

On the Dani Correspondence and some of its Applications

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Diophantine approximation is a systematic attempt to "quantify" the density of rational numbers within the real line. The foundation of this field is a well-known theorem of Dirichlet, stating that all real numbers have a at least a "quadratic rate of approximation" in terms of the denominator of some approximating sequence. Many variations of this fact have been explored throughout the years. In this mini-course, I will give an overview of how ergodic theory and dynamics can be used to study problems related to Dirichlet's Theorem. Starting from ideas of Schmidt and Davenport (~ 1960), later formalised by Dani (1985), I will attempt to show how to re-interpret many Diophantine properties in terms of the long-term behaviour of certain orbits, hinting, if time permits, at the most recent developments in the field that rest on this dynamical reformulation.