Barcelona Analysis Seminar **2022–2023**

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Room. C3B-158 (Universitat Autònoma de Barcelona)

Online streaming. Click here to join.

The Hausdorff dimension of planar elliptic measures

Ignasi Guillén Mola

Universitat Autònoma de Barcelona

In the plane, in 1988 Jones and Wolff showed $\dim_{\mathcal{H}} \omega_\Omega^p \leq 1$, and in 1993 this result was improved by Wolff by finding a subset $F \subset \partial\Omega$ with σ-finite length and with full harmonic measure $\omega_\Omega^p(F) = 1$.

In the same direction for higher dimensions, $\mathbb{R}^{n+1}$ with $n \geq 2$, Bourgain in 1987 proved that there exists a constant $b_n > 0$ such that $\dim_{\mathcal{H}} \omega_\Omega^p \leq n + 1 - b_n$. Wolff in 1995 constructed a set $\Omega_n \subset \mathbb{R}^{n+1}$ such that $\dim_{\mathcal{H}} \omega_{\Omega_n}^p > n$.

We focus on the study of the dimension of planar elliptic measures arising from the PDE $\operatorname{div}(A\nabla\cdot) = 0$ with uniformly elliptic matrix A. In this scenario, we present the analogous result of Wolff in the plane for these situations:

- Reifenberg flat domains with small constant and Lipschitz matrices.
- General domains and symmetric matrices with determinant 1, assuming some regularity on the matrix.

This is joint work with Martí Prats and Xavier Tolsa.