# SEMINAR

**DATE** January 22nd , 2024 (Monday)

**TIME** 14:00 ~ 15:00

**VENUE** R716, New Physics Bldg., NTU

**SPEAKER** **Xi Dai**
Chair Professor,
Hong Kong University of Sci. & Tech.

**TITLE** **From quantum anomalous Hall effect to orbital magnetism: theoretical models and realistic materials**

**BIOGRAPHY**

Education: Ph.D., Institute of Theoretical Physics, CAS (China), 1999
Appointments: Chair Professor; 9/2018 – now; Hong Kong University of Sci. & Tech., Hong Kong
Professor; 9/2017 – 9/2018; Hong Kong University of Sci. & Tech., Hong Kong
The Honorary Associate Director; 3/2018 – present; South Bay Interdisciplinary Science Center; DongGuan, China (Adjunct)
Professor; 4/2007 – 9/2017; Institute of Physics, CAS, Beijing, China
Research Assistant Professor; 4/2004 – 4/2007; Hong Kong University, Hong Kong

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**ABSTRACT**

In today's seminar, I will explore the significant advancements made in the realm of the Quantum Anomalous Hall Effect (QAHE) over the last ten years. QAHE is a new type of quantum Hall effect that intriguingly occurs without an external magnetic field. My focus will be on two primary material systems that facilitate this phenomenon: magnetically doped topological insulator thin films and honeycomb lattices under strong electron correlations. The former is a unique category of ferromagnetic semiconductor, characterized by magnetic ordering that is stabilized via the Van Vleck mechanism. The latter system emerges from a synergy of topological band structures at the single-particle level and strong correlation effects, which lead to pure orbital ferromagnetism. Remarkably, both systems have been successfully realized in recent years using for example the Cr or V doped Bi2Te3 systems and 2D Moiré systems, marking a groundbreaking expansion in the field of condensed matter physics.

Organizer: Department of Physics, National Taiwan University
Sponsor: Center for Quantum Science and Engineering 量子科學與工程研究中心
NCTS National Center for Theoretical Sciences Physics Division 國家理論科學研究中心 物理組