

School of Physics and Astronomy Colloquium
Dr Lucas Fabian Hackl
University of Melbourne

Wednesday 22 November @ 2pm
Room 107, 10 College Walk
Followed by tea and biscuits

Using entanglement to probe quantum dynamics

Entanglement is a crucial resource in quantum information and I will explain how understanding its statistical properties can be used as a probe for the dynamics of a quantum system. In the first part, I will show how the typical entanglement entropy of six characteristic ensembles reproduces the typical entanglement entropy of energy eigenstates, which allows us to discriminate between integrable and quantum chaotic systems. In the second part, I will present a general formula for the typical entanglement entropy in any system with a fixed number of quantum particles.

Lucas Hackl graduated 2018 from the Pennsylvania State University with a PhD in physics. He completed postdocs at Max Planck Harvard Research Center for Quantum Optics, the University of Copenhagen and the University of Melbourne, the latter where he is now Lecturer in Mathematical Physics since 2022. His research lies at the interface of quantum information, geometry and fundamental theory with recent projects focusing on entanglement theory, mathematics of Gaussian states and variational methods for quantum many body systems.

