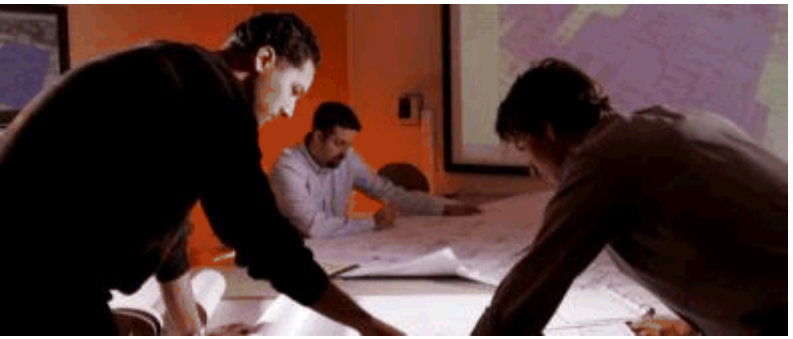
SAND2012-7788P

Exceptional service in the national interest

Sandia National Laboratories



Sandia National Laboratories

An Overview

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SAND No. 2012-5130P

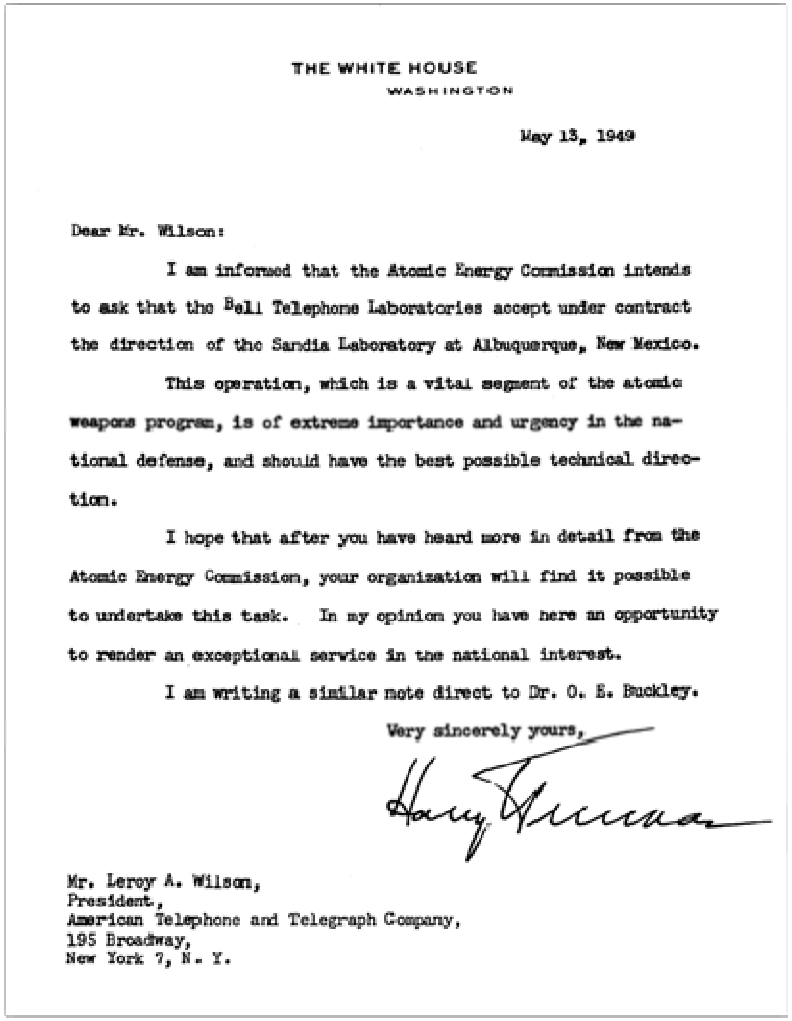
What is a National Lab?

Sandia National Laboratories

Origins

The National Labs started with the Manhattan Project. The effort to create the world's first nuclear weapon resulted in a vast R&D network under the control of the War Department's Army Corps of Engineers. These large, multi-purpose facilities became the nation's first national laboratories.

Sandia's History



THE WHITE HOUSE
WASHINGTON

May 13, 1949

Dear Mr. Wilson:

I am informed that the Atomic Energy Commission intends to ask that the Bell Telephone Laboratories accept under contract the direction of the Sandia Laboratory at Albuquerque, New Mexico.

This operation, which is a vital segment of the atomic weapons program, is of extreme importance and urgency in the national defense, and should have the best possible technical direction.

I hope that after you have heard more in detail from the Atomic Energy Commission, your organization will find it possible to undertake this task. In my opinion you have here an opportunity to render an exceptional service in the national interest.

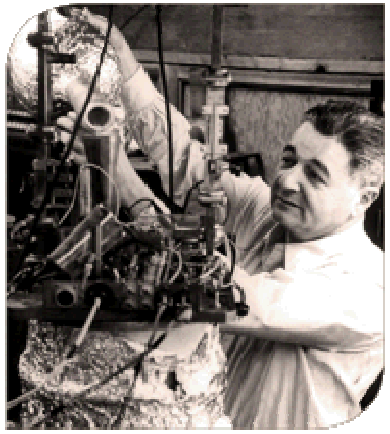
I am writing a similar note direct to Dr. O. E. Buckley.

Very sincerely yours,

Harry Truman

Mr. Leroy A. Wilson,
President,
American Telephone and Telegraph Company,
195 Broadway,
New York 7, N. Y.

