**Complexity from Commodity: Development of Methods for Catalytic Alkene Functionalization**

The discovery and development of small organic molecules as new medicines is one of the most important objectives in modern biomedical research. Central to fueling the pipeline of new medicines is the chemical synthesis of novel small molecules. Stereochemically and topologically complex biologically significant molecules are particularly challenging to prepare in useful quantities, even with state-of-the-art chemical reactions. Therefore, the discovery and development of novel and widely applicable stereoselective chemical reactions stands at the forefront of modern organic chemistry research.

 Alkenes constitute an appealing class of starting materials for chemical synthesis because of their wide availability and ease of synthesis. Difunctionalization reactions are particularly important as two new bonds and two new stereocenters can be generated in a single operation thus allowing for the rapid buildup of molecular complexity. In this seminar, advances in Ni-catalyzed alkene functionalization will be presented. In particular, discussion of carboboration processes will be a focus. The development of these methods, application to complex molecule synthesis, and mechanistic studies will be described.

