opportunities; and promote cooperation with other educational institutions including K-12. Through efforts under the MOA, enhanced or new programs have been developed at both the Chabot and Las Positas campuses.

Don Correll, a member of the Lab's Student Policy Committee, talks with graduate students at poster session for students who are fellows in the Student Employee Graduate Research Fellowship program.

– Through LLNL participation and support, the machinist program at the Chabot College campus in Hayward has been enhanced by upgrading the shop with additional newer equipment and expanding industrial participation to provide updated industry-driven curriculum. Program enrollment has increased. In a related effort, LLNL worked with Livermore's Granada High School to enhance the high school's machinist program. Granada High School is one of the few remaining high schools in the region that features an established machine shop program thanks in part to a donation of excess machine tools once used for work at LLNL. Laboratory personnel renovated the machine shop through the repair of

lathes, mills, grinders, and other machining equipment. By enhancing the training at the high school level, LLNL is helping students better prepare themselves for entering technical training at the community college level. Granada High School is now a feeder program for the Chabot College program, giving students the opportunity to earn college credits for their high school machining courses.

– At the Las Positas College campus in Livermore, a laser technologist certificate program was developed and implemented with LLNL assistance. Through an innovative approach, LLNL and other industrial partners worked hand-in-hand with the college faculty to develop industry-responsive curriculum. Additionally, the essential hands-on laboratory courses are taught on the LLNL site in laser equipped laboratories. A laser specialist from LLNL is retained by the College as the trainer. This program supports laser industrial workforce needs, including those of the National Ignition Facility under construction at LLNL.

– LLNL, BART (Bay Area Rapid Transit), C-LPCCD, and the Economic Development Allliance for Business have a MOA to develop a cost-effective, performance-based, state-of-the-art training program for rapid transit train operators that includes enhanced curricula, updated methodology and high-tech facilities. Under this agreement, the Laboratory provides scientific and technical expertise in identifying and recommending state-of-the-art training delivery methodology and equipment. This project serves as a national model for rapid transit training.

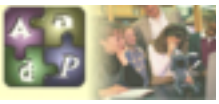
– We have a MOA with Monroe Community College (MCC) in Rochester, NY, to train technicians in optical fabrication. This agreement has important implications for the nation's future in energy and scientific research as well as national security. MCC's one-year Optical Fabrication Certificate Program, which is also supported by the American Precision Optics Manufacturers Association (APOMA), was designed to alleviate the national shortage of skilled optical workers. The MCC curricula will serve as a model for a distance education program to supply a workforce of hundreds more trained optics fabricators to all the nation's optical manufacturers in the years to come.

- Plant Engineering (PE) has a strong bond with California State University (CSU) California Maritime Academy (CMA), the first four-year institution in California to offer a degree in facilities management. This degree program provides PE, as the LLNL facilities management organization, with a future workforce of trained professionals. Joining with other companies such as Exxon, PG&E, ARCO Marine, and the US Coast Guard in an Industrial Advisory Board, LLNL helped create the four-year facilities management curriculum. The Board serves in an advisory capacity on curriculum development, mentoring on the program's mission and vision, and offers internships for students majoring in facilities management. Educational outreach by individual PE employees also extends to teaching and lecturing within the Pleasanton Unified School District, at Chabot Community College for local apprenticeship programs, and at CSU campuses. Other educational opportunities provided by PE include summer internships in land surveying and in space and site planning.

Teachers at a school in Stockton do experiments in the Great Explorations in Math and Science (GEMS) "Chemical Reactions" unit.

LLNL employee and adjunct CMA professor Captain Keith Graham lecturing prospective U.S. Merchant Marine reserve ensigns.

Outreach Programs



LLNL workforce plans consider both programmatic needs and institutional goals. One such institutional goal is to achieve “a workforce that is reflective of the rich diversity of California and the nation.” We have developed and are working to implement plans to increase the representation of minorities and women in the our workforce.

A focal point for our efforts to ensure equal employment opportunity and workforce diversity is the Laboratory’s Affirmative Action & Diversity Program (AADP). In addition to monitoring compliance with relevant executive orders and legislation, AADP develops the Laboratory’s action plans to increase diversity, sponsors a variety of outreach programs and interacts with employee network groups to foster strong working relationships among these diverse associations. AADP represents the Laboratory to diverse communities as a resource for employment, education, and commercial ventures. These outreach programs also serve the Laboratory in our recruitment and collaborative efforts, following government regulations, which require outreach efforts to women and minorities not currently in the workforce. AADP’s outreach efforts include professional and community organizations as well as educational institutions.

