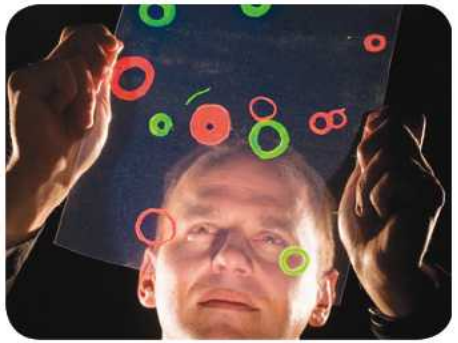
SAND2013-5671C

Exceptional service in the national interest

Sandia National Laboratories


Sandia National Laboratories

J. Stephen Rottler, PhD
Vice President, California Laboratory
Vice President, Energy, Climate, & Infrastructure Security

U.S. DEPARTMENT OF ENERGY

NNSA National Nuclear Security Administration

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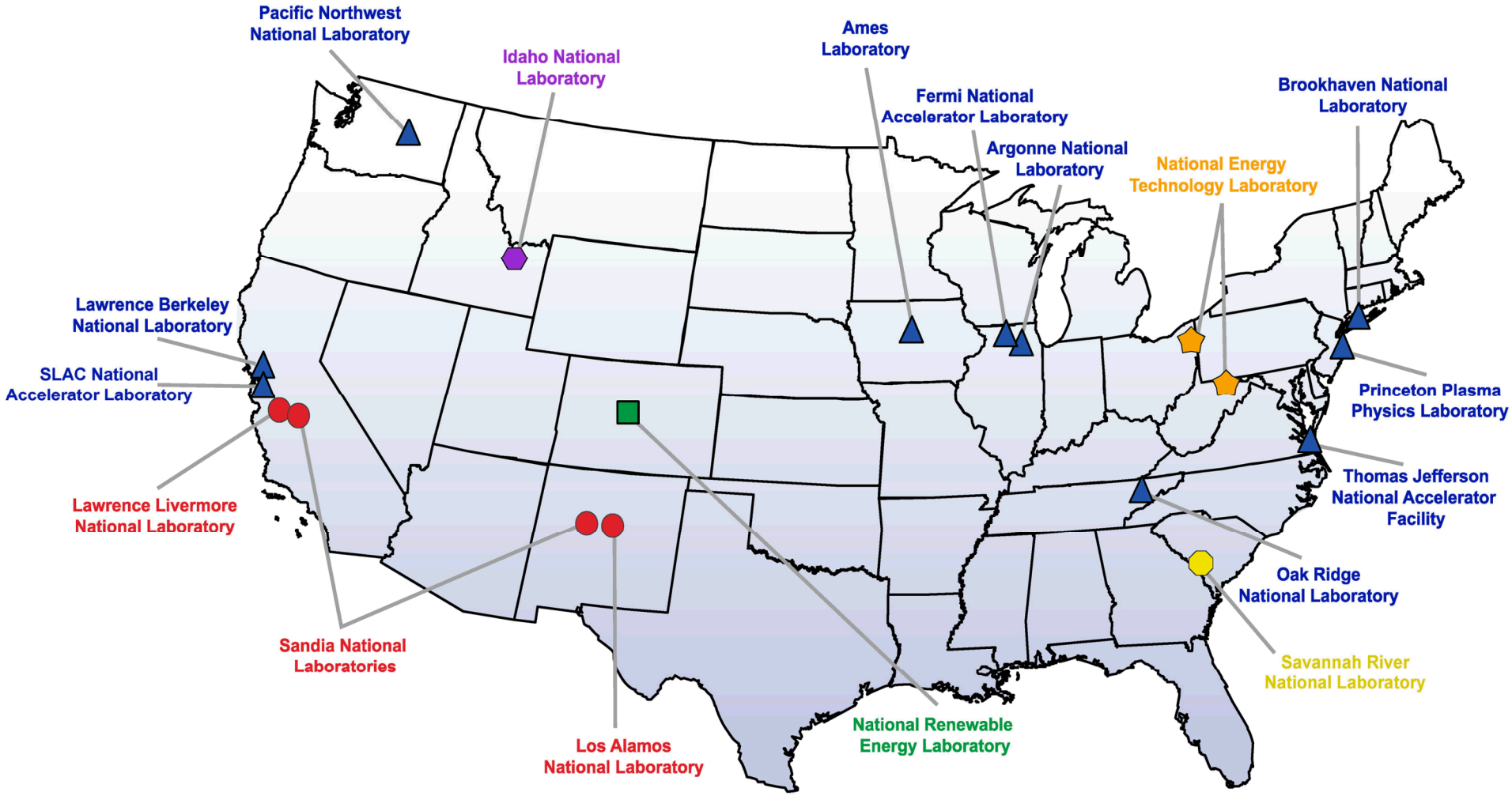
Sandia is part of a network of Department of Energy national laboratories

