Davide Peddis

Associate professor

davide.peddis@unige.it
+39 010 3538705
+39 010 7767974

Education and training

2007

PhD in Chemistry

Università di Cagliari - Cagliari - IT

Academic experience

2018 - ONGOING

Professore Associato di Chimica Fisica

Università Di Genova - Genova - IT

Research interests

RESERACH ACTIVITY

Research activity of Davide Peddis (DP) has been developed in the framework of Solid State Physical-Chemistry and Condensed Matter Physics, studying the relationship between physical properties, crystalline structures and morphological features of nanostructured magnetic materials. DP's activity focuses on the design of magnetic nano –hetero-structures (nanoparticles, particles embedded in matrix, core shell structures, hollow nanoparticles, anisometric particles) and the study of their magnetic properties. Particular attention has been devoted to the investigation of fundamental properties of magnetic nanoparticles (static and dynamical properties) with particular interest in materials for applications in biomedicine (MRI, drug delivery, hyperthermia), catalysis, and energy field (permanent magnets, hydrogen production). Specific research topics are briefly outlined in the following:

Synthesis of nanostructured materials

An important part of DP's research activity is focused on the synthesis by chemical methods of magnetic nano–hetero-structures of metals (Fe, Co), metal alloys (FePt, CoFe) and metal oxides (Fe_2O_3, $CoFe_2O_4$, NiO, $LaCaMnO_4$; $BaFeO_3$). Since 2012 DP has been also involved in the deposition of magnetic thin films (CoFe; CoFe/NiO) by Pulsed Laser Deposition.

Magnetic Properties of nanostructured materials.

DP's activity is mainly devoted to the study of static and dynamical properties of magnetic nano-hetero-structures by AC/DC magnetization measurements and Mössbauer spectroscopy. Particular attention has been devoted to the influence of magnetic interactions on equilibrium and out-of-equilibrium dynamic of magnetization in nano-hetero-structure

materials (particles embedded in magnetic and non magnetic matrix; core shell systems).

Magnetic Structure at the nanoscale

Among the relevant features of the size reduction of magnetic particles, the presence of a non-collinear spin structure (spin canting) deserves special attention, as it determines relevant modifications in the magnetic properties. Hence, DP's research activity is also focused on the study of influence of spin canting and, more generally, of surface magnetism on the magnetic properties of the materials. The study of the correlation between spin canting, crystalline and magnetic structure has been also performed for ferrites with spinel structure by Mössbauer spectroscopy under intense magnetic and Neutron Powder Diffraction (NPD).

Interface Magnetism

antiferromagnetic materials (i.e. exchange bias) at the nanoscale (thin films, ferromagnetic particles embedded in antiferromagnetic matrix, core shell particles In the last years DP focused his attention on interface exchange coupling between Ferro(ferri)magnetic and.)