

Oak Ridge National Laboratory World Class Science Initiatives for the Department of Energy Office of Science

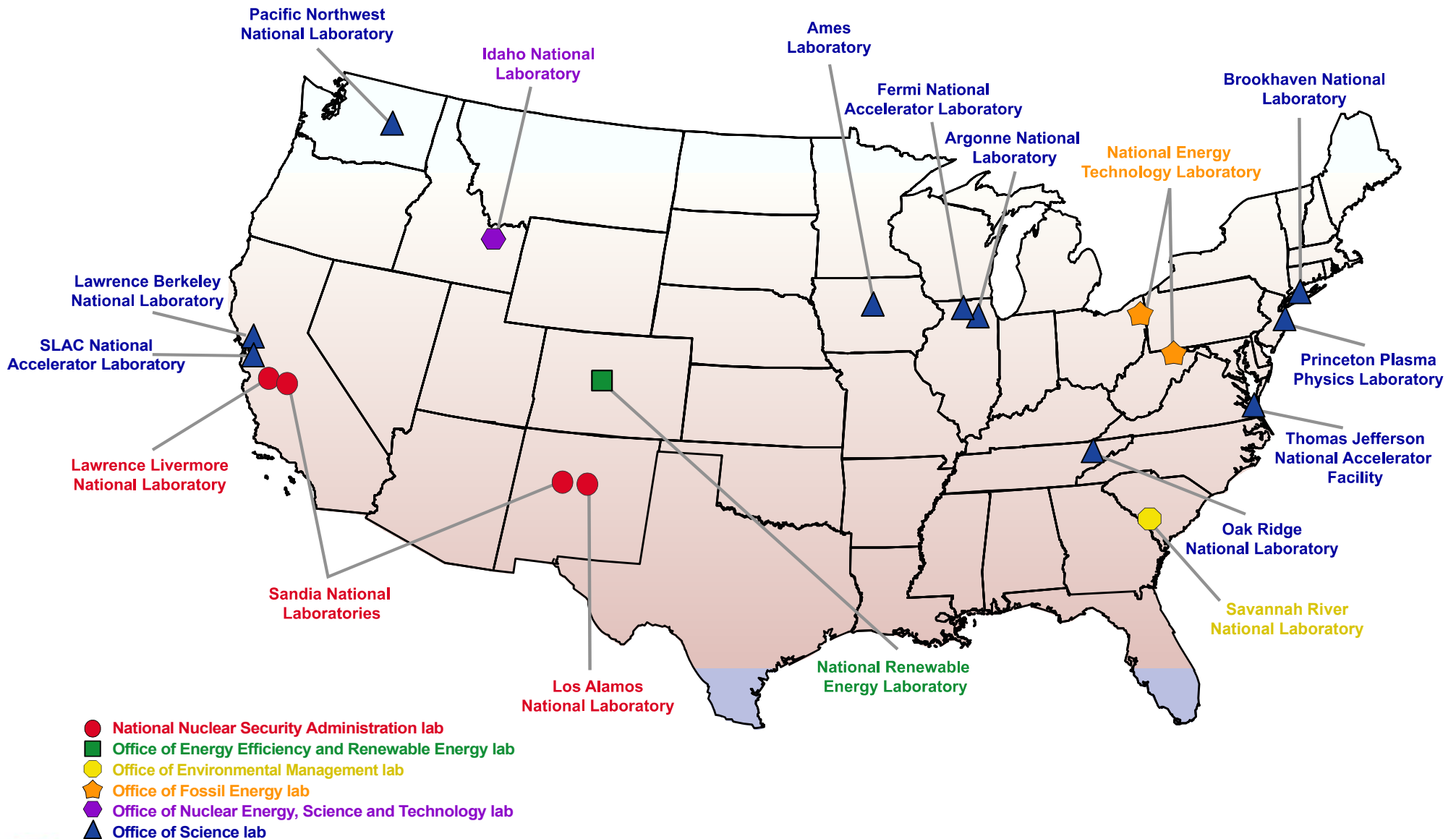
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UT-Battelle Environmental Management Program Office

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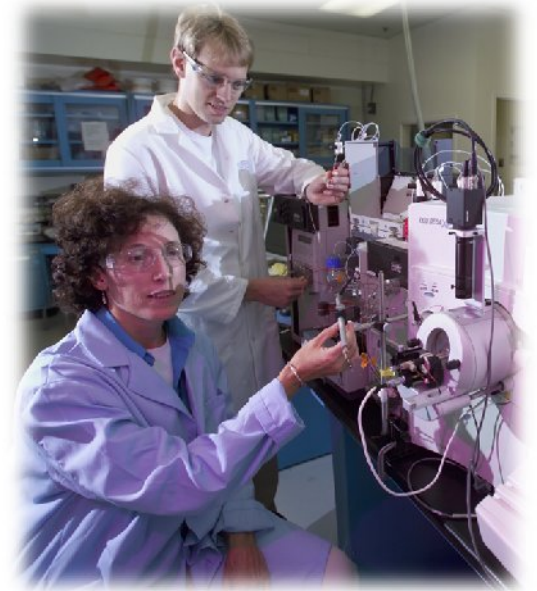
DOE National Laboratories



