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Research & Development Trends in the National Security Environment

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Component Science, Engineering, and Production Center
Nuclear Deterrence Program

Sandia National Laboratories

R&D 100 CONFERENCE

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WALDORF ASTORIA ORLANDO
ORLANDO, FL

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#RD100

The Department of Energy Executes Its Missions Through Diverse National Labs

Office of Science Laboratories

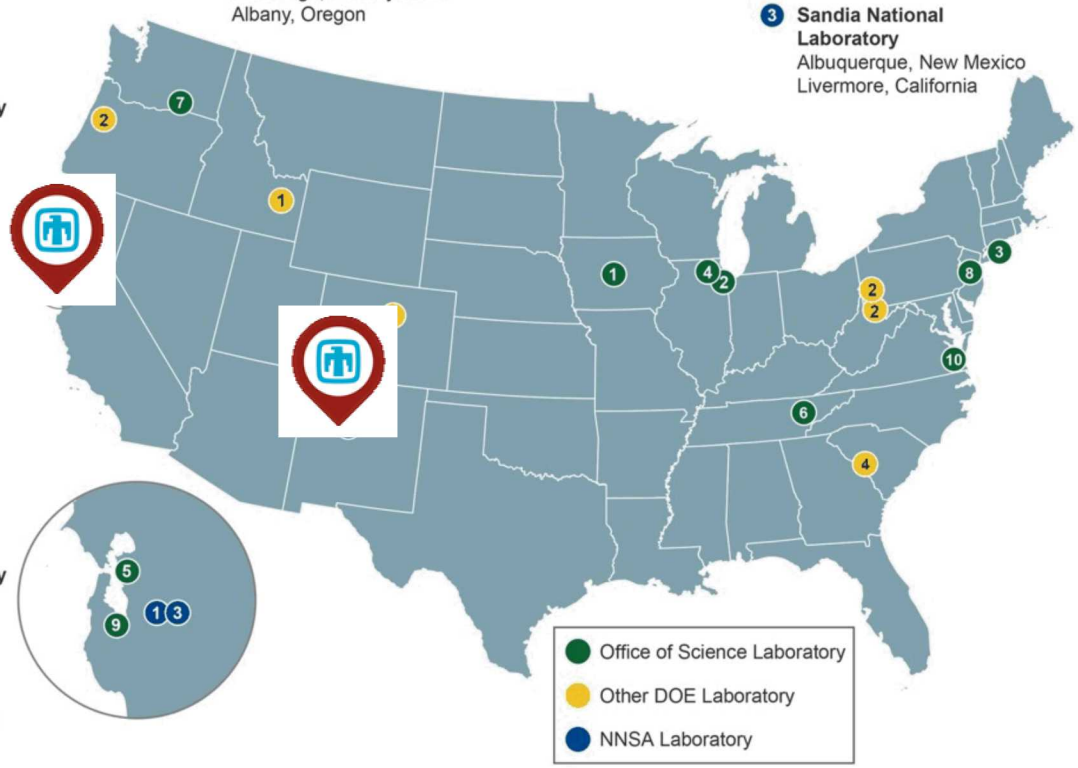
1. **Ames Laboratory**
   Ames, Iowa
2. **Argonne National Laboratory**
   Argonne, Illinois
3. **Brookhaven National Laboratory**
   Upton, New York
4. **Fermi National Accelerator Laboratory**
   Batavia, Illinois
5. **Lawrence Berkeley National Laboratory**
   Berkeley, California
6. **Oak Ridge National Laboratory**
   Oak Ridge, Tennessee
7. **Pacific Northwest National Laboratory**
   Richland, Washington
8. **Princeton Plasma Physics Laboratory**
   Princeton, New Jersey
9. **SLAC National Accelerator Laboratory**
   Menlo Park, California
10. **Thomas Jefferson National Accelerator Facility**
    Newport News, Virginia

