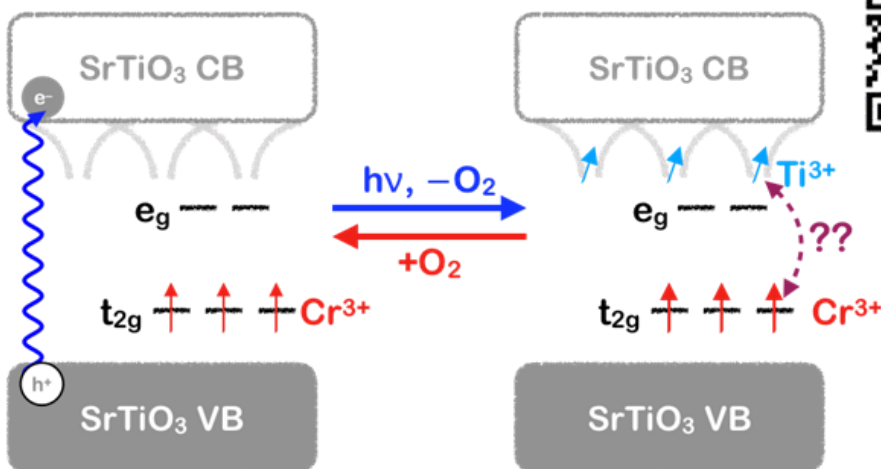


PHYSICAL SEMINAR

“Emergent Phenomena in Old Materials”

Professor Kevin Kittilstved
University of Massachusetts, Amherst
Department of Chemistry



Monday, May 14th, 4:00pm
Hutchison Hall 473
University of Rochester
Department of Chemistry

Abstract

The electronic structure and functionality of semiconductors is very sensitive to the presence of defects in the lattice. Aliovalent transition metal dopants in bulk oxide semiconductors are well-known multifunctional materials with potential application in visible light photocatalysis, energy storage and optoelectronics. However, these types of materials have received little attention as nanocrystalline materials. In this talk, I will present our recent work on the synthesis and characterization of Fe-doped ZnO and Cr-doped SrTiO₃ colloidal nanocrystals. We have discovered unique electronic structures that can be easily exploited in both of these nanoscale doped semiconductors. I will also demonstrate the tunability and reversibility of this post-synthetic modification of the nanocrystals to study emergent interactions between dopants and charge carriers.

Biography: Kevin Kittilstved is an Assistant Professor at the University of Massachusetts Amherst. After obtaining a B.S. from Gonzaga University, Kevin attended the University of Washington (Ph.D., 2006) under Daniel Gamelin on the electronic structure origins of carrier-mediated magnetic ordering in diluted magnetic oxide semiconductors. Kevin then spent three years at the Université de Genève as a post-doc with Andreas Hauser. After a short post-doc with Daniel Gamelin, Kevin began his current appointment in 2011. Professor Kittilstved's current research program is centered around controlling defects in multifunctional inorganic nanomaterials and molecular clusters for energy applications.

Host: Ellen Matson • Email: matson@chem.rochester.edu