THE

CONFERENCE 2015

INFORMATION

AND

ABSTRACTS

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Practical information

Welcome

We are glad to welcome you to the Young Mathematicians in C^*-Algebras conference 2015. Since you have already got hold of this booklet, you probably already found the location of the conference. Nontheless, we have included some information about where the different events take place.

Locations

University of Copenhagen has buildings all around Copenhagen city, but Faculty of Science is mainly concentrated around Universitetsparken (english: the university park). A large part, including the Department of Mathematics, is in the building called the H.C. Ørsted Institute (named after the Danish physicist called Hans Christian Ørsted), and this is where all parts of the conference, except lunch and excursions, will take place. With high probability this is the building you are in now.

Most of the conference will take place in the HCØ building either in auditorium 2 or in the southern end of the main hall (this is probably where you received this folder, since this was where registration took place). To be more precise, the different events will take place at the following locations:

- **Mini-courses** takes place in **auditorium 2**.
- **Participant talks** takes place in **auditorium 2**.
- **Commemorative lecture** takes place in **auditorium 1**.
- **Breaks** takes place in the **southern end** of the main hall.
- **Lunch** takes place in the canteen of the **Biocenter building**.
- **Poster session** takes place in the **southern end** of the main hall.
- **Reception** takes place in the **southern end** of the main hall.
- **Conference dinner** takes place in the **southern end** of the main hall.

To find these places you can use the map on page 9.

Internet

If you have **eduroam** then you should just be able to log-on using your usual settings. If you do not have eduroam or cannot get it to work, then you should log-on to the network called **KU Guest** with the following login information:

Username: The email address you registered with
Password: 65923874

Who are the organisers?

If you have any question or need any help, and were wondering who the organisers are, so that you may ask them, then the answer is that they are easy to recognise. They all wear light green badges that say "YMC*A organiser" in addition to their name tags, so they should not be that hard to find. There are 9 organisers in total, and at least 2 of those should be around at all times.

Lunch

We do not provide lunch, and people are free to go wherever they choose to eat lunch. But for your convenience, we have booked room at the canteen in the Biocenter building. Probably most people will go there, so you can just follow the crowd. There will definitely be some local people leading the way.

Reception

On Monday there will be a reception featuring pizza, beer and soft drinks. The reception starts at 19:00 in the southern and of the main hall.

Commemorative lecture

As a last thing on Tuesday, Professor George Elliott (University of Toronto) will deliver a lecture commemorating the life and work of Uffe Haagerup.

Afterwards the Department of Mathematical Sciences will host a memorial gathering in the southern end of the main hall. Refreshments will be served.

Dinner

On Thursday, there will be a conference dinner. The dinner will start at 19:00 in the southern end of the main hall where Indian food and beverages will be served.

Poster session

Thursday there will be a poster session. If you want to present a poster at the poster session, you should be present at the southern end of the main hall in the beginning of the lunch break on Monday.

The poster session will be held Thursday from 10:00 to 11:00, and people should be present by their poster, so that other participants can come and ask questions.

If you have not been able to print your poster, then the organisers can help you print it, but it will be printed in A3 on an ordinary office printer.

Excursions

On Wednesday, we have several different excursions arranged. **It is important that you remember** to bring some cash for the excursion (see the descriptions for more info). We are going there by public transport, so if you do not have a FlexCard (as mentioned under Public transport) you need cash for the public transport.

- **Christiania:** Freetown Christiania is a green and car-free neighbourhood in Copenhagen, best known for its autonomous inhabitants' different way of life. It was established in 1971 by a group of hippies who occupied some abandoned military barracks on the site and developed their own set of society rules, completely independent of the Danish government.
  - You should bring **50 DKK in cash** for the guided tour.
  - You should bring **48 DKK in cash** for the public transport.
  - Note that if you in Christiania you can only pay cash.
- **The beach:** Amager strandpark (Amager beach park) is the best place in Copenhagen to escape the scorching summer heat. It comes with sand for sunbathing and seawater for swimming, so do remember to

bring your bathing suit. Amager Strandpark also has some other nice features. For instance, there are places to play beach volleyball and football, and we will make sure to bring some balls in case anyone would like to make use of these. For those less seriously athletically inclined, we will also bring kites and frisbees. In summary: (Sand, Sea, Sun, balls, disks and kites)=beach!

