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Illinois Accelerator Research Center

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Abstract

The Illinois Accelerator Research Center (IARC) hosts a new accelerator development program at Fermi National Accelerator Laboratory. IARC provides access to Fermi's state-of-the-art facilities and technologies for research, development and industrialization of particle accelerator technology. In addition to facilitating access to available existing Fermi infrastructure, the IARC Campus has a dedicated 36,000 ft² Heavy Assembly Building (HAB) with all the infrastructure needed to develop, commission and operate new accelerators. Connected to the HAB is a 47,000 ft² Office, Technology and Engineering (OTE) building, paid for by the state, that has office, meeting, and light technical space. The OTE building, which contains the Accelerator Physics Center, and nearby Accelerator and Technical divisions provide IARC collaborators with unique access to world class expertise in a wide array of accelerator technologies. At IARC scientists and engineers from Fermilab and academia work side by side with industrial partners to develop breakthroughs in accelerator science and translate them into applications for the nation's health, wealth and security.

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1. IARC – Concept

The creation of the Illinois Accelerator Research Center (IARC) was made possible through the combined efforts of the Fermi National Accelerator Laboratory (Fermilab), the US Department of Energy (DOE) – Office of Science, and the State of Illinois. Together they have created a space and an organization that can help transfer state-of-the-art accelerator technology from the science lab into the marketplace with greater efficiency and maximize the return on the investment of tax dollars.

1.1. Fermilab

Fermilab is the nation's accelerator laboratory for high energy physics. It's staff of 350 accelerator scientists and engineers plus 300 technical staff design, build, and operate high-energy, high-power accelerators that must operate reliably to support an ambitious discovery-physics program. With its proximity to Argonne National Laboratory, another national laboratory (less than 30 km away) with extensive accelerator expertise, the area has the highest concentration of accelerator experts in the world.

1.2. Stewardship

The creation of IARC was first proposed to Illinois' Department of Commerce and Economic Opportunity (DCEO) in 2007. Funding was received in 2011 and the DOE donated the Heavy Assembly Building (HAB) and provided for its refurbishment. During this interval, the Accelerators for America's Future workshop was held and the report produced. Soon after, in 2011, a concern was expressed by the Senate Energy and Water subcommittee [1]. In expressing their concern, the committee noted the length of time that it traditionally takes to translate breakthroughs in accelerator science and technology into applications with more direct benefits to society. One of the goals of IARC is to ease and quicken those translations. This requires moving beyond "Build accelerators and they will come," to looking for new applications for emerging accelerator technology and engaging and educating potential users.

2. IARC – Physical Description

The physical presence of IARC is a combination of new construction, for Office, Technology, and Engineering (OTE) and the repurposing of the Heavy Assembly Building (HAB) that formerly housed the construction and maintenance the 5000 ton CDF detector for Fermilab's Tevatron program. The HAB provides 36,000 ft² of industrial space to develop, commission and operate new accelerators. The OTE provides 47,000 ft² of office, meeting and light technical space. Some of the space in both buildings is available to strategic partners in instances where the unique facilities available at IARC are not available elsewhere. As seen in Figure 1, IARC is located very close to Fermilab's Technical Division which provides easy access to the lab's superconducting accelerator and magnet expertise.

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