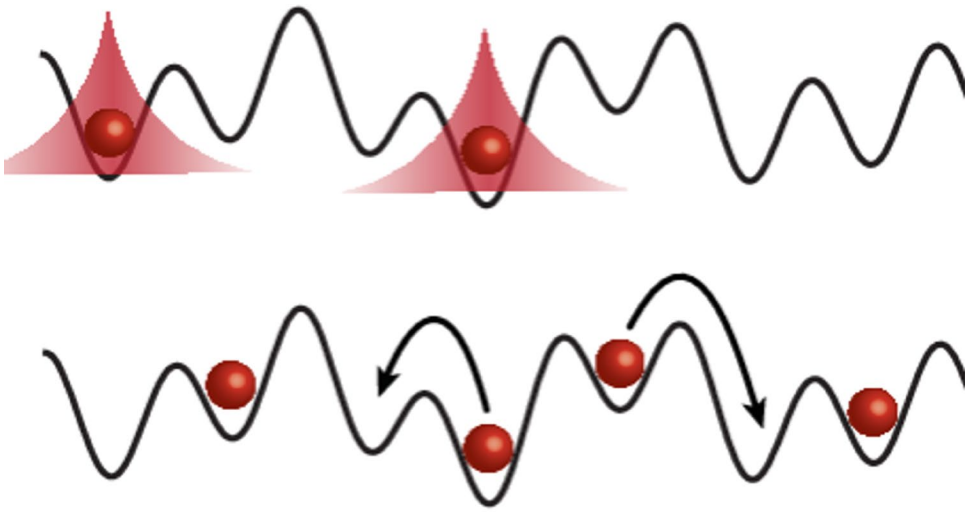
Physikalisches Institut
Fakultät für Mathematik und Physik
Albert-Ludwigs-Universität Freiburg

PHYSIKALISCHES KOLLOQUIUM

AM 15. JANUAR 2024 UM 17 UHR C.T.
IM GROßEN HÖRSAAL



MANY-BODY (DE-)LOCALIZATION - STATUS AND PERSPECTIVES

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Anderson localization is a quantum-interference phenomenon that turns disordered wires into insulators. The fate of Anderson-localization in the presence of many-body interactions received considerable attention over the past twenty years within the field of condensed matter physcis and beyond. Early work proclaimed many-body localization (MBL): particles remain strictly localized at strong enough disorder. In stark contrast, extensive computational studies demonstrated recently the absence of MBL in the MBL-fruit-fly model, the random field Heisenberg chain. Despite many claims to the opposite, many-body delocalization (MBdL) prevails in the numerically accessible parameter window. Most recent investigations uncover further details of the relaxation dynamics: MBdL exhibits a surprising degree of universality when adopting the entanglement evolution as a measure of time. The observation motivates us to introduce the “internal clock” as a novel concept for describing systems with slow relaxation dynamics.

The talk will describe the state of affairs in MBL and offer a perspective on future developments.

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