Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Exploring Magnetic Interactions of an Mo_3O_{13} Trimer Containing Compound: $La_5Mo_6O_{21}$ WILLIAM PHELAN, The Johns Hopkins University, RACHEL BEAL, Northwestern University, JAMES NEILSON, JOHN SHECKELTON, PATRICK COTTINGHAM, The Johns Hopkins University, ANNA LLOBET, Los Alamos National Laboratory, TYREL MCQUEEN, The Johns Hopkins University — When searching for exotic magnetic ground states, it is often useful to seek out materials with certain geometric networks such as: triangular, kagome, and even square lattices with uniform magnetic exchange. Recently, the formation of a condensed valence bond state was proposed to explain the physical properties of $LiZn_2Mo_3O_8$. This low-temperature ground state emanates from the interactions of one unpaired electron residing on the Mo_3O_{13} magnetic subunits. Thus, compounds containing related Mo_3O_{13} subunits may prove to be a fertile playground for the study of magnetic interactions between these molecule-like clusters. Earlier structural reports of $La_5Mo_6O_{21}$ showed that this compound was built from these subunits, as well as, 1-D "double lambda" perovskite-like MoO_6 octahedra. The Mo atoms residing on the Mo_3O_{13} trimers and the double lambda units have oxidation states of 4+ and 5+, respectively. Consequently, the magnetic response and entropy loss ca. 10 K are likely due to the magnetic interactions between the double lambda units and not the Mo_3O_{13} trimers. In this presentation, the analysis of the total neutron scattering of $La_5Mo_6O_{21}$ will be used to draw correlations between the structure and the properties.

William Phelan
The Johns Hopkins University

Date submitted: 20 Dec 2012 Electronic form version 1.4