Other DOE Laboratories

1. **Idaho National Laboratory**
   Idaho Falls, Idaho
2. **National Energy Technology Laboratory**
   Morgantown, West Virginia
   Pittsburgh, Pennsylvania
   Albany, Oregon
3. **National Renewable Energy Laboratory**
   Golden, Colorado
4. **Savannah River National Laboratory**
   Aiken, South Carolina

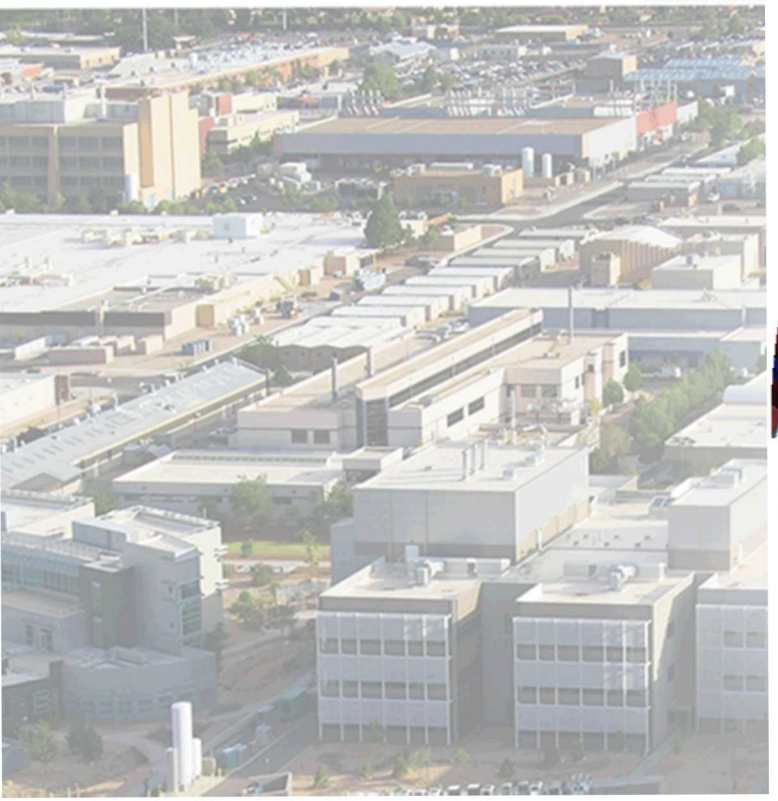
NNSA Laboratories

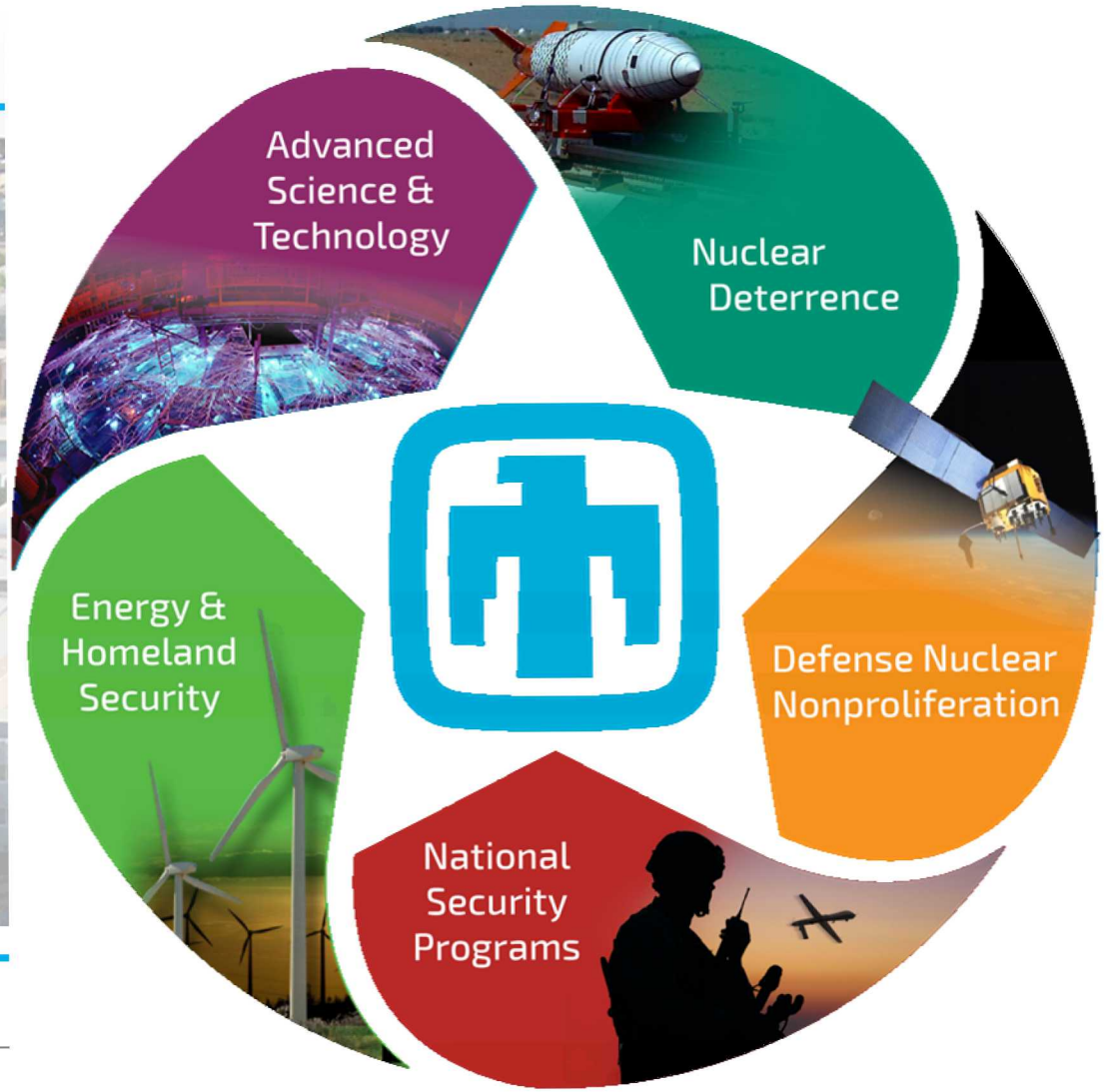
1. **Lawrence Livermore National Laboratory**
   Livermore, California
2. **Los Alamos National Laboratory**
   Los Alamos, New Mexico
3. **Sandia National Laboratory**
   Albuquerque, New Mexico
   Livermore, California



Three NNSA labs are dedicated to the science and technology of keeping the nation safe

Sandia is a Multi-mission National Security Laboratory





At A Glance

BUDGET

FY18 BUDGET

NUCLEAR WEAPONS (NNSA and DoD)

