

**Title:** Design of Large Scale Superconducting Magnet system for Physics

**Lecturer:** Dr Arnaud Foussat


**Date and Times:** 15th May 2009 at 13:30 - CERN


**Summary of the proposed talk:**


The aim of the course is to focus on the warm and superconducting magnets for the HEP detectors, the Fusion superconducting large scale magnets and give some highlights on design of real magnet systems applications. At first, we will give a brief review of Superconductivity physics principles and material. What are the main steps in the magnetic design in superconducting magnet technologies. Starting from the experiments requirements for detector magnets, we will outline the main design features and issues for producing strong magnetic fields with superconductors. The lecture will then illustrate some real magnet application cases on HEP detector and Fusion reactors.


**Prerequisite knowledge:** Basic knowledge of Superconductivity, mechanics, magnet design, cryogenics and power electrical system.


**References:**

 Iwasa, Y. *Case Studies in Superconducting Magnets*. New York: Plenum, 1994. ISBN: 9780306448812.

 Wilson, M. N. *Superconducting Magnets*. New York: Oxford University Press, 1987. ISBN: 9780198548102.

 Thome, R. J., and J. M. Tarrh. *MHD and Fusion Magnets: Field and Force Design Concepts*. Hoboken: Wiley, 1982. ISBN: 9780471093176.

 Osamura, K., ed. *Composite Superconductors*. New York: Marcel Dekker, 1993. ISBN: 9780824791179.

 Montgomery, D. B. *Solenoid Magnet Design: The Magnetic and Mechanical Aspects of Resistive and Superconducting Systems*. Melbourne: Krieger, 1980. ISBN: 9780882759937.

## Biography-

**Brief CV:** Graduated from Applied Physics at National Institute of Applied Sciences in Toulouse (Fr). From 1991 to 1996 has studied Material science and Energy systems with applications to Nuclear Physics. From 1996, involved in industry development of High Pulsed Power technology devices (DGA) and NMR magnet design (Oxford Instruments - UK). Since 1999 at CERN, within the ATLAS Detector Magnet group (PH Department), participated in all design phases of ATLAS Toroidal magnets, in charge of the Construction of ATLAS Barrel Toroid superconducting magnet system. Currently, project engineer in ITER Magnet division on Fusion magnets focusing on Correction coils and ITER Central solenoid design phase and manufacture..