Mercoledì 4 Ottobre 2023
alle ore 16.30

presso AULA 2 dell'Edificio F
Area della Ricerca CNR di Firenze
Via Madonna del Piano 10, Sesto Fiorentino

Il Prof. Davide Peddis
Department of Chemistry and Industrial Chemistry & Genova INSTM RU, nM2-Lab, University of Genova, 16146 Genova,
Institute of Structure of Matter, National Research Council, nM2-Lab, Via Salaria km 29.300, Monterotondo Scalo 00015, Roma, Italy

terrà il seguente seminario:

" Design advanced magnetic nano-architecture "

Si invitano tutti gli interessati a partecipare.

Dr. Claudio Sangregorio
Direttore ICCOM

Short Abstract:

Magnetic Nanoparticles (MNPs) are unique complex objects whose physical properties differ greatly from their parent massive materials. In fact, the magnetic properties are particularly sensitive to the particle size, being determined by finite size effects on the core properties, related to the reduced number of spins cooperatively linked within the particle, and by surface effects, becoming more important as the particle size decreases. MNPs have generated much interest because of their possible applications in high density data storage, ferrofluid technology, catalysis, environmental technology, and biomedicine (e.g., drug delivery, contrast enhanced MRI). To synthetize magnetic nanoarchtiecture (MN) represent an additional tool to further tuning physical properties of MNPs, obtaining new multifunctional materials. MN consist in a magnetic core embedded in shell/matrix that may be composed of polymers, mesoporous structures (e.g., silica, zirconia, zeolites, metalorganic framework) or even molecules. Shell/matrix can have magnetic properties and in this case properties of MN rely even more strong on the interplay between those of the constituent components. When the individual components themselves, are complex systems belonging for examples to the family of correlated electron oxide with exotic physical properties, it becomes non-trivial and extremely fascinating to customize the properties of these bi-magnetic MN. Based on this framework, this talk will focus on the design of MN that means to control the matter at the nanoscale, correlating magnetic properties, micro- and meso-structure and molecular coating. Some recent results on synthesis of MN and their application in energy (e.g., permanent magnets, thermoelectricity), biomedicine, catalysis and other technological field will be discussed.

Biographic sketch

Davide Peddis (DP) graduated *magna cum laude* in Physical Chemistry (2003) and obtained his PhD in Physical Chemistry (2007) at the University of Cagliari. Since 2022 DP is Full Professor of Physical chemistry @ University of Genova and associate researcher at CNR-ISM. In the years 2007-2009 he worked as Research Fellow at University of Cagliari and at ISM – CNR. He was Senior Scientist at Vinca Institute, University of Belgrade between December 2015 and February 2017 where he was team leader of a group focused on synthesis and functionalization of magnetic nanoparticles for biomedical application. He has extensive experience in collaborations with international groups; among the others DP has been visiting professor at the Le Mans University; Extended Guest Lecturer at the Uppsala University and visiting scholar at the University of Delaware. Research activity of DP is 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 magnetic nano–hetero-structures (nanoparticles, particles embedded in matrix, core shell structures, hollow nanoparticles, anisometric particles). DP research activity is presented in over 170 peer reviewed papers (h-index/Cit.: 40/~5200- Google Scholar,) and 6 book chapter in the period 2006-2020. He was co-editor of a book titled "*New Trends of Nanoparticles Magnetism*" (Springer, 2021). DP over 250 communications, including invited (58 personally given) and oral presentations (25 personally given), to national / international conferences ad recognized scientific institution. DP has been co- supervisor of 5 master students, 7 PhD student, 8 post-docs, 5 researchers in formation and he was also appointed for three international PhD committee (February 2015, November 2017 Uppsala University, 2020, Basel University). Davide Peddis has been granted over 1.3 milion of euro to date, coming for national and EU project.