

Nanodevices: A Window to the Realm of Quantum Physics

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Host: Juana Moreno

3:30 PM Thursday, August 31

109 Nicholson Hall

• Refreshments served at 3:10 PM in 232 (Library) Nicholson Hall •

Quantum world is microscopic and we can deduce its laws mostly indirectly from measurements on bulk samples via macroscopic devices. Recent progress in experimental techniques allowed, however, for isolating nano-scale structures on which one can directly observe quantum-mechanical behavior of individual molecules or elementary particles. If nanodevices such as quantum dots or carbon nanotubes are attached to metallic and/or superconducting leads fundamental quantum phenomena can be demonstrated. In particular the Kondo effect, tunneling of the Cooper pairs and the interplay between electron correlations and superconductivity. We will present experimental realizations and theoretical description of Josephson junctions, clarify the behavior of the supercurrent through the dot and explain the role of the impurity bound states and Andreev reflections in the tunneling of the Cooper pairs

