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Electron transport in magnetite nanoparticles SUNGBAE LEE, Physics and Astronomy, Rice University, JOHN T. MAYO, VIKKI L. COLVIN, Chemistry, Rice University, DOUGLAS NATELSON, Physics and Astronomy, Rice University — Magnetite (Fe_3O_4) is an example of a strongly correlated, mixed valence oxide. Electron transport through small numbers of monodisperse magnetite nanocrystals (20nm in diameter) is measured on nanometer-scale three-terminal devices where nanoparticles are decorated on lithographically defined platinum electrodes. The abrupt development of discontinuities on IV curves around 120K and below strongly suggests the particles are going through the Verwey transition. Initial measurements of the full range of IV characteristics and magnetoresistive behaviors of these devices are presented.

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