MOVING TO THE FUTURE BY CLEANING UP THE PAST

DOE's Office of Science

- Is the lead federal agency supporting fundamental scientific research for energy
- Is the nation's largest supporter of basic research in the physical sciences



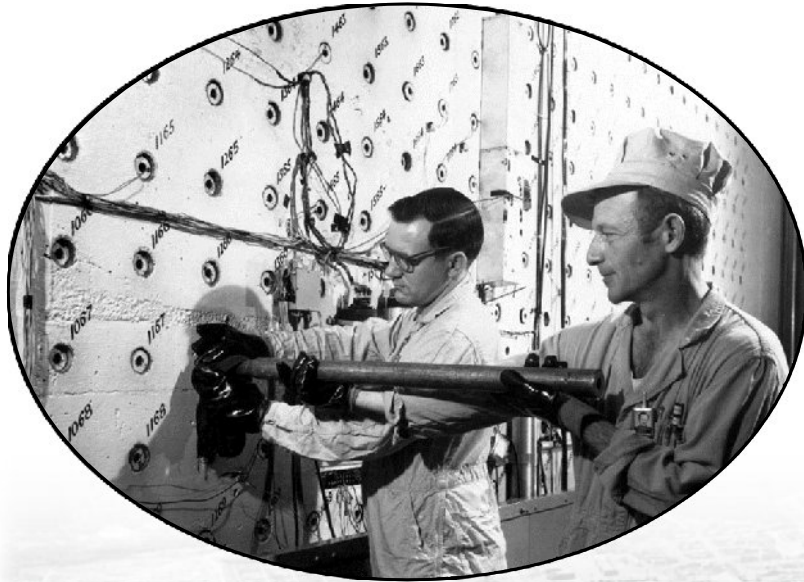
The Office of Science portfolio has two principal thrusts:

- direct support of scientific research, and
- direct support of the development, construction, and operation of unique, open-access scientific user facilities.



MOVING TO THE FUTURE BY CLEANING UP THE PAST

Oak Ridge National Laboratory evolved from the Manhattan Project



The Clinton Pile, or Graphite Reactor, was the world's first continuously operated nuclear reactor.

Chemical processing techniques were developed to separate plutonium from irradiated fuel.



MOVING TO THE FUTURE BY CLEANING UP THE PAST

ORNL's Mission: Science to Solutions

Deliver scientific discoveries and technical breakthroughs that will accelerate the development and deployment of solutions in clean energy and global security, and in doing so create economic opportunity for the nation.



MOVING TO THE FUTURE BY CLEANING UP THE PAST

Today, ORNL is DOE's largest science and energy laboratory

**\$1.65B
budget**

**4,650
employees**

**3,000
research
guests
annually**

**\$500M
modernization
investment**

**Nation's
largest
materials
research
portfolio**

**Most
powerful open
scientific
computing
facility**

**World's
most intense
neutron
source**

**World-class
research
reactor**

**Nation's
most diverse
energy portfolio**

**Managing
billion-dollar
U.S. ITER
project**



MOVING TO THE FUTURE BY CLEANING UP THE PAST

ORNL is equipped to play a leading role in solving our nation's challenges

Signature Strengths

Neutron science and technology

Materials science and technology

Nuclear science and technology

Nuclear physics

Accelerator science

Chemical and molecular science

Biological systems science

Advanced computer science, visualization, data

Integration and application

Plasma and fusion energy sciences

Computational science

Applied nuclear science and technology

Chemical and molecular science

Applied materials science and engineering

Environmental subsurface science

Chemical engineering

Chemical and molecular science

Systems engineering and integration

User facilities/ advanced instrumentation

Critical Mission Outcomes

Scientific discovery and innovation

Clean energy

ORNL possesses 15 of the 17 core capabilities distributed across DOE's national laboratories

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Integration of our signature strengths supports DOE and other customers

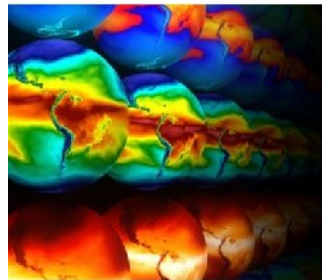
Clean Energy Technologies



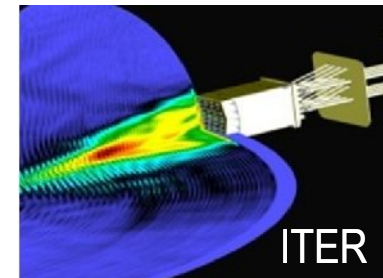
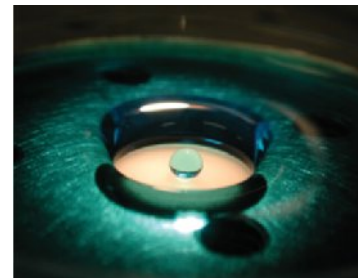
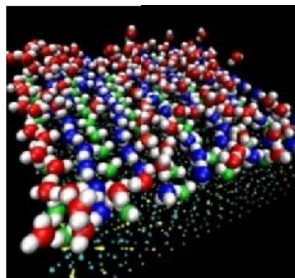
Global Security



