



Weekly Seminar

Topological spin textures in frustrated magnets: Insights from microscopic modeling

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Time: 3:00 pm, May.21, 2025 (Wednesday)

时间: 2025年5月21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

Topological spin textures, as exemplified by magnetic skyrmions, hold great potential for spintronics applications. In this talk, I will share our recent understanding of the topological spin textures in two frustrated magnets, including the breathing kagome-lattice compound $\text{Gd}_3\text{Ru}_4\text{Al}_{12}$ and the pyrochlore-lattice compound GeCo_2O_4 . Through combined neutron scattering experiments and theoretical calculations, accurate microscopic spin models are successfully established for both compounds. In $\text{Gd}_3\text{Ru}_4\text{Al}_{12}$, competition between the dipolar interactions and the easy-planar single-ion anisotropy is revealed to be crucial in inducing a variety of topological orders, including two novel meron crystals with fractional topological charges [1]. In GeCo_2O_4 , an exotic lattice of hedgehog-like spin texture is discovered, which arises from the competing anisotropic interactions [2].

[1] J. J. Mo ... S. Gao#, under review

[2] J. J. Mo ... X.F. Sun#, S.Gao#, in preparation

About the speaker

高尚, 中国科学技术大学物理系特任教授。2013至2017年在瑞士保罗谢勒研究所学习 neutron scattering, 获日内瓦大学物理学博士学位。之后于日本理化学研究所 (2018至2020) 和美国橡树岭国家实验室 (2020至2022) 从事中子和X射线散射相关的博士后研究。2022年入职中国科学技术大学。研究方向集中于阻挫磁体, 尤其关注奇异短程关联和拓扑有序态。