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## Low-lying magnetism in heavy-fermion $\text{CeRh}_2\text{Sn}_2$

Wednesday, 13 July 2011 17:00 (2 hours)

The existence of the ternary intermetallic compound  $\text{CeRh}_2\text{Sn}_2$  has been known since the crystallographic report of Selsane et al on the  $\text{CeM}_2\text{Sn}_2$  family of compounds in which M is a d-electron element. The crystal structure is well ordered and the sole magnetic species, Ce, occupies a unique symmetry site in the unit cell. Subsequent studies into these compounds revealed a general trend of magnetic ordering at very low temperatures.  $\text{CeRh}_2\text{Sn}_2$  was found to order antiferromagnetic through a peculiar smeared out transition around  $T_N = 0.4$  K. Most significantly though was the giant electronic specific heat witnessed in the Sommerfeld coefficient  $C_p(T)/T$  which was found to develop in this compound even well above the magnetic ordering temperature. The behaviour of this system was explained in the framework of a heavy-electron quasiparticle state forming out of the many-body Kondo interaction between localized magnetic moments of Ce ions and the conduction electrons. This results in an exceedingly high electronic density of states at the Fermi energy EF. In this work we present a detailed study of specific heat, magnetic susceptibility, and electrical resistivity of  $\text{CeRh}_2\text{Sn}_2$  in order to map the field stability of salient cooperative effects. The magnetic ordering is found to be unstable to fields beyond about 0.5 T. At the same time, applied magnetic fields displace the huge 4f-electron entropy towards higher temperatures. Further evidence for the importance of the Kondo effect in  $\text{CeRh}_2\text{Sn}_2$  will be discussed.

**Level (Hons, MSc,   
 &nbsp; PhD, other)?**

other

**Consider for a student   
 &nbsp; award (Yes / No)?**

No

**Would you like to   
 submit a short paper   
 for the Conference   
 Proceedings (Yes / No)?**

Yes

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**Session Classification:** Poster1

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