

GPOTS 2008 Abstracts

Charles Akemann, University of California St. Barbara.

Title: The Kadison-Singer Problem for type II_1 factors and related questions

Abstract: NOTATION: M is a type II_1 factor and A is a MASA of M .

QUESTION: Do the pure states of A have unique extensions to pure states of M ?

PARTIAL ANSWER: Sometimes the answer is NO.

FACT: There is a unique normal conditional expectation $E : M \rightarrow A$.

QUESTION: If f_0 is a pure state of A and if $f = f_0 \circ E$, is f a pure state of M ?

PARTIAL ANSWER: Sometimes the answer is YES.

QUESTION: Does this have any relevance to the original Kadison-Singer Problem?

PARTIAL ANSWER: maybe

Maria Laura Arias, Instituto Argentino de Matematica- Argentina.

Title: Classes of operators in semi-Hilbertian spaces

Abstract: We consider a Hilbert space H with an additional semi inner product defined by a positive semidefinite operator A , namely $\langle \xi, \eta \rangle_A = \langle A\xi, \eta \rangle$ for every $\xi, \eta \in H$. Our goal is to describe classes of operators which are Hermitian, isometric, unitary or partially isometric with respect to $\langle \cdot, \cdot \rangle_A$. It must be observed that this additional structure induces an adjoint operation. However, this operation is defined for not every bounded linear operator on H , unless A is invertible. Operators T which are selfadjoint with respect to $\langle \cdot, \cdot \rangle_A$ in the sense that $\langle T\xi, \eta \rangle_A = \langle \xi, T\eta \rangle_A$ for every $\xi, \eta \in H$ are called "symmetrizable" (with respect to A) and they have been studied since longtime. For those operators T which admit an adjoint with respect to $\langle \cdot, \cdot \rangle_A$, we choose one, denoted by $T * A$, which has similar, but not identical, properties as the classical T^* .

Since not every operator admits an A - adjoint and, in case it admits one, it may have many others, then the extensions of isometries, unitary and partial isometries are not trivial. Many of the descriptions are easier if the range $R(A)$ is closed. Moreover, for describing the class of A -partial isometries which is our main goal, we need an additional hypothesis, known as compatibility in the recent literature. A closed subspace K and a positive (semidefinite) operator A are called compatible if there exists a (bounded linear) projection Q onto K which is A - selfadjoint.

We shall describe elsewhere the relationship between the system generated by H , A and the adjoint operation \sharp as studied here, with the Hilbert space $R(A^{1/2})$ with the inner product $\langle A^{1/2}\xi, A^{1/2}\eta \rangle' = \langle P\xi, P\eta \rangle$, where $\xi, \eta \in H$ and $P = P_{R(A)}$. These Hilbert spaces are relevant in the De Branges theory.

Jon Bannon, Siena College.

Title: Correspondences and Haagerup's Approximation Property

Abstract: A finite von Neumann algebra M with a faithful normal trace τ has Haagerup's approximation property (relative to a von Neumann subalgebra N) if there exists a net $(\phi_\alpha)_{\alpha \in \Lambda}$ of normal completely positive (N -bimodular) maps from M to M that satisfy the subtracial condition $\tau \circ \phi_\alpha \leq \tau$, the extension operators T_{ϕ_α} are bounded compact operators (in $\langle M, e_N \rangle$), and pointwise approximate the identity in the trace-norm, i.e., $\lim_\alpha \|\phi_\alpha(x) - x\|_2 = 0$ for all $x \in M$. We prove that the subtraciality condition can be removed, and provide a description of Haagerup's approximation property in terms of Connes's theory of correspondences. We show that if $N \subseteq M$ is an amenable inclusion of finite von Neumann algebras and N has Haagerup's approximation property, then M also has Haagerup's approximation property. This work answers two questions of Sorin Popa.

David Blecher, University of Houston.

Title: Matrix norm characterizations of certain operators and operator spaces

Abstract: We use some new 2 by 1 and 2 by 2 matrix tricks to characterize unitaries, isometries, unital operator spaces, operator systems, C^* -algebras, and related objects. There are known several characterizations of these objects in the literature, however unlike some of these other characterizations, our characterizations

only use the vector space structure and the (matrix) norms, in the spirit of Ruan's matrix norm characterization of operator spaces. In particular, they do not mention maps or functionals on the space. This is a joint work with Matthew Neal.

Jonathan Brown, Dartmouth College.

Title: Proper actions of Groupoids on C^* -algebras

Abstract: In 1990 Rieffel introduced a notion of proper actions of groups on C^* -algebras. In his paper he shows how this generalizes the notion of a proper action of a group G on a space X , by considering the coresponding action of G on $C_0(X)$. Given a group G acting on a C^* -algebra A by α , Rieffel also introduces the notion of a generalized fixed point algebra $A^\alpha \in M(A)$ and shows that A^α is Morita equivalent to a subalgebra of the reduced crossed product. I will generalize these notions to groupoids acting on C^* -algebras and give a Morita equivalence result.

Larry Brown, Purdue University.

Title: On Higher Real and Stable Ranks for CCR C^* -algebras.

Abstract: We calculate the real rank and stable rank of CCR algebras which either have only finite dimensional irreducible representations or have finite topological dimension. We show that either rank of A is determined in a good way by the ranks of an ideal I and the quotient A/I in four cases: When A is CCR ; when I has only finite dimensional irreducible representations; when I is separable, of generalized continuous trace and finite topological dimension, and all its irreducible representations of I are infinite dimensional; or when I is separable, stable, has an approximate identity consisting of projections, and has the corona factorization property. We also present a counterexample on higher ranks of $M(A)$, A subhomogeneous, and a theorem of P. Green on generalized continuous trace algebras.

Jan Cameron, Texas A&M University.

Title: Normalizers of Subfactors

Abstract. It is sometimes of interest to describe the normalizer of a subalgebra B of a II_1 factor M , that is, to describe the group $N_M(B)$ of unitaries in M that fix B under conjugation and the von Neumann algebra that the group generates. We present structure results for both the group $N_M(B)$ and the associated von Neumann algebra for the case in which B is a subfactor. Inclusions arising from the crossed product, group von Neumann algebra, and tensor product constructions will also be discussed.

Pete Casazza, University of Missouri.

Title: The Kadison-Singer Problem in Mathematics and Engineering

Abstract: We will see that the 1959 Kadison-Singer Problem in C^* -algebras is equivalent to fundamental unsolved problems in a dozen areas of research in pure mathematics, applied mathematics and engineering. This gives all these research areas common ground on which to interact as well as explaining why each of them has volumes of literature on their respective problems without a satisfactory resolution.

Ionut Chifan, UCLA.

Title: Ergodic Subequivalence Relations Induced by a Bernoulli Action

Abstract: Let Γ be a countable group and denote by S the equivalence relation induced by the Bernoulli action $\Gamma \curvearrowright [0, 1]^\Gamma$, where $[0, 1]^\Gamma$ is endowed with the product Lebesgue measure. We prove that for any subequivalence relation R of S , there exists a partition $\{X_i\}_{i \geq 0}$ of $[0, 1]^\Gamma$ with R -invariant measurable sets such that $R|_{X_0}$ is hyperfinite and $R|_{X_i}$ is strongly ergodic (hence ergodic), for every $i \geq 1$. This is joint work with Adrian Ioana.

