



Quantum and SQMS

Fermilab and partners are working together to solve the challenges of quantum sciences and technology. This includes building a state-of-the-art quantum computer and research on coherence time (how long qubits can maintain their quantum state), entanglement (the phenomenon in which the quantum states of two or more qubits are correlated), and algorithms (the set of tasks for a quantum computer to solve a problem).



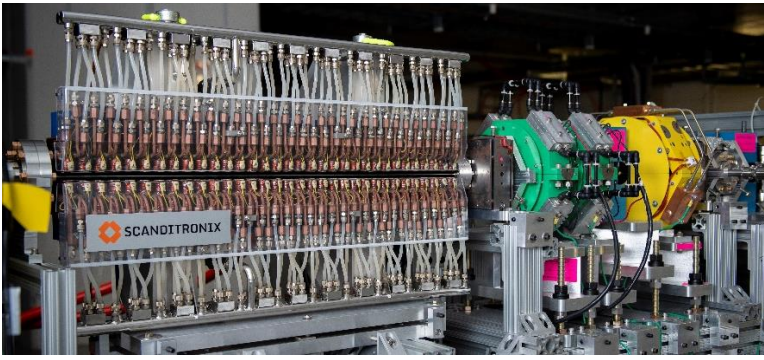
IARC and Technology Transfer

The mission of IARC is to advance technologies developed by Fermilab towards commercialization and, with industry partners, help create products and services that improve the health, wealth, and security of the nation. This 83,000 square foot, state-of-the-art building houses offices, technical and educational space to study cutting-edge accelerator technologies.



U.S. DEPARTMENT OF
ENERGY

Office of
Science

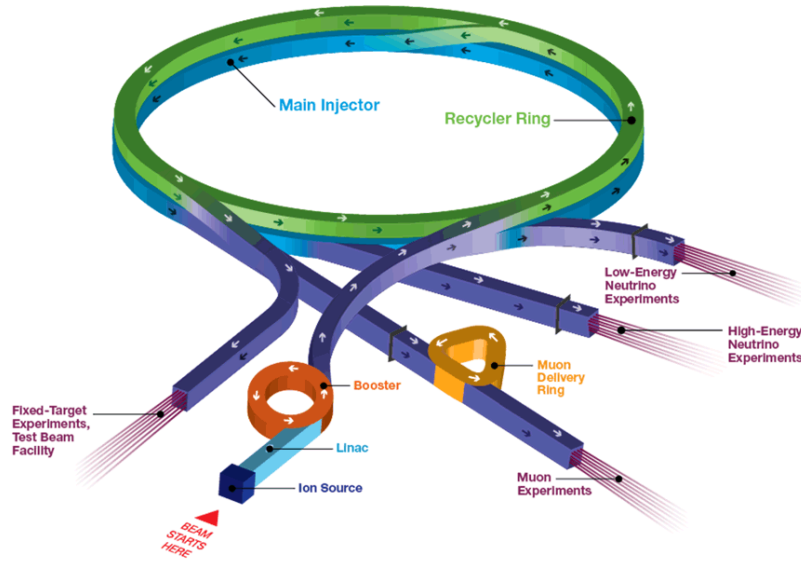


FAST/IOTA

The mission of the Fermilab Accelerator Science and Technology (FAST) facility is to develop a fully equipped accelerator chain intended to support R&D of accelerator technology for the next generation of particle accelerators. The primary focus of this effort is the Integrable Optics Test Accelerator (IOTA) ring.

User Facility – Accelerator Complex

Fermilab's particle accelerators help drive discovery in fundamental physics, innovations in accelerator science and advances in accelerator-based applications. Its main accelerator complex comprises four particle accelerators and storage rings — the Linac, Booster, Recycler and Main Injector — the last of which produces the world's most powerful high-energy neutrino beam and provides proton beams for various experiments and R&D programs. The accelerator complex will become even more powerful with the upcoming PIP-II project, an essential upgrade of the accelerator complex.



Computing

Strives to deliver timely, innovative computing solutions and services that enable Fermilab to achieve its scientific mission, efficiently execute the business of the laboratory and provide a modern user experience. The Information Technology Division (ITD) is the IT arm of the laboratory with the goal to deploy and support excellent and innovative cost-effective computing solutions and services. The Computational Science and AI Directorate (CSAID) provides software solutions and deploys and operates scientific computing facilities in support of the program.

Core Capabilities	Lead	FNAL
Accelerator and Detector Science and Technology	HEP (ARDAP, ASCR, BES, FES, NP)	✓
Advanced Computer Science, Visualization, and Data	ASCR (OE)	✓
Condensed Matter Physics and Materials Science	BES (FES, IRDP, EM)	✓
Large Scale User Facilities/Advanced Instrumentation	All programs	✓
Mechanical Design and Engineering	FECM (IRDP, EERE)	✓
Microelectronics	BES (ASCR, FES, HEP, NP, EERE, OE)	E
Particle Physics	HEP	✓
Plasma and Fusion Energy Science	FES (BES, EM)	E
Systems Engineering and Integration	NE (ARDAP, IRDP, EERE, EM, FECM, OE)	✓