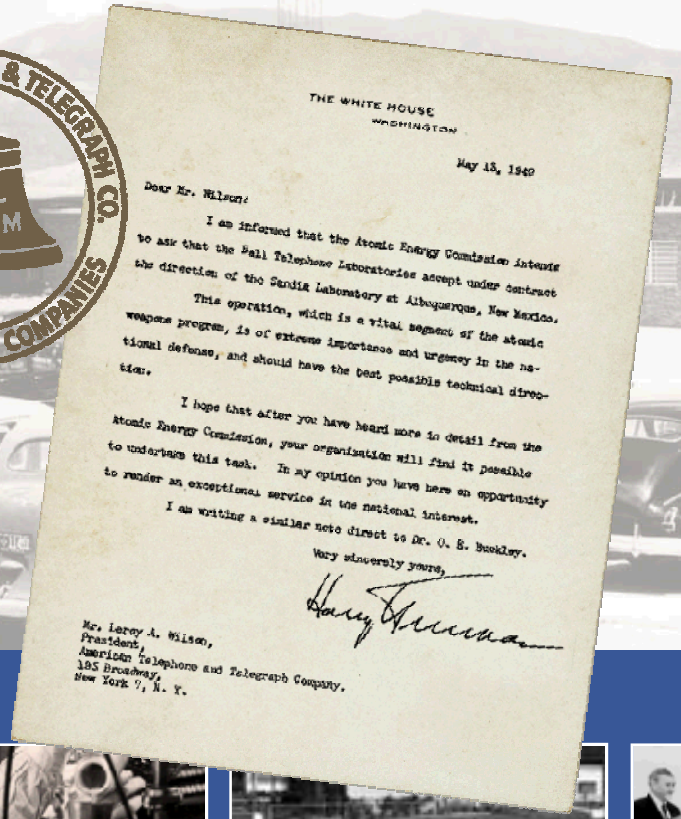
Sandia National Laboratories



Sandia's history

Exceptional service in the national interest

Sandia National Laboratories



THE WHITE HOUSE
WASHINGTON

May 18, 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.

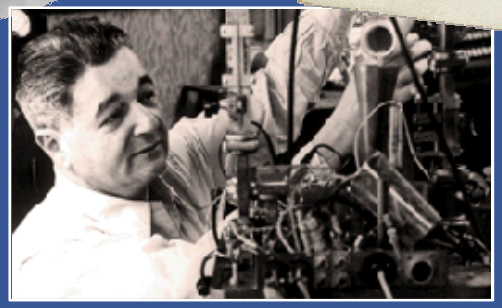
I hope that after you have heard more in detail from the Atomic Energy Commission, your organization will find it possible to undertake this task. In my opinion you have here an opportunity to render an exceptional service in the national interest.

