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Statistical fluxes and the sodium cobaltate Curie-Weiss metal KAI WU, ZHENG-YU WENG, Institute for Advanced Study, Tsinghua University, JAN ZAANEN, Instituut Lorentz for Theoretical Physics, Leiden University — A central pursuit in the study of quantum matter is whether non Fermi liquid states exist, as invoked in trying to explain e.g. high-T_c superconductivity. A quite different context is the search for thermodynamic materials in energy applications, which require at the same time a very large thermopower and a low resistivity. Here we predict a new state of matter that descends from a strongly interacting microscopy described by a t-J model on a triangular lattice. Due to the altered role of quantum statistics the spins are "localized" in statistical Landau orbits, while the charge carriers form a Bose metal that feels the spins through random gauge fields. In contrast to the Fermi-liquid state, this state naturally exhibits a Curie-Weiss susceptibility, large thermopower, and linear-temperature resistivity, explaining the physics of Na_xCoO_2 at $x > 0.5$. A "smoking gun" prediction for neutron scattering is presented.

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