Seminar/Talk

Microwave spectra of Andreev levels in nanowire Josephson junctions

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Host: Georgios Katsaros

Narrow gap semiconductors, such as InAs and InSb have recently become the most studied platform of Majorana zero modes and novel superconducting qubit architectures. The microscopic description of the superconducting proximity effect however requires the understanding of the Andreev bound state spectrum in these systems. Here we present our experimental work addressing the Andreev levels in Josephson junctions of InAs nanowires with aluminum epitaxial shells. In order to directly access the excited Andreev levels up to 90 GHz, bounded by the gap of aluminum, we utilize inelastic Cooper-pair tunneling in an on-chip coupled superconducting tunnel junction.
With this technique, we show the presence of gate-tunable Andreev levels in a ballistic semiconductor channel for the first time, and demonstrate how an external applied magnetic field influences the spectrum in the presence of strong spin-orbit coupling, relevant for parity-controlled investigations of Majorana bound states.

Friday, May 19, 2017 01:30pm - 02:30pm
Meeting room 2nd floor / Lab Bldg West (I21.02.132)

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