Titles and Abstracts:

Harmonic Analysis, Operators Algebras and Representation Theory

CIRM, October 22-26 2012

1. Rob Archbold

   Title: Norms of inner derivations for multiplier algebras of group C^*-algebras.

   Abstract: The derivation constant $K(A) \geq \frac{1}{2}$ has been previously studied for *unital* non-commutative C^*-algebras A. For a non-unital C^*-algebra A, the natural unitization in the context of derivations is the multiplier algebra $M(A)$. After a brief historical account of the theory of $K(A)$, we shall describe some C^*-theoretic results for $K(M(A))$ and apply these to $A = C^*(G)$ for a number of locally compact groups G including $SL(2,\mathbb{R})$, $SL(2,\mathbb{C})$ and the classical motion groups $\mathbb{R}^N \rtimes SO(N)$. If G is a (non-abelian) amenable [SIN]-group then $K(M(A)) = \frac{1}{2}$. This is joint work with Eberhard Kaniuth and Douglas Somerset.

2. Martin Argerami

   Title: C^*-envelopes of singly generated operator systems

   Abstract: An Operator System is a unital selfadjoint subspace of a C*-algebra, considered as a category where the morphisms are the completely positive maps. Here we study operator systems generated by a single operator. Such operator systems are necessarily 2 or 3 dimensional, a fact that would make one think that they are easy to understand: after all, all 3-dimensional complex vector spaces are isomorphic to $\mathbb{C}^3$, and all even all 3-dimensional C*-algebras are isomorphic to $\mathbb{C}^3$. But it turns out that no such easy characterization exists. We will address this problem, and the problem of finding the minimal C*-algebra generated by such an operator system.

3. Marek Bozejko

   Title: Positive definite functions and Riesz products on Coxeter groups with applications

   Abstract: In my talk I will consider the following topics:

   1.The lengths functions on Coxeter groups. 2.Riesz products on Coxeter groups and its positivity. 3.If (W,S) is Coxeter group ,then S is Sidon set. 4.Operator version of Khinchine inequality. 5.The normal law N(0,1) and theta functions of Jacobi are infinitely divisible in the free probability.

   References:

   (a) Serban T. Belinschi, Marek Bozejko, Franz Lehner, and Roland Speicher. The normal distribution is free infinitely divisible. Adv.Math.,226(4):3677-3698, 2011.

   (b) Marek Bozejko,Deformed Fock spaces, Hecke operators and monotone Fock space of Muraki, Demonstartio Math.,Vol. XLV No 2 ,2012.

   (c) M.Bozejko, S.Gal, W.Mlotkowski, Positive definite functions on Coxeter groups with applications to operators spaces and noncommutative probability, Preprint 2012,23 pp.

   (d) M.Anshelevich, S.Belinschi ,M.Bozejko, F.Lehner, Free infinite divisibility for q - Gaussians, Math.Res.Lett.17(2010), 909-920.

4. Yemon Choi

   Title: Can quotients of the Fourier algebra be operator algebras?

   Abstract: When can a quotient of $A(G)$ be isomorphic to an infinite-dimensional subalgebra of $\mathcal{B}(H)$? We discuss some well-known positive answers when isomorphism is taken in the Banach algebra category, and use this to give explicit examples of bounded representations

of $A(G)$ on Hilbert space that are not similar to $*$-representations. We then mention some partial negative results when isomorphism is taken in the sense of completely contractive Banach algebras, and present some unresolved questions. Some of these can be reformulated in terms of embedding $\mathrm{MAX}(\ell_1)$ into C^*-algebras in certain restricted ways.

This is joint work with E. Samei (Saskatchewan).

5. Cho-Ho Chu

   Title: Harmonic functions on hypergroups

   Abstract: We introduce the concept of a harmonic function on a hypergroup and explain the background. Properties of these functions and an application will be discussed.

6. Michael Cowling

   Title: Hardy's theorem without complex analysis.

