

POZVÁNKA

na seminář oddělení 15 Fyzikálního ústavu AV ČR, v.v.i.

Seminář se koná

ve středu 10. srpna 2011 v 10:00

v zasedací místnosti budovy A (1. patro vedle knihovny)
Fyzikálního ústavu, Cukrovarnická 10, Praha 6.

Na programu je přednáška

InAs Spinfilter Cascades

kterou prosloví

Jan Jacob

University of Hamburg — Institute of Applied Physics and
Microstructure Research Center

Abstrakt

The combined use of the electron's charge and its spin as information carriers in the field of spintronics opens up many new opportunities for computing beyond standard CMOS-technology. While ferromagnets yield a high spin polarization semiconductors allow convenient manipulation of spins. However as the injection of a spin-polarized current from a ferromagnet into a semiconductor is not straight forward due to the conductivity mismatch and scattering at the interface, it would be favorable to have an all-semiconductor device that allows all-electric generation of spin-polarized currents. By employing the intrinsic spin Hall effect in III-V semiconductors like InAs an unpolarized current can be split into two oppositely spin-polarized currents in a y-shaped junction of three quasi one-dimensional nanowires. If such a spin filter is fed with an already spin-polarized current it reveals this polarization as a conductance difference of its two outputs allowing all-electrical detection of spin-polarized currents. A two-stage cascade of spin-filters allows investigation of basic spintronics properties. It can deliver information about spin relaxation, spin precession and the zitterbewegung.