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LAPME Seminar

Magneto-optical spectroscopy in van der Waals layered materials and bulk semiconductors

Prof. Xiao LI

City University of Hong Kong

Date: 04/12/2023; Time: 14:30 – 15:30; Venue: N23-4018

In this talk, I will discuss our recent work on magneto-optical spectroscopy in van der Waals layered materials and bulk semiconductors. In the first part, I will discuss the existence of unconventional valley-dependent optical selection rules and Landau level mixing in bilayer graphene. In particular, I will show why they could be attributed to the trigonal warping effects and electron-electron interactions. In the second part, I will introduce our recent theory of magneto-optical conductivity in bulk SnTe. I will explain how the signatures of different valleys in this material could appear in the transmission spectrum. Finally, I will briefly discuss our recent work on the Goos-Hanchen and Imbert-Fedorov shifts in monolayer MoS_2 samples. We demonstrate that the experimentally observed IF and GH shifts contain important information about the exciton states in MoS_2 .



Prof. Xiao LI is an Assistant Professor in the Department of Physics, City University of Hong Kong. He received his BSc degree from Peking University in 2008 and his Ph.D. in Physics from the University of Texas at Austin in 2014. Between 2015 and 2018, he worked as a postdoc associate at the Condensed Matter Theory Center, University of Maryland (College Park). Prof. Li's main interest is novel states of matter that arise due to the interplay between topology, disorder, and electron-electron interactions. Recently, his research mainly focused on various aspects of non-equilibrium dynamics, such as many-body localization, quantum many-body scar states, and quantum chaos.