

Exceptional service in the national interest



Sandia California Laboratory Overview

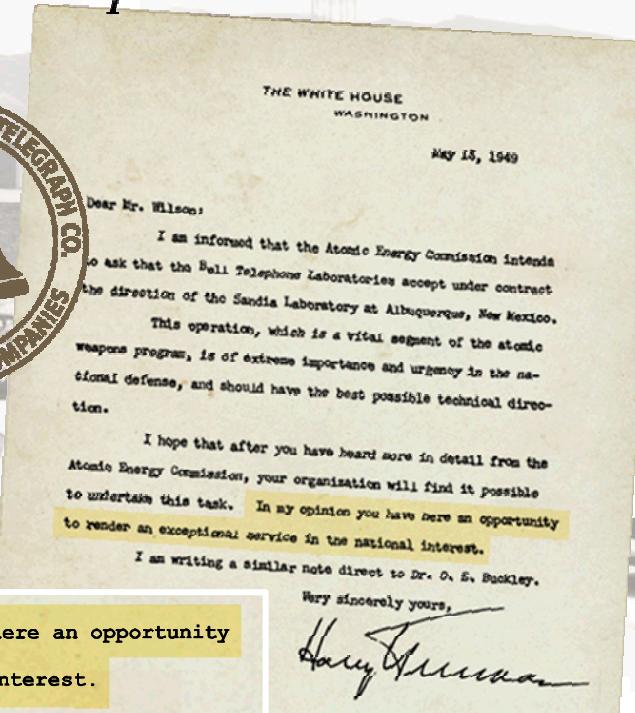
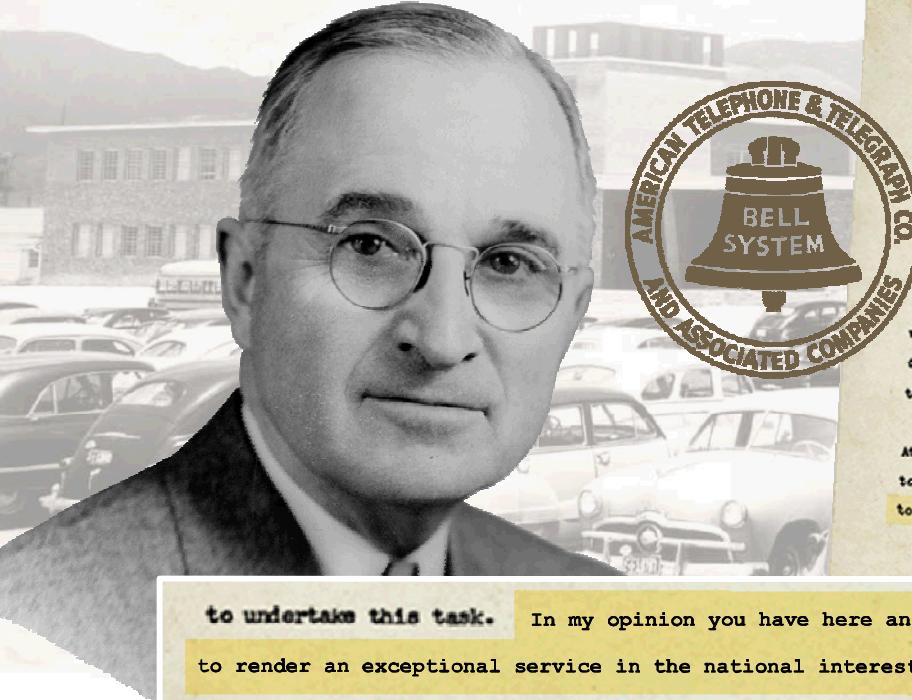
History, Structure & Missions
For New Employees



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.

Sandia's history

Exceptional service in the national interest



- **July 1945:** Los Alamos creates Z Division
- Nonnuclear component engineering
- **November 1, 1949:** Sandia Laboratory established



Sandia's mission work reflects national security challenges

1950s

NW production engineering & manufacturing engineering

1960s

Development engineering

Vietnam conflict

1970s

Multiprogram laboratory

Energy crisis

1980s

Missile defense work

Cold War

1990s

Post-Cold War transition

Stockpile stewardship

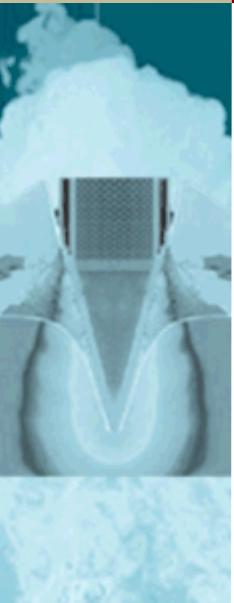
2000s

Expanded national security role post 9/11

2010s

LEPs
Cyber, Biosecurity
Proliferation

Evolving national security challenges



Sandia's sites



Albuquerque, New Mexico



Livermore, California

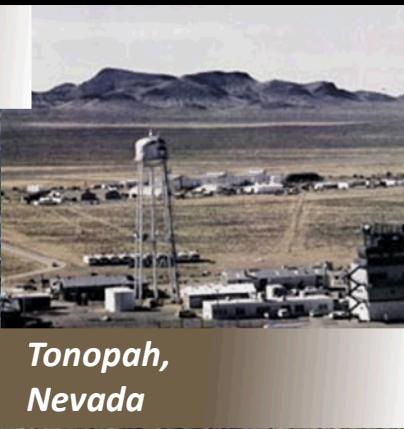


Kauai, Hawaii



*Waste Isolation Pilot Plant,
Carlsbad, New Mexico*

*Pantex Plant,
Amarillo, Texas*



*Tonopah,
Nevada*

14,168 acres (labs); 179,333 acres (test areas); and 417 buildings

FY13 Total budget: \$2.5 billion

Total workforce (all sites): 12,000

Vision and mission statements

- On behalf of our nation, we anticipate and solve the most challenging problems that threaten security in the 21st century
- Our unique mission responsibilities in the nuclear weapons program create a foundation from which we leverage capabilities enabling us to solve complex national security problems



Sandia's nuclear weapon mission

Central to U.S. national security



- Sandia originated as a single-mission engineering organization for nonnuclear components of nuclear weapons
- Our nuclear weapons mission is focused on three major imperatives:
 - Take care of the existing stockpile
 - Sustain the stockpile into the future through life extension programs and alterations
 - Maintain and advance Sandia's required engineering and science capabilities, foundational operations, and infrastructure



Sandia's foundation

A solid base supporting our national security missions

- People
 - Strategically managed workforce of diverse skills and competencies
 - Modern business practices and operations in support of our missions
- Research
 - Management framework to ensure innovation and quality in Sandia's differentiating products
 - Disciplined-based Research Foundations
 - Multidisciplinary research challenges
 - R&D investments
- Capabilities
- Facilities and tools
 - Major environmental test facilities
 - High-performance computing



