SEMINARIO DE ANÁLISIS COMPLEJO Y TEMAS RELACIONADOS

"**On duality, distance and compact operators
in spaces with supremum-type norms**"

Karl-Mikael PERFEKT

(NTNU, Trondheim, Noruega)

Viernes, 28 de noviembre de 2014, a las 10:30

Aula 520, Módulo 17, Departamento de Matemáticas

Universidad Autónoma de Madrid

Resumen:

We consider a general framework of Banach spaces M defined by a boundedness condition. Prototype examples are l^∞, weighted spaces of functions or their derivatives, BMO, Lipschitz spaces, and many others. Each space M has a small space counterpart M_0, consisting of elements of M where the quantity of the boundedness condition "vanishes at infinity". In the above examples, the corresponding M_0-spaces are c_0, vanishing weighted spaces, the space VMO, small Lipschitz spaces, etc.

We will show that the bidual of M_0 is always M, as expected. Furthermore, letting T be a continuous operator $T : M_0 \to Z$, Z any Banach space, it turns out that if T is weakly compact, it is already very close to being compact. This is remarkable since weak compactness is in general a very weak property. The phenomenon has been observed previously for classes of concrete operators such as composition operators and integration operators acting on spaces of analytic functions with supremum-type norms, where it often happens that weak compactness and compactness coincide.