北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Seminar

Exploring Transient Photo-Induced Phases and Nonequilibrium States in Quantum Materials

Hamoon Hedayat

University of Cologne

Time: 10:00 am, Aug. 26, 2024 (Monday)

时间：2024年8月26日 （周一）上午10:00

Venue: Room w563, Physics building, Peking University

地点：北京大学物理楼，西563会议室

Abstract

In this seminar, I will overview some of our recent results on transient photo-induced phases and nonequilibrium states in quantum materials. Using time-resolved optical spectroscopy techniques such as time-resolved spontaneous Raman spectroscopy, transient grating, and magneto-optical spectroscopy, we focused on investigating 2D heterostructures, spin liquid candidates, and charge density wave (CDW) prototypes. Our findings reveal unique metastable states induced by photoexcitation and various exotic electronic, excitonic, and phononic dynamics driven by ultrashort laser pulses. Focusing particularly on $TiSe_2$, a well-established CDW prototype, we have uncovered long-lived metastable states and intricate CDW lattice dynamics that provide deeper insights into the nature of this phase. These insights are crucial for understanding optically driven correlated phases in quantum materials.

About the speaker

Hamoon Hedayat earned his Ph.D. in Physics with honors from Politecnico di Milano in 2015. Following his doctoral studies, he worked as a Postdoctoral Researcher and later as a Politecnico International Fellowship (PIF) holder at Politecnico di Milano until 2020. He then served as a Senior Researcher at the Italian National Research Council for one year before joining the University of Cologne as a Senior Researcher and Junior Group Leader, where he is still working. His research focuses on exploring ultrafast interactions in strongly correlated materials using femtosecond laser pulses and various ultrafast optical spectroscopy techniques.