Sandia's national security missions

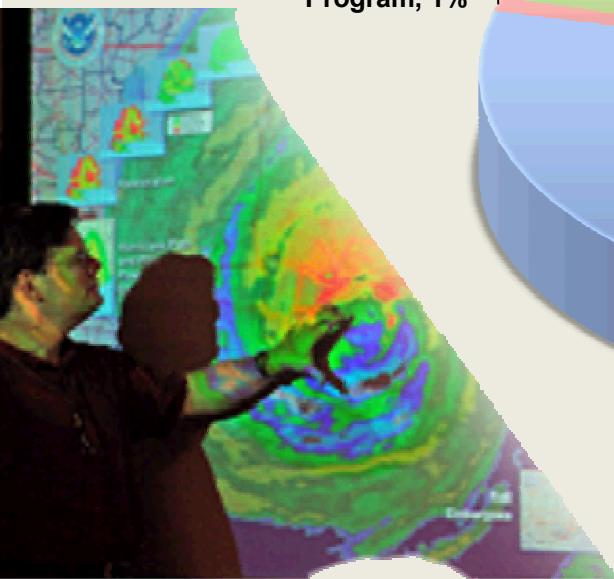
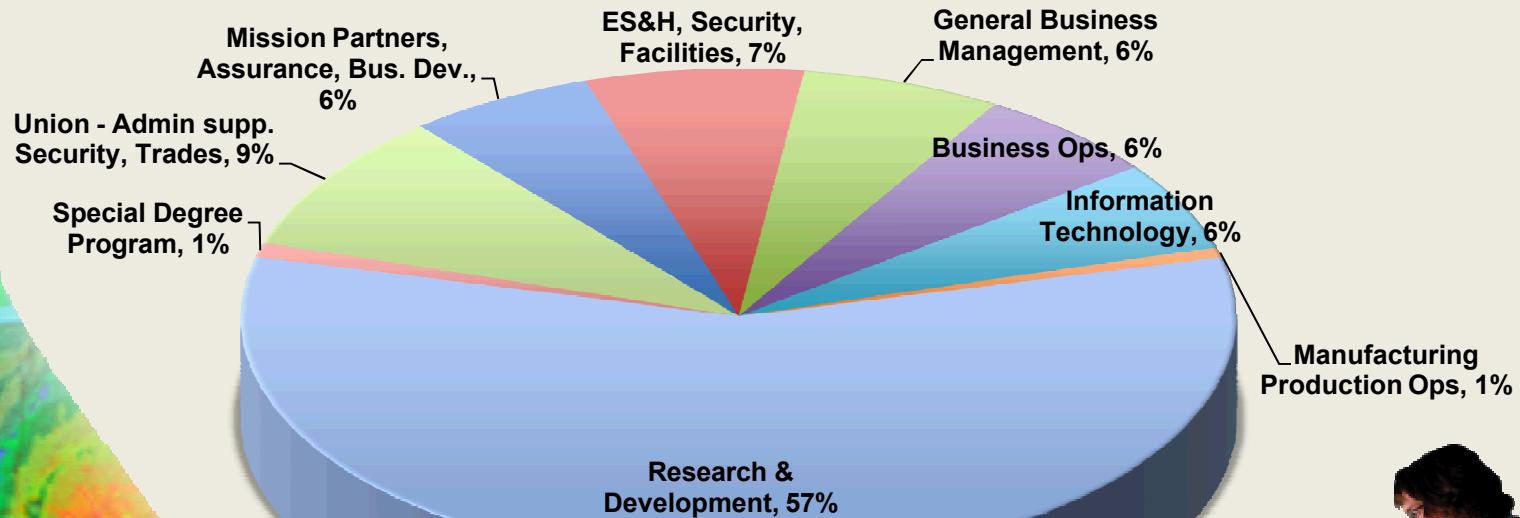
- Maintain a safe, secure stockpile and an effective nuclear deterrent now and into the future
- Reduce global nuclear dangers
- Provide nuclear assessments and warning
- Enable the United States to defend and dominate in cyberspace
- Maintain U.S. defense technological superiority through synergistic products
- Maintain U.S. defense technological superiority through leveraged innovations
- Reduce global chemical and biological dangers
- Ensure a secure and sustainable energy future



Who we are as a laboratory

(September, 2013)

