LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

ARNOLD SOMMERFELD CENTER FOR THEORETICAL PHYSICS

Arnold Sommerfeld Lecture Series

Professor Boris Altshuler

Columbia University, USA

Condensed Matter Theory Seminar:

Quantum Levy-Flights in Two Dimensions

This talk is devoted to quantum propagation of dipole excitations in two dimensions in the presence of disorder. This problem differs from the conventional Anderson localization due to existence of long range hops. We found that the critical wave functions of the dipoles always exist which manifest themselves by a scale independent diffusion constant. If the system is T-invariant the states are critical for all values of the parameters. Otherwise, there can be a "normal metal - perfect metal" transition between this "ordinary" diffusion and the Levy-flights (the diffusion constant logarithmically increasing with the scale). These results follow from the two-loop analysis of the modified non-linear supermatrix σ-model.
The paper was written in collaboration with Igor Aleiner (Columbia University) and Konstantin Efetov (Ruhr University, Bochum, Germany).

Friday, May 25, 2012, 10:15 h, Room A 348/349, Theresienstr. 37, LMU

Prof. J. von Delft