19 PERCENT

DoD/ INTELLIGENCE COMMUNITY

6 PERCENT

OTHER DOE

14 PERCENT

OTHER PROGRAMS

DEMOGRAPHICS

12,330 MEMBERS

OF THE WORKFORCE

49 PERCENT

TECHNICAL RESEARCH STAFF

38 PERCENT

4 OR FEWER YEARS AT SANDIA

59 PERCENT

LESS THAN 10 YEARS AT SANDIA

ECONOMIC IMPACT

$1.3 BILLION

TOTAL SALARIES

$1.17 BILLION

TOTAL PROCUREMENT

53 PERCENT

OF PROCUREMENT TO SMALL BUSINESSES

FACILITIES

7 LOCATIONS

194 THOUSAND

TOTAL ACRES

7.6 MILLION SQ. FT.

BUILDINGS

38 YEARS

AVERAGE AGE OF FACILITIES

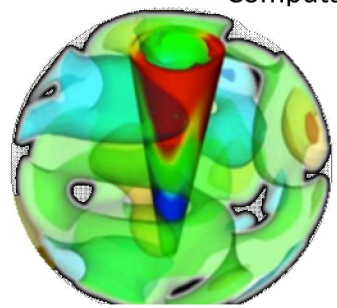
Sandia Lab's Non-Nuclear Components

Sandia is a national security laboratory, with the core mission of designing all, and producing many of the non-nuclear components used in America's nuclear weapons stockpile. At its essence, Sandia is a surety laboratory, ensuring that the U.S. stockpile is safe, secure, and reliable.

