DEPARTMENT OF PHYSICS AND ASTRONOMY

CONDENSED MATTER SEMINAR

Friday, October 28, 2016

3:30 PM, Physics, Room 203

(Refreshments 3:00 PM, Physics, Room 242)

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Experimental progress on Majoranas in semiconductors

Majoranas in semiconductor nanowires can be probed via various electrical measurements. Tunnel spectroscopy reveals zero-bias peaks in the differential conductance. These zero-bias peaks have a particular dependence on magnetic field (amplitude and direction) and electron density. This dependence allows to falsify many alternative theories for our observations. New challenges include quantum superpositions of Majorana states leading, for instance, to a 4pi current phase relation or a fractional Josephson effect. When the existence of Majoranas is firmly established, the next challenge is to build Majorana qubits. We discuss the different qubit schemes and report on our first building blocks.