Sandia National Laboratories



Sandia's Governance Structure

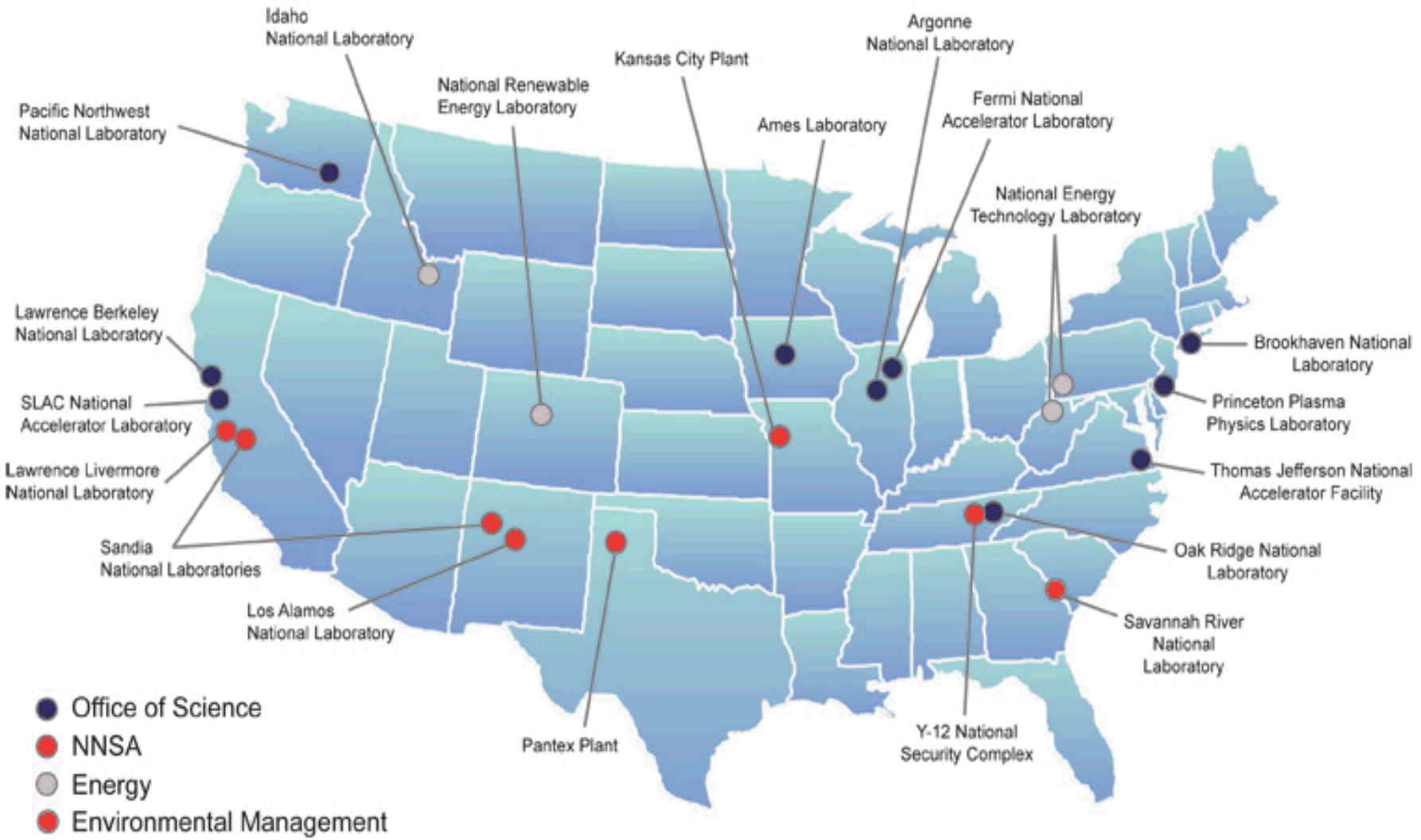
Sandia Corporation

- AT&T: 1949–1993
- Martin Marietta: 1993–1995
- Lockheed Martin: 1995–present
- Existing contract expires: Sept. 30, 2012
- One-year contract extension: Sept. 30, 2013