To meet our mission commitments, we develop advanced technology, across all science and engineering disciplines, to design:

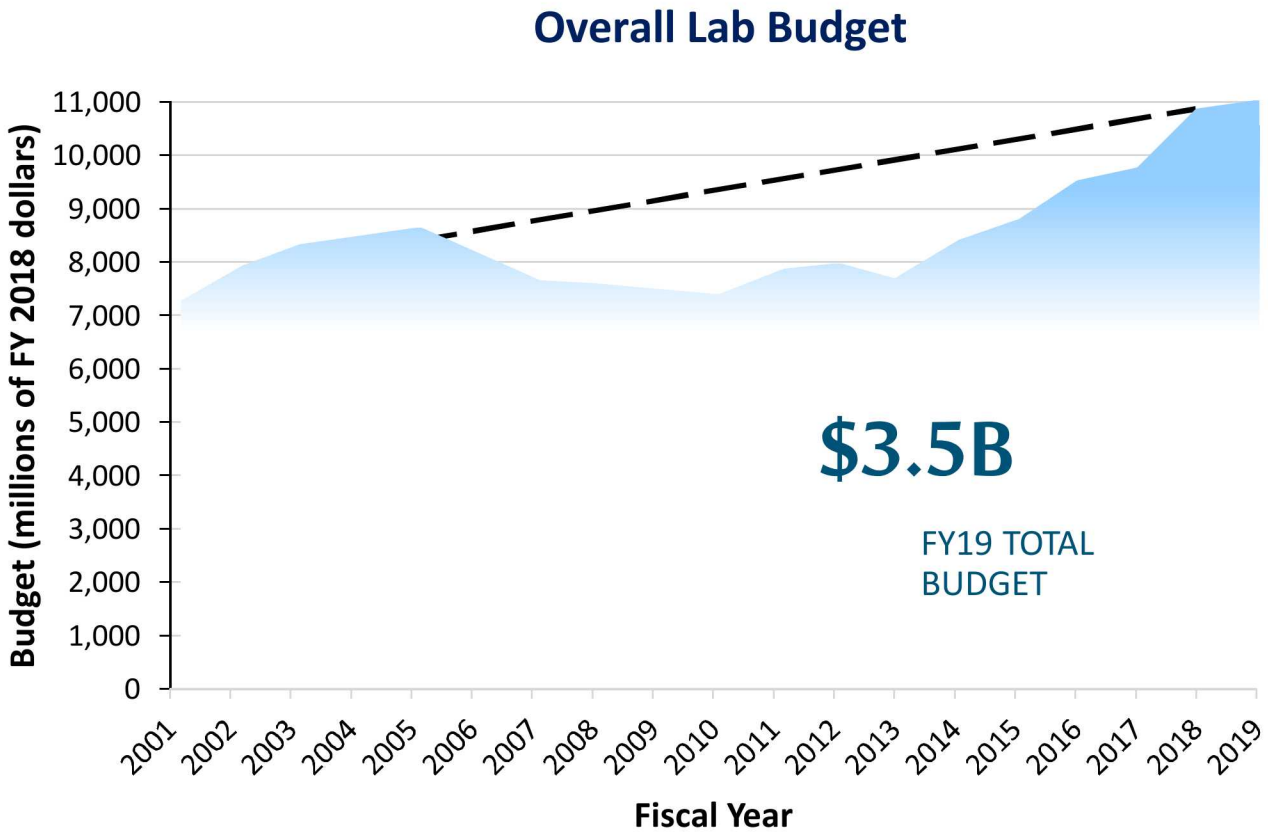
- Neutron Components
- Power Sources
- Explosive Components
- Radiation-hardened Microelectronics
- Radars
- Arming, Fuzing, and Firing Systems
- Clocks and other Timing Devices
- Sensors and Tags
- Modeling and High-performance Computing
- Radiation Effects Sciences
- Systems Engineering