   Abstract: Hardy showed that, if f is a function on $\mathbb{R}$ that satisfies $|f(x)| \leq C\exp(() - x^2/2)$ and $|\hat{f}(y)| \leq C\exp(() - y^2/2)$ for all $x, y \in \mathbb{R}$ (where $\hat{f}$ is the Fourier transform of f and C is a positive constant), then $f(x) = c\exp(() - x^2/2)$ (where c is a complex constant). The proof uses complex analysis, and is hard to generalise for this reason. Indeed, there are many generalisations of related results to Lie groups, but few of this theorem. We survey progress on finding proofs without complex analysis.

7. Tim De Laat

   Title: Simple Lie groups without the Approximation Property

   Abstract: In 2010, Lafforgue and de la Salle proved that for n ¿ 2, the group SL(n,R) does not have the Haagerup-Kraus Approximation Property (AP). In this talk, I will present the results from a joint work with Uffe Haagerup, in which we proved that also Sp(2,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. A key element of the proof are certain Hoelder continuity conditions of spherical functions for certain compact Gelfand pairs.

8. Antoine Derighetti.

   Title: Approximation of convolution operators by discrete measures.

   Abstract. Using the Banach algebra Bp(G) I treat the problem of approximation of L^p convolution operators by discrete measures.

9. Tony Dooley

   Title: Orbital Convolutions and the Kirillov formula.

10. Michel Duflo

    Title : Frobenius Lie subalgebras of simple Lie algebras.

    Abstract : A Frobenius Lie algebra is a Lie algebra for which the coadjoint action has an open orbit. I present results on Frobenius Lie subalgebras of a simple complex Lie algebra which contain a Cartan subalgebra, with a special emphasis on the "Ooms spectrum" (the Ooms spectrum is an equivalent for Frobenius Lie algebras of the set of exponents of a simple Lie algebra). This is a joint work with M. S. Khalgui and P. Torasso.

11. Rachid Elharti

    Title: The profinite completion of Group-C*-algebras

    Abstract: In this talk we discuss the connection between the group $C*$-algebra $C*(G)n$ of a locally compact group G and the group $C*$-algebra of the profinite completion of this group G. For that, we introduce a new definition called the profinite structure on $C*$-algebras wihch will permit to establish this connection.

12. Jacques Faraut

    Title: Invariant differential operators on the Heisenberg group and Meixner-Pollaczek polynomials.

    Abstract.: Consider the Heisenberg Lie algebra with basis X, Y, Z, such that $[X, Y] = Z$. Then the symmetrization $\sigma(X^n Y^n)$ can be written as a polynomial in $\sigma(XY)$ and Z, and this polynomial is identified as a Meixner-Pollaczek polynomial. This is a result by Bender, Mead and Pinsky, whose Koornwinder gave an alternative proof (1988), by using the Schrödinger representation. We extend this result in the framework of Gelfand pairs associated with the Heisenberg group. This extension involves multivariate Meixner-Pollaczek polynomials. This is a joint work with Masato Wakayama.

13. Gero Fendler

    Title: Aspects of the finite Fourier transform of prime order, Uncertainty and Eigenvectors of small support.

    Abstract: The uncertainty principle gives restrictions on the support of a vector and the support of its Fourier transform. We show how to construct a basis of eigenvectors with smallest support. (Joint work with Norbert Kaiblinger)

14. Mahmoud Filali

    Title: Extreme non-Arens regularity

    Abstract: In 1965, Pym considered the space $WAP(A)$ of weakly almost periodic functionals on a Banach algebra A, and showed that A is Arens regular if and only if $WAP(A) = A^*$. Thirty years later, Pyms result was countered by the notion of extreme non-Arens regularity introduced by Granirer. Granirer said that the Banach algebra A is ex- tremely non-Arens regular if $A^*/WAP(A)$ contains a closed linear sub- space which has A^* as a continuous linear image, and he proved that the Fourier algebras $A(\mathbb{R})$ and $A(\mathcal{T})$ are extremely non-Arens regular. In 1997, Hu generalized Granirers results to many other locally com- pact groups. We discuss in this talk further developments on extreme non-Arens regularity.

