Seminář odd. 26
Tenkých vrstev a nanostruktur

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TÉMA

Combined *in situ* thin film growth and characterization of topological materials

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The past decade has borne witness to the rapid development of a new field of theoretical and experimental condensed matter physics commonly referred to as “topological insulators”. I will briefly discuss some of the concepts that motivate these so-called topological states of matter, before presenting some of our work on two of these bismuth based materials. Motivated by the persistent doping problems plaguing the seminal topological "insulator" Bi_2Se_3, we have developed an apparatus capable of thin film growth combined with in situ, real time transport measurements, which has provided insight into gaining ready access to the topological regime. We have extended this success to studying the topological Dirac semimetal Na_3Bi, whose reactivity to ambient prohibits the use of conventional sample preparation techniques. Our thin film samples have low temperature mobilities in excess of 6,000 cm^2/Vs. Perpendicular magnetoresistance up to 1T shows unusually large quadratic behavior with weak anti-localization at low field. I will discuss our latest efforts to understand our results in terms of spatial charge inhomogeneity.

odborný garant: *Ing. Pavel Jelínek, Ph.D.*