Man-Duen Choi, University of Toronto.

Title: My Adventures in the Quantum Wonderland

Abstract: In the early 70's, I started off my mathematical journey in the wonderland of completely positive linear maps. Now, in an unexpected era of quantum computers, the time runs backwards in an alternate world. As I have to come back to the same scene, I shall report what I found there, through the Looking-Glass. Indeed, the simple reflections of many real computations have appeared as sorts of magic shows in the environment of non-commutative probability /geometry.

Raúl E. Curto, The University of Iowa.

Title: An analogue of the Riesz-Haviland Theorem for the truncated moment problem

Abstract. Let $\beta \equiv \beta^{(2n)} = \{\beta_i\}_{|i| \leq 2n}$ denote a d -dimensional real multisequence, let K denote a closed subset of \mathbb{R}^d , and let $\mathcal{P}_{2n} := \{p \in \mathbb{R}[x_1, \dots, x_d] : \deg p \leq 2n\}$. Corresponding to β , the *Riesz functional* $L \equiv L_\beta : \mathcal{P}_{2n} \rightarrow \mathbb{R}$ is defined by $L(\sum a_i x^i) := \sum a_i \beta_i$. We say that L is K -positive if whenever $p \in \mathcal{P}_{2n}$ and $p|_K \geq 0$, then $L(p) \geq 0$. In joint work with Lawrence A. Fialkow, we prove that β admits a K -representing measure if and only if L_β admits a K -positive linear extension $\tilde{L} : \mathcal{P}_{2n+2} \rightarrow \mathbb{R}$. This provides a generalization (from the full moment problem to the truncated moment problem) of the Riesz-Haviland Theorem. We also show that a semialgebraic set solves the truncated moment problem in terms of natural “degree-bounded” positivity conditions if and only if each polynomial strictly positive on that set admits a degree-bounded weighted sum-of-squares representation.

Marius Dadarlat, Purdue University.

Title: Toward a generalized Dixmier-Douady theory

Abstract: The classical Dixmier-Douady theory is concerned with the structure and the classification of continuous fields of compact operators. We explore generalizations of this theory to continuous fields of nuclear C^* -algebras.

Paramita Das, Vanderbilt University.

Title: Planar algebra of diagonal subfactor

Abstract: Starting with a finite set $\{\theta_i\}_{i \in I}$ of automorphisms of a II_1 factor N , one can construct the *diagonal subfactor* $N \subset M_I(N)$ where an element $x \in N$ sits in $M_I(N)$ diagonally where the i -th diagonal element is given by $\theta_i(x)$. Diagonal subfactors play an important role in the theory; a correspondence between amenability of such subfactors and amenability of the group generated by the automorphisms in $Out(N)$ was obtained by Sorin Popa. We will describe the standard invariant, or equivalently, the planar algebra of such subfactors. In a special case, this planar algebra matches with Jones's example of planar algebra associated to finitely generated group.

Ken Davidson, University of Waterloo.

Title: Topological stable rank of Banach algebras

Abstract: 25 years ago, Rieffel introduced an algebraic invariant for Banach algebras called topological stable rank which generalized the notion of dimension to the non-commutative setting. The topological stable rank has a left and right version, which coincide for C^* -algebras and commutative algebras. Moreover, tsr is a Banach algebra variant of the purely algebraic invariant of Bass stable rank for rings—and the left and right versions of Bass stable rank are always equal. So Rieffel asked whether they are always equal? We have calculated the left and right topological stable ranks for the class of nest algebras, and can answer Rieffel's question negatively. Coauthors: You Qing Ji, Rupert Levene, Laurent Marcoux, Heydar Radjavi.

Kenny De Commer, K.U. Leuven.

Title: Monoidal Equivalence of locally compact quantum groups

Abstract: In this talk, I will introduce the notion of monoidal equivalence for locally compact quantum groups. As with Morita equivalence for C^* -algebras, the emphasis is on the linking object, which is in this

case a von Neumann algebra with special coactions on it by two locally compact quantum groups. In fact, also here, this linking object and one of the quantum groups is enough to reconstruct the other (the main issue being the construction of the invariant weights). To develop these concepts, the theory of measured quantum groupoids, as developed recently by Lesieur and Enock, is very useful. It provides for example a convenient setting to show that our notion really provides us with a monoidal equivalence of corepresentation categories for the two quantum groups.

Abdelkader Dehici, University of Guelma.

Title: Measure of noncompactness and some new results in Fredholm Theory

Abstract: The work presented here has as a central subject the study of certain class of operators allowing to derive the interesting results intervening in the Fredholm theory, which represents one of the tools for the resolution of the equations of the type $u - Tu = f$ (Fredholm alternative). Our analysis is based on the remarkable properties satisfied by the concept of measure of non-compactness of bounded operators. These properties will bring us sufficient conditions for which $Q(T) \in \Phi(X)$ with index 0 for a certain class of complex polynomials Q . The objective is to establish a rather general functional framework which enable us to unify many well known results in this direction. Indeed, we show that if $A \in \mathcal{L}(X)$ and P, Q are two complex polynomials satisfying $Q(0), P(1) \neq 0$ with Q divide $P - P(1)$, and if $\delta((P(tA))) < |P(1)|, \forall t \in]0, 1]$, then $Q(A) \in \Phi(X)$ with index 0, this represents a quasi-macroscopic study of certain contributions. Moreover, an extension of a part of the analysis carried out by several authors was established. It is a question of giving a new characterization of Weyl essential spectrum of closed densely defined operators in Banach spaces.

Detelin Dosev, Texas A&M University.

Title: Commutators on ℓ_1

Abstract: A classification of the commutators on ℓ_1 will be given. The main result is that the commutators on ℓ_1 are the operators not of the form $\lambda I + K$ with $\lambda \neq 0$ and K compact. We generalize Apostol's technique ("Commutators on ℓ_p spaces", 1972) to obtain the classification and using this generalization we also obtain

partial results about commutators on Banach spaces X which can be represented as $X \simeq \left(\bigoplus_{i=0}^{\infty} X \right)_p$ for some

$1 \leq p < \infty$. In particular, it is shown that every compact operator on L_1 is commutator. A characterization of the commutators on $\ell_{p_1} \oplus \ell_{p_2} \oplus \dots \oplus \ell_{p_n}$ is given. We also show that strictly singular operators on ℓ_{∞} are commutators.

Benton Duncan, North Dakota State University.

Title: Universal free products of directed graph operator algebras

Abstract: Directed graph algebras provide a tractable and well understood class of operator algebras. To better understand universal free products of operator algebras we focus on the class of directed graph operator algebras. In particular, given two directed graphs G_1 and G_2 with common vertex sets, we investigate the free product of the algebras $C^*(G_1)$ and $C^*(G_2)$ with amalgamation over the subalgebra generated by the vertex projections. To analyse the free products we define a new directed graph G , combining the graphs G_1 and G_2 , together with a coloring function, f , on the edge set. We also look at the nonselfadjoint versions of these algebras. Some foundational results will be discussed and several examples will be explored.

