Analysis and Differential Geometry Seminar

Sum rules for eigenvalues of differential equations on surfaces and graphs

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Abstract: I will discuss "sum rule" identities that can be derived at the level of operator algebra, and their uses to prove sharp inequalities for eigenvalues of elliptic differential operators on manifolds and on metric graphs. Three uses of the sum rules are to find connections between Laplace spectra and curvature on "quantum waveguides," to find connections between Schrödinger spectra and topology on "quantum graphs," and to yield short, efficient derivation of sharp semiclassical estimates of Lieb-Thirring type in the same situations. Parts of this work are joint with Demirel, Hermi, and Stubbe.

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