U.S. DEPARTMENT OF ENERGY | Office of Science

The U.S. Department of Energy Office of Science:

Steward of Ten World-Class National Laboratories

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Introduction

The Department of Energy (DOE) Office of Science (SC) is the single largest supporter of basic research in the physical sciences in the United States (U.S.), providing more than 40 percent of total funding for this vital area of national importance. It oversees—and is the principal federal funding agency of—the Nation's research programs in high energy physics, nuclear physics, and fusion energy sciences. SC sponsors fundamental research programs in basic energy sciences, biological and environmental sciences, and computational science, and is the Federal Government's largest single funder of materials and chemical sciences, and it supports unique and vital parts of U.S. research in climate change, geophysics, genomics, life sciences, and science education.

SC is also responsible for the effective stewardship of ten national laboratories.[1] The DOE national laboratories were created as a means to an end: victory in World War II and national security in the face of the new atomic age. Since then, they have consistently responded to national priorities: first for national defense, but also in the space race and more recently in the search for new sources of energy, new energy-efficient materials, new methods for countering terrorism domestically and abroad, and addressing the challenges established in the President's American Competitive Initiative (ACI) and the Advanced Energy Initiative (AEI).

Today, the ten national laboratories for which SC is responsible comprise the most comprehensive research system of their kind in the world. In supporting DOE's mission and strategic goals, the SC national laboratories perform a pivotal function in the nation's research and development (R&D) efforts: increasingly the most interesting and important scientific questions fall at the intersections of scientific disciplines—chemistry, biology, physics, astronomy, mathematics—rather than within individual disciplines. The SC national laboratories are specifically designed and structured to pursue research at these intersections, and SC's challenge is to ensure that these institutions are oriented to focus, individually and collectively, on achieving the DOE mission, that Government resources and support are allocated to ensure their long-term scientific and technical excellence, and that a proper balance exists among them between competition and collaboration. Their history is replete with examples of multi- and inter-disciplinary research with far-reaching consequences. This kind of synergy, and the ability to transfer technology from one scientific field to another on a grand scale, is a unique feature of SC national laboratories and is not well-suited to university or private sector research facilities because of its scope, infrastructure needs or multidisciplinary nature.

As they have pursued solutions to our nation's technological challenges, the SC national laboratories have also shaped, and in many cases led, whole fields of science—high energy physics, solid state physics and materials science, nanotechnology, plasma science, nuclear medicine and radiobiology, and large-scale scientific computing, to name a few. This wide-ranging impact on the nation's scientific and technological achievement is due in large part to the fact that since their inception the DOE national laboratories have been home to many of the world's largest, most sophisticated research facilities. From the "atom smashers" which allow us to see back to the earliest moments of the Universe, to fusion containers that enable experiments on how to harness the power of the sun for commercial purposes, to nanoscience research facilities and scientific computing networks that support thousands of researchers, the national laboratories are the stewards of our country's "big science." As such, the national laboratories remain the best means we know of to foster multi-disciplinary, large-facility science to national ends.

In addition to serving as lynchpins for major initiatives that support DOE missions, the scientific facilities at the SC national laboratories are also operated as a resource for the broader national research community. Collectively, the laboratories served over 25,000 facility users and over 11,000 visiting scientists in Fiscal Year (FY) 2011, significant portions of which are from universities, other Federal agencies, and private companies.

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[1] They are: Ames Laboratory, Argonne National Laboratory, Brookhaven National Laboratory, Fermi National Accelerator Laboratory, Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, Princeton Plasma Physics Laboratory, SLAC National Accelerator Laboratory, and the Thomas Jefferson National Accelerator Facility. SC also funds research and development at the seven national laboratories that are overseen by other DOE offices: Idaho National Laboratory, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, National Energy Technology Laboratory, National Renewable Energy Laboratory, Sandia National Laboratories, Savannah River National Laboratory.

Ames Laboratory

Mission and Overview

The Ames Laboratory (AMES) was formally established in 1947 by the United States (U.S.) Atomic Energy Commission (AEC) as a result of the AMES Project's successful development of the most efficient process to produce high-purity uranium metal in large quantities for the Manhattan Project. Situated on the campus of Iowa State University (ISU), the parent contractor, AMES's mission is to create materials, inspire minds to solve problems, and address global challenges. AMES operates the Materials Preparation Center (MPC), which prepares, purifies, fabricates and characterizes materials in support of R&D programs throughout the world. AMES also performs research for the DOE applied energy technology and nonproliferation programs and, through its Work for Others program, provides research and materials to the National Institute of Justice, Department of Defense, various law enforcement agencies, and corporate entities. AMES researchers have won 17 R&D 100 Awards from *R&D Magazine*, which selects the 100 most significant technical products and innovations each year. Educating the next generation of scientists is a key component of the research at AMES; since 1947, over 3,000 Masters and Ph.D. degrees in science and engineering have been awarded to ISU students working on DOE-funded projects.

Six areas of expertise underpin activities at AMES: (1) materials design, synthesis and processing; (2) analytical instrumentation/device design/fabrication; (3) materials characterization; (4) catalysis; (5) condensed matter theory (including photonic band gap and other novel materials); and (6) separation science. These six areas enable AMES to deliver its mission and customer focus, to perform a core role in the DOE laboratory system, and to pursue its vision for scientific excellence and pre-eminence in the areas of:

- Materials research directed towards energy technologies including optical, magnetic, intermetallic, and catalytic materials; studies of high temperature materials and materials in extreme conditions; and
- Analytical techniques and instrument development.