Ken Dykema, Texas A&M University.

Title: On sums of Hermitian operators in finite von Neumann algebras

Abstract: Given Hermitian $n \times n$ matrices A and B , whose eigenvalues (and multiplicities) are known, what can the eigenvalues of $A + B$ be? In 1962, A. Horn conjectured an answer, in terms of eigenvalue inequalities known as Horn inequalities. His conjecture was proved less than a decade ago due to work of Klyachko, Knutson and Tao. We consider the analogous question in finite von Neumann algebras, and prove that Horn inequalities (appropriately recast) hold in all finite von Neumann algebras. The classical method of proving a Horn inequality involves proving the existence of a projection satisfying certain properties with

respect to three arbitrary flags. In order to do so, and building on ideas of Knutson, Tao and Woodward, we found methods of constructing these projections in a II_1 -factor. These work also in the finite dimensional situation and give a new and constructive proof. This is joint work with H. Bercovici, B. Collins, W.S. Li and D. Timotin.

In work with B. Collins, Connes's embedding problem is shown to be equivalent to a version of the above question about the distribution of sums of Hermitian elements in finite von Neumann algebras, but with matrix coefficients

Caleb Eckhardt, University of Illinois at Urbana-Champaign.

Title: \mathcal{OL}_∞ structure related to quasidiagonality and finiteness for nuclear C^* -algebras.

Abstract: \mathcal{OL}_∞ is an invariant for nuclear C^* -algebras born out of operator space theory. \mathcal{OL}_∞ has an interesting relationship with both quasidiagonality and stable finiteness. In this talk, I will discuss the relationship between open questions about \mathcal{OL}_∞ and the open question "Is every nuclear stably finite C^* -algebra quasidiagonal?"

Junsheng Fang, University of New Hampshire.

Title: Unitarily invariant norms and factor von Neumann algebras

Abstract: In 1937 J. von Neumann characterized all norms on the $n \times n$ complex matrices that are invariant under left and right multiplication by unitary operators. We extend von Neumann's theorem to all factor von Neumann algebras, and we apply our results to the noncommutative L_p -theory. This is joint work with Don Hadwin, Eric Nordgren and Junhao Shen.

Remus Floricel, University of Regina, Canada.

Title: The asymptotic flow of an E_0 -semigroup.

Abstract: The asymptotic flow of an E_0 -semigroup $\rho = \{\rho_t \mid t \geq 0\}$ acting on a type I_∞ factor M is the W^* -dynamical system $(M_\infty, \rho \mid_{M_\infty})$, where M_∞ is the tail algebra $\bigcap_{t>0} \rho_t(M)$. We show that for any E_0 -semigroup ρ , and $s > 0$, there exists an uncountable family of pairwise non-conjugate, cocycle perturbations of ρ whose asymptotic flows is a s -periodic type I_∞ W^* -dynamical system.

Shamindra Kumar Ghosh, Vanderbilt University.

Title: Planar algebra of Bisch-Haagerup subfactors

Abstract: We describe the planar algebra, or equivalently, the standard invariant, of the subfactor $P^H \subset P \rtimes K$ arising from outer actions of two finite groups H and K on a II_1 -factor P . These subfactors, introduced by Bisch and Haagerup, play an important role in the theory providing a very simple mechanism to construct irreducible subfactors whose standard invariant has infinite depth. The planar algebra heavily depends on the cocycle arising as an obstruction to lifting the subgroup G in $Out(P)$ generated by H and K . If we assume that the group generated by H and K in $Aut(P)$ intersects trivially with $Inn(P)$, (equivalently, the obstruction is trivial), then the planar algebra has an interesting similarity with IRF models in Statistical Mechanics. This is a joint work with Dietmar Bisch and Paramita Das.

Geoff Goehle, Dartmouth College.

Title: The Spectrum of Groupoid C^* -algebras

Abstract: If G is a groupoid then the stabilizer group bundle associated to G is $S = \{\gamma : r(\gamma) = s(\gamma)\}$. When S has a Haar system and all of its fibres are abelian the Pontryagin duals of those fibres can be collected into a dual group bundle, \hat{S} , which carries an action of G induced by conjugation. If the quotient space $G^{(0)}/G$ is at least T_0 then we can show that the spectrum of $C^*(G)$ is homeomorphic to \hat{S}/G . This is related to a similar result for abelian transformation groups, (G, X) , which states that if X/G is T_0 then the spectrum of $C^*(G, X)$ is homeomorphic to a quotient of X .

Guihua Gong, University of Puerto Rico.

Title: Strong Novikov conjecture and Geometrical Novikov conjecture.

Abstract: In this talk, I will present the following theorem: The strong Novikov conjecture for residually finite groups is equivalent to the Geometrical Novikov conjecture for the corresponding Box space. As an application, we proved the geometrical Novikov conjecture holds for Lafforgue's example of spaces which can not coarse embedding in to uniformly convex Banach spaces. This is a joint work with Qin Wang and Guoliang Yu.

María Celeste Gonzalez, Instituto Argentino de Matemática.

Title: Metric properties of projections in semi-Hilbertian spaces

Abstract: Let H be a Hilbert space, $L(H)$ the algebra of bounded linear operators on H and Q the subset of $L(H)$ of all projections (i.e. idempotents). Given a closed subspace K of H , Q_K denotes the subset of Q of all projections with image K . Let $P_K \in Q_K$ denote the unique Hermitian projection with image K . The following properties are well known:

- (I) For all $0 \neq Q \in Q$ it holds $\|Q\| = 1$ if and only if $Q^* = Q$;
- (II) For every non trivial $Q \in Q$ it holds $\|Q\| = \|I - Q\|$;
- (III) Given closed subspaces K and L of H it holds $\|P_K - P_L\| \leq \|Q_K - Q_L\|$ for every $Q_K \in Q_K$ and $Q_L \in Q_L$;
- (IV) For all closed subspaces K and L of H it holds $\|P_K - P_L\| \leq 1$. Equality holds if and only if P_K and P_L commute;
- (V) For all closed subspaces K and L of H it holds $\|P_K - P_L\| = \max \{ \|P_K(I - P_L)\|, \|P_L(I - P_K)\| \}$;
- (VI) For every $Q \in Q$ it holds $\|Q\| = \frac{1}{\sin \theta}$ if $\theta \in [0, \pi/2]$ is the angle such that $\cos \theta = \sup\{ | \langle \xi, \eta \rangle | : \xi \in R(Q), \eta \in N(Q) \text{ and } \|\xi\| = \|\eta\| = 1 \}$.

The main goal of this talk is to study these properties if we consider an additional seminorm $\| \cdot \|_A$, defined by a positive semidefinite operator $A \in L(H)$ by $\|\xi\|_A^2 = \langle A\xi, \xi \rangle$, $\xi \in H$, and we replace the operator norm in formulas (I) to (VI) by the quantity

$$\|T\|_A = \sup\{\|T\xi\|_A : \|\xi\|_A = 1\}.$$

Pinhas Grossman, Vanderbilt University.

