

Quantum Many-Body Localization

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Abstract

In this talk I will introduce the field of Quantum Many-Body Localization (QMBL), which consist of systems of interacting particles which fail to thermalize retaining information about their initial conditions for arbitrarily long times. The field is quite young, with most of its work having been done in the last years. Being so recent, it works with new concepts and has still many opened questions. Nonetheless, the basic ideas behind QMBL are still accessible and understandable. The talk will focus in these basic concepts, namely, Anderson Localization, Quantum Thermalization and the Eigenstate Thermalization Hypothesis, all of which define the frame in which QMBL appears and allow for its characterization. Simple examples about non-thermalizing systems will be presented and also a recent work by Jonas A. et al. will be explained in which they propose a new method of studying the phase transition between the localized and thermal phase, which still has many unanswered questions.