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Institut für Quantenoptik und
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Complex
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INVITATION

to a talk held by

Martin Holthaus

Carl von Ossietzky Universität

Cold atoms in shaken optical lattices: From quasienergy bands to “dressed matter waves”

A single particle moving on a tight-binding lattice under the influence of an ac force remains perpetually localized for certain values of that force’s amplitude. While this effect is hard to observe in traditional solid-state systems, it has recently been made visible with a Bose-Einstein condensate in a shaken optical lattice. The theoretical formulation of this phenomenon leads to the notion of quasienergy bands, which take into account both the spatial and the temporal periodicity. Dynamic localization occurs when such a band collapses. A generalization of these ideas has led to the prediction that a superfluid-to-Mott insulator transition with ultracold atoms in shaken optical lattices can be induced by adiabatically varying the driving amplitude. Again, this has been observed in a recent experiment by the Pisa group. In this talk we will discuss the new options arising from these developments, ranging from quasienergy band engineering to a possible analog of the “dressed atom picture” for mesoscopic matter waves”.

Montag, 20. Oktober 2008

17:30 Uhr s.t.

TU Wien; Hauptgebäude, HS 7, Shütte-Lihotzky,
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