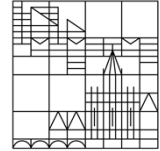


Physikalisches Kolloquium

Universität
Konstanz



Di 19.12.17
15:15 Uhr
14:45 Uhr, Kaffee/Tee
R 513



Prof. Dr. Takis Kontos
Laboratoire Pierre Aigrain,
Ecole Normale Supérieure,
Paris, France

Hybrid quantum circuits with carbon nanotubes

Carbon nanotubes are low dimensional conductors which can be used to implement various types of model systems. They can be used to investigate various aspects of mesoscopic circuits ranging from atomic like systems (i.e. quantum dots) to strongly correlated electron fluids. In the first part of my talk, I will present our recent work in which we combine superconducting contacts with a magnetic texture proximal to a carbon nanotube. We demonstrate a large synthetic spin orbit interaction which deeply modifies the induced superconducting correlations in the carbon nanotube. We also observe a zero bias conductance peak which is the hallmark of Majorana zero modes.

Recently, we have also demonstrated that nanotube based devices could be coupled to microwave cavities. These hybrid electron-photon architectures are interesting for quantum information processing but also to study fermion-boson problems relevant for condensed matter. I will show how we can use cavity photons to unravel the freezing of charge dynamics which accompanies the Kondo effect.