Title: Quadrilaterals of factors

Abstract: An intermediate subfactor is an algebra P in between two factors: $N \subset P \subset M$, where $N \subset M$ is an irreducible inclusion of factors with finite Jones index. For non-commuting pairs of intermediate subfactors, there is a rigidity to the inclusions which severely limits the number of possible configurations, in terms of the indices and the standard invariant of the total inclusion. In particular, there are exactly seven non-commuting quadrilaterals of factors whose sides have index less than or equal to 4. This is joint work with Masaki Izumi

Manjul Gupta, Indian Institute of Technology.

Title: On the Representation of Lorentz Sequence Class type Operators

Abstract: For a continuous, strictly increasing, subadditive function $\psi : [0, \infty) \rightarrow [0, \infty)$ satisfying $\psi(0) = 0$; we consider the weighted generalized Lorentz sequence classes

$$\ell_{p,q}^{v,\omega,\psi} = \{ \{x_n\} \in c_0 : \left\{ \sum_{k=1}^{\infty} [k^{1/p-1/q} v_k \psi(\omega_k s_k(x))]^q \right\}^{1/q} < \infty \},$$

for $0 < p \leq \infty$, $0 < q < \infty$; and

$$\ell_{p,\infty}^{v,\omega,\psi} = \{ \{x_n\} \in c_0 : \sup_{k \in \mathbb{N}} k^{1/p} v_k \psi(\omega_k s_k(x)) < \infty \},$$

for $0 < p \leq \infty$, $q = \infty$, where $v_n = (1 + \log n)^\alpha$, $n \geq 1$ or $v_n = (1 + \log \log n)^\alpha$, $n \geq 2$, $\alpha \in \mathbb{R}$; and give representations theorems for bounded linear operators whose sequences of approximation numbers belong to these classes. Here $\{s_n(x)\}$ is the sequence of decreasing rearrangement of $\{|x_n|\}$, $\{x_n\} \in c_0$.

This is a joint work with L.R. Acharya.

U. Haagerup, Odense University.

Title of Taft Center Lecture: The invariant subspace problem -Linear algebra in infinitely many dimensions

Abstract: Most scientists have at some point in their life been introduced to linear algebra in finitely many dimensions, i.e. calculation with $n \times n$ matrices, including determinants, eigenvalues and eigenvectors of such matrices. The development of quantum physics in the 20's have forced us to work with linear maps (= operators) on infinite dimensional vector spaces in order to get a satisfactory description of the world around us. This development formed the basis of the mathematical field "Operator Algebra Theory", which was initiated by von Neumann and his student Murray in the late 30's.

A famous and still open problem in this theory is the invariant subspace problem: "Does every bounded operator on a Hilbert space have a non-trivial closed invariant subspace?" In this lecture I will discuss this problem as well as a variant of the problem coming from a special class of von Neumann algebras, the so-called factors of Type II_1 . Although these algebras are infinite dimensional, they share many properties with the algebra of $n \times n$ matrices: For instance all operators in such an algebra has a generalized determinant (Fuglede and Kadison 1952) and a generalized eigenvalue distribution (L. G. Brown 1983). In a recent joint work with Hanne Scultz, we give a partial solution to the invariant subspace problem for II_1 factors by providing a new construction of spectral subspaces (generalized eigenspaces) for all operators in such a factor.

U. Haagerup, Odense University.

Title: Solution of the Effros-Ruan conjecture for bilinear forms on C^* -algebras

Abstract: In 1991 Effros and Ruan conjectured that a certain Grothendieck type inequality for a bilinear form on a pair of C^* -algebras holds if (and only if) the bilinear form is jointly completely bounded. In 2002 Pisier and Shlyakhtenko proved that this inequality holds in the more general setting of operator spaces, provided that the operator spaces in question are exact, in particular they proved the Effros-Ruan conjecture for pairs of exact C^* -algebras. In a recent joint work with Magdalena Musat we prove the Effros - Ruan conjecture for general C^* -algebras (and with constant one), i.e. for every jointly completely bounded (jcb) bilinear form u on a pair of C^* -algebras A, B there exists states f_1, f_2 on A and g_1, g_2 on B , such that $|u(a, b)| \leq \|u\|_{jcb} (f_1(aa^*)^2 g_1(b * b)^2 + f_2(a * a)^2 g_2(bb^*)^2)$.

While the approach by Pisier and Shlyakhtenko relied on free probability theory, our proof uses more classical operator algebra methods, namely Tomita Takesaki theory and special properties of the Powers factors of Type III_λ , $0 < \lambda < 1$. This is a joint work with Magdalena Musat.

Don Hadwin, University of New Hampshire.

Title: Topological Free Entropy Dimension

Abstract: This talk describes a number of new results on Voiculescu's topological free entropy dimension for n -tuples of elements in a C^* -algebra. We develop precise formulas related to direct sums, tensoring with a matrix algebra, free products, commutative algebras, finite-dimensional algebras. The topological free entropy dimension is defined for a tuple precisely when its generated C^* -algebra is MF. We obtain a few new results on MF algebras that give new examples of C^* -algebras whose Ext is not a group.

This is a joint work with Junhao Shen and Qihui Li.

Larry Harris, University of Kentucky.

Title: Removable singularities of analytic functions and real rank zero

Abstract: Let A be a Banach algebra with identity and let D be the intersection of the open unit ball B of A and the identity component of the set of invertible elements of A . We say that A has the removable singularity property if every bounded holomorphic function on D has a holomorphic extension to B . We discuss examples and show that any C^* -algebra of real rank zero has the removable singularity property. We conjecture that this property characterizes the C^* -algebras of real rank zero.

Marius Ionescu, Cornell University.

Title: The Generalized Effros-Hahn Conjecture for Groupoids.

Abstract: One of the fundamental results in the theory of crossed product of C^* -algebras is Effros-Hahn conjecture, proved by Gootman, Rosenberg, and Sauvageot: If (A, G, α) is a separable dynamical system with G amenable then every primitive ideal of the crossed product $A \rtimes G$ is induced from a stability group. In this talk, which is based on joint work with Dana Williams, we present a generalization of the Effros-Hahn conjecture to groupoid C^* -algebras. Our work is based on groundbreaking results due to Jean Renault. We also define induced representations from subgroupoids, and show that the induced representation of an irreducible representation of a stability group is also irreducible. This result is a key ingredient for our proof of the Effros-Hahn conjecture for groupoids. This is a joint work with Dana Williams.

Chris Jankowski, University of Pennsylvania.

Title: On E_0 -semigroups induced by completely positive maps on $M_n(C)$.

Abstract: We obtain new examples of Type II E_0 -semigroups of $B(K \otimes L^2(0, \infty))$ using q -pure maps $\phi : B(K) \rightarrow B(K)$, where K is a finite-dimensional Hilbert space. A linear map ϕ is said to be q -positive ($\phi \geq_q 0$) if $\phi(I + t\phi)^{-1}$ is completely positive for all $t \geq 0$, and is q -pure if it satisfies the further condition that $\phi \geq_q \psi \geq_q 0$ if and only if $\psi = \phi(I + t_0\phi)^{-1}$ for some $t_0 \geq 0$. Given a unital q -pure map ϕ acting on $B(K)$, we naturally define a boundary weight ω on $B(K \otimes L^2(0, \infty))$, inducing a CP -flow over K which dilates to an E_0 -semigroup. We determine when two unital q -pure maps ϕ_1 and ϕ_2 acting on $B(K_1)$ and $B(K_2)$ induce cocycle conjugate E_0 -semigroups, and we discuss current results.