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's sites

Sandia National Laboratories

Albuquerque, New Mexico

Livermore, California

Kauai, Hawaii

Waste Isolation Pilot Plan
Carlsbad, New Mexico

Pantex Plant,
Amarillo, Texas

Tonopah,
Nevada

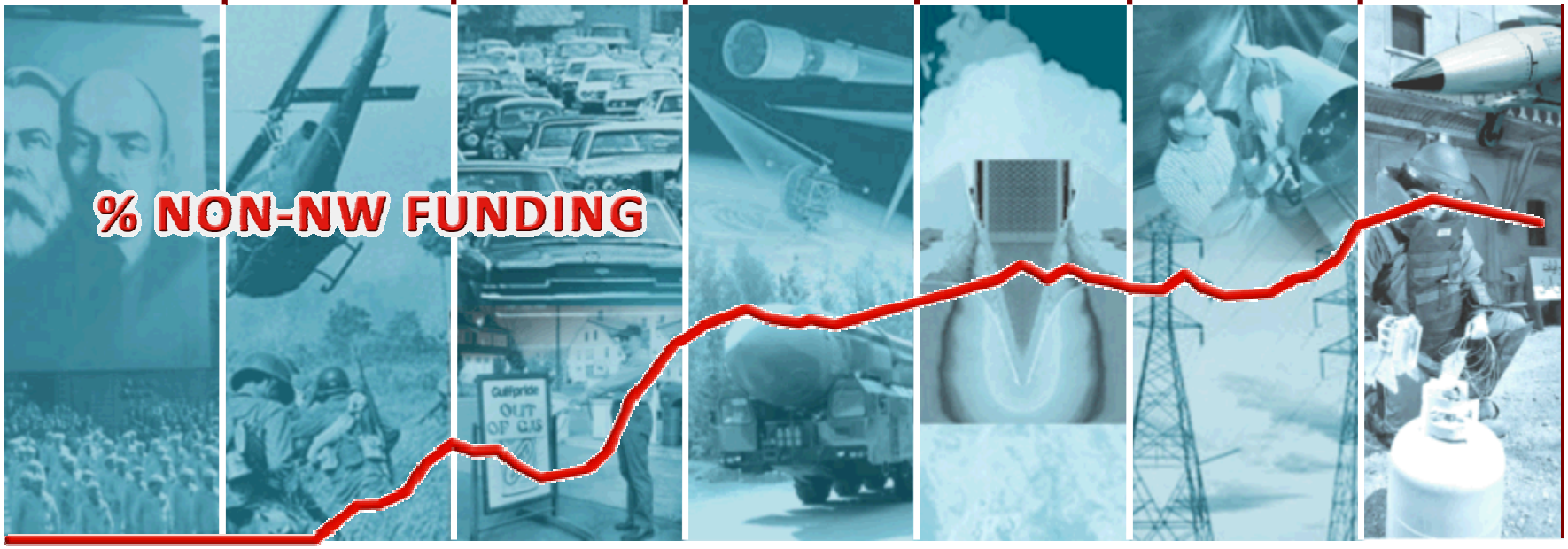
Our core values

- Serve the nation.
- Deliver with excellence.
- Respect each other.
- Act with integrity.
- Team for great results.

Sandia's mission work reflects national security challenges

Sandia National Laboratories

1950s	1960s	1970s	1980s	1990s	2000s	2010s
NW production engineering & manufacturing engineering	Development engineering Vietnam conflict	Multiprogram laboratory Energy crisis	Missile defense work Cold War	Post–Cold War transition Stockpile stewardship	Expanded national security role post 9/11	LEPs New START Evolving national security challenges

