

Titel: “Area Laws for the Entanglement in the XXZ spin chain”

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Abstract:

The question on how to rigorously define and prove Many-Body-Localization (MBL) phenomena has attracted significant interest over the recent years.

In this talk, we will give a physical interpretation of the so-called entanglement entropy (EE) and explain why an area law for the EE can be interpreted as a sign of MBL. We then introduce the Heisenberg XXZ spin Hamiltonian, which is unitarily equivalent to a direct sum of discrete many-particle Schrödinger operators with an attractive potential that energetically favors the formation of clusters of particles. After this, generalizing results previously obtained by V. Beaud and S. Warzel, we present a (log-corrected) area law that works for any state corresponding to a finite but arbitrary number of such clusters.

This is joint work with H. Abdul-Rahman (U of Arizona) and G. Stolz (UAB).