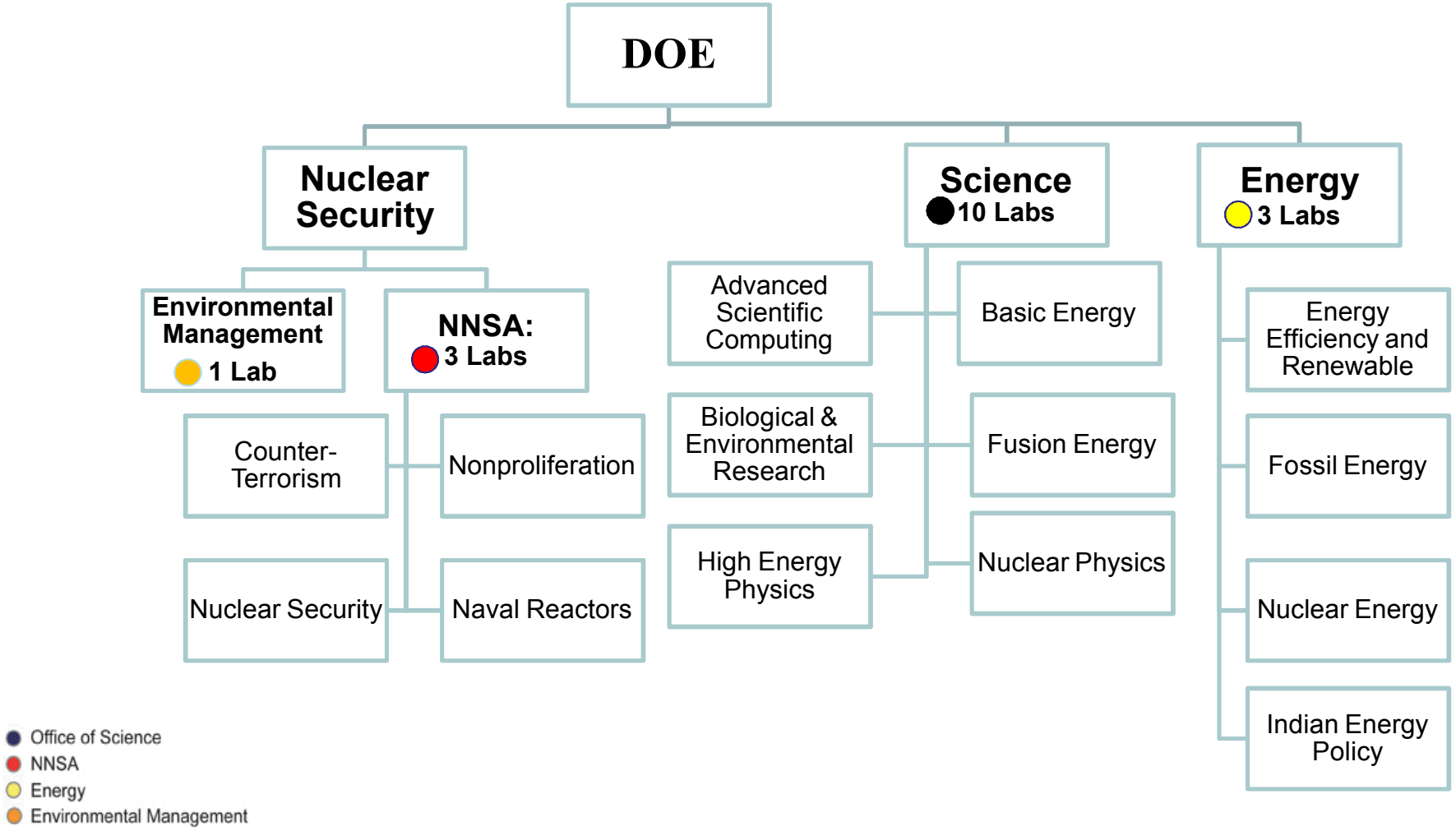
Government-owned contractor-operated

Federally funded research and development center

Where are the National Labs?



Lab Organization within DOE

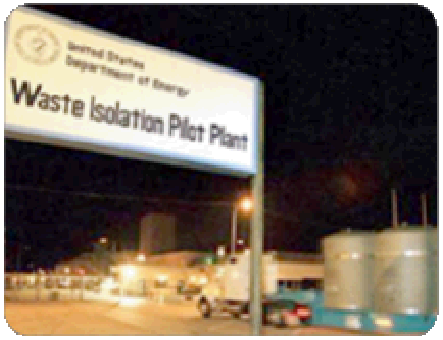


Sandia's Sites

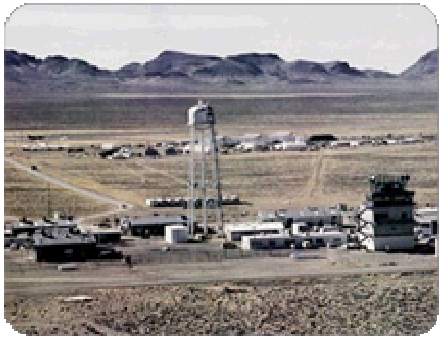
Sandia National Laboratories

Albuquerque, New Mexico

Carlsbad, New Mexico



Tonopah, Nevada



Livermore, California

Amarillo, Texas

Kauai, Hawaii

National Security Challenges

1950s	1960s	1970s	1980s	1990s	2000s	2010s
Nuclear weapons	Development engineering	Multiprogram laboratory	Missile defense work	Post–Cold War transition	Post 9/11	Life Extension Programs START
Production and manufacturing engineering	Vietnam conflict	Energy crisis	Cold War	Stockpile stewardship	National security	National security challenges

60 YEARS OF EXCEPTIONAL SERVICE

Cleanroom invented 1963

Katrina Aftermath

Robotic Stealth Coating

Gulf of Mexico Oil Spill

Unabomber and shoe bomber investigations

Challenger Explosion Investigation

WHY WORK AT SANDIA?
(OR ANOTHER NATIONAL LAB)

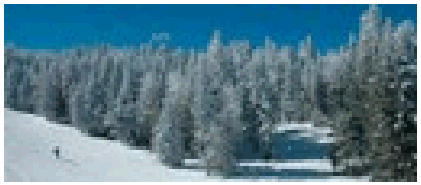
Sandia National Laboratories

- Why Sandia?
  - Competitive salaries
  - Diverse applied research
  - Work/life balance
- Opportunities at Sandia
  - Full-time
  - Internships
  - University Programs
  - Truman Fellowship










R&D 100 Awards

R&D Magazine identifies the 100 most technologically significant products and advancements for each year and recognizes the winning innovators and their organizations. The winners are chosen from an international pool of contestants from universities, private corporations, and government labs.

In 2012, Sandia researchers and their collaborators received four R&D 100 awards. Since 1976, Sandia has received 101 of these coveted R&D 100 Awards — often referred to as the "Oscars of invention" or "the Nobel Prizes of technology."

