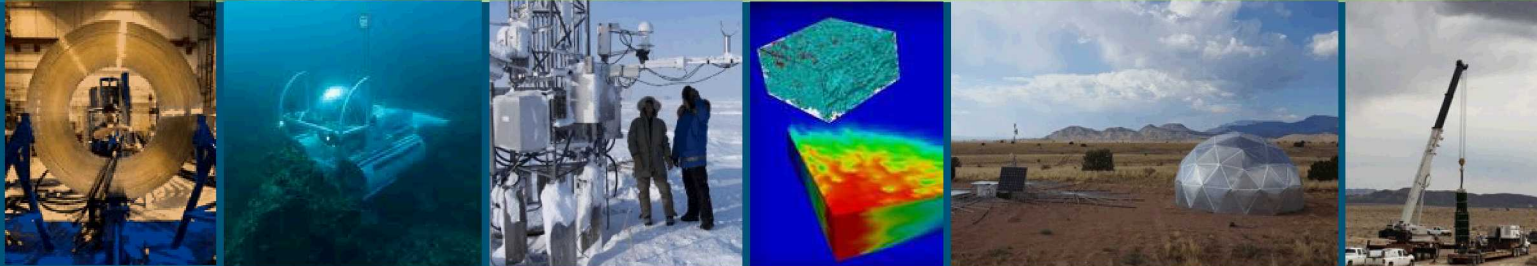
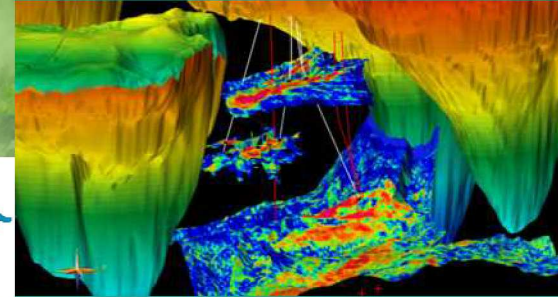


# Sandia National Laboratories Overview



*PRESENTED BY*

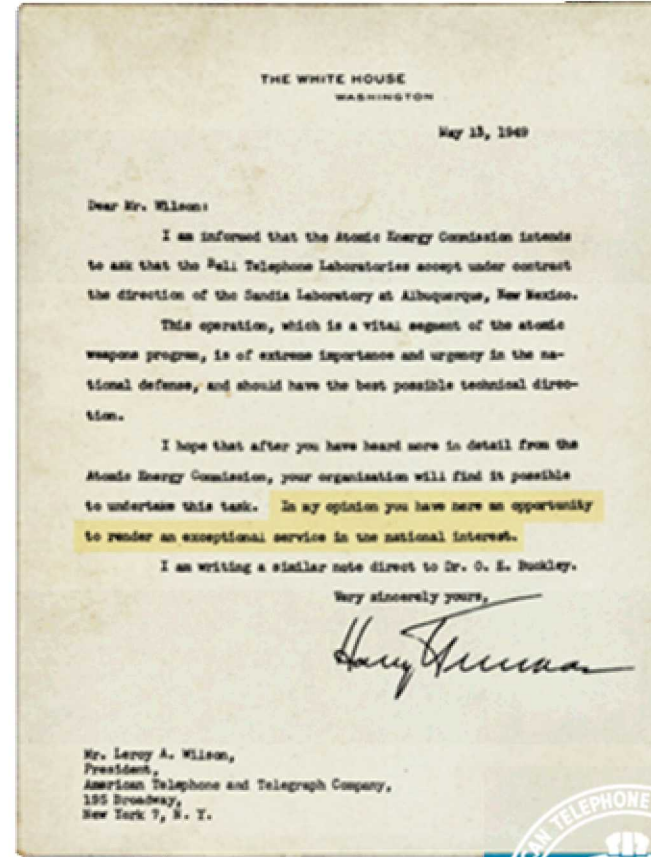
Erik | Senior Manager, Geoscience Research and Applications

