UNIVERSITÄT BIELEFELD

Faculty of Physics
Faculty of Mathematics

THE UNIVERSITY OF MELBOURNE

Seminar

Bielefeld - Melbourne Random Matrices

Lucas Hackl

University of Melbourne

Volume-law entanglement entropy of typical pure quantum states

In this talk, I will discuss the statistical properties of entanglement entropy, which serves as a natural measure of quantum correlations between a subsystem and its complement. Entanglement is a defining feature of quantum theory and understanding its statistical properties has applications in many areas of physics (quantum information, statistical mechanics, condensed matter physics, black hole thermodynamics).

First, I will introduce the physical model and explain its relevance for practical applications. Second, I will explain how the statistical ensemble of quantum states can naturally be described through the methods of random matrix theory. Third and finally, I review a number of new results describing the typical properties (e.g., average, variance) of the entanglement entropy for various ensembles of quantum states (general vs. Gaussian, arbitrary vs. fixed particle number).

Wednesday, 08 December 2021, 0900 hrs CET

Zoom Conference Call— Please contact Mario Kieburg (m.kieburg@unimelb.edu.au) for details regarding access

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