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**2005 CELEBRATING SIX DECADES
OF OUTSTANDING SCIENTIFIC
ACHIEVEMENT...AND BEYOND**

1946

1975

1984

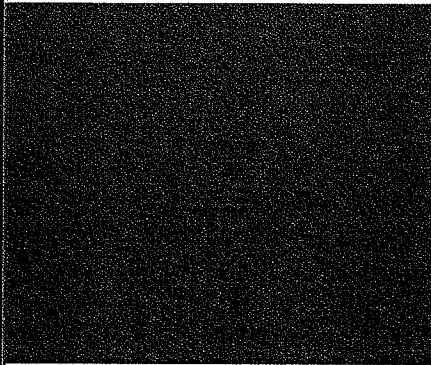
1993

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2006 marks Argonne's 60th anniversary. Formally chartered on **July 1, 1946**, Argonne was the first national laboratory—a government-funded organization that applies academic research traditions to solving the nation's most pressing science and technology problems.



1946



Argonne is a direct descendant of The University of Chicago's Metallurgical Laboratory, part of the World War II Manhattan Project. At the Met Lab on Dec. 2, 1942, Enrico Fermi and his colleagues created the world's first controlled self-sustaining nuclear chain reaction in a squash court under the stands of The University of Chicago's Stagg Field. By the end of February 1943, Fermi's reactor had been moved to a new site in the Argonne Forest section of the Cook County Forest Preserve.

"CREATING ARGONNE AND THE NATIONAL LABORATORY SYSTEM INTRODUCED A NEW ERA OF SCIENTIFIC RESEARCH IN THE PUBLIC INTEREST...THE NATIONAL LABORATORIES HAVE BECOME CENTERS WHERE GREAT MINDS AND GREAT RESEARCH FACILITIES ARE JOINED IN PURSUIT OF SOLUTIONS TO THE NATION'S MOST COMPLEX SCIENTIFIC PROBLEMS."

**ROBERT ROSNER
DIRECTOR, ARGONNE NATIONAL LABORATORY**

In 1946, the mission of the laboratory changed to focus on developing nuclear reactors for peaceful purposes and the lab was officially renamed Argonne National Laboratory. In 1948, a new location near Darien, Illinois, became the laboratory's new home. Over the next 60 years, each decade saw the lab expand its research to include many other areas of science, engineering and technology.

1950s

The fifties focused on research and development in reactor technology. Among the earliest reactors Argonne scientists designed was a pressurized-water submarine thermal reactor for the world's first atomic-powered submarine. In 1950, Argonne built and operated the first submarine reactor prototype. In January 1954, the USS Nautilus, the first atomic submarine, was launched. With virtually unlimited power, this class of submarines could remain under water for indefinitely long periods and travel at significantly faster speeds. The Argonne-designed reactor in the Nautilus lasted for 62,500 miles, including a dramatic crossing of the Arctic Ocean in 1958.

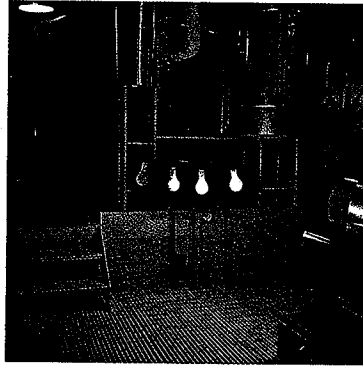
Experimental Breeder Reactor I (EBR-I) achieved many benchmarks during its 14 years of operation. It was the first nuclear reactor to produce usable amounts of electricity, lighting a string of four 150-watt bulbs on Dec. 20, 1951. In 1953, it was the first reactor to demonstrate the breeder principle—generating more new nuclear fuel than it consumed. It was the first, in November 1962, to achieve a chain reaction with plutonium and the first to demonstrate the feasibility of using liquid metals at high temperatures as a reactor coolant. EBR-I gained National Historic Landmark status in 1966.

Benchmark research in boiling water reactors began with a series of Boiling Reactor Experiments (BORAX) in 1953. In 1955, BORAX III produced enough electricity to light up the town of Arco, Idaho—the first time in history that any town had all its electricity provided by nuclear energy.

1960s

The sixties continued with further developments in work related to the Experimental Breeder Reactor II, which operated from 1964 to 1994. This reactor was the first to demonstrate a closed nuclear fuel cycle. From 1965-69, 20,000 spent fuel pins were removed from the reactor core, processed at the reactor's Fuel Cycle Facility to remove some

1951



1954

1946

Argonne's first site in the Cook County Forest Preserve was located in the Argonne Forest area, giving the lab its name.

1951

The Experimental Breeder Reactor-1 achieved many benchmarks during its 14 years of operation. It was the first nuclear reactor to produce useful electric power when it lighted a string of four 150-watt bulbs on Dec. 20, 1951.

1954

One of Argonne's early missions, assigned in 1947, was to design a nuclear power plant for a submarine. The result was the 1954 launching of the Nautilus, the world's first nuclear-powered submarine.

fission products, and recast and returned to the core as new fuel pins. Today, closing the nuclear fuel cycle is a key aspect of the U.S. Department of Energy's (DOE's) plans to develop economical, safe and proliferation-resistant nuclear power plants for the 21st century.

In 1963, Maria Goeppert Mayer became the second Argonne scientist to win a Nobel Prize in physics—founding director Enrico Fermi won in 1938. Goeppert Mayer was recognized for developing the nuclear shell model to explain how neutrons and protons within atomic nuclei are structured. She performed the work at Argonne in 1948.

Also in 1963 construction was completed for the Zero Gradient Synchrotron (ZGS), a 12.5 GeV proton accelerator built for high energy physics research. For the next 16 years, the ZGS would attract leading scientists from all over the nation to study the fundamental nature of matter and energy. Design, construction and operation of the ZGS helped establish Argonne's world-leading capabilities in accelerator physics and design, which enabled the later creation of the Advanced Photon Source, the Intense Pulsed Neutron Source and the Argonne Tandem-Linac Accelerator System, cutting-edge materials science and physics accelerators the laboratory operates today.

1970s

This decade witnessed Argonne's involvement in environmental stewardship. With the advent of new environmental standards and policies in the early 1970s, the need arose for establishing documentation called Environmental Impact Statements. Starting in 1973, Argonne scientists began developing these statements for the Atomic Energy Commission and, later, for DOE and the Nuclear Regulatory Commission. This work continues today, with Argonne recognized as the preeminent laboratory in this field.

The 1970s also saw Argonne develop prototypes for a new kind of neutron source for materials research—one based on an accelerator rather than a nuclear reactor. By the end of the decade, design was under way for the Intense Pulsed Neutron Source (IPNS). Based largely on components from the ZGS, shut down in 1979, the IPNS would become DOE's first scientific user facility.

1980s

THROUGHOUT THE LATE 1970S AND 1980S, ARGONNE SCIENTISTS DESIGNED AND BUILT STATE-OF-THE-ART FACILITIES THAT ENABLED THEM TO REVOLUTIONIZE THE WAYS IN WHICH RESEARCH IS CONDUCTED. THE IPNS WAS COMMISSIONED IN 1981. OVER ITS 25 YEARS OF OPERATION, THE FACILITY HAS PROVIDED THE NATION'S MOST RELIABLE SOURCE OF NEUTRONS FOR THE STUDY OF ATOMIC ARRANGEMENTS AND MOTIONS IN LIQUIDS AND SOLIDS—INFORMATION KEY TO DEVELOPING