February 25, 2020

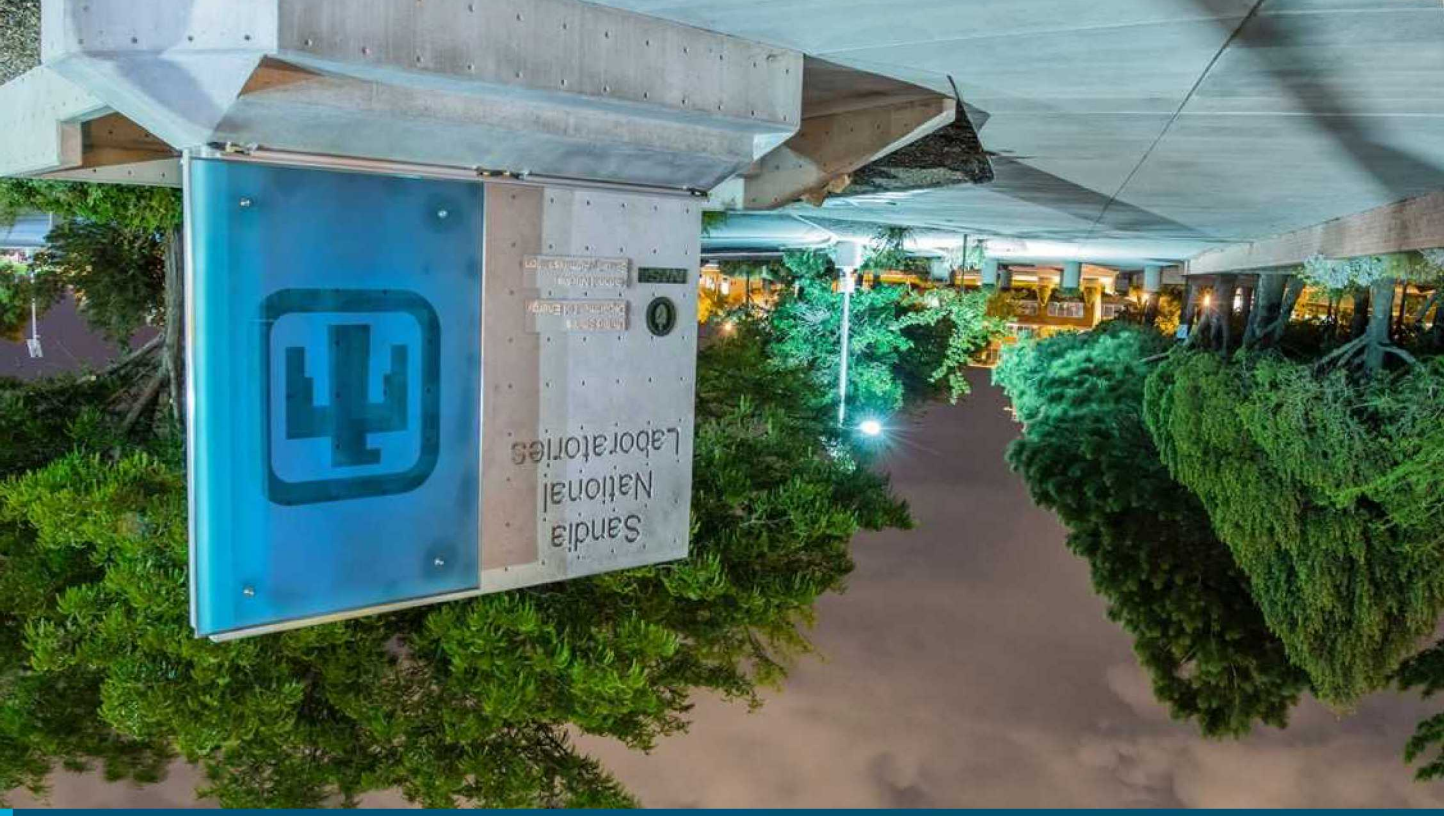
# SANDIA'S HISTORY IS TRACED TO THE MAN

*...In my opinion you have here an opportunity to render an exceptional service in the national interest.*

- July 1945 Los Alamos creates Z Division
- Nonnuclear component engineering
- November 1, 1949, Sandia Laboratory established
- AT&T: 1949–1993
- Martin Marietta: 1993–1995
- Lockheed Martin: 1995–2017
- Honeywell: 2017–present



# SANDIA IS A FEDERALLY FUNDED RESEARCH & DEVELOPMENT CENTER OPERATED BY...



National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc.: 2017 – present

Government owned, contractor operated



## SANDIA MAIN SITES

Albuquerque, New Mexico  
Livermore, California

## FACTS & FIGURES

Largest of the national laboratories

FY19 budget of \$3.81B

- 57% allocated to nuclear deterrence

FY20 projected budget of \$3.77B

- 57% allocated to nuclear deterrence

14,089 employees

- 51% are technical staff
- 44% have been at Sandia less than 5 years

Average age of facilities is 39 years

- >7,000,000 sq. ft.
- >300 sq. mi.

