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Barcelona Analysis Seminar **2025–2026**

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An improved lower bound for the logarithmic energy on the sphere

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Given a configuration of points on the sphere $x_1, \dots, x_N \in \mathbb{S}^2$ their discrete logarithmic energy is defined by

$$\mathcal{E}(x_1, \dots, x_N) = \sum_{i \neq j} \log \frac{1}{|x_i - x_j|}.$$

The asymptotic behavior of the minimum of this energy

$$\mathcal{E}(N) = \min_{x_1, \dots, x_N \in \mathbb{S}^2} \mathcal{E}(x_1, \dots, x_N)$$

has been extensively studied. In particular, the value of the constant multiplying the linear term in its asymptotic expansion is the subject of the Brauchart–Hardin–Saff conjecture (2012), which is equivalent to the Sandier–Serfaty conjecture concerning the minimality of the triangular lattice.

In this talk, we will present an improvement on the previously known lower bound for this constant.