  - You should bring **48 DKK in cash** for the public transport.

- **Louisiana:** The Louisiana Museum of Modern Art is an art museum located directly on the shore of the Øresund Sound in Humlebæk, 35 km north of Copenhagen. It is the most visited art museum in Denmark with an extensive permanent collection of modern and contemporary art, dating from World War II up until now. This summer's major exhibition at Louisiana focuses on architecture, art and culture on the African continent. You can also find more information on the webpage: en.louisiana.dk.

  - You do not need to bring money for public transport as we will pay the ticket.
  - The entrance fee for the Museum is **115 DKK** unless you have a student card, in which case it is **100 DKK**. They accept credit cards, so you do not have to bring cash

- **Guided trip of CPH city:** The city of Copenhagen dates back more than 1000 years, and for almost 600 years it's been the main seat of the royal family of Denmark. Not many buildings date back more than 300 years though, because the city has been ravaged by two great fires and one major bombardment. For this reason the old city center of Copenhagen is a relative new town built on top of the ruins of the old. Our tour will take us through the city center and we will take a look at what was, what became and what disappeared forever.

  - You should bring **100 DKK in cash** for the guided tour. The price will be 75–100 DKK depending on the number of participants.
  - You should bring **48 DKK in cash** for the public transport.

On Monday, there will be a list on which you should sign up for one of the excursions if there is one you would like to attend. The list will be

available all of Monday. If you have already in advance indicated to the organisers which excursion you would like to attend but have changed your mind, this is no problem. Just sign up for the excursion you would like to attend.

After the last lecture on Wednesday, we will provide some practical details about the excursions, and we will point out which organisers are in charge of the different excursions, so that you know whom to follow. Please note that some excursions might be canceled if there are not enough participants or if the weather is too bad.

Places to eat in CPH

Here is a list with some suggestions on where to eat in Copenhagen.

- **Spiseloppen:** Located in Christiania, this is a nice place to eat if you are in the neighbourhood. The restaurant is located at:

  Bådsmandsstræde 43, 1407 København K

- **Grød:** Grød, which means porridge, is a restaurant that specializes in porridge. Indeed, this is the only thing they serve, but this is not a bad thing. A bowl of porridge is about 70 DKK. Grød has 3 different restaurants located at:

  Jægersborggade 50, kld. tv, 2200 København N

  Hal 2, Stade 8A, Linnésgade 17, 1362 København K

  Guldbergsgade 7a, 2200 København N

- **Aroii:** The take-away part of the Michelin restaurant Kiin Kiin, which serves Thai food. Aroii is located at:

  Guldbergsgade 21, 2200 København

- **Kate's Joint:** The menu changes regularly, but consists mainly of various Asian and African dishes. The restaurant is located at:

  Blågårdsgade 12, 2200 København N

- **The Bronx Burger Bar:** As the name suggest this is a burger bar, but the high end kind. A burger with fries is about 100 DKK. Bronx has 3 different restaurants located at:

Nørrebrogade 114, 2200 København N

Godthåbsvej 30, 2000 Frederiksberg

Vandkunsten 1, 1467 København K

- **Halifax:** This is a burger joint in the same category as Bronx, but maybe slightly more expensive. A burger with fries is about 130 DKK. Halifax has 5 different restaurants located at:

  Trianglen 1, 2100 København Ø

  Frederiksborggade 35, 1360 København K

  Larsbjørnsstræde 9, 1454 København K

  Falkoner Plads 1, 2000 Frederiksberg

  Vesterbrogade 72, 1620 København V

- **LêLê Street Kitchen:** If you feel like having some Vietnamese food, then LêLê Street kitchen is a good option. A large dish will cost you about 100 DKK, but they also serve smaller ones for about 50 DKK. There are 3 different street kitchens, located at:

