

ADVANCING AMERICA *through* TECHNOLOGY TRANSFER

FERMI NATIONAL ACCELERATOR LABORATORY

ACCELERATING *the* SUPERCONDUCTING WIRE INDUSTRY



SUPERCONDUCTING MAGNETS

EXPANDED UNDERSTANDING *of the*
UNIVERSE *and a* HEALTHIER WORLD

 **Fermilab**

U.S. DEPARTMENT OF
ENERGY

Office of
TECHNOLOGY TRANSITIONS



What do a particle accelerator and medical imaging have in common?

Both use superconducting magnets. In the 1970s, when scientists at Fermi National Accelerator Laboratory (Fermilab) envisioned an unparalleled particle accelerator – the Tevatron – that would advance discoveries into the structure and origins of the Universe, they didn’t expect to create an industry and improve lives, too.

Realizing Fermilab’s vision required superconducting magnets that demanded an unprecedented supply of unavailable niobium-titanium wire. The Tevatron’s prodigious construction effort drove the wire’s commercial production and as a result, literally and figuratively laid the groundwork for the nascent superconducting industry and transformed medical diagnostics with Magnetic Resonance Imaging (MRI) technology. Decades later, Fermilab remains the global leader in research and development of superconducting magnet and accelerator technologies with advances that benefit industry and mankind.

Fermilab at a Glance

Born in 1967 in the wide, open Illinois prairie 35 miles west of Chicago and later named in honor of one of the greatest scientists of the 20th century, Fermilab is America’s premier particle physics and accelerator laboratory where the global physics community collaboratively coalesces to solve the mysteries of matter, energy, space, and time. The Lab’s mission is to build, operate, and lead the world in particle accelerator and detector facilities; perform pioneering research on a global scale; and develop new technologies for science that support American industry. Fermilab’s discoveries benefit everyday Americans with applications that span medical diagnostics and treatment, homeland security, energy, transportation, and advanced computing.

U.S. Department of Energy Laboratories

The 17 U.S. Department of Energy (DOE) National Laboratories comprise a preeminent federal research system that executes long-term government scientific and technological missions, often with complex security, safety, project management, or other operational challenges. The National Laboratory system produces the scientific research needed to develop national energy policy and solutions allowing DOE to be one of the largest supporters of technology transfer in the federal government.

Technology Transitions

The mission of the Office of Technology Transitions (OTT) is to expand the commercial impact of the DOE’s research and development portfolio to advance the economic, energy, and national security interests of the Nation. The office develops the Department’s policy and vision for expanding the commercial impact of its research investments, and streamlines information and access to DOE’s National Labs and sites to foster partnerships that will move innovations from the labs into the marketplace.

www.energy.gov/technologytransitions

Fermilab’s pioneering role in commercializing superconducting wire made applications such as MRI commercially viable

Technology

The accelerator’s 1,000 superconducting magnets operated at -450°F to achieve desired particle energies.

Economy

The annual global MRI market is projected to exceed \$6 billion by 2025.

Awards

Fermilab was awarded the prestigious IEEE Milestone Award for the development of the Tevatron’s superconducting magnets.

Contact Us

The scientific discovery highlighted on this poster is just one of DOE’s many successes advancing America.

Learn more about available resources and partnering opportunities with the National Labs by visiting:

www.energy.gov/technologytransitions

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