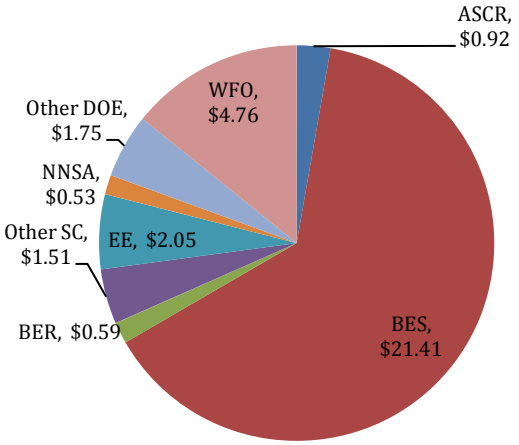
Lab-at-a-Glance

Location: Ames, Iowa
Type: Single-program laboratory
Contractor: Iowa State University
Responsible Site Office: Ames Site Office
Website: www.ameslab.gov

Physical Assets:
- 10 acres (lease–long term, no cost) and 12 buildings
- 327,664 GSF in Active Operational Buildings
- Replacement Plant Value: $73.1M
- Deferred Maintenance: $1.4M
- Asset Condition Index:
  - Mission Critical: Excellent
  - Mission Dependent: Good
  - Asset Utilization Index: Excellent

Human Capital:
- 307 Full Time Equivalent Employees
- 103 Joint faculty
- 53 Postdoctoral Researchers
- 70 Undergraduate Students
- 109 Graduate Students
- 0 Facility Users
- 1 Visiting Scientists

FY 2010 Funding by Source (Cost in $M):



FY 2010 Total Lab Operating Cost (excluding ARRA): $33.5
FY 2010 Total DOE/NNSA Cost: $0.5
FY 2010 WFO (Non-DOE/Non-DHS) Cost: $4.7
FY 2010 WFO as % Total Lab Operating Cost: 14%
FY 2010 Total DHS Cost: $0.03

ARRA Obligated from DOE Sources in FY 2010: $0.0
ARRA Costed from DOE Sources in FY 2010: $1.541

Argonne National Laboratory

Mission and Overview

Located 25 miles southwest of Chicago, Argonne National Laboratory (ANL) was the country's first national laboratory, and is a direct descendant of the University of Chicago's Metallurgical Laboratory where Enrico Fermi and his colleagues created the world's first controlled nuclear chain reaction. Appropriately, Argonne's first mission 64 years ago was to develop nuclear reactors for peaceful purposes. Managed by the University of Chicago for the DOE, Argonne has grown into a multidisciplinary laboratory with a unique mix of world-class scientists and engineers and leading-edge user facilities, working to create new knowledge that addresses the most important scientific and societal needs of our nation.

Argonne's vision is to lead the world in discovery science and engineering that provides technical solutions to the grand challenges of our time: sustainable energy, a clean environment, economic competitiveness, and a secure nation. Toward this vision, Argonne's current major initiatives include hard x-ray science (a key and essential component being the upgrade of the Advanced Photon Source [APS]), leadership computing and computational science, energy sources and storage, materials and molecular design and discovery, regional climate and biogeospheric interactions, and national security.

These research initiatives are enabled by partnerships with academia, industry, and the government, and the laboratory's core capabilities in fundamental and applied science and engineering in which Argonne is a national leader: large-scale national user facilities and advanced instrumentation; applied mathematics; advanced computer science, visualization and data; chemical and molecular science; chemical engineering; condensed matter physics and materials science; applied materials science and engineering; particle physics; nuclear physics; accelerator science and technology; applied nuclear science and technology; and systems engineering and integration. ANL's national user facilities include the APS, the Argonne Leadership Computing Facility (ALCF), the Center for Nanoscale Materials (CNM), the Electron Microscopy Center (EMC), the Argonne Tandem Linac Accelerator System (ATLAS), the Atmospheric Radiation Measurement Climate Research Facility, and the Transportation Research and Analysis Computing Center (TRACC).

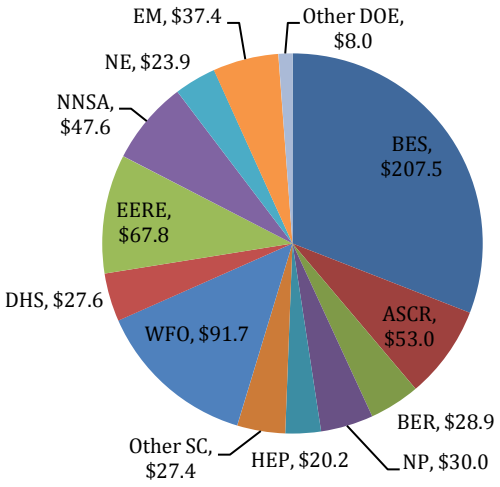
Lab-at-a-Glance

Location: Argonne, Illinois
Type: Multi-program laboratory
Contractor: UChicago Argonne, LLC
Responsible Site Office: Argonne Site Office
Website: www.anl.gov

Physical Assets:
- 1,500 acres and 99 buildings
- 4.7M GSF in buildings
- Replacement Plant Value: $2.2B
- Deferred Maintenance: $111.8M
- Asset Condition Index:
  - Mission Critical: Good
  - Mission Dependent: Adequate
  - Asset Utilization Index: Good

Human Capital:
- 3,223 Full Time Equivalent Employees
- 126 Joint Faculty
- 241 Postdoctoral Researchers
- 779 Graduate Students
- 189 Undergraduate Students
- 4,426 Facility Users
- 46 Visiting Scientists

FY 2010 Funding by Source (Cost in $M):



FY 2010 Total Lab Operating Costs (Excluding ARRA): $604
FY 2010 Total DOE/NNSA Costs: $47.6
FY 2010 WFO (Non-DOE/Non-DHS) Costs: $91.7
FY 2010 WFO as % Total Lab Operating Costs: 17.8%
FY 2010 Total DHS Costs: $27.6

