Spin Disordered States of the frustrated magnets $NiGa_2S_4$ and $Pr_2Ir_2O_7$

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We first present the novel spin disordered states found in $NiGa_2S_4$, a rare example of 2D triangular lattice antiferromagnets. Despite antiferromagnetic (AF) interactions (80 K), no long-range AF order has been observed down to 0.35 K. We instead find nano-scale quasi-static correlation between S = 1 spins that develops below 10 K. Double peak formation of the specific heat on cooling (Fig.1) and its low-T T^2 dependence suggests that coherent propagation of the gapless mode in the low temperature spin liquid or frozen state. Then, we briefly introduce the pyrochlore type Kondo lattice $Pr_2Ir_2O_7$ that exhibits a metallic spin liquid behavior. In the spin-liquid-like regime below 2 K, we observed the logarithmically diverging Hall conductivity, which comes from the frustrated non-coplanar spin configuration.

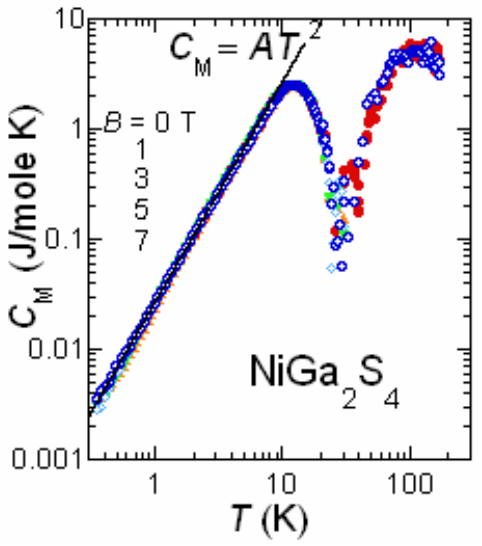

Fig. 1 Magnetic specific heat of $NiGa_2S_4$