



Seminarankündigung

**Dienstag, 24. September 2013
13:00 Uhr**

WSI, Seminarraum S 101

“Solar fuels production by artificial photosynthesis”

A practical method to use sunlight to generate liquid transportation fuels would be a carbon-neutral energy source which could dramatically change the landscape of global energy generation. The fundamental steps involved in developing such an “artificial photosynthesis” scheme will be discussed, along with the scientific barriers which have prevented development of a feasible system to date. In the Joint Center for Artificial Photosynthesis(JCAP) we are developing solar-driven systems to split water into hydrogen and oxygen, targeting a solar to energy efficiency of 10x that of natural photosynthesis.

The minimum voltage required to split water into H_2 and O_2 is 1.23 V (values for reducing CO_2 to methanol or to methane are similar). The JCAP approach uses inorganic photocathodes (H_2 or hydrocarbon producing) and photoanodes (O_2 producing) linked in a tandem geometry. Photocathode approaches based on nanostructured III-V semiconductors coupled with metal oxide passivation layers will be presented. Solar to hydrogen conversion efficiencies approach 15% with multiday stability. In the development of $BiVO_4$ photoanodes, we are targeting control of native defects and carrier motion to improve the water oxidation performance. Initial demonstrations of coupled “no-wires” water splitting will also be presented.

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