Monday 9/11

Speaker: Mari Carmen Bañuls

Title: Converting entanglement into mixture: a new algorithm for long-time dynamics with tensor networks

Abstract: In out-of-equilibrium quench scenarios, fast degrees of freedom contribute to long-range entanglement and prevent the efficient simulation of the state with tensor networks. Local observables, on the other hand, are not sensitive to such long-range correlations, but only to their marginals, i.e. their contribution to the reduced state at the level of the local subsystem. We present a tensor network method that identifies such long-range entanglement structures in a time-evolved quantum spin chain, and efficiently transforms them into mixture, realizing this intuitive picture. In this way, we obtain an effective description of the time-evolved state as a density matrix that captures the long-time behavior of local properties for systems in which quasiparticles (exact or not) are responsible for the entanglement spreading.