INVITED TALKS

Siegfried Echterhoff, WWU Münster,
Irreducible C*-inclusions of fixed-point algebras and crossed products.

A unital inclusion of unital C^*-algebras $A \subseteq B$ is called C*-irreducible, if all intermediate C^*-algebras $A \subseteq C \subseteq B$ are simple. C*-irreducible inclusions have been introduced and studied recently in detail by Mikael Rørdam. In this talk we report on some joint results with Rørdam on inclusions of the form $A^H \subseteq A \rtimes G$, where the groups H and G admit commuting outer actions on on the unital C*-algebra A and H is finite abelian. As a consequence of our results, we can present examples of C*-irreducible inclusions of AF-algebras $A \subseteq B$ which admit an intermediate C*-algebra C that is not AF.

Nigel Higson, Pennsylvania State University,
Automorphisms of the reduced C*-algebra of a reductive Lie group

The Mackey bijection, recently established by Alexandre Afgoustidis in full generality, gives a new solution to the problem of describing the tempered dual (a.k.a the reduced dual) of a real reductive group. It is a purely representation-theoretic statement, but it likely would never have been discovered were it not for C*-algebra theory and K-theory. I shall give an account of how the Mackey bijection came about, and then I shall describe an alternative approach to it that involves the construction of scaling automorphisms on the reduced group C*-algebra that are invisible at the group level.

Masaki Izumi, Kyoto University,
Group actions on C*-algebras and homotopy fixed points.

We give a brief account of the role of homotopy fixed points in our recent work on classification of group actions on Kirchberg algebras. We discuss the following three problems of characterizing (1) when two actions are cocycle conjugate , (2) when a given 1-cocycle is approximately coboundary, (3) when a given cocycle action is equivalent to a genuine action. This is joint work with Hiroki Matui.

Ralf Meyer, University of Göttingen
Noncommutative algebraic topology

I will survey my work, often together with Ryszard Nest, on homological algebra in bivariant K-theory and its applications. This starts with the approach to the Baum-Connes conjecture by localisation of triangulated categories and ends with my recent article on the classification of group actions on Kirchberg algebras up to equivariant KK-equivalence. The key idea is a package of tools for doing homological algebra in any triangulated category.

Nicolas Monod, École Polytechnique Fédérale de Lausanne,
Gelfand pairs, Iwasawa decompositions and type I groups.

In this talk, we will prove that every Gelfand pair admits an Iwasawa decomposition.

Before that, we will explain what Gelfand pairs are and why Iwasawa decompositions are useful.

At the end, we will discuss a conjecture studied in collaboration with M. Kalantar and P.-E. Caprace, speculating about similar results for type I groups.

Sergiy Neshveyev, University of Oslo,
Subproduct systems with quantum group symmetry.

The goal of the talk is to demonstrate how representation theoretic methods can be used to compute Toeplitz and Cuntz-Pimsner algebras associated with certain subproduct systems. Given a compact quantum group G and a subproduct system of G-modules, we first show how fusion rules for G give rise to commutation relations for the corresponding Toeplitz algebra. We show next that given a monoidally equivalent quantum group H, the Toeplitz and Cuntz-Pimsner algebras behave well with respect to the equivalences of categories of G- and H-C*-algebras.

As an example we consider $G = SU_q(2)$ and free orthogonal quantum groups $H = O^+_F$. Their representation categories have canonical subproduct systems studied by Andersson and, in particular cases, by Arici and Kaad. For $SU_q(2)$ these are q-analogues of Arveson's symmetric subproduct system SSP_2, and in analogy with his result we get that the corresponding Cuntz-Pimsner algebra is $C(SU_q(2))$. For O^+_F we conclude that the Cuntz-Pimsner algebras are the so called linking algebras between $SU_q(2)$ and O^+_F. This allows us to obtain a complete list of generators and relations of Toeplitz and Cuntz-Pimsner algebras for O^+_F. (Joint work with Erik Habbestad.)

Ian Putnam, University of Victoria,
Bratteli diagrams, translation flows and their C*-algebras.

