

Thursday 07/09, Bruno Bertini

Title: Temporal Entanglement in Chaotic Quantum Circuits

Abstract: The concept of space-evolution (or space-time duality) has emerged as a promising approach for studying quantum dynamics. The basic idea involves exchanging the roles of space and time, evolving the system using a space transfer matrix rather than the time evolution operator. The infinite-volume limit is then described by the fixed points of the latter transfer matrix, also known as influence matrices. To establish the potential of this method as a bona fide computational scheme, it is important to understand whether the influence matrices can be efficiently encoded in a classical computer. In this talk I will present a systematic characterisation of their entanglement -- dubbed temporal entanglement -- in chaotic quantum systems with special focus on dual-unitary circuits. Specifically, I will show that, although Rényi entropies with index larger than one are sub-linear in time, the von Neumann entanglement entropy grows linearly.