

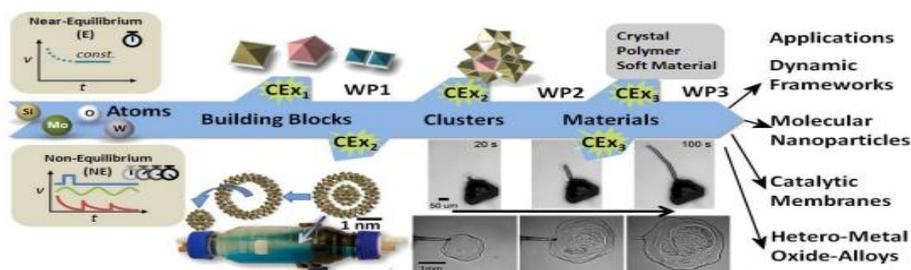
CBC SEMINAR ANNOUNCEMENT



Professor Lee Cronin
University of Glasgow

Non Equilibrium Structured Nanomolecular Inorganic Assemblies

The organization of matter across length scales, starting from well defined building blocks, is a key challenge in the design of advanced functional materials and devices. Patterned, or highly structured, assemblies can be formed spontaneously in systems which are exposed to fluxes of matter and energy. These assemblies can sustain themselves far from equilibrium whilst the fluxes are maintained, leading to the emergence of temporal and spatial structures. In our work we opted to investigate such assemblies using polyoxometalate clusters. Such clusters are interesting since their assembly can bridge multiple length scales from the assembly of sub-nanoscale to protein sized molecules and even colloidal aggregates of clusters many hundreds of nm in size and have many interesting properties. Here we will explore the dynamic self assembly of polyoxometalate clusters from the nanometer to the micron scale. For instance at the nano-scale we have recently developed a new approach to examine the dynamic assembly of clusters using a flow system, and using this we have also been able to 'trap' the big 'Mo 154' wheel cluster $\{[\text{Mo VI } 130 \text{ Mo V } 20 \text{ O } 442 (\text{OH})_{10} (\text{H}_2\text{O})_{60}]_{14}\}$ complete with the templating 'Mo 36' $[\text{Mo VI } 36 \text{ O } 112 (\text{H}_2\text{O})_{16}]_{8}$ cluster essential for the self assembly of the big wheel. Further, we will discuss non-equilibrium structured assemblies using cation exchange, see Figure, reactions at interfaces, as well as the possibility of setting up complex interconnected reaction pathways in solution to form self-organizing and emergent inorganic systems.



Date: 27th March 2012 (Tuesday)
Time: 11am – 12:30pm
Venue: NTU SPMS CBC Building Level 2,
Conference Room
Host: Assoc Professor Li Tianhu