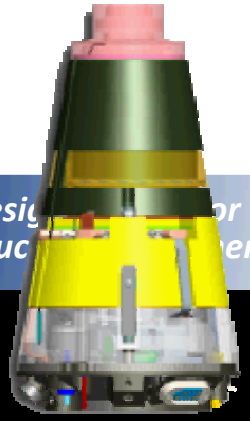


Nuclear Weapons

Sandia National Laboratories

Warhead Systems Engineering and Integration

Desig… or Nonnuc… …ents



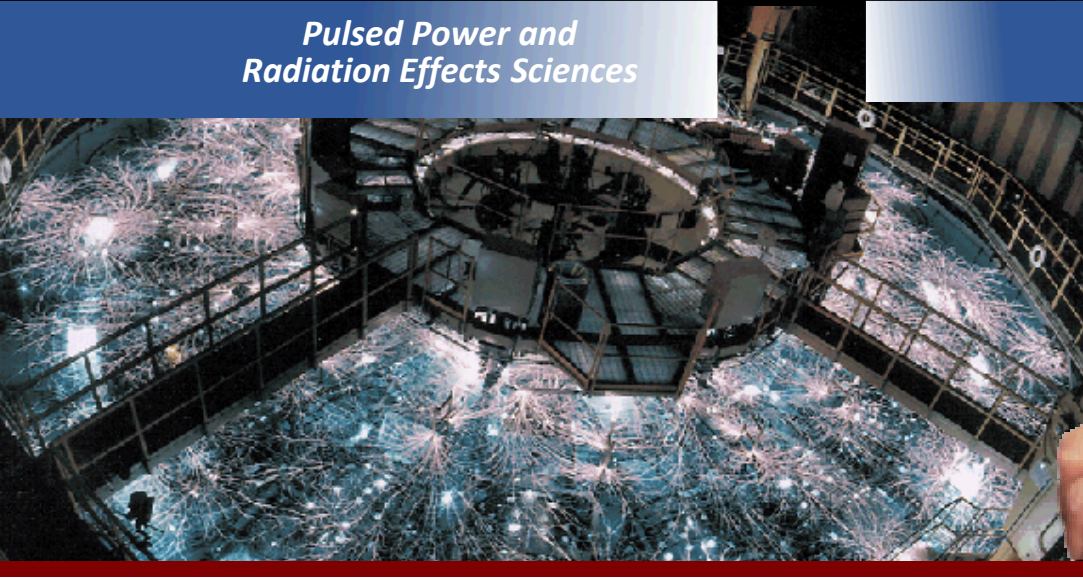
Safety systems

Arming, fuzing, and firing systems

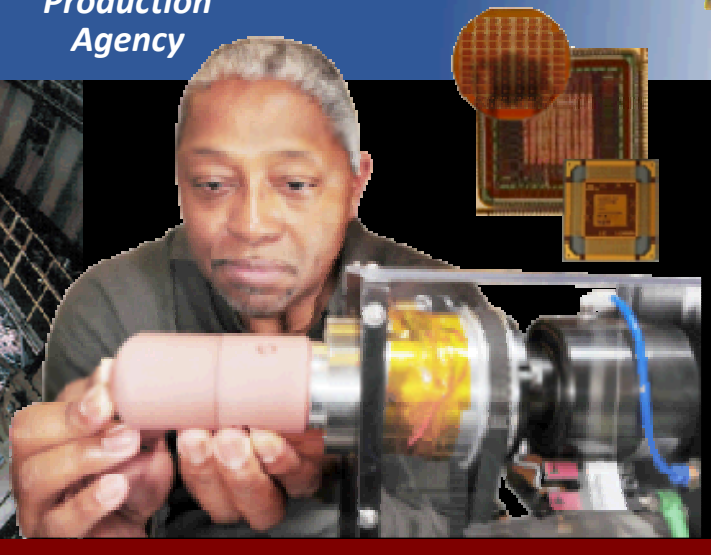
Gas transfer systems

Neutron generators

