ICTS Probability Seminar

Title   : Universal models in ergodic theory

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Date   : Friday, February 15, 2019

Time   : 3:00 PM

Venue   : Feynman Lecture Hall, ICTS Campus, Bangalore

Abstract   : A topological dynamical system is a pair (X,T) where T is a homeomorphism of a compact space X. A measure preserving action is a triple (Y, μ, S) where Y is a standard Borel space, μ is a probability measure on X and S is a measurable automorphism of Y which preserves the measure μ. We say that (X,T) is universal if it can embed any measure preserving action (under some suitable restrictions). Krieger's generator theorem shows that if X is A^Z (bi-infinite sequences in elements of A) and T is the transformation on X which shifts its elements one unit to the left then (X,T) is universal. Along with Tom Meyerovitch, we establish very general conditions under which Z^d (where now we have d commuting transformations on X)-dynamical systems are universal. These conditions are general enough to prove that
1) A self-homeomorphism with non uniform specification on a compact metric space (answering a question by Quas and Soo and recovering recent results by David Burguet)
2) A generic (in the sense of dense G_δ) self-homeomorphism of the 2-torus preserving Lebesgue measure (extending result by Lind and Thouvenot to infinite entropy)
3) Proper colourings of the Z^d lattice with more than two colours and the domino tilings of the Z^2 lattice (answering a question by Şahin and Robinson) are universal. Our results also extend to the almost Borel category giving partial answers to some questions by Gao and Jackson.
The talk will not assume background in ergodic theory and dynamical systems.