



OPEN TALK, VASP - EVLP

27 November 2015

15:30 hrs.

Fermion

Speaker:

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(*Short Term visitor, VASP, EVLP*)

Topic:

Physics of Novel Superconductors: Multi-Band Materials

Abstract:

Discovery of a host of multi-band superconductors has created a new class of novel superconductors during the past decade. In many respect those are different from the conventional one-band BCS superconductors. Firstly the electronic bands are more complicated, particularly at the Fermi energy. This gives rise to multiple Fermi surfaces leading to different types of Cooper pairs. A particular aspect of interband pairing gives rise to novel features, such as interband Josephson effect, time reversed broken symmetry states and hidden critical states within the superconducting phase. In the context of new multi-band superconductors (e.g.; magnesium diboride, nickel boro-carbides and iron nictides), we discuss their superconducting properties both at the level of BCS and Ginzburg-Landau theories.

Finally based on the background of these theories, we shall address to a basic question of how superconductivity manifests at the nanoscale. We shall present some predictive properties of quantum confined nano-superconductive systems, which bear significance in recently experimentally realized single and multi-band materials.

The talk will be of pedagogic interest to researchers working in the realm of materials and nanoscience.
