Saturday 9/13
8:00
refreshments
8:50-9:00 Welcome
9:00- 9:50 Bezuglyi
10:00-10:25 Kaneda
refreshments
10:50-11:40 Milan
[lunch]
1:40-2:30 Packer
refreshments
3:00-3:50 Giol
4:00-4:50 Blecher
[dinner]

Sunday 9/14
8:50- 9:40 Loring
refreshments
10:10-11:00 Shulman
11:10-12:00 Kumjian

Sergey Bezuglyi

Title: Stationary Bratteli diagrams in Cantor dynamics

Abstract: Every aperiodic homeomorphism of a Cantor set can be realized as a Vershik map acting on the path space of a Bratteli diagram. We study the class of homeomorphisms which can be represented as Vershik maps of stationary Bratteli diagrams. It is proved that the Vershik map F of a stationary Bratteli diagram is topologically conjugate to an aperiodic substitution dynamical system if and only if no restriction of F to a minimal component is conjugate to an odometer. We prove that every aperiodic substitution system generated by a substitution with nesting property is conjugate to a Vershik map of a stationary Bratteli diagram. Every aperiodic substitution system is recognizable.

For stationary Bratteli diagrams, we explicitly describe all ergodic probability non-atomic measures invariant with respect to the tail equivalence relation (or the Vershik map). These measures are completely found by the incidence matrix of the diagram. Since such diagrams correspond to substitution dynamical systems, this description gives a feasible algorithm of finding invariant probability measures for any aperiodic substitution system. Several corollaries of these results are obtained. In particular, we show that the invariant measures are not mixing and give a criterion for a complex number to be an eigenvalue for the Vershik map.

The talk is based on the results proved jointly with J. Kwiatkowski, K. Medynets, and B. Solomyak.

David Blecher

Title: Unital operator spaces and systems: metric characterization and duality

Abstract: In the first part of the talk (Joint work with M. Neal), we give some new characterizations, of unitaries, isometries, unital operator spaces, unital function spaces, function systems, operator systems, C^*-algebras, and related objects. In the second part (joint work with B. Magajna), we investigate the duality of operator systems and unital operator spaces. For example, we particular characterize weak* closed unital operator spaces and systems, and dual function systems. If time permits we will discuss some new applications to von Neumann algebraic H^p theory (joint with L. Labuschagne).

Julien Giol

Title: Hyperreflexivity and derivations

Abstract: Is every von Neumann algebra hyperreflexive? We will make some remarks on Arveson's question, with a focus on its relation to the derivation problem.

Masayoshi Kaneda

Title: Multipliers and Extreme Points of Operator Spaces

Abstract: In the first part of the talk, we give alternative definitions of one-sided multipliers and quasi-multipliers of operator spaces. Then we characterize the operator algebras that have an (approximate) contractive (one-sided) identity in terms of quasi-multipliers and extreme points. We also give an operator space characterization of C*-algebras and their one-sided ideals. In the second part, we show that a ternary ring of operators with predual can be decomposed to the direct sum of a two-sided ideal, a left ideal, and a right ideal of some von Neumann algebra. Using this decomposition, we give a definition of two-sided multipliers of operator spaces which generalize two-sided multipliers of C*-algebras.

Alex Kumjian

Title: On k-morphs

Abstract:

Many interesting C*-algebras arise from the study of k-graphs. A k-morph between two k-graphs yields a $(k+1)$-graph. Isomorphism classes of k-morphs form a category. There is a functor from a subcategory to a certain category of C*-algebras.

This is joint work with David Pask and Aidan Sims of the University of Wollongong.

Terry Loring

Title: Amalgamated products and extensions of C*-algebras

Abstract:

There is an interplay between some full amalgamated free products and extensions. These extension provide examples of amalgamated products where the K-theory is relatively easy to compute.

Going the other way, the amalgamated product picture can provide a way to relate star-homomorphisms defined on a C*-algebra to star-homomorphisms defined on an ideal.

This will be discussed in the contexts of semiprojectivity, MF algebras and asymptotic morphisms.

David Milan

Title: On the C*-algebras of E-unitary inverse semigroups

Abstract: Many of the well known C*-algebras generated by partial isometries are generated by an inverse semigroup of partial isometries. Usually the semigroup is an ideal quotient of an E-unitary inverse semigroup. We show that the proof of the P-theorem, a well known structure theorem for E-unitary inverse semigroups, naturally leads to a partial crossed product description of the C*-algebra of such semigroups.

Using Abadie's work on enveloping actions for partial actions, we describe a special class of E-unitaries whose C*-algebras are Morita equivalent to crossed products by (full) group actions. This allows us to explain some connections between our work and earlier work of Khoshkam and Skandalis.

This is joint work with B. Steinberg.

Judith A. Packer

Title: Filters, isometries, and wavelet representations of the Baumslag-Solitar group

Abstract: We consider filter banks associated to the dilation $x \to Nx$ on R, where N be a positive integer greater than 1. These consist of a family of Borel functions $m_i : \mathbf{T} \to \mathbf{C},\ 0 \leq i \leq N-1$ satisfying

$$\sum_{k=0}^{N-1} m_i(ze^{\frac{2\pi ik}{N}})\overline{m_j(ze^{\frac{2\pi ik}{N}})} \ = \ N\delta_{i,j},\ \text{a.e}\ z \in \mathbf{T}.$$

Usually, but not always, one wants $m_0(1) = \sqrt{N},\ m_0$ Lipschitz at 1 and non-vanishing in a large enough neighborhood of 1. In 1997 O. Bratteli and P. Jorgensen showed that defining operators $\{S_i :\ 0 \leq i \leq N-1\}$ on $L^2(\mathbf{T})$ by

$$S_i(f)(z) \ = \ m_i(z)f(z^N),\ 0 \leq i \leq N-1,$$

the family $\{S_i\}$ are isometries and give a representation of the Cuntz algebra $\mathcal{O}_N$ on $L^2(\mathbf{T})$. This talk will discuss to what extent one can relax the conditions on the filters $\{m_i\}$ and still come up with generalized filter banks that give rise to pure isometries on more general Hilbert spaces, and what sort of relations the isometries satisfy. These isometries can be used to construct directly a variety of generalized multiresolution analyses in wavelet and frame theory.

At the same time, one can use these filters to construct representations of the Baumslag-Solitar group BS_N, that is, the group with two generators a and b satisfying the single relation $aba^{-1} = b^N$. We discuss what knowledge can be gleaned about these representations from the filter banks.

This is ongoing joint work with L. Baggett, N. Larsen, K. Merrill, I. Raeburn and A. Ramsay.

Tatiana Shulman

Title: On some lifting problems in C*-algebras

Abstract: For the standard epimorphism from a C*-algebra A to its quotient A/I by a closed ideal I, one may ask whether an element b in A/I with some specific properties is the image of some element a in A with the same properties. This is known as a lifting problem that can be considered as a non-commutative analogue of extension problems for functions. I am going to discuss some lifting problems connected with the notion of projectivity and semiprojectivity for C*-algebras, in particular the question about lifting of nilpotent contractions posed by T. Loring.