UNIVERSITY PROGRAMS

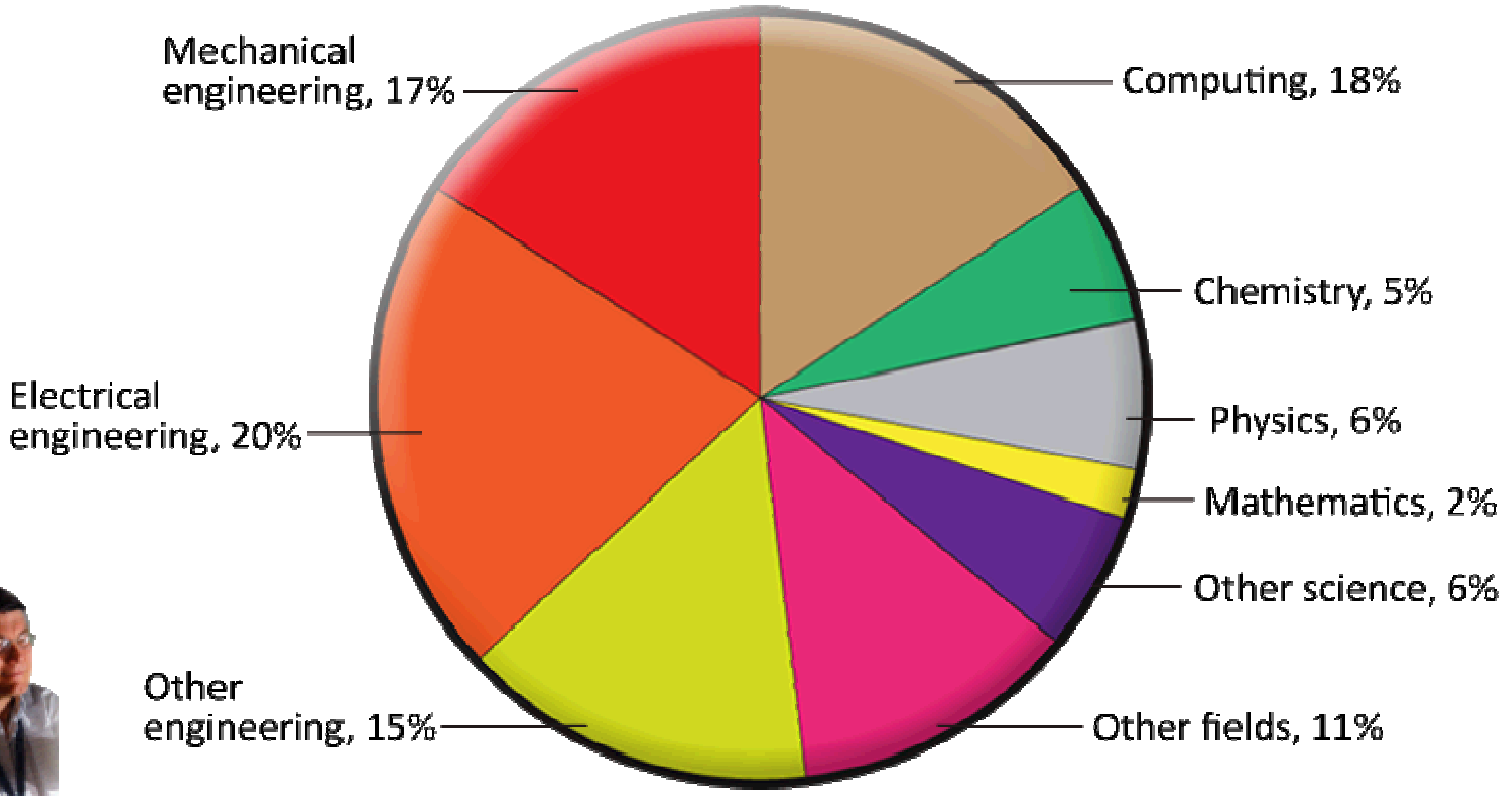
- Tuition Assistance Program
- University Part-Time
- Special Masters Program
- Doctoral Study Program
- Master's Fellowship Program
- Critical Skills Master's Program

Our Workforce

- Onsite workforce: 11,554
- Regular employees: 8,949
- Gross payroll: ~$515M

Data for FY12 through the end of March

Technical staff (4,419) by discipline



Who are National Labs Looking for?

- **Good Grades**
- **Interesting Research Experience**
- **Computational Skills**
- **Desire to work on a team and to serve in the national interest**
- **Engineers who will be graduating Dec 2012, May 2013, Aug 2013, or even Dec 2014. Students interested in a grad internship this summer to "try us out".**

MSMEs with emphasis in integrated design, systems engineering, project management, environmental testing, materials engineering, computational simulation of system/subsystem performance, embedded electronics design, mechatronics, or analysis of the response of electrical and electro-mechanical systems to various environments.

MSEEs with emphasis in digital design, RF design, digital signal processing, analog design, electromagnetics, embedded electronics design, microsystems design, or analysis of the response of electrical and electro-mechanical systems to various environments.