Byung-Jay Kahng, Canisius College.

Title: Fourier transform in the quantum group setting

Abstract: In abstract harmonic analysis, the notion of Fourier transform is defined at the level of abelian locally compact groups, where Pontryagin duality holds. For further generalization, we consider the category of locally compact quantum groups, where Pontryagin-type, self duality holds. Motivated by some recent works by Van Daele in the multiplier Hopf algebra framework, and by using the Haar weights, we can define the (generalized) Fourier transform and the inverse Fourier transform, at the quantum group level. We then consider the analogues of the Fourier inversion theorem, Plancherel theorem, and the convolution product. Along the way, we also obtain an alternative description of the dual pairing map between a quantum group and its dual.

Steve Kaliszewski, Arizona State University.

Title: Proper Actions and Categorical Landstad Duality

Abstract: Given a free and proper action of a locally compact group G on a locally compact Hausdorff space X , we consider a comma category of C^* -dynamical systems (A, G, α) for which there is an equivariant homomorphism of $C_0(X)$ into $M(A)$. We show that Rieffel's fixed-point algebra construction gives rise to a functor on this category which is naturally equivalent to a reduced-crossed-product functor.

As an application, we derive a categorical version of Landstad duality for coactions; this in turn yields new information about Landstad duality for actions. This is joint work with John Quigg and Iain Raeburn.

Sooran Kang, University of Colorado at Boulder.

Title: Yang Mills for a deformed Heisenberg C^* Algebra

Abstract : In this talk, we discuss Yang-Mills theory for a deformed Heisenberg C^* algebra, the deformation quantization of Heisenberg manifold, $D_{\mu\nu}^{c,\hbar}$, using the noncommutative geometrical method developed by Alain Connes. In particular, I will describe Grassmannian connection and its curvature on a projective module over the noncommutative C^* algebra, $D_{\mu\nu}^{c,\hbar}$, and produce a specific element R in this projective module that determines both a non-trivial Rieffel projection and the curvature of the corresponding Grassmannian connection. Also, I will discuss a certain family of connections on the deformed Heisenberg C^* algebra that give critical points of the Yang-Mills functional, called solutions of Yang-Mills equation.

Upasana Kashyap, University of Houston.

Title: Morita equivalence of dual operator algebras

Abstract: We consider some variants of the notion of Morita equivalence appropriate to algebras of Hilbert space operators which are closed in the ‘weak* topology’ (or equivalently, which are dual spaces), and we will describe how the earlier theory of strong Morita equivalence due to Blecher, Muhly, and Paulsen, transfers to this ‘weak* topology setting’.

Claus Koestler, University of Illinois at Urbana-Champaign.

Title: A noncommutative extended de Finetti theorem

Abstract: The extended de Finetti theorem characterizes exchangeable infinite random sequences as conditionally i.i.d. and shows that the apparently weaker distributional symmetry of spreadability is equivalent to exchangeability. Our main result is the noncommutative version of this theorem. We introduce exchangeability and spreadability of infinite noncommutative random sequences. In contrast to the classical result of Ryll-Nadzewski, exchangeability turns out to be stronger for infinite noncommutative random sequences. Out of our investigations emerges noncommutative conditional independence in terms of a von Neumann algebraic structure closely related to Popa’s notion of commuting squares.

Alexander Kumjian, University of Nevada.

Title: k -morphs

Abstract: A k -morph may be thought of as a bridge between two k -graphs; it functions as the analog of a C^* -correspondence in a sense which we make precise in a functorial way. It is the minimum structure needed to synthesize a $(k + l)$ -graph from two given k -graphs. This is joint work with David Pask and Aidan Sims of the University of Wollongong.

David R. Larson, Texas A&M University

Title: Topological properties of wavelet frames

Abstract: Several years ago the speaker posed a problem concerning density of the set of wavelet frames. Bownik recently solved this problem, and we examine his result from the point of view of orthogonality of frames and certain operators we call Bessel multiplier operators. We obtain some new results using this approach, including a new proof of Bownik’s density theorem.

Sneh Lata, University of Houston.

Title : An Operator Algebraic Proof of the Agler and Nevanlinna Factorization Theorems

Abstract: We present a short proof of the Agler and Nevanlinna factorization theorems that primarily uses the abstract characterization of operator algebras. In the case of polynomials, we obtain somewhat more information. This talk is based on joint work with Meghna Mittal and Vern Paulsen.

Hyun Ho Lee, Purdue University.

Title: Three examples of homotopy classifications of projections in corona algebra of a non-simple stable C^* -algebras

Abstract: In this talk, we will consider the question of lifting projections from the corona algebra of $I = C(X) \otimes \mathcal{K}$ to the multiplier algebra where X be $[0, 1]$, $[0, \infty)$ or $(-\infty, \infty)$. Also, we give criterions for the homotopy equivalence, unitary equivalence, and Murray-von Neumann equivalence of two projections in the corona algebra. This is a work based on the author's Ph.D. thesis under Larry Brown.

Weihua Li, University of New Hampshire.

Title: A Note on Approximately Divisible C^* -algebras

Abstract: Let \mathcal{A} be a separable, unital, approximately divisible C^* -algebra. We show that \mathcal{A} is generated by two self-adjoint elements and the topological free entropy dimension of any finite generating set of \mathcal{A} is less than or equal to 1. In addition, we show that the similarity degree of \mathcal{A} is at most 5, which shows that an approximately divisible C^* -algebra has an affirmative answer to Kadison's similarity problem.

Huaxin Lin, University of Oregon.

Title: Asymptotic Unitary Equivalence and Applications

Abstract: Let C be a unital separable amenable C^* -algebra and A be unital separable simple C^* -algebra. Suppose that h_1 and h_2 are two unital monomorphisms from C to A . When are h_1 and h_2 asymptotically unitarily equivalent? i.e., when are there a continuous path of unitaries $\{u(t) : t \in [0, \infty)\}$ in A such that $\lim_{t \rightarrow \infty} u(t)^* h_1(c) u(t) = h_2(c)$ for all c in C ? In the talk, we will give a K-theoretic necessary and sufficient condition for these two monomorphisms asymptotically unitarily equivalent (at least for the some important cases). We will also give a bijective map from the asymptotically unitary equivalence classes of unital monomorphisms from C to A and an invariant set. Applications of these results to the Voiculescu AF-embedding problem and the Elliott program of classification of amenable simple C^* -algebras will be given.

Magdalena Musat, University of Memphis.