- On-site workforce: 11,034
- Regular employees: 9,761

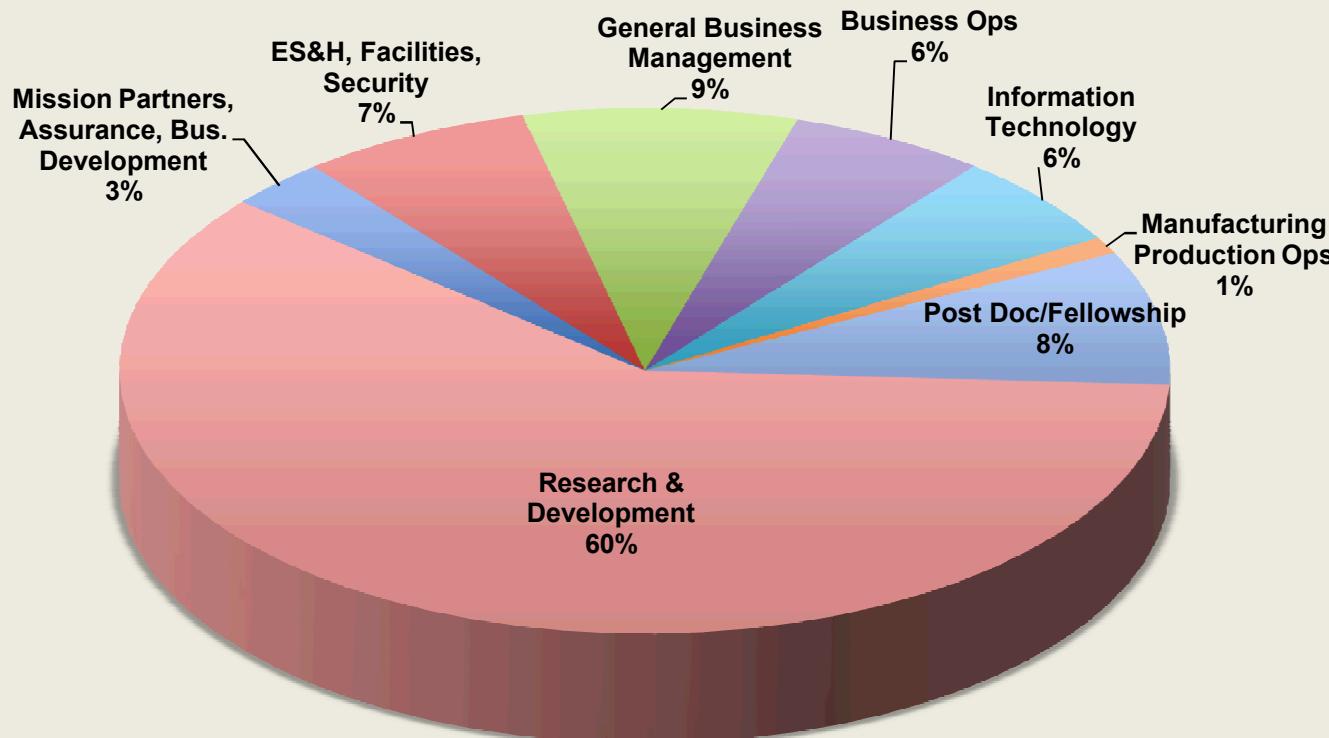


Who we are in Division 8000

(September, 2013)

- On-site workforce: 1,288
- R&D staff: 678

CA site by Job Family



*Includes 61 highly
talented international
workers*

California laboratory history



1956

California Laboratory opens, singular NW mission

1960s



Gas Transfer



Polaris - W47



Poseidon - W68

Strong NW mission,
Energy crisis

1970s



Minuteman III



Lance - W70



Combustion
Research



Solar Tower

Strong NW mission,
"Star wars"

1980s



AFAP - W79



B83



Peacekeeper - W87

"Tech Transfer",
Stockpile stewardship

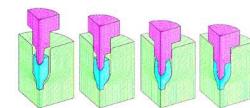
1990s



Extreme Ultraviolet
Lithography



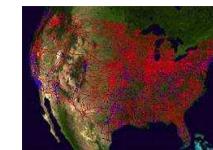
Demil



Stockpile
Stewardship

Broader national
security

2000s



Homeland Security



m - Chemlab



ALCM - W80 LEP



Stockpile
modernization,
Open campus

2010s



B61 LEP

Minuteman III
W78 LEP

California laboratory management structure



The California site is fully integrated with reachback to New Mexico

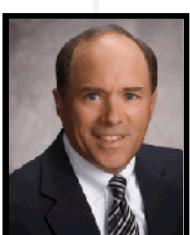
CI (20)
Legal (11000)
Govt Relations (100)
Quality (400)
Recruiting (3000)



8000
Steve Rottler
California
Laboratory
Division



8100
Duane Lindner
**Homeland
Security &
Defense
Systems**



8200
Russ Miller
**CA Nuclear
Weapon
Systems
Engineering**



8300
Bob Hwang
**Transportation
Energy**



8500
Denise Koker
**Site
Operations**

- HR
- Facilities
- ES&H



8600
Malin Young
**Biological &
Materials
Science**



8900
Len Napolitano
**Computer
Science &
Information
Systems**



DIVISION 8000 CAPABILITIES AND ORGANIZATIONS

Division 8000 capabilities

NUCLEAR WEAPONS

*Systems
Engineering
& Analysis for
Nuclear Weapons*



GLOBAL CHEMICAL AND BIOLOGICAL DANGERS

*CBRN
Defense*



*CA
Approach*

*Defense
Against
Cyber Threats*



CYBERSPACE

*Transportation,
Fuels, &
Engines and
their Impacts*

**SECURE AND SUSTAINABLE
ENERGY FUTURE**



Homeland security and defense systems



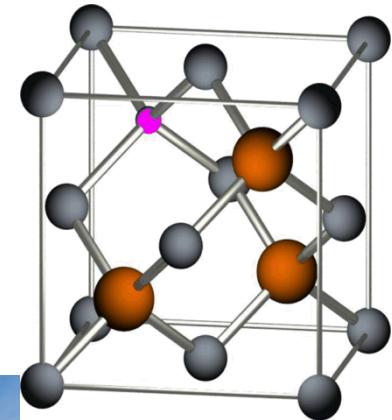
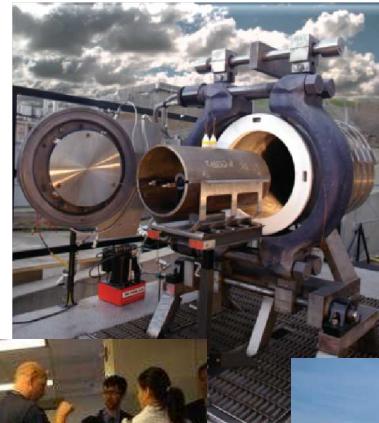
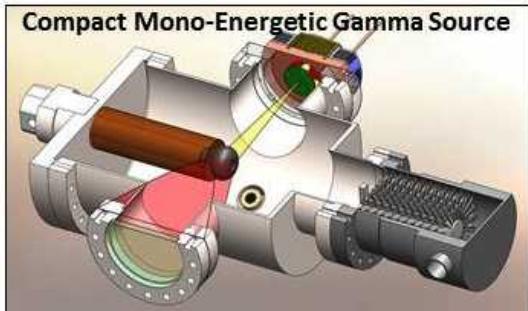
Center 8100

- Center 8100 supports a broad range of sponsors
 - Nuclear weapons (DOE/NNSA)
 - Non proliferation (DOE/NNSA and DOD)
 - Homeland security and defense (DHS and DOD)
 - Weapons demilitarization (DOD)
 - Advanced energy systems (DOE)



8100 core capabilities

- 8100 utilizes a set of core capabilities to support a diverse suite of activities
 - Systems analysis
 - Advanced engineering
 - Applied R&D



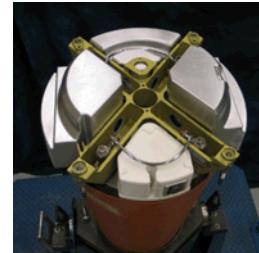
California weapons systems engineering



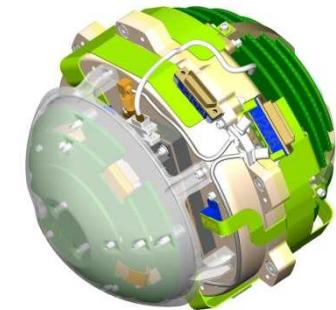
Center 8200



Surety Systems



JTA/TM

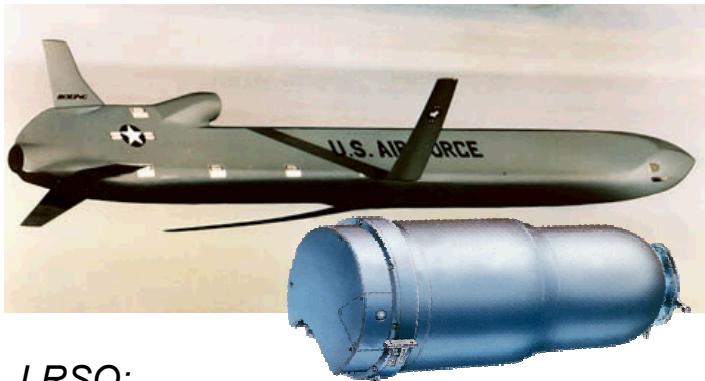


GTS



Center 8200 assures the safety, security, and reliability of the nation's nuclear assets

