Abstract Submitted
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Giant Antiferromagnetically-Coupled Moments in a Diruthenium Molecule-Based Magnet with Interpenetrating Sublattices*[1] RANDY FISHMAN, SATOSHI OKAMOTO, Oak Ridge National Laboratory, WILLIAM SHUM, JOEL MILLER, University of Utah — The molecule-based magnet $[Ru_2(O_2CMe)_4]_3[Cr(CN)_6]$ contains two interpenetrating cubic sublattices. Each sublattice is magnetically frustrated by the easy-plane anisotropy of the spin-3/2 diruthenium paddlewheel complexes, which are antiferromagnetically coupled to spin-3/2 Cr ions at the cube corners. Consequently, each cubic sublattice has a non-collinear spin state with net moment along one of the cubic diagonals. The moments of the two interpenetrating sublattices behave like giant moments that are antiferromagnetically coupled at small fields and become aligned above a critical field of about 1000 Oe $\sim K_c/\mu_B$,where $K_c \sim 2 \times 10^{-3}$meV is the weak coupling between sublattices. Due to the small critical field, the magnetic correlation length can be directly estimated from the field and temperature dependence of the magnetization while a polycrystalline sample undergoes the metamagnetic transition. *R.S. Fishman, S. Okamoto, W.W. Shum, and J.S. Miller, *Physical Review B* **80**, 064401 (2009).

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