ARRA Obligated from DOE in FY 2010: $22.0
ARRA Costed from DOE in FY 2010: $67.1

Brookhaven National Laboratory

Mission and Overview

Established in 1947, Brookhaven National Laboratory (BNL) originated as a nuclear science facility. Today, BNL maintains a primary mission focus in the physical, energy, and life sciences, with additional expertise in environmental sciences, energy technologies, and national security. BNL brings specific strengths and capabilities to the Department of Energy laboratory system to produce excellent science and advanced technologies, safely, securely, and environmentally responsibly, with the cooperation and involvement of the local, national, and scientific communities. With a long-standing expertise in accelerator science and technology, BNL conceptualizes, designs, builds, and operates major scientific facilities available to university, industry and government researchers, in support of its Office of Science mission. These facilities serve not only the basic research needs of the DOE, but they reflect BNL and DOE stewardship of national research infrastructure that is made available on a competitive basis to a wide range of university, industry, and government researchers. While the Relativistic Heavy Ion Collider (RHIC) complex and the National Synchrotron Light Source (NSLS) are the two facilities that account for most of the 4200 scientists/year served at BNL, the Center for Functional Nanomaterials (CFN) served nearly 300 users in FY 2010, and that number is expected to grow. STo date, seven Nobel Prizes have been awarded for discoveries made at the Laboratory.

BNL's strong partnerships with Stony Brook University (SBU) and Battelle Memorial Institute are important strategic assets in accomplishing the Lab's missions. Beyond their roles in Brookhaven Science Associates (BSA), which manages the Laboratory, Stony Brook and Battelle are key partners in all of BNL's strategic initiatives, from basic research to the commercial deployment of technology, and figure prominently in BNL's energy research and development strategy.

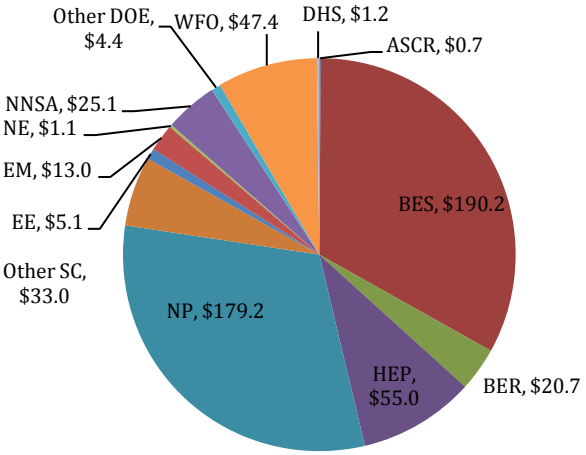
Lab-at-a-Glance

Location: Upton, New York
Type: Multi-program laboratory
Contractor: Brookhaven Science Associates
Responsible Site Office: Brookhaven Site Office
Website: www.bnl.gov

Physical Assets:
- 5320 acres and 331 buildings
- 4.0M GSF in buildings
- Replacement Plant Value: $1.65B
- Deferred Maintenance: $92M
- Asset Condition Index:
  - Mission Critical: Adequate
  - Mission Dependent: Adequate
  - Asset Utilization Index: Excellent

Human Capital:
- 2,945 Full Time Equivalent Employees
- 21 Joint faculty
- 160 Postdoctoral Researchers
- 124 Graduate Students
- 328 Undergraduate Students
- 4,223 Facility Users
- 1,052 Visiting Scientists

FY 2010 Funding by Source (Cost in $M):



FY 2010 Total Lab Operating Cost (Excluding ARRA): $575.0
FY 2010 Total DOE/NNSA Cost: $526.4
FY 2010 WFO (Non-DOE/Non-DHS) Cost: $47.4
FY 2010 WFO as % Total Lab Operating Cost: 8.2%
FY 2010 Total DHS Cost: $1.2

ARRA Obligated from DOE Sources in FY 2010: $32.1
ARRA Costed from DOE Sources in FY 2010: $131.6

Fermi National Accelerator Laboratory

Mission and Overview

Fermi National Accelerator Laboratory (Fermilab) advances the understanding of matter, energy, space and time by providing leadership and resources for researchers to conduct research at the frontiers of particle physics and related disciplines. As the only U.S. laboratory devoted to particle physics research, Fermilab helps maintain U.S. global leadership in science and engineering, and achieves the high-level goals of the Office of High Energy Physics.

Fermi Research Alliance manages Fermilab for the Department of Energy. FRA is an alliance of the University of Chicago and the Universities Research Association, a consortium of 86 universities. FRA combines the depth and commitment of the University of Chicago with the broad involvement of URA universities for the benefit of Fermilab, the particle physics community and the nation.

Fermilab's 1,925 employees and 2,300 users carry out a world-leading program of discovery at the three interrelated frontiers of particle physics. At the Energy Frontier, particle accelerators produce high-energy collisions that signal new phenomena. Fermilab supports the U.S. community engaged in research at the Large Hadron Collider and carries out R&D on future colliders. At the Intensity Frontier, scientists use intense beams from particle accelerators to explore neutrino interactions and ultra-rare processes in nature: Fermilab produces the world's most intense beams of neutrinos. At the Cosmic Frontier, scientists use the cosmos as a laboratory to investigate the fundamental laws of physics. Fermilab investigates dark matter, dark energy, and ultra-high energy cosmic rays using underground experiments, ground-based telescopes, and Cerenkov-fluorescence detectors.

Fermilab's core skills include experimental and theoretical particle physics, astrophysics, and accelerator science; R&D and development of accelerator and detector technologies; the construction and operation of large-scale facilities; and high-performance scientific computing. The laboratory operates particle accelerators and particle detectors; test beams for detector development; test facilities for accelerator research and development; and large-scale computing facilities such as a Tier-1 computing center for the CMS experiment at the LHC, the Lattice QCD center, and the Grid Computing Center. In FY 2010, more than 100 Ph.D. degrees were received based on work done at Fermilab.

