IUPUI Department of Physics Presents:

Dr. Giorgio Ambrosio  
Applied Scientist  
Fermi National Accelerator Laboratory

“A new generation of superconducting magnets for High Energy Physics at Hadron Colliders”

Thursday, March 10, 2016  
3:30p.m., LD 010  
402 N. Blackford Street

Refreshments at 3:00pm in the Physics Conference Room, LD 154B  
For additional information, call 317-274-6900

Abstract: Particle accelerators and colliders are powerful tools for investigating the smallest things human beings have ever observed, and allow scientists to recreate conditions very close to those of the Big Bang. Superconducting magnets are an enabling technology for high-energy hadron colliders.

The first part of this talk will provide an introduction to high-energy physics in hadron colliders, describing the relevant tools and experimental methods.

The second part will focus on the low-beta quadrupoles to be used for the high luminosity upgrade of the Large Hadron Collider at CERN. These quadrupole magnets introduce a new superconducting material, Nb₃Sn, which allows for higher magnetic fields than the most commonly-used material, NbTi. I will present some of the challenges stemming from the use of the Nb₃Sn conductor, and the solutions which have been developed.

At the end of the talk, we will see possible developments and applications of this technology in future hadron colliders.

**Physics colloquium is scheduled for 2015-16 academic year for every Thursday, 3:30p.m. in LD 010. Changes to the schedule will be posted at www.physics.iupui.edu.**