

EPFL Valais, ChE 602 Seminar, 14.07.2016

Title: Engineering Synergy: Energy and Mass Transport in Hybrid Nanomaterials

Abstract:

The interface between hard (inorganic) and soft (organic) condensed matter presents new and compelling research opportunities in the transport of energy and mass due to the dramatic contrasts in bond strength, chemical interactions, and transport modalities between these constituents. Often, however, when inorganic and organic materials are blended into composites, performance suffers and new failure modes appear. Here, I will discuss the design and understanding of transport properties in “hybrid” systems, which show the surprisingly pivotal role that nanoscale interfaces can play in dictating macroscale transport properties. This talk will cover recent work in hybrid materials for applications in thermoelectric energy conversion, chemical energy storage, and gas separations membranes.

Bio:

Jeff Urban a Facility Director at the Molecular Foundry and Staff Scientist in the Materials Science Division at Berkeley Labs. He is currently leading programs in thermoelectrics and hydrogen fuel cells and co-leading a new water initiative as well. His research focuses on the materials and physics of mass, heat, and charge transport in complex hybrid nanomaterials.