

Joint seminar of the NPI of the CAS

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Many-body systems around universality

Universal systems are quantum mechanical objects that can be described similarly despite having different typical sizes, energies, and degrees of freedom. This is possible because they share identical few-body properties. Unitarity is arguably the most common universality class for low-energy physics and can be found in hadronic, nuclear, and atomic fields. This interconnection between fields is important because it allows for the passage of knowledge from one field to another. This is of special benefit to the fields in which very little is experimentally known since emergent phenomena can be predicted from more widely known sectors of physics. What is the “best” theory to describe the emergent phenomena maintaining interdisciplinarity is not a simple question to be answered. However, effective field theories result to be the most natural framework for this search for their systematic improvability and the connection to the underlying physics of the various universal systems. In this seminar, I will talk about various universal systems, especially in the unitarity universality class. A particular focus will be put on how to build an effective quantum mechanical theory, how to pass the knowledge from one field to others, and on what phenomena emerge in many-body systems.

The seminar will take place on Wednesday, June 28, 2023 at 10:00 a.m. in the NPI conference room.