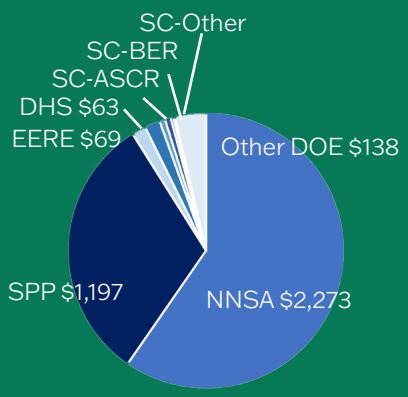
AT A GLANCE: SANDIA NATIONAL LABORATORIES

Sandia grew out of the effort to develop the first atomic bombs. Today, maintaining the U.S. nuclear stockpile is a major part of Sandia's work as a multimission national security engineering laboratory. Its role has evolved to address the complex threats facing the United States through R&D in the following: Supporting U.S. deterrence policy by ensuring a safe, secure, and effective nuclear stockpile; protecting nuclear assets and materials, and addressing nuclear emergency response and global nonproliferation; supplying new capabilities to U.S. defense and national security communities; ensuring a stable energy supply and infrastructure; and creating science-based, systems engineering solutions to the Nation's most challenging national security problems.

After 70 years, Sandia's highly specialized research staff remains at the forefront of innovation, collaborating with government, academia, and industry to live up to its mandate of providing exceptional service in the national interest.

FUNDING BY SOURCE

FY 2019 (Costs in $M)
Total Laboratory Operating Costs: $3,811
DOE/NNSA Costs: $2,551
SPP (Non-DOE/Non-DHS) Costs: $1,197
SPP as % of Total Laboratory Operating Costs: 33%
DHS costs: $63



FACTS

Location: Albuquerque, NM; Livermore, CA; Carlsbad, NM; Amarillo, TX; Tonopah, NV; Kauai, HI
Type: Multiprogram Laboratories
Contractor: National Technology and Engineering Solutions of Sandia LLC
Site Office: Sandia Field Office
Website: sandia.gov

PHYSICAL ASSETS

196,192 acres
1,001 buildings/trailers (all sites)
$16,397,460,863 replacement plant value (includes structures)
7,695,261 GSF in buildings/trailers
375,289 GSF in leased facilities
42,603 GSF in 16 excess facilities

HUMAN CAPITAL

12,783 FTE employees
32 joint faculty
251 postdoctoral researchers
948 undergraduate and graduate students

CORE CAPABILITIES

Cyber technology
High-reliability engineering
Micro and nano devices and systems
Modeling and simulation and experiment
Natural and engineered materials
Pathfinder engineered systems
Radiation-hardened, trusted microelectronics development/ production
Systems engineering
Safety, risk, and vulnerability analysis

MISSION UNIQUE FACILITIES

Center for Integrated Nanotechnologies (CINT)
Combustion Research Facility
Microsystems Engineering, Science and Applications (MESA) complex
National Solar Thermal Test Facility
Z Machine

U.S. DEPARTMENT OF ENERGY

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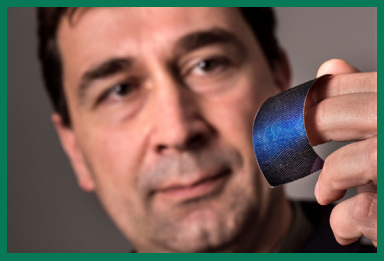
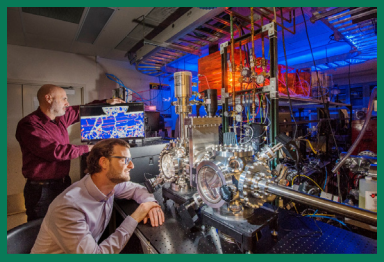
Sandia National Laboratories

ACCOMPLISHMENTS

Unique Facility: The Z Machine - Sandia's Z machine, Earth's most powerful pulsed-power facility and generator of gamma and X-rays, provides the fastest, most accurate method to determine how materials will react under extreme pressures and temperatures and to study the dense plasmas that make up the Sun and other stars. Data generated in hundreds of experiments at Z over the years have advanced mankind's understanding of the fundamentals of physics. Visiting researchers who use Z have gained important insights into how materials behave, how black holes grow, how hot the Sun is, and how old the planets in the solar system are. Z also serves as a vital source for studies of nuclear weapon effects and of the optimal methods to increase neutron output in the quest to generate fusion energy.



Tech-to-Market Highlight: Microsystems Enabled Photovoltaics - With Laboratory Directed R&D funds, Sandia designed Microsystems Enabled Photovoltaics (MEPV) to reduce semiconductor size and material costs and enhance solar cell performance. The smaller photovoltaic cells are flexible, nearly unbreakable, and can be integrated into many different materials. They harness energy that can power devices in flexible, moldable, or flat-plate formats for a wide range of applications, including space satellites, UAVs, or portable power for soldiers or campers. A small, New Mexico-based startup, mPower Technologies, licensed MEPV in 2017 and is now developing and testing solar modules for the U.S. Army and others based on its DragonSCALES™ (SemiConductor Active Layer Embedded Solar) design. The technology provides the freedom to integrate solar power capability into buildings, clothing, portable electronics, or vehicles in nearly any shape.



Research Highlight: The Friction Behavior of Metals - Sandia researchers have designed computer models that predict the limits of friction behavior of metals based on materials properties—how much pressure can be put on materials or how much current can go through them before they stop working properly. Their model is especially valuable for electrical contacts, with impacts on everything from small electronic devices to electric vehicles to wind turbines. By extrapolating from models of friction and wear at the fundamental level in pure metals—down to how tiny differences in grain size produce big changes in friction—to more complex materials and structures, the researchers developed models that provide guidelines valuable in developing a variety of new materials.