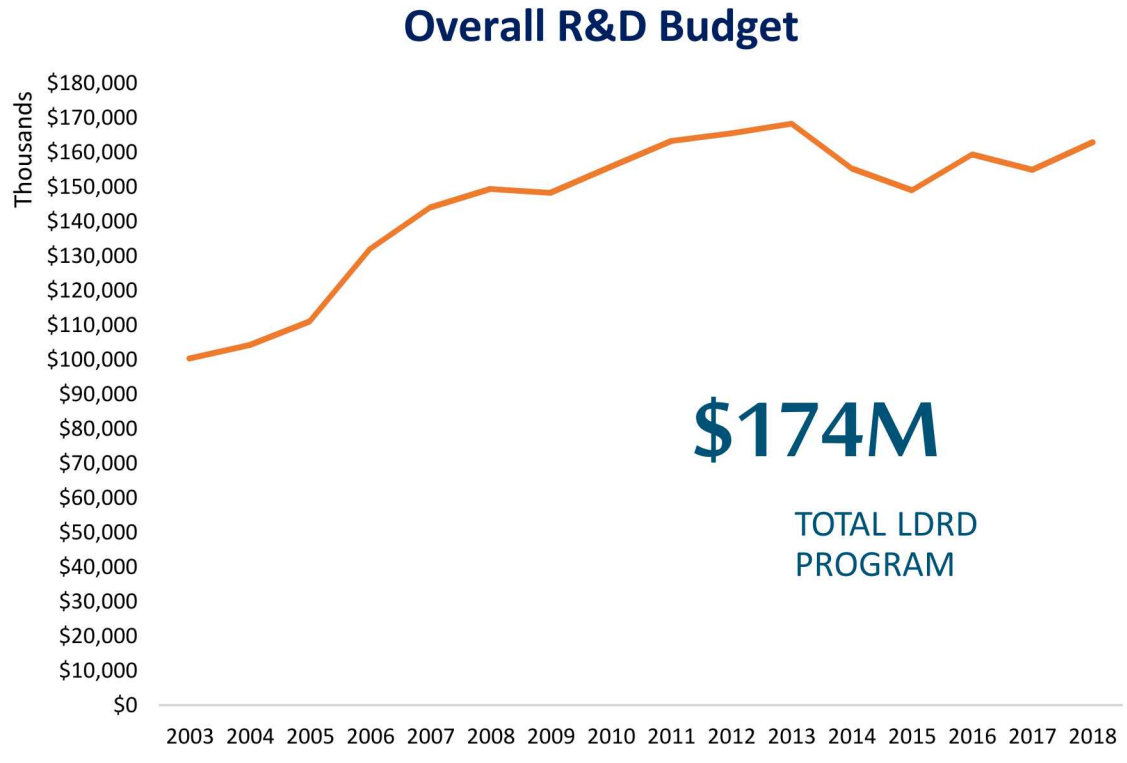
We maintain a robust science and technology base to support all of the above.



