

Colloquium
Dahlem Center for Complex Quantum Systems

Spin Polarization and Control in Nanostructures

Prof. Dr. Sergio Ulloa

Department of Physics and Astronomy and Nanoscale and Quantum Phenomena Institute, Ohio University, Athens, Ohio, USA
and
Dahlem Center for Complex Quantum Systems, FU Berlin

Time: Tuesday, June 25th 2013, 14:00 c.t.

Location: Hörsaal A (1.3.14)

Abstract:

Spin-orbit interactions (SOIs) result in interesting dynamical properties on electronic nanostructures. These systems, accessible experimentally on metallic surfaces, semiconducting heterostructures, and carbon nanotubes, allow the exploration of *measurable* quantities, such as current polarization [1]. This behavior provides powerful alternative tools for probing spintronic properties in different systems.

As an example of such behavior, this talk will discuss how SOIs modulate *magnetoelectric effects* at the atomic scale when considering adatoms on surfaces. Quantum corrals made with magnetic atoms allow one to control the spectral properties of quantum systems located inside, including *tunable* Kondo screening effects, and cloaking of vibrational modes [2].

[1] G. S. Diniz, A. Latge, and S. E. Ulloa, Phys. Rev. Lett. **108**, 126601 (2012).

[2] A. T. Ngo, J. Rodriguez-Laguna, S. E. Ulloa, and E. H. Kim, Nano Letters **12**, 13–16 (2012).