

# The Covering Spectrum and Isospectrality

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Thursday, April 2, 2009

007 Kemeny Hall, 4:00 pm  
(Tea 3:30 pm 300 Kemeny Hall)

## Abstract

"Can one hear the shape of a drum?" is a question popularized by M. Kac. The question asks whether the geometry of a shape can be "heard"; i.e., determined by the frequencies it makes. Mathematically translated, can geometric properties be determined by the eigenvalues of the Laplace-Beltrami operator. We will focus on the length spectrum (the set of all lengths of closed geodesics), and a weaker/related notion, the Covering Spectrum, which was recently defined by C. Sormani and G. Wei. In particular, we compare and contrast the group theoretic conditions used by Sunada to construct isospectral manifolds and the group theoretic conditions used by DeSmit-Gornet-Sutton to construct manifolds with the same covering spectrum.

This talk is aimed at graduate students. Definitions will be carefully presented and discussed on elementary examples.