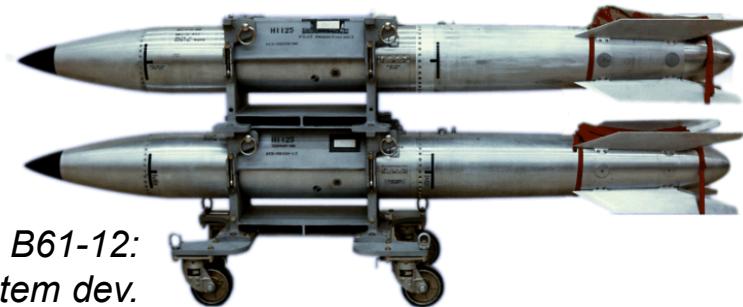
8200 exercises systems engineering expertise for advanced development



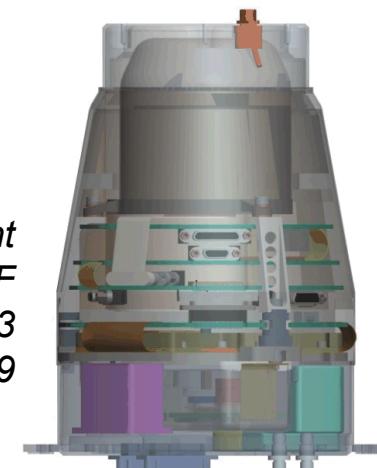
*LRSO:
Phase 6.1 in Q4 2014*



*W78/88-1:
Phase 6.2 in Oct 2012*



*B61-12:
subsystem dev.
FPU in 2019*



*Mk21 Fuze Replacement
WFO with USAF
Phase 6.3 in July 2013
FPU in 2019*

Sandia uses a “two site / one lab” model to partner with LANL and LLNL



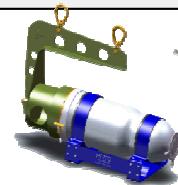
W80 B83 W87

B61 W76 W78 W88



leveraged infrastructure

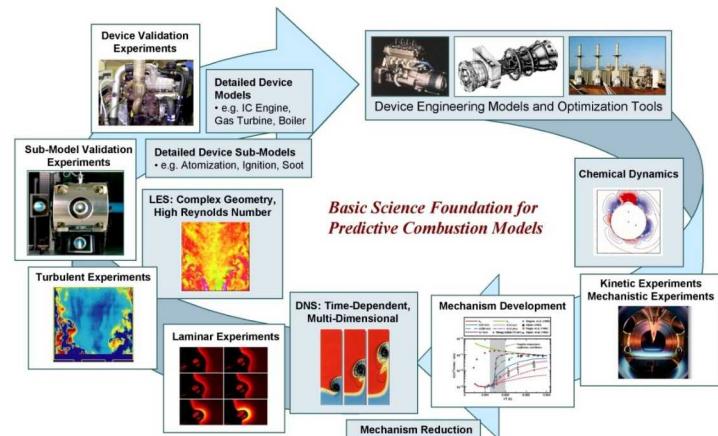
Use Denial	JTA Telemetry	Handling Gear	Gas Transfer Systems	Arming, Fuzing & Firing	Neutron Generators	Coded Control	Stronglinks
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Transportation energy

Center 8300

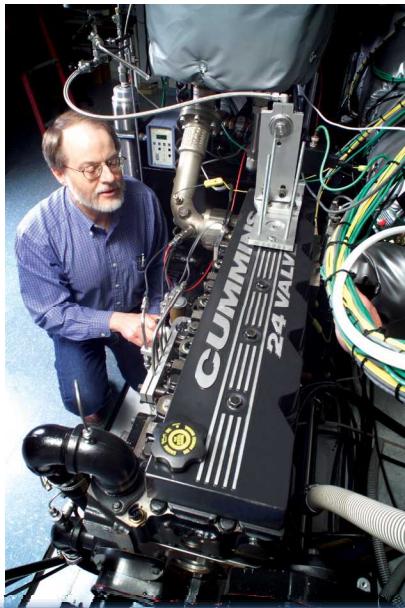
- Combustion Research Facility dedicated to excellence in energy science and technology for the twenty-first century
 - 82,000-square-foot office and laboratory facility
 - 36 highly specialized labs
 - 8000 square-foot computational lab
- Keys to CRF's success
 - Common scientific purpose
 - Collocation and collaboration
 - Strong ties to application
 - Full spectrum of basic to applied
- Reducing fuel use through enhancing engine efficiency



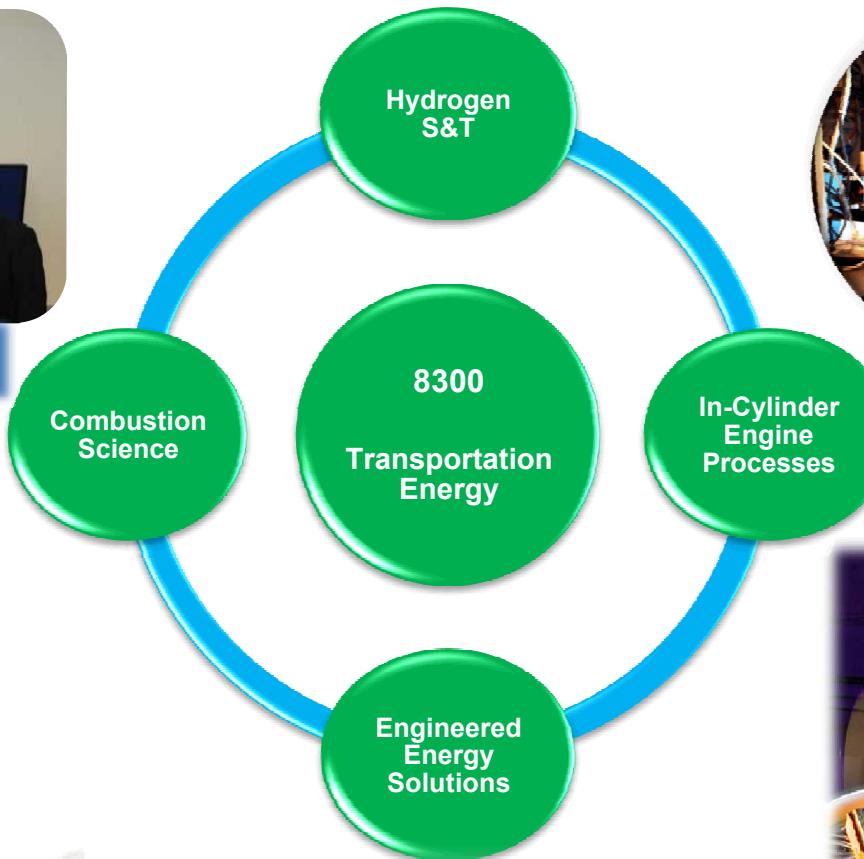
Center 8300 maintains a tradition of technical excellence



