NILIMA NIGAM, Simon Fraser University
On numerical analysis and spectral geometry

Spectral geometry is concerned with the relationships between the geometric properties of domains and the spectra of elliptic operators on them. For most domains, there is no exact expression for these spectra, and they must be approximated.

How does one compute the eigenvalue of an elliptic operator on a bounded domain? It is easy to compute such approximations; it requires more effort to compute them well. In this talk I'll provide a high-level survey of the challenges of approximation of spectra. I'll then present a high-accuracy method which is based on integral operators, and another, lower-accuracy technique which is suited to validated numerical computations.