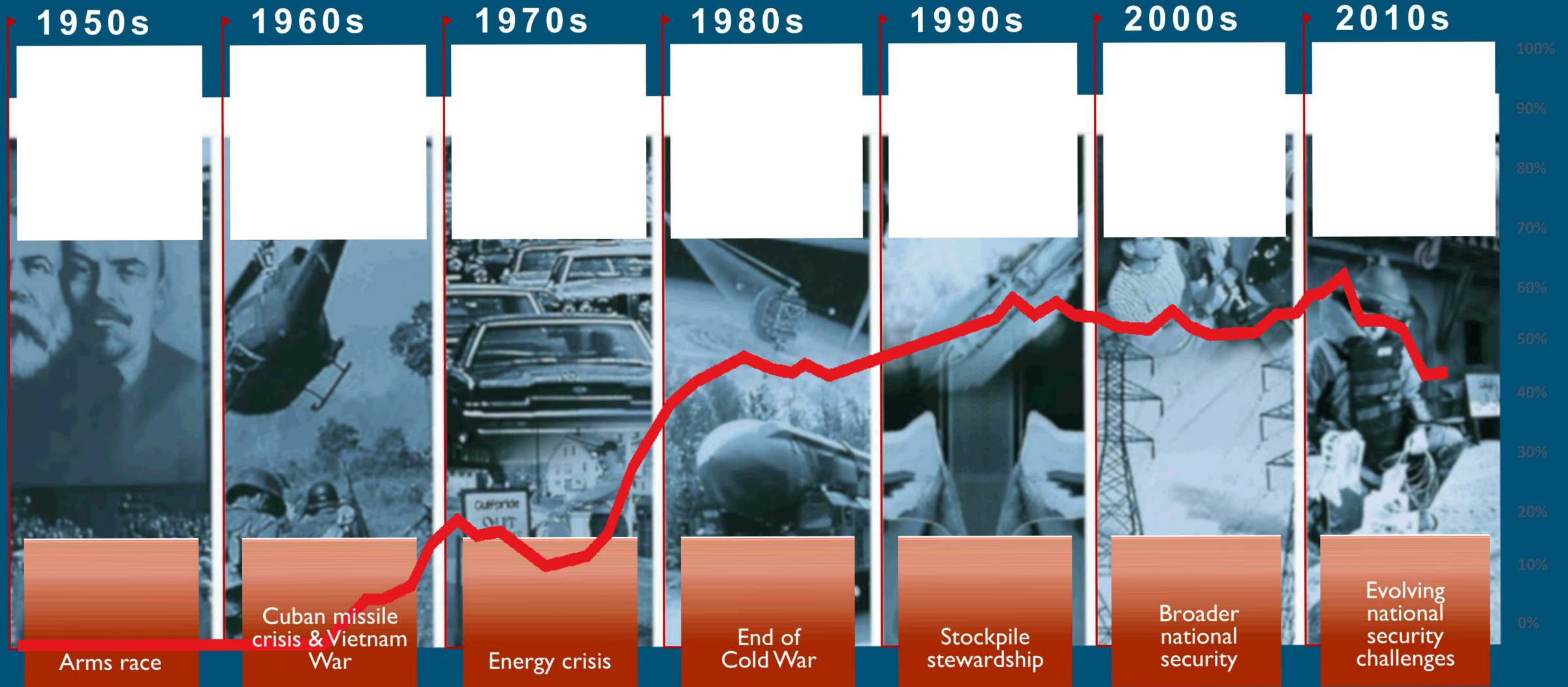
## LOCATIONS

- **Kauai, Hawaii**
- **Pantex Plant  
Amarillo, Texas**
- **Tonopah, Nevada**
- **Washington, D.C.**
- **Waste Isolation  
Pilot Plant (WIPP)  
Carlsbad, New  
Mexico**



Sandia develops  
advanced technologies  
to ensure global peace

# SANDIA ADDRESSES NATIONAL SECURITY CHALLENGES



% Non-NW Funding

Board of Managers

Independent Audit



Labs Director's Office

  
Labs Director  
*James S. Peery, Ph.D.*

  
Deputy Labs Director  
*Dori Ellis*

Counterintelligence  
Environment, Safety, and Health  
Strategic Plans and Policy

