

Title: Topological aspects of discrete spectrum

Abstract: The pure point or discrete spectrum is a fundamental dynamical property often linked to the invariant measures of group actions associated to quasicrystals. The Halmos - von Neumann representation theory shows that Measure-preserving actions with pure point spectrum inherently possess a straightforward and uniquely ergodic topological model, namely group rotations. However, it's worth noting that every measure-preserving action can have more intricate topological models. For instance, one can derive topologically mixing models for actions exhibiting pure point spectrum. In this presentation, we aim to provide a comprehensive overview of recent findings regarding ALL conceivable topological models for pure point spectrum actions, with particular emphasis on the natural classes that emerge within this framework.