



Inorganic Chemistry Seminar Series

Tuesday, October 3, 2017, 12:30 pm
Seaver Science Library, Room 150

SSC Auditorium next to the library

Professor Paul Chirik

Department of Chemistry

Princeton University

Catalysis with Earth Abundant Transition Metals

Abstract:

Transition metal catalysis has revolutionized modern society by enabling new chemical transformations with unprecedented activity and control over selectivity. Applications range from new silicone materials, to building blocks for pharmaceuticals, to transforming hydrocarbons into fuels. Our laboratory is actively developing catalysts based on earth abundant elements rather than more traditionally deployed precious metals. Potential benefits include lower costs, reduced carbon dioxide production and stability of supply chains. Ultimately, we aim to discover new reactivity that exploits the unique electronic structures of first row transition metals. My lecture will combine applications developed in combination with industrial collaborators and focus on the multifaceted challenges of transitioning from the academic laboratory to processes used on scale. Earth abundant catalysts have been developed for commercial silicone production, asymmetric alkene hydrogenation, C-H functionalization and radiolabeling of pharmaceuticals. Through continued ligand evolution and understanding of electronic structure, we have discovered base metal catalysts that promote chemistry that is unknown using established precious metal variants. The mechanisms of the various catalytic transformations, the importance of electronic structure controlled through ligand manipulation and strategies for imparting air stability will be highlighted throughout.

Hosted by professors Smaranda Marinescu and Travis Williams

The scientific community is invited

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