U.S. Resources Being Committed to National Security Programs are Increasing

As Illustrated by the Budget Trend for U.S. Nuclear Weapon Activities

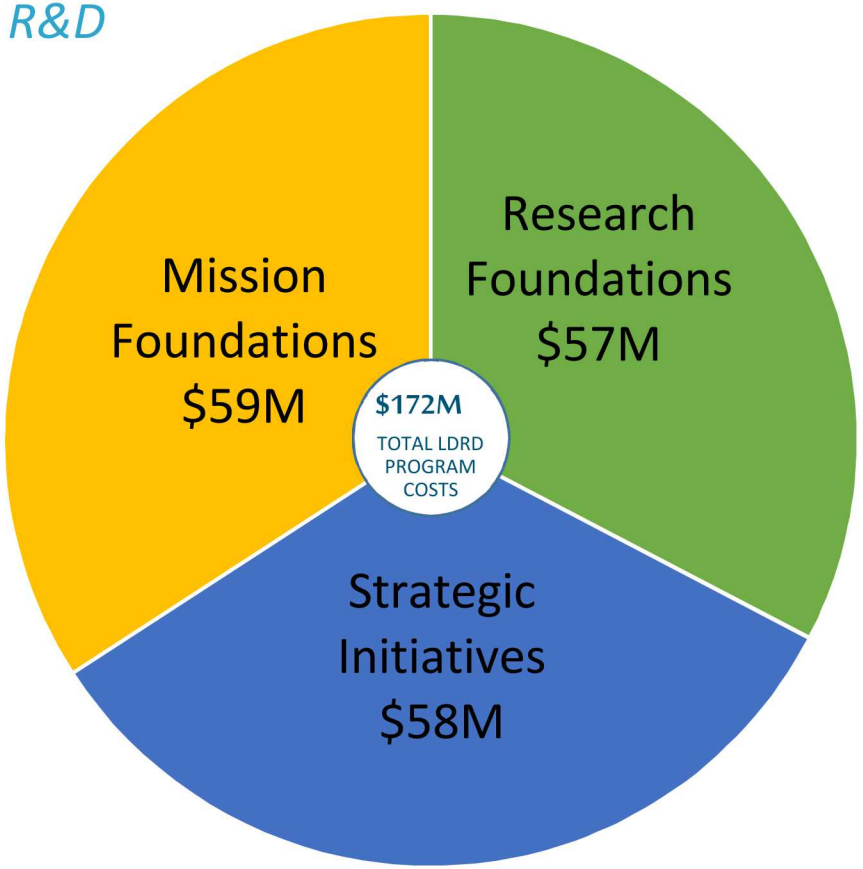




The Size of Sandia's Laboratory Directed Research and Development Portfolio Has Increased to Support Its Expanding Mission

LDRD Program Structure

Sandia has a robust budget and internal investments in R&D



"Discovery Science"

Research Foundations
Conduct fundamental/discovery research in disciplines germane to and inspired by national security mission needs to advance the frontiers of knowledge, explore innovative solutions, and build/maintain technical capability.

"Prevent Technological Surprise"

Mission Foundations
Conduct applied research in areas directly relevant to current/anticipated missions to develop and demonstrate new capabilities and prototype new solutions.

Strategic Initiatives
Grand Challenges and Mission Campaigns.

