# 凝聚态物理-北京大学论坛

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## Fidelity approach to quantum phase transitions

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报告摘要： Quantum phase transitions of a many-body system at zero temperature are characterized by the change of the ground state properties as model parameter g in the system Hamiltonian H(g) is varied across the transition point. People think that structures of the ground-state wavefunction become qualitatively different across the transition point. That is, if we calculate the fidelity, a concept emerging from quantum information theory, between two ground states separated by small distance in parameter space, it should show a minimum around the critical point due to the relatively larger distance at that point. This primary observation has motivated many people to explore the role of quantum fidelity in critical phenomena in recent years. In this talk, I will introduce the quantum fidelity approach to quantum phase transitions based on its leading term, i.e. the fidelity susceptibility. The fidelity susceptibility denotes the adiabatic leading response of the ground state to the driving parameter. Differ from traditionally approach based on the ground-state energy, the fidelity susceptibility shows distinct scaling and singular behaviours around the critical point. I will present also the ground-state fidelity approach to both Landau's phase transition and topological phase transition, as illustrated by the Lipkin-Meshkov-Glick model and the Kitaev honeycomb model, respectively.

顾世建： 浙江大学1996届本科毕业，2002年理论物理博士；2005获全国百篇优秀博士论文。顾世建博士02年毕业后留校做了一年博士后，03年到香港中文大学物理系林海青研究小组做博士后研究工作，05年至今为香港中文大学物理系的研究助理教授。顾世建博士现在最主要的研究方向为量子信息与凝聚态物理现象，在这一方向上共发表论文20多篇。这些论文受到同行们的一定的关注，近几年来共获近400次SCI引用，单篇最高引用已超过110次。二年前他与合作者首次提出的保真度率已成为研究量子相变的一个有效工具，在这一领域具有一定的影响。

时间：4月9日（星期四）15:00-16:40
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Photo by Xiaodong Hu