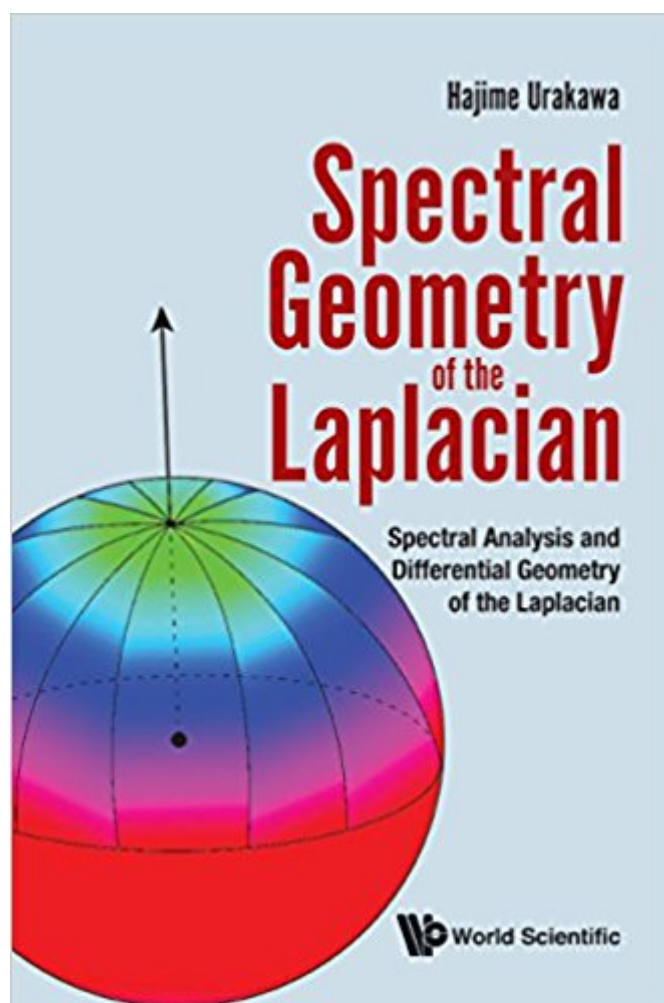


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# Spectral Geometry Of The Laplacian: Spectral Analysis And Differential Geometry Of The Laplacian



## Synopsis

The totality of the eigenvalues of the Laplacian of a compact Riemannian manifold is called the spectrum. We describe how the spectrum determines a Riemannian manifold. The continuity of the eigenvalue of the Laplacian, Cheeger and Yau's estimate of the first eigenvalue, the Lichnerowicz Obata's theorem on the first eigenvalue, the Cheng's estimates of the  $k$ th eigenvalues, and Payne Polya Weinberger's inequality of the Dirichlet eigenvalue of the Laplacian are also described. Then, the theorem of Colin de Verdière, that is, the spectrum determines the totality of all the lengths of closed geodesics is described. We give the V Guillemin and D Kazhdan's theorem which determines the Riemannian manifold of negative curvature.

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