Pulsed Power and Radiation Effects Sciences



Production Agency



Defense Systems and Assessments

International, Homeland, and Nuclear Security

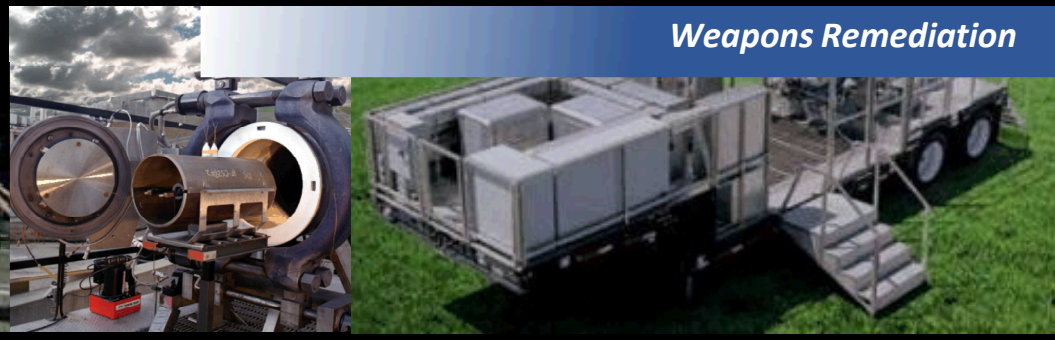
Sandia National Laboratories

Biological and Chemical Security

Emergency Response

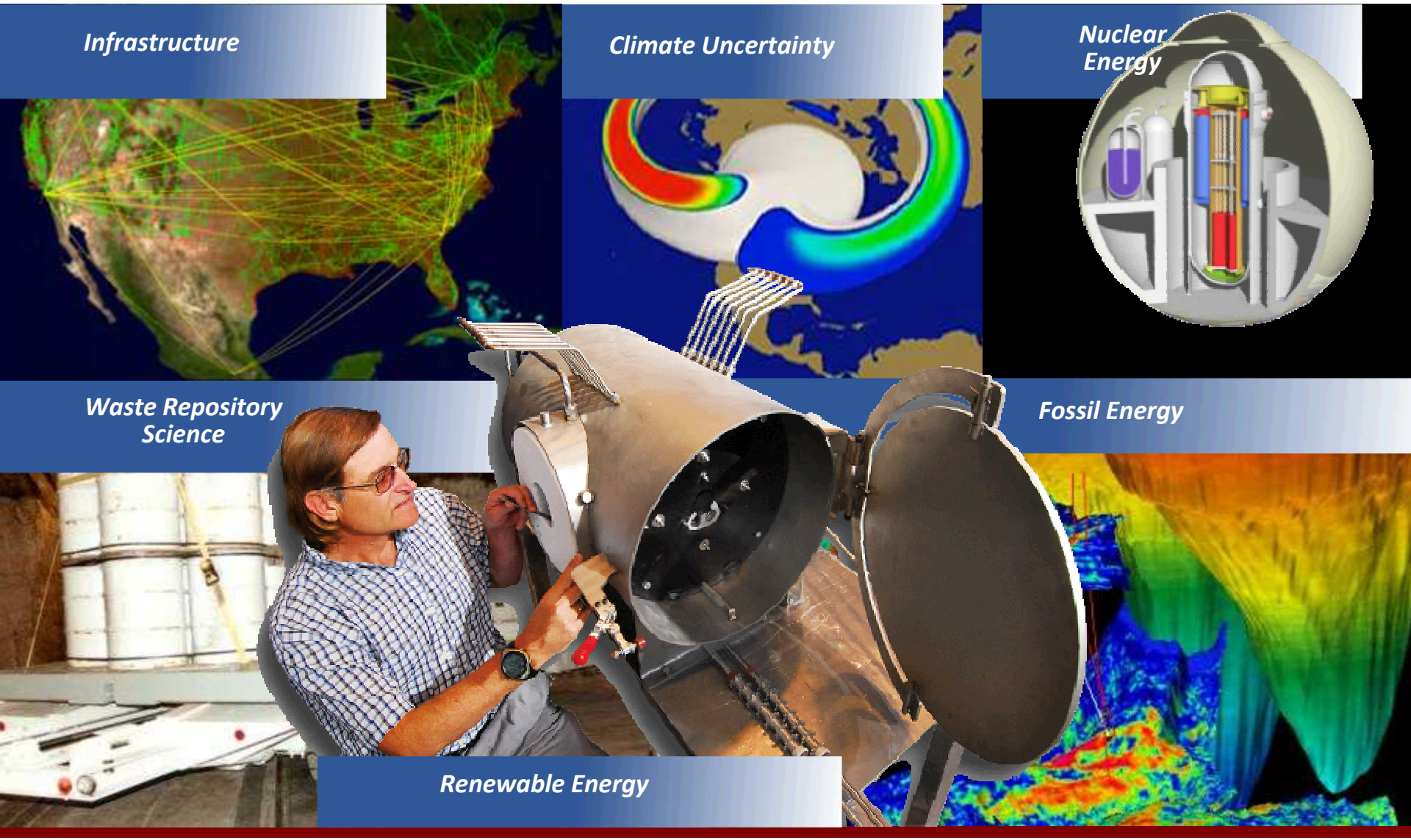
Physical Security

Weapons Remediation