  
Advanced Science & Technology  
Dr. Susan Seestrom

  
Nuclear Deterrence  
Dr. Steve Girrens

  
HR & Communications  
John Myers

  
Infrastructure Operations (Acting)  
Dr. Joel Lash

  
National Security Programs  
Mike Burns

  
Global Security  
Doug Bruder

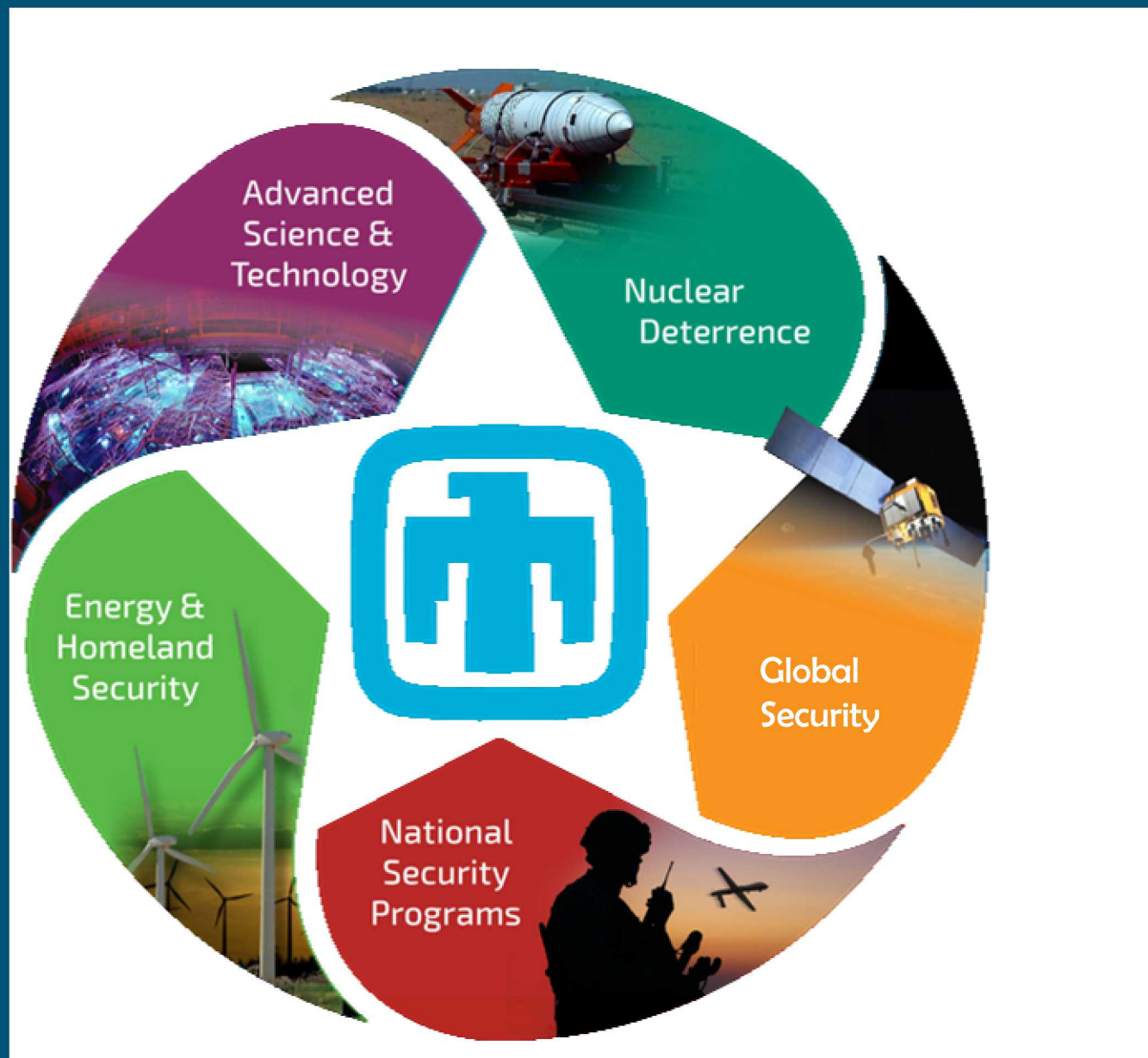
  
Integrated Security Solutions  
Dr. Andrew McIlroy

  
Mission Assurance  
Mark Sellers

  
Mission Services  
Scott Aeilts

  
General Counsel  
Will Elias

# SANDIA HAS FIVE MISSION AREAS



# NUCLEAR DETERRENCE

## Our primary mission drivers

### Maintain the current U.S. nuclear weapons stockpile

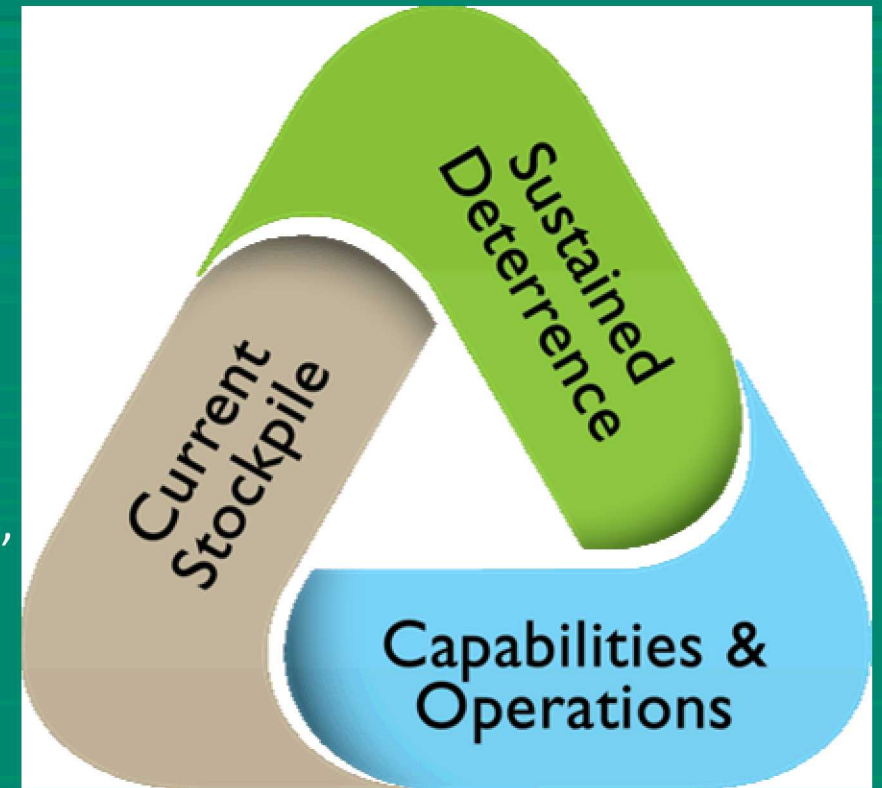
Continue the safety, security, and reliability of the current stockpile through Annual Assessment, surveillance, limited life component exchanges, significant finding investigations

