



中心系列讲座 **ICQM Weekly Seminar Series**
“The Exciton Superfluid in Quantum-Hall Bilayers”

Prof. Werner Dietsche

Max-Planck-Institute for Solid-State Research
Stuttgart, Germany

Time: 4:00pm, Apr. 20, 2011 (Wednesday)

时间: 2011年4月20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

Soon after it had been realized that superconductivity is caused by the pairing of electrons, researchers started to search for other pairing mechanisms leading to similar macroscopic ground states in solids. Obvious candidates were optically generated excitons expected to undergo a Bose-Einstein condensation at low temperatures. However, all efforts to look for this condensation process remained unsuccessful. A completely different approach to realize exciton condensation is the use of two electron layers in close proximity and which are exposed to a magnetic field at very low temperatures. Such a system can be prepared to behave like a gas of excitons if the lowest Landau level in both layers is just half full. In the talk I will review our methods to produce GaAs/AlGaAs heterostructures hosting separate electron layers with these phase coherence properties. Recent experiments by our and other research group will be presented. Theoretical issues like the minimal dissipation in the system and the missing Kosterlitz-Thouless transition will be discussed.

About the Speaker

Professor Werner Dietsche obtained PhD from University Karlsruhe. From 1975 to 1989, he undertook research work at the Technical University Munich and the University of Illinois, U SA. During 1989 to 2011, he worked at Max-Planck-Institute Stuttgart (von Klitzing department) Initially, his main interests focused on experiments with ballistic and monochromatic phonons (1975-1995), then shifted into molecular beam epitaxy and Quantum-Hall effect (1990-2011).