清华大学高等研究院

Institute for Advanced Study, Tsinghua University

学术报告

Title: **Quantum Simulation of Localization**

Speaker: **Prof. Dieter Suter**
(*University of Dortmund, Germany*)

Time: **3:30pm, Friday, 2016-08-12**

Venue: **Conference Hall 322, Science Building, Tsinghua University**

Abstract

The simulation of the evolution of quantum systems is one of the computationally hard problems, since the computational cost scales exponentially with the size of the system. Quantum computers or specialized quantum simulators can overcome this obstacle, since the scaling properties of suitable quantum algorithms are qualitatively different from those of algorithms designed for classical computers. A specific example is the problem of localization: While ideal quantum systems often have ground states that are delocalized, random perturbations can cause them to become localized, with a sharp phase transition at a specific value of the perturbation strength. This example was demonstrated in an experimental quantum simulator based on nuclear spin qubits.

About the Speaker: Dieter Suter received his PhD from ETH Zurich in 1985 for work on the dynamics of nuclear spins in solids. After a postdoctoral position at UC Berekely, he moved into quantum optics at ETH Zurich, where he studied atomic multilevel systems. In 1995, he became a full professor at the University of Dortmund. His current research concentrates on the investigation of structure and dynamics of condensed matter systems by magnetic resonance and high resolution laser spectroscopy, and on quantum information processing.