Title: Noncommutative Khintchine-type inequalities and applications

Abstract: In joint work with Uffe Haagerup, we obtain new proofs with improved constants of the Khintchine-type inequality with matrix coefficients in two cases. The first case is the Pisier and Lust-Piquard noncommutative Khintchine inequality for $p=1$, where we obtain the sharp lower bound of $1/\sqrt{2}$ in the complex Gaussian setting. The second case is Junge's recent Khintchine-type inequality for subspaces of the operator space $R+C$ (row and column Hilbert space), which he used to construct a completely bounded embedding of the operator Hilbert space OH into a noncommutative L_1 space. Also in this case, we obtain a sharp lower bound of $1/\sqrt{2}$. As a consequence, it follows that any sub-quotient of $(R+C)^*$ is completely isomorphic to a subspace of the predual of the hyperfinite factor of type III_1 , with cb-isomorphism constant less than or equal to $\sqrt{2}$. In particular, the operator Hilbert space OH has this property.

Matt Neal, Denison University.

Title: A solution to the generalized contractive projection problem

Abstract: In the sixties, Douglas proved that an isometric copy of an L^1 space inside of a second L^1 space is always contractively complemented. In the early nineties, Kirchberg generalized this result to von Neumann algebras, showing that an isometric copy of the predual of a von Neumann algebra inside the predual of a second von Neumann algebra is always contractively complemented. It is well known that the open unit ball of a von Neumann algebra is a bounded symmetric domain. Dual Banach spaces having this property are known more generally as JBW^* -triples, and they have a natural algebraic characterization in terms of a ternary product. In this talk, we will completely solve the above contractive projection problem for preduals of JBW^* -triples, answering a conjecture of Ng and Ozawa. We will also explain why JBW^* -triples constitute the most natural setting for this question. One of several reasons for this claim is the fact that, as Kaup

proved in the eighties, the range of a normal contractive projection on a JBW*-triple is isometric to another JBW*-triple, a stability property that fails for von Neumann algebras. Finally, we will discuss connections with similar questions in operator space theory. This is joint work with Bernard Russo.

Ping Wong Ng, University of Louisiana.

Title: Nuclearity and weak uniqueness

Abstract: We characterize nuclearity using a weak uniqueness theorem, where the invariant is the Cuntz semigroup. joint work with A. Ciuperca and Z. Niu.

Igor Nikolaev, Fields Institute.

Title: On a desingularization of the moduli space of noncommutative tori.

Abstract: It is shown that the moduli space of the noncommutative tori A admits a natural desingularization by the group $\text{Ext}(A, A)$. Namely, we prove that the moduli space of pairs $(A, \text{Ext}(A, A))$ is homeomorphic to a punctured two-dimensional sphere. The proof is based on a correspondence (a covariant functor) between the complex and noncommutative tori.

Nikolai K. Nikolski, University of Bordeaux. (France).

Title: Looking at the bounded inversion conjecture via model operators

Abstract: Bourgain-Tzafriri's bounded inversion problem is to answer the following question. Given an orthonormal basis (e_j) in a Hilbert space and a bounded operator T on it having a matrix (t_{ij}) with respect to (e_j) such that $\inf_j |t_{jj}| > 0$, whether there exists a partition σ_k , $k = 1, \dots, n$, of the integers making all compression operators $(t_{ij})_{i,j \in \sigma_k}$ boundedly invertible? The question is still open and is known to be equivalent to the Kadison-Singer problem. We give a counterexample to a stronger version of the problem replacing "orthonormal basis" by "a normalized asymptotically block-orthogonal basis". The construction is based on a choice of a sequence of Szegő reproducing kernels and a suitable function $T = f(M)$ of the corresponding model operator M . We discuss whether the same operator could be useful for the original Bourgain-Tzafriri's problem

Zhidong (Patrick) Pan, Saginaw Valley State University.

Title: On isomorphisms of reflexive algebras on Banach spaces

Abstract: We will discuss some lattice-theoretic conditions that will guarantee that all isomorphisms between the corresponding algebras must be quasi-spatial. This generalizes similar results in the literature on isomorphisms between commutative subspace lattice algebras on Hilbert spaces. (joint work with Jiankui Li)

Vern Paulsen, University of Houston.

Title: A dynamical systems approach to the Kadison-Singer problem

Abstract: We develop a link between the Kadison-Singer problem and questions about certain dynamical systems. Our hope is that whether or not a given state has a unique extension can be related to certain dynamical properties of the state. We prove that if any state corresponding to a minimal idempotent point extends uniquely to the von Neumann algebra of the group, then every state extends uniquely to the von Neumann algebra of the group. We prove that if any state arising in the Kadison-Singer problem has a unique extension, then the injective envelope of a C^* -crossed product algebra associated with the state necessarily contains the full von Neumann algebra of the group.

Jesse Peterson, University of California Berkeley.

Title: Finite von Neumann algebras associated to groups with positive first ℓ^2 -Betti number.

Abstract: Given a countable discrete group Γ with positive first ℓ^2 -Betti number, one can produce a large number of closable derivations from $L\Gamma$ to the Hilbert-Schmidt operators on $\ell^2\Gamma$. Through the analysis of these derivations we will show how a number of “free entropy dimension type” structural results for $L\Gamma$ can be obtained, e.g. primeness, etc.

Gabriel Picioroaga, SUNY at Binghamton.

Title: Representations of Thompson’s Group F in $L^2(\mathbf{R}^n)$

Abstract: In this joint work with D.Dutkay we study faithful representations of the Thompson’s group F in $L^2(\mathbf{R}^n)$. The amenability question of F is translated within this framework in terms of weak containments with respect to the left regular representation. We prove that the extension of each representation to the universal group algebra has non-trivial kernel. Also, the C^* algebras generated by these representations contain projections, in stark contrast with the reduced C^* algebra of the group F which contains none but trivial projections. In a different direction, the local similarity of F with the Baumslag Solitar group $BS(1, 2)$ enables us to find subsets of F which generate orthonormal bases of $L^2(\mathbf{R})$ with respect to the Haar wavelet.

Robert T. Powers, University of Pennsylvania.

Title: E-0-Semigroups of type II_{00}

Abstract: An E-0-semigroup of $B(H)$ is a strongly continuous one parameter semigroup of $*$ -endomorphisms of $B(H)$ which preserve the identity. An E-0-semigroup is said to be spatial if there is a strongly continuous one parameter semigroup of isometries that intertwine it. Such intertwining semigroups of isometries are called units. An E-0-semigroup is of type I if the units completely determine the semigroup, type II if it is spatial but not completely determined by its units and type III if it has no units. We discuss the problem of classifying all E-0-semigroups of type II_{00} . These are type II E-0-semigroups with only one unit and a trival gauge group. Though these are the simplest E-0-semigroups outside those of type I the problems of classification seem formidable.

John Quigg, Arizona State University.

Title: Coverings of skew-products and crossed products by coactions

Abstract: Consider a projective limit G of finite groups G_n and a compatible family δ_n of coactions of the G_n on a C^* -algebra A . From this data we obtain a coaction δ of G on A , and indicate how the coaction crossed product is isomorphic to a direct limit of the coaction crossed products of A by the δ_n .

If $A = C^*(\Lambda)$ for some k -graph Λ , and if the coactions δ_n correspond to skew-products of Λ , then we can say more: the coaction crossed product may be realized as a full corner of the C^* -algebra of a $(k+1)$ -graph. Time permitting, I’ll discuss connections with Yeend’s topological higher-rank graphs and their C^* -algebras.