    Joint work with Jorge Galindo.

15. Junko Inoue

    Title: The Fourier transform of the C^*-algebra of a solvable Lie group : An example

    Abstract: We will discuss a description of the C^*-algebra of a solvable Lie group in terms of algebras of operator fields defined over its dual space. As an example, we treat a six dimensional connected and simply connected Lie group whose Lie algebra is a normal j-algebra.

    This is a joint work with Ying-Fen Lin and Jean Ludwig.

16. Toshiyuki Kobayashi

    Title: Finite Multiplicity Theorems and Real Spherical Varieties.

    Abstract: I plan to discuss geometric conditions that control the multiplicities of irreducible representations of real reductive groups occurring in branching laws (restriction) and Plancherel formulas (induction).

17. Yulia Kuznetsova

    Title A duality of locally compact groups that does not involve the Haar measure

    Abstract: We present a simple and intuitive framework for duality of locally compacts groups, which is not based on the Haar measure. This is a functor on the category of Hopf C^*-algebras, and a similar functor on the category of coinvolutive Hopf-von Neumann algebras. In the C^*-version, this functor sends $C_0(G)$ to $C^*(G)$ and vice versa, for every locally compact group G. As opposed to preceding approaches, there is an explicit description of commutative

and co-commutative algebras in the range of this functor (without assumption of being isomorphic to their bidual): these algebras have the form $C_0(G)$ or $C^*(G)$ respectively, where G is a locally compact group. The von Neumann version of the functor puts into duality, in the group case, the enveloping von Neumann algebras of the algebras above: $C_0(G)^{**}$ and $C^*(G)^{**}$.

18. Christian Le Merdy

    Title: Gamma-bounded representations of amenable groups

    Abstract: Let G be an amenable group, let X be a Banach space and let $\pi\colon G \to B(X)$ be a bounded representation. We show that if the set $\{\pi(t) : t \in G\}$ is gamma-bounded, then π extends to a bounded homomorphism $C^*(G) \to B(X)$ on the group C^*-algebra of G. This extends to the Banach space setting a theorem of Day and Dixmier saying that any bounded representation of an amenable group on Hilbert space is unitarizable. We give applications to single operator theory on Banach space.

19. Hun Hee Lee

    Title: Beurling-Fourier algebras of compact quantum groups: characters and finite dimensional representations

    Abstract: In this talk we will consider weighted versions of Fourier algebras of compact quantum groups. In the case of compact groups Ludwig/Spronk/Turowska recently showed that the spectrum of the resulting commutative Banach algebra reflects the structure of the complexification of the original group. We would like to continue the same line of research in the setting of compact quantum groups. We will focus on the characters and finite-dimensional representations of these Banach algebras with connection to complexifications. Our examples include quantum orthogonal groups, quantum unitary groups and $SU_q(2)$. This is a joint ongoing project with Uwe Franz.

20. Michael Leinert

    Title: Some characterisations of compact groups

    Abstract: Let G be a locally compact group. We give a number of characterisations of compactness of G in terms of its Fourier-Stieltjes algebra. (Joint work with G.Fendler and A.T.Lau).

21. Viktor Losert

    Title : Multipliers and completely bounded multipliers of the Fourier algebra. The case $SL(2, \mathbb{C})$

    Abstract: In earlier investigations, we have described the multipliers of the Fourier algebra of the group $SL(2, \mathbb{R})$ and showed that all multipliers are completely bounded. In this talk, we will review these results and discuss the situation for the group $SL(2, \mathbb{C})$.

22. Matthew Mazowita

    Title: A weighted compactification of a locally compact group

    Abstract: Let G be a locally compact group. The spectrum of the algebra of left uniformly continuous functions on G is a compact semigroup called the LUC-compactification of G. This compactification densely contains the group, has topological centre equal to the group, and identifies the group. Now consider a weight on the group. The spectrum of the algebra of weighted left uniformly continuous functions on G is homeomorphic to the LUC-compactification but fails to be a semigroup for most weights. I investigate the algebraic properties of this "weighted compactification" and the extensions of the topological centre and identification results. I will also present some applications to Beurling (weighted convolution) algebras and one- and two-point sets which determine the topological centres of the weighted compactification, the dual of weighted LUC, and the second duals of Beurling

(weighted convolution) algebras (with a mild assumption on the weight), extending recent result of Budak, Isik, and Pym.

