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Low-lying magnetism in heavy-fermion CeRh_2Sn_2

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The existence of the ternary intermetallic compound CeRh_2Sn_2 has been known since the crystallographic report of Selsane et al on the CeM_2Sn_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. CeRh_2Sn_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 CeRh_2Sn_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 CeRh_2Sn_2 will be discussed.

**Level (Hons, MSc,
 PhD, other)?**

other

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

No

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

Yes

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