New Trends in Noncommutative Geometry

Adam Rennie (11:00-11:50)

Poincare duality for Cuntz-Pimsner algebras

I will give an overview of recent results with Robertson and Sims. The theme is "the behaviour of topological data under dynamics". In particular we give conditions on an algebra A and an A-A correspondence E which ensure that Poincare duality for A lifts to Poincare duality for the Cuntz-Pimsner algebra $\mathcal{O}_E$.

Eduard Ortega (13:15-14:00)

Topological full groups and homology of étale groupoids

Matui has recently studied the topological full groups of (minimal) étale groupoids, a generalization of the topological full groups of Cantor minimal systems and shifts of finite type. He also computed the homology of étale groupoids and conjectured that it captures the K-theory of the reduced groupoid C*-algebra. In this talk I will make an overview of Matui's work and show how his work can be extended to more general étale groupoids. This talk is part of an ongoing project with Petter Nyland.

Makoto Yamashita (14:15-15:00)

Integrating Gauss-Manin connection by group cohomology

Understanding the linear forms on K-groups given by traces, and more generally by cyclic cocycles, is one of the central questions in operator algebra and noncommutative geometry. When there is a continuous family of algebra structures, the Gauss-Manin connection on periodic cyclic (co)homology due to Getzler, Tsygan, and others in deformation quantization gives a powerful guiding principle on this problem, which is however difficult to substantiate in the operator algebraic (or "strict deformation") setting. In this talk we consider algebras graded over discrete groups, and consider deformation of product structure by group 2-cocycles. This setting allows us to integrate the Gauss-Manin connection using the natural action of group cohomology, and it recovers previous computations for noncommutative tori and other twisted group algebras. Based partly on joint work with S. Chakraborty (Muenster).

Adam Sørensen (15:30-16:15)

C*-stable groups

We will look at when almost representation of a group in a C*-algebra is close to an exact representation. A particularly interesting case is if we assume the C*-algebra is finite dimensional. I will mostly discuss a collection of examples. The talk is based on joint work with Søren Eilers and Tatiana Shulman.

Are Austad (16:30-17:00)

Modulation spaces as a smooth structure in noncommutative geometry

Mesland described in his thesis a notion of smoothness on C*-algebras and Hilbert C*-modules. Under these smoothness restrictions one can get an algebraic formula for the interior product in unbounded KK-theory. We explore what this means for the noncommutative 2-torus A_θ and find that existence of smooth modules over A_θ is actually a statement on existence of certain Gabor frames in time-frequency analysis.