

CORE-CM SEMINAR
Michigan State University — Department of Chemistry

Professor Jeffrey Long
Department of Chemistry, University of California, Berkeley
Materials Sciences Division, Lawrence Berkeley National Laboratory

**New Single-Molecule Magnets with High Blocking
Temperatures**

A number of strategies are being pursued for the synthesis of new single-molecule magnets exhibiting high blocking temperatures. Mononuclear transition metal complexes with a low coordination number and appropriate electron configuration can exhibit large orbital contributions to the magnetism, resulting in effective spin relaxation barriers as high as 226 cm^{-1} . The unquenched orbital angular momentum innate to the electronic structures of lanthanide ions such as Tb^{3+} , Dy^{3+} , and Er^{3+} , enable the design of large relaxation barriers in mononuclear complexes through matching of the ligand field to the M_J level shape anisotropy. Further, the use of radical bridging ligands such as N_2^{3-} and $[2,2'\text{-bipyrimidine}]^-$ can lead to strong magnetic exchange coupling with lanthanide ions, suppressing quantum tunneling processes and resulting in molecules that display magnetic hysteresis up to a record of 14 K. Some new actinide-based single-molecule magnets and the prospects for achieving large relaxation barriers in such species will also be discussed.

Thursday, November 20, 2014
12:00 NOON
Room 1400 – Biomedical & Physical Sciences
Professor James McCusker – Host

Accommodations for persons with disabilities may be requested by calling the Chemistry Department at (517) 355-9715, X191 two days prior to the event to ensure sufficient time to make arrangements. Requests received after this date will be met when possible.