On L_p Brunn-Minkowski type inequalities for a general class of functionals

Lidia Gordo Malagón

Universidad de Murcia

(Joint work with J. Yepes Nicolás)

The L_p version (for $p \geqslant 1$) of the Brunn-Minkowski inequality proven by Firey in the 60's for two convex bodies containing the origin $K, L \subset \mathbb{R}^n$, and recently extended to non-empty compact sets by Lutwak, Yang and Zhang, asserts that the volume is a (p/n)-concave functional, namely,

$$\mathrm{vol}\big((1-\lambda)\cdot K +_p \lambda\cdot L\big)^{p/n} \geqslant (1-\lambda)\mathrm{vol}(K)^{p/n} + \lambda\mathrm{vol}(L)^{p/n}$$

for all $\lambda \in (0,1)$.

In this talk, we will collect different Brunn-Minkowski type inequalities for a general class of functionals, defined on a certain family of subsets, when dealing with the p-sum of the sets involved.

As a particular case of our general approach, we derive new L_p Brunn-Minkowski type inequalities for both the Wills functional and the standard Gaussian measure. Furthermore, we will provide other remarkable examples of functionals satisfying L_p Brunn-Minkowski type inequalities, such as different absolutely continuous measures with radially decreasing densities.