



Weekly Seminar

Magnetic and charge properties in the Kitaev Candidate material α -RuCl₃

Zheng-Xin Liu

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Time: 3:00 pm, May. 22, 2024 (Wednesday)

时间: 2024年5月22日 (周三) 下午3:00

Venue: Room w563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

Abstract

Spin-orbit coupled quantum magnets on the Honeycomb lattice, including the material α -RuCl₃, have attracted lots of research interest due to the existence of Kitaev exchange interactions. Since most Kitaev materials exhibit long-range magnetic order at low temperatures, theoretical investigation of the effective spin models is helpful for experimental realization of exotic magnetic phases. In the first part of the talk, we will introduce the theoretical study of field induced quantum spin liquids motivated by recent experiments on α -RuCl₃. In the second part, after introducing recent STM data of few layered α -RuCl₃ on the substrate of graphite, we will try to interpret the reduced Mott charge gap in 2- and 3-layered samples, and then provide a possible explanation of the observed incommensurate charge super-modulation from the viewpoint of electric-dipole order. Our work may shed light on study of multiferroic properties of Kitaev candidate magnets.

About the speaker

Zheng-Xin Liu obtained his Ph.D in the Hong Kong University of Science and Technology in 2010. In the following five years he worked in the Institute for Advanced Study in Tsinghua University as a post doctor and then as an associate member. He joined Renmin University of China in 2015. Dr. Liu's research area includes quantum magnetism, topological phases and symmetries in condensed matter physics. Recently, his interest is focused on quantum spin liquids in Kitaev materials and band structure of itinerant electrons in magnetically ordered systems.