Worldwide Impact



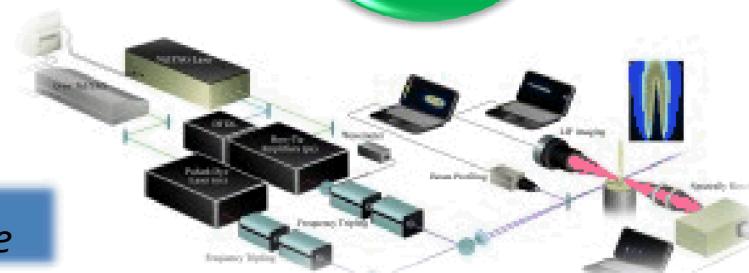
Understanding & Knowledge



Innovative Solutions



International Acclaim



California site operations

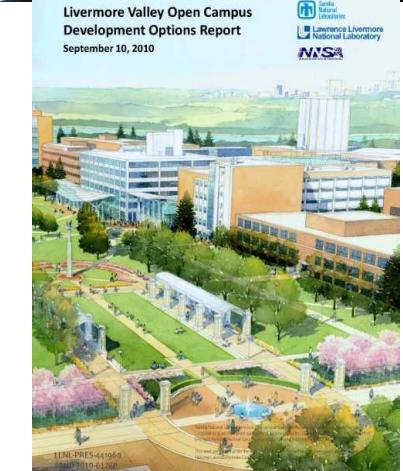
Center 8500



- Diverse workforce spans 14 job families
 - Physical operations: Security, facilities, ES&H
 - Business operations: Communications, HR, logistics, procurement, health/employee resources
 - Mission partners and assurance: Business development, assurance and quality, mission partners
- 225 employees (150 onsite contractors)
- 8500 manages \$25M in annual onsite service contracts
 - Security, maintenance, janitorial, communications, landscaping and construction

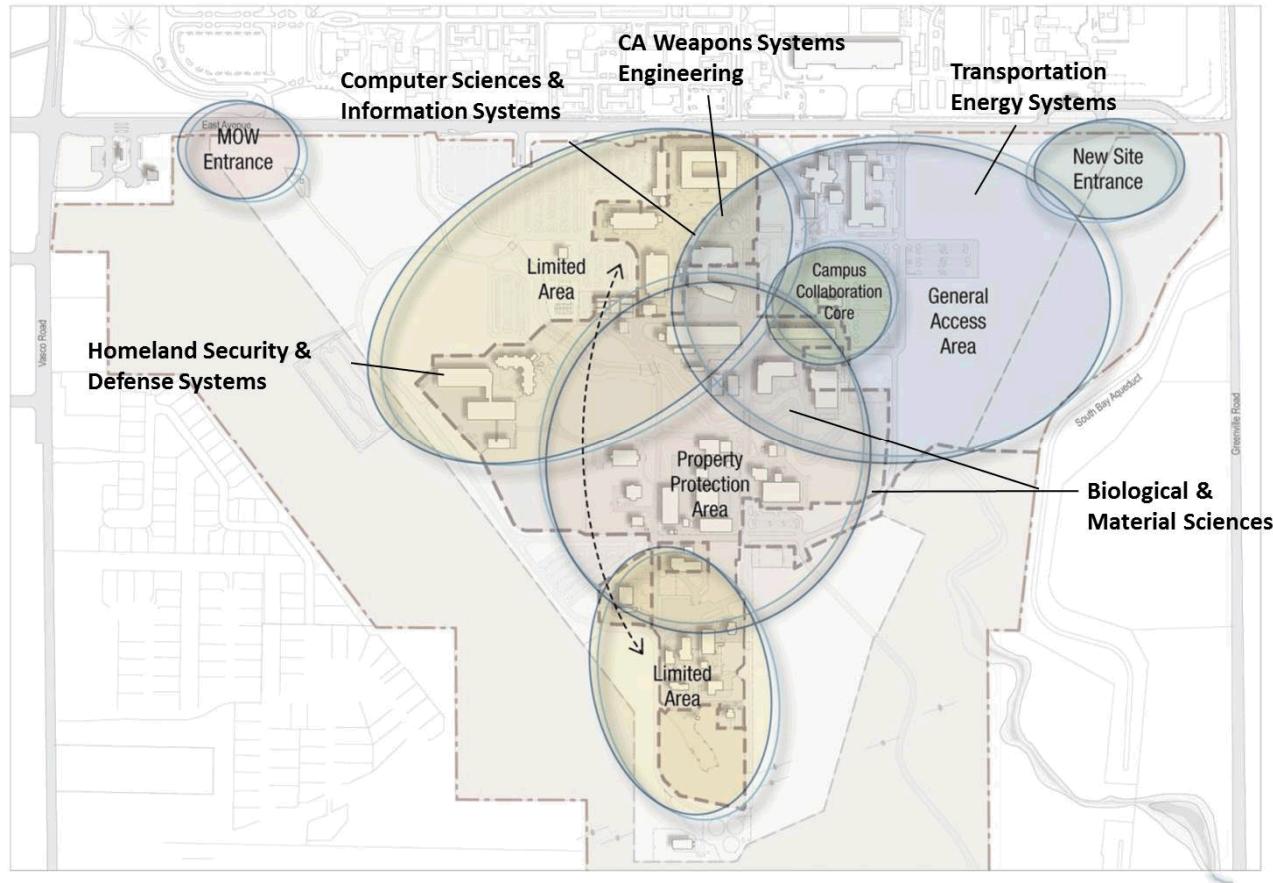
8500 is the mission partner for operations and service delivery

- Knows the mission and understands business requirements
 - Has “walked a mile” in the customers’ shoes
- Provides value-needed core services in a variety of ways that are effective as well as efficient
- Addresses mission, division, and center needs through integrated services
- Attracts and develops the required talent and functional expertise to do all this



