

DESCRIPTION FOR THE GENERAL PUBLIC

The main aim of the project is the synthesis and investigation of the electronic hybrid graphene/topological insulator systems. A characteristic feature of these materials is their unusual electronic structure resulting in charge carriers travelling in them with very high velocities. To describe their behavior it is necessary to apply the equation for massless Dirac fermions. As a result such systems enable testing the quantum electrodynamics formalism. The implementation of the project in the first place will lead to gathering the fundamental knowledge on the production processes of such hybrid materials as well as the possibilities of anticorrosive protection of the topological insulators surface. The electronic properties of the systems will be designed controlled during the synthesis through steering the layer deposition process parameters. The research led will also allow to assess how the interactions between the materials constituting the heterostructures influence the electronic properties and the transport of spin polarized charge carriers within the constructed complex system. The knowledge obtained during the implementation of the project could be advantageous for electronics and spintronics and in further perspective could lead to the design and construction of quantum computers.