  Vesterbrogade 56, 1620 København V

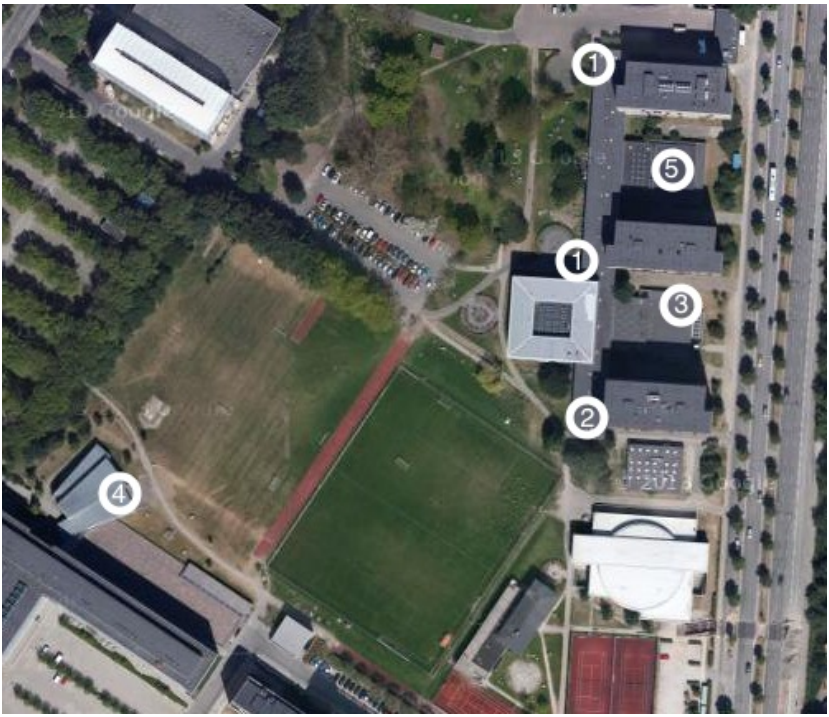
  Østerbrogade 56, 2100 København Ø

  H.C. Andersens Boulevard 8, 1553 København V

- **Copenhagen Street Food:** Located in Warehouse 7 & 8 Papirøen (english: The Paper Island), is a collection of small food trucks serving a variety of different kinds of foods. Each food truck serves at least one meal that costs 50–75 DKK. The address is:

  Trangravsvej 14, 1436 Copenhagen K

Map of the campus



(1) Entrances to the HCØ building.
(2) Southern end of the main hall.
(3) Auditorium 2.
(4) Entrance to the Biocenter, where the canteen is.
(5) Auditorium 1.

Public transport

You might already have encountered the public transport in Copenhagen since you managed to arrive at the conference, but we have written some useful information about it in this folder anyway.

You can get around Copenhagen by bus, train, metro, bike, and of course by foot. We recommend using the website **www.rejseplanen.dk**, the corresponding app **Rejseplanen** (for smartphones), or **Google Maps** to find the best routes. Note that Rejseplanen will always include some kind of public transportation, so it is not very well suited for short trips which may simply be taken by foot.

Buying tickets for public transportation in Copenhagen used to be very simple for tourists and others visiting, but with the recent phasing out of so-called "klippekort" (10-trip tickets), things have gotten a lot more complicated. There are several ticket options for the public transport, and which one is best suited for you depends on how much you plan to use the public transportation. The options are:

- **You can buy a single tickets each trip.** This option is probably best if you do not plan to use public transport much, since a ticket for getting around the inner city will cost 24 DKK, which is a bit expensive in the long run. If this is the option you use, then you should note that you need to pay with cash in the buses (no large notes), and that you can only use coins and credit cards in the automates in the train stations.
- **You can buy a "FlexCard 7-days."** This option will enable you to use any public transportation in Zone 1 and Zone 2 for 7 days. Such a FlexCard will cost 250 DKK.[1]
- **You can buy a "Rejsekort."** A Rejsekort (english: travelcard) is a plastic card that can be used for almost all kinds of travel in Denmark.

[1] Remember that with this option you will have to buy an "tillægsbillet" (english: add-on ticket) to reach the airport, since it is in Zone 3.

One simply has to check in at the starting point and for every change of transportation during the journey, and check out at the end. This is done by holding the card near to a “check in” or “check out” stand, respectively, which are both easily recognized by the blue light.

