

**MIT Chemical Engineering Department**  
**Spring 2019 Seminar Series**

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# Nanoporous Dilute Alloy Materials for Selective Catalysis



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**Friday, May 3, 2019**  
**3:00 PM (Reception at 2:45 PM)**  
**66-110**

**Abstract:** Improvement in reaction selectivity in heterogeneous catalysis has the potential to make major improvements in the energy efficiency of chemical synthesis. Dilute metallic alloys are of interest as catalysts that would exploit their bifunctionality to improve selectivity. The use of dilute Au- and Ag-based alloys for selective oxidation and selective hydrogenation processes will be discussed. Fundamental surface science studies are used to define reaction mechanisms and to understand materials rearrangement under reaction conditions. In parallel, nanoporous alloy catalysts are investigated under operational conditions using advanced imaging and spectroscopy tools in conjunction with rate and selectivity measurements. The ability to use fundamental understanding to predict catalytic selectivity will be illustrated through selected examples.