NordForsk junior workshop

University of Copenhagen, 14–17 September 2010

Scientific program

Speaker: Adam Sørensen (University of Copenhagen)

Time and place: 09.00-09.30 Thursday 15 September in room 4.0.32 at Copenhagen Biocenter

Title: Classification of amplified graph C^*-algebras

Abstract: To any countable directed graph one can associate a C^*-algebra. A natural question is then: Which graphs give rise to stably isomorphic C^*-algebras? I will give an answer in the special case of amplified graphs. An amplified graph is a graph with the property that if there is an edge between two vertices then there are infinitely many such edges. The answer is two fold: We show that the amplified graph C^*-algebras are classified by (filtrated) K-theory, and that given two concrete amplified graphs their algebras are stably isomorphic if and only if we can transform one graph into the other by a finite sequence of allowed moves. Hence, we can tell if two concrete amplified graph algebras are stably isomorphic by 'looking' at them.

This is joint work with Søren Eilers and Efren Ruiz.

Speaker: Hannes Thiel (University of Copenhagen)

Time and place: 09.30-10.00 Thursday 15 September in room 4.0.32 at Copenhagen Biocenter

Title: The generator problem for Z-stable C^*-algebras

Abstract: Every operator acting on a separable Hilbert space generates a C^*-algebra and a von Neumann algebra. Such an operator algebra (always assumed to act on a separable Hilbert space) is called singly generated, and the generator problem asks which operator algebras arise this way.

For von Neumann algebras, this is Problem 14 of Kadison's famous "Problems on von Neumann algebras", and it was extensively studied over the last 40 years. The conjecture is that every von Neumann algebra is singly generated, and this has been verified for many classes of von Neummann algebras.

For C^*-algebras there is no such clear-cut conjecture, since there exist commutative C^*-algebras that are not singly generated. This seems to be due to the lack of non-commutativity. One therefore expects that a C^*-algebra is singly generated if it is 'maximally non-commutative', i.e., if it has no finite-dimensional representations. We verify this conjecture for the class of C^*-algebras that can be written as the tensor product of some C^*-algebra with the Jiang-Su algebra Z. The class of these so-called Z-stable C^*-algebras is studied in the classification program, and it includes many other natural classes of C^*-algebras.

This is joint work with Wilhelm Winter.

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Speaker: Tim de Laat (University of Copenhagen)

Time and place: 10.00-10.30 Thursday 15 September in room 4.0.32 at Copenhagen Biocenter

Title: Lie groups without the Approximation Property (joint work with Uffe Haagerup)

Abstract: For a locally compact group G, let $A(G)$ be its Fourier algebra, and let $M_0A(G)$ be the space of completely bounded Fourier multipliers. G is said to have the Approximation Property (AP) if the constant function 1 can be approximated by a net in $A(G)$ in the weak *-topology on the dual space $M_0A(G)$. Recently, Lafforgue and de la Salle proved that $SL(3,\mathbb{R})$ does not have the AP, implying the first example of an exact discrete group without the AP, namely $SL(3,\mathbb{Z})$. In this talk, I will explain that also $Sp(2,\mathbb{R})$ does not have the AP. It follows that all connected simple Lie groups with finite center and real rank greater than or equal to two do not have the AP.

Speaker: Sören Möller (University of Southern Denmark)

Time and place: 11.00-11.30 Thursday 15 September in room 4.0.32 at Copenhagen Biocenter

Title: Radial Multipliers on Reduced Free Products

Abstract: For every family (A_i, f_i) of C^*-algebras or von Neumann-Algebras with specfied states we construct "radial multipliers" on the reduced free product of these algebras. The multipliers are associated to certain complex functions ϕ on the non-negative integers and the multipliers are completely bounded, if the Hankel matrix $(\phi(i+j))_{i,j}$ of the function is of trace class.

The result presented in this talk is joint work with Uffe Haagerup, and it generalizes a result of Wyszocianski on radial Herz-Schur multipliers on free products of groups.