Nuclear and Radiological Threat Reduction

Energy, Climate, and Infrastructure Security



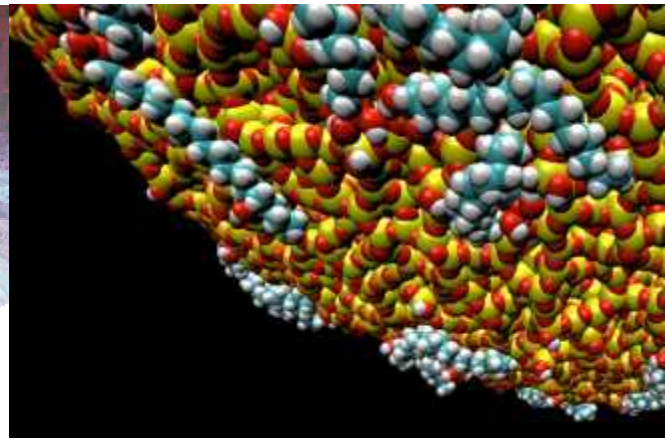
Strong Research Foundations Enable Mission Performance

Sandia National Laboratories

Computing & Information Sciences

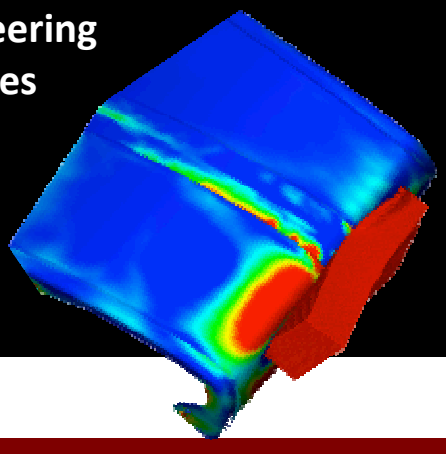
Radiation Effects & High Energy Density Science