### Sustain a flexible and responsive stockpile into the future

Ensure U.S. nuclear deterrent effectiveness by extending warhead life and maintaining readiness to counter emerging and unconventional nuclear deterrent threats through Life Extension Programs, Alterations, Modifications, Technology Maturation, as well as Advanced & Exploratory work

### Steward the long-term vitality of our capabilities, infrastructure, and operations

Continue the persistent commitment to world-class, multi-disciplinary staff, state-of-the-art labs, equipment, facilities, and safe/secure/quality/affordable operations



## Protects the nation from threats at home and abroad

- Develop space- and ground-based sensor systems for monitoring emerging threats
- Supply technology, crisis response, and training to respond to a crisis associated with weapons of mass destruction
- Provide capabilities for protecting U.S. nuclear weapons and materials at fixed sites and in transit
- Produce systems that deter proliferation and verify compliance with international agreements using space-borne and ground-based sensing technology
- Lead global technical engagement to prevent the misuse of nuclear, chemical, biological, and radiological materials

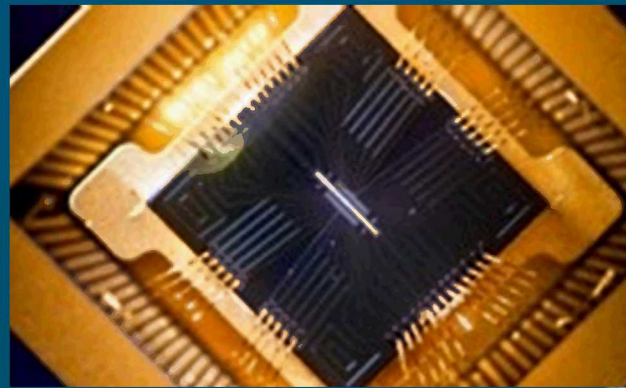


# NATIONAL SECURITY PROGRAMS

## Strengthens our nation's defenders



Information operations



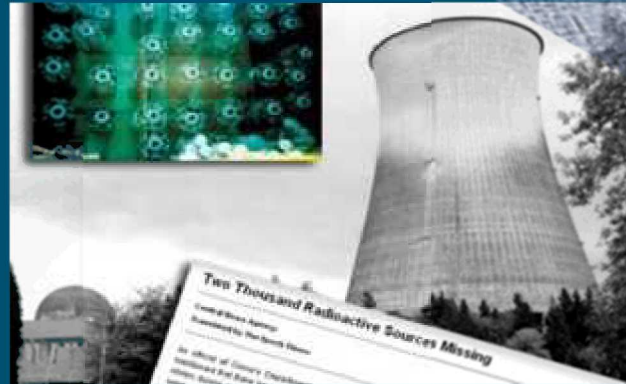
Science & technology products



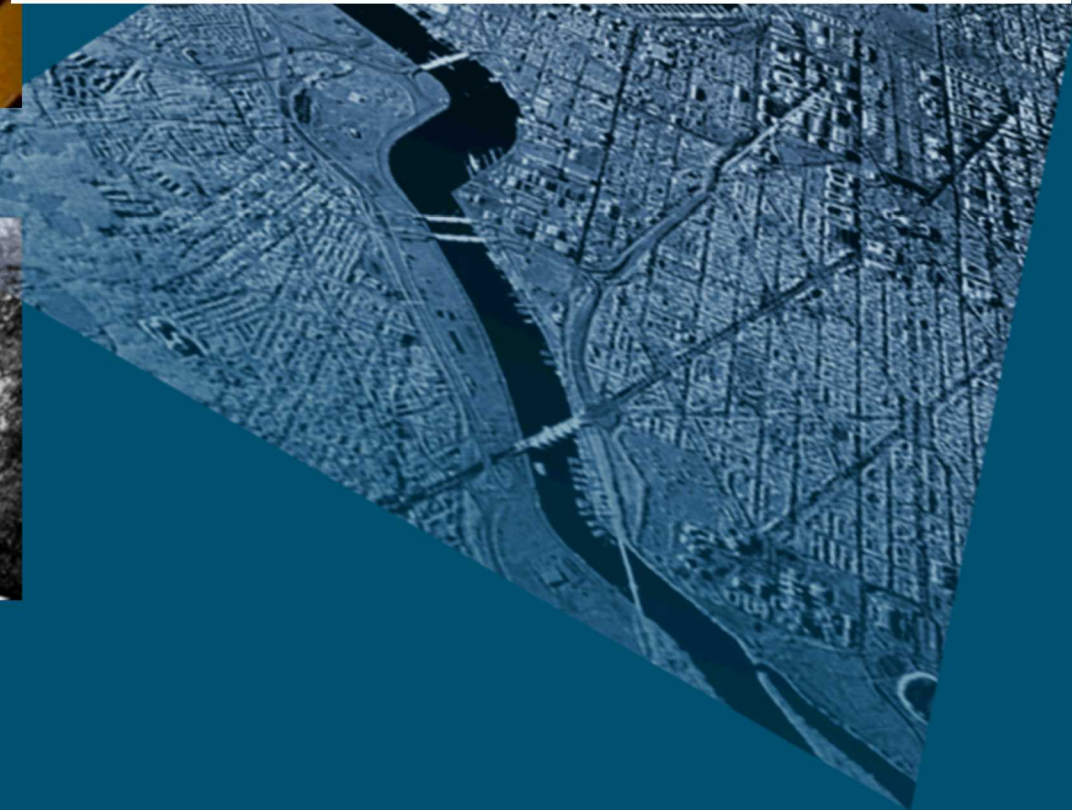
