



College of Liberal Arts and Sciences
Spring 2023 Chemistry Seminar Series
Friday, April 17th

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Princeton University

Organic Synthesis Away from Equilibrium

Abstract: Inspired by biological photosynthesis and advances in solar fuels chemistry, our lab has become interested in light-driven strategies for organic synthesis wherein excited-state redox events facilitate transformations that are otherwise thermodynamically unfavorable. These electron transfer-based schemes provide a general mechanism for driving reactions in opposition to a thermodynamic gradient by selectively channeling the energy generated from photon-absorption events. Moreover, as these reactions occur across multiple free energy surfaces, they are able to circumvent the constraints of microscopic reversibility that govern thermal processes and enable unique forms of selectivity. Several recent projects will be discussed.

Bio: A native of Virginia's Shenandoah Valley, Rob received a B.S in chemistry from the College of William and Mary in 2003. He went on to receive his PhD in synthetic organic chemistry from Caltech in 2008 for his work on natural product synthesis in the labs of Dave MacMillan. Following his doctoral work, Rob moved to Eric Jacobsen's lab at Harvard University as a NIH postdoctoral fellow, where his work focused on asymmetric catalysis and new reaction development. Rob moved to Princeton in the summer of 2011, where his group's work has focused primarily on the applications of proton-coupled electron transfer (PCET) in organic synthesis. In 2017 he was promoted to Professor of Chemistry.