

CORE-CM SEMINAR
Michigan State University — Department of Chemistry

Dr. Nathan R. Neale
National Renewable Energy Laboratory

**Controlling the Properties of Silicon and Germanium
Nanocrystals for Advanced Energy Applications**

The tremendous recent progress in the methods for preparing thin films of semiconductor nanocrystals (NCs) has led to a flurry of research employing NC films as the photoactive layer in solar photoconversion, photodetectors, LEDs, and related technologies. The majority of the research has focused on metal chalcogenide NCs owing to the ease of performing ligand exchange reactions at the NC surface. Our group and others have been exploring methods for preparing group IV NCs, and in particular Si and Ge NCs, as potential earth abundant and nontoxic infrared absorbing and emitting alternatives to metal chalcogenide or III-V quantum dots. Group IV NCs produced from either solution approaches or vapor-phase strategies are typically functionalized via hydrosilylation (or hydrogermylation) chemistry to prepare colloidal NCs. But the insulating alkyl surface ligands that lead to solution processibility and stability also give rise to poor film conductivity, mitigating their potential usefulness in optoelectronic applications. We will discuss recent results on the reactions at group IV NC surfaces aimed at both tuning their fundamental photophysical properties and affording electronically coupled NC thin films.

Thursday, September 19, 2013

12:00 PM

Room 1400 – BPS

Professor Jim McCusker – Host

Accommodations for persons with disabilities may be requested by calling the Chemistry Department at (517) 355-9715, X191 two days prior to the event to ensure sufficient time to make arrangements. Requests received after this date will be met when possible.