

POZVÁNKA

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

Seminář se koná

v úterý 2. května 2017 ve 14:00

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

Na programu je přednáška

Non-trivial topology of diamond and zincblende semiconductors

kterou prosloví

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Abstrakt

Diamond and zincblende semiconductors have been widely studied and applied in electronics in the past. In the last decade, they also played a significant role in the field of topological materials. Quantum wells of HgTe crystallizing in the zincblende lattice were the first systems in which signatures of quantum spin Hall effect were observed in two dimensions (Science **318**, 766). In three dimensions, α -Sn, possessing the diamond structure at low temperatures, was one of the first materials proposed to be a time-reversal invariant strong topological insulator (Phys. Rev. B **76**, 045302).

In my talk, I will present the results of our calculations of topological properties of these zincblende and diamond materials in three dimensions. Using our home-made *ab initio*-based tight-binding code, we were able to calculate various topological invariants of electronic bulk bands and thus prove the existence of different insulating and metallic topological phases, mostly mediated by strain or alloying. These findings were confirmed by calculating the electronic structure of semi-infinite systems, which show topological surface states in projected band gaps, corresponding to the values of topological invariants of the bulk bands.