Illinois Accelerator Research Center

Developing breakthroughs in accelerator science and translating them into applications for the nation's health, wealth and security.

Mission

The mission of the Illinois Accelerator Research Center, or IARC, is to partner with industry to translate technology developed at Fermilab to advance the next generation of accelerator-based technologies, products and applications to assist U.S. industry.

Application areas of accelerator technology

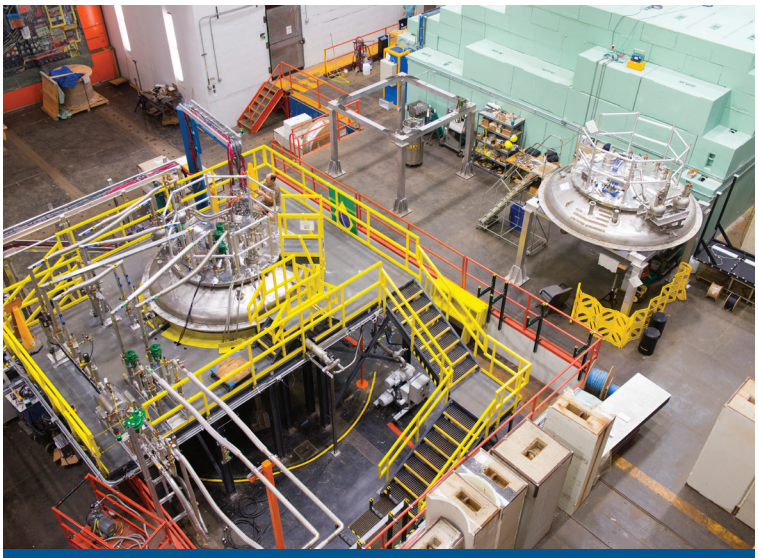
Accelerator technology has applications in:

- water and biosolids treatment
- cargo scanning
- material modification using electron beams
- medical sterilization (X-ray and electron beam)
- industrial electron-beam-driven chemistry
- advanced manufacturing
- environmental remediation
- food sterilization

Available infrastructure

At IARC's Office, Technical and Education Building, partners have access to 47,000 square feet of office and meeting space, including a state-of-the-art auditorium that accommodates 175 people. In addition, there is an experimental area in the adjacent Heavy Assembly Building that offers:

- 42,000 square feet of development and demonstration space
- 50-ton and 10-ton overhead cranes
- 600-watt, 4-Kelvin cryogenic refrigerator
- 1.5 megawatts of power
- Chilled water with 500 kilowatts of cooling capacity
- Radiation shielding



The Heavy Assembling Building at IARC offers our partners 42,000 square feet of experimental area with state-of-the-art infrastructure.

The Illinois Accelerator Research Center at Fermilab provides office space and offers a total of 89,000 square feet of space for industrial partners, with access to leading experts at the lab.

A brand new facility—A2D2

The new Accelerator Applications Development and Demonstration (A2D2) Facility is a test accelerator that accommodates proof-of-concept studies for research into new applications and validation of existing applications using electron beam technology. It is available for use by industry, universities and other federal laboratories.

Impact on Illinois universities

Regional universities, including the University of Chicago, University of Illinois, Illinois Institute of Technology, Northern Illinois University and Northwestern University, have active research programs at Fermilab.

By providing state-of-the-art facilities for visiting scientists, students and entrepreneurs, IARC will strengthen Fermilab's links to Illinois universities and industry and harness their creative energy to create new accelerator-technology-based applications and industries.

Technology development partnerships

With access to the largest population of accelerator experts in the world, IARC marshals strengths in accelerator-physics modeling and simulation, radiation effects in materials, and mobile platforms to deliver high-quality, application-specific beams.

IARC works with technology companies to address how advanced, high-performance, and high-power accelerators and components can solve industry's problems and provide competitive advantage. Contact us and let's together create the future of electron beam applications for your industry.

IARC is helping Illinois become a world leader in accelerator technology.

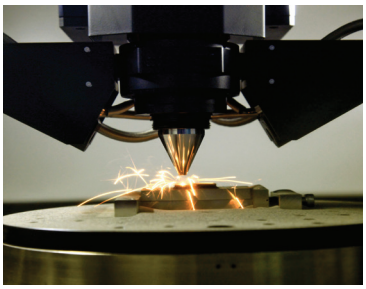
Strengthening our economy

Extending the life of paved surfaces

By cross-linking modified bitumen or other binders, mobile, vehicle-mounted electron accelerators could transform a newly constructed paved surface into a tough, long-lasting material, significantly extending the life of public roads and airport runways.