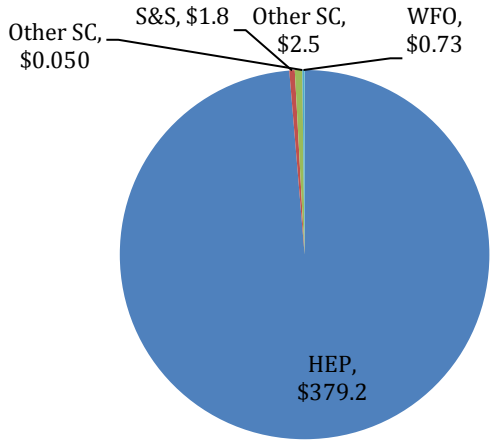
Lab-at-a-Glance

Location: Batavia, Illinois
Type: Single-program laboratory
Contract Operator: Fermi Research Alliance
Responsible Site Office: Fermi Site Office
Web site: www.fnal.gov/

Physical Assets:
- 6,800 acres, 356 buildings, other structures and facilities
- 2.4 Million GSF in buildings
- Replacement Plant Value: $1,699M
- Deferred Maintenance: $44.7M
- Asset Condition Index:
  - Mission Critical: Adequate
  - Mission Dependent: Excellent
  - Asset Utilization Index: Excellent

Human Capital:
- 1,925 Full Time Equivalent Employees (FTEs)
- 10 Joint faculty
- 250 Postdoctoral researchers
- 540 Graduate Students
- 300 Undergraduate Students
- 2,300 Facility users
- 50 Visiting scientists

FY 2010 Funding by Source (Cost in $M):



FY 2010 Total Lab Operating Cost (Excluding ARRA): $384.3
FY 2010 Total DOE/NNSA Cost: $383.6
FY 2010 WFO (Non-DOE/Non-DHS) Cost: $0.7
FY 2010 WFO as % Total Lab Operating Cost: 0.2%
FY 2010 Total DHS Cost: $0.05

ARRA Obligated from DOE Sources in FY 2010: $19.1
ARRA Costed from DOE Sources in FY 2010: $35.0

Lawrence Berkeley National Laboratory

Mission and Overview

Founded in 1931, Lawrence Berkeley National Laboratory (LBNL) has grown from a pioneering particle and nuclear physics laboratory into a multidisciplinary research facility with broad capabilities in physical, chemical, biological, and Earth systems research, including energy supply, efficiency, and storage; and environmental science. LBNL researchers conduct experiments in ultrafast soft X-ray science to engineer systems at quantum, atomic, and molecular scales; fabricate nanostructured materials and devices; gain new insight into particle physics, nuclear physics, and cosmology; apply computational science to the solution of scientific problems of scale; and study and engineer complex biosystems. As a Department of Energy national laboratory with international impact, LBNL strives to continually strengthen its core capabilities, intellectual creativity, and rigorous safety culture. LBNL applies these strengths to address the greatest scientific and technical challenges of our time to transform the world energy economy and to provide a sustainable future for humankind.

LBNL provides critical national scientific infrastructure for university, industry, and government researchers. Major facilities include the Advanced Light Source (ALS), a world center for ultraviolet and soft X-ray synchrotron-based science; the Molecular Foundry, a nanoscale-science user facility; the National Center for Electron Microscopy (NCEM) for materials science; the Joint Genome Institute (JGI); the National Energy Research Scientific Computing Center (NERSC), with high-performance computational science capabilities; the Energy Sciences Network (ESnet), the Office of Science (SC) data and connectivity backbone; and the 88-Inch Cyclotron, for nuclear science. LBNL also hosts two DOE sustainable-energy research centers, the Joint BioEnergy Institute (JBEI) and the Solar Energy Research Center (SERC); and co-leads (with the California Institute of Technology [Caltech]) DOE's Joint Center for Artificial Photosynthesis (JCAP).

LBNL fosters the creativity of outstanding individuals working collectively across disciplines to deliver solutions to DOE challenges of scale and urgency. Founder Ernest Lawrence was the Laboratory's first Nobel laureate; following that tradition, 11 Nobel laureates have worked or are working at LBNL, and many more have had significant research associations. Eighty current members of the National Academies of Science, Engineering, and the Institute of Medicine are affiliated with LBNL.

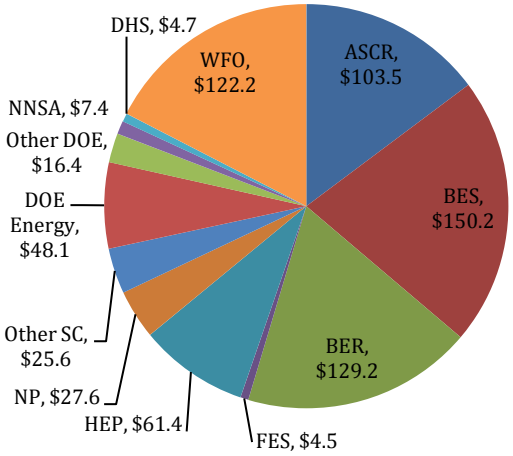
Lab at a Glance

Location: Berkeley, California
Type: Multi-program laboratory
Contract Operator: University of California
Responsible Site Office: Berkeley Site Office
Web site: www.lbl.gov/

Physical Assets:
- 202 acres (leased) and 106 buildings
- 1.55M gsf in active operational buildings
- Replacement plant value: $1.006B
- Deferred maintenance: $46.1M
- Asset Condition Index:
  - Mission Critical: Good
  - Mission Dependent: Excellent
  - Asset Utilization Index: Good

