Colloquium

Department of Physics

Superconductivity in Accelerator and Particle Physics

J.F. Zasadzinski

Paul and Suzi Schutt Endowed Chair of Physics
Illinois Institute of Technology
And
Materials Science Division, Argonne National Laboratory

Abstract

Superconductivity permeates the fields of Accelerator and Particle Physics, from the underlying devices responsible for acceleration, focusing and bending of particles, to the theoretical underpinnings of the Standard Model. An overview of these topics will be presented. The BCS theory of superconductivity explains the symmetry breaking of the vacuum of space responsible for the Higgs Field and the generation of rest mass for fermions and Goldstone bosons. Superfluids and superconductors form the core of neutron stars. The interior of hadrons has properties similar to that of type II superconductors. As for devices, a focus will be placed on superconducting RF cavities used for acceleration of charged particles. Recent advances at Fermilab have led to Nb based SRF cavities with record high quality factors, Q.

Monday, March 16, 2015 at 3:00pm
SERC, Room 110A
Refreshments served at 2:45pm