You can purchase an anonymous Rejsekort for 80 DKK at various train stations, but you also have to put some money on the card to travel for. A single journey inside Zones 1 and 2 will cost either 12 DKK or 15 DKK, depending on the time of day, and going from the airport to the city will be 20 DKK. However, you cannot check in unless you have at least 70 DKK on your card. This means that a Rejsekort is really only suited for those who plan to visit Denmark frequently and/or for an extended period of time.

Mini-courses

The conference features two mini-courses. One will be given by Stefaan Vaes from Leuven and the other by Stuart White from Glasgow. Each mini-course consists of 4 lectures of 1 hour.

Stefaan Vaes

An introduction to deformation/rigidity theory and the classification of II_1 factors.

Sorin Popa's deformation/rigidity theory has provided a wealth of deep classification theorems for von Neumann algebras. I will introduce the basic principles of this theory and then focus on the classification of crossed product von Neumann algebras arising from actions of the free groups.

Stuart White

Interactions between von Neumann algebras and C^*-algebras

Recent developments in the structure of simple nuclear C^*-algebras have shown remarkable parallels with the structure of injective factors. Indeed key regularity properties of simple nuclear C^*-algebras can be viewed as 'coloured versions' of properties of von Neumann algebras. During the talks, I'll explore the connections between von Neumann algebras and C^*-algebras with the aim of making the previous sentence precise. I'll show how von Neumann type techniques are currently being used in the structure theory of simple nuclear C*-algebras, including how the structure of Connes proof that injective II_1 factors are hyperfinite gives an architecture for obtaining covering dimension estimates for C^*-algebras, and how the different flavours of central sequence algebras enter into the picture.

Abstracts

Here you find the abstracts for the participant talks given at the conference. The abstracts are listed in chronological order according to the schedule.

Zahra Afsar

Equilibrium states on C^*-algebras associated to local homeomorphisms

Abstract. Given a local homeomorphism, there is an associated Hilbert bimodule over a C^*-algebra. This Hilbert bimodule gives two main C^*-algebras: the Toeplitz algebra and its quotient the Cuntz-Pimsner algebra. Both algebras carry natural gauge actions of the circle, and hence one can obtain natural dynamics by lifting these actions to actions of the real numbers. Equilibrium states (or KMS states) of the Cuntz-Pimsner algebra are widely investigated in the literature and recent works show that the Toeplitz algebra is expected to have many more equilibrium states. I will talk about the equilibrium states of the Toeplitz algebra. This work is joint with Astrid an Huef and Iain Raeburn, and has published in the International Journal of Mathematics.

Jianchao Wu

Crossed product C^*-algebras and nuclear dimension

Nuclear dimension is a dimension concept for (nuclear) C^*-algebras that generalizes the notion of covering dimension for topological spaces. It has played an important role in the classification program of simple separable unital nuclear C^*-algebras. An important problem currently under active research is the behavior of nuclear dimension under taking crossed products. To this end, various dimensions of dynamical nature have recently been developed, including Rokhlin dimension, amenability dimension, etc. Roughly speaking, these dimensions measure the complexity of the topological or C^*-dynamical system that gives rise to a given crossed product.

We will survey these concepts and discuss their connections to each other as well as applications. The talk is based on joint works with Ilan Hirshberg, Gabor Szabo, Wilhelm Winter and Joachim Zacharias.

Philip Dowerk

Bounded normal generation and invariant automatic continuity

In this talk I will present joint work with Andreas Thom on bounded normal generation (BNG). We say that a group has (BNG) if the conjugacy class of every nontrivial element (and its inverse) generates the whole group in finitely many steps. I will focus on (BNG) for the projective unitary group G of a II1 factor and present applications such as invariant automatic continuity (that is, every homomorphism from G to any separable SIN group is continuous) and uniqueness of the polish group topology.

Sam Evington

From traces to W^*-bundles

Tracial states play a major role in the stably finite case of the Elliott classification programme. The need for certain estimates to be uniform over all the tracial states of a C^*-algebra motivates the study of *tracially continuous W^*-bundles*. These bundles, first introduce by Ozawa in 2013, have von Neumann algebras as their fibres, and each fibre has a distinguished tracial state. The question of whether a given W^*-bundle is isomorphic to the trivial W^*-bundle with the same fibres and base space is deeply related to the resolution of the Toms-Winter Conjecture.

I shall give an exposition of W^*-bundles and discuss the work of the Glasgow team on the trivialisation problem.

