Contribution ID: **6** Type: **Poster**

Squeezed Ensembles and Anomalous Dynamic Roughening in Interacting Integrable Chains

It is widely accepted that local subsystems in isolated integrable quantum systems equilibrate to generalized Gibbs ensembles. Here, we identify a particular class of initial states in interacting integrable models that evade canonical generalized thermalization. Particularly, we demonstrate that in the easy-axis regime of the quantum XXZ chain, pure nonequilibrium initial states that lack magnetic fluctuations instead locally relax to squeezed generalized Gibbs ensembles governed by nonlocal equilibrium Hamiltonians, representing exotic equilibrium states with subextensive charge fluctuations that violate the self-affine scaling. At the isotropic point, we find exceptional behavior and explicit dependence on the initial state. Particularly, we find that relaxation from the Néel state is governed by extensive fluctuations and a superdiffusive dynamical exponent compatible with the Kardar-Parisi-Zhang universality. On the other hand, there are other nonfluctuating initial states that display diffusive scaling, e.g., a product state of spin singlets. Our predictions provide examples of anomalous quantum transport and fluctuations in strictly quantum states which can be directly tested in state-of-the-art cold atomic experimental settings.

Authors: Dr ILIEVSKI, Enej (University of Ljubljana); DE NARDIS, Jacopo (CY Cergy Paris University); CECILE, Mario Guillaume (University of Hamburg)

Presenter: CECILE, Mario Guillaume (University of Hamburg)

Session Classification: Poster