1. Pere Ara
Universitat Autonoma de Barcelona

Title: K-theory for the tame C*-algebra of a separated graph

Abstract: A *separated graph* is a pair (E, C) consisting of a directed graph E and a set $C = \bigsqcup_{v \in E^0} C_v$, where each C_v is a partition of the set of edges whose terminal vertex is v. Given a separated graph (E, C), such that all the sets $X \in C$ are finite, the K-theory of the graph C*-algebra $C^*(E, C)$ is known to be determined by the kernel and the cokernel of a certain map, denoted by $1_C - A_{(E,C)}$, from $\mathbb{Z}^{(C)}$ to $\mathbb{Z}^{(E^0)}$. In this paper, we compute the K-theory of the *tame* graph C*-algebra $\mathcal{O}(E, C)$ associated to (E, C), which has been recently introduced by the authors. Letting π denote the natural surjective homomorphism from $C^*(E, C)$ onto $\mathcal{O}(E, C)$, we show that $K_1(\pi)$ is a group isomorphism, and that $K_0(\pi)$ is a split monomorphism, whose cokernel is a torsion-free abelian group. We also prove that this cokernel is a free abelian group when the graph E is finite, and determine its generators in terms of a sequence of separated graphs $\{(E_n, C^n)\}_{n=1}^{\infty}$ naturally attached to (E, C). On the way to showing our main results, we obtain an explicit description of a connecting map arising in a six-term exact sequence computing the K-theory of an amalgamated free product, and we also exhibit an explicit isomorphism between $\ker(1_C - A_{(E,C)})$ and $K_1(C^*(E, C))$. This is joint work with Ruy Exel.

2. Rasmus Bentmann
University of Goettingen

Title: Localizing the classification problem for Kirchberg X-algebras at the universal UHF-algebra

Abstract: I will describe how localization at the universal UHF-algebra turns the classification problem of seperable, stable, nuclear, strongly purely infinite C*-algebras with finitely many ideals and with all simple subquotients satisfying the universal coefficient theorem into a purely algebraic problem and discuss some consequences of this result.

3. Mike Boyle
University of Maryland

Title: Strong shift equivalence and algebraic K-theory

4. Jonathan H. Brown
University of Dayton

Title: Purely infinite groupoid C*-algebras

Abstract: Many C*-algebras, including graph and higher-rank graph algebras, have etale groupoid models. So the classification of etale groupoid C*-algebras has wide applicability. The seminal work of Kirchberg and Phillips showed that simple nuclear purely infinite C*-algebras (Kirchberg Algebras) satisfying the UCT can be classified by their ordered K-theory. It is thus interesting from a classification perspective to know which etale groupoids yield Kirchberg algebras and for this it is essential to understand precisely when an etale groupoid yields a purely infinite C*-algebra. In this talk we show that a simple etale groupoid C*-algebra is purely infinite if the nonzero positive elements of a canonical Cartan MASA are infinite. We further reduce these criteria in the case of higher rank graph groupoids. We also provide a general construction that shows we can use etale groupoids to provide concrete models for many Kirchberg algebras. We apply this construction to the groupoids associated to Bratteli diagrams and deduce that for every simple dimension group D not equal to Z, the stable Kirchberg algebra with K-theory (D, {0}) can be realised as the C*-algebra of an amenable principal groupoid.

5. Toke Meier Carlsen
Norwegian University of Science and Technology

Title: Graph algebras and orbit equivalence

Abstract: Recently Matsumoto and Matui proved that if A and B are two irreducible square matrices with entries in $\{0, 1\}$, then the corresponding two-sided topological Markov shifts are flow equivalent if and only if there is an isomorphism between the stabilizations of the Cuntz-Krieger algebras of A and B which maps the canonical maximal abelian subalgebra onto each other. An important ingredient of their proof of this result is a theorem of Matsumoto which says that there is an isomorphism between the Cuntz-Krieger algebras of A and B which maps the canonical maximal abelian subalgebra onto each other if and only if the one-sided topological Markov shifts corresponding to A and B are continuously orbit equivalent. In this talk, I will report on a recent preprint with Nathan Brownlowe and Michael Whittaker from the University of Wollongong in which we generalise the latter result to arbitrary graph algebras.

