

Spectral geometry: old questions and new answers

Spectral geometry is concerned with the interaction between the spectrum of linear differential operators and the geometry of underlying Riemannian manifolds. The goal of the lecture is to acquaint the student with classical problems as well as the most recent developments in the field. The emphasis is put on the Laplace operator in Euclidean domains, subject to Dirichlet, Neumann and Robin boundary conditions. Among the topics covered, there are embedded eigenvalues in unbounded domains, spectral isoperimetric inequalities, nodal-line and hot-spots conjectures, inverse problems of hearing the shape of a drum and geometrically induced eigenvalues and Hardy-type inequalities in curved tubes.

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