

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Evolution of the magnetic and superconducting states in UCoGe with Fe and Ni substitution¹ J. J. HAMLIN, N. KANCHANAVATEE, K. HUANG, R. E. BAUMBACH, D. A. ZOCCO, L. SHU, M. JANOSCHEK, M. B. MAPLE, University of California, San Diego — Recently, UCoGe has emerged as a new member of the class of materials exhibiting coexistence of ferromagnetism and superconductivity (Curie temperature $T_{Curie} = 3$ K; superconducting critical temperature $T_c = 0.8$ K). This compound has generated much excitement in part because it has been proposed that the superconductivity derives from spin triplet pairing mediated by critical fluctuations of the magnetic order parameter. Thus, a key question is how changes in the magnetic state of UCoGe affect the superconducting properties. We have carried out a comprehensive study of the $UCo_{1-x}Fe_xGe$ and $UCo_{1-x}Ni_xGe$ series of compounds across the entire range of composition $0 \leq x \leq 1$. In this talk, we report the results of x-ray diffraction, electrical resistivity, and magnetization measurements to elucidate the magnetic and superconducting phase diagram of the U[Fe, Co, Ni]Ge system.

¹Sample synthesis and characterization was sponsored by the U.S. Department of Energy under grant #DE-FG02-04ER46105. Low temperature measurements were supported by the National Science Foundation under grant #DMR0802478.

J. J. Hamlin
University of California, San Diego

Date submitted: 19 Nov 2009

Electronic form version 1.4