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Strong-coupling Superconductivity and Structural Quantum Criticality in (Ca,Sr)3Rh4Sn13

By

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Date: 1 September 2016 (Thursday)
Time: 11:00a.m.
Venue: E12-G021

Abstract

In this talk, I will first give an overview of our effort in examining correlated electron systems under extreme conditions. After that, I will focus on a class of material with R3T4X13 stoichiometry, and describe our recent effort to identify a structural quantum critical point in superconducting (Ca,Sr)3Rh4Sn13 using chemical pressure and physical pressure. The phase diagram we constructed suggests an intricate interplay between superconductivity and structural order. Using heat capacity, we further unravel the strong coupling nature of the superconducting state when the structural transition temperature is suppressed to 0 K. This system thus provides a unique opportunity to investigate the interplay between superconductivity and structural instability.

2D semiconductor based nonlinear photonics, spectroscopy and relevant photonic devices.

Biography

Dr. Swee Kuan GOH received his Ph.D. at the University of Cambridge, United Kingdom in 2009. Before he joined the Department of Physics of the Chinese University of Hong Kong as an Assistant Professor, he had been working for the Kyoto University, Japan, as a Visiting Foreign Researcher (2011-2012), and as a Trinity College Research Fellow at the University of Cambridge, U.K. (2009-2010, 2012-2013).

His group studies a diverse range of SCES under extreme conditions. They are able to perform inductive measurements at pressures of the order of 100 kbar, which is large enough to significantly modify the structural, magnetic and transport properties of many SCES. In addition, they operate their own cryogen-free dilution refrigerator to cool the samples to millikelvin temperatures. Magnetic field up to 14 tesla can be applied routinely, offering an additional parameter for the investigation of SCES. Their high field, low temperature environment is beneficial for the measurements of quantum oscillations, such as the de Haas-van Alphen effect and Shubnikov-de Haas effect, allowing them to map the Fermi surfaces of the purest single crystals available.

All are Welcome!