Hannes Thiel

Abstract bivariant Cuntz semigroups

We study the category Cu of (abstract) Cuntz semigroups. The Cuntz semigroup $\mathrm{Cu}(A)$ of a C^*-algebra A is an object in Cu. This assignment is a continuous functor from C^*-algebras to Cu. In previous work by Antoine, Perera and the speaker, it was shown that there is a natural notion of tensor

product in Cu, which gives Cu the structure of a symmetric monoidal category. In some cases, the Cuntz semigroup of a tensor product of C^*-algebras can be computed as the tensor product of the Cuntz semigroups of the C^*-algebras.

We will show that for any two semigroups S and T in Cu, there is another semigroup $[[S,T]]$ in Cu which plays the role of the morphisms from S to T. This construction is adjoint to the tensor product in the following sense: For any three semigroups R, S and T in Cu, there is a natural bijection

$$\mathrm{Hom}_{\mathrm{Cu}}(S \otimes_{\mathrm{Cu}} T, R) \cong \mathrm{Hom}_{\mathrm{Cu}}(S, [[T,R]]).$$

It follows that Cu is a *closed* monoidal category.

Given C^*-algebras A and B, we propose that $[[\mathrm{Cu}(A), \mathrm{Cu}(B)]]$ should be considered as the target of a possible analogue of the universal coefficient theorem for Cuntz semigroups.

As an application of our tools, we show that the category Cu admits (ultra)products and inverse limits, and that the functor from C^*-algebras to Cu respects these.

This is joint work in progress with Ramon Antoine and Francesc Perera.

Yuhei Suzuki

Group C^*-algebras as decreasing intersection of nuclear C^*-algebras

We will see that for any discrete group with the AP, the reduced group C *-algebra is realized as a decreasing intersection of nuclear C^*- algebras. This in particular says that unlike the W*-case, the decreasing intersection of nuclear C^*-algebras can behave badly. In fact, it turned out that the decreasing intersection of nuclear C^*-algebras does not need to have the OAP and the LLP, even when the decreasing sequence admits a compatible family of conditional expectations.

Bartosz Kwaśniewski

Purely infinite C^*-algebras associated to Fell bundles

In this talk we present conditions implying pure infiniteness of the reduced cross-sectional C^*-algebra $C_r^*(\mathscr{B})$ of a Fell bundle $\mathscr{B}$ over a discrete group

G. We introduce notions of aperiodicity, $\mathscr{B}$-paradoxicality and residual $\mathscr{B}$-infiniteness. We discuss their relationship with similar conditions studied, in the context of crossed products, by the following duos: Laca, Spielberg; Jolissaint, Robertson; Sierakowski, Rørdam; Giordano, Sierakowski and Kirchberg, Sierakowski. The obtained results are shown to be optimal when applied to graph C^*-algebras. They are also applied to a class of Exel-Larsen crossed products. (based on joint work with Wojciech Szymański)

Thomas Schmidt

C^*-algebras from groupoids from dynamical systems – an introduction

In this talk, I'll explain why groupoids are useful tools in any operator algebraist's toolbox – in particular, I will dicuss how groupoids are useful intermediaries when constructing C^*-algebras from dynamical systems. Time permitting, I will talk about my own work on C^*-algebras arising from circle maps with critical points.

Shoji Ino

Perturbations of crossed product C^*-algebras by amenable groups

We study the perturbation theory of operator algebras. We show that sufficiently close intermediate C^*-subalgebras for simple C^*-algebras of finite Watatani index are unitarily equivalent. This is a joint work with Y. Watatani.

Moreover, we show that sufficiently close von Neumann subalgebras of a von Neumann algebra with finite probabilistic index are unitarily equivalent. Recently, we study uniform perturbations of crossed product C^*-algebras by amenable groups. In this talk, we introduce these results.

Huichi Huang

Ergodic invariant states via crossed product C^*-algebras

Given a C^*-dynamical system consisting of a unital C^*-algebra A and a discrete group Γ acting on A as automorphisms, we show that the space of (ergodic) Γ-invariant states on A is homeomorphic to a subspace of (pure)

state space of $A \rtimes \Gamma$. Then we show some applications of it to topological dynamical systems and representation theory. This is joint work with Jianchao Wu.

