

# T<sub>C</sub>SUH/Physics Special Seminar

Texas Center for Superconductivity at the University of Houston

## Prof. Lucio Rossi

IEEE CSC Distinguished Lecturer on  
Superconductivity for 2013

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Monday, April 15, 2013

12:00 Noon – 1:00 P.M.

UH Houston Science Center, Room 102

## LHC and the Role of Superconductivity in the Hunt for the Higgs Boson

### ABSTRACT

The Large Hadron Collider (LHC) is the world's largest scientific instrument. Based on thousands of large superconducting magnets, it has allowed the recent discovery of the Higgs boson, a much-heralded cornerstone in our knowledge of the world. Further development in applied superconductivity is being pursued for the upgrading of the LHC, to allow the full exploitation of the accelerator. The talk will address these new advances and will discuss the next generation technology and the new horizons we expect to explore.

### BIOGRAPHY

**Lucio Rossi** received his Ph.D. in Physics from the University of Milan in 1980 with a thesis on plasma physics. He then carried out its research on applied superconductivity for particle accelerators in the Physics department of the University of Milan, becoming Professor of Experimental Physics in 1992. His main activities have been the design and construction of Superconducting Cyclotron (5 tesla, 40 MJ coils), now operating at the INFN-LNS in Catania, I; the design of the Al-stabilized thin SC (superconducting) solenoid of the ZEUS detector (HERA at Desy, Hamburg); the development in 1998 of record  $J_c$  Nb<sub>3</sub>Sn superconductors with Europa Metall; the construction of the first prototype of the LHC 9 T magnet dipole for CERN; and the development of the super-stabilized superconductor and the first 25 m long superconducting coils for the Barrel Toroid SC magnet of LHC experiment ATLAS.

In 2001 he joined CERN, where until June 2011 he led the Magnet, Superconductor and Cryostat Group for the LHC Project, (about 1700 large superconducting magnets operating in superfluid helium). The magnet system is the main part of the LHC (worth 1200 M€, more than 50% of the total LHC material budget), the most complex and technological advanced system. It is the largest enterprise in superconductivity ever attempted.

Since 2010 he has been the leader of the High Luminosity LHC, a project aimed at increasing by a factor of 10 the luminosity performance of the LHC above its nominal value. The project includes the development of 13 T high field SC magnets, special SC RF Cavities (crab cavities), high current (200 kA) SC links and also the R&D for 16-20 T class dipoles in view of the High Energy LHC.

He received the IEEE Council of Superconductivity Award for sustained contributions to Applied Superconductivity in August 2007, and has been selected as the 2013 IEEE-CSC Distinguished Lecturer for Superconductivity. He has authored 140+ publications in international journals and reviews. Active in public outreach, he is founding member (1985) of "Euresis", a Milan-based association for the promotion of scientific culture. He frequently gives talks to the general public and at cultural events on science and the relation between science, technology, certainty and truth.

*Persons with disabilities who require special accommodations in attending this lecture should call (713) 743-8213 as soon as possible.*