AADP outreach helps LLNL employ a diverse high-quality workforce. Jerry Johnson, Nonproliferation, Arms Control, and International Security directorate (center).

The Laboratory supports local and national service and community-action programs that improve employment opportunities for women and minorities. These outreach activities aim to meet our immediate and future hiring needs by reaching the broadest population, thus ensuring that all employment pools are diverse and represent the population available in specific career areas. The Laboratory supports and participates in activities sponsored by the following organizations:

- Asian Pacific Personnel Association
- Bay Area Apprentice Coordinators Association
- Bay Area Job Developer Consortium
- Bay Area Urban League
- Diversity in DOE
- Expanding Your Horizons
- Image Conference
- Project Uplift Job Fair

To promote LLNL as an employer of choice, AADP staff members participate in conferences for recruitment and educational purposes, support collaborative partnerships, and co-sponsor scholarships. The following list includes some of the professional organizations that are part of our program.

- American Association for the Advancement of Science
- American Chemical Society
- American Indian Higher Education Consortium
- American Indian Science and Engineering Society
- American Society of Mechanical Engineers

- California School for the Deaf
- National Association for Equal Opportunity in Higher Education
- National Consortium for Educational Access
- National Consortium for Graduate Degrees for Minorities in Engineering and Sciences, Inc.
- National Organization of Black Chemists and Chemical Engineers
- National Physical Science Consortium
- National Society of Black Engineers
- National Society of Black Physicists
- Northern California Diversity Forum
- Society for Hispanic Engineers
- Society of Mexican American Engineers and Scientists
- Society for the Advancement of Chicanos and Native Americans in Science
- Society for Women Engineers

Research collaborations program for historically black colleges and universities and other minority institutions.

LLNL interacts with minority educational institutions to encourage students to pursue science and technology careers. This effort is aided by the use of minority and female role models to help illustrate the viability of these fields as realistic career options. Additionally, because of the central role that educational institutions often play in minority communities, the introduction of LLNL science and technology by AADP can help stimulate the community's future economic growth. Minority institutions supported through this effort include:

- American Indian Tribal Colleges
- Historically Black Colleges and Universities
- Hispanic Serving Institutions

LLNL is also a partner in the Science and Engineering Alliance (SEA), a non-profit consortium founded by the Laboratory, Alabama A&M University, Jackson State University, Prairie View A&M University, and Southern University and A&M College in 1990. SEA is a national resource that is addressing the challenge of establishing an ethnically diverse technical workforce prepared to compete in today's global marketplace. SEA's unique program is dedicated to ensuring African Americans play a vital role in the nation's scientific and engineering future.

Laser scientist Joel Speth gives Hispanic students from West Hills Community College in central California an overview of LLNL's laser program during a tour as part of the Lab's Cinco de Mayo activities.

Through our Engineering directorate, the Laboratory has been a member of the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. (GEM) since 1977. GEM is a tax-exempt, nonprofit organization headquartered at the University of Notre Dame that is chartered to increase the number of under-represented minorities in masters and doctoral programs in engineering and the natural sciences. GEM is governed by a board of directors comprised of university and corporate representatives that partner to offer fellowships and paid internships for minority graduate students in these fields. Through GEM, comprehensive nation-wide programs have been established to identify, recruit, enroll and retain minority science and engineering students in graduate programs leading to an advanced degree. The GEM Fellowship Program includes M.S. Engineering, Ph.D. Engineering, and Ph.D. Science Fellowships.

Helping Others

Annual employee fun run to kick off the HOME Campaign.

As previously mentioned, the Laboratory employs some 8,100 workers who reside primarily in the Tri-Valley and San Joaquin County. Our employees are active volunteers within their own communities and hold a range of community positions, such as elected officials, classroom volunteers, nonprofit board members, and service club members.

In addition to these numerous acts of individual volunteerism, LLNL also sponsors an annual fundraising campaign for nonprofit agencies, called HOME (Helping Others More Effectively). We've been raising monies through the HOME Campaign for some 27 years. In the last seven years, the Campaign has steadily increased in the amount of money donated, totalling almost $7 million. This year, for the fourth year in a row, the HOME Campaign has raised more than $1 million to give to community charities.

LLNL continues to be the largest single workplace supporter of the Tri-Valley Community Fund (TVCF) through our HOME contributions. The TVCF is dedicated to raising and distributing local charitable contributions to human service, educational, cultural, and recreational organizations located throughout Livermore, Pleasanton, Sunol, Dublin, San Ramon, Danville, and Alamo. LLNL is also the biggest blood donor in Alameda and Contra Costa Counties. Our blood drives occur four times a year. Numerous other charitable programs, some of which are listed below, occur on an annual basis throughout the Laboratory.

