Gang Qiu

Wednesday, May 3: Seminar at 11:00AM, TANMS Conference Rm (7702A Boelter Hall)

"Twist and Lock – Chirality-Enabled Topological Quantum Systems"

Abstract:
Chirality is a fundamental concept that permeates different fields including physics, material science, chemistry, and biology. This talk explores the profound connections between chirality and topology in condensed matter systems. Three concrete examples are presented to illustrate this connection at different levels. Firstly, I will present a new chiral 2D material, where topologically non-trivial band features, namely Kramers-Weyl are observed. Secondly, quantum anomalous Hall insulators will be discussed, which demonstrate how chiral states in momentum space can be translated to topologically protected electron transport in real space. These chiral electronic states can be exploited to build non-reciprocal devices, enabling the scaling up of solid-state quantum computers. Lastly, I will briefly touch on an interdisciplinary approach to imprint molecular level chirality into 2D superconductors to derive chiral superconductors.These chiral superconductors may be utilized to construct future fault-tolerant topological qubits.

Bio:
Dr. Gang Qiu is a postdoctoral researcher at the University of California, Los Angeles. He received his bachelor's degree in Microelectronics from Peking University in 2014, and his Ph. D. degree in Electrical and Computer Engineering from Purdue University in 2019. He is a recipient of the Birck Williams Scholarship and Bilsland Dissertation Fellowship. He has authored and co-authored over 60 peer-reviewed journal conference publications, and serves as a reviewer for over 10 journals and Session Chairs for the APS March Meeting. His research focuses on novel low-dimensional materials for advanced electronics and quantum applications. His current research interest includes employing topological materials for topological quantum computing as well as cryo-electronics amalgamating the quantum-classical divide.

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