There has been great interest in the dynamics of translation flows: these are either flows or one-dimensional foliations of non-compact surfaces. Recently, Kathryn Lindsey and Rodrigo Trevino gave a construction of such objects using (bi-infinite) Bratteli diagrams. One of the features is that the construction produces many interesting examples of infinite genus surfaces, while also reproducing (almost all) of the standard, finite-genus ones. I will describe the basics of translation flows and the Lindsey-Trevino construction. I will first discuss the connection between the foliation C*-algebras and the AF-algebras associated with the Bratteli diagrams. Secondly, there are important results providing quite detailed information on how averaging functions along orbits of these flows behaves asymptotically. These results can be extended to many infinite-genus Lindsey-Trevino surfaces using the AF-algebras. This is joint work, in progress, with Rodrigo Trevino (Maryland).

Baruch Solel, Technion - IIT,
Weighted Cuntz-Krieger algebras

We fix a finite directed graph E with no sources or sinks and consider the graph correspondence X_E. The algebras we study are subalgebras of $\mathcal{L}(\mathcal{F}(X_E))/\mathcal{K}(\mathcal{F}(X_E))$ that are generated by a weighted shift on the Fock space correspondence $\mathcal{F}(X_E)$ modulo $\mathcal{K}(\mathcal{F}(X_E))$. The weights are given by a sequence $\{Z_k\}$ of positive, adjointable operators on $\{(X_E)^{\otimes k}\}$. If $Z_k = I$ for every k, we get the Cuntz-Krieger algebra $C^*(E)$. For a general weight $Z := \{Z_k\}$, we write $C^*(E, Z)$ for the algebra, and refer to it as the *weighter Cuntz-Krieger algebra* associated with E and Z.

We show that the weighted Cuntz-Krieger algebra $C^*(E, Z)$ is isomorphic to a Cuntz-Pimsner algebra $\mathcal{O}(q(F), q(\mathcal{D}))$ associated with a C*-correspondence $q(F)$ over a C*-algebra $q(\mathcal{D})$.

We then use results that are known for Cuntz-Pimsner algebras to study the simplicity of weighted Cuntz-Krieger algebras and the collection of all gauge-invariant ideals. This is done under the assumption that the weights are essentially periodic.

This is joint work with Leonid Helmer.

Andreas Thom, TU Dresden,
Amenability of polish groups.

I will explain some progress in the study of amenability of general topological groups, providing an equivalent Folner criterion. This is joint work with Martin Schneider. I will also discuss examples and open problems concerning the question of amenability of unitary groups of C*-algebras.

Stefaan Vaes, KU Leuven,
W*-rigidity paradigms for embeddings of II_1 factors.

I will report on a recent joint work with Sorin Popa in which we undertake a systematic study of W*-rigidity paradigms for the embeddability relation between II_1 factors and their amplifications. We say that a II_1 factor M stably embeds into a II_1 factor N if M may be realized as a subfactor of an amplification of N, not necessarily of finite index. This is a preorder relation, denoted as $M \hookrightarrow_s N$, and we prove that it is as complicated as it can be: under the appropriate separability assumptions, we concretely realize any partially ordered set inside the preordered class of II_1 factors with embeddability. We provide an augmentation functor $G \mapsto H_G$ from the category of groups into icc groups, so that $L(H_{G_1}) \hookrightarrow_s L(H_{G_2})$ iff $G_1 \hookrightarrow G_2$. We produce a large class of II_1 factors for which we compute all stable self-embeddings, including II_1 factors M without nontrivial endomorphisms $M \hookrightarrow M^t$ and II_1 factors with numerous prescribed outer automorphism groups.

Stuart White, University of Oxford,
Tracially complete C*-algebras.

I'll discuss the class of tracially complete C*-algebras, which lie somewhere between a C*-algebra and a tracial von Neumann algebra. These provide a generalisation of Ozawa's notion of W*-bundles, and provide tools for tackling problems in the structure and classification of amenable C*-algebras whose trace space is big. In this talk, I'll introduce tracially complete C*-agebras and discuss concepts such as amenability, property Gamma and look at classification results in the spirit of Connes theorem these tracially complete C*-algebras.

Dilian Yang, University of Windsor,
Self-similar k-graph algebras.

A self-similar k-graph is a pair consisting of a (discrete countable) group and a k-graph, such that the group acts on the k-graph in a 'self-similar' way. Given a self-similar k-graph, one can associate to it a natural universal C*-algebra. The class of such C*-algebras includes many important and well-known C*-algebras as examples. In this talk, I will present some recent results for those C*-algebras. This is based on some joint work with H. Li.