

Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

October 31 **Eva Gallardo-Gutierrez**, Universidad Complutense de Madrid and ICMAT, visiting UC Berkeley

Title: *Insights into the Invariant Subspace Problem for compact perturbations of normal operators.*

Despite its simplicity, apparently one of the most difficult questions in the theory of invariant subspaces in separable, infinite dimensional complex Hilbert spaces is the problem of the existence of non-trivial closed invariant subspaces for a compact perturbation of a self-adjoint operator. Livsic solved this problem for nuclear perturbations, Sahnovic for Hilbert-Schmidt perturbations, and Gohberg and Krein, Macaev, and Schwartz for the perturbation being in the von Neumann class. However, it is still an open question if every compact perturbation of a selfadjoint operator has a non-trivial closed invariant subspace. The situation is still even hopeless if one considers compact perturbations of a bit broader class of operators, namely normal operators. In this talk we will address this latter question and show recent improvements obtained in collaboration with Javier Gonzales-Dona which extends previous works by Foias, Jung, Ko and Percy and Fang and Xia.