Adan Ochoa, age 4, relaxes in a pile of toys donated by Lab employees in the annual Toys for Children drive.

- American Heart Association
- Baby Shower
- Breast Cancer
- Buy a Book, Help a Child
- Cycletrons Bicycle Giveaway
- Daffodil Days
- For Pet's Sake
- Juvenile Diabetes Research
- Brighter Holidays
- Spirit of Christmas
- Teddy Bear Drive
- Toys for Children
- Week of Caring

Need More Information or Assistance

For further information regarding the Laboratory's community outreach programs, refer to the Web sites listed in Appendix A. You may also contact our Public Affairs Office at (925) 422-4599.

Appendix A. LLNL Web Site Resources

The Laboratory is making use of rapid advances in technology to improve communications, both internally with employees and externally with the general public, local and regional audiences, and government leaders. With our commitment to openness and information dissemination, the Laboratory maintains a publicly accessible external home page that provides insight into our organization, programs, operations and job opportunities and is a national resource of science and technology information. Many of LLNL's Web pages have won awards from WWW organizations or have been cited as "best practices" within the DOE. Web pages that describe various aspects of our community outreach are listed below.

Affirmative Action & Diversity Program (http://www.llnl.gov/aadp/)

Emergency Management
(http://www.llnl.gov/es_and_h/hc_dept/hc_emerg_manage.html)

Environment, Safety & Health (http://www.llnl.gov/es_and_h/)

Environmental Community Relations (http://www-envirinfo.llnl.gov/)

Environmental Protection Department (http://www.llnl.gov/epd/)

Industrial Partnerships and Commercialization Office (http://www.llnl.gov/IPandC/)

Institutional Publications (http://www.llnl.gov/llnl/08pub/llnl-pubs.html)

News & Public Affairs (http://www.llnl.gov/llnl/001index/06news-index.html)

Operations & Regulatory Affairs Division (http://www.llnl.gov/epd/ora.html)

Opportunities for Students and Faculty (http://education.llnl.gov/student/index3.html)

Partnership Opportunities (http://www.llnl.gov/llnl/01opp/partner.html)

Procurement & Materiel (http://www.llnl.gov/procurement/)

Science & Technology Education Program (http://education.llnl.gov/index.html)

University Relations Program (http://www.llnl.gov/urp/index.html)

The "Raging Light" quilt commemorates breast cancer victims, survivors and caregivers. The quilt was on display throught the Cancer Awareness campaign.

Appendix B. Science & Technology Education Program Partners

Jim Ellis of the Lab's Energy and Environment directorate demonstrates fundamental principles of atmosphere measurements to a local middle school student during a Science on Saturday lecture.

Frances Foy of Mechanical Engineering demonstrates liquid nitrogen experiments while interacting with students at a school in the Central Valley.

- American Indian Science & Engineering Society
- California Alliance for Minority Programs - UC & CSU Systems
- California Cooperative Education Association
- California Department of Education
- California Science Education Advisory Committee
- California Science Teachers Association
- California State University Fresno
- Carnergie Foundation for the Advancement of Teaching
- Challenger Learning Center of San Joaquin Valley
- Chicano and Latino Engineers and Scientists Society
- Department of Energy
- Educational Resources for California
- Fresno Community College
- Fresno Unified School District
- Las Positas Community College
- Lawrence Berkeley National Laboratory
- Lawrence Hall of Science
- Los Alamos National Laboratory
- Los Angeles Unified School District
- Massachusetts Institute of Technology
- Merced Unified School District
- Minority Undergraduate Research Participation in the Physical & Mathematical Sciences
- Monterey Institute of International Studies - Center for Nonproliferation Studies
- NAACP
- National Science Teachers Association
- Naval Post Graduate School, Monterey, CA
- Northern Arizona - University
- Optical Society of America
- ORISE
- Sandia National Laboratories
- San Francisco Exploratorium
- San Jose State University
- San Jose Tech Museum
- Society of Hispanic Professional Engineers
- University of California, Davis and Merced
- University of Oregon, Summer Enrichment Program, College of Education
- University of Oregon, The Center for Advanced Technology in Education

Appendix C. Science & Technology Education Program Outreach and Educator Project

Classroom/Career Days Speakers Bureau
STEP maintains a database of employees and their related areas of expertise who have volunteered to provide presentations and speak to audiences upon request.