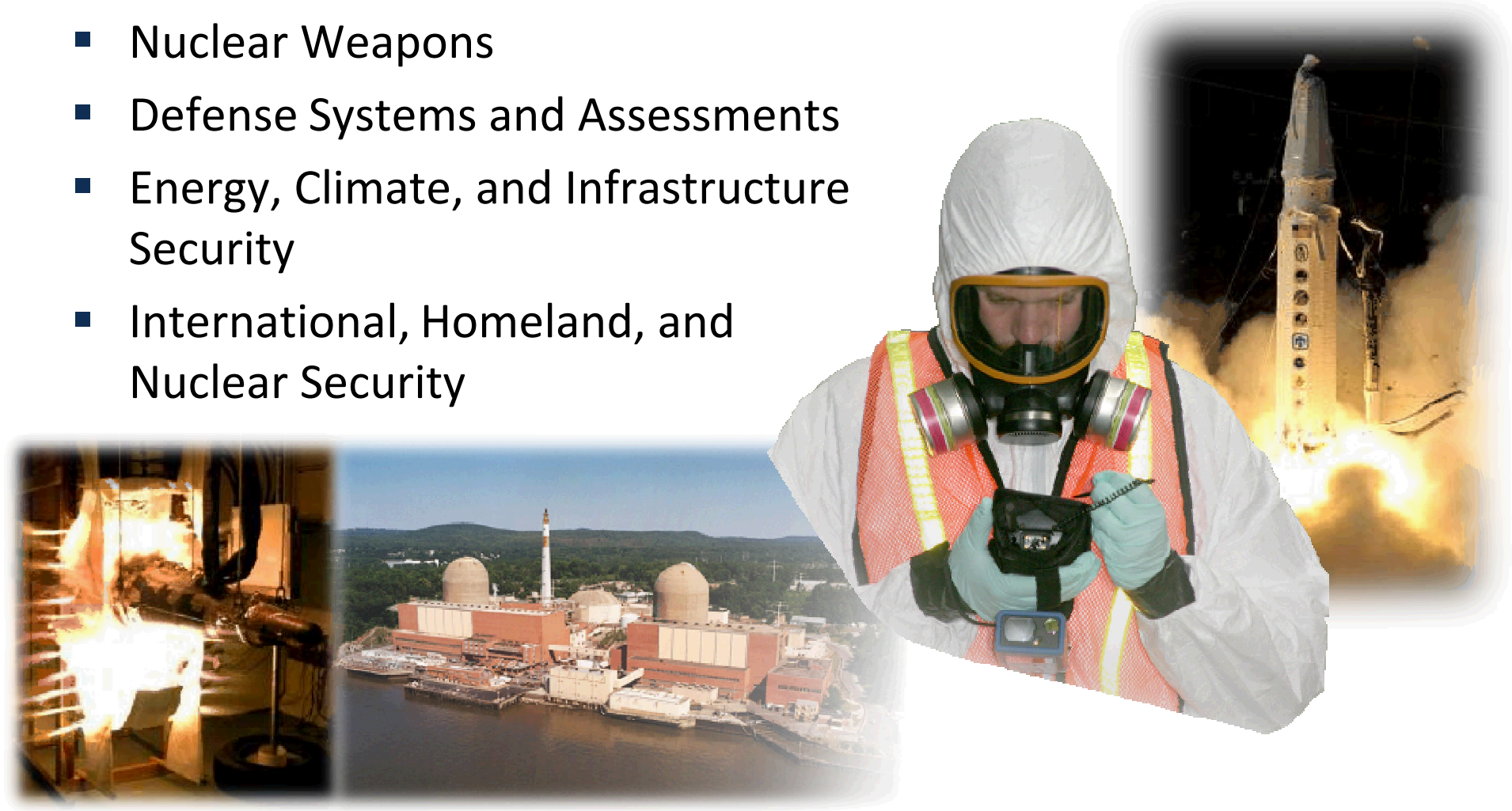
TECHNICAL DISCIPLINES OF NEW HIRES

Disciplines of Most Technical Hires
(FY06 – FY09)

Top 3 hire fields comprise approximately 52% of technical hires	▪ CS/CE ▪ EE ▪ ME
Top 5 hire fields are approximately 68% of technical hires	▪ Chemistry ▪ Physics
Top 10 hire fields represent approximately 82% of technical hires	▪ Nuclear Eng ▪ Geo & Environmental Sciences ▪ Bio/Biochem ▪ Materials Science ▪ Math

FOUR MISSION AREAS

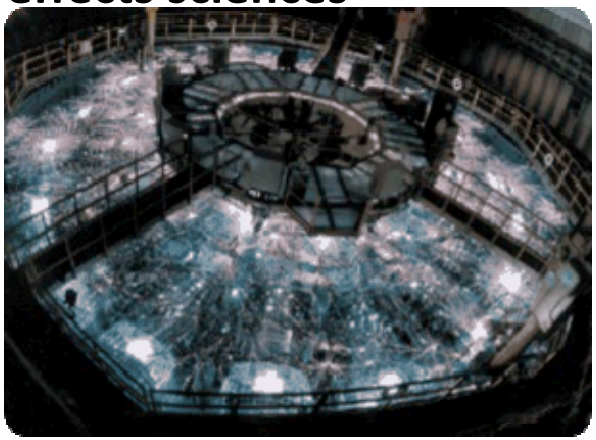
- Nuclear Weapons
- Defense Systems and Assessments
- Energy, Climate, and Infrastructure Security
- International, Homeland, and Nuclear Security



Nuclear Weapons

Ensuring the Nation's Nuclear Weapons Stockpile is Safe, Secure, and Reliable

Pulsed power and radiation effects sciences

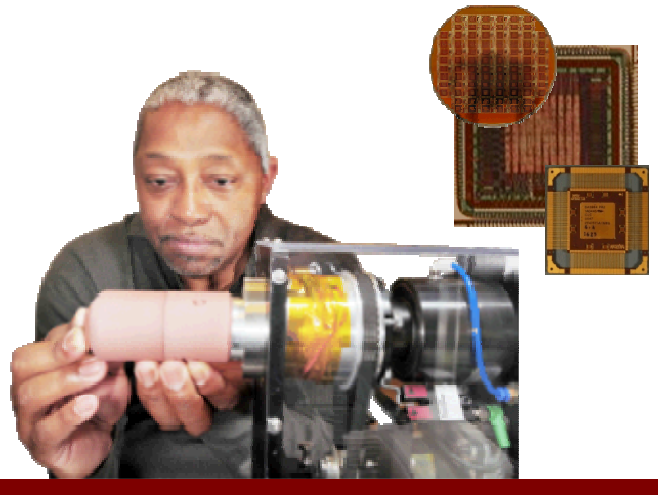


Design agency for nonnuclear components

- Neutron generators
- Arming, fuzing and firing systems
- Safety systems
- Gas transfer systems

Warhead systems engineering and integration

Production agency



Defense Systems and Assessments

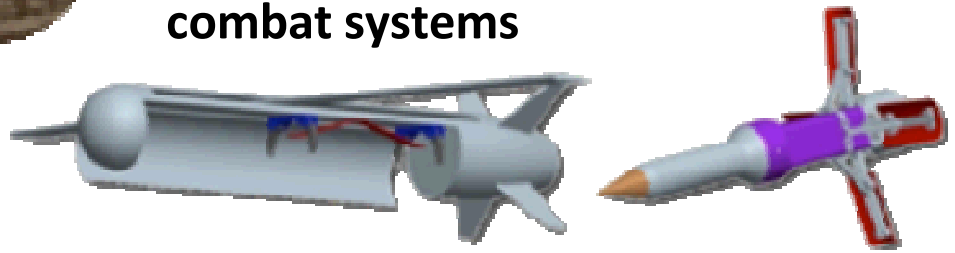
Sandia National Laboratories

Synthetic aperture radar

Support for NASA

Support for ballistic missile defense

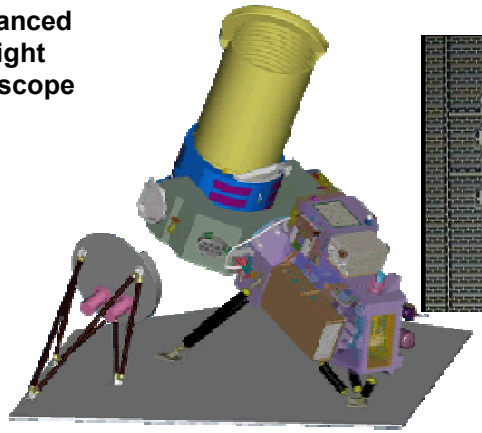
Ground sensors for future combat systems

