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Barcelona Analysis Seminar **2025–2026**

Date: Thursday September 25, 2025

Time: **15:30 CET**

Room: UB iA (Universitat de Barcelona)

Weighted maximal inequalities on hyperbolic spaces

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In this talk, we will discuss the singularity of the (centered) maximal operator in the hyperbolic spaces. With this aim, we changed the density of the underlying measure to avoid possible compensations due to the symmetries of the hyperbolic measure. Our starting point will be a variant of the well-known endpoint Fefferman-Stein inequality for the centered Hardy-Littlewood maximal function. In the hyperbolic setting, this inequality generalizes the weak (1,1) estimates obtained by Strömberg in "Weak type L1 estimates for maximal functions on noncompact symmetric spaces", Ann. of Math. 114 (1981) who answered a question posed by Stein and Wainger in "Problems in harmonic analysis related to curvature", Bull. Amer. Math. Soc. 84 (1978). We briefly discuss the ideas of the proof, which combines some geometrical arguments with some ideas used in the discrete setting of regular trees by Naor and Tao in "Random martingales and localization of maximal inequalities", J. Funct. Anal. 259 (2010). By the end of the talk, we will say a few words about weighted estimates for the maximal function for p¿1. On the one hand, we show that the classical A_p conditions are not the right ones in this setting. On the other hand, we will show sharp sufficient conditions for weighted weak and strong type (p, p) boundedness of the centered maximal function, when $p > 1$. This talk is based on a joint work with Sheldy Ombrosi.

More information at: `https://mat.uab.cat/web/seminarianalisi/`