Seminar im Rahmen des NANONET Styria und

Institutsseminar aus Halbleiterphysik und Nanotechnologie

Fr., 13. Mai 2011, 14:00 Uhr, Hörsaal für Physik der MUL

Semiconductor nanomaterials: growth, optical properties and applications

by

Prof. Dr. Aleksandra B. Djurišić

Department of Physics, The University of Hong Kong,

Hong Kong, PR China

Semiconductor nanomaterials are of interest for a variety of practical applications in electronics and optoelectronics. They can be prepared by a variety of different techniques, and their properties are strongly dependent on their morphology and dimensions, and more importantly deposition conditions and resulting native defects. In this talk, wide band gap semiconductors (mainly ZnO, but this will include GaN, TiO_2, In_2O_3 and SnO_2) growth and their properties will be discussed. In case of ZnO, which can be grown in a variety of morphologies and by a number of different methods, the difference in the material optical properties for different growth methods will be discussed. The effect of the post-growth treatment (annealing) on the photoluminescence spectra will be presented. In addition, the applications of metal oxide nanostructures in optoelectronic devices (light emitting diodes and solar cells), including the effect of material properties on the device performance, will be demonstrated. Finally, the growth of organic nanowires and nanoribbons for different organic donor and acceptor materials will be discussed.