

# AT A GLANCE: ARGONNE NATIONAL LABORATORY



Argonne National Laboratory accelerates science and technology (S&T) to drive U.S. prosperity and security. The laboratory is recognized for seminal discoveries in fundamental science, innovations in energy technologies, leadership in scientific computing and analysis, and excellence in stewardship of national scientific user facilities. Argonne's basic research drives advances in materials science, chemistry, physics, biology, and environmental science. In applied science and engineering, the laboratory overcomes critical technological challenges in energy and national security. The laboratory's user facilities propel breakthroughs in fields ranging from supercomputing and AI applications for science, to materials characterization and nuclear physics, and climate science. The laboratory also leads nationwide collaborations spanning the research spectrum from discovery to application, including the Q-NEXT quantum information science center, Joint Center for Energy Storage Research, and ReCell advanced battery recycling center. To take laboratory discoveries to market, Argonne collaborates actively with regional universities and companies and expands the impact of its research through innovative partnerships.

## FUNDING BY SOURCE

FY 2019 Costs (in \$M)

Total Laboratory Operating Costs: \$837\*

DOE/NNSA Costs: \$727

SPP (Non-DOE/Non-DHS)

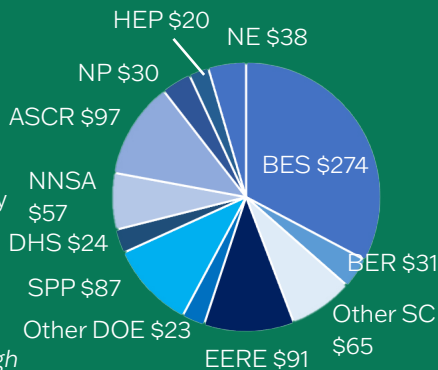
Costs: \$87

SPP as % of Total Laboratory

Operating Costs: 13%

DHS Costs: \$24

\*Excludes expenditures of monies received from other DOE contractors and through joint appointments of research staff.



## HUMAN CAPITAL

3,448 FTE employees

379 joint faculty

317 postdoctoral researchers

297 undergraduate students

224 graduate students

8,035 facility users

809 visiting scientists

## CORE CAPABILITIES

Accelerator S&T

Advanced Computer Science, Visualization, and Data

Applied Materials Science and Engineering

Applied Mathematics

Biological and Bioprocess Engineering

Chemical and Molecular Science

Chemical Engineering

Climate Change Science and Atmospheric Science

Computational Science

Condensed Matter Physics and Materials Science

Cyber and Information Sciences

Decision Science and Analysis

Large-Scale User Facilities/Advanced Instrumentation

Nuclear Engineering

Nuclear Physics

Nuclear and Radio Chemistry

Particle Physics

Systems Engineering and Integration

## MISSION UNIQUE FACILITIES

Advanced Photon Source

Argonne Leadership Computing Facility

Argonne Tandem Linear Accelerator System

Atmospheric Radiation Measurement Southern Great Plains Site

Center for Nanoscale Materials

Materials Engineering Research Facility

## FACTS

Location: Lemont, Illinois, near Chicago

Type: Multiprogram Laboratory

Contractor: UChicago Argonne, LLC

Site Office: Argonne Site Office

Website: anl.gov

## PHYSICAL ASSETS

1,517 acres

156 buildings

\$3.9 billion replacement plant value

5.1 million GSF in buildings

0.3 million GSF in leased facilities

0.02 million GSF in 16 excess facilities



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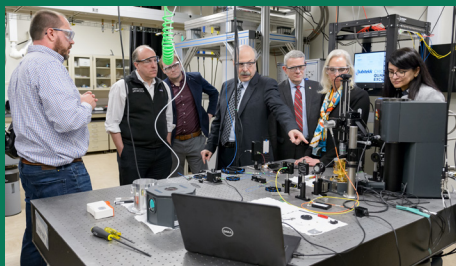
## ACCOMPLISHMENTS



**Unique Facility: X-rays for Discovery** - The Advanced Photon Source (APS) is the Nation's highest-energy light source and is used for studies in nearly every scientific discipline. More than 5,000 researchers use the APS annually, making it one of the world's most productive X-ray light source facilities. It has paved the way for better batteries, numerous new therapeutic drugs, more-efficient vehicles, stronger infrastructure materials, and more powerful electronics. Research at the APS has directly led to two Nobel Prizes and contributed to a third. The APS has also made significant contributions in the fight against COVID-19 by supporting research to both identify the protein structures of the virus and find potential pharmaceutical treatments and/or vaccines. The APS upgrade project now underway will make it up to 500 times brighter and vastly expand available research opportunities.



**Tech-to-Market Highlight: Argonne Cathode Technology "Game Changer" in Battery Industry** - The battery that helps power General Motors' plug-in hybrid Chevy Bolt, the 2017 Motor Trend Car of the Year, is based in part on a chemistry breakthrough by Argonne scientists. The researchers used the Advanced Photon Source as part of their toolkit to better understand in real time the reactions that occur inside a battery. The nickel manganese cobalt (NMC) blended cathode structure developed at Argonne offers the longest-lasting energy available in the smallest, lightest package—a 50 to 100 percent increase in energy storage capacity over conventional cathode material. The NMC technology has been licensed to General Motors (Detroit, M.I.), BASF Corporation (Florham Park, N.J.), TODA America, Inc. (Battle Creek, M.I.), and LG Chem.



**Research Highlight: The Birth of the Quantum Internet** - Building systems to communicate using quantum mechanics represents one of the most important technological frontiers of the 21st century. Argonne scientists took an important step toward achieving this goal in 2020 when they demonstrated entanglement of photons across a 52-mile "Quantum Loop" in the Chicago suburbs. To ultimately make a national quantum internet a reality, Argonne is leading efforts to develop quantum technologies. Those technologies include quantum repeaters enabling development of "unhackable" networks for information transfer, sensors with unprecedented sensitivities for transformational applications in the physical and life sciences, and "test beds" for both quantum simulators and quantum computers. Argonne's multi-partner Q-NEXT quantum information science center, established in 2020, is accelerating the development of quantum technology.