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Quasiparticles, Fermi surface topology and Phase transitions in Na_xCoO_2[1]

M. ZAHID HASAN, Dept. of Physics, Princeton University, Princeton, NJ

Recently discovered triangular cobaltate class is a novel realization of doped Mott insulators on a triangular spin- lattice. This system exhibits superconductivity, spin-density- waves, charge-order, metal-insulator phase transitions and colossal thermopower as well as Mott and Band insulation. We employ state-of-the-art ARPES to uncover the nature of electron motion in the cobaltates over the phase diagram. Quasiparticle dynamics (Fermi velocity, bandwidth, FS topology, correlation parameters, quasiparticle coherence) we extract from the data provides valueable insights into the novel phases of matter realized on this first realization of a triangular lattice Mott system. Low-T metal-insulator (order-disorder) phase transition will be discussed in this presentation.

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