Title/Abstract Wei Ku

Normal and superconducting states of cuprates: an emergent Bose liquid?”

Besides the puzzling high-temperature superconductivity, cuprates also features numerous unusual normal-state properties. This talk will present a simple picture of an emergent Bose liquid (EBL) and demonstrate several non-Fermi liquid characteristics of EBL that seems to capture the essence of the normal and superconducting states of cuprates. These include: 1) bad metal behavior (linear resistivity beyond the Mott limit), 2) mid-infrared features in optical conductivity, 3) non-Fermi liquid scattering rate, 4) zero-temperature phase diagram, 5) diminishing superfluid stiffness at high doping, and 6) weak doping dependence of superconducting gap. The similarities in these highly unusual characteristics suggest strongly that cuprates are a prototype of EBL, and EBL might often take place in strongly correlated materials that complements the standard textbook Fermi liquid in condensed matter systems.