Surveillance & reconnaissance



Integrated military systems



Proliferation assessment



**Integrates multidisciplinary efforts to advance the science of the possible for Sandia's missions**

## WEAPONS SCIENCE & TECHNOLOGY

Provides Sandia with foundational science and engineering capabilities to ensure the nation's nuclear stockpile is safe, secure, and effective

## OFFICE OF SCIENCE

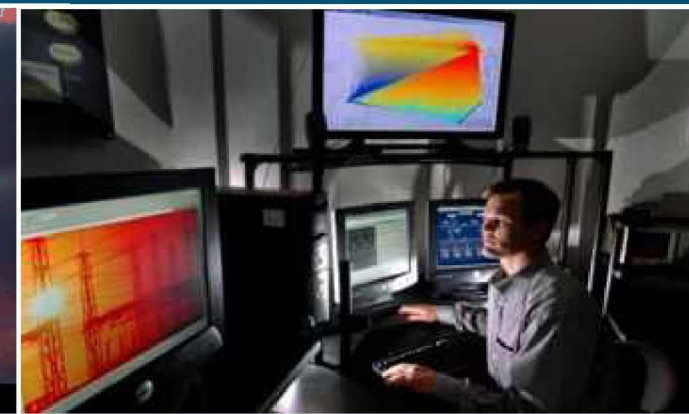
Leads creative, hypothesis-driven inquiry in fundamental science to promote national security and international scientific leadership

## CHIEF RESEARCH OFFICER

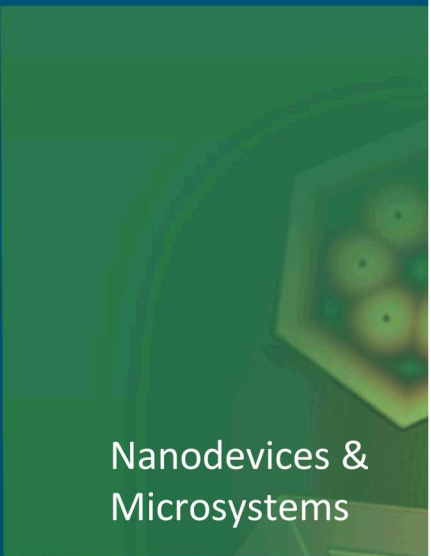
Governs and leads research strategy and stewardship of capabilities at Sandia, including the Laboratory Directed Research and Development program. Responsible for leadership of technology transfer and Sandia's partnerships with universities, industry, and the state of New Mexico.



- Perform fundamental and applied R&D to support the resilience and security of the nation's energy system
- Provide protection for our nation's digital and physical critical infrastructures
- Reduce U.S. vulnerability to chemical, biological, radiological, and nuclear threats
- Accelerate transformative innovations in the transportation sector through foundational physical and computational research



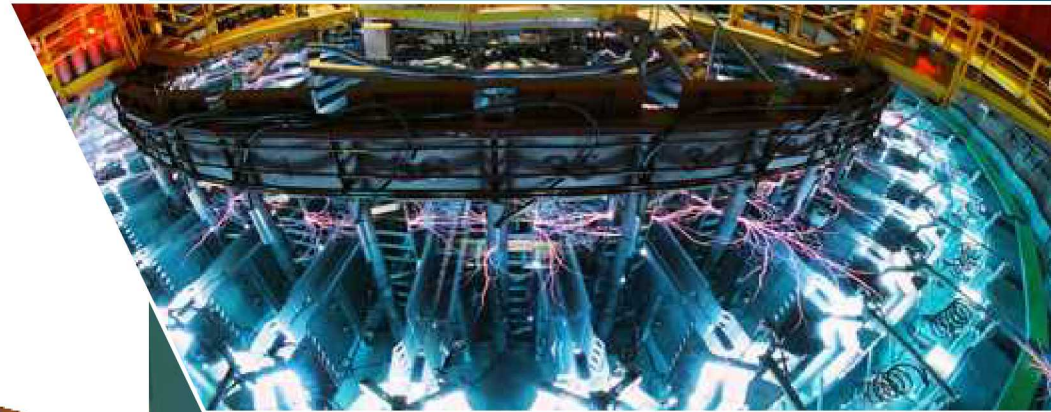
# OUR RESEARCH FOUNDATIONS STEWARD THE SCIENCE & TECHNOLOGY INTEGRAL TO MISSION EXECUTION



