

T_CSUH Special Seminar

Texas Center for Superconductivity at the University of Houston



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Magnetotransport in Heavy Fermion Metals $CeMIn_5$ ($M = Co, Ir$): The Influence of Antiferromagnetic Fluctuations

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Room 102, University of Houston Science Center
12:00 noon - 1:00 p.m.

Abstract

Heavy fermion metals are often characterized by a variety of relevant energy scales and competing interactions which may result in such fascinating phenomena as quantum criticality and unconventional superconductivity. Therefore, these materials have advanced to suitable model systems by means of which electronic interactions can be studied in detail. This will be discussed for two classes of heavy fermion metals: First, results of detailed magneto-transport investigations on $YbRh_2Si_2$ will be described. In the second part, we present an overview of magnetotransport measurements on $CeCoIn_5$ and $CeIrIn_5$. Pressure-dependent Hall measurements on $CeCoIn_5$ exhibit a well developed feature that can unambiguously be related to spin fluctuations associated with the departure from Landau Fermi liquid behavior. Magnetotransport measurements on $CeIrIn_5$ indicate a precursor state to superconductivity. The relation of this precursor state to the so-called pseudogap in high- T_C cuprate superconductors will be discussed.

Bio

Steffen Wirth obtained his Ph.D. from the Technical University in Dresden, Germany. He conducted postdoctoral research at the Trinity College Dublin, Ireland, (1995 - 1996) and the Florida State University, Tallahassee (1996 - 2000) under the guidance of Prof. J.M.D. Coey and Prof. S. von Molnár, respectively, with emphasis on hard magnetic materials, nanometer-scale magnetic particles, manganites and half metals. Since 2000 he is a research staff member of the Max-Planck-Institute for Chemical Physics of Solids, Dresden, Germany. His research now focuses on heavy fermion metals and manganites investigated by magnetotransport and Scanning Tunneling Microscopy as well as on thin film fabrication.

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