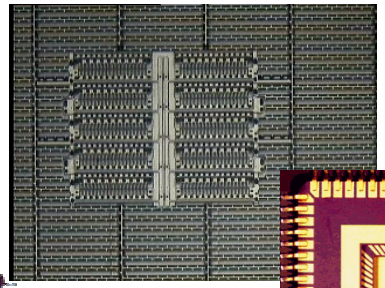


Defense Systems and Assessments

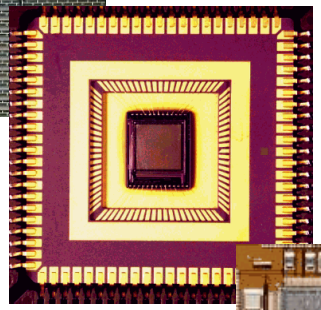
Space Mission

Advanced Flight Telescope

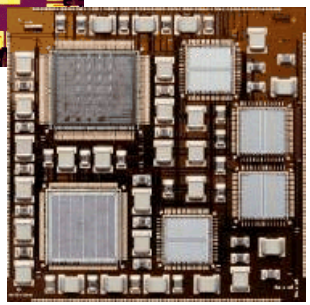




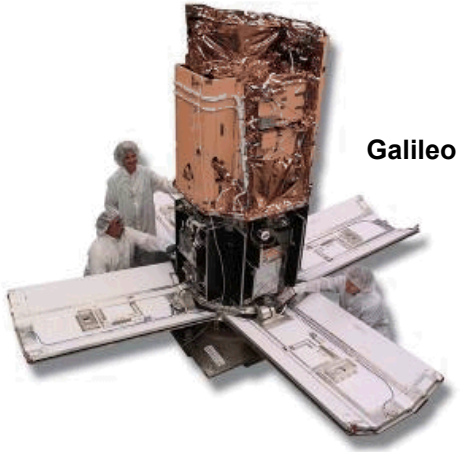
MEMS louvers



Focal plane array



Rad-hard multi-chip module



Galileo spacecraft

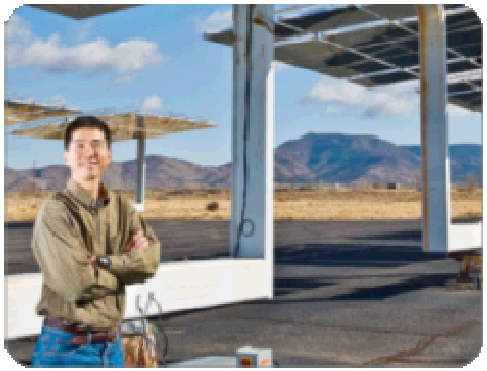
Laser Dynamic Range Imager Orbiter Inspection System (LOIS)

Space Mission delivers sensing solutions that address complex national security issues in space

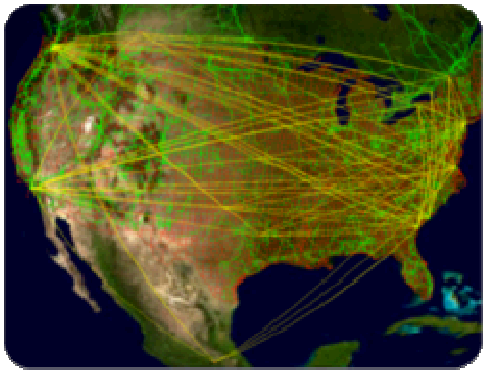
Energy, Climate, and Infrastructure Security

Sandia National Laboratories

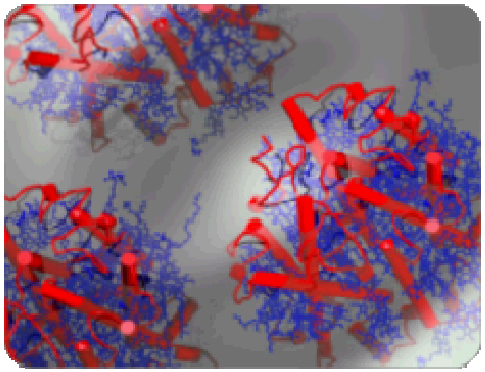
Energy



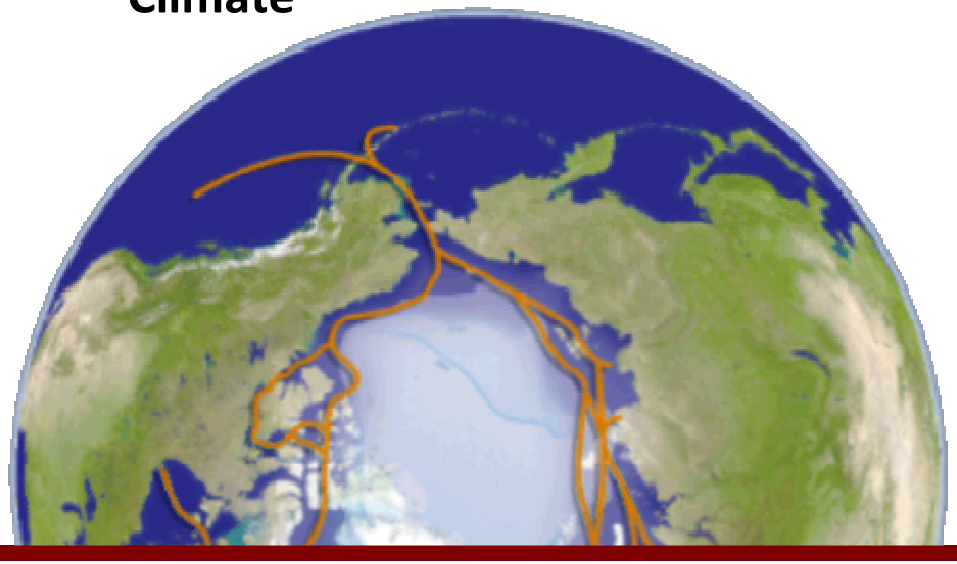
Infrastructure



Crosscuts and enablers



Climate



jbei
Joint BioEnergy Institute

Energy, Climate, and Infrastructure Security

Investigating solar, wind, and geothermal energy science and technologies since the 1970s and new programs in biofuels and biomass

Reducing dependence on petroleum-based fuels and developing sustainable alternative fuels and increased efficiency of vehicle technologies

Developing novel approaches to increasing energy efficiency and clean energy sources to be transferred to industry to resolve the nation's energy future

Supporting the use of nuclear power worldwide through repository science, nonproliferation, safety and security, transportation, modeling, and system demonstrations

Energy, Climate, and Infrastructure Security

Nuclear Energy: Waste Isolation Pilot Plant

"A solution for transuranic waste."

