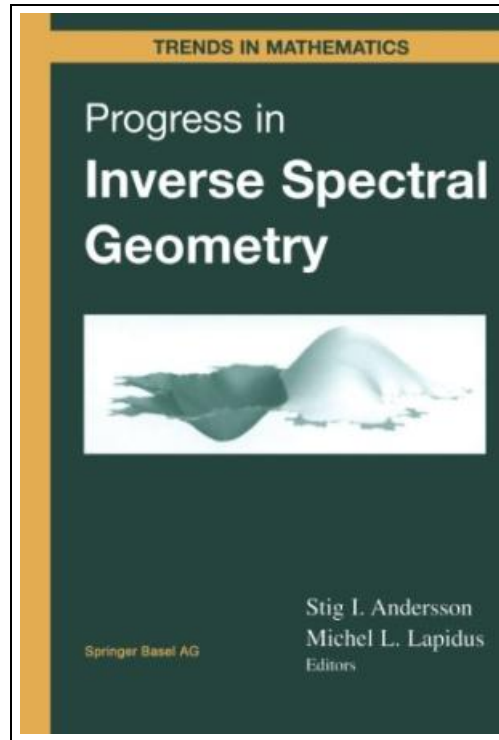


## Progress in Inverse Spectral Geometry



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### ***Reviews***

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## PROGRESS IN INVERSE SPECTRAL GEOMETRY



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Book Condition: New. Publisher/Verlag: Springer, Basel | most polynomial growth on every half-space  $\text{Re}(z) \geq c$ . Moreover,  $Op(t)$  depends holomorphically on  $t$  for  $\text{Re } t > 0$ . General references for much of the material on the derivation of spectral functions, asymptotic expansions and analytic properties of spectral functions are [A-P-S] and [Sh], especially Chapter 2. To study the spectral functions and their relation to the geometry and topology of  $X$ , one could, for example, take the natural associated parabolic problem as a starting point. That is, consider the heat equation  $(\partial_t + p)u(x, t) = 0$   $\{ u(x, 0) = U_0(x), t \geq 0$  which is solved by means of the (heat) semi group  $V(t) = e^{-tP}$ ; namely,  $u(x, t) = V(t)u_0$ . Assuming that  $V(t)$  is of trace class (which is guaranteed, for instance, if  $P$  has a positive principal symbol), it has a Schwartz kernel  $K_E \in \mathcal{CO}(X \times X \times \mathbb{R}_t, E \otimes E)$ , locally given by  $K(x, y; t) = \sum_{k=0}^{\infty} e^{-k^2 t} \langle P^k \rangle(x, y)$ ,  $k=0$  for a complete set of orthonormal eigensections  $\langle P^k \rangle \in \mathcal{CO}(E)$ . Taking the trace, we then obtain:  $\text{tr} Op(t) = \text{trace}(V(t)) = \sum_{k=0}^{\infty} e^{-k^2 t}$ . Now, using, e. g. , the Dunford calculus formula (where  $C$  is a suitable curve around  $a(P)$ ) as a starting point and the standard formalism of pseudodifferential operators, one easily derives asymptotic expansions for the spectral functions, in this case for  $Op$ . | Spectral Geometry: An Introduction and Background Material for this Volume.- Geometry Detected by a Finite Part of the Spectrum.- Spectral Geometry on Nilmanifolds.- Upper Bounds for the Poincaré Metric Near a Fractal Boundary.- Construction de Variétés Isospectrales du Théorème de T. Sunada.- Inverse spectral theory for Riemannian foliations and curvature theory.- Computer Graphics and the Eigenfunctions for the Koch Snowflake Drum.- Inverse Spectral Geometry.- Inverse Spectral...



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