Publicacions més rellevants de la línia de recerca:
Estructura d'espais de funcions

Referència: Cascante, C., Ortega Aramburu, J. and Verbitsky, I. On L^p-L^q trace inequalities. *J. London Math. Soc. (2)* **74(2)** (2006), pp. 497–511.

Abstract: We give necessary and sufficient conditions in order that inequalities of the type

$$\|T_K f\|_{L^q(d\mu)} \leq C\|f\|_{L^p(d\sigma)}, \quad f \in L^p(d\sigma),$$

hold for a class of integral operators $T_K f(x) = \int_{R^n} K(x,y) f(y)\, d\sigma(y)$ with nonnegative kernels, and measures $d\mu$ and $d\sigma$ on $\mathbb{R}^n$, in the case where $p > q > 0$ and $p > 1$.

An important model is provided by the dyadic integral operator with kernel $K_{\mathcal{D}}(x,y) = \sum_{Q\in\mathcal{D}} K(Q)\chi_Q(x)\chi_Q(y)$, where $\mathcal{D} = \{Q\}$ is the family of all dyadic cubes in $\mathbb{R}^n$, and $K(Q)$ are arbitrary nonnegative constants associated with $Q \in \mathcal{D}$.

The corresponding continuous versions are deduced from their dyadic counterparts. In particular, we show that, for the convolution operator $T_k f = k \star f$ with positive radially decreasing kernel $k(|x-y|)$, the trace inequality

$$\|T_k f\|_{L^q(d\mu)} \leq C\|f\|_{L^p(dx)}, \quad f \in L^p(dx),$$

holds if and only if $\mathcal{W}_k[\mu] \in L^s(d\mu)$, where $s = q(p-1)/(p-q)$. Here $\mathcal{W}_k[\mu]$ is a nonlinear Wolff potential defined by $\mathcal{W}_k[\mu](x) = \int_0^{+\infty} k(r)\bar{k}(r)^{1/(p-1)}\mu(B(x,r))^{1/(p-1)} r^{n-1}\, dr$, and $\bar{k}(r) = (1/r^n)\int_0^r k(t)t^{n-1}\, dt$. Analogous inequalities for $1 \leq q < p$ were characterized earlier by the authors using a different method which is not applicable when $q < 1$.

Referència: Ortega Aramburu, J.; Fàbrega, J. Multipliers in Hardy-Sobolev spaces. Integral Equations *Operator Theory* **55 (4)** (2006), pp. 535–560.

Abstract: For $1 < p < \infty$ and $0 \leq n - sp < 1$, we give characterizations of the space of pointwise multipliers of the holomorphic Hardy-Sobolev spaces on the unit ball B of $\mathbb{C}^n$ As an application of these results we obtain a corona theorem for these spaces.

Referència: Cascante, C. and Ortega Aramburu, J. Carleson measures for weighted Hardy-

Sobolev spaces. *Nagoya Math. J.* **186** (2007), pp. 29–68.

Abstract: We obtain characterizations of positive Borel measures μ on $\mathbf{B}^n$ so that some weighted Hardy-Sobolev are imbedded in $L^p(d\mu)$, where w is an A_p weight in the unit sphere of $\mathbf{C}^n$.