Abstracts

Eusebio Gardella *(University of Münster, Germany)*
Rokhlin-type properties for group actions on C*-algebras

Abstract: Since the work of Connes in the classification of von Neumann algebras and their automorphisms, group actions have received a great deal of attention. Amenable group actions on the hyperfinite II_1-factor were completely classified by Ocneanu, extending earlier results of Connes and Jones. In their work, showing that outer actions have the so-called Rokhlin property was fundamental, as this property allows one to prove classification. For C*-algebras, the picture is more complicated. For once, it is no longer true that (strong) outerness implies the Rokhlin property, and there is little hope to classify general group actions unless they have the Rokhlin property. On the other hand, the Rokhlin property is very restrictive, and there are many C*-algebras that do not admit any action with this property. Several weakenings of the Rokhlin property have been introduced to address this problem. Among them, the weak tracial Rokhlin property and Rokhlin dimension (for which Rokhlin dimension zero is equivalent to the Rokhlin property) have been successfully used to prove structure results for crossed products. Furthermore, actions with these properties seem to be very common.

In this lecture series, we will focus on actions of groups that are either compact or discrete and amenable. We will introduce the Rokhlin property, provide many examples,

and show that Rokhlin actions can be classified. We will also see that there are natural obstructions to the Rokhlin property, and will present some weaker variants of it: the (weak) tracial Rokhlin property and Rokhlin dimension (with and without commuting towers). These properties are flexible enough to cover many relevant examples, and are strong enough to yield interesting structural properties for their crossed products. Finally, we will prove a recent analog of Ocneanu's theorem for amenable group actions on C*-algebras, namely, that for actions on classifiable algebras (in particular, Jiang-Su stable), strong outerness is equivalent to the weak tracial Rokhlin property, and also equivalent to finite Rokhlin dimension (in fact, dimension at most one).

Ebrahim Samei (*University of Saskatchewan, Canada*)
Similarity degree of Fourier algebras

Abstract: We show that for a locally compact group G, amongst a class which contains amenable and small invariant neighbourhood groups, that its Fourier algebra $A(G)$ satisfies a completely bounded version of Pisier's similarity property with similarity degree at most 2. Specifically, any completely bounded homomorphism $\pi: A(G) \to B(H)$ admits an invertible S in B(H) for which $||S||\,||S^{-1}|| < ||\pi||^2_{cb}$ and $S^{-1}\pi(.)S$ extends to a*-representation of the C*-algebra $C_0(G)$. We also note that A(G) is completely isomorphically an operator algebra -- a property which we will call completely bounded similarity degree 1 -- if and only if G is finite.

This is a joint work with Hun Hee Lee and Nico Spronk.