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# Timescales for thermalization and many-body quantum chaos

*Monday 5 May 2025 14:45 (1 hour)*

In this talk, we review the connection between thermalization in isolated many-body quantum systems and the emergence of quantum chaos. This relationship is explored to address the timescales for isolated many-body quantum systems to reach thermal equilibrium after a dynamical quench, which remains an important open question. We examine how the equilibration process depends on the models, observables, energy of the initial state, and system size, revealing distinct dynamical behaviors across different timescales. Special attention is given to the dynamical manifestations of many-body quantum chaos and methods for detecting them in experimental setups, such as cold atoms, ion traps, and NMR systems. We show that coupling the system to a dephasing environment can reduce dynamical fluctuations that might otherwise obscure these manifestations.

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