

Department of Physics

Condensed Matter Physics

Clarendon Laboratory, Parks Road, Oxford OX1 3PU



CONDENSED MATTER SEMINAR

Thursday 24th of November at 2.15pm

“Universal mechanisms for electron paramagnetic resonance of individual atoms on a surface”

Dr. Joaquin Fernandez Rossier

International Iberian Nanotechnology Laboratory (INL), Braga, Portugal

I will discuss our proposal [1] for two universal mechanisms that make it possible to drive and probe, respectively, an individual atomic spin using a spin polarized STM.

We show that the combination of the slanting magnetic field created by the tip and the electrically driven mechanical oscillation of the surface spins results in an efficient way to electrically drive the surface spins. For probing, I will discuss the existence of zero bias charge current, pumped across the magnetic tip-surface junction on account of the atomic spin relaxation.

Based on density functional theory calculations, I will assess the relevance of the proposed mechanisms for an individual Fe atom on an MgO surface, the system used in recent experiments [2] on STM-electron spin resonance (STM-ESR).

[1] J. Lado, A. Ferron, F. Delgado, J. Fernández-Rossier, in preparation

[2] S. Baumann, W. Paul, T. Choi, CP Lutz, A. Ardavan, A. J. Heinrich et. al, Science 350, 417 (2015)

Host: Prof. Arzhang Ardavan

Audrey Wood Seminar Room, Clarendon Laboratory