Human Capital:
- 3,863 Full Time Equivalent Employees
- 267Joint faculty
- 491 Postdoctoral Researchers
- 328 Graduate students
- 194 Undergraduate Students
- 8,025 Facility users
- 1,612 Visiting scientists

FY 2010 Funding by Source (Cost in $M):



FY 2010 Total Lab Operating Costs (Excluding ARRA): $680.6
FY 2010 Total DOE/NNSA Costs: $573.8
FY 2010 WFO (Non-DOE/Non-DHS) Costs: $122.1
FY 2010 WFO as % Total Lab Operating Costs: 18%
FY 2010 Total DHS Costs: $4.7

ARRA Obligated from DOE Sources in FY 2010: $87.8
ARRA Costed from DOE Sources in FY 2010: $96.2

Oak Ridge National Laboratory

Mission and Overview

The mission of Oak Ridge National Laboratory (ORNL) is to 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. This "science-to-solutions" mission depends critically on the integration and application of distinctive capabilities in basic and applied research, which include leadership positions in neutron scattering, advanced materials, high-performance computing (HPC), and nuclear S&T. The intended outcome is to produce transformational innovations that will enable a 21st century industrial revolution.

Managed since April 2000 by UT-Battelle, a partnership of the University of Tennessee (UT) and Battelle Memorial Institute, ORNL was established in 1943 as a keystone of the Manhattan Project. During the 1950s and 1960s, it became a leader in nuclear energy and related research in the physical and life sciences. In the 1970s, ORNL's portfolio expanded to include energy production, distribution, and conservation. Its capabilities are increasingly being applied to strengthen national and homeland security, arms control, and nonproliferation. Today, ORNL is engaged in a variety of partnerships that leverage the nation's investment in critical research infrastructure. The Spallation Neutron Source (SNS) and the High Flux Isotope Reactor (HFIR) provide ORNL with the world's foremost resources for neutron sciences, and support from DOE, the DOD, the National Science Foundation (NSF), and the National Oceanographic and Atmospheric Administration (NOAA) has made ORNL the world's most powerful computing complex. ORNL also manages the U.S. ITER project for DOE. ORNL hosts some 2,500 facility users and 3,200 visiting scientists annually, providing access to its 11 user facilities on a competitive basis, and supports the development of a new generation of scientific and technical talent.

Of the 17 core capabilities distributed across DOE/SC's national laboratories, ORNL possesses 15. This set of capabilities extends across the continuum from basic to applied research, and the interaction of basic and applied work is in and of itself a signature strength of the Laboratory: in 1967, Alvin Weinberg observed "that applied research done in a basic atmosphere has a sophistication that is hard to duplicate in a less scientific environment, and that basic research done in an applied atmosphere has a kind of no-nonsense aggressiveness that is hard to duplicate when basic research is done entirely by itself."

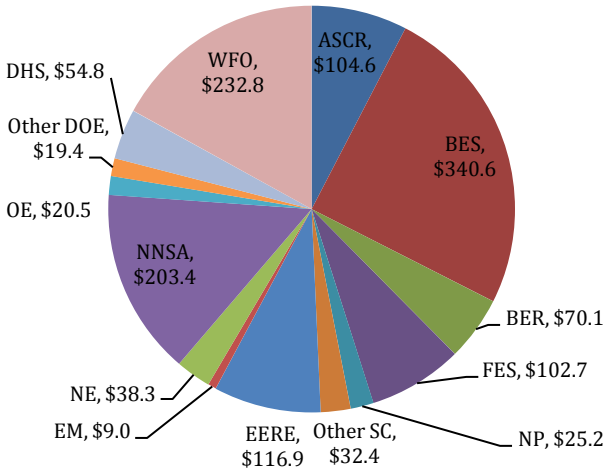
Lab-at-a-Glance

Location: Oak Ridge, Tennessee
Type: Multi-program laboratory
Contract Operator: UT-Battelle, LLC
Responsible Site Office: Oak Ridge Office
Web site: www.ornl.gov/

Physical Assets:
- 4470 acres and 252 buildings
- 4.5M GSF in active operational buildings; 260K GSF in non-operational buildings
- Replacement Plant Value: $7.0B
- Deferred Maintenance: $91.3M
- Asset Condition Index:
  - Mission Critical: Adequate
  - Mission Dependent: Adequate
  - Asset Utilization Index: Adequate

Human Capital:
- 4,702 Full Time Equivalent Employees
- 83 Joint Faculty
- 90 Postdoctoral Researchers
- 239 Graduate Students
- 490 Undergraduate Students
- 2,833 Facility Users
- 1901 Visiting Scientists

FY 2010 Funding by Source (Cost in $M):



FY 2010 Total Lab Operating Costs (Excluding ARRA): $1,368
FY 2010 Total DOE/NNSA Costs: $1,083
FY 2010 WFO (Non-DOE/Non-DHS) Costs: $230
FY 2010 WFO as % Total Lab Operating Costs: 16.8%
FY 2010 Total DHS Costs: $54.8

ARRA Obligated from DOE FY 2010: $223.9
ARRA Costed from DOE FY 2010: $12.3

Pacific Northwest National Laboratory

Mission and Overview

The Pacific Northwest National Laboratory (PNNL) is a DOE SC national laboratory with an enduring mission to advance molecular and environmental sciences and engineering in support of DOE and national needs. PNNL's vision is to be recognized worldwide and valued nationally for leadership in accelerating scientific discovery and innovation, and deploying solutions to national challenges in energy, national security, and the environment. To achieve its mission and vision, PNNL provides distinctive, world-leading science and technology in:

- the design and scalable synthesis of materials and chemicals;
- climate change science and emissions management;
- efficient and secure electricity management from generation to end use; and
- signature discovery and exploitation for threat detection and reduction.

