ACCELERATOR SCIENCE SEMINAR

ACCELERATOR AND BEAM PHYSICS RESEARCH AT FERMILAB

Giulio Stancari,
Fermilab

Mon
May 15
3:30 PM

MCP 201
Michelson Center for Physics
933 E 56th Street

THE UNIVERSITY OF CHICAGO

The Fermilab Accelerator Science and Technology (FAST) facility at Fermilab is dedicated to research and education in beam physics. It comprises a photoinjector, a superconducting electron linac and a storage ring, the Integrable Optics Test Accelerator (IOTA). Recent results include the implementation of nonlinear integrable lattices and the suppression of resonances and instabilities; the demonstration of optical stochastic cooling, which uses a particle's radiation to finely control its dynamics; the observation of the motion of single electrons; and the measurement of the classical and quantum properties of undulator radiation. In the linac, experiments on high-efficiency gamma-ray sources and on noise in intense electron bunches are under way. The IOTA proton injector, currently under construction, will enable the program on space-charge-dominated beams. Some research areas under study are beam dynamics with electron lenses; the interplay between instabilities, space-charge, feedback systems and electron cooling; and crystalline ion beams. In this presentation, results and plans are highlighted, together with opportunities for collaboration.