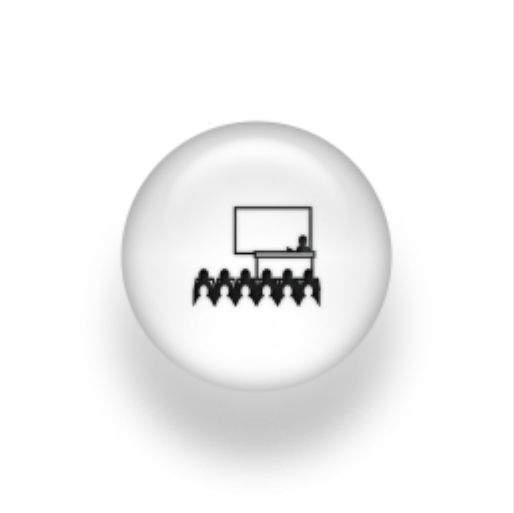
Single Molecule Junctions

Wednesday, 10 November 2010, 12:00-13.00



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ABSTRACT:
One of the most challenging aspects to reach ultimate miniaturization of electronic devices is the characterization of charge transport through individual molecules in contact with metallic electrodes. However, from an experimental point of view, it is very difficult to ensure that the junction consists of just a single molecule. I will present a new protocol for unambiguously isolating a single organic molecule on a metal surface and wiring it inside a nanojunction under ambient conditions[1]. I will also discuss the use of inelastic electron spectroscopy as an *in situ* characterization tool to explore the relation between molecular conformation and molecular conductance[2,3].
[1] E Leary, MT González, C van der Pol, MR Bryce,2 Salvatore Filippone, N Martín, G Rubio-Bollinger and N Agraït. “Unambiguous One-Molecule Conductance Measurements Under Ambient Conditions” (to be published).
[2] J Hihath, CR Arroyo, G Rubio-Bollinger,NJ Tao, N Agrait, “Study of electron-phonon interactions in a single molecule covalently connected to two electrodes”, Nano Letters 8, 1673-1678 (2008).
[3] CR Arroyo, T Frederiksen, G Rubio-Bollinger, M Vélez, A Arnau, Dl Sánchez-Portal, and N Agraït, “Characterization of single-molecule pentanedithiol junctions by inelastic electron tunneling spectroscopy and first-principles calculations”, Phys. Rev. B 81, 075405 (2010)