



## Seminar

### From fidelity approach to quantum phase transitions to dynamics of quantum systems

Prof. Bogdan Damski

*Jagiellonian University, Poland*



**Time: 10:00am, Dec. 17, 2015 (Thursday)**

**时间: 2015年12月17日 (周四) 上午10:00**

**Venue: w563, Physics building, Peking University**

**地点: 北京大学物理楼, 西563会议室**

#### Abstract

Fidelity approach to quantum phase transitions is based on the studies of the overlap between two ground states of the same quantum system obtained for different values of the parameters of its Hamiltonian. Both the location of the critical point and one of the critical exponents can be extracted out of this overlap. We will carefully illustrate how this approach works in a model system undergoing a quantum phase transition: the quantum Ising model. Besides characterizing some equilibrium properties of the system, this overlap and the techniques employed to compute it can be used to get analytical insights into the dynamics of quantum systems. We will illustrate this statement by considering two types of quantum quenches in the quantum Ising chain: smooth crossing of the critical point and counterdiabatic dynamics across the critical point.

#### About the speaker

Dr. Bogdan Damski obtained a Ph.D. degree from the Jagiellonian University, Krakow, Poland in 2003. From 2003 till 2008, he was a postdoc first at the University of Hannover, Germany and then at Los Alamos National Laboratory, USA. From 2009 to 2012 he was a Staff Member at Los Alamos National Laboratory. Since 2013 he is a permanent faculty at Jagiellonian University. Dr. Bogdan Damski has been theoretically studying various aspects of both equilibrium and non-equilibrium quantum phase transitions in cold atom and spin systems.