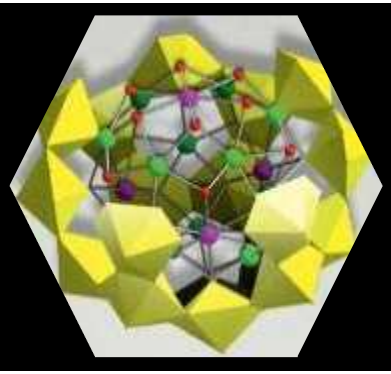
Materials Science

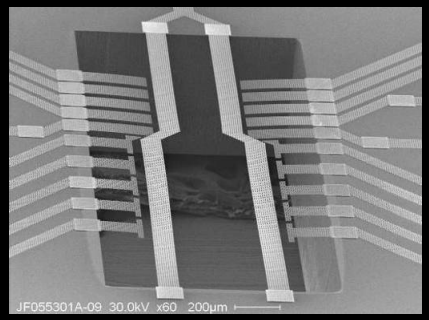


Nanodevices & Microsystems

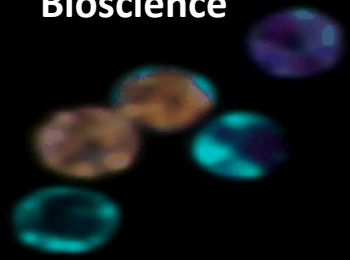
Engineering Sciences







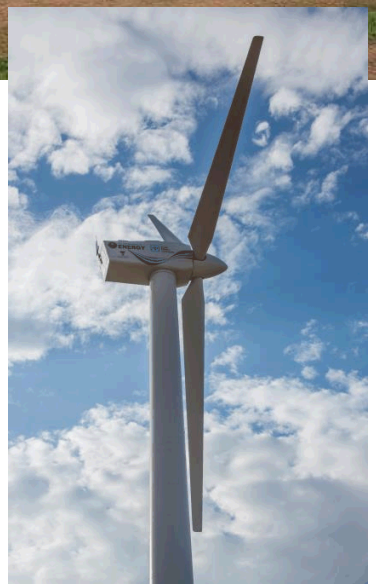
Bioscience



Geoscience

Advancing the Frontiers for National Security

Jon White



Low-cost electrical power through transformative wind energy technologies

- The DOE/Sandia Scaled Wind Farm Technology (SWiFT) is the first public facility of its kind to use multiple wind turbines to study complex wind plant interaction.
- The facility allows for rapid, cost-efficient testing and development of transformative wind energy technology.
- Working with industry and university partners, this research will enable greater productivity and efficiency at wind farms.

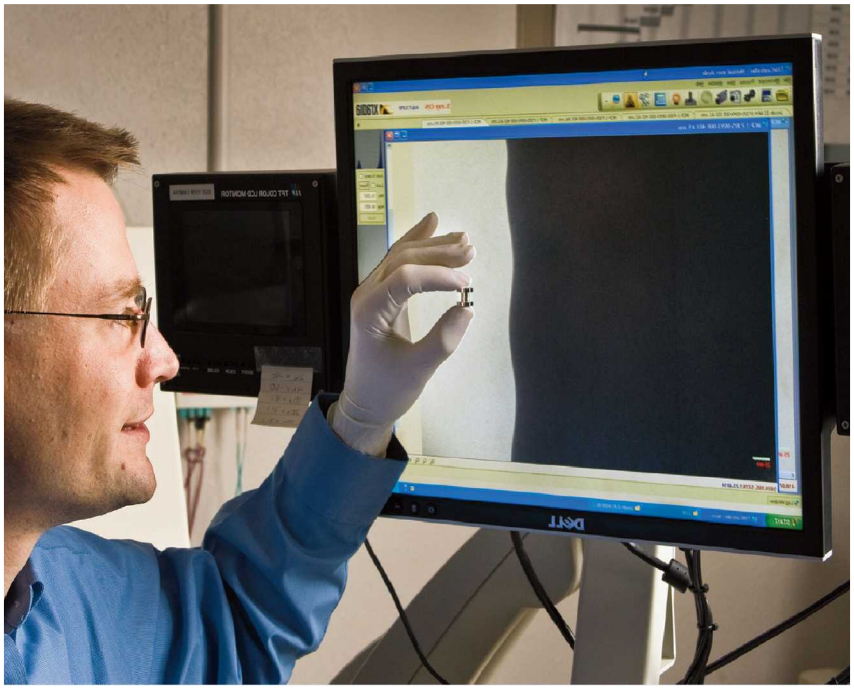
Advancing the Frontiers for National Security

Truman Fellow Carlee Ashley
and Sandia Fellow Jeff Brinker

One-dose killing of cancer cells through targeted drug delivery

- By melding nanotechnology and medicine, research has produced an effective strategy to target a cancerous cell and deliver a mélange of killer drugs into it.
- This new delivery system results in 106-fold higher therapeutic efficacy when compared with other state-of-the-art liposomal delivery systems.
- These findings promise to mitigate the side effects of conventional chemotherapy.

