

Großes Physikalisches Kolloquium an der Universität zu Köln

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Non-equilibrium matter through the prism of quantum entanglement

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16³⁰ Uhr
HS III

Remarkable experimental progress in quantum simulation enabled studies of non-equilibrium phenomena in interacting quantum systems. Bringing quantum matter out-of-equilibrium is a tool to engineer desired properties, but theoretically poses a major challenge, due to the exponential growth of computational complexity. I will overview theoretical progress in describing non-equilibrium quantum matter, based on quantum entanglement. In particular, I will describe mechanisms to avoid thermalisation, which lead to coherence protection and enable non-equilibrium phenomena not envisioned within statistical mechanics. Understanding spatial and temporal entanglement out-of-equilibrium suggests new efficient computational methods and provides a unifying principle for classification of non-equilibrium phases.

