

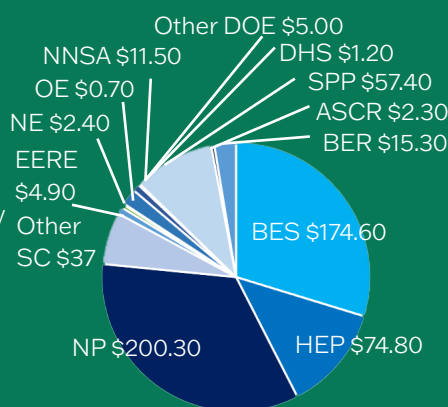
AT A GLANCE: BROOKHAVEN NATIONAL LABORATORY



With seven Nobel Prize-winning discoveries and more than 70 years of pioneering research, Brookhaven National Laboratory (BNL) delivers discovery science and transformative technology to power and secure the Nation's future. The laboratory leads and supports diverse research teams including other National Laboratories, academia, and industry, by designing, building, and operating major scientific user facilities in support of its DOE mission. These facilities reflect BNL/DOE stewardship of national research infrastructure critical for researchers—such as response to national emergencies (e.g., COVID-19 research). Energy and data science, nuclear science and particle physics, accelerator S&T, quantitative plant science, and quantum information science are Brookhaven's current initiatives. Managed by a partnership between Stony Brook University (SBU) and Battelle plus six universities—Columbia, Cornell, Harvard, MIT, Princeton, and Yale—Brookhaven manages programs that also help prevent the spread of nuclear weapons, protect astronauts on future space missions, and produce medical isotopes to diagnose and treat disease.

FUNDING BY SOURCE

FY 2019 Costs (in \$M)
 Total Laboratory Operating Costs: \$587.5
 DOE Costs: \$528.9
 SPP (Non-DOE/Non-DHS) Costs: \$57.4
 SPP as % of Total Laboratory Operating Costs: 10%
 DHS Costs: \$1.2



HUMAN CAPITAL

2,421 FTE employees
 139 joint faculty
 159 postdoctoral researchers
 286 undergraduate students
 200 graduate students
 3,555 facility users
 1,523 visiting scientists

CORE CAPABILITIES

Accelerator S&T
 Advanced Computer Science, Visualization, and Data
 Applied Materials Science and Engineering
 Applied Mathematics
 Biological System Science
 Chemical and Molecular Science
 Chemical Engineering
 Climate Change Science and Atmospheric Science
 Computational Science
 Condensed Matter Physics and Materials Science
 Large-Scale User Facilities/R&D Facilities/Advanced Instrumentation
 Nuclear and Radio Chemistry
 Nuclear Physics
 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

FACTS

Location: Upton, NY
 Type: Multiprogram Laboratory
 Contractor: Brookhaven Science Associates
 Site Office: Brookhaven Site Office
 Website: bnl.gov

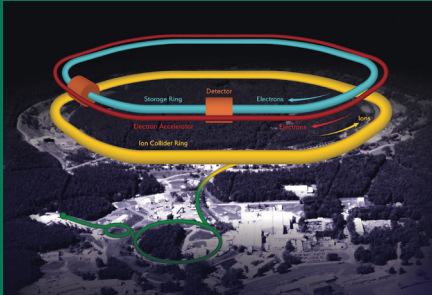
PHYSICAL ASSETS

5,322 acres and 314 buildings
 4.83M GSF in buildings
 Replacement plant value: \$5.8 B
 159,912 GSF in 27 excess facilities
 0 GSF in leased facilities

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ACCOMPLISHMENTS



Unique Facility: Electron-Ion Collider - In January 2020, DOE named Brookhaven Laboratory as the site for a future Electron-Ion Collider (EIC), a one-of-a-kind nuclear physics research facility to be built in partnership with Thomas Jefferson National Accelerator Facility and New York State. The EIC will reuse key infrastructure from Brookhaven Laboratory's Relativistic Heavy Ion Collider (RHIC) and will serve as a 3D "microscope" for studying quarks and gluons—the building blocks of the protons, neutrons, and atomic nuclei that make up all visible matter in the universe. Scientists from across the Nation and around the world will use the EIC to study the properties of these building blocks of matter and unlock the secrets of the strongest force in nature. Technological advances being developed for the EIC will have widespread benefits for science and society.



Tech-to-Market Highlight: Application-Specific Integrated Circuits - Several companies have licensed Brookhaven Laboratory intellectual properties that cover application-specific integrated circuits (ASICs) that were originally conceived by laboratory scientists for detectors in nuclear and particle physics experiments. These physics experiments generally require hundreds of integrated circuits produced within specified constraints of low noise, high precision, and high speed while maintaining low power consumption and low cost—attributes attractive to many industrial applications. Licensees of Brookhaven's intellectual properties are incorporating such ASICs in products designed for imaging and monitoring applications in the security, nuclear power, and medical industries.



Research Highlight: Going the Distance for Quantum Networking - Scientists from Brookhaven Laboratory and SBU recently demonstrated a three-node quantum network prototype, extending the reach and potential of future quantum communication systems. Such networks are based on the extraordinary phenomena of quantum physics, including quantum entanglement—where the properties of photons are intertwined even when those particles are separated by vast distances. The team recently transmitted single-photon level polarized quantum bits ("qubits") in a looping configuration for approximately 87 miles, using commercially available telecommunications fiber connecting the SBU and Brookhaven campuses. The achievement marks the longest successful quantum communication link experiment in the United States and is a significant step toward achieving a secure quantum network that could revolutionize the way people communicate.