

Non-Equilibrium Quantum Dynamics

Equilibrium statistical physics developed over past many decades has led to the successful explanation of various phenomena in many body systems. However, recent experiments ranging from polariton condensates in the context of semiconductor quantum wells in optical cavities, arrays of micro-cavities to trapped ions, opto-mechanical setups and strongly interacting Rydberg polaritons have opened new avenues to probe far-from-equilibrium many-body systems in the presence of both coherent dynamics and controlled dissipation, the so-called driven-dissipative systems. As these systems are driven by dissipation in addition to coherent dynamics governed by the Hamiltonian, the competition between these lead to new non-equilibrium phases of matter.

Publications:

1. *Keldysh approach to dissipative dynamics of interacting spins with long range interactions*, **Muzaffar Q. Lone**, M. Rashid, J. M. Bhat, A. Farouk. arXiv:1803.01167[quant-ph].

2. *Dissipation driven hard-core bosons on optical lattice*, **Muzaffar Qadir Lone**
(in preparation).