Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Seminar

Exploring the nonequilibrium dynamics of open many-body quantum systems with ultracold atoms in optical lattices

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Understanding the equilibrium and non-equilibrium dynamics of an interacting quantum system lies at the heart of many-body physics. How a closed system transits from an initial out-of-equilibrium state to a final equilibrium state is not yet clearly understood. The ability to design, control and probe such states pave the way towards understanding local and global properties of non-equilibrium dynamics. Ultracold quantum gases offer unique possibilities to study such non-equilibrium quantum dynamics in highly controllable and precisely tunable setup. In the first part of my talk, I will present the experimental realization of a driven dissipative superfluid by using a scanning electron microscope as a dissipative potential on a single site of an optical lattice [1]. Then, I will present the measurement of the build-up of phase coherence after a quantum quench of a Bose-Einstein Condensate residing in a one-dimensional optical lattice using Talbot interferometry [2]. In the last part of my talk, I will present the realization of dissipative Fermi-Hubbard model using an optical clock transition in a Fermi gas of ^{173}Yb.

References:

[1] R. Labouvie, B. Santra, S. Heun, H. Ott, Phys. Rev. Lett. 116, 235302 (2016)
[2] B. Santra, C. Baals, R. Labouvie, A. Bhattacherjee, A. Pelster, H. Ott, Nat. Commun. 8, 15601 (2017)

Wednesday, Apr 4th 2018

04:00 PM (Tea/Coffee at 03:30 PM)

Seminar Hall, TIFR-H