



PAUL SCHERRER INSTITUT

PHOTON SCIENCE - SEMINAR

Quantum matter and mesoscopic effects in a common old metal

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COFFEE: 11:00 h
SEMINAR: 11:15 h
PLACE: WBGB/019

Abstract

Chromium is a simple metal and quintessential spin-density wave antiferromagnet with a readily accessible (through alloying) quantum critical point. The inverse Hall number collapses on entering the antiferromagnetic state because the Fermi surface is reduced as some of the carriers are localized to produce the magnetic order [1]. By growing extremely high quality Cr films we observe mesoscopic effects associated with the spin-density wave, namely quantization of spin-density waves [2]. If time permits, magnetoresistance measurements of chromium showing striking similarity with the strange metal phase of cuprates will also be discussed.

References

- [1] "Quantum phase transition in a common metal", A. Yeh, Yeong-Ah Soh, J. Brooke, G. Aeppli, T. F. Rosenbaum, and S. M. Hayden, *Nature (London)* 419, 459 (2002).
- [2] "Electrical effects of spin density wave quantization and magnetic domain walls in chromium", Ravi K. Kummamuru and Yeong-Ah Soh, *Nature* 452, 859 – 863 (2008).

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