Zhuofeng He

Certain actions of finitely generated abelian groups on higher dimensional noncommutative tori

We study certain actions of finitely generated abelian groups on higher dimensional noncommutative tori through this paper. Given a dimension d and a finitely generated abelian group G, we apply a certain function to detect whether there is a simple noncommutative d-torus which admits a specific action by G. Such an action is a natural generalization of actions of finite subgroups of $\mathrm{SL}_2(\mathbb{Z})$ on 2-torus $\mathbb{T} \cong \mathbb{R}^2/\mathbb{Z}^2$. For possible cases, we provide a way to construct each such action of G on a simple higher dimensional noncommutative torus, and then compute the K-theory of the resulting crossed product. We also describe a sufficient and necessary condition of G under which the associated crossed product is an AF algebra.

Tomasz Kania

On C^*-algebras that do not decompose into tensor products

We prove that C^*-algebras which satisfy a certain Banach-space property related to weak* convergence in the dual cannot be decomposed into a tensor product of two in finite-dimensional C^*-algebras. By a result of Pfizner, this class contains all von Neumann algebras and their norm-quotients (so for instance the Calkin algebra). We thus complement a recent result of Ghasemi who established a similar conclusion for the class of SAW*-algebras.

Andrew McKee

Herz-Schur multipliers of dynamical systems

Classical Schur and Herz-Schur multipliers have been studied extensively, with many applications being found in the context of group C^*-algebras. I will introduce and characterise more general versions of these multipliers, with a view to replacing the group C^*-algebra with the C^*-algebra of a

dynamical system, and show how these characterisations extend classical results of authors such as Grothendieck.

Martijn Caspers

Non-commutative De Leeuw theorems

A classical theorem due to Karel de Leeuw (1965) states that the norm of an Lp-Fourier multiplier of the real numbers does not depend on the topology put on the real numbers, and in particular can be taken either Euclidian or discrete. Recent developments both in the theory of approximation properties and non-commutative harmonic analysis motivate an investigation of De Leeuw his theorem(s) for arbitrary locally compact groups. In this talk we consider these "non-commutative" forms of De Leeuw's theorems: restriction, lattice approximation, periodization, et cetera. This is joint work with J. Parcet, M. Perrin and E. Ricard.

Rudolf Zeidler

Positive scalar curvature and secondary index theory on complete manifolds

We introduce secondary index invariants associated to complete Riemannian metrics on a (possibly non-compact) spin manifold which have uniformly positive scalar curvature (psc) outside a prescribed subset. Our definition includes as a special case the higher ρ-invariant of a psc metric as it has been studied in recent work of Piazza-Schick and Xie-Yu. We work in the setup of coarse geometry and employ the K-theory groups of Yu's localization algebras as receptacles for our secondary invariants. We present a construction of these invariants using only the functional calculus of the spinor Dirac operator and a description of K-theory for Z_2-graded C^*-algebras due to Trout. This approach allows simple proofs of various product formulas (cf. arXiv:1412.0685). As a consequence, we obtain a new proof of the secondary partitioned manifold index theorem of Piazza-Schick. As a further application, we explain how to use this theory to distinguish psc. metrics on non-compact spin manifolds up to concordance relative certain "coarsely negligible" subsets.

Sarah Browne

E-theory spectra

E-theory is a bivariant theory, being a cohomology theory in the first variable and a homology theory in the second variable. My talk will start by defining the E-theory groups which are defined on classes of morphisms of C^*-algebras. Then I will define the concept of a symmetric spectra before given the definition of the spectra for these groups. The construction is similar yet substantial simpler than the spectra for the KK-theory groups.

Nicolai Stammeier

Key facts and open questions related to boundary quotients for semigroups

I will present a rough overview on the status quo of boundary quotients for left cancellative, discrete (and right LCM) semigroups, as well as a list of related open problems. Topics to be mentioned (at least once) are: semigroup C^*-algebras (in the sense of Li), ring C^*-algebras, unital UCT Kirchberg algebras, K-theory, spectral sequences, algebraic dynamical systems, the accurate refinement property, tight groupoid of an inverse semigroup and covariance conditions for product systems over right LCM semigroups.

