

**Abstract for IAS Focused Program on Mathematical Foundations of Topological Materials  
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**On Phase Transitions in Quasiperiodic Hermitian and Non-Hermitian Systems**

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Phase transition refers to the abrupt change in a system's physical properties at a specific parameter value (termed the phase transition point) when one or more of its physical parameters are varied. We discuss phase transitions in quasiperiodic Hermitian and Non-Hermitian systems. In Hermitian systems, an important phase transition is marked by the mobility edge—an energy boundary in the electronic spectrum of disordered materials that separates extended electronic states (enabling conduction) from localized states (trapping electrons). In Non-Hermitian systems, a prominent phase transition type is the topological phase transition. In this talk, we present several classes of exactly solvable models that host distinct types of mobility edges, elucidate topological phase transitions in Non-Hermitian quasicrystals, and highlight the underlying mathematical mechanisms governing these phenomena.