WORKSHOP ON THE FRONTIERS BETWEEN FUNCTIONAL ANALYSIS AND ALGEBRA (WFFAA)

María de Gádor Cabrera Padilla

- **Title**: Maximal Banach ideals of Lipschitz maps.

- **Abstract**:

The strong connection between norms defined on tensor products of two Banach spaces and some ideals of linear operators made us wonder if it is possible to develop a similar theory when we deal with norms on Lipschitz tensor products of a pointed metric space and a Banach space and ideals of Lipschitz operators defined between these kinds of spaces.

With this aim in mind, we were able to get some interesting relations between certain Lipschitz cross-norms and ideals of Lipschitz maps taking values in a dual Banach space. Our intention in this work is to extend these results when the Lipschitz operators are defined from a pointed metric space to a Banach space which is not necessary to be a dual space. The main tool will be the representation theorem for maximal operator ideals, from which we obtain a Lipschitz version.

This is a joint work with Javier Alejandro Chávez–Domínguez (University of Oklahoma, USA), Antonio Jiménez–Vargas (University of Almería, Spain) and Moisés Villegas–Vallecillos (University of Cádiz, Spain).

Decompositions of linear spaces induced by bilinear maps

Antonio Jesús Calderón Martín

Let V be an arbitrary linear space and $f : V \times V \to V$ a bilinear map. We show that, for any choice of basis $\mathcal{B}$ of V, the bilinear map f induces on V a decomposition

$$V = \bigoplus_{j \in J} V_j$$

as a direct sum of linear subspaces, which is f-orthogonal in the sense

$$f(V_j, V_k) = 0$$

when $j \neq k$, and in such a way that any V_j is strongly f-invariant in the sense

$$f(V_j, V) + f(V, V_j) \subset V_j.$$

We also characterize the f-simplicity of any V_j. Finally, an application to the structure theory of arbitrary algebras is also provided.

On the structure topology on the set of all extreme points of the closed unit ball of the dual of a Banach space

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Abstract

Let X be a real Banach space, and let E_{X^*} stand for the set of all extreme points of the closed unit ball of X^*, endowed with the Alfsen–Effros structure topology . We prove that, whenever X is nice, the fact that $\{\pm s^*\}$ is a structurally open subset of E_{X^*} can be characterized in many apparently different ways. (We recall that X is said to be nice if every extreme operator from any Banach space to X is a nice operator, i.e. its adjoint preserves extreme points.) As a consequence, we obtain new characterizations (as well as new proofs of known characterizations) of those nice Banach spaces which are isometrically isomorphic to $c_0(I)$ for some set I.