Ilija Tolich

C*-algebras generated by semigroups of partial isometries

Nica introduced a class of partially ordered groups called quasi-lattice ordered groups and studied the C*-algebras generated by semigroups of isometries satisfying a covariance condition. For each quasi-lattice ordered group we can construct a universal algebra generated by a family of covariant isometries, such that, for any other algebra B, generated by a family of covariant isometries, there exists a representation of the universal algebra onto B. Interestingly the representation onto the reduced algebra generated by the left regular representation is faithful if and only if the quasi-lattice ordered group satisfies a condition Nica called amenability. Many interesting examples of amenable quasi-lattice ordered groups have arisen since, including groups that are not amenable in the usual group definition, such as the free semigroup on n generators.

Studying partial isometries adds interesting complications to the theory. We must add a second partial order to our semigroups, working with doubly quasi-lattice ordered groups. I will describe the universal algebras generated by semigroups of partial isometries and when doubly quasi-lattice ordered groups are amenable in Nica's sense.

Based on work from my PhD thesis under the supervision of Professor Astrid an Huef and Professor Iain Raeburn.

Cyril Houdayer

Asymptotic structure and rigidity of free product von Neumann algebras

I will give an overview of recent results obtained in joint work with Yoshimichi Ueda on the asymptotic structure and the rigidity of arbitrary free product von Neumann algebras. First, I will explain that in any free product von Neumann algebra, any amenable von Neumann subalgebra that has a diffuse intersection with one of the free components is necessarily contained in this free component. This result completely settles the problem of maximal amenability inside free product von Neumann algebras. Then I will present new Kurosh-type rigidity results for free product von Neumann algebras. Namely, I will explain that for any family of nonamenable factors belonging to a large class of (possibly type III) factors including nonprime factors, nonfull factors and factors with a Cartan subalgebra, the corresponding free product von Neumann algebra with respect to arbitrary states retains the cardinality of the family as well as each factor up to stable inner conjugacy, after permutation of the indices.

Peter Verraedt

Bernoulli crossed products without almost periodic weights

Crossed products with noncommutative Bernoulli actions were introduced by Connes as the first examples of full factors of type III. In [1], a complete classification of the factors $(P,\phi)^{\mathbb{F}_n} \rtimes \mathbb{F}_n$ was presented, where $\mathbb{F}_n$ is the free group and P is an amenable factor with an almost periodic state ϕ. In this talk, I will show a recent nonisomorphism result for Bernoulli crossed products that do not admit an almost periodic state or weight.

[1] Classification of type III Bernoulli crossed products. With Stefaan Vaes. Advances in Mathematics 281 (2015), 296–332. arXiv:1408.6414.

Hamed Nikpey

Injective operator spaces

Let V be an operator space. The injective envelope of the Paulsen operator system

$$S(V) = \begin{bmatrix} \mathbb{C}I_H & V \\ V^* & \mathbb{C}I_K \end{bmatrix} \subseteq B(H \oplus K)$$

has a canonical decomposition as $\begin{bmatrix} I_{11}(V) & I(V) \\ I(V)^* & I_{22}(V) \end{bmatrix}$, where $I_{11}(V)$ and $I_{22}(V)$ are injective C^*-algebras (by new products). It is well known that when $V \cong B(K,H)$ for Hilbert spaces H and K, then $I_{11}(V) \cong B(H)$. Conversely, I want to show that if $I_{11}(V) \cong \bigoplus_{i=1}^n B(H_i)$ where $H_1, \ldots, H_n$ are Hilbert spaces then there are Hilbert spaces $K_1, \ldots, K_n$ such that $V \cong \bigoplus_{i=1}^n B(K_i, H_i)$.

In continue, I want to show that an infinite dimensional injective operator space has an infinite dimensional operator subspace completely isometric to the row or column Hilbert spaces or ℓ^∞. Finally, I want to characterize injective operator spaces V and W for which $V \check{\otimes} W$ is injective.

