



## Weekly Seminar

### Integrating Gaussian States with Tensor Networks: A Framework for Quantum Many-Body Simulation

金汇可

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**Time: 3:00 pm, Mar.4, 2026 (Wednesday)**

**时间: 2026年3月4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

In this talk, I will introduce a general framework that unifies fermionic and bosonic Gaussian states with tensor network methods for simulations of quantum many-body systems. This approach greatly enriches the toolbox for characterizing variational wave functions, including mean-field and Gutzwiller projected states, and also provides suitable initial states that can substantially improve the performance of tensor network algorithms. I will begin with an overview of Gaussian states as analytically tractable building blocks, and demonstrate how they can be naturally incorporated into tensor network representations. I will then discuss how this integration enhances both the interpretability and computational efficiency of simulating strongly correlated systems.

To illustrate the versatility of the approach, I will present selected applications, including evidence for a chiral spin liquid ground state in the spin-1/2 kagome Heisenberg model, and, if time permits, a preliminary exploration of its use in Gaussian boson sampling.

#### About the speaker

金汇可, 先后于2015年和2020年在浙江大学获得理学学士和博士学位。2020年至2024年, 在德国慕尼黑黑工业大学从事博士后研究工作。2024年9月加入上海科技大学物质学院担任助理教授。主要从事强关联电子和非平衡物理的理论研究, 以及开发新的方法。