



复旦大学物理系 Colloquium

Time: 14:00, Tuesday, 2022.12.13

Location: C108, Jiangwan Physics Building

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Quantum Spin Liquid Physics in 1T-TaS₂/TaSe₂

贺文字 博士

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Abstract: Quantum spin liquid phase has been a long sought exotic state of matter since 1980s. Recently, it was predicted that in the transition metal dichalcogenides 1T-TaS₂, the ground state of its Mott insulating phase is a U(1) quantum spin liquid with spinon Fermi surface. In this talk, I will review how the 1T-TaS₂ was proposed as a quantum spin liquid candidate in 2017, and further introduce the recent studies on the related material: monolayer 1T-TaSe₂. I will talk about the recent experimental tunneling spectroscopy measurements on the Co atom embedded on the monolayer 1T-TaSe₂ and present our explanation to the pair of band edge resonance peaks observed in the experiment. I will show that the spinon Kondo resonance on the magnetic impurity combined with the gauge field fluctuations in the spin liquid can give rise to a pair of band edge resonance peaks. We conclude that the experimental observation of a pair of band edge resonance peaks on the Co atom thus provides further evidence that the monolayer 1T-TaSe₂ is a charge insulator with gapless spinon excitations.



报告人简介: 贺文字博士2013年本科毕业于北京师范大学物理学系，2018年博士毕业于香港科技大学物理学系，并在香港科技大学物理学系担任博士后研究员至2020年。随后，他赴麻省理工学院在Patrick A. Lee教授组担任博士研究员至2022年。在2022年四月，他加入上海科技大学物质科学与技术学院担任助理教授、研究员。贺文字博士的研究领域集中在凝聚态物理，主要以二维过渡金属硫化物、双层有转角石墨烯和二维莫尔超晶格体系等二维量子材料为平台，研究其中出现的拓扑态、超导态和电子强关联效应。他的研究内容关注预言材料中的新物性和新物相，以及对实验中观测到的新现象提供物理解释。