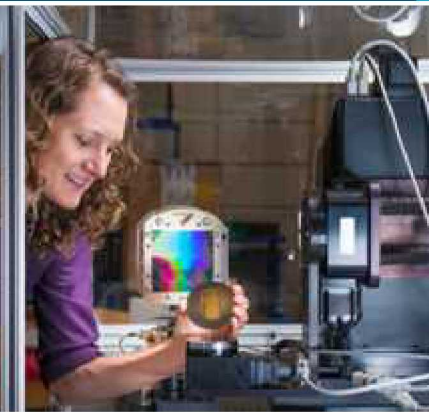
Nanodevices & Microsystems



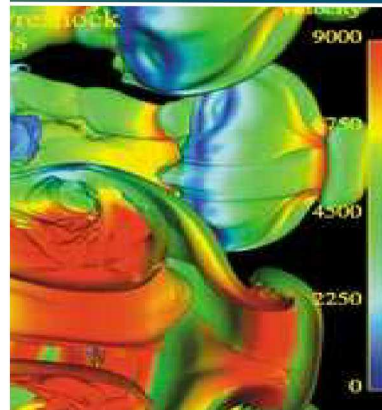
Computing & Information



Radiation Effects & High Energy Density Science



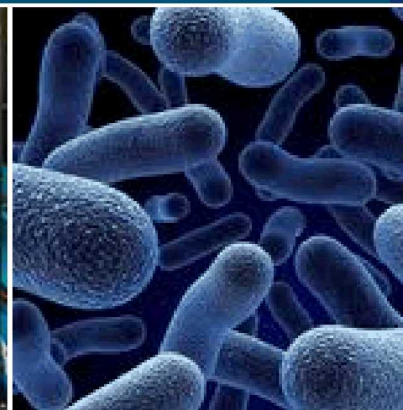
Materials Science



Engineering Science

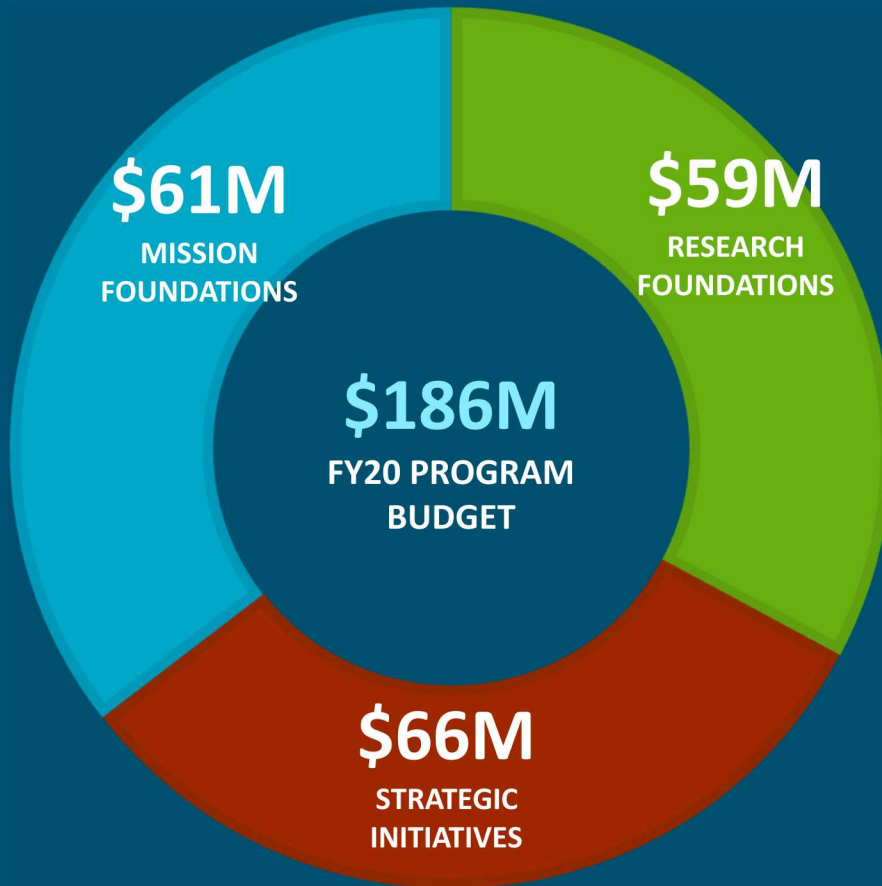


Earth Science



Bioscience

# LABORATORY DIRECTED R&D (LDRD) BALANCES FOUNDATIONAL AND APPLIED INVESTMENTS



## Research Foundations

Conduct fundamental discovery research fundamental to the national security mission needs.