PNNL leadership also extends to operating the Environmental Molecular Sciences Laboratory (EMSL), a national scientific user facility providing integrated experimental and computational resources for discovery and technological innovation in the environmental molecular sciences.

Established in 1965 with 2,200 employees and facilities supporting Hanford Site operations, PNNL expanded its nuclear fuel cycle research, and focused on developing advanced reactor designs and materials, fabricating and testing novel reactor fuels, and monitoring and protecting human health and the environment. Since then, PNNL has evolved into a leading multidisciplinary national laboratory with a long-standing reputation for advancing scientific frontiers through world-class R&D.

PNNL is operated by the Battelle Memorial Institute, a private, non-profit, science and technology enterprise that explores emerging areas of science, develops and commercializes technology, and manages laboratories. The total cost for the Laboratory in FY 2010 was $880.0 million (excluding Recovery Act). In addition to SC, principal PNNL customers include DOE's Offices of Energy Efficiency and Renewable Energy, Electricity Delivery and Energy Reliability, Environmental Management, Fossil Energy, and the NNSA, as well as DHS, DOD, the Nuclear Regulatory Commission, and the National Institutes of Health.

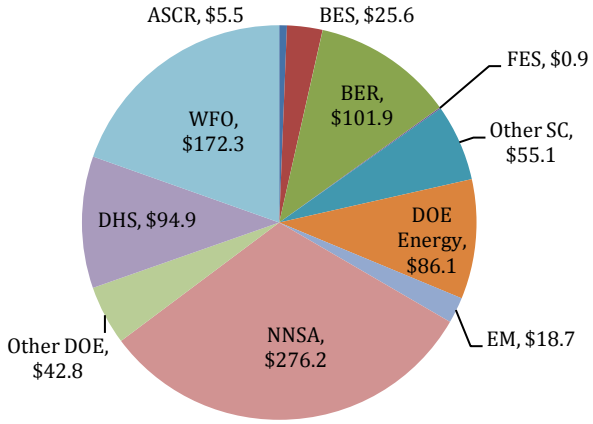
Lab-at-a-Glance

Location: Richland, Washington
Type: Multi-program laboratory
Contractor: Battelle Memorial Institute
Responsible Site Office: Pacific Northwest Site Office
Website: www.pnnl.gov

Physical Assets:
- 350 acres DOE, 250 acres Battelle, 101 buildings
- 831,249 gsf DOE-owned
- Replacement Plant Value: $428.5M
- Deferred Maintenance: $8.0M
- Asset Condition Index:
  - Mission Critical: Excellent
  - Mission Dependent: Good
  - Asset Utilization Index: Adequate

Human Capital:
- 4,103 Full Time Equivalent Employees
- 1 Joint Faculty
- 200 Postdoctoral Researchers
- 185 Graduate Students
- 232 Undergraduate Students
- 1,894 Facility Users
- 19 Visiting Scientists

FY 2010 Funding by Source (Cost in $M):



FY 2010 Total Lab Operating Cost (Excluding ARRA): $880
FY 2010 Total DOE/NNSA Cost: $612.8
FY 2010 WFO (Non-DOE/Non-DHS) Cost: $172.3
FY 2010 WFO as % Lab Operating Cost: 19%
FY 2010 DHS Cost: $94.9

ARRA Obligated from DOE Sources in FY 2010: $85
ARRA Costed from DOE Sources in FY 2010: $96

Princeton Plasma Physics Laboratory

Mission and Overview

The Princeton Plasma Physics Laboratory (PPPL) is a collaborative national center for plasma and fusion energy sciences. It is the only DOE laboratory devoted to these areas, and it is committed to being the leading U.S. institution investigating the science of magnetic fusion energy.

PPPL has two coupled missions. First, PPPL develops the scientific knowledge to realize fusion energy as a clean, safe, and abundant energy source for all nations. Plasma is a hot, ionized gas that under appropriate conditions of temperature, density, and confinement produces fusion energy. PPPL has been a leader in developing the physics of high temperature plasmas needed for fusion. PPPL will continue to solve plasma physics problems crucial to fusion energy, as well as contribute to solutions of key engineering science challenges associated with the material structure that surrounds the hot plasma. The second mission is to develop plasma science over its broad range of physics challenges and applications. Modern plasma physics began with the advent of the world fusion program, and continues to lead to new discoveries in the nonlinear dynamics of this complex state of matter. The vast applications range from scientific (e.g., plasmas in the cosmos), to technological (e.g., plasma-aided manufacturing).

For over five decades PPPL has been a leader in magnetic confinement experiments and theory. PPPL is a partner in the U.S. contributions to the ITER Project and leads multi-institutional collaborative work on the National Spherical Torus Experiment (NSTX). The Laboratory hosts smaller experimental facilities used by multi-institutional research teams and collaborates strongly by sending scientists, engineers and specialized equipment to other fusion research facilities in the U.S. and abroad. To support these activities, the Laboratory maintains nationally leading programs in plasma theory and computation, plasma science and technology, and graduate education.

PPPL's core capabilities in Plasma and Fusion Energy Sciences and Large Scale User Facilities enable PPPL to make major progress in support of the DOE Office of Fusion Energy Science's mission to develop the knowledge base for fusion energy and high temperature plasmas. These capabilities also provide the scientific training ground for Princeton University's Graduate Program in Plasma Physics, ranked one of the highest in the nation in plasma physics, providing leaders who will sustain plasma physics and fusion energy science research into the future.