This is joint work with David Pask and Aidan Sims.

Mrinal Raghupathi, University of Houston.

Title: Representations of Logmodular Algebras

Abstract: It is still an unsolved problem as to whether every contractive representation of H^∞ is completely contractive. The disk algebra, the algebra H^∞ and nest algebras are all examples of logmodular algebras - a notion first introduced by Ken Hoffman. In this talk we present a modern operator space proof of a classical result of Foias and Suciuc that proves that every two-contractive representation of an abelian logmodular algebra is completely contractive. This is a joint work with Vern I. Paulsen.

Mohan Ravichandran, University of New Hampshire.

Title: The Laplacian masa in a free group factor is Maximal Injective

Abstract: The Laplacian(radial) Masa in LF_N is generated by the sum of all words of length one. It is known that this masa is strongly singular and has Pukhaznsky invariant $\{\infty\}$. In this talk, we show that the

masa is maximal injective in LF_N . The proof uses an orthonormal basis for $l^2(F_N)$ discovered by Radulescu and builds upon ultrapower techniques developed by Popa.

Notes - Joint with Junsheng Fang(Texas A&M), Stuart White(University of Glasgow).

Mikael Rordam, University of Copenhagen.

Title: The Jiang-Su algebra

Abstract: The Jiang-Su algebra plays a central role in the classification program of Elliott. It seems plausible that classification is possible for nuclear simple separable C^* -algebras if one in addition require that the C^* -algebras also tensorially absorb the Jiang-Su algebra; and there are strong results in this direction today. These results have increased our interest in getting a better understanding of the Jiang-Su algebra, and to give more concrete representations of this C^* -algebra. In this talk, which contains results from a joint work with Wilhelm Winter and from a current collaboration with Marius Dadarlat, we present results that characterize the Jiang-Su algebra inside the class of strongly self-absorbing C^* -algebras.

Zhong-Jin Ruan, University of Illinois at Urbana-Champaign.

Title: p -Operator Spaces

Abstract: It is known that operator space theory has been quite well developed. The theory has a lot of interesting and important applications to some related areas such as operator algebras and abstract harmonic analysis.

In 1996, C. Le Merdy considered the p -analogue of operator spaces, which he called 'p-operator spaces' (for $1 < p < \infty$). Last year, M. Daws further investigated this theory again in his study with Figa-Talamanka-Herz algebras. In this talk, I will discuss some properties in p -operator spaces and show some of my recent results on this topic.

Claude Schochet, Wayne State University.

Title: Bundles of C^* -algebras and a theorem of Eilenberg and Steenrod

Abstract: Topologists in the 1940's and 1950's thought it natural to look at the category of compact spaces. With the advent of spectra, attention shifted to CW complexes. As every compact space is an inverse limit of finite CW complexes, it is then reasonable to try to reduce homotopy classification problems on compact spaces to problems on finite complexes. Our (mathematical) ancestors knew how to do this. I will review some of these results and show how they may be used to study homotopy invariants of C^* -algebras of sections of certain bundles related to gauge groups.

Orr Shalit, University of Technion (Israel).

Title: Is every (multi-parameter) semigroup of completely positive maps "a part of" a semigroup of $*$ -endomorphisms?

Abstract: Is every multi-parameter semigroup of completely positive maps "a part of" a semigroup of $*$ -endomorphisms? In this talk I will survey a strategy for proving that the answer to the above question is "yes" (at least in some interesting cases). Or, in technical terms: I will describe a tentative general framework for constructing an E-dilation of a multiparameter CP-semigroup. I will overview the positive results obtained by following this strategy, which exist mainly in the two-parameter case. I will also discuss the difficulties in solving the general case, ideas to overcome these difficulties, and state some concrete open problems. The talk is based on parts of my PhD. thesis, done under the supervision of Baruch Solel.

Sonia Sharma, University of Houston.

Title: Operator spaces which are M -ideals in their bidual.

Abstract: In the classical M -ideal theory, the Banach spaces which are M -ideals in their bidual form an interesting class, called the M -embedded spaces.

These spaces exhibit a lot of nice properties like stability under taking subspaces and quotients, unique extension property, RNP of the dual space, etc. We will discuss the one-sided M -embedded spaces, namely the operator spaces which are one-sided M -ideals in their bidual, and talk about some of the properties these spaces have.

David Sherman, University of Virginia.

Title: Locally inner automorphisms of operator algebras

Abstract: Say that an automorphism of a unital C^* -algebra is *locally inner* if on any element it agrees with some inner automorphism. We discuss whether, for various classes of C^* -algebras and von Neumann algebras, a locally inner automorphism must be inner. We also employ this concept to answer the question: does the diagonal sum descend to a well-defined map on the automorphism orbits of a unital C^* -algebra? (By the “diagonal sum” of two elements we simply mean the 2×2 matrix which has the given elements on the diagonal.) If time allows we will conclude with an application to ultrapowers.

Aidan Sims, University of Wollongong Australia.

Title: The classes of graph algebras, Exel-Laca algebras, and ultragraph algebras coincide up to Morita equivalence.

Abstract: Graph algebras and Exel-Laca algebras arose in the late 1990s as non-unital generalisations of Cuntz-Krieger theory, and ultragraph algebras were introduced in 2003 as a simultaneous generalisation of the two. Results of Fowler-Laca-Raeburn (2000) imply that each graph algebra is Morita equivalent to an Exel-Laca algebra. Results of Tomforde (2003) show that each graph algebra and each Exel-Laca algebra is isomorphic to an ultragraph algebra, and that every ultragraph algebra is Morita equivalent to an Exel-Laca algebra. The extent, if any, to which Morita equivalence classes of ultragraph algebras are more general than Morita equivalence classes of graph algebras was not known.

In this talk we will outline a construction which shows that each ultragraph algebra is Morita equivalent to a graph algebra. In particular, all three classes — graph algebras, Exel-Laca algebras, and ultragraph algebras — coincide up to Morita equivalence. We will also discuss some applications of our theorem to structure theory for ultragraph algebras if time permits.

This is joint work with Katsura, Muhly and Tomforde.

Preeti Singh, University of Houston.

Title: Tight Frames and Unitary Representations.

Abstract: Considerable amount of research has been done in group representation theory and frames. In this talk we will discuss group representations on \mathbb{C}^k that form tight frames for the Hilbert space M_k . Using these frames for M_k , we will find techniques to construct frames for \mathbb{C}^k and \mathbb{C}^{k^2} .

For insight into applications, we will measure the correlation between the frame elements of representations and will derive bounds for the maximum correlation.

Anna Skripka, Texas A&M University.

Title: Spectral shift and trace inequalities.

Abstract: In the standard perturbation theory setting, Krein’s and Koplienko’s spectral shift functions describe how the spectrum of a function of a self-adjoint operator changes under a trace class (or possibly a Hilbert-Schmidt) perturbation. Perturbations with non-trivial essential spectra can be handled by passing to a general semi-finite von Neumann algebra setting. An available tool for treating relative trace class perturbations is a semi-finite von Neumann algebra analog of Krein’s spectral shift function. We complement this tool by a semi-finite von Neumann algebra analog of Koplienko’s spectral shift function. As an application of the spectral shift function theory, we derive monotonicity and convexity inequalities for operator functions inside a normal faithful semi-finite trace. The planned talk is based on joint work with K.A. Makarov.