Magdalena Georgescu

Spectral flow and type II factors

In the context of bounded operators on a Hilbert space, spectral flow counts the net number of eigenvalues which change sign as one travels along a path of self-adjoint Fredholm operators. Spectral flow can be used to calculate the pairing between K-theory and K-homology, making it of interest in the study of noncommutative geometry. It is possible to generalize the concept of spectral flow to semifinite von Neumann algebras, whereby the associated trace can be used to measure the net amount of spectrum which changes sign along a path of self-adjoint Breuer-Fredholm operators. In the type I case, Lesch showed that any groupoid homomorphism from the set of paths to the integers which satisfies a normalization property must cal-

culate the spectral flow. I will discuss a characterization of spectral flow for type II factors, mirroring this result of Lesch.

Chris Cave

Exactness of locally compact groups

In this talk we will generalise the result that exactness of the reduced cross product functor is equivalent to the existence of an amenable action on a compact space for locally compact second countable groups. This is joint work with Jacek Brodzki and Kang Li.

Jorge Castillejos

Colored equivalence for C*-algebras

In this talk I will introduce a notion of coloured equivalence for C*-algebras which is motivated by recent developments in the classification of nuclear C*-algebras. I will present some permanence properties and some applications. This is a joint work with Aaron Tikuisis and Stuart White.

Eusebio Gardella

Group representations on L^p-spaces

We study representations of a group G on L^p/spaces, for $p \in [1,\infty)$, and the associated Banach algebras $F^p_\lambda(G)$ [Herz, 1973] and $F^p(G)$ [Phillips, 2012]. These are, respectively, generalizations of the reduced group C^*-algebra, and the full group C^*-algebra, which are the cases $p = 2$ of this construction. While some classical results from group C^*-algebras carry over to the L^p-analogues (for instance, a characterization of amenability of G in terms of the canonical map from full to reduced), the algebras $F^p_\lambda(G)$ and $F^p(G)$ tend to be very rigid objects when p is not equal to 2. The main result of the talk a description of all contractive, unital maps $F^p_\lambda(G) \to F^p_\lambda(H)$ for discrete groups G and H, and for p not equal to 2. As an application, we show that if G is torsion free and p is not equal to 2, then $F^p_\lambda(G)$ does not contain any bi-contractive idempotent. Whether this also holds for $p = 2$ is a very relevant open problem.

This is based on joint work with Hannes Thiel.

Søren Knudby

Rigidity of group C*-algebras

To a group G one associates the (reduced) group C*-algebra $C^*_\lambda(G)$. A group is rigid (or more precisely, C^*_λ-rigid) if its C*-algebra completely remembers the group. In other words, G is rigid if, for any other group H, isomorphism $C^*_\lambda(G) \simeq C^*_\lambda(H)$ of the group C*-algebras implies isomorphism of the groups $G \simeq H$.

Torsion-free abelian groups are known to be rigid, but apart from this not much is known. I will present the first examples of torsion-free non-abelian groups that are rigid. The examples all lie in the class of torsion-free virtually abelian groups.

This is joint work with Hannes Thiel and Stuart White.

	Monday	Tuesday	Wednesday	Thursday	Friday
08:00 - 08:25	Registration				
08:30 - 08:55		Coffee	Coffee	Coffee	
09:00 - 09:25	Stefaan Vaes	Stefaan Vaes	Stefaan Vaes	Stefaan Vaes	
09:30 - 09:55					
10:00 - 10:25	Break	Break	Break	Poster session	Coffee
10:30 - 10:55	Afsar	Kwaśniewski	Kania		Stuart White
11:00 - 11:25	Wu	Schmidt	McKee	Stammeier	
11:30 - 11:55	Practical info	Ino	Caspers	Tolich	Break
12:00 - 12:25	Lunch	Lunch	Break	Lunch	Cave
12:30 - 12:55			Zeidler		Castillejos
13:00 - 13:25			Browne		Break
13:30 - 13:55			Excursion and lunch		Gardella
14:00 - 14:25	Stuart White	Stuart White		Stuart White	Knudby
14:30 - 14:55					
15:00 - 15:25	Break	Break		Break	
15:30 - 15:55	Dowerk	Huang		Houdayer	
16:00 - 16:25	Evington	He		Verraedt	
16:30 - 16:55	Break	Break		Break	
17:00 - 17:25	Thiel	Lecture commemorating Uffe Haagerup, by George Elliott		Nikpey	
17:30 - 17:55	Suzuki			Georgescu	
	Reception (with pizza and beer)			Dinner	