23. Vladimir Molchanov

    Title: Berezin quantization as a part of the representation theory.

    Let G/H be a para-Hermitian symmetric space, $\varkappa$ the genus of the corresponding Jordan pair. We can consider that G/H is a manifold in the Lie algebra $\mathfrak{g}$ of G. We construct quantization on G/H in the spirit of Berezin, similarly to Berezin's scheme for Hermitian spaces G/K. Namely, we define co- and contravariant symbols of operators and define the Berezin transform, which transfers contravariant symbols to covariant ones; its kernel (a function) gives a multiplication of covariant symbols. In particular, for an initial algebra operators, let us take the algebra of operators $D = \pi_\lambda^-(X)$, where X runs the universal enveloping algebra $\mathrm{Env}\,(\mathfrak{g})$ and π_λ^-, $\lambda \in \mathbb{C}$, is a maximal degenerate series representation. Then symbols turn out to be polynomials on G/H. It is why we call this variant the *polynomial* quantization. Let $\widetilde{R}_\lambda$ be a maximal degenerate series representation of the "overgroup" $widetildeG = G \times G$ (in fact, $\widetilde{R}_\lambda$ is the tensor product $\pi_\lambda^- \otimes \pi_\lambda^+$ of maximal degenerate series representations of G). It can be realized in functions on G/H. Let us restrict $\widetilde{R}_\lambda$ to component subgroups $G_1 = G \times e$ and $G_2 = e \times G$ and pass from G to $\mathrm{Env}\,(\mathfrak{g})$. Applying $\widetilde{R}_\lambda(0, X)$ and $\widetilde{R}_{-\lambda-\varkappa}(X, 0)$ to the function f_0 on G/H identyically equal to 1, we obtain precisely co- and contravariant symbols of the operator D respectively. The Berezin transform is the tensor product of operators intertwining $\pi^\pm_{-\lambda-\varkappa}$ with $\pi^\mp_\lambda$.

24. Matthias Neufang

    Title:

    Quantum group amenability, injectivity, and a question of Bédos–Tuset

    Abstract: As is well known, the equivalence between amenability of a locally compact group G and injectivity of its von Neumann algebra $\mathcal{L}(G)$ does not hold in general beyond inner amenable groups. In this talk, we show that the equivalence persists for all locally compact groups if injectivity takes into account the convolution action of $\mathcal{T}(L_2(G))$. In fact, we prove a version of this result for every locally compact quantum group $\mathbf{G}$. As a consequence, we answer affirmatively an open problem on quantum group amenability posed by E. Bédos and L. Tuset in 2003, generalizing V. Runde's result concerning the co-amenable case. We shall further see that quantum group properties such as amenability and compactness can be completely characterized through homological properties of natural $\mathcal{T}(L_2(\mathbf{G}))$-modules.

    The talk is based on joint work with my Ph.D. student Jason Crann, as well as earlier work with Zhiguo Hu and Zhong-Jin Ruan.

25. Chi-Keung Ng

    Title: A Murray-von Neumann type classification of C^*-algebras

    Abstract: We define type $\mathfrak{A}$, type $\mathfrak{B}$, type $\mathfrak{C}$ as well as C^*-semi-finite C^*-algebras.

    It is shown that a von Neumann algebra is a type $\mathfrak{A}$, type $\mathfrak{B}$, type $\mathfrak{C}$ or C^*-semi-finite C^*-algebra if and only if it is, respectively, a type I, type II, type III or semi-finite von Neumann algebra. Any type I C^*-algebra is of type $\mathfrak{A}$ (actually, type $\mathfrak{A}$ coincides with the discreteness as defined by Peligrad and Zsidó), and any type II C^*-algebra (as defined by Cuntz and Pedersen) is of type $\mathfrak{B}$. Moreover, any type $\mathfrak{C}$ C^*-algebra is of type III (in the sense of Cuntz and Pedersen). Conversely, any purely infinite C^*-algebra (in the sense of Kirchberg and Rördam) with real rank zero is of type $\mathfrak{C}$, and any separable purely infinite C^*-algebra with stable rank one is also of type $\mathfrak{C}$.

