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IAPME Seminar

Weyl-Related Surface Circular Photogalvanic Effect in Nonsymmorphic-Symmetry $ZrGeTe_4$ Semiconductor

5 November 2025

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Venue: N23-4018
Time: 14:00 - 15:00
Hosted by: Prof. Shen LAI

Abstract

Weyl semiconductors, combining the high tunability features of semiconductors with the exotic topological properties of Weyl materials, are of great significance for fundamental physics studies and functional topological devices. Despite the potential theoretical implications, few Weyl semiconductors are experimentally discovered. Chirality is an extraordinary feature of Weyl nodes, which can give rise to helicity-resolved photocurrents, known as the circular photogalvanic effect (CPGE). In this talk, we discuss the surface CPGE in nonsymmorphic-symmetry $ZrGeTe_4$ semiconductors via a specific excitation and detection geometry, demonstrating that it originates from asymmetric helicity-dependent optical transitions between two Kramers–Weyl nodes in the conduction and valence bands. Wavelength-dependent experiments support the chirality-related Weyl features of the CPGE in $ZrGeTe_4$ semiconductors. It is experimentally confirmed that the Weyl-related surface CPGE is an intrinsic phenomenon that can be flexibly tuned with an in-plane electric field.

Biography

Prof. Chongyun JIANG is a Professor of Nankai University since 2019. His research interest is spintronics and photonics in low-dimensional semiconductors. Recent research topics include photogalvanic effect, anormalous Hall effect that associated with the chiral contrast properties in van der Waals heterostructures. He has published peer-reviewed articles on Nature Electronics, ACS, Laser & Phononics Reviews, etc.

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