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Barcelona Analysis Seminar **2024–2025**

Date: Thursday June 5, 2025

Time: 15:00 CET

Room: UB B6 (Universitat de Barcelona)

Shape optimization problems for the eigenvalues of Toeplitz operators and Wehrl-type entropies

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Toeplitz operators are well-known operators acting on the Fock space, that is the Hilbert space of entire functions that are in $L^2(\mathbb{C}, e^{-\pi|z|^2}dz)$, and associated with a function $\varphi\colon \mathbb{C} \to \mathbb{C}$, called the symbol of the operator. When the symbol is the characteristic function of a set $\Omega \subset \mathbb{C}$ of finite measure, the corresponding Toeplitz operator T_Ω is self-adjoint, compact and positive. We denote its eigenvalues (ordered in a decreasing way) with $\lambda_1(\Omega) \geq \lambda_2(\Omega) \geq \cdots > 0$.

In this seminar, we are going to present some shape optimization results for various quantities involving these eigenvalues. We are also going to connect these problems with the minimization and the characterization of minimizers of Wehrl-type entropies, an analogous of a "classical" entropy for quantum states. To conclude, we will discuss several open questions.

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