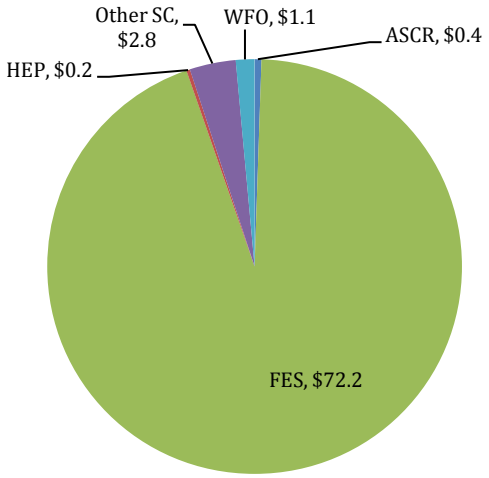
Lab-at-a-Glance

Location: Princeton, New Jersey
Type: Single-program laboratory
Contract Operator: Princeton University
Responsible Field Office: Princeton Site Office
Website: http://www.pppl.gov/

Physical Assets:
- 88.5 acres; 34 buildings
- 754K GSF in Active Operational Buildings
- Replacement Plant Value: $339M
- Deferred Maintenance: $7.3M
- Asset Condition Index:
  - Mission Critical: Good
  - Mission Dependent: Good
  - Asset Utilization Index: Excellent

Human Capital:
- 436 Full Time Equivalent Employees (FTEs)
- 4 Joint Faculty
- 15 Postdoctoral Researchers
- 38 Graduate students
- 0 Facility Users
- 250 Visiting Scientists

FY 2010 Funding by Source (Cost in $M):



FY 2010 Total Lab Operating Cost (Excluding ARRA): $76.7
FY 2010 Total DOE/NNSA Cost: $75.6
FY 2010 WFO (Non-DOE/Non DHS) Cost: $1.1
FY 2010 WFO as % Lab Operating Cost: 1.5%
FY 2010 Total DHS Cost: $0.0

ARRA Obligated from DOE Sources in FY 2010: $4.7
ARRA Costed from DOE Sources in FY 2010: $7.1

SLAC National Accelerator Laboratory

Mission and Overview

The SLAC National Accelerator Laboratory, operated by Stanford University for DOE SC, is home to some of the world's most cutting-edge technologies, used by researchers to acquire scientific insights pertinent to national and international challenges within the DOE mission. SLAC is a multi-program laboratory, involved in leading research in the areas of materials and chemical science, energy, structural biology, and particle physics and astrophysics, among others. SLAC's mission is three-fold: to be an internationally recognized photon science user laboratory; to maintain its leadership position as one of the world's premier accelerator laboratories; and to pursue targeted programs in particle physics and particle astrophysics. SLAC operates two leading x-ray scientific facilities: the Linac Coherent Light Source (LCLS) and the Stanford Synchrotron Radiation Lightsource (SSRL). To date, six scientists have been awarded the Nobel Prize for work carried out at SLAC.

The LCLS began operating at SLAC in 2009 and has redefined the frontiers of x-ray science with its ultra-short, ultra-bright pulses of hard x-rays. Over a billion times brighter than any other hard x-ray source, LCLS allows experimenters to probe the structure and dynamics of materials at the atomic scale. Scientists can now see where the atoms are and what they are doing on atomic time scales of femtoseconds. Early experiments ranged from nanocrystal diffraction, demonstrating the technology to study macromolecular structures that do not form crystals large enough to be examined at synchrotron-based sources, to studies of reaction states on surfaces to understand the structural dynamics of catalysis. LCLS works in synergy with SSRL, as well as the many science programs that drive the development of the facilities for the broader user community.

SLAC's particle physics programs have a heavy emphasis on particle astrophysics. SLAC led the development of the primary instrument for the Fermi Gamma-ray Space Telescope (FGST), a joint DOE-NASA mission that launched in 2008. Currently, SLAC runs the Instrument Science and Operations Center for Fermi and is a primary contributor to the science. SLAC anticipates mission need approval (CD-0) in the near future for the Large Synoptic Survey Telescope (LSST), a ground-based telescope that will survey the entire night sky every few nights. LSST will be a joint DOE-National Science Foundation (NSF) project, with SLAC responsible for the camera fabrication.

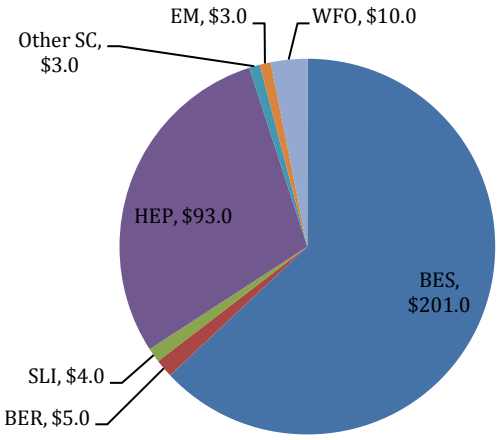
Lab-at-a-Glance

Location: Menlo Park, California
Type: Multi-program laboratory
Contractor: Stanford University
Responsible Site Office: Stanford Site Office
Website: www.slac.stanford.edu

Physical Assets:
- 426 Acres and 142 DOE-owned Buildings
- 1.7M square feet in DOE-owned buildings
- Replacement Plant Value: $1.134M
- Deferred Maintenance: $21.4M
- Asset Condition Index:
  - Mission Critical: Good
  - Mission Dependent: Good
  - Asset Utilization Index: Good

Human Capital:
- 1,579 Full Time Equivalent Employees
- 21 Joint Faculty
- 70 Postdoctoral Researchers
- 135 Graduate Students
- 0 Undergraduate Students
- 3,112 Facility Users
- 30 Visiting Scientists

FY 2010 Funding by Source (Cost in $M):



