



PHYSIKALISCHES KOLLOQUIUM

des Fachbereichs Physik
der Johann Wolfgang Goethe-Universität Frankfurt

Mittwoch, den 17.05.2017, 16 Uhr c.t.
Großer Hörsaal, Raum _0.111,
Max-von-Laue-Str. 1



Dr. Ulrich Schneider

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"Many-body localization: How quantum dynamics wins against thermodynamics"

The out-of-equilibrium dynamics of interacting many-body systems presents one of the most challenging problems in quantum physics with implications ranging from thermalization dynamics over transport properties to novel transient effects and the formation of order. Traditionally, however, out-of-equilibrium dynamics was mostly confined to short transients, since typical systems would ultimately relax back into well-understood thermal states. In this talk, I will demonstrate that synthetic many-body systems offers access to intrinsically non-ergodic dynamics, where a quantum non-equilibrium system can beat thermodynamics and never relax to a thermal state. We use ultracold atoms in optical lattices as a very versatile platform to study quantum many-body physics in a clean and well-controlled environment. One example, connected to 'classical' integrability, is the sudden expansion of hard-core lattice bosons. The second, more generic example is the experimental realization of Many-Body Localization of interacting fermions, where the presence of disorder creates a non-ergodic state that will, in a closed system, never thermalize.

Die Dozenten der Physik

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