EPFL Valais, ChE 602 Seminar, 15.12.2016

Title: Solution-processed Semiconductor Thin Film Photoelectrodes for Solar Fuel Production

Abstract:
High-efficiency direct solar-to-fuel energy conversion can be achieved using a photoelectrochemical (PEC) device consisting of an n-type photoanode in tandem with a p-type photocathode. However, the development of robust and inexpensive photoelectrodes are needed to make PEC devices economically viable. In this presentation our laboratory's progress in the development new materials for economically-prepared, high performance photoelectrodes will be discussed along with the application toward overall PEC water splitting tandem cells for H2 production. Specifically, this talk will focus on the application of ternary oxide CuFeO2, 2D transition metal dicalcogenides, and organic (carbon-based) polymers as solution-processed photoelectrodes.

Bio:
Sivula obtained a Bachelor's degree in Chemical Engineering from the University of Minnesota, and a PhD from the University of California (Berkeley), with a thesis on developing strategies to control the morphology of bulk-heterojunction photovoltaic devices. Sivula joined the Laboratory of Photonics and Interfaces (Professor Michael Grätzel) at EPFL in 2007 where he developed nanostructured films of iron oxide for hydrogen production using solar energy. He was promoted to research group leader in LPI in 2008 and in 2011 he accepted an appointment as tenure-track assistant professor at EPFL in the Institute of Chemical Science and Engineering. There he heads the Laboratory for molecular engineering of optoelectronic nanomaterials (LIMNO).