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ARNOLD SOMMERFELD
CENTER FOR THEORETICAL PHYSICS



Arnold Sommerfeld Lecture Series

Professor Boris Altshuler

Columbia University, USA

Sommerfeld Theory Colloquium:

Many-Body Anderson Localization

Localization of the eigenfunctions of quantum particles in a random potential was discovered by P.W. Anderson more than 50 years ago in connection with spin relaxation and charge transport in disordered solids. Later experimentally was realized localization of other quantum particles and classical waves: light, microwaves, sound, cold atoms. At the same time it became clear that the domain of applicability of the concept of localization is much broader. In particular, it can be extended to various problems in condensed matter physics that involve not only disorder, but also interaction between quantum particles. We will consider manifestation of the Anderson localization in model systems: interacting Bose and Fermi gases and disordered spin models. This will allow us to discuss such phenomena as superconductor-metal-insulator (superfluid-normal fluid-glass) transitions. In particular, we will introduce a new class of finite-temperature phase transitions that can exist even in one-dimensional systems and manifest themselves in transport rather than equilibrium properties. We will also be able to get some insight on some problems in quantum computational complexity.

Wednesday, May 23, 2012, 16:15 h, Room A 348/349, Theresienstr. 37, LMU

Prof. J. von Delft