On the Hardy constant of non-convex planar domains: the case of the quadrilateral

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Abstract: The Hardy constant of a simply connected domain Ω in $\mathbb{R}^2$ is the best constant for the inequality

$$\int_\Omega |\nabla u|^2 dx \geq c \int_\Omega \frac{u^2}{\text{dist}^2(x, \partial\Omega)} dx, \quad \forall\, u \in C_c^\infty(\Omega).$$

After the work of Ancona where the universal lower bound $1/16$ was obtained, there has been a substantial interest on computing or estimating the Hardy constant of planar domains. In this talk we present new results concerning the case of an arbitrary quadrilateral in the plane (joint with A. Tertikas).