WIPP is the world's only licensed and operating deep geologic repository for transuranic nuclear waste disposal.

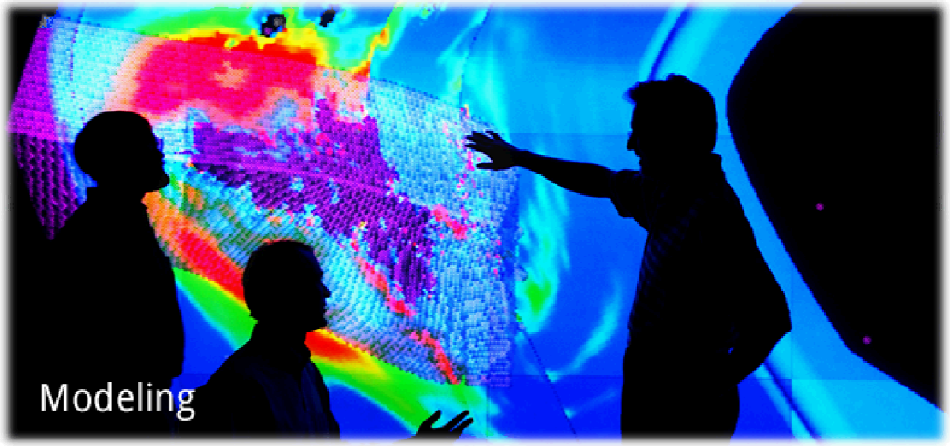
Sandia's primary WIPP activities:

- Performance assessment
- Scientific investigations of natural system
- Technical lead for EPA recertification of WIPP

- Initially sited – 1975
- First Waste Receipt – 1999
- First Recertification Approved – March 2006

Energy, **Climate**, and Infrastructure Security

Sandia National Laboratories



Energy, Climate, and **Infrastructure Security**

Sandia National Laboratories

Improving the **reliability and performance** of the nation's energy infrastructure

Ensuring the **integrity and availability of the nation's cyber infrastructure**

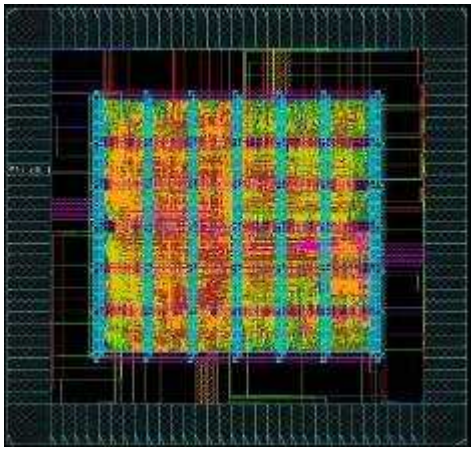
R&D of energy-storage technologies and applications for **electric utilities, renewables, and grid security**

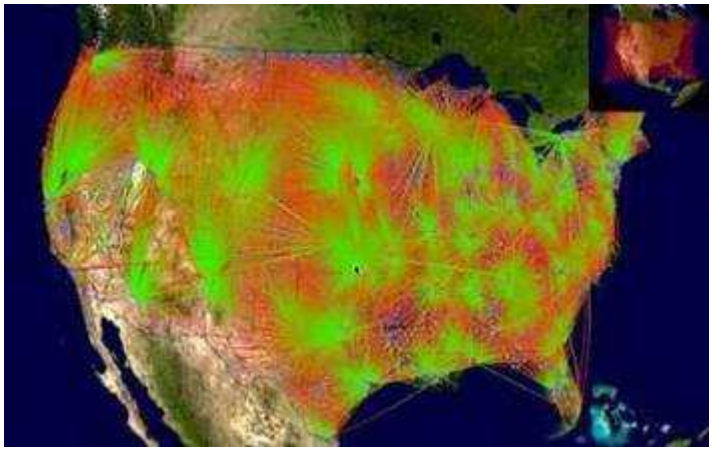
High-performance computer modeling and analysis of the interactions of political, health, social, economic, and technical systems

Energy, Climate, and Infrastructure Security

Cyber Security

Low Power
Cryptographic Chip





Infrastructure modeling

Microelectronics
Development Lab
(Trusted Foundry)

Identification of genuine
versus counterfeit parts

International, Homeland, and Nuclear Security

Sandia National Laboratories

Critical asset protection

Homeland defense and force protection

Homeland security programs

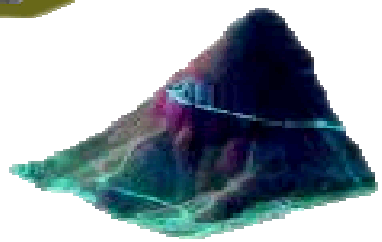
Global security

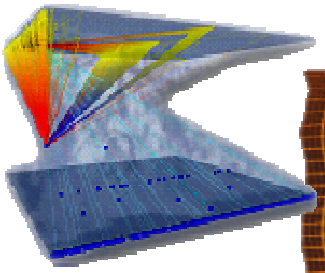
International, Homeland, and Nuclear Security *Addressing the Most Important Risks at Home and Abroad*

