



Physical Sciences Seminar

Engineering entanglement in synthetic quantum systems

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Entanglement is a central feature of quantum systems, as it encodes the detailed structure of the quantum states that underlie physical systems. It allows for quantum simulation of many-body systems, it can be used for applications spanning quantum chemistry and quantum enhanced precision measurements, and it is essential to quantum computing architectures. Yet although entanglement is fundamental in such varied settings, it is notoriously hard to produce, maintain, and measure. In my talk, I will present our recent studies on entanglement in non-equilibrium quantum systems, ranging from quantum thermalization to many-body localization. We use neutral atoms in an optical lattice to deterministically prepare a pure quantum state, evolve it unitarily under a microscopically controlled Hamiltonian, and perform projective measurements in the Fock basis. We use a number of quantities to characterize the entanglement state such as entanglement entropy, configurational correlations, and multi-point correlations. Our results demonstrate innovative ways to characterize quantum many-body systems, and they pave the way to quantum simulations beyond the capabilities of numerical simulations.

Thursday, March 12, 2020 10:00am - 11:00am

Mondi Seminar Room 2, Central Building



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.

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<https://ista.ac.at/en/campus/how-to-get-here/> The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.