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Ferromagnetism, paramagnetism and a Curie-Weiss metal in NaxCoO2 JAIME MERINO, Universidad Autónoma de Madrid, BEN POWELL, ROSS MCKENZIE, University of Queensland — Motivated by the unconventional properties and rich phase diagram of Na_xCoO_2 we consider the electronic and magnetic properties of a two-dimensional Hubbard model on an isotropic triangular lattice doped with electrons away from half-filling. Dynamical mean-field theory (DMFT) calculations predict that for negative inter-site hopping amplitudes ($t < 0$) and an on-site Coulomb repulsion, U, comparable to the bandwidth, the system displays properties typical of a weakly correlated metal. In contrast, for $t > 0$ a large enhancement of the effective mass, itinerant ferromagnetism and a metallic phase with a Curie-Weiss magnetic susceptibility are found in a broad electron doping range. The transport and magnetic properties measured in Na_xCoO_2 are consistent with DMFT predictions of a metal close to the Mott insulator and we discuss the role of Na ordering in driving the system towards the Mott transition. We propose that the Curie-Weiss metal phase observed in Na_xCoO_2 is a consequence of the crossover from "bad metal" with incoherent quasiparticles at temperatures T>T* and Fermi liquid behavior with enhanced parameters below T*, where T* is a low energy coherence scale induced by strong local Coulomb electron correlations. Our analysis shows that the one band Hubbard model on a triangular lattice is not enough to describe the unusual properties of Na_xCoO_2.

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