6. Søren Eilers
University of Copenhagen

See separate page.

7. Lisa Orloff Clark
University of Otago

Title: Algebras associated to Ample Groupoids

Abstract: Algebras associated to groupoids provide a unifying theory that includes graph algebras, higher-rank graph algebras, group algebras, inverse semi-group algebras and algebras associated to group actions. In this talk, I will give an overview of *Steinberg algebras*. A Steinberg Algebra is purely algebraic structure constructed from an *ample* groupoid. These algebras have proved useful in a number of settings and serve as an alternate model of Leavitt path algebras.

8. James Gabe
University of Copenhagen

Title: On the K-theoretic classification of graph C*-algebras

Abstract: We introduce a new K-theoretic invariant for certain C*-algebras with an action of a topological space, which resembles and is highly inspired by invariants introduced by Bentmann and Meyer. This invariant seems very natural for graph C*-algebras, and under very modest assumptions (such as real rank zero), this invariant classifies all graph C*-algebras up to ideal-related KK-theory. A consequence of this, together with and a deep classification result of Kirchberg, is that all purely infinite graph C*-algebras, possibly with infinitely many ideals, are classified up to stable isomorphism by this invariant.

9. Daniel Gonçalves
Universidade Federal de Santa Catarina

Title: (M + 1)-step shift spaces that are not conjugate to M-step shift spaces

Abstract: In this talk we will present a brief introduction to one sided shifts over infinite alphabets, as recently proposed by Ott, Tomforde and Willis. In this approach the conjugacy classes of shifts of finite type, edge shifts, and M-step shifts are distinct and the authors conjecture that for each nonnegative positive integer M there exist an (M+1)-step shift space that is not conjugate to any M-step shift. The aim of this talk is to build a class of (M+1)-step shifts that are not conjugate to any M-step shift and hence show that the above conjecture is correct.

10. James Lutley
University of Toronto

Title: Which k-Graphs Have AF C*-algebras?

11. Ralf Meyer
University of Goettingen

Title: Classification with and without Universal Coefficient Theorem

Abstract: Classification of purely infinite, nuclear C*-algebras with given finite spectrum X requires to classify objects in the X-equivariant KK-category up to KK-equivalence. We first explain how to do this if there is a K-theoretic invariant on KK(X) with a Universal Coefficient Theorem (this is joint work with Ryszard Nest). This is based on homological algebra in KK(X) and the existence of projective resolutions of length 1. Then we explain a generalisation that only needs projective resolutions of length 2 (this is joint work with Rasmus Bentmann). This happens much more frequently, for instance, for graph C*-algebras or for arbitrary C*-algebras over unique path spaces. It requires a more complicated invariant, however, which adds an Ext^2-obstruction class to a usual homological invariant.

12. Eduard Ortega
Norwegian University of Science and Technology

Title: Cycles in C*-correspondences

Abstract: The C*-algebras associated to shift spaces can be constructed as universal algebras generated by C*-correspondences (Cuntz-Krieger algebras, Graph C*-algebras, Carlsen-Matsumoto algebras). In the recent years there have been constructed and studied the purely algebraic analogs of these algebras (Leavitt Path algebras), and proved to be useful in the study of shift spaces. Together with Toke Meier Carlsen we proposed the purely algebraic general analog of Cuntz-Pimsner algebras. Although the results in both fields look to be very similar, there is no clear connection between the way one can prove them. In this talk we will detail these results and their connections. Finally we will propose a definition of a cycle for a C*-correspondence, an obstruction for the Cuntz-Pimsner C*-algebra to satisfy the Cuntz-Krieger uniqueness theorem. This talk is based on a joint work with Toke Meier Carlsen and Enrique Pardo, and on on-going project with Bartosz Kwasnievski.

13. Enrique Pardo
Universidad de Cadiz

Title: Towards a K-theoretic characterization of graded isomorphisms between Leavitt path algebras

Abstract: In 2013, Hazrat gave a K-theoretic invariant for Leavitt path algebras as graded algebras. Hazrat conjectured that this invariant classifies Leavitt path algebras up to graded isomorphism, and proved the conjecture in some cases. In this paper, we prove that a weak version of the conjecture holds for all finite essential graphs.

