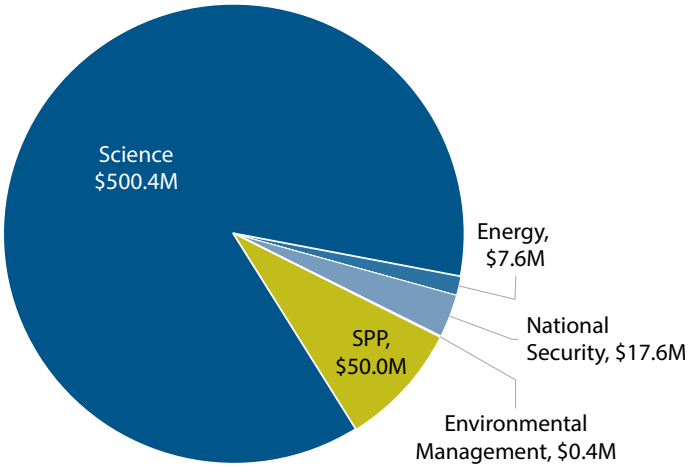
Brookhaven National Laboratory
At a Glance

U.S. DEPARTMENT OF ENERGY

BNL brings world-class facilities and expertise to advance fundamental research in nuclear and particle physics to gain a deeper understanding of matter, energy, space, and time; apply photon sciences and nanomaterials research to energy challenges of critical importance to the Nation; and perform cross-disciplinary research on climate change, sustainable energy, computation, and earth's ecosystems.

The Lab's 2,750 scientists, engineers, and support staff are joined each year by thousands of visiting researchers who use its large-scale scientific facilities. BNL is operated and managed by Brookhaven Science Associates, founded by the Research Foundation for the State University of New York on behalf of Stony Brook University, and Battelle, a nonprofit applied science and technology organization.

FY 2016 Funding by Source



Lab operating costs: **$576.1M**
DOE/NNSA costs: **$524.9M**
SPP costs (non-DOE/non-DHS): **$50M**
DHS costs: **$1.3M**
SPP as % total Lab operating costs: **8.9%**

Facts

Location: Upton, New York
Type: Multi-program Laboratory
Year Founded: 1947
Director: Doon Gibbs
Contractor: Brookhaven Science Associates
Responsible Site Office: Brookhaven Site Office

Physical Assets

5,322 acres and **316** buildings
4.85M GSF in buildings
Replacement plant value: **$5.23B**
95,702 GSF in **11** excess facilities

Human Capital

2,618 full-time equivalent employees (FTEs)
121 joint faculty
122 postdoctoral researchers
203 undergraduate students
140 graduate students
2,594 facility users
2,134 visiting scientists

Core Capabilities

- Accelerator Science and Technology
- Advanced Computer Science, Visualization, and Data
- Applied Materials Science and Engineering
- Biological Systems Science
- Chemical Engineering
- Chemical and Molecular Science
- Climate Change Science and Atmospheric Science
- Condensed Matter Physics and Materials Science
- Large Scale User Facilities/ Advanced Instrumentation
- Nuclear Physics
- Nuclear and Radio Chemistry
- Particle Physics
- Systems Engineering and Integration

Mission Unique Facilities

- Accelerator Test Facility
- Center for Functional Nanomaterials
- National Synchrotron Light Source II
- Relativistic Heavy Ion Collider

BROOKHAVEN NATIONAL LABORATORY

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Accomplishments

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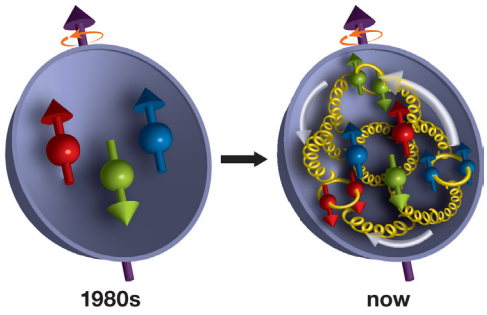
Unique Facility
World's most advanced synchrotron light source

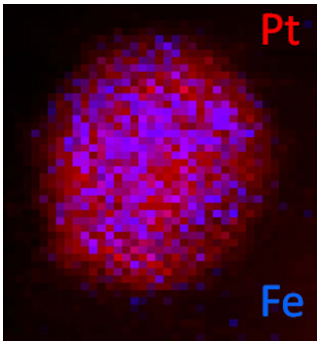
BNL is entering an exciting new chapter of discovery with one of the newest and most advanced x-ray facilities in the world. The National Synchrotron Light Source II (NSLS-II) delivers beams of extremely bright x-rays used by researchers to study a material's properties and functions with nanoscale resolution and exquisite sensitivity. This facility is open to scientists from academia, industry, and other Labs, and provides the research tools needed for basic and applied research, thereby fostering key discoveries in biology and medicine, materials and chemical sciences, geosciences and environmental sciences, and nanoscience. These discoveries will advance new technologies and generate breakthroughs in energy security, human health, and more.

Research Highlight
Gluons make big contribution to proton spin



"Spin" is a fundamental property that influences a proton's optical, electrical, and magnetic characteristics—put to use every day in MRI scans. But the source of spin is a mystery: quarks, the proton's inner building blocks, account for only about a third. New data from high-energy collisions of spin-aligned protons—possible only at the Relativistic Heavy Ion Collider—indicate that gluons, glue-like particles that bind quarks, play a substantial role in spin, possibly more than the quarks. These high-resolution experiments gave scientists access to gluons that carry the lowest fraction of the proton's overall momentum. Though these gluons are "lightweight," they're abundant, which explains their outsized contribution to spin.

Technology to Market Highlight
Custom nanocatalysts advance fuel cell vehicle production



Hydrogen fuel-cell electric vehicles could significantly reduce the harmful emissions associated with fossil fuels, but these fuel cells rely on costly precious metals for peak performance. To reduce reliance on platinum—the most expensive, fragile, and critical fuel cell catalyst component—BNL scientists developed a breakthrough nanocatalyst that uses just a one-atom thick platinum coating over less-expensive metals like palladium. Experiments showed that the new nanocatalyst outperformed its expensive precursors. N.E. Chemcat Corporation, Japan's leading catalyst manufacturer, has licensed the nanoparticle design and synthesis process and is working with leading automotive manufacturers to accelerate production of an eco-friendly fleet of zero-emission vehicles.