

# ACCELERATOR SEMINAR

**Giulio Stancari**  
(Fermilab/Univ. Chicago)

**Thursday, April 18<sup>th</sup>, 2024 at 4:00 p.m.**

**Side room Lecture hall**  
(SB1.1.200)

**The seminar takes place exclusively in presence**

## **Beam Physics Research in IOTA/FAST at Fermilab**

### Description

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 and the interplay between instabilities, space-charge, feedback systems and electron cooling. In this presentation, results and plans are highlighted, together with opportunities for collaboration.



Coordinator: Claude Krantz, Janet Schmidt  
Secretary: Paola Lindenberg



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