This is a joint work with P. Ara (UAB, Spain).

14. Kulumani M. Rangaswamy
University of Colorado at Colorado Springs

Title: Graded irreducible representations of Leavitt path algebras

Abstract: Using the idea of graded algebraic branching systems, various graded irreducible representations of a Leavitt path algebra L of an arbitrary graph E are constructed. The graded socle of L is shown to be generated by Laurent vertices and line points in E and its structure is described. Leavitt path algebras with finitely presented irreducible representations are completely characterized. The case when every irreducible representation of L is graded is analyzed and this is followed by the description of the Leavitt path algebras which are graded self-injective.

This is a joint work with Roozbeh Hazrat, University of Western Sydney

15. Sarah Reznikoff
Kansas State University

Title: The faithful subalgebra

Abstract: The classical uniqueness theorems for representations of combinatorially defined C*-algebras demand either that the map itself intertwine gauge actions or that the underlying structure satisfy an aperiodicity condition. In the last several years we have developed a new genre of uniqueness theorems that rely on neither of these assumptions. In particular, we have identified a special subalgebra in a graph, k-graph, or groupoid algebra that captures failure of aperiodicity in the underlying combinatorial structure and in turn reflects failure of injectivity in the representation. Very new results provide conditions under which this subalgebra is Cartan.

16. Adam P. W. Sørensen
University of Oslo

Title: Embedding into L_2

Abstract: An important result in C*-algebra theory, due to Kirchberg, is that all separable, exact C*-algebras embed into O_2. We will discuss possible algebraic analogs of this result. In particular we will show that all Leavitt path algebras of countable graphs embed into L_2, and that $L_2 \otimes L_2$ does not embed into L_2 when the ring of coefficients is the integers. This is joint work with Brownlowe.

17. Charles Starling
University of Ottawa

Title: Boundary Quotients of Semigroup C*-algebras

Abstract: The construction due to Li of a C*-algebra associated to a left-cancellative semigroup P generalizes many interesting classes of C*-algebras. These algebras are akin to Toeplitz algebras, and in this analogy their boundary quotients play the role of the Cuntz algebras. Li's recent work on these algebras focuses on the case where P embeds in a group. The class of semigroups which embed into groups is a large and rich class, though it does not include a great many interesting examples – for instance semigroups obtained from self-similar groups. In this talk we discuss the boundary quotients of the C*-algebras of such P by using a canonical embedding into an inverse semigroup, and find algebraic conditions on P which guarantee that the boundary quotient is simple and purely infinite.

18. Lia Vaš
University of the Sciences

Title: Leavitt path and graph C^*-algebras: connections via traces

Abstract: While related, the worlds of algebra and operator theory often remain hard to connect. Motivated by the study of traces on graph C^*-algebras, we consider traces on Leavitt path algebras as a way to establish a connection. In particular, we adapt some desirable properties of a $\mathbb{C}$-valued trace on a C^*-algebra to those of a trace on a Leavitt path algebra with values in any involutive ring. Then we consider traces with these desirable properties on both classes of algebras.

We also present how the study of traces leads us to a characterization of directly finite Leavitt path algebras by a graph theoretic condition. The idea of our proof involves consideration of "local" Cohn-Leavitt subalgebras of finite subgraphs and we illustrate that this idea transcends the consideration of direct finiteness alone.

19. Da Zheng
University of Houston

Title: The Operator System Generated by Cuntz Isometries

Abstract: In this talk, we consider the operator system $\mathcal{S}_n$ $(2 \leq n < \infty)$ generated by the Cuntz isometries $S_1, \ldots, S_n$, that is, $S_1, \ldots, S_n$ are isometries with $\sum S_i S_i^* = I$. We define an operator system $\mathcal{E}_n \subseteq M_n$ and prove that $\mathcal{S}_n$ is complete order isomorphic to a quotient of $\mathcal{E}_n$. Next, we study tensor products of $\mathcal{S}_n$ and examine various nuclearities of $\mathcal{S}_n$ in the operator system category. Also, the relation between the dual operator system $\mathcal{S}_n^d$ is discussed. Finally, some open problems are discussed.