MP 2: Hauptvortrag

Zeit: Donnerstag 9:45–10:30 Raum: KGI-HS 1098

Hauptvortrag MP 2.1 Do 9:45 KGI-HS 1098

Can Entanglement be Distilled From Nothing? Quantum Fields and Infinite Spin Systems as Entanglement Resources

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Entanglement is a crucial resource of quantum information theory which is necessary to outperform classical information processing by quantum devices. Therefore it is important to quantify entanglement and to find methods which can provide large amounts of it. This talk starts with a short review of entanglement theory focusing in particular on entanglement measures and on entanglement distillation (i.e. methods to extract maximally entangled particles from a big amount of low entangled systems). These concepts are then generalized to infinite degrees of freedom systems like quantum fields and infinite spin chains. In this context several interesting new phenomena occur, including in particular the possibility to have infinite entanglement. Therefore it is possible (at least in principle) to distill an infinite amount of maximally entanglement qubit pairs from the vacuum state of a quantum field, i.e. from effectively "nothing".