Site master plan concept

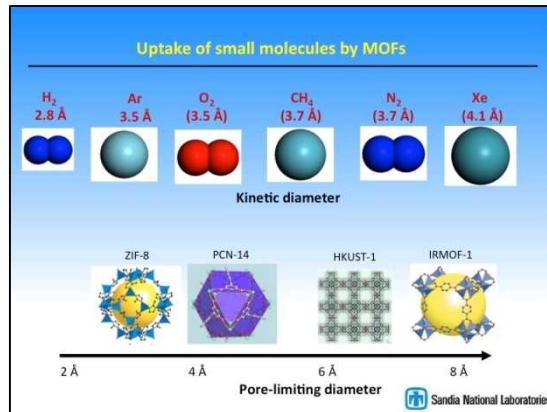
- CA Site Development Plan promotes a positive, productive environment for the workforce and execution of missions



Biological and materials science

Center 8600

- 8600's research and development programs are aimed at providing biological and materials science solutions to improve our Nation's:
 - Energy independence
 - Resilience to biological attacks and natural outbreaks
 - NW stockpile reliability



Materials for energy and national security



Biomass deconstruction and biofuels development

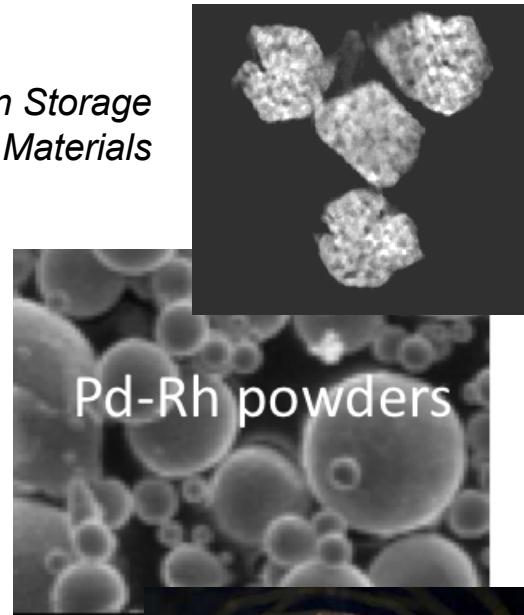


Biodefense and emerging infectious disease R&D

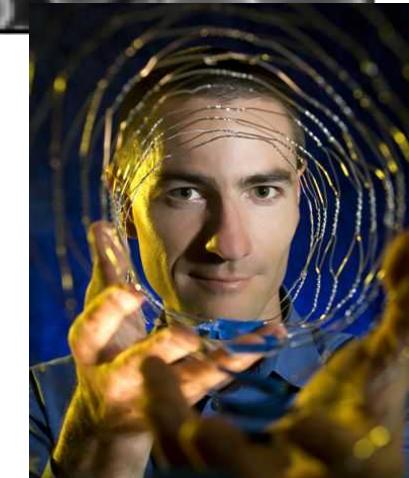
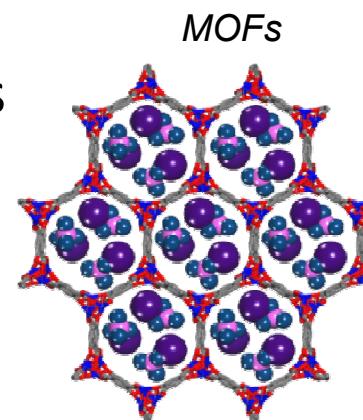
8600 conducts R&D on materials important to energy and national security

- Energy storage materials
(batteries, solid electrolytes)
- Hydrogen storage materials
- Thermoelectric materials
- Surface science
(graphene, adsorbates, oxides)
- Dynamics, structure, and electrochemistry
of surfaces and interfaces
- Nanoelectronics and nanophotonics
(CNTs, MOFs, TIs, NWs)

Hydrogen Storage Materials



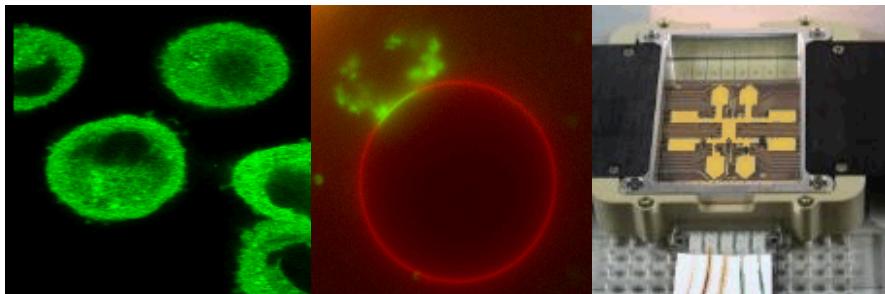
Pd-Rh powders



Carbon nanotubes

8600's bioscience program addresses the nation's biodefense and biofuels needs

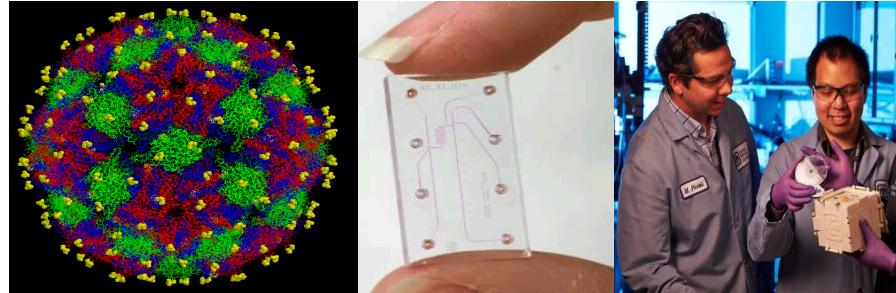
Biology of Pathogens and Host-Pathogen Interactions



Lignocellulosic biofuels (JBEI)