Sandia National Laboratories

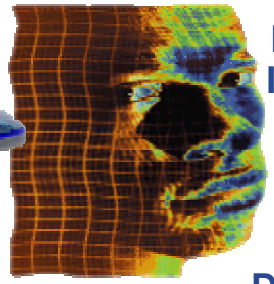
Synthetic Aperture Radars

Vulnerability Assessment Mod/Sim Tools





Cyber Security



Scanner-less Range Imager

Explosive Destruction System

Anticipate | **Predict & Prevent** | **Respond** | **Recover**

Access Delay

Critical Infrastructure Protection Systems Analysis Tools

Explosive Detection Portal

Unattended Ground Sensors

Tunnel Detection and Characterization

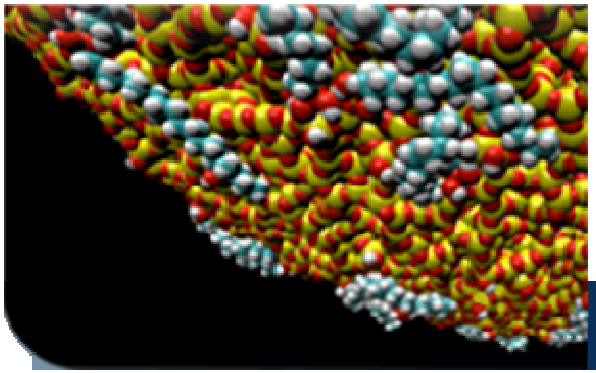
Radiation Remediation Foam

Science and Engineering Foundations

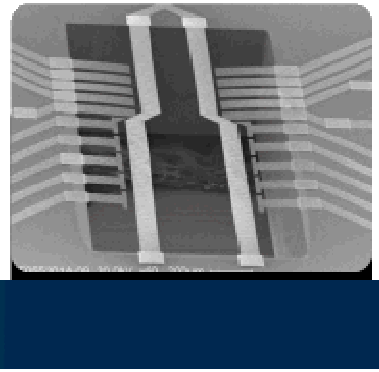
Sandia National Laboratories

Computing and information science

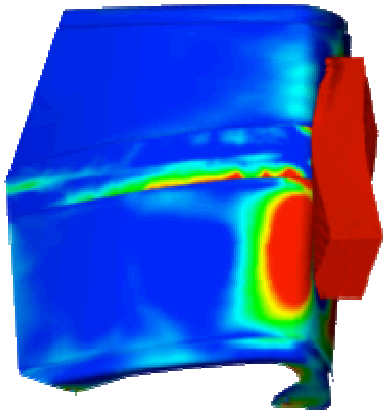
Materials science



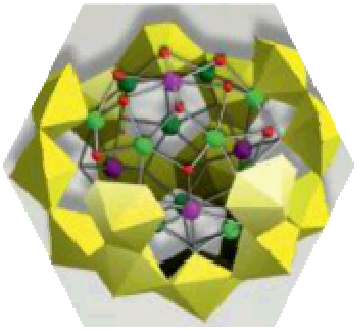
Nanodevices and microsystems



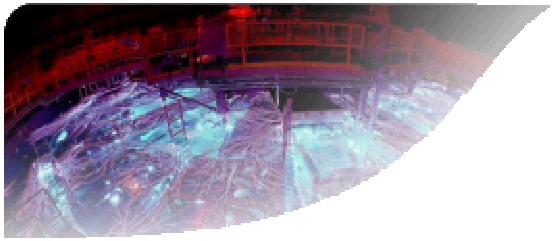
Engineering sciences



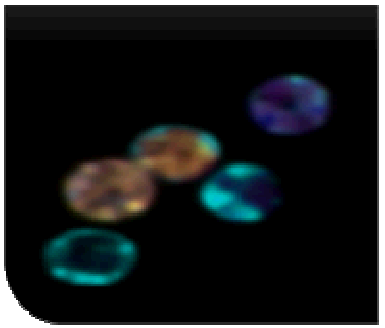
Geoscience



Radiation effects and high-energy density science



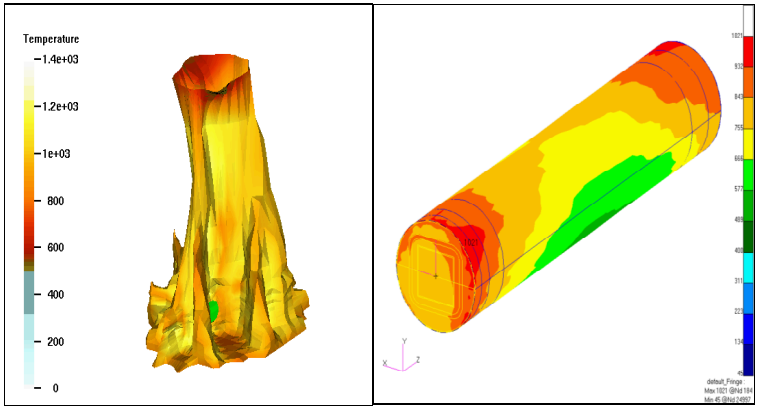
Bioscience



Large-Scale Testing Capabilities Combined with Model Validation/Calibration

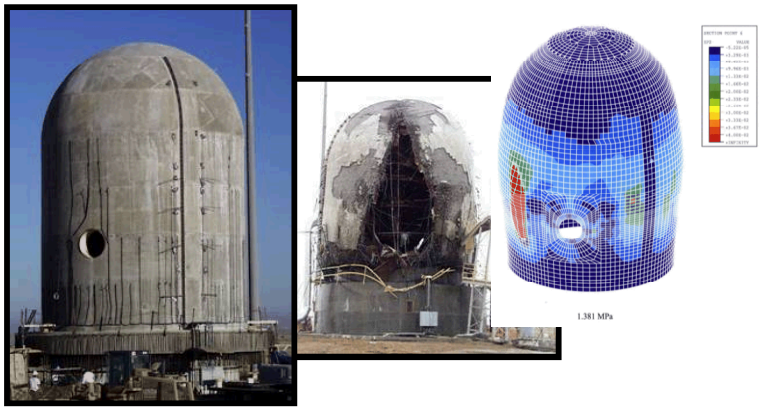
Impact Testing

Fire Testing and Modeling



Water Slug Impact Test (NRC)

F4 Crash Test (Japanese co-op)



¼-Scale Prestressed Concrete Containment Vessel Test (Japanese co-op)

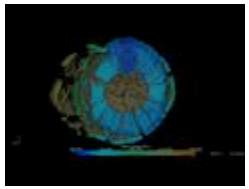
Software Engineering

- Large Projects
  - Multi-year development cycles
  - Millions of lines of code
  - Large teams/Independent Projects
  - S.E. design methodologies
  - Processes and process designs
  - Distributed Computing
  - Project/Program Mgmt
- Small Projects
  - Research and engineering
  - Rapid development cycles

Stay Connected…

www.youtube.com/user/SandiaLabs

Top viewed videos:



Apophis destruction simulation
140,800+ views

Z Machine at Sandia Labs
64,200+ views

Rocket Powered Train Impact Test
59,000+ views

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www.linkedin.com/home?trk=hb_logo

Search by Group or Company

www.sandia.gov