

INTRODUCCIÓN A LA INVESTIGACIÓN SEVERO OCHOA 2021
RESEARCH PROJECT: FREE BANACH LATTICES

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Banach lattices are a class of Banach spaces which incorporate order and lattice structure. Many of the classical function spaces arising in analysis are Banach lattices, this includes for instance sequence spaces ℓ_p , spaces of integrable functions on a measurable space $L_p(\Omega, \Sigma, \mu)$ and spaces of continuous functions on a compact space $C(K)$. Research in this area focuses on the interplay between algebraic, geometric, analytic and order structures.

In a recent work [1], we have introduced the notion of free Banach lattice generated by a Banach space. This provides a new canonical functor between the categories of Banach spaces (and linear operators) and Banach lattices (with lattice homomorphisms, that is, those maps preserving the lattice structure). This new tool has become fundamental to tackle some exciting open problems in the area. The student will have the chance to approximate to this very recent developments in Functional Analysis and learn from a variety of topics connected to them.

In order to properly profit from this project it is highly recommended to have gone through a basic course in Functional Analysis.

REFERENCES

- [1] A. Avilés, J. Rodríguez, P. Tradacete, The free Banach lattice generated by a Banach space. *J. Funct. Anal.* 274 (2018), 2955-2977.