Department of Mathematics,
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Math 243 - Functional Analysis Seminar

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Lower bounds on the radius of comparison of the crossed product by a minimal homeomorphism.

Abstract:

Let X be a compact metric space, and let h be a homeomorphism of X. The mean dimension of h is an invariant invented by people in topological dynamics, with no consideration of C*-algebras. The shift on the product of copies of $[0,1]^d$ indexed by $\mathbb{Z}$ has mean dimension d.

The radius of comparison of a C*-algebra A is an invariant introduced with no consideration of dynamics, and originally applied to C*-algebras which are not given as crossed products. It is a numerical measure of bad behavior in the Cuntz semigroup of A, and its original use was to distinguish counterexamples to the original formulation of the Elliott conjecture.

It is conjectured that if h is a minimal homeomorphism of a compact metric space, then the radius of comparison of $C*(Z,X,h)$ is equal to half the mean dimension of h. There is a generalization to countable amenable groups. Considerable progress has been made on proving that the radius of comparison of $C*(Z,X,h)$ is at most half the mean dimension; in particular, this is known in full generality for minimal homeomorphisms. We give the first systematic results for the opposite inequality. We do not get the exact expected lower bound, but, for many known examples of actions of amenable groups with large mean dimension, we come close.

The methods depend on "mean cohomological independence dimension," Cech cohomology, and the Chern character.

This is joint work with Ilan Hirshberg.

Host: Matthew Wiersma

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11:00 AM
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