Advancing the Frontiers for National Security

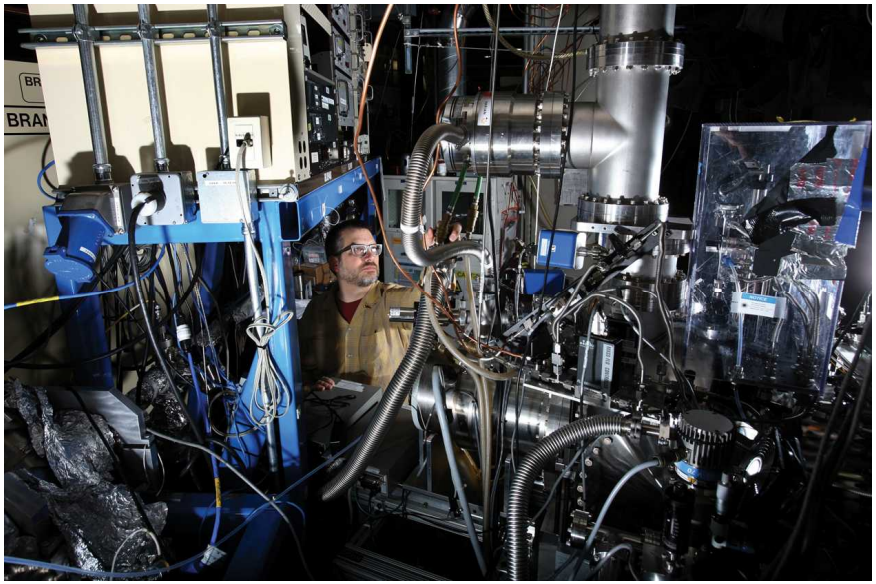


Dan Sinars

Measuring fundamental instabilities in magnetically driven Z-pinch explosions

- This research addresses the important but poorly understood phenomenon of Magneto-Rayleigh-Taylor (MRT) – the damaging instability in Z-pinch magnetic fields – and conditions that could mitigate the problem.
- The results will significantly impact high energy density plasmas, inertial confinement fusion, and related fields.

Advancing the Frontiers for National Security



Craig Taatjes

Tailoring biofuels to work with vehicles of today and tomorrow

- Biofuels being investigated are produced by a fungi that grow on cellulose and digest it, forming fuel-type hydrocarbons as a by product of their metabolic processes.
- This material can be converted into compounds that are similar to those found in petroleum-derived fuels.
- Combustion experts are working directly with biofuels researchers to understand from the start what will work best for existing and future internal combustion engines.

Advancing the Frontiers for National Security

Sandia National Laboratories

Glitter-sized photovoltaic cells

- Tiny crystalline silicon photovoltaic cells 14 to 20 micrometers thick, 0.25 to 1 mm across.
- Formed on silicon wafers, etched, and released in hexagonal shapes with electrical contacts prefabricated on each piece.
- Achieved 15% efficiency for 14 micron thick silicon cell.
- Goal is to perform at greater than 50% efficiency.

Greg Nielson

If These Challenges Interest You…

- Focus on academic excellence
- Obtain an advanced degree
- Seek opportunities beyond the classroom to become more well-rounded
- Obtain internships or summer positions that will allow you to experience practice of engineering

Lessons I Did Not Learn in College

- Leadership skills ≠ management skills
- The power of good communication skills
- The importance of relationships
- The effectiveness of multi-disciplinary teaming
- The utility of a well-rounded education
- The necessity of continuous learning
- Excellence in engineering as an ethical imperative
- The satisfaction of investing in community activities

Closing Remarks

- SNL has helped maintain an effective US nuclear deterrent for over 60 years
- We provide timely solutions to a vast array of national security problems
- We rely on world-class science and engineering, and the capability to develop product that meets rigid specifications
- A broad spectrum of technical talent is essential to meet national security challenges
- Sandia provides opportunities to change career fields and encourages continuing education