北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Weekly Seminar

Validity of Jarzynski equality for the rapidly expanding quantum piston

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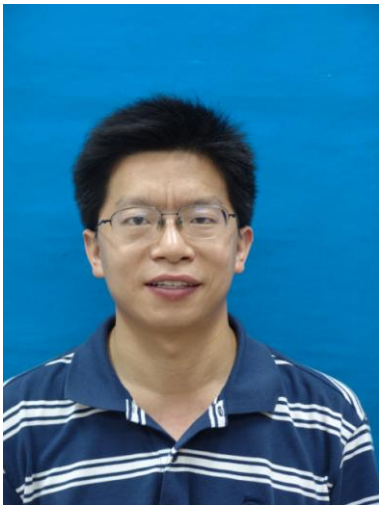

Time: 4:00pm, Feb. 27, 2013 (Wednesday)

时间：2013年2月27日 （周三）下午4:00

Venue: Room 607, Conference Room A , Science Building 5

地点：理科五号楼607会议室

Abstract

We study the validity of quantum Jarzynski equality in the context of the rapidly expanding one-dimensional quantum piston. Utilizing exact solutions of the time-dependent Schrodinger equation, we find that the evolution of the wave function can be decomposed into static and dynamic components, which have simple semiclassical interpretations in terms of particle-piston collisions. We show that nonequilibrium work relations remain valid at any finite piston speed, provided both components are included, and we study explicitly the work distribution for this model system.

About the speaker

Haitao Quan obtained his bachelor's degree and his PhD from Central South University and Chinese Academy of Sciences in 2002 and 2007, respectively. From 2007 to 2010 he was a postdoctoral fellow in Los Alamos National Laboratory. From 2010 to 2012 he was a research associate at the University of Maryland, college park. He joined school of physics, Peking University as a junior faculty in Dec. 2012. His main research interests lie in statistical mechanics and quantum physics. He has published more than 20 scientific papers in peer-reviewed journals with a total citation of more than 700 times.