Speaker: Siri-Malén Høynes (Norwegian University of Science and Technology)

Time and place: 11.30-12.00 Thursday 15 September in room 4.0.32 at Copenhagen Biocenter

Title:

Abstract:

Speaker: Dávid Kunszenti-Kovács (ELTE University Budapest)

Time and place: 14.00-14.30 Thursday 15 September in room 4.0.32 at Copenhagen Biocenter

Title: Dynamical systems and the Jacobs-deLeeeuw-Glicksberg decomposition

Abstract: We consider the decomposition theorem by Jacobs, deLeeuw and Glicksberg for Hilbert spaces, and apply it to obtain results on the asymptotics of entangled and multiple ergodic averages. Further motivated by the latter, we adapt the decomposition to the setting of W^*-algebras and W^*-dynamical systems.

Speaker: Hiroshi Ando (University of Copenhagen/Kyoto University)

Time and place: 14.30-15.00 Thursday 15 September in room 4.0.32 at Copenhagen Biocenter

Title: On Polish Groups of Finite Type

Abstract: In this talk we discuss the necessary and sufficient conditions for Polish groups to be embeddable as a strongly closed subgroup into unitary groups of separable II_1 factors. Such groups are called of finite type after Sorin Popa. We also give examples of such Polish groups.

Speaker: Eduard Ortega (Norwegian University of Science and Technology)

Time and place: 15.00-15.30 Thursday 15 September in room 4.0.32 at Copenhagen Biocenter

Title: The structure of Crossed product by endomorphisms

Abstract: We describe, under nice conditions of the endomorphism, when the Stacey crossed product $A \times_\beta \mathbb{N}$ is simple. We also give sufficient conditions for $A \times_\beta \mathbb{N}$ being a purely infinite simple C^*-algebra. Finally we use as an example the characterization of the graph C^*-algebras $C^*(E)$ as the Stacey crossed product $C^*(E)^\gamma \times_{\beta_E} \mathbb{N}$, to study their (well-known) ideal properties in terms of the (non-classical) C^*-dynamical system $(C^*(E)^\gamma, \beta_E)$.

Speaker: Jonas Andersen Seebach (Aarhus Universitet)

Time and place: 10.30-11.00 Friday 16 September in auditorium 1 at HCØ

Title: On non-invertibility of C^*-extension

Abstract: We give a brief introduction to the theory of C^*-extensions. In particular we discuss the invertibility question and give a few (recent) examples.

Speaker: David Robertson (University of Southern Denmark)

Time and place: 11.00-11.30 Friday 16 September in auditorium 1 at HCØ

Title: Multiplier correspondences and applications to crossed products

Abstract: The multipliers of a C^*-correspondence are an analogue of the corresponding object for C^*-algebras. In this talk I will recall the definition of a C^*-correspondence X and the associated Cuntz-Pimsner algebra $\mathscr{O}_X$, and show that under certain conditions, a map $X \to M(Y)$ determines a homomorphism $\mathscr{O}_X \to M(\mathscr{O}_Y)$. I will then give an application to the theory of crossed-product C^*-correspondences. This represents ongoing work with Steven Kaliszewski and John Quigg of Arizona State University.

Speaker: Steven Deprez (University of Copenhagen)

Time and place: 12.00-12.30 Friday 16 September in auditorium 1 at HCØ

Title: The fundamental group of a type II_1 factor

Abstract: Murray and von Neumann introduced the fundamental group as an invariant of type II_1 factors. It has to be said that the terminology is confusing because there is no link whatsoever with the classical notion of the fundamental group of a topological space. The fundamental group of a type II_1 factor is always a subgroup of the positive real numbers. It is extremely hard to compute. Murray and von Neumann themselves could only show that the fundamental group of the hyperfinite type II_1 factor is $\mathbb{R}_+$ itself. Connes showed that there are type II_1 factors with countable fundamental group. Recently, Popa's deformation/rigidity theory has been used successfully to compute fundamental groups of type II_1 factors. I present an explicit construction of type II_1 factors that have uncountable fundamental group different from $\mathbb{R}_+$.

