Pólya's conjecture for Euclidean balls

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In 1954, G. Pólya conjectured that the estimate

$$N_{\mathcal{D}}(\Omega, \Lambda) \leqslant C_W \Lambda^{d/2}$$

holds true for all $\Lambda \geqslant 0$. Here $\Omega \subset \mathbb{R}^d$ is a bounded domain, Λ is the spectral parameter, $N_{\mathcal{D}}(\Omega, \Lambda)$ is the counting function of the Laplace operator of the Dirichlet problem in Ω, and C_W is the constant in the Weyl law. We prove this conjecture for the balls of arbitrary dimension.

This is a joint work with M. Levitin, I. Polterovich and D. A. Sher.