Discrete Groups and Operator Algebras
Groupes discrets et algèbres des opérateurs
(Org: **Guillermo Cortiñas** (University of Buenos Aires), **Andrés Navas Flores** (University of Santiago de Chile), **Mikael Pichot,** (McGill University) and/et **Guoliang Yu** (Texas A&M University))

ANDRES NAVAS, Universidad de Santiago de Chile
On the affine isometric actions over a dynamics.

We will review some results concerning fixed points for twisted affine actions on Banach spaces for which there is a bounded orbit. We will first remind that the twisting comes from an abstract dynamics, and the existence of a fixed point in the right space is sometimes related to the dynamics of this action.

BOGDAN NICA, McGill University
C-algebras of hyperbolic groups - To infinity and back*

I will discuss the (somewhat surprising) role played by the boundary in studying the reduced C*-algebra of a hyperbolic group.

GISELA TARTAGLIA, Universidad Nacional de La Plata
The Farrell-Jones conjecture for Haagerup groups and $\mathcal{K}$-stable coefficients.

A celebrated theorem of Higson and Kasparov says that if G is Haagerup group then the topological K-theory assembly map (the Baum-Connes assembly map) with coefficients in a G-C^*-algebra A

$$H_*^G(\underline{EG}, K^{\mathrm{top}}(A)) \to K_*^{\mathrm{top}}(C_r^*(G, A))$$

is an isomorphism. Here $C_r^*(G, A)$ is the reduced C^*-algebra crossed product. Thus the Higson-Kasparov theorem establishes the Baum-Connes conjecture for Haagerup groups. In joint work with G. Cortiñas we have shown that if G is Haagerup, $\mathcal{K}$ is the ideal of compact operators, I is a K-excisive ring, A a G-C^*-algebra and $B = I \otimes_{\mathbb{Z}} (A \otimes_{\min} \mathcal{K})$ then the algebraic K-theory assembly map (the Farrell-Jones assembly map)

$$H_*^G(\underline{EG}, K(B)) \to K_*(B \rtimes G)$$

is an isomorphism. Here $\rtimes$ is the algebraic crossed product. Thus the latter result establishes Farell-Jones conjecture with $\mathcal{K}$-stable coefficients. The talk will review this result and report on our current project with Cortiñas and Willett to partly extend this to rings of coefficients which are stable under the ideal of trace-class operators.

RODOLFO VIERA, Universidad de Santiago de Chile
Densitites non-realizable as the Jacobian of a 2-dimensional bi-Lipschitz map are generic

In this talk, positive functions defined on the plane are considered from a generic viewpoint, both in the continuous and the bounded setting. By pursuing on constructions of Burago-Kleiner and McMullen, we show that, generically, such a function cannot be written as the Jacobian of a bi-Lipschitz homeomorphism.

RUFUS WILLETT, University of Hawaii at Manoa
K-homology and localization algebras

I'll discuss a new model for K-homology based on a non-commutative generalization of the localization algebra of Guoliang Yu. I'll then talk about how this model gives rise to a 'controlled' picture of K-homology, and some applications to computing the

K-theory and K-homology of crossed product C*-algebras associated to actions of discrete groups on compact spaces, among other things. This is based on joint work with Marius Dadarlat and Jianchao Wu, and with Guoliang Yu.

MITSURU WILSON, Universidad de los Andes
Pseudo-differential calculus on noncommutative special unitary groups

In this talk, I will discuss a construction of pseudo-differential for a noncommutative analogue $SU(3)_\theta$ of the special unitary group $SU(3)$ viewed as a quantum group. In geometry, pseudo-differential calculus is a global concept that is used to reveal the global geometry. The constructions very much carry over to the C^*-algebra and quantum group settings. This work is based on a collaboration with a Ph.D. student Carlos Rodriguez.

ZHIZHANG XIE, Texas A&M University
Additivity of higher rho invariants and nonrigidity of topological manifolds

The talk is based on joint work with Shmuel Weinberger and Guoliang Yu. The main result of the talk concerns the additivity of the higher rho invariant. More precisely, we show that the higher rho invariant is a group homomorphism from the structure group of a topological manifold to its analytic structure group. This result is then applied to study non-rigidity of topological manifolds. More precisely, we give a lower bound for the size of reduced structure group of a topological manifold, in terms of the number of torsion elements in its fundamental group.