

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Ce<sub>2</sub>Pt<sub>2</sub>Pb : Frustrated heavy fermion system with the Shastry-Sutherland lattice** MOO SUNG KIM, Brookhaven National Laboratory, MEIGAN ARONSON, Brookhaven National Laboratory, Stony Brook University — We have synthesized single crystals of Ce<sub>2</sub>Pt<sub>2</sub>Pb which has the Shastry-Sutherland lattice network of Ce-ions on the crystallographic c-plane, that can induce magnetic frustration. The specific heat, magnetic susceptibility, and resistivity were measured for as-grown crystals. Above 30 K, Curie-Weiss behavior is found in the magnetic susceptibility, with a Ce moment of 2.33  $\mu_B$ /Ce and a Weiss temperature of -15 K, indicating antiferromagnetic interactions among the Ce<sup>3+</sup> ions. The magnetic specific heat rises from a minimum at 15 K to a broad maximum at 2 K, before falling to a heavy fermion value of  $\sim 0.8$  J/Ce-molK<sup>2</sup> at the lowest temperature. The entropy reaches only  $1/2R\ln 2$  at the maximum in the specific heat, and the full doublet ground state  $R\ln 2$  is only recovered at 15 K. Ce<sub>2</sub>Pt<sub>2</sub>Pb is an unusual material, in which a heavy fermion liquid with short range antiferromagnetic order emerges from a strongly frustrated and fluctuating paramagnetic state.

Moo Sung Kim  
Brookhaven National Laboratory

Date submitted: 21 Nov 2008

Electronic form version 1.4