

# Exploring the Synthesis and Characterization of Hetero- and Homometallic Clusters

## Seminar

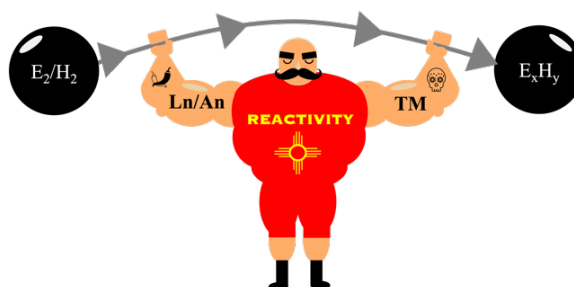
Monday  
Feb. 2, 2026

3:00 – 4:00 p.m.

Beaupre Center,  
Room 105



Understanding how metals communicate is critical for a fundamental understanding of the elements, as well as pioneering new materials and catalysts. The use of metal clusters also enables the in-depth study of the reduction-oxidation chemistry of these metals. Here, we focus on the electronic structure and reactivity of hetero- and homometallic non-aqueous clusters featuring *f*-elements. Through the reaction of a piano stool ( $C_5Me_5$ )MR<sub>3</sub> (M = U, Ti; R = Me, Bn) metal complex with a protic main group substrate based on N, O, or S, clusters with nuclearities ranging from three to six are isolated. Ti-*f* (*f* = U, Ce, Nd) clusters are built through further reactivity followed by reduction. With these results in hand, the spectroscopic, bonding, and reduction-oxidation properties will be further defined. Future efforts will focus on the magnetic properties, as well as small molecule activation. These studies may also uncover new opportunities in multi-electron reduction processes mediated by the *f*-elements.



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