C*-algebras and applications
Les C*-algèbres et leurs applications

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ANDREW DEAN, Lakehead University
Structure and classification of real C^*-algebras

We shall survey classification results for real C^*-algebras and discuss the question of what stable ranks the various real forms of a C^*-algebra can have.

ROBIN DEELEY, University of Colorado
Solenoids and their C-algebras*

Given a map $g : Y \to Y$ that is continuous and onto, one can construct a solenoid, which is the stationary inverse limit associated to g. This process leads to a space X and a homeomorphism $\varphi : X \to X$. The dynamics of g and φ are very much related. I will discuss various examples of this process and the C*-algebras associated with solenoids. In particular, we will see examples where Y is non-Hausdorff, but the associated solenoid X is Hausdorff.

GEORGE ELLIOTT, University of Toronto
A generalization of AF algebras

A classification is given (in collaboration with Yasuhiko Sato) of a class of non-simple C*-algebras properly containing the class of AF algebras. It consists of those C*-algebras the tensor product of which with every (infinite-dimensional) Glimm UHF algebra is AF. Strictly speaking, the type I algebras with this property are not included, although these are necessarily even AF. The reason is that, for technical reasons, one must restrict to Jiang-Su stable C*-algebras (those absorbing tensorially the Jiang-Su C*-algebra)—although this property may hold automatically if there are no type I subquotients. The invariant, in the unital case, is exactly the same as for AF algebras.

MAGDALENA GEORGESCU, n/a
Cuntz-Pimsner algebras arising from C*-correspondences over commutative C*-algebras

The Cuntz-Pimsner algebra construction produces a C*-algebra from the data contained in a C*-correspondence. Many other constructions — for example, crossed products $C(X) \rtimes_\alpha \mathbb{Z}$ — can be viewed through a Cuntz-Pimsner lens. As such, results and approaches from crossed products can inform investigations of some Cuntz-Pimsner algebras. In this talk, we will concentrate on C*-algebras arising from C*-correspondences over commutative algebras $C(X)$.

Specifically, consider X an infinite compact metric space, $\mathcal{V}$ a locally trivial vector bundle over X and $\alpha : X \to X$ a homeomorphism (often assumed minimal). We can construct a C*-correspondence $\mathcal{E}$ over $C(X)$ from the module of sections of $\mathcal{V}$, where we use the homeomorphism α to twist the left multiplication. As we shall see, many tractable and interesting C*-correspondences over $C(X)$ do in fact arise in this manner.

In this talk, I will discuss some of the structural properties and classification of the resulting Cuntz-Pimsner algebra $\mathcal{O}(\mathcal{E})$. Under the additional assumption that $\mathcal{V}$ is a line bundle the Cuntz-Pimsner algebra is a generalized crossed product, suggesting additional means of investigation. For Cuntz-Pimsner algebras arising from line bundles we can construct orbit-breaking subalgebras of $\mathcal{O}(\mathcal{E})$ and show that they are centrally large in the sense of Phillips.

This is based on joint work with Maria Stella Adamo, Dawn Archey, Marzieh Forough, Ja A Jeong, Karen Strung and Maria Grazia Viola.

ADAM HUMENIUK, MacEwan University
The lattice of C-covers of an operator algebra.*

Every non-selfadjoint operator algebra A generates a C*-algebra, but isomorphic copies of A can generate many non-isomorphic C*-algebras, and we call these the C*-covers of A. A celebrated result–first proved by Hamana, is that a unique minimum C*-cover for any A exists, called the C*-envelope. The C*-envelope is intrinsic to A, but non-isomorphic operator algebras A and B can share the same C*-envelope. If we instead ask that A and B share ALL the same C*-covers, must A and B be isomorphic?

There are multiple natural senses in which two operator algebras may have "the same" C*-covers, and we will discuss how these different senses remember different information about the operator algebras involved. Along the way, we will see how to construct a simple operator algebra that is not similar to a C*-algebra. This is joint work with Dr. Christopher Ramsey.

CRISTIAN IVANESCU, MacEwan University
Notes on Villadsen algebras

Using Villadsen construction, we construct an idempotent C*-algebra under the tensor product. This idempotent algebra is not strongly self-absorbing in the sense defined by Toms and Winter. However, the algebra we constructed does have the homotopic flip property. Some other properties of these idempotent Villadsen algebras will also be presented. This is joint work with Dan Kucerovsky from UNB.

BOYU LI, New Mexico State University
Examples of self-similar actions and imprimitivity theorems

We introduce the notion of self-similar actions between groupoids, which leads to an imprimitivity theorem arising from these actions. This generalizes the many imprimitivity theorems arising from groupoid actions. We then apply our result to a special class of rank-2 graphs.

JAMIE MINGO, Queen's University
Infinitesimal Freeness

Infinitesimal freeness is an important tool for analysizing spike models in random matrix theory. However, independent copies of many of the standard ensembles in random matrix theory do not exhibit this property. On the other hand universal rules do exist. In this talk I will report on some recent progress with Guillaume Cébron which gives a new kind of free independence in the case of orthogonally invariant matrices.

PAWEL SARKOWICZ, University of Ottawa
Polar decomposition in algebraic K-theory

We discuss how polar decomposition gives a natural relationship between the (Hausdorffized) algebraic K_1 group and the (Hausdorffized) unitary algebraic K_1 group for a unital C*-algebra, where one must account for positive elements in terms of tracial information.