    We also prove that type $\mathfrak{A}$, type $\mathfrak{B}$, type $\mathfrak{C}$ and C^*-semi-finiteness are stable under taking hereditary C^*-subalgebras, multiplier algebras and strong Morita equivalence. Furthermore, any C^*-algebra A contains a largest type $\mathfrak{A}$ closed ideal $J_\mathfrak{A}$, a largest type $\mathfrak{B}$ closed ideal $J_\mathfrak{B}$,

a largest type $\mathfrak{C}$ closed ideal $J_{\mathfrak{C}}$ as well as a largest C^*-semi-finite closed ideal $J_{\mathfrak{sf}}$. Among them, we have $J_{\mathfrak{A}} + J_{\mathfrak{B}}$ being an essential ideal of $J_{\mathfrak{sf}}$, and $J_{\mathfrak{A}} + J_{\mathfrak{B}} + J_{\mathfrak{C}}$ being an essential ideal of A. On the other hand, $A/J_{\mathfrak{C}}$ is always C^*-semi-finite, and if A is C^*-semi-finite, then $A/J_{\mathfrak{B}}$ is of type $\mathfrak{A}$.

Finally, we show that these results hold if type $\mathfrak{A}$, type $\mathfrak{B}$, type $\mathfrak{C}$ and C^*-semi-finiteness are replaced by discreteness, type II, type III and semi-finiteness (as defined by Cuntz and Pedersen), respectively.

[It is a joint work with Ngai-Ching Wong]

26. Takkaki Nomura

    Title: Homogeneous convex cones and the basic relative invariants associated to representations of Euclidean Jordan algebras

    Abstract: Let V be a finite-dimensional Euclidean Jordan algebra. To each selfadjoint representation φ of V on a real Euclidean space, we define a clan in the sense of Vinberg, and consider the corresponding homogeneous convex cone and the basic relative invariants. The cone contains a real homogeneous Siegel domain associated to φ as a cross-section with a hyperplane. We also look at the dual cone, which turns out to generalize the cone that appeared as a certain example in the previous paper written with Ishi published in Math. Z., 2008. This is a joint work with Hideto Nakashima, a student of mine.

27. Narutaka Ozawa

    Title: Survey on the classification of von Neumann factors of type II_1

    In the early 40s, Murray and von Neumann found that discrete groups and their measure-preserving actions on probability spaces give rise to von Neumann factors of type II_1, and posed the classification problem. Thirty years later, Connes gave the celebrated classification theorem for injective von Neumann algebras which implies the uniqueness of von Neumann factors arising from amenable groups (and their actions). Even though the complete classification beyond amenable cases is impossibly di cult, one tries to distinguish them as much as one can. A decade ago, Popa discovered that the tension between amenability and rigidity can be used to unfold the structure of factors of type II_1. Since Popa's breakthrough, the classification theory of von Neumann factors of type II_1 has seen remarkable progress. It also found exciting interaction with ergodic and geometric group theory and descriptive set theory. I will survey these progresses, with an emphasis on rigidity phenomena in the classification theory.

28. Okayasu Rui

    Title : Free group C^*-algebras associated with ℓ_p.

    Abstract :

    We consider the free group C^*-algebra associated with ell_p, which is defined by N. P. Brown and E. Guentner. More precisely, they introduce new C^*-completion of the group ring of a countable discrete group for a given algebraic ideal. We give a characterization of positive definite functions on a free group with finitely many generators, which can be extended to the positive linear functionals on the free group C^*-algebra associated with ℓ_p. This is the complete generalization of Haagerup's characterization for the case of the reduced free group C^*-algebra. As a consequence, the associated C^*-algebras are mutually non-isomorphic, and they have a unique tracial state.

