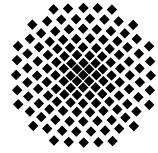


Stuttgarter Physikalisches Kolloquium

Max-Planck-Institut für Festkörperforschung
Max-Planck-Institut für Intelligente Systeme
Fachbereich Physik, Universität Stuttgart

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Dienstag, 26. Januar 2016

17.15 Uhr

Hörsaal 2 D5

Stuttgarter Max-Planck-Institute, Heisenbergstraße 1, 70569 Stuttgart-Büsnau

Charge order in HTS superconductors – key player or mere spectator ?

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Abstract

The mechanism of high temperature superconductivity remains largely mysterious. Efforts to understand this fascinating state of matter have recently focused on ordered electronic phases, especially charge density waves, observed in the precursor normal state. However, the role of these ordered phases – whether they contribute, compete or simply coexist with the superconducting phase – remains open. We shall discuss new scanning tunneling microscopy and spectroscopy studies of $\text{YBa}_2\text{Cu}_3\text{O}_7$ which provide novel insight on these issues. We shall in particular discuss local probe tunneling spectroscopy of vortex cores as a mean to disentangle phase coherent from non-superconducting contributions to the tunneling spectra. These studies show that the vacuum tunneling spectra of $\text{YBa}_2\text{Cu}_3\text{O}_7$ consist of a coherent and perfect d-wave channel – including the vortex core spectra – and an incoherent channel possibly related to a charge-ordered phase.