PAUL SCHERRER INSTITUT

Invitation

LMU-Seminar

Title: **MAGNETIC NANOPARTICLES**
Fundamental physics and a novel approach to the problem of cellular uptake

Speaker: **Tomas Orlando (Università degli Studi di Pavia, Italy)**

Time: **Friday, September 25th, 2015 at 09:30**

Place: **WBGB/019**

Abstract:

The research about magnetic nanoparticles for biomedical applications is nowadays very active. Among the magnetic materials, iron oxides, such as maghemite and magnetite, are the only ones which have been already approved by US Food and Drug Administration (FDA).

The possibility to dope the iron oxide magnetic core with different transition metal ions can boost the use of nanoparticles, allowing to obtain different magnetic properties. A complete and systematic study of the effect of metal doping on the basic physical properties was performed. In particular, the evolution of the magnetic anisotropy and the relaxometric properties as function of the Cobalt and Nickel doping were investigated.

Finally, some attention was devoted to the interaction between magnetic nanoparticles and biological systems as a starting point to arrive to biomedical stages. In particular, the evaluation of the degree of cellular uptake of such nanostructures is of great interest, being crucial for future in vivo applications. For this reason, a new and affordable method based on NMR relaxometry to establish the uptake degree was developed.