ICTS | INTERNATIONAL CENTRE for THEORETICAL SCIENCES

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS Statistical Physics Journal Club Seminar

Title : Dynamical regimes of finite temperature discrete nonlinear Schrödinger chain

Speaker : Amit Kumar Chatterjee (ICTS, Bengaluru)

Date : Friday, 25th June, 2021

Time : 03:00 pm (IST)

Abstract : The discrete nonlinear Schrödinger chain (DNLS) has been a subject of interest due to its wide range of applicability in many fields (ranging from biological systems to condensed matter systems), as well as its exciting mathematical and physical features. In particular, the DNLS has a non-trivial Hamiltonian structure which is non-separable. We have shown [1] that the DNLS has three distinct dynamical regimes at finite temperatures, namely, ultra-low temperature, low temperature and high temperature regimes. We will discuss elaborately the different approaches used to establish these different regimes, (i) one point macroscopic thermodynamic observables (temperature, average energy and their ratio) and their relationships, (ii) emergence and disappearance of an additional conserved quantity with variation of temperature, (iii) variation in the chaotic nature of DNLS with temperature (by probing the system with classical out-of-time-ordered correlator, butterfly speed and Lyapunov exponent). The crossover temperatures between the different regimes, obtained from these separate approaches, agree satisfactorily with each other.

Reference: [1] Amit Kumar Chatterjee, Manas Kulkarni and Anupam Kundu, arXiv:2106.01267 (2021).

Venue : Please click on the below link to join the seminar

https://us06web.zoom.us/j/85257107165?pwd=L0hFUEFTa3I3SEtwYTRmRUQxQjlGQT09
Meeting ID: 852 5710 7165
Passcode: 878781