Countermeasure development



Biodefense

Algal biofuels

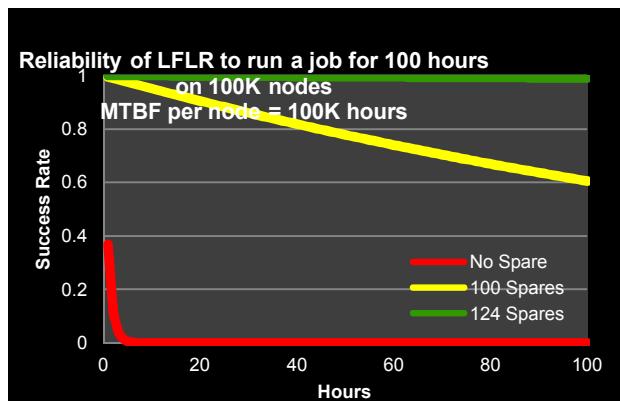


Biofuels

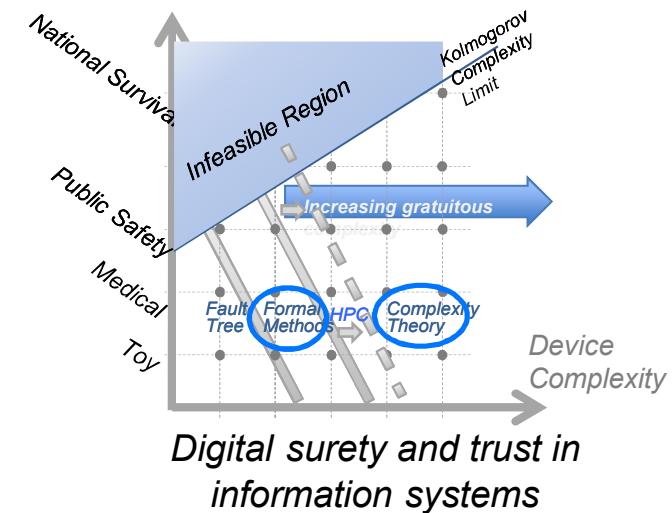
Computer sciences and information systems

Center 8900

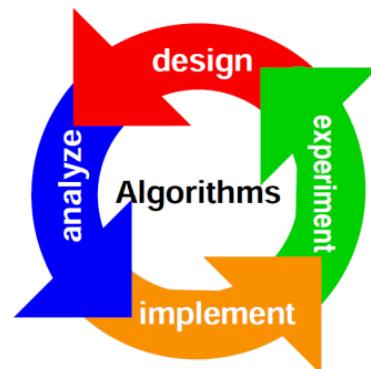
- Center 8900 solves national security problems through research, development, and application of computers



Developing scalable, fault-oblivious computing for extreme scales



Providing tools and leadership in modeling and simulation



Threat and vulnerability analysis on information systems of national consequence



8900 has five business focus areas

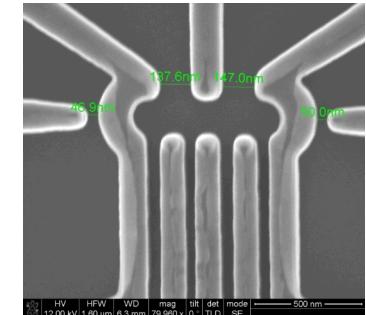
- Advanced computing concepts
- Information security
- Information operations (IO) program
- Information technology solutions
- Tools for the nuclear weapons program



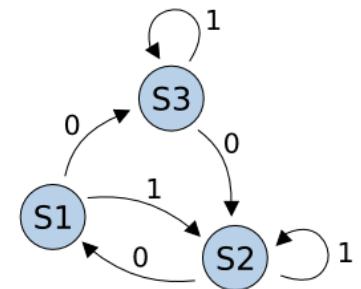
*Internet-scale network emulation
and analysis tools*



*Communications systems that
enable national security missions*

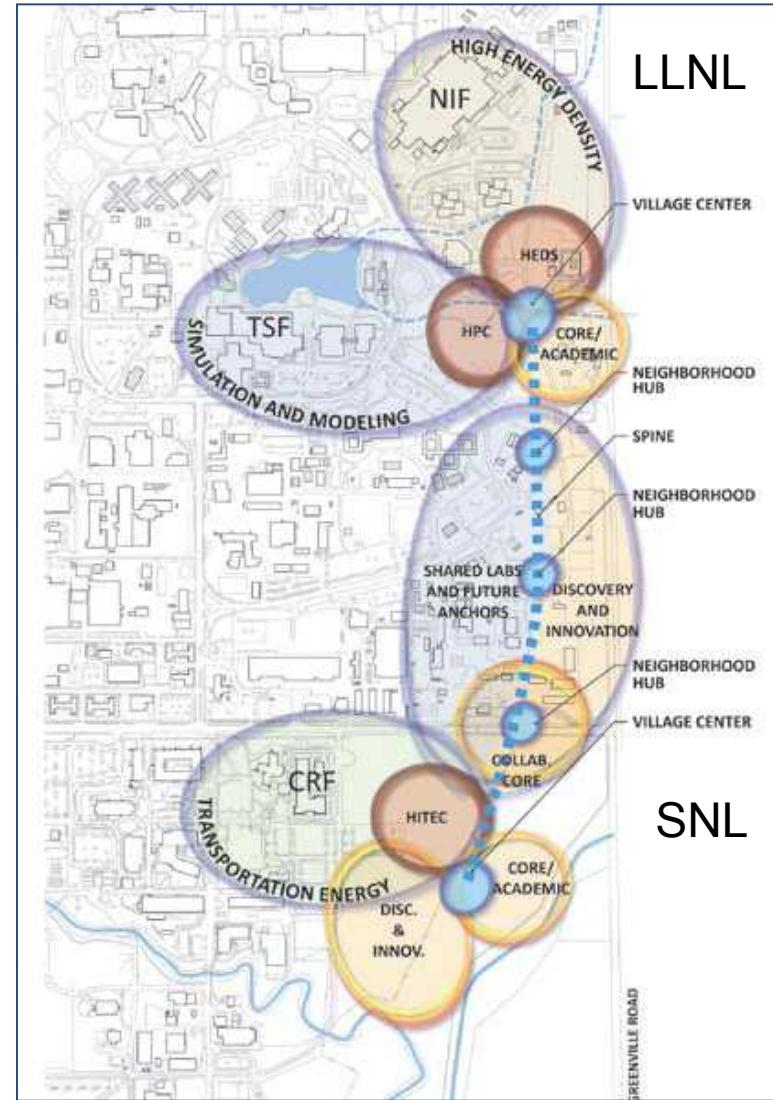
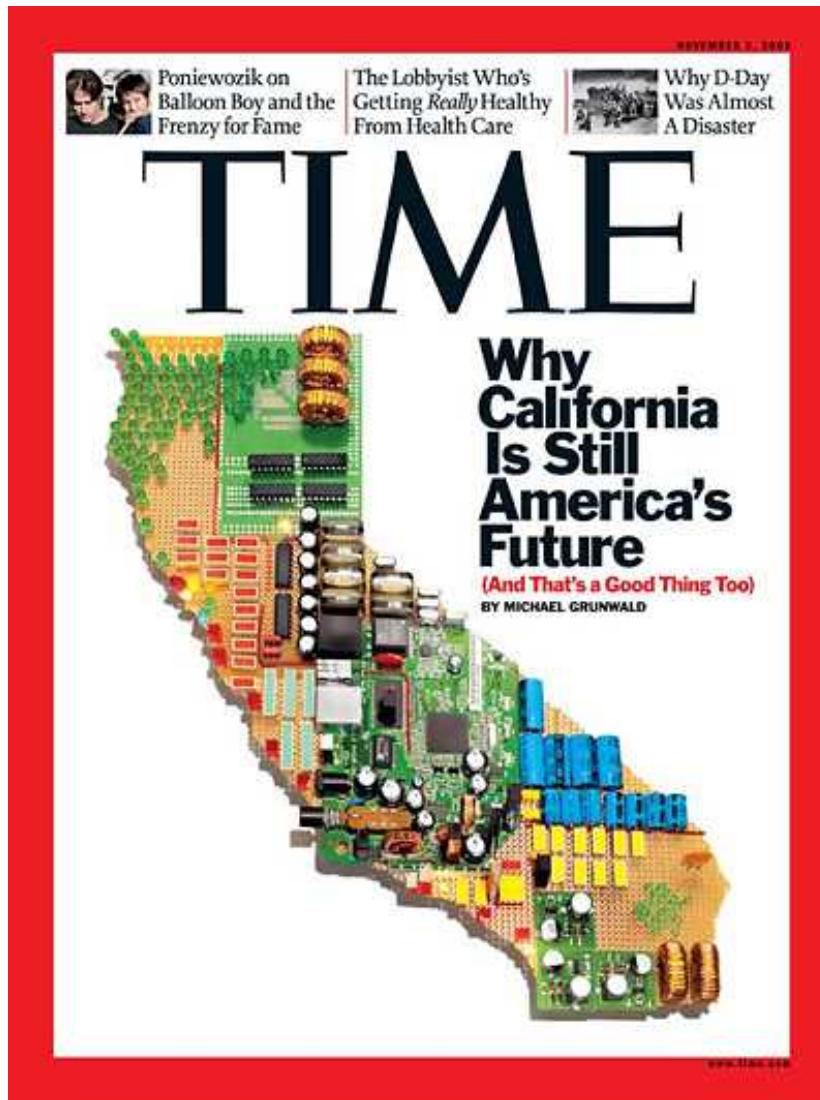


