

Coexisting Superconductivity and Magnetism in UCoGe

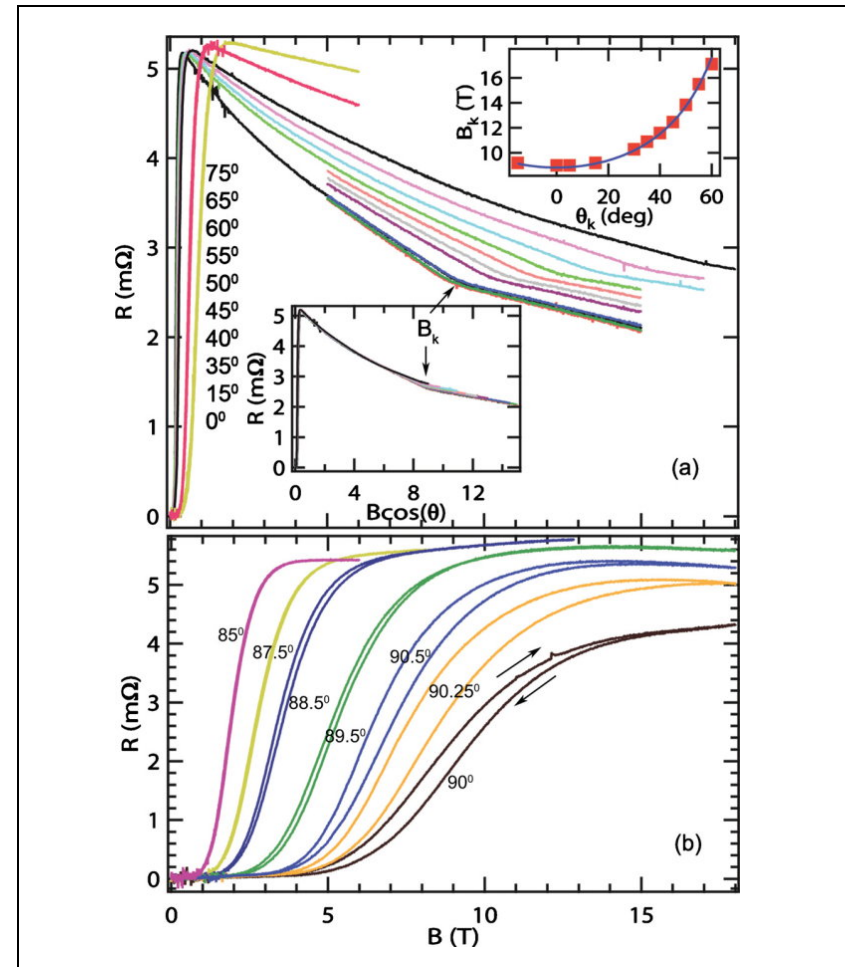
Gregory S. Boebinger, National High Magnetic Field Laboratory
DMR-Award 0654118
DC Field Facility



Current interest in uranium-based materials has focused on the coexistence of superconductivity and ferromagnetism, including UGe₂, URhGe, and UCoGe. In these materials, superconductivity develops below the ferromagnetic Curie temperature T_C without destroying magnetic order.

There is evidence that unconventional superconductivity is magnetically-induced and involves spin-triplet pairing.

The figure shows the magnetic field dependence of the resistance in UCoGe at 40mK for field directions tilted from the c-axis to the ab-plane. The insets highlight the scaling of the magneto-resistance and the B_k anomaly with the angle.



E. Steven, A. Kiswandhi, D. Krstovska, J. S. Brooks, M. Almeida, A. P. Gonçalves, M. S. Henriques, G. M. Luke, T. J. Williams Appl. Phys. Lett. **98**, 132507 (2011)



Properties of the superconducting ferromagnet UCoGe

Gregory S. Boebinger, National High Magnetic Field Laboratory
DMR-Award 0654118
DC Field Facility



This work involved a far-reaching and international collaboration. Measurements were performed at the Magnet Lab's DC Field Facility, samples were fabricated and characterized at McMaster University in Canada and theoretical input came from researchers at ITeN/CFMCUL in Portugal. The effort was led by Dr. Danica Krstovska, a visiting scientist at the Magnet Lab funded by a State Department Fulbright Fellowship.

Dr. Danica Krstovska

E. Steven, A. Kiswandhi, D. Krstovska, J. S. Brooks, M. Almeida, A. P. Gonçalves, M. S. Henriques, G. M. Luke, T. J. Williams, *Appl. Phys. Lett.* **98**, 132507 (2011)