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Quantum criticality in $CeRh_{0.58}Ir_{0.42}In_5$: Kondo-breakdown and spin-density critical points YONGKANG LUO, Los Alamos Natl Lab, USA, XIN LU, Zhejiang University, China, A. P. DIOGUARDI, P. F. S. ROSA, E. D. BAUER, Los Alamos Natl Lab, USA, QIMIAO SI, Rice University, USA, J. D. THOMPSON, Los Alamos Natl Lab, USA — An appropriate description of the state of matter that appears as a second order quantum phase transition, *viz.* quantum-critical point (QCP), poses fundamental and still not fully answered questions for both conventional and unconventional QCPs. Experiments are needed both to test their basic conclusions and to guide their further refinement. Here, charge and entropy transport properties of the heavy-fermion compound $CeRh_{0.58}Ir_{0.42}In_5$ measured as a function of pressure, reveal two qualitatively different QCPs in a single material driven by only a non-symmetry-breaking tuning parameter. A discontinuous jump in thermopower signals an unconventional QCP at p_{c1} accompanied with an abrupt Fermi-surface reconstruction that is followed by a conventional spin-density-wave critical point at p_{c2} across which the Fermi surface evolves smoothly. Such a sequence of critical points is anticipated by theoretical predictions for a global phase diagram of heavy-fermion materials. References: [1] Y. Luo *et al.*, arXiv: 1606.07848 (2016).

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