

REGISTERED PARTICIPANTS

Key: Graduate Student (G), Organizer (O), Poster Presenter(P), Speaker (S),

Pedro Albin (G), **Stanford**. Research Interests: Invariants such as the analytic torsion and the functional determinant; more generally, index theory and algebraic topology.

Bernd Amman (P), **University of Hamburg, Germany**. Research Interests: We are studying a nonlinear eigenvalue problem for the Dirac operator on a closed Riemannian spin manifold (see abstracts). Other research areas of mine: analysis on complete manifolds, small eigenvalues of the Dirac operator and eigenvalue estimates for the Dirac operator on surfaces.

Vincent Bonini (G), **UC Santa Cruz**

David Borthwick (S), **Emory**

Eduardo Cabral (G), **Notre Dame**

Sun-Yung Alice Chang (S), **Princeton University**

Xianzhe Dai, **UC Santa Barbara**

Harold Donnelly (S), **Purdue**

Stewart Dowker (S), **University of Manchester, England**

Hao Fang, **NYU**

Tatyana Foth, **University of Michigan**. Current research interests: holomorphic automorphic forms on bounded symmetric domains, Berezin-Toeplitz quantization, moduli spaces of complex structures.

Lenoid Friedlander (O), **University of Arizona**

Mohammed Ghomi, **University of South Carolina**

Fan Chung Graham (S), **UC San Diego**

Lotfi Hermi (G), **University of Arizona**. Research Interests: I am mainly concerned with inequalities relating eigenvalues of partial differential operators. These involve domain-dependent as well as universal inequalities relating eigenvalues of operators modeled after the Laplace-Beltrami operator. These are related to the classical results of Payne, Polya, and Weinberger, Hile and Protter, H.C. Yang, Ashbaugh and Benguria, Harrell and Stubbe, and others.

Svetlana Jitomirskaya (S), **UC Irvine**

Christopher Judge, **Indiana University**

Hyunsuk Kang (G), **Cambridge University, England**. Research Interests: My main interests are:

- 1) Eigenvalues of the Laplacian, particularly on 1-forms,
- 2) Isospectral Riemannian surfaces of genus less than 4,
- 3) Spectral properties of a perturbed Laplacian

Yulia Karpeshina (S), **University of Alabama at Birmingham**

Sasha Alexandre Kirillov, **University of Pennsylvania**

Deborah Koslover (G)(P), UC, Irvine

Richard Kenyon (S), Université de Paris-Sud

Kay Kirkpatrick (G), UC Berkeley

Ari Laptev, Royal Institute of Technology, Sweden

Richard Laugesen (P), University of Illinois. Research Interests: I'm interested in sharp inequalities for eigenvalues and related spectral functionals such as zeta functions. Recently I've concentrated on fourth order operators, such as the biLaplace eigenvalue problems

Hanjin Lee (G), Columbia University

Young-Ran Lee (G), University of Alabama at Birmingham

Zhiqin Lu, UC Irvine. Research Interests: Complex geometry: Stability of compact complex manifold, geometry of moduli space, special Kahler geometry

Anandateertha Mangasuli (G), Purdue

Richard Melrose (S), Massachusetts Institute of Technology

Richard Millman, NSF. Research Interests: Richard Millman has worked in the area of holomorphic connections on complex fiber bundles, the space of Riemannian metrics, and the spectrum of the Laplacian on compact Riemannian manifolds, especially on Lie Groups. He is now program officer for infrastructure at the National Science Foundation and was program officer for Geometric Analysis at NSF in 1984-86.

Kate Okikiolu (O), UC San Diego Primary Research Interests: Elliptic operators on Riemannian manifolds and their spectral invariants, particularly zeta invariants such as the determinant. Extremal problems for spectral invariants. Spectral invariants of Toeplitz operators on manifolds.

Peter Perry (S), University of Kentucky

Emily Proctor (G), Dartmouth. Research Interests: My research interests include isospectrality and Lie groups. In particular, I am interested in producing examples of pairs or families of manifolds which are isospectral but which differ in some geometric property.

Jie Qing (S), UC Santa Cruz

Abdul Rahman, Howard. Research Interests: I have been engaged in developing a homology theory for stratified varieties motivated from gauged linear sigma models from String theory. These stratified spaces are formed by taking the disjoint union of a singular Calabi-Yau three-fold (conifold), the singular point, and an antenna (S2). The homology of these spaces, excepting the middle dimension, satisfies the Kahler package, the mirror map, and String theory. Future work will consist of studying more complex singularities in addition to examining candidate sub-varieties that can remove middle dimension obstructions.

Ken Richardson, TCU. Research Interests: I study spectral invariants, in particular those associated to transversally elliptic operators on smooth manifolds endowed with compact group actions or with Riemannian foliations. I also work on

the index theory of such operators. For example, if G is a compact Lie group, the G -index of a G -equivariant, transversally elliptic operator on a G -manifold is a type of distribution on G that is given as the formal difference of traces of infinite dimensional representations of G whose multiplicities are finite integers. One problem under consideration is to express these multiplicities in terms of geometric and topological data. Because of progress made on this and related questions, we now have the analogue of the Gauss-Bonnet theorem for Riemannian foliations.

Peter Sarnak (S), **Princeton University and NYU**

Melinda Schulteis (G)(P), **UC Irvine**. Research Interests: Ergodic Schrödinger operators, and in particular quasiperiodic Jacobi matrices.

Jeff Selden (G), **University of Arizona**. Research Interests: I am interested in asymptotics for the eigenvalues of the Laplacian under singular perturbations of the domain. Of particular interest is the case when the width of a fattened graph tends to zero. Results are known for the "finite" eigenvalues, but the state of the art seems to end there.

Florin Spinu (G)(P), **Princeton University**. Research: Uniform boundedness of the L^4 norm of the Eisenstein series on $\mathrm{PSL}(2, \mathbb{Z})$.

Jean Steiner (G), **UC San Diego**. Research interests: Elliptic and parabolic operators, spectral invariants and Riemannian geometry, conformal geometry.

Craig Sutton, **University of Pennsylvania**. Research Interests: My current research interests are centered around differential geometry. In particular, I am interested in constructing examples of isospectral manifolds through representation theoretic techniques and I am also interested in exploring the spectral rigidity of certain classes of manifolds. Recently, I have concentrated on using a generalization of Sunada's method to construct simply-connected isospectral pairs.

Terence Tao, **UCLA**. Research Interests: Harmonic Analysis, non-linear PDE, representation theory, combinatorics.

Tatsuya Tate, **Johns Hopkins**

Audrey Terras (S), **UC San Diego**. Research Interests: Number Theory, Harmonic Analysis on Symmetric Spaces

Gang Tian (S), **MIT**

Xiangjin Xu (G), **Johns Hopkins**. Research Interests: 1. Harmonic analysis: eigenfunction estimates and Hormander multiplier problems on Riemannian manifolds, Gibbs' phenomenon and Pinsky's phenomenon for pointwise convergence of Fourier inversion and eigenfunction expansion.

2. Nonlinear differential equations: existence and uniqueness results for nonlinear hyperbolic equations, periodic solutions and homoclinic orbits for Hamiltonian systems.

Paul Yang, **Princeton University**

Steven Zelditch (O)(P), **Johns Hopkins**. My primary research interests: spectral and scattering theory, waves on Riemannian manifolds, asymptotics in real and complex geometry.