FY 2010 Total Lab Operating Costs (Excluding ARRA): $317.8
FY 2010 Total DOE/NNSA Costs: $308
FY 2010 WFO (Non-DOE/Non-DHS) Costs: $9.8
FY 2010 WFO as % Lab Operating Costs: 3.1%
FY 2010 Total DHS Costs: $0.0

ARRA Obligated from DOE Sources in FY 2010: $6.5
ARRA Costed from DOE Sources in FY 2010: $32.8

Thomas Jefferson National Accelerator Facility

Mission and Overview

The Thomas Jefferson National Accelerator Facility (TJNAF), located in Newport News, Virginia, is a laboratory operated by Jefferson Science Associates, LLC for the Department of Energy's Office of Science. The primary mission of the laboratory is to utilize its unique Continuous Electron-Beam Accelerator Facility (CEBAF) to explore the fundamental nature of confined states of quarks and gluons, including the nucleons that comprise the mass of the visible universe. TJNAF also is a world-leader in the further development of the superconducting radio-frequency (SRF) technology utilized for CEBAF. This technology is the basis for an increasing array of applications at TJNAF, other DOE labs, and in the international scientific community. At TJNAF, the advancement of SRF technology has enabled the 12 GeV upgrade project to double the energy of CEBAF which is presently underway. In addition, it facilitated the development of TJNAF's Free Electron Laser (FEL) and Energy Recovery Linac (ERL), key technologies for future state-of–the–art light sources. TJNAF's present core capabilities are: experimental, theoretical and computational Nuclear Physics; Accelerator Science; Applied Nuclear Science and Technology; and Large Scale User Facilities/Advanced Instrumentation.

TJNAF has an international user community of 1,356 researchers whose work has resulted in scientific data from 172 experiments to date, 289 Physics Letters and Physical Review Letters publications and 889 publications in other refereed journals at the end of FY 2010. Collectively, there have been over 30,000 citations for work done at Jefferson Lab.

Research at TJNAF and CEBAF also contributes to thesis research material for about one-third of all U.S. Ph.D.s awarded annually in Nuclear Physics (25 in FY 2010; 419 to date, 204 more in progress). The Lab's outstanding science education programs for K-12 students, undergraduates and teachers build critical knowledge and skills in the physical sciences that are needed to solve many of the nation's future challenges.

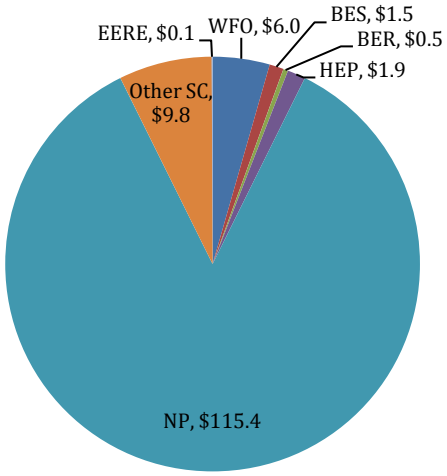
Lab-at-a-Glance

Location: Newport News, Virginia
Type: Single-program laboratory
Contract Operator: Jefferson Science Associates, LLC
Responsible Site Office: Thomas Jefferson Site Office
Website: www.jlab.org

Physical Assets:
- 169 Acres
- 63 DOE owned Buildings
- 685K GSF in DOE Buildings
- Replacement Plant Value: $318.7M
- Deferred Maintenance: $12.3M
- Asset Condition Index:
  - Mission Critical: Excellent
  - Mission Dependent: Good
  - Asset Utilization Index: Excellent

Human Capital:
- 720 Full Time Equivalent Employees
- 22 Joint Faculty
- 19 Postdoctoral Researchers
- 30 Graduate Students
- 14 Undergraduate Students
- 1,258 Facility Users
- 1,110 Visiting Scientists

FY 2010 Funding by Source (Cost in $M):



FY 2010 Total Lab Operating Cost (Excluding ARRA): $135.2
FY 2010 Total DOE/NNSA Cost: $129.2
FY 2010 WFO (Non-DOE/Non-DHS) Cost: $6.0
FY 2010 WFO as % Total Lab Operating Cost: 4%
FY 2010 DHS Cost: $0.0

ARRA Obligated from DOE Sources in FY 2010: $0.0
ARRA Costed from DOE Sources in FY 2010: $43.5

Office of Science National Laboratories Directory

Ames Laboratory
111 TASF
Ames, IA 50011-3020
Phone: (515) 294-9557
http://www.ameslab.gov/

Argonne National Laboratory
9700 S. Cass Avenue
Argonne, IL 60439
Phone: (630) 252-2000
http://www.anl.gov/

Brookhaven National Laboratory
P.O. Box 5000
Upton, NY 11973-5000
Phone: (631) 344-8000
http://www.bnl.gov/

Fermi National Accelerator Laboratory
P.O. Box 500
Batavia, IL 60510-0500
Phone (630) 840 3000
http://www.fnal.gov/

Lawrence Berkeley National Laboratory
1 Cyclotron Road
Berkeley, CA 94720
Phone: (510) 486-4000
http://www.lbl.gov/

Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, TN 37831
Phone: (865) 574-4160
http://www.ornl.gov/

Pacific Northwest National Laboratory
902 Battelle Boulevard
Richland, WA
Phone: (509) 375-2121
http://www.pnnl.gov/

Princeton Plasma Physics Laboratory
P.O. Box 451
Princeton, NJ 08543-0451
Phone: (609) 243-2000
http://www.pppl.gov/

SLAC National Accelerator Laboratory
2575 Sand Hill Road
Menlo Park, CA 94025
Phone: (650) 926-3300
http://www.slac.stanford.edu/

Thomas Jefferson National Accelerator Facility
12000 Jefferson Avenue
Newport News, VA 23606
Phone: (757) 269-7100
http://www.jlab.org/