

# MaMaSELF

Contribution ID: 4

Type: **not specified**

## Hybrid solar cells based on zinc oxide nanostructures

*Wednesday, 22 May 2013 14:00 (30 minutes)*

Hybrid solar cells based on zinc oxide nanostructures

Rui Wang, Kuhu Sarkar, Peter Müller- Buschbaum

Keywords: mesoporous ZnO, P(S-b-AA) template, sol-gel synthesis

Abstract: Mesoporous zinc oxide (ZnO) structures in the form of thin films have been investigated in the present work. The promising electronic and optical properties of ZnO leads to its wide scale applications in various fields of which the area of hybrid photovoltaics interests us. In a hybrid solar cell, ZnO acts as the inorganic electron acceptor in combination with a hole-conducting organic polymer.

The main focus of this thesis would be to synthesize mesoporous ZnO network morphologies in the form of thin films. The mesoporous network provides large surface-to-volume ratio to enhance light harvesting capacity and the interconnected network reduces the probability of electron-hole recombination in addition. In order to design such a morphology, an amphiphilic diblock copolymer Poly(styrene-b-acrylic acid) is used as a template via solution based sol-gel route. The task is to find a proper morphology of ZnO network by adjusting the weight fractions of solvents and the ZnO precursor. Structural characterization of the thin films is done by scanning electron microscopy (SEM) and atomic force microscopy (AFM). Thickness of the films is investigated by white light interferometry and height profilometry. Optical properties of the films are studied by UV/Vis spectroscopy and photoluminescence.

**Primary author:** Mr WANG, Rui (E13, Physics Department, TUM)

**Co-authors:** Ms SARKAR, Kuhu (E13, Physics Department, TUM); Prof. MÜLLER-BUSCHBAUM, Peter (E13, Physics Department, TUM)

**Presenter:** Mr WANG, Rui (E13, Physics Department, TUM)

**Session Classification:** Early Afternoon Session Wednesday