SFB-Seminar (Research Project C2)

TIME:
21 Jun 2016, 15:00 - 18:00

LOCATION:
IRIS-Haus 2.07, HU Berlin

PROGRAM:

15:00 - 15:30 Coffee Break

15:30 - 16:30 **Prof. Dr. Carolyn Gordon (Dartmouth College)**

Inverse Spectral Problems for Dirichlet-to-Neumann operators
The Dirichlet-to-Neumann operator of a compact Riemannian manifold M with boundary is an endomorphism of the space of smooth functions on the boundary that maps the Dirichlet boundary values of each harmonic function f on M to the Neumann boundary values of f. The spectrum of this operator is discrete and is called the Steklov spectrum. The Dirichlet-to-Neumann operator also generalizes to the setting of orbifolds. We will compare the behavior of the Steklov spectrum on smooth surfaces with that of two-dimensional orbifolds. In arbitrary dimensions, we will adapt techniques for constructing isospectral manifolds to the setting of the Steklov spectrum.

16:30 - 17:00 Coffee Break

17:00 - 18:00 **Sebastian Boldt (HU Berlin)**

Dirac isospectrality of lens spaces
To what extent are lens spaces determined by the spectrum of their Dirac operator(s)? The Dirac spectrum of the sphere is very well known. When passing to lens spaces, the eigenvalues remain the same but the multiplicities are in general smaller. We present two approaches to describe the latter. In the first approach, we encode

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the multiplicities into power series. These turn out to represent meromorphic functions. An analysis of their poles then leads to a partial rigidity result in dimension three. In the second approach we associate with each lens space an affine lattice. The multiplicities of the Dirac operator on a lens space are then connected to the number of points in the associated lattice with a certain 1-norm by a concrete formula. As a consequence we obtain a finite Dirac isospectrality criterion for lens spaces which in turn leads to several infinite families of Dirac isospectral pairs. We complement these with computer generated isospectral pairs and conclude with some unexpected phenomena.

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