Isoperimetric Inequalities, Sobolev Constants and Heat Kernels

(2 Lectures)

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We first introduce the isoperimetric inequalities and their relations with the Sobolev and Poincaré type inequalities on Riemannian manifolds. We discuss the geometric and analytic implications of the isoperimetric and Faber-Krahn type inequalities, their relation to bounds for heat kernels and their geometric and analytical implications. Finally, we introduce the Poincaré and Sobolev inequalities in the framework of abstract spaces.