

# Overview

*Our mission is national security.*

*We develop and apply science and technology to ensure the safety and reliability of the U.S. nuclear deterrent; reduce the threat of weapons of mass destruction, proliferation and terrorism; and solve national problems in defense, energy, environment and infrastructure.*

From its origins as a secret Manhattan Project laboratory, Los Alamos has attracted world-class scientists and applied their energy and creativity to solving the nation's most challenging problems. That tradition remains today. As one of the U.S. Department of Energy's multi-program, multi-disciplinary research laboratories, Los Alamos thrives on having the best people doing the best science to solve problems of global importance.

The University of California, which has operated the laboratory since its founding by UC physicist J. Robert Oppenheimer, has contributed significantly to the scientific quality of the laboratory's work and technical staff. The UC tradition of world-class science has always been key to the laboratory's creativity and innovation.

Los Alamos' core values combine security awareness, intellectual freedom and scientific excellence with national service to generate scientific and engineering solutions for the nation's most pressing problems. Maintaining the nation's nuclear stockpile is Los Alamos' most important job. Certifying that the nation's nuclear weapons remain safe and reliable without underground testing remains the biggest technical challenge. The laboratory is the second-largest manufacturing site in the nuclear weapons complex and one of only two national laboratories operating at this high level of mission importance and scientific excellence.

Outstanding science is the intellectual underpinning of the laboratory's past and its future. The rich variety of research programs directly and indirectly support the laboratory's basic mission. As a national research laboratory, success depends on remaining at the forefront of multi-disciplinary and robust science.



The 9- by 15-foot Power Wall helps scientists visualize and analyze large computer simulations of instability and mixing.



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*Since 1943, Los Alamos has created and applied advanced science and technology to solve critical challenges in national defense and civilian research.*

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## High-Performance Computing

Extraordinarily powerful supercomputers and detailed numerical models allow scientists to visualize and predict real phenomena, from the inner workings of nuclear weapons to the course of epidemics and global climate patterns. High-performance computing ensures the effectiveness of America's nuclear arsenal and plays an increasing role on the forefront of scientific discovery.

## New and Exotic Advanced Materials

The behavior of materials is crucial to predicting nuclear weapons performance and developing new, high-tech products. Breakthroughs in materials science include smaller, longer-lasting batteries, efficient fuel cells, stronger composite materials and all-carbon prosthetics and joint replacements. Advanced materials promise such scientific breakthroughs as quantum computing and room-temperature superconductivity.

## Bioscience and Biotechnology

Evolved from the early need to understand the effects of radiation on humans, the laboratory's health sciences groups seek to understand and protect people from the dangers associated with nuclear, biological and chemical weapons, and to expand the scope of knowledge in bioscience and biotechnology. A world leader in development of the human genome map, Los Alamos continues to develop new and better ways of unlocking the mysteries of life.

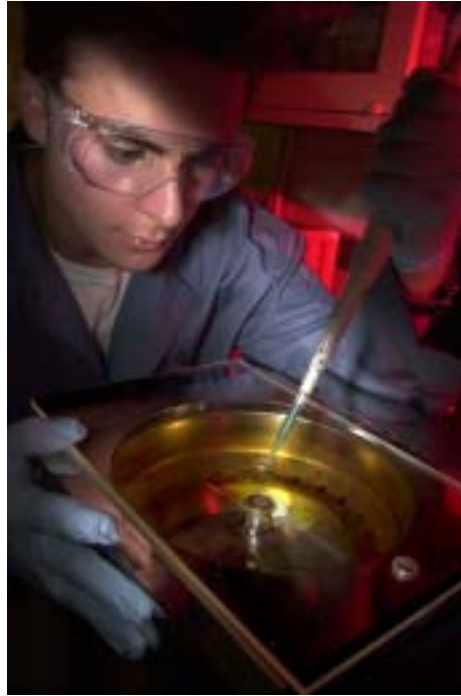
## Physics and Theory

Los Alamos contributes to scientific understanding of the physical world, and generates new technologies through physical experimentation and accurate analysis of experimental data. From high-energy nuclear physics to the structure of the human genome to the theoretical quantum computer, the physical sciences are central to the Laboratory mission.

## Recent Accomplishments

Recent Los Alamos accomplishments:

- Nanoscale imaging technologies
- Proton radiography, a powerful new technique that provides motion picture-like images of the forces inside high-explosive detonations
- Quantum computing and quantum cryptography breakthroughs
- Manufactured the first certified plutonium weapon pit in 14 years
- Computer-modeled date for the origin of HIV and the genetic foundation for a potential vaccine
- Forensics assistance to the investigations of anthrax bioterror attacks



Los Alamos developed a unique spin technology for advanced thin films.

## Research and Development Awards

Each year, *R&D Magazine* recognizes the world's top 100 advances in science and technology with its R&D 100 awards. Los Alamos National Laboratory has received 89 R&D 100 awards since 1978.

## Opportunities in Education

Research and educational experiences at Los Alamos enhance the skills of up to 2,000 students each year. In addition to its post-doctoral program, the Laboratory provides on-the-job educational opportunities to graduate and undergraduate students in a broad spectrum of technical fields.

## Partnerships with Industry

Los Alamos has more than 300 industrial partnerships with a combined value in excess of \$650 million in the past decade, with an aggressive continuing program. Laboratory industrial partnerships bolster the economy and increase America's global competitiveness.

## Quick Facts

### Location

Los Alamos, New Mexico, approx. 35 miles northwest of Santa Fe.

### Employment (Jan. 2004)

University of California	8,047
Postdoc	405
Students	1,410
Contractors	3,424
Limited term and other	307
<b>Total</b>	<b>13,593</b>

### Budget FY04

\$2.2 billion

National Security /

Nonproliferation 73 percent

Science/Energy/Other DOE 9 percent

Environmental Management 6 percent

Work for Others (non-DOE) 12 percent



### Site Characteristics

- 39.5 square miles
- 47 separate technical areas
- More than 2,100 individual facilities containing 8-9 million gross square feet with a \$5.9 billion replacement value



Los Alamos National Laboratory is operated by the University of California for the U.S. Department of Energy's National Nuclear Security Administration