Roger Smith, Texas A&M University.

Title: Normalizers of tensor products

Abstract: Normalizing unitaries have played an important role in von Neumann algebra theory ever since Dixmier first used them to classify various types of masas in the 1950's. For a containment $B \subseteq M$ of finite von Neumann algebras, a normalizing unitary $u \in M$ is one such that $uBu^* = B$. More generally, a groupoid normalizer is a partial isometry $v \in M$ such that $vBv^* \subseteq B$ and $vv^*, v^*v \in B$. A theorem of Dye asserts a close connection between these concepts for masas: each groupoid normalizer v has the form pu for a unitary normalizer u and a projection $p \in B$. However, this connection disappears in more general settings, and these operators must be studied separately.

In this talk we will describe recent joint work with Junsheng Fang, Stuart White and Alan Wiggins concerning the structure of normalizing unitaries and partial isometries for tensor products of inclusions $B_i \subseteq M_i$, $i = 1, 2$. This is in the context of algebras satisfying $B' \cap M \subseteq B$, which includes the extreme cases of masas and subfactors of trivial relative commutant. For such algebras, a sample result is

$$W^*(\mathcal{GN}(B_1 \overline{\otimes} B_2)) = W^*(\mathcal{GN}(B_1)) \overline{\otimes} W^*(\mathcal{GN}(B_2))$$

where $\mathcal{GN}(\cdot)$ denotes the set of groupoid normalizers. The main tool for obtaining such results is the basic construction algebra $\langle M, e_B \rangle$ arising from an inclusion $B \subseteq M$, and some background on this will be included.

Richard M. Timoney, Trinity College Dublin.

Title: Operator space structure of JC^* triples and TROs

Abstract: In joint work with L. Bunce and B. Feely, we consider universal enveloping objects for JC^* -triples, including enveloping ternary rings of operators (TROs) and C^* -algebras. By means of a concept of reversibility, we are able to characterise explicitly the universal TRO for a wide range of examples. One application is the characterisation of all the possible operator space structures on a JC^* -triple X in a given (isometric) equivalence classes of triples. We recover and extend some recent results of M. Neal & B. Russo, replacing their extensive grid calculations with our more global methods, and we recast the results in terms of quotients of the universal TRO. In particular, the Hilbertian case is of interest. We exhibit two canonical operator space structures on odd spin factors.

Ivan Todorov, Queen's University Belfast.

Title: s -numbers of elementary operators

Abstract: A well-known theorem of Fong and Sourour states that if E is an elementary operator acting on the space $B(H)$ of all bounded linear operators on a Hilbert space H then E is compact if and only if it has the form $E(X) = \sum_{i=1}^n A_i X B_i$, $X \in B(H)$, for some compact operators A_i and B_i , $i = 1, \dots, n$. In this talk we provide versions of this result in the case the ideal of compact operators is replaced by an s -number ideal. More precisely, we relate the inclusion of an elementary operator E on $B(H)$ in an s -number ideals in $B(B(H))$ to the inclusion of the operators A_i and B_i in a suitable representation of E to the corresponding s -number ideal in $B(H)$. We pay special attention to the Hilbert, Kolmogorov and approximation s -number ideals. We give an s -number ideal version of a generalisation of the Fong-Sourour Theorem for prime C^* -algebras due to Mathieu.

Mark Tomforde, University of Houston.

Title: Equiangular tight frames from Seidel matrices containing cube roots of unity

Abstract: We derive easily verifiable conditions which characterize when complex Seidel matrices containing cube roots of unity have exactly two eigenvalues. The existence of such matrices is equivalent to the existence of equiangular tight frames for which the inner product between any two frame vectors is always a common multiple of the cube roots of unity. We also exhibit a relationship between these equiangular tight frames, complex Seidel matrices, and highly regular directed graphs. We will end by showing how to construct examples of such frames with arbitrarily many vectors. This is joint work with Bernhard Bodmann and Vern Paulsen.

Gabriel Tucci, Texas A&M University.

Title: Some quasinilpotent generators of the hyperfinite II_1 -factor

Abstract: For each sequence $\{c_n\}_n$ in $l_1(N)$ we define an operator A in the hyperfinite II_1 -factor R . We prove that these operators are quasinilpotent and they generate the whole hyperfinite II_1 -factor. We provide enough evidence to suggest that these operators are interesting for the hyperinvariant subspace problem.

Alfons Van Daele, Katholieke Universiteit Leuven.

Title: The antipode: a fascinating concept

Abstract: It is fair to say that, in the search for the right notion of a locally compact quantum group, say during the last three to four decades, the main problem has been the antipode (or coinverse). It is the quantum analogue of taking the inverse in a group. By now, the antipode is very well understood and it is known to have nice properties. This is exactly what I will talk about.

So, first I will explain what kind of problems arise when defining and studying the antipode for locally compact quantum groups. Then I will tell about several ways to overcome this problem and in particular, about one approach in a more recent treatment of the subject. Finally, I will say something about the more interesting features of the antipode.

Throughout the talk, I will use (and refer to) Hopf algebra theory, as well as the basic examples coming from groups, to motivate this approach.

Marty Walter, University of Colorado.

Title: Off Diagonal Matrix Coefficients are Tangents to State Space: Orientation and C^* -algebras

Abstract: We have a simple way of transferring the complex structure of the underlying Hilbert space for a C^* -algebra (represented on said Hilbert space) to its state space, hence a method for describing the orientation of the state space in the sense of Alfsen and Shultz.

Alan Wiggins, Vanderbilt University.

Title: Strong Singularity Constants for Subfactors of II_1 Factors

Abstract: We investigate the property of α -strong singularity (defined by Sinclair and Smith) for proper subfactors of II_1 factors. We produce an absolute constant c for which all proper singular subfactors of any II_1 factor are c -strongly singular and observe that, unlike the case for masas, singularity is not equivalent to the weak asymptotic homomorphism property. We give a family of finite-index examples for which the constant may be improved.

Dana P. Williams, Dartmouth College.

Title: Renault's Equivalence Theorem for Groupoid Dynamical Systems and Beyond.

Abstract: Induced representations and their corresponding imprimitivity theorems form a crucial part of the harmonic analysis of dynamical systems and their crossed products. I will give a brief exposition of the main features Renault's equivalence theorem, and if time permits, its extension to Fell bundles.

Jasang Yoon, University of Texas-Pan American.

Title: When is hyponormality for 2-variable weighted shifts invariant under powers?

Abstract: (Joint work with R. Curto) Joseph G. Stampfli showed that there exists a subnormal weighted shifts W_α for which any power W_α^n (all $n \geq 2$) need not be subnormal. If, in the commuting multivariable case, we further assume that each component is subnormal, then the analogous result appears to be very difficult. In this talk, we will mention part of these problems using examples (a class of 2-variable weighted shifts) and give a relative theory.