UAB Universitat Autònoma de Barcelona | Universitat de Barcelona | Universitat Politècnica de Catalunya BarcelonaTech

**Barcelona Analysis Seminar** **2026–2027**

**Date:** Thursday December 3, 2026
**Time:** 15:00 CET
**Room:** UB iA (Universitat de Barcelona)

# On Optimal Constants for Classical Operators on Lebesgue Spaces and some applications

Achraf Ben Said
Universidad Complutense de Madrid

Let $1 < p < \infty$. The Cesàro space $\mathrm{Ces}_p(\mathbb{R}^+)$ consists of functions $f$ such that

$$\|H|f|\|_p < \infty,$$

where $H$ is the Hardy operator, defined by

$$Hf(x) = \frac{1}{x}\int_0^x f(t)\,dt.$$

By Hardy's inequality, we have the inclusion

$$L^p(\mathbb{R}^+) \subset \mathrm{Ces}_p(\mathbb{R}^+),$$

and this inclusion is strict. An analogous situation arises in the discrete case when considering the Cesàro operator instead of the Hardy operator. A line of research of significant interest is to find norms equivalent to the usual norms in the spaces $L^p(\mathbb{R}^+)$, $\mathrm{Ces}_p(\mathbb{R}^+)$, and in $\ell^p(\mathbb{N})$, giving the **sharp constants** in such equivalences.

In this talk, I will present our results from my recently defended doctoral thesis and discuss open problems in these areas.