



复旦大学物理系 Colloquium

Time: 14:00, Tuesday, 2023.12.5

Location: C108, Jiangwan Physics Building

Functional renormalization group for strongly correlated electron systems

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Abstract: Unlike in Landau-Fermi liquids where the only possible instability is Cooper pairing, in strongly correlated electron systems, various ordering tendencies exist and compete closely. This requires an unbiased approach that treats all potential ordering channels on the same footing. Functional renormalization group (FRG) is such a theory and is formally exact, although some truncations have to be made in practice. In this talk I will present a thorough introduction to the idea and implementation of FRG. In particular I will discuss and compare two implementation schemes: the patch-FRG and our singular-mode FRG (SM-FRG). Finally, I will present some insights we obtained using the SM-FRG for the Kagome lattice model at the van Hove filling that has inspired much of the discussions in SrV_3Sb_5 (and related materials), and the possible pairing mechanism in $\text{La}_3\text{Ni}_2\text{O}_7$ which is very recently found to become superconducting under moderate pressure.



报告人简介: 王强华教授 1993年于南京大学获博士学位，之后留校工作。1995-1997年在香港大学做博士后研究工作，2000-2002年在加州伯克利大学访问研究，2002年起任南京大学教授。获2003年度国家杰出青年基金资助，受聘2006-2009年度教育部长江学者特聘教授。获国家教委科技进步奖1项，江苏省科学技术奖1项。从事凝聚态理论方面的研究，主要研究方向为强关联电子系统中的超导等物质态的物理性质及其微观机理。发表研究论文多篇，其中Nature, Phys. Rev. Lett, Phys. Rev. X, Nature Physics, Nature Communications等论文25篇。提出并命名准粒子散射相干效应，被实验同行作为分析扫描隧道显微谱的新原理并促进了实验技术的发展；提出和发展处理强关联系统物理的非约束及有限温情况下的重整化平均场方法；提出和发展基于费米子双线性奇异散射模式的泛函重整化群方案，揭示和发现若干强关联体系中的超导微观机理和超导配对特性，以及其它相关磁性和拓扑物质态特性。