Hauptvortrag/Plenary lecture

Dienstag/Tuesday, 9:00, Wolfgang-Paul-Hörsaal

Algebraic Dynamical Systems

KLAUS SCHMIDT

An *algebraic action* of a countable discrete group Γ is an action of Γ by automorphisms of a compact abelian group X. The study of algebraic $\mathbf{Z}$-actions amounts to the investigation of single automorphisms of compact groups, one of the many classical sources of ergodic theory. During the 1990's some remarkable properties of algebraic $\mathbf{Z}^d$-actions with $d > 1$ were discovered which had no analogue in 'traditional' ergodic theory (i.e. in the study of single ergodic transformations or flows). These new phenomena ranged from unexpected rigidity properties (isomorphism rigidity and measure rigidity) and intricate higher order mixing behaviour (connected with solutions of linear equations in multiplicative groups of fields) to the arithmetically intriguing values of the entropies of such actions (which turn out to be Mahler measures of multivariate polynomials).
This lecture presents an overview of algebraic $\mathbf{Z}^d$-actions, some connections between these actions and certain lattice models of statistical mechanics, and a few facts about algebraic Γ-actions of more general discrete amenable groups.