

Abstracts of C*-days

J.P. McCarthy

Title: *A quantum Frucht theorem?*

Abstract: The first part of the talk will give a post hoc motivation for Banica's 2005 definition of the quantum automorphism group of a finite graph, and in doing so attempt to build a good intuition for quantum automorphism. Frucht in 1939 showed that every finite group is the automorphism group of a finite graph, and a natural pursuit in the theory of quantum automorphism groups is to establish quantum analogues of this result.

Based on a joint work with Banica, the second part of the talk will address this question.

Arnab Bhattacharjee

Title: *Weak expectations of discrete quantum group algebras and crossed products*

Abstract: Studying various finite-dimensional approximation properties such as nuclearity, exactness has become one of the central areas of investigation in the theory of C*-algebras. One of the natural questions is whether standard constructions of C*-algebras preserve the approximation properties. In the classical discrete group case, approximation properties such as Nuclearity, Weak expectation property of the group C*-algebra can be characterized by the amenability of the group. In this talk, I will present the connection between weak expectations of the discrete quantum group C*-algebras, the crossed product of C*-algebras, and the amenability of the discrete quantum groups.

This is joint work with Angshuman Bhattacharya.

Marzieh Forough

Title: *Lifts of completely positive maps*

Abstract: In this talk, I will discuss some questions about lifts of completely positive linear maps between G-algebras where G is a locally compact second countable group. Our motivation to investigate this type of problems was studying equivariant C(X)-algebras whose fibers absorb a fixed strongly self-absorbing C*-dynamical system. For this, we need a new characterization of absorption of a strongly self-absorbing action in a local manner. The main technical tool to obtain this characterization is the existence of asymptotically equivariant lifts of equivariant completely positive maps.

I will also present a connection between amenability of locally compact second countable groups and the lifting problem in the equivariant setting. This leads to a new characterization of amenability for groups.

Finally, I discuss lifting problems for completely positive maps between G-algebras where G is a locally compact Hausdorff second countable groupoid.

This is based on joint works with Eusebio Gardella and Klaus Thomsen and an ongoing work with Suvrajit Bhattacharjee.

Francesc Perera

Title: *A notion of almost finiteness for C^* -dynamical systems and categorical crossed products.*

Abstract: We introduce the notion of noncommutative castle in a C^* -dynamical system, thus generalising the corresponding notion coming from actions of discrete groups on compact metric spaces. This is used to propose an extension of Kerr's almost finiteness for minimal actions on general C^* -algebras, by combining approximations of the action and the algebra up to a small remainder. These systems are called almost elementary, and may be thought with advantage of the right notion of Z -stability for C^* -dynamical systems, as it leads in particular to Z -stable crossed products. (Noncommutative) dynamical comparison is a key ingredient in this approach which can be rephrased completely in terms of Cuntz semigroup language. In turn, this is related to categorical crossed products.

This talk is based on joint work with Joan Bosa, Jianchao Wu, and Joachim Zacharias, and also with Ramon Antoine and Hannes Thiel.

Aaron Kettner

Title: *Cuntz-Pimsner algebras arising from partial automorphisms twisted by vector bundles*

Abstract: Given a C^* -correspondence over a C^* -algebra, one can form the associated Cuntz-Pimsner algebra. This construction generalises crossed products by the integers as well as Cuntz-Krieger algebras, and thus is able to produce a wide range of interesting examples. In this talk, we will look at Cuntz-Pimsner algebras arising from partial automorphisms twisted by vector bundles. First, we will discuss the construction of the Cuntz-Pimsner algebra starting from a general C^* -correspondence. We will then specialise to C^* -correspondences defined as spaces of sections of a vector bundle, where the "left multiplication" comes from a partial automorphism acting on the base space of the bundle. Finally, structural properties of the algebra, like simplicity and grading, will be discussed.

Joan Bosa

Title: *Almost Elementary Dynamical Systems*

Abstract: Motivated by recent work on dynamical analogues of the Toms-Winter conjecture, we propose an extension of Kerr's notion of almost finiteness for actions of discrete groups on compact metric spaces to actions on general C^* -algebras by generalising the concept of castle. We call such actions almost elementary and study these dynamical systems in different frameworks. For instance, we show that they lead to Z -stable crossed products, if these are simple, and that for actions of the trivial group our condition is a weak form of being tracially AF or having tracial nuclear dimension 0.

This talk is based on joint work with Francesc Perera, Jianchao Wu, and Joachim Zacharias.

Sophie Emma Zegers

Title: *Equivariant isomorphisms of quantum lens spaces*

Abstract: In the study of noncommutative geometry many classical spaces have been given a quantum analogue. An example is quantum lens spaces, which are defined as fixed point algebras of the quantum sphere by Vaksman and Soibelman under the actions of finite cyclic groups. Quantum lens spaces have been given a graph C^* -algebraic description which has made it possible to work on classifying them.

Every quantum lens space comes with a natural circle action, leading to an equivariant isomorphisms problem. In this talk, I will present some recent work on the existence and construction of equivariant isomorphisms of low dimensional quantum lens spaces. Contrary to the isomorphism problem, we can no longer use the graph C^* -algebraic description to solve the equivariant isomorphism problem. This is due to the fact that full corners of graph C^* -algebras are not always equivariantly isomorphic to graph C^* -algebras themselves.

The talk is based on joint work with Søren Eilers.

Hannes Thiel

Title: *Traces on ultrapowers of C^* -algebras*

Abstract: Every sequence of traces on a C^* -algebra A induces a limit trace on a free ultrapower of A . Using Cuntz semigroup techniques, we characterize when these limit traces are dense. Quite unexpectedly, we obtain as an application that every simple C^* -algebra that is (m,n) -pure in the sense of Winter is already pure.

This is joint work with Antoine, Perera and Robert.