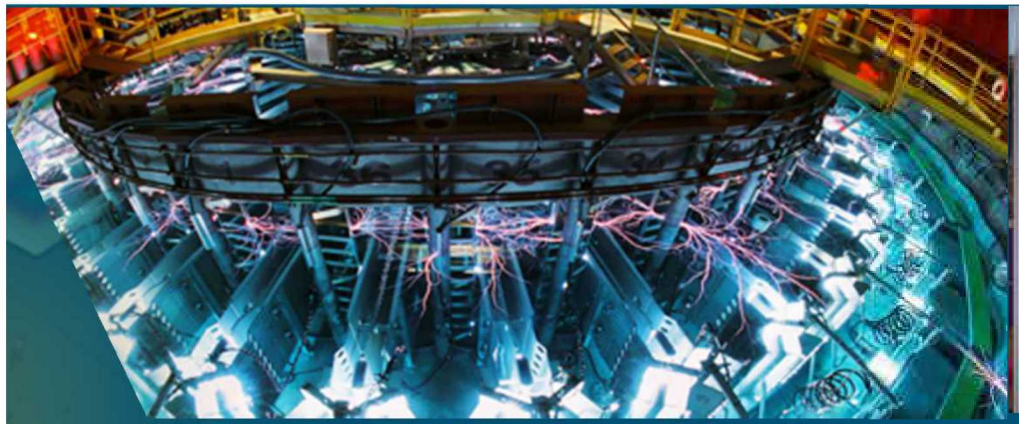
LDRD LABORATORY DIRECTED RESEARCH & DEVELOPMENT
WHERE INNOVATION BEGINS

Research Foundations

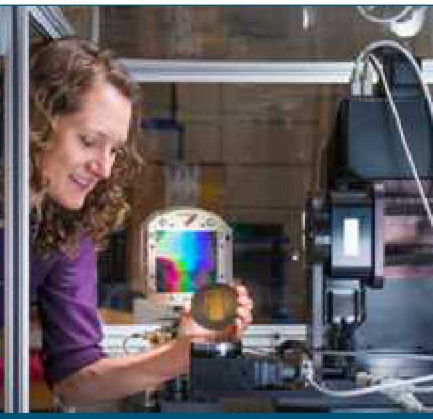
Research Foundations play an integral role in mission delivery

Nanodevi
Microsys

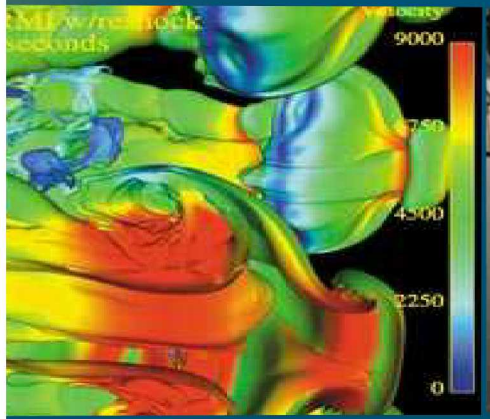
Computing &



Radiation Effects & High Energy Density Science

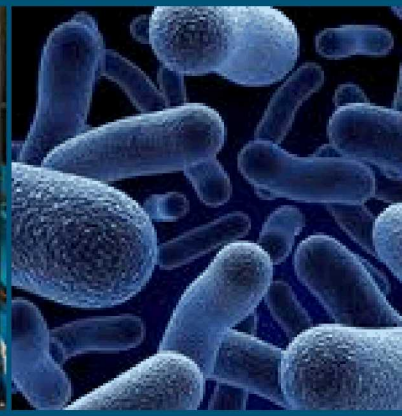


Material Science



Engineering Science

Geoscience



Bioscience

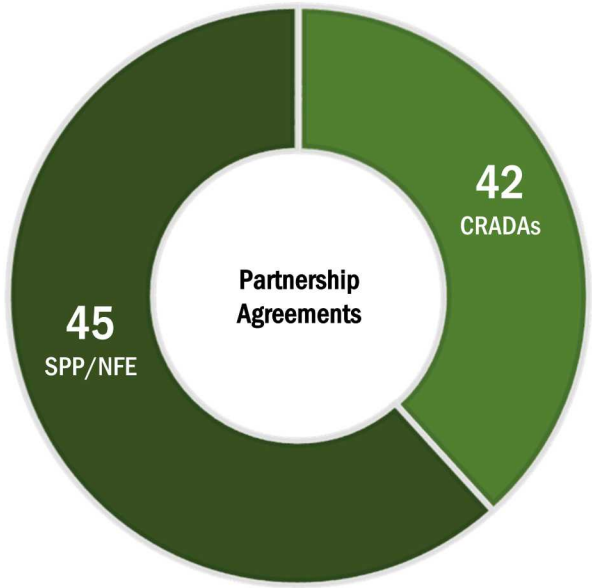
Sandia's Partnerships & Tech Transfer

Enhance mission delivery: develop/deploy technologies for mission delivery.

Enable innovation: facilitate the flow of people and ideas into and out of the Labs.

Maximize public good: enhance the local and national economy.

Meet DOE and legislated requirements: fulfill our M&O contractual obligation.



FY18 Results

219
Patents Filed

121
Copyrighted Works Created

193
Government Use Notices

26
Commercial Licenses Signed

Moving Forward

Common Challenges with a Our Commercial Partners

- Autonomy
- Trusted Microelectronics
- Analytics
- Advanced Manufacturing