## Mission Foundations

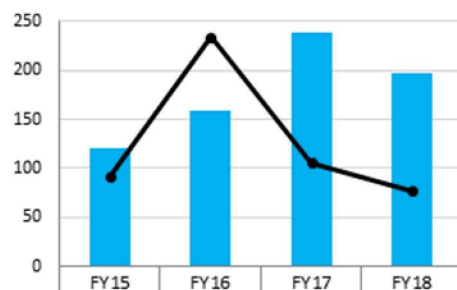
Conduct applied research in areas directly relevant to current and anticipated missions.

## Strategic Initiatives

Promote strategic collaborations and CRO/Labs-directed initiatives.

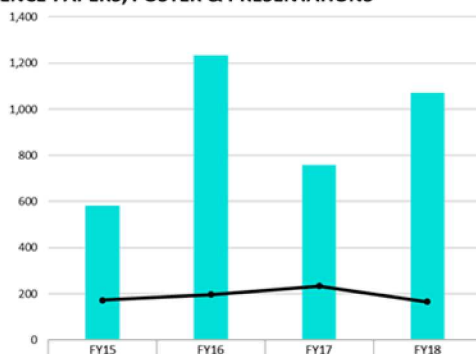
## PUBLICATIONS/POSTERS/PRESENTATIONS/JOURNALS/BOOKS

## JOURNAL ARTICLES



Number of Publications	FY15	FY16	FY17	FY18
	120	159	238	197
Number of Authors	92	234	106	77

## CONFERENCE PAPERS, POSTER &amp; PRESENTATIONS

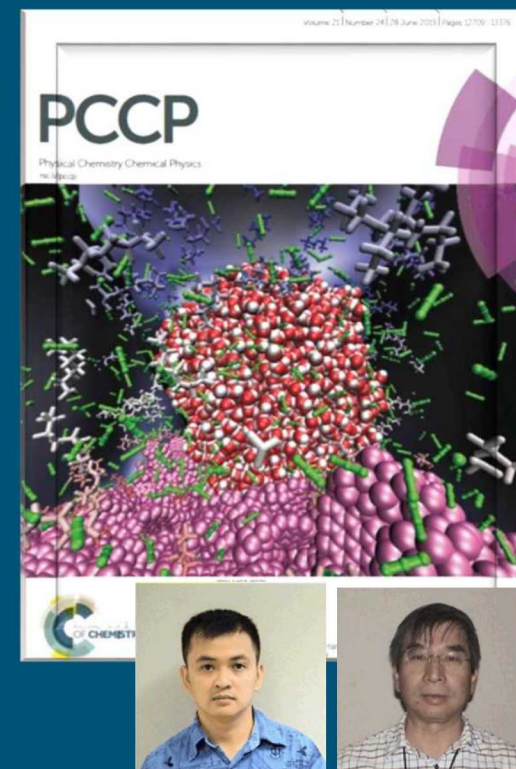
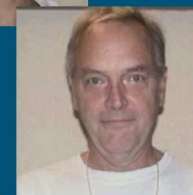
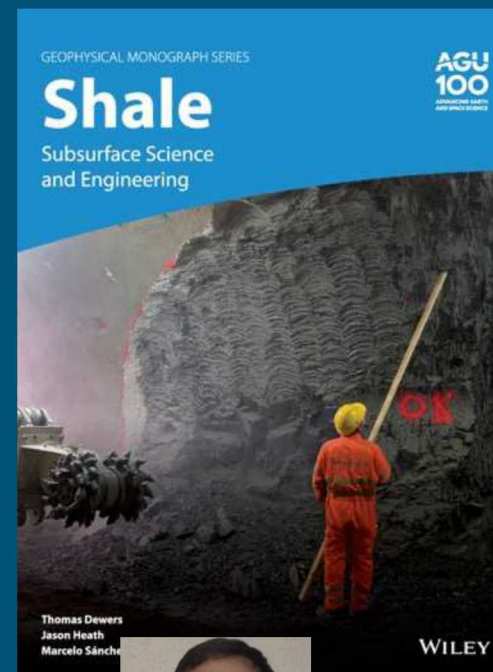


Number of Conference Papers, Posters & Presentations	FY15	FY16	FY17	FY18
	581	1232	757	1070
Number of Authors	172	196	234	165



Anastasia Ilgen and Kevin Leung's BES paper, "Switching on" iron in clay minerals (Ilgen, Kukkadapu, Leung, and Washington, *Environ. Sci.: Nano*, 2019,6, 1704-1715) was selected as one of the top 10% for *Environmental Science Nano*.

Tuan Ho & Yifeng Wang, *Enhancement of oil flow in shale nanopores by manipulating friction and viscosity*, *Physical Chemistry Chemical Physics*, Vol 21, No. 24, June 28, 2019



Jason Heath, Thomas Dewers, and Marcelo Sanchez, *Shale: Subsurface Science and Engineering*. Part of a Geophysical Monograph Series.