Climate Science



Bioenergy



Materials Science & Engineering

Nuclear Science & Technology

Neutron Science & Technology

Computational Science & Engineering



MOVING TO THE FUTURE BY CLEANING UP THE PAST

Translating science and technology into sustainable energy solutions

Clean and Affordable Electricity



Nuclear Power
Solar Photovoltaics
Batteries & Energy Storage
Secure & Reliable Electric Grid

Sustainable Transportation



Lightweight Materials
Power Electronics
Biofuels
Batteries

Energy Efficiency



Industry
Manufacturing
Buildings



MOVING TO THE FUTURE BY CLEANING UP THE PAST

Moving technology to the marketplace and fostering economic development

- Creating a 21st century research environment
- Building an entrepreneurial culture
- Providing access to venture capital
- Establishing the first S&T park on a national laboratory campus
- Building new partnerships
 - *Universities*
 - *Industry*
 - *State and local government*



MOVING TO THE FUTURE BY CLEANING UP THE PAST

Transforming ORNL with 21st Century Research Facilities

East Campus



Chestnut Ridge Campus



Science and Technology Park



West Campus



MOVING TO THE FUTURE BY CLEANING UP THE PAST

The DOE Office of Environmental Management enables ORNL's Science missions and modernization



Operating three radioactive waste treatment systems that are critical to ORNL nuclear science and engineering missions and facility operations



Dispositioning ORNL solid transuranic waste



Removing excess materials from Central Campus, thus reducing environment, safety, health, and mission risk



Removing > 50 excess facilities and cleaning up ~ 3 acres of soil providing areas for future development

Integration is the Key to Success



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ORNL's Potential 5 Year Development Opportunities



Science and Technology Park



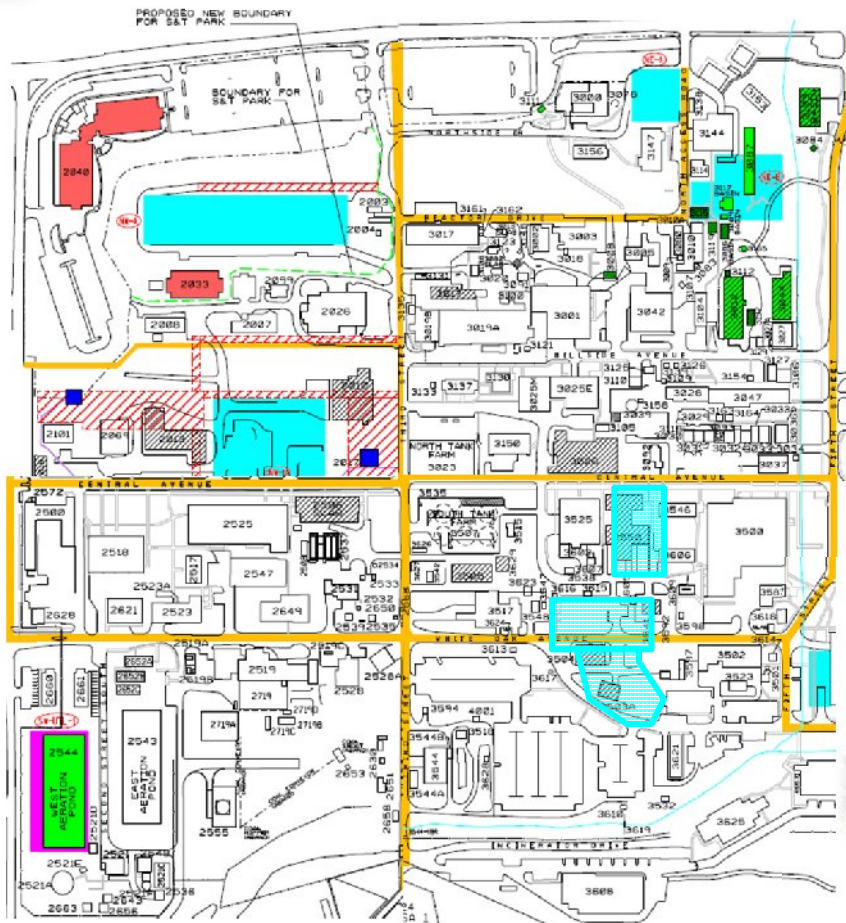
New Maximum Energy Efficiency Lab

Central Campus Legend

- Existing Science & Technology Park Facilities
- Available Development Sites
- Future Demolition
- Future Slab Demolition
- Slab
- Utility Corridor (power, water, sewer, etc. as required)
- Utility Buildings Space
- Future Roads/Parking
- Extraction Well Site



Biological and Environmental Sciences



Advanced Materials Characterization Lab



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Future Vision of ORNL

Creating a vibrant, inviting setting for research collaborations.



ORNL circa 2030



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