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Phase Diagram Of UGe_2: The Magnetic Transition within the Ferromagnetic Phase and the Superconducting Transition; the Effect of Magnetic Field on the Ambient-Pressure Ferromagnetic Phase N.E. PHILLIPS, F. BOUQUET, R.A. FISHER, F. HARDY, N. OESCHLER, LBNL and University of California, Berkekey, CA, J.C. LASHLEY, LANL, Los Alamos, NM, J. FLOUQUET, A. HUXLEY, DRFMC, SPSMS, CEA, Grenoble, France — Superconductivity in UGe_2 occurs near 1.2 GPa at the 0-K termination of the phase boundary (T_x, P_x) of a magnetic transition that occurs within the ferromagnetic phase. Ambient-pressure specific-heat measurements show a hysteretic transition at $T_x(0) \sim 22$ K, reminiscent of the CDW/SDW transition in α-U, and consistent with the suggestion that the transition in UGe_2 is also a CDW/SDW transition. The magnetic field dependence of the specific heat, at ambient pressure, demonstrates the presence of structure in the electron density of states and an unusual nature of the ferromagnetic ordering at the Curie temperature. Specific-heat measurements to 1.8 GPa give an estimate of the latent heat of the transition and determine the phase boundary for $1 \leq T \leq 11$ K. Contrary to expectations, the onset temperature of the superconducting transition is independent of pressure in the region in which it was observed, $1.08 \leq P \leq 1.35$ GPa.

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