DEPARTMENT OF CHEMISTRY AND
CHEMICAL BIOLOGY

SPRING 2014 COLLOQUIUM SERIES

Tuesday, February 11, 2014
11:00AM, Wright-Riemann Auditorium

Dr. Pingyun Feng
UC Riverside
Chemistry Department

"Crystalline Semiconducting and Porous Materials: Synthesis, Properties, and Applications"

Abstract: The self-assembly of several series of metal chalcogenide tetrahedral clusters will be presented. The single-sized tetrahedral clusters act as building blocks to form well-ordered three-dimensional superlattices in the presence of either organic or inorganic species as structure directing agents. The structural analysis based on single crystals reveals detailed information that could serve as the basis for the elucidation of larger colloidal nanostructures. In addition to the expansion of known series of clusters, new series of tetrahedral clusters with different geometrical features have also been developed. The diversity of superlattices is achieved by modifying the cluster size, the cluster composition, and the inter-cluster linkage mode. Nanoclusters prepared in this research include those that are currently the largest known single-sized semiconducting tetrahedral clusters, which serve to bridge the size gap between colloidal nanoclusters and small molecular clusters. The electronic band structures can be tuned over a wide range in UV-Vis region. Physical properties such as porosity, photoluminescence, and electrical properties will be presented.

In addition to porous chalcogenides, metal-organic framework materials (MOFs) are another family of fascinating solid state porous materials, because of their highly tunable compositions, structures, and properties. In this presentation, strategies for the synthesis of new porous MOFs will be discussed briefly, with the focus on the use of different metallic elements and their various combinations. The talk will also cover our recent efforts on engineering pore space of MOF by using extra-framework ions or nested cage-in-cage configurations to tune the gas sorption properties. Finally a brief introduction on our recent progress in the synthesis of reduced TiO2 as photocatalytic materials for water reduction will also be covered.

Host: Professor Jing Li

~ Coffee/tea will be served prior to lecture ~
Anyone wishing to meet with Dr. Feng, please contact Kristin Render at 848-445-8602 or Kristin.render@rutgers.edu to set up an appointment