

Abstract Submitted
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First-order metal-insulator transitions in manganites: Are they universal?¹ KENNETH GRAY, QING'AN LI, STINE KLAUSEN, HONG ZHENG, STEPHAN ROSENKRANZ, RAY OSBORN, JOHN MITCHELL, Argonne National Laboratory — Conductivity data for $\text{La}_{2-2x}\text{Sr}_{1+2x}\text{Mn}_2\text{O}_7$ ($x=0.6$) show a first-order transition from an orbital/charge-ordered insulator to a metal as the temperature falls below ~ 160 K. The change in conductivity of ~ 10000 is 100 times larger than that seen previously in any single-phase manganite in zero field. The metallic low-temperature state is similar to that found at $x=0.58$, but $x=0.58$ shows no evidence of orbital/charge order. This result, and further analysis, supports a conclusion that strongly coupled magnetic/conductive transitions are universally of first order.

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Kenneth Gray
Argonne National Laboratory

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