29. Volker Runde

    Title: Beurling–Figà-Talamanca–Herz algebras

    Abstract: For a locally compact group G and $p \in (1, \infty)$, we define and study the Beurling–Figà-Talamanca–Herz algebras $A_p(G, \omega)$. For $p = 2$ and abelian G, these are precisely the

Beurling algebras on the dual group $\widehat{G}$. For $p = 2$ and compact G, our approach subsumes an earlier one by H. H. Lee and E. Samei. The key to our approach is not to define Beurling algebras through weights, i.e., possibly unbounded continuous functions, but rather through their inverses, which are bounded continuous functions. We prove that a locally compact group G is amenable if and only if one and, equivalently, every Beurling-Figà-Talamanca-Herz algebra $A_p(G, \omega)$ has a bounded approximate identity.

30. Ebrahim Samei

    Title: Amenability properties for the centres of certain discrete group algebras.

    Abstract: Let G be a discrete group with finite conjugacy classes, and let $Zl^1(G)$ denote the centre of its group algebra. In this talk, we study various properties of $Zl^1(G)$, such as amenability and its spectrum, for the case where G is a restricted direct product of finite groups $\{G_i\}_{i\in I}$. Among other things, we show that $Zl^1(G)$ is amenable if and only if G_i is abelian for all but finitely many i, and characterize maximal ideals of $Zl^1(G)$ with bounded approximate identities. We also calculate the exact amenability constant of $Zl^1(G)$ for certain finite metabelian groups G.

    This is a joint work with M. Alaghmandan and Y. Choi.

31. Roger Smith

    Title: Spatial isomorphism of certain close von Neumann algebras

    Abstract: Kadison and Kastler introduced a metric between two operator algebras on a Hilbert space in terms of the Hausdorff distance between their unit balls, and conjectured that sufficiently close operator algebras should be isomorphic. This was verified by Christensen when one of the algebras was an amenable von Neumann algebra. In the talk I will present the first examples of nonamenable von Neumann factors which are isomorphic to all sufficiently close neighboring algebras. This is joint work with Jan Cameron, Erik Christensen, Allan Sinclair, Stuart White and Alan Wiggins.

32. Nico Spronk

    Title: p-Operator spaces and harmonic analysis

    Abstract: The notion of completely bounded maps generalises readily from subspaces of bounded operators on Hilbert spaces to operators on L^p-spaces. This compels one to examine p-operator space structures on mapping spaces and dual spaces. Recently M. Daws applied this to study problems on Figà-Talamanca–Herz algebras $A_p(G)$ for locally compact groups G. Serap Öztop and I continue in this vein and introduce a version Feichtinger's Segal algebra $S^p_0(G)$ in $A_p(G)$. One of the benefits is that this category offers an appropriate version of the projective tensor product which allows that $S^p_0(G)\hat{\otimes}^p S^p_0(H) = S^p_o(G \times H)$. This result is new, even for abelian groups. I discuss other functorial properties of $S^p_0(G)$.

33. Keith F. Taylor

    Title: Harmonic Analysis on [AR]-Groups

    Abstract: A locally compact group is called an [AR]-group if its regular representation is a direct sum of irreducible representations. This class contains the compact groups and more. The affine group of the real line, the shearlet group, and other non-compact [AR]-groups play a fundamental role in the theory of wavelet analysis. In this talk, we will explore what we know about explicit harmonic analysis on [AR]-groups and formulate some questions we believe should be answered.

34. Lyudmila Turowska

    Title: Sets of multiplicity and closable multipliers on group algebras.