Crystals in the Classroom
The San Ramon Valley School District (SRVSD) and LLNL are working together to bring state-of-the-art crystal growing science and technology to high school classrooms. SRVSD and LLNL provide training and mentoring to enable high school teachers to be able to use this cutting-edge technology. Initially the workshops focus on schools in the vicinity of LLNL. In subsequent years the training will be offered to schools throughout the United States.

Programs such as Crystals in the Classroom take state-of-the-art science and technology to high school classrooms.

Educational Partnerships
This program addresses the requests, both by the education community as well as the public, for LLNL partnerships, collaborations, committee representation, and presentations. As an example, the Teacher Learning Center (TLC), instituted in 2001, includes use of the DAS campus at LLNL to provide professional development instruction for K-12 science teachers in addition to specialized science classes for high school students.

Edward Teller Science Education Symposium
The Symposium provides a bridge to link the science classroom with the research laboratory. STEP, UC Davis - DAS and the Sigma Xi Research Society are providing secondary and community college science educators the opportunity to explore ongoing research at LLNL in physics, chemistry, biology and environmental science. Lessons and activities are directly linked to the California Science Education Standards.

Expanding Your Horizons (EYH)
EYH Conferences are one-day conferences for young women, grades 6-12, that are designed to encourage them to consider careers in math and science related fields. Two of the three annual conferences are conducted in areas that have a large population of underrepresented students and a heavy emphasis is placed on encouraging their participation.

Elvis Spencer of Mechanical Engineering (standing center) is one of the regular presenters with Fun With Science, in which Lab employees venture out to promote science and math to students.

Explorer Post
The Science and Technology Explorer Post 957, chartered by STEP, is under the “career awareness” auspices of the Boy Scouts of America. The goal of the program is to encourage college prep high school students to stay focused on pursuing a college education by providing opportunities for students to work on projects related to their areas of study and interest.

Fun With Science (FWS)
This program addresses requests from educators and the public for science-related presentations in the classroom and at community events. Presentations are centered on Laboratory expertise in areas such as Lasers, Energy, and Chemistry.

Future Scientists and Engineers of America (FSEA)
FSEA, based in southern California, is a national non-profit organization that provides the structure, project material, documentation and workshop training necessary to establish after-school technology clubs. The program is structured around scientists mentoring a classroom of students (grades 4 through 12) on a project chosen by the scientist.

Internet Technology Computer Classes
LLNL provides an educational server and computer facility that allows our partners in the education community to communicate with the Laboratory and to access Internet resources.

Laser Science and Optics in the Classroom (LSOC)
The LSOC program is a high school component initializing a school-to-career path leading to careers in laser science and optics. Teachers participating in LSOC receive materials and lessons to help them integrate laser and optics technology into high school science and mathematics curricula.

Tri-Valley Expanding your Horizons 2001 Conference.

Math Challenge
This event, co-sponsored by STEP and the NNSA Oakland Operations Office, is designed to encourage students' interest in math. Each school participating in the Math Challenge may send up to five teams of three students to participate.

Promoting Achievement through Hands-On Science (PATHS)
PATHS is a partnerships between LLNL and UC Merced at the San Joaquin County Office of Education to benefit students and teachers in the Central Valley and Livermore Tri-Valley communities. Teachers are trained in the Lawrence Hall of Science Great Explorations in Math and Science (GEMS) and students interact with scientists from LLNL through related science demonstrations with LLNL's Fun With Science program.

Science on Saturday (SOS)
SOS, co-sponsored with Sigma Xi, is a seven-week series of free lectures and demonstrations on topics from the forefront of S&T research in a variety of disciplines, targeting students grades 6-12. The goal is to allow students to interact with well-known scientists and engineers in the hopes of increasing the numbers who pursue careers in science and technology.

Tri-Valley Science & Engineering Fair (TVSEF)
TVSEF is a science project competition for students grades 7-12 from public schools within the areas of Danville, Dublin, Livermore, Pleasanton, San Ramon, and Sunol. The fair is affiliated with the Intel International Science and Engineering Fair.

UC Merced/Merced College School to Work
LLNL is assisting Merced College in developing "state-of-the-art" S&T education programs. The graduates from these programs will be qualified to enter the technical workforce or continue their education at the UC Merced campus in pursuit of advanced technical degrees.

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Barry Schrader, Public Affairs Office
Bob Schumacher, Procurement & Materiel
Pam Smith, Business Services Department
Tommy Smith, Affirmative Action & Diversity Program
Jan Tulk, Administrative Directorate

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