Seminar/Talk

Seminar by Alessio Lerose

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Host: Maksym Serbyn

In this talk, I will introduce an approach to study quantum many-body dynamics, inspired by the Feynman-Vernon influence functional. Its central object is the influence matrix (IM), which describes the effect of a Floquet many-body system on the dynamics of local subsystems. For translationally invariant systems, the IM obeys a self-consistency equation. For certain fine-tuned models, remarkably simple exact solutions appear, which represent perfect dephasers (PD), i.e., many-body systems acting as perfectly Markovian baths on their parts. Such PDs include dual-unitary quantum circuits investigated in recent works. In the vicinity of PD points, the system is not perfectly Markovian, but rather acts as a quantum bath with a short memory time. In this case, we demonstrate that the self-consistency equation can be solved using matrix-product states (MPS) methods, as the IM temporal entanglement is low. Using a combination of analytical insights and MPS computations, we characterize the structure of the IM in terms of an effective “statistical-mechanics” description for interfering intervals of local quantum trajectories and illustrate its predictive power.In the last part of the talk, I will describe how to use these ideas to study the many-body localized (MBL) phase of strongly disordered interacting spin systems subject to periodic kicks. This approach allows to study exact disorder-averaged time evolution in the thermodynamic limit. MBL systems fail to act as efficient baths, and this property is encoded in their IM. I will discuss the structure of an MBL IM and link it to the onset of temporal long-range order.References:A. Lerose, M. Sonner, D. A. Abanin, https://arxiv.org/abs/2009.10105M. Sonner, A. Lerose, D. A. Abanin, https://arxiv.org/abs/2012.00777Join Zoom Meetinghttps://istaustria.zoom.us/j/94054749815?pwd=TVg4MFVudzNyMmlwaFZQZEhUK3BaUT09Meeting ID: 940 5474 9815Passcode: 312244

Wednesday, December 16, 2020 12:00pm - 01:00pm

via Zoom

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