

Seminar

Institute for Plasma Research

Title: Introduction to Quantum Materials at the Interface of Physics and Technology: A Magneto-transport study

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Time: 03:30 PM

Venue: Seminar Hall, IPR

Abstract

Quantum mechanics describes how atoms are bond and how electrons interact within the material at a fundamental level. In recent times the materials, known as quantum materials in which quantum effects manifest over a large energy and length scales are gaining interest due to their exotic properties and potential applications. These quantum materials include superconductors, graphene, topological insulators, Weyl semimetals, spin liquids. Most of these materials derive their specific properties from reduced dimensionality, in particular from confinement of electrons to two-dimensional sheets. Topological materials are exotic materials whose surface and bulk properties are drastically different. Topological materials are insulators in their bulk but are highly conducting at the boundaries due to the presence of states which are topologically protected, which enables these materials to be the potential candidates for electronic devices. The intrinsic behaviour of three-dimensional topological insulators like Bi_2Se_3 , Bi_2Te_3 , Sb_2Te_3 and in their doped derivates is usually masked by conduction due to native defects. The special properties of topological materials which are protected against perturbations make these materials unique. In this talk a brief introduction to this newer class of materials and their interesting magneto-transport properties will be discussed.