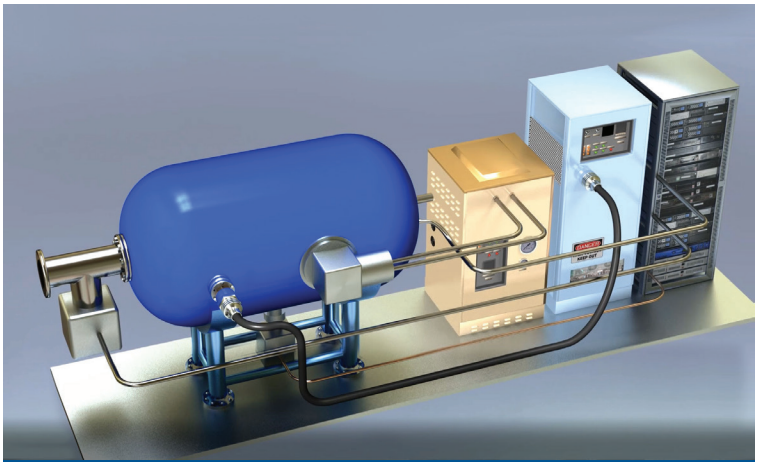
Enhancing additive manufacturing

A compact, portable, energy-efficient electron beam printer could transform the advanced manufacturing landscape in both civilian and defense applications by opening the door to new materials and methods.

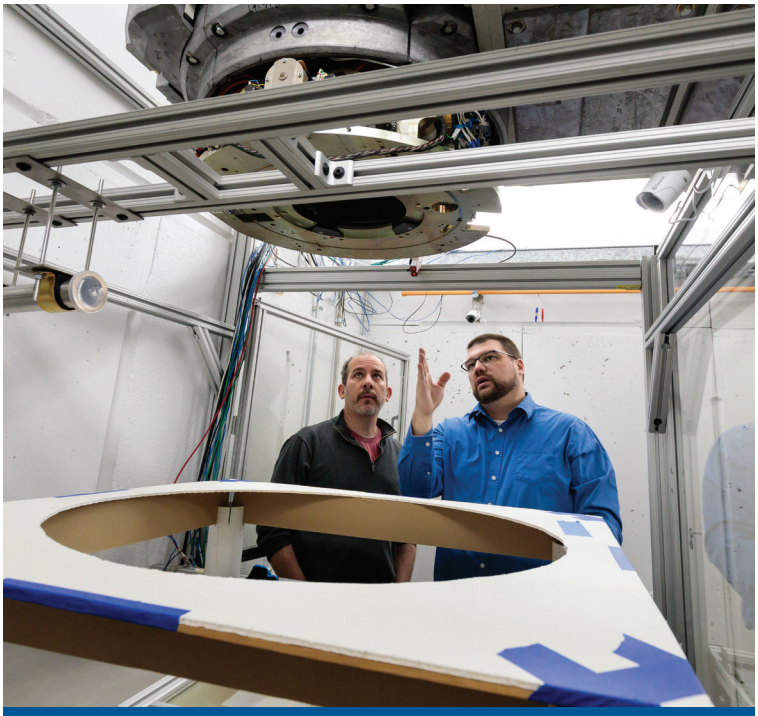


Improving coatings technology

High-power, portable machines could allow for greater use of solvent-free paint and coating materials in the field, from painting the lines on a highway to applying specialty coatings to the deck of an aircraft carrier, both reducing the time from application to use and improving the properties of the material itself.



The Compact SRF Accelerator is a portable, energy-efficient, high-power electron beam generator that combines several innovations in superconducting radio-frequency technology and accelerator science to make it suitable for industrial applications.



The Accelerator Applications Development and Demonstration (A2D2) Facility is a test platform that is currently accepting applications from industry to evaluate new ideas that require MeV electron beams or X-rays.

Protecting our citizens

Strengthening national security

Improved accelerator and detector technology can be used to detect threats, such as special nuclear materials in ship-borne cargo containers and at stand-off distances—before the materials enter U.S. ports.

Improving environmental quality

Reliable, cost-effective electron accelerators can be used to sterilize municipal sludge and wastewater while simultaneously destroying harmful pathogens, pharmaceuticals and organic contaminants.

Protecting human health

Electron beam processing is an effective means for eliminating bacteria from foods and hard surfaces and eradicating live insects from crops. A compact, mobile accelerator could be used to treat crops before they are even shipped.