Spectral geometry is a field in mathematics which concerns relationships between geometric structures of manifolds and spectra of canonically defined differential operators. The case of the Laplace–Beltrami operator on a closed Riemannian manifold has been most intensively studied, although other Laplace operators in differential geometry have also been examined. The field concerns itself with two kinds of questions: direct problems and inverse problems.

Spectral Theory and Geometry - edited by E. Brian Davies September 1999. Also, I have tried, in some strictly Riemannian topics, to complement Burstall's elegant treatment with a more classical approach to some of the same material. In particular, I devote more time than might be warranted to the calculation of the Laplacian in geodesic spherical coordinates. Recommend this book. Email your librarian or administrator to recommend adding this book to your organisation's collection. Spectral Theory and Geometry. Edited by E. Brian Davies, Yuri Safarov.

For example, spectral theory is arguably the centerpiece of functional analysis and famously interacts with quantum mechanics; on the other hand, Riemannian geometry is instrumental in such marvels as general relativity, any number of aspects of Morse theory in its broadest sense (e.g. the work of Novikov), and Perelman's recent proof of the 3-dimensional Poincaré conjecture. So it is, then, that the material covered in the pages of this book attests to the fecund interplay between mathematics and physics over the centuries, and its recent waxing. We start off with what Lableé describes as a...

Addressed to students or young researchers, the present book is a first introduction in spectral theory applied to geometry. For readers interested in pursuing the subject further, this book will provide a basis for understanding principles, concepts and developments of spectral geometry.

Keywords: Spectral theory, linear operators, spectrum of operators, spectral geometry, eigenvalues, Laplacian, inverse problems, Riemannian geometry, analysis on manifolds

Further Information

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