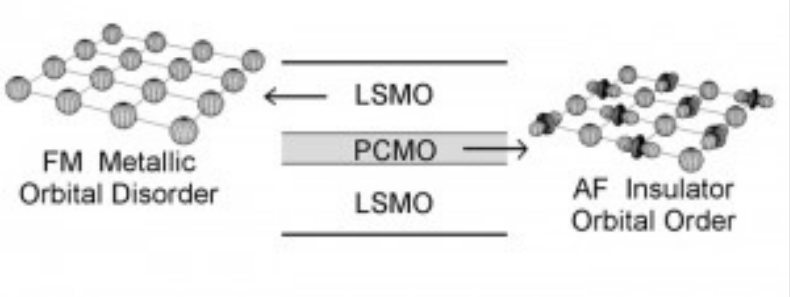
Anisotropic Magnetoresistance and the Nature of the Electronic Reconstruction in Oxide Heterostructures

Date: Friday, 17th January 2014.



Time: 12:00h
Place: Departamento de Física de la Materia Condensada, Facultad Ciencias, Módulo 3 , Aula de Seminarios (5ª Planta).
María José Calderón. (Instituto de Ciencia de Materiales de Madrid).
ABSTRACT:

The possibility of growing good quality oxide heterostructures has opened a vast field of research in which the electronic properties of strongly correlated systems may be modified on the nanoscale. In many occasions, the interface between two different oxides has properties different from the ones corresponding to the constituent layers in bulk. For instance, the interface between two insulating oxides (for instance, LaAlO3 and SrTiO3) can be metallic. New phases at interfaces have been observed in many different oxide multilayers. Different orders can arise due to the complexity of these materials in which the orbital degree of freedom, magnetism and lattice are strongly interdependent.
In this talk, I will present a joint theoretical-experimental effort to understand the properties of a multilayer formed by a metallic ferromagnetic manganite oxide (La0.7Sr0.3MnO3) and the insulating SrTiO3.
Magnetoresistance measurements as a function of the relative angle between the magnetic field and the interface plane have shown an unexpected in-plane peak. Calculations of resistivity in a model system including spin-orbit coupling reveal that the unexpected in-plane maximum is due to transport through a two-dimensional system formed at the manganite interface. The magnetoresistance measurements thus expose the character of the electronic reconstruction occurring in this multilayer.
More information on IFIMAC Website