*Advancing QIS
double quantum dot*



*Formal methods for
hardware/software
verification*

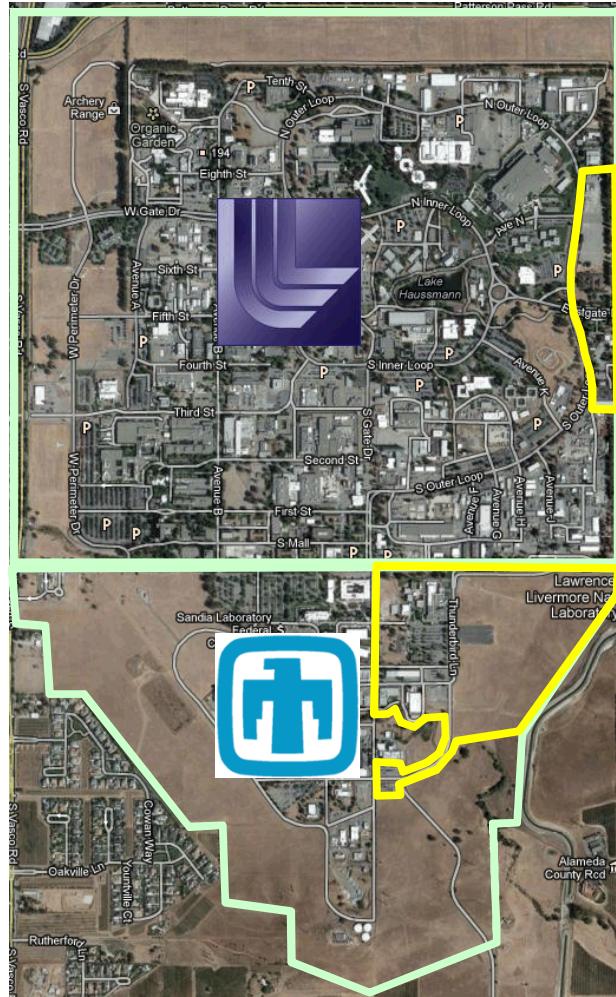
The Livermore Valley Open Campus: Expanding our national security role



Livermore Valley Open Campus (LVOC)

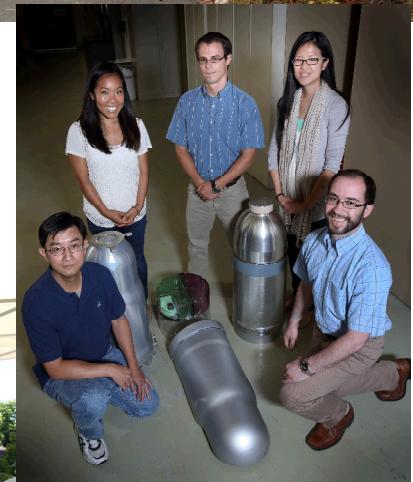
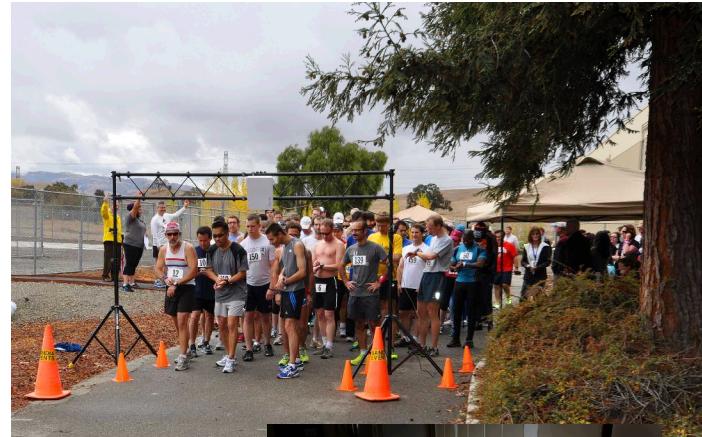


- Established to address NNSA's and DOE's broader national security objectives
 - Enable open, collaborative culture
 - Attract and retain an exceptional workforce
- Inaugural programs
 - Combustion Research Facility (CRF)
 - Cybersecurity Technologies Research Laboratory (CTRL)
 - Center for Infrastructure Research and Innovation (CIRI)
 - Institute for Translational Biomedicine (ITB)
 - Collaboration in Research and Engineering for Advanced Technology and Education (CREATE)



Diversity and inclusion in the Sandia/California community

- We are committed to sustaining and deepening the diversity and inclusion culture in the Division to:
 - Gain deeper cross-cultural understanding
 - Form more authentic human relationships
 - Develop a skillset to shift attitudes in ourselves and in our community
- Our diversity groups sponsor D&I events, celebrate diverse groups, and help with recruiting



Questions?



END