    Abstract: W.Arveson in his fundamental paper (Ann.Math.,1974) discovered an interplay between the invariant subspace and operator algebra theory and spectral synthesis in harmonic

analysis. We develop further his ideas and establish new connections with harmonic analysis, in particular, sets of multiplicity (M-sets). M-sets in commutative harmonic analysis arose in connection with problems of uniqueness of trigonometric series. J.Froelich (J.Funct.Anal., 1988) found a connection between M-sets and the property of operator algebra associated with a commutative subspace lattice to contain a nonzero compact operator. Recently we observed also a connection with the property of certain Schur type transformations on the space of compact operators to be closable. This motivated us to generalize the notion of multiplicity sets to general locally compact groups, define their operator counterparts and study multipliers of group algebras closable in different topologies. In this talk we will discuss the notions, their properties and connection with operator theory. This is a joint work with V.Shulman and I.Todorov.

35. Ivan Todorov

    Title: A formula involving annihilators

    Abstract: This talk will be based on a joint work with M. Anoussis and A. Katavolos. Using techniques, developed by J. Ludwig, N. Spronk and L. Turowska, we establish a formula that links the annihilator of a closed ideal J of the Fourier algebra A(G) of a locally compact group G, in the von Neumann algebra of G, to the saturation of J within the trace class on $L^2(G)$. The result has several consequences: in case of amenable groups, it extends the results of Ludwig-Spronk-Turowska on the relation between spectral and operator synthesis; it provides a short route to results of Parthasarathy-Prakash on relative operator synthesis, and it allows us to identify the weak* closed subspaces acting on $L^2(G)$ that are invariant under both Schur multiplication and the action of the measure algebra of G as completely bounded maps on the space of bounded linear operators on $L^2(G)$, studied by Smith-Spronk and Neufang-Ruan-Spronk.

36. Alain Valette

    Title: Easy examples of non-amenable groups without free subgroups, after N. Monod.

    Abstract: Let A be a subring of real numbers, not reduced to the integers. Nicolas Monod just showed that the stabilizer of ∞ in the group of homeomorphisms of $P^1(\mathbb{R})$ which are piecewise $PSL_2(A)$, is an example of a non-amenable group without free non-abelian subgroup. Moreover these groups have extra properties that make them look like amenable groups: they are inner amenable, all their L^2-Betti numbers are zero...

37. Armando R. Villena
    Title: Spectral isometries
    (joint work with J. Alaminos and J. Extremera, Granada)

    Abstract: Let $\mathcal{A}$ and $\mathcal{B}$ be unital primitive Banach algebras with minimal idempotents. We prove that every surjective spectral isometry from $\mathcal{A}$ onto $\mathcal{B}$ is of the form $\lambda\Psi$ where $\lambda \in \mathbb{C}$ with $|\lambda| = 1$ and Ψ is either an isomorphism or an anti-isomorphism from $\mathcal{A}$ onto $\mathcal{B}$. As an application we show that, for all Banach spaces X and Y, the spectral nearisometries and the approximate spectrum-preserving maps from $\mathcal{L}(X)$ onto $\mathcal{L}(Y)$ are perturbations of actual spectral isometries and spectrum-preserving maps, respectively.

38. Ami Viselter

    Title: Locally compact quantum groups and amenability

    Abstract: We will begin by introducing the Kustermans-Vaes definition of locally compact quantum groups (LCQGs). Then, after reviewing the definition of amenability for locally compact groups, we will present its generalization(s) to LCQGs, and relate several problems of current research connected with these notions.

39. Zhang Yong

    Title: Approximate diagonals for function and semi-group algebras

Let A be a Banach algebra. An approximate diagonal for A is a net $\{u_\alpha\} \subset A\widehat{\otimes}A$ that satisfies $a \cdot u_\alpha - u_\alpha \cdot a \xrightarrow{\alpha} o$ and $\pi(u_\alpha)a \xrightarrow{\alpha} a$ for all $a \in A$, where $\widehat{\otimes}$ denotes the projective tensor product and $\pi\colon A\widehat{\otimes}A \to A$ is the multiplication mapping defined by $\pi(a \otimes b) = ab$. It is well-known that A is amenable if and only if there exists a bounded approximate diagonal for it. If A has a bounded approximate identity, then A is approximately amenable if and only if there is an approximate diagonal for it.

In this talk we will focus on the construction of approximate diagonals for some Banach algebras associated to semigroups and continuous functions.