Speaker: Dominic Enders (Münster University)

Time and place: 12.30-13.00 Friday 16 September in auditorium 1 at HCØ

Title: Ideals in (semi)projective C^*-algebras

Abstract: One disadvantage in dealing with the class of (semi)projective C^*-algebras is the fact that it lacks good closure properties. In particular, (semi)projectivity does not pass to ideals, quotients or extensions in general. In this talk we present certain finiteness conditions which are sufficient for (semi)projectivity to pass to ideals. We will also report on recent work on the class of (semi)projective, subhomogeneous C^*-algebras where the abovementioned conditions can also shown to be necessary. We conclude by giving some examples and applications of these results.

Speaker: Asger Törnquist (University of Copenhagen)

Time and place: 15.00-15.30 Friday 16 September in auditorium 8 at HCØ

Title:

Abstract:

Speaker: Sara Arklint (University of Copenhagen)

Time and place: 15.30-16.00 Friday 16 September in auditorium 8 at HCØ

Title: Classification using ideal related K-theory

Abstract: I will define ideal related K-theory (also called filtered K-theory or filtrated K-theory), I will explain why we hope ideal related K-theory can be used to classify graph algebras, and I will give an overview of the partial results that have been obtained so far. I will be mentioning work of Kirchberg, Eilers-Restorff-Ruiz, Meyer-Nest and Bentmann-Köhler, as well as joint work with G. Restorff and E. Ruiz, and with R. Bentmann and T. Katsura.

Speaker: Jean Savinien (University of Metz)

Time and place: 16.00-16.30 Friday 16 September in auditorium 8 at HCØ

Title: A characterization of subshifts with bounded powers

Abstract: We build a family of spectral triples for a minimal and aperiodic subshift over a finite alphabet. This yields a family a metrics (the associated Connes distances) on the subshift space. We show that the subshift has bounded powers iff the inf and sup metrics are Lipschitz equivalent. Joint work with J. Kellendonk and D. Lenz.

Speaker: Rui Palma (University of Oslo)

Time and place: 17.00-17.30 Friday 16 September in auditorium 8 at HCØ

Title: Enveloping C^*-algebras of Hecke algebras

Abstract: Hecke algebras can be seen as an analogue of group algebras of quotient groups G/H when H is no longer a normal subgroup. Hecke algebras admit several canonical C^*-completions and when some of these coincide, and an enveloping C^*-algebra exists, there is a nice correspondence between representations of the Hecke algebra and unitary representations of G generated by the H-fixed vectors. I will discuss a sufficient condition for a *-algebra to have an enveloping C^*-algebra and explain how this approach covers many well-known classes of Hecke algebras and more general ones.

Speaker: Tron Omland (Norwegian University of Science and Technology)

Time and place: 17.30-18.00 Friday 16 September in auditorium 8 at HCØ

Title:

Abstract:

Speaker: Rasmus Bentmann (University of Copenhagen)

Time and place: 10.30-11.00 Saturday 17 September in auditorium 8 at HCØ

Title: Universal Coefficient Theorems for C^*-algebras over finite topological spaces

Abstract: I will survey results and conjectures concerning universal coefficient theorems for C^*-algebras over finite topological spaces.

Speaker: Maria Ramirez-Solano (University of Copenhagen)

Time and place: 11.30-12.00 Saturday 17 September in auditorium 8 at HCØ

Title:

Abstract:

Speaker: Rune Johansen (University of Copenhagen)

Time and place: 12.00-12.30 Saturday 17 September in auditorium 8 at HCØ

Title: Flow equivalence of beta-shifts

Abstract: Minimal presentations of sofic beta-shifts by labelled graphs are constructed and used to compute certain invariants of flow equivalence. With a conjecture by Boyle, this results in a complete classification of sofic beta-shifts.