



"Physical aspects of new materials and nanostructures"

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Course contents:

During this lecture new transport phenomena and new nanostructures will be considered. In particular, I will discuss, materials which are described by Dirac-like equation (for example graphene and topological insulators). Transport in nanostructures and in hybrid materials (topological insulators or graphene/superconductors) will be analyzed from the theoretical and experimental perspectives.

Syllabus of the lecture:

1. Introduction to the mesoscopic transport and nanostructures
2. Dirac equation versus spin-orbit coupling
3. Introduction to new materials with Dirac dispersion: graphene and topological insulators
4. Transport in topological insulators and graphene
5. Physics of hybrid structures consisting of topological insulators and superconductors
6. Josephson effect in gapless and gapped Dirac systems
7. Superconducting Klein tunneling

TERMINY WYKŁADÓW			
Data	Dzień tygodnia	Godzina	Sala
2014-10-27	poniedziałek	14-17	CN 2/07
2014-10-28	wtorek	14-17	CN 2/07
2014-10-29	środa	16-19	CN 2/07
2014-10-30	czwartek	16-19	013 Chemia C – przejście podziemne)
2014-10-31	piątek	14-17	CN 2/07