Special seminar
Density of States and Tunneling Conductance of Fe-based Superconductors

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Venue: w563, Physics building, Peking University

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Abstract

A mystery in understanding cuprate superconductors is the inconsistency between the experimental data measured by scanning tunneling spectroscopy (STS) and angle-resolved photoemission spectroscopy (ARPES). In particular, prominent two side peaks observed in STS do not match the superconducting gap observed by ARPES. The same problem occurs in recently interesting Fe-based superconductors. In this seminar talk, I show that the mystery is resolved by discriminating between tunneling conductance and sample density of states in performing STS for correlated superconductors. I will discriminate the roles of band and M-band in Fe-based superconductors, and prove that the commonly observed two prominent side peaks in STS have a universal origin: They are formed by coherence-mediated tunneling under bias. The materials under consideration are cuprate Bi2212, pnictides LiFeAs and Ba_{1-x}K_xFe_2As_2, and single layer FeSe. My study is given by generalizing a theory which was previously applied to zero-dimensional quantum impurity systems to correlated superconductors.

About the Speaker

Jongbae Hong received the B.S. degree from Seoul National University in 1972, and the Ph.D degree from University of Georgia in 1982. From 1983 to 2011, he was a professor at Seoul National University. Currently, he is an invited research fellow at PCS-IBS. His research interests focus on Nonequilibrium Transport in Strongly Correlated Systems, which includes Cuprate and Fe-based Superconductors; Multi-layer Graphene; Quantum Dot Single-Electron Transistors; Quantum Point Contacts; Adsorbed