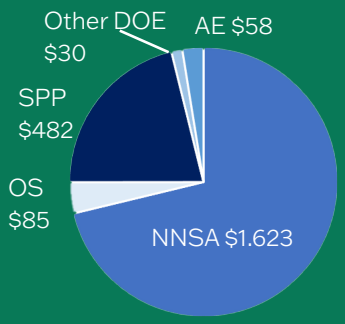
AT A GLANCE: LAWRENCE LIVERMORE NATIONAL LABORATORY

Lawrence Livermore National Laboratory

S&T on a mission—this is the hallmark of Lawrence Livermore National Laboratory (LLNL). In service to DOE/National Nuclear Security Administration (NNSA) and other federal agencies, LLNL develops and applies world-class S&T to ensure the safety, security, and reliability of the nation's nuclear deterrent. Founded in 1952, LLNL also applies S&T to confront dangers ranging from nuclear proliferation and terrorism to energy shortages and climate change that threaten national security and global stability. Using a multidisciplinary approach that encompasses all disciplines of science and engineering—and that utilizes unmatched facilities—the laboratory pushes the boundaries to provide breakthroughs for counterterrorism and nonproliferation, defense and intelligence, and energy and environmental security.

FUNDING BY SOURCE

FY 2019 Costs (in $M)
Total Laboratory Operating Costs: $2.21 billion
DOE/NNSA Costs: $1.9 billion
SPP (Non-DOE/Non-DHS) Costs: $306 million
SPP as % of Total Laboratory Operating Costs: 13.9%
DHS Costs: $23 million



FACTS

Location: Livermore, California
Type: Multidisciplinary National Security Laboratory
Contractor: Lawrence Livermore National Security, LLC
Site Office: Livermore Field Office
Website: llnl.gov

PHYSICAL ASSETS

7,700 acres
517 buildings
$20.2 billion replacement plant value*
6.4 million GSF in active buildings
0.6 million GSF in 88 non-operational buildings
24,000 GSF in leased facilities

**In FY 2019 NNSA implemented a new tool (BUILDER) to calculate the replacement plant value (RPV) for buildings and trailers. The change in modeling platforms produced new values and we are in the process of validating the updated figures with NNSA. In FY20+, the utility and other structures and facilities (OSF) assets will start migrating into BUILDER.*

HUMAN CAPITAL

7,378 FTE employees
18 joint faculty
253 postdoctoral researchers
184 undergraduate students
138 graduate students
531 contractors (non-LLNS employees)

CORE CAPABILITIES

Advanced Materials and Manufacturing
All-Source Intelligence Analysis
Bioscience and Bioengineering
Earth and Atmospheric Sciences
High-Energy-Density Science
High-Performance Computing, Simulation and Data Science
Lasers and Optical S&T
Nuclear, Chemical and Isotopic S&T
Nuclear Weapons Design and Engineering

MISSION UNIQUE FACILITIES

Advanced Manufacturing Laboratory
Center for Accelerator Mass Spectrometry
Center for Bioengineering
Center for Micro and Nanotechnology
Contained Firing Facility
Forensic Science Center
High-Explosives Applications Facility
Livermore Computing Complex
National Atmospheric Release Advisory Center
National Ignition Facility

U.S. DEPARTMENT OF ENERGY

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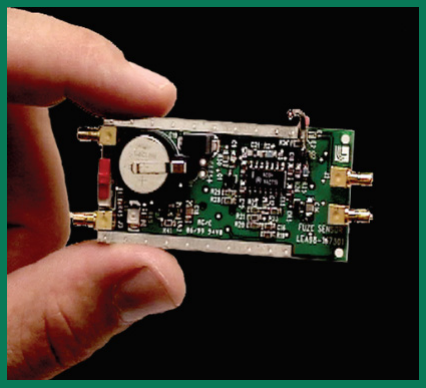
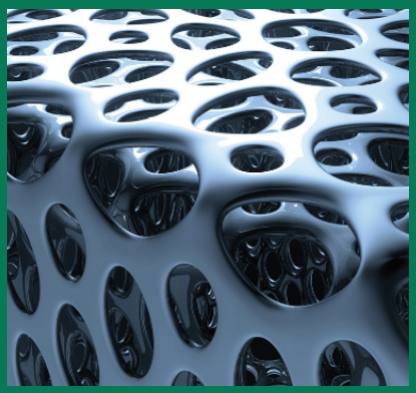
ACCOMPLISHMENTS

Unique Facility: One of the World's Premier High-Performance Computing (HPC) Facilities - LLNL is home to Livermore Computing (LC), one of the world's premier HPC facilities. LC boasts more than 188 petaflops of computing power and numerous TOP500 systems, including the 125-petaflop Sierra. Continuing the long lineage of world-class LLNL supercomputers, Sierra represents the penultimate step on the road to exascale computing, expected to be achieved by 2023 with an LLNL system called El Capitan. These flagship systems are GPU-enabled and produce multi-physics simulations in 3D at never-before-seen resolutions for a variety of mission-critical needs. In 2020, LLNL and Cerebras Systems integrated the world's largest computer chip into the Lassen system, upgrading the top-tier supercomputer with cutting-edge AI technology. This combination creates a radically new type of computing solution, enabling researchers to investigate novel approaches to predictive modeling.



Tech-to-Market Highlight: Micropower Impulse Radar (MIR) - The laboratory's compact, lightweight MIR uses very short electromagnetic pulses and can detect objects at a much shorter range than conventional radar can. MIR has been used in, among other applications, fluid-level sensing, medical applications, nondestructive evaluation, motion detection, and devices to detect breathing through walls or rubble to assist in rescue after disasters. The portable radar system was the first that SWAT and land-mine detection teams were able to use in the field. Search and rescue missions, including those on 9/11, have used MIR devices to detect lung or heart movements of people buried under rubble. Since 1994, MIR has held 197 patents and 44 licenses—more than any other technology in LLNL history. It was developed using $10 worth of off-the-shelf materials.



Research Highlight: Advanced Materials and Manufacturing -In support of national security applications and to meet broader national needs, LLNL is making significant advances in capabilities to develop specialized materials together with processes and systems for product manufacturing and qualification. LLNL researchers are approaching advanced manufacturing as a fully integrated process from discovery and development of optimized materials to manufactured product. The goal is to achieve better products at reduced cost, infrastructure footprint, and development times. Successes include printed glass, aerospace-grade carbon fiber composite, and marine-grade stainless steel, as well as micro-structured materials with unprecedented properties (e.g., graphene aerogels for supercapacitors). In addition, advances in underlying science, experimentation and high-performance computing with machine learning are being combined to develop innovative means for improving fabrication, printing speeds, and product quality. Partnerships with industry and academia make vital contributions to these efforts.