Laplacian Eigenvalues and Eigenfunctions: Theory, Computation, Application

Monday February 9, 2009

8:00–8:45 *Continental Breakfast*

8:45–9:00 *Welcome and Opening Remarks*

9:00–10:00 **Ronald Coifman** (Yale University)
Eigenfunctions of Lapalace operators as Integrators of local models.

10:00–10:15 *Break*

10:15–11:15 **Mauro Maggioni** (Duke University)
Parametrizations of manifolds via Laplacian eigenfunctions and heat kernels

11:30–1:00 *Lunch (on your own)*

1:00–2:00 **Alfred Stone** (Yale University)
Parametrized non-hermitian Laplacian eigenvalue problem for solution of the laser equations

2:00–2:15 *Break*

2:15–3:15 **Fan Chung-Graham** (University of California, San Diego (UCSD))
PageRank as a discrete Green's function

3:15–3:30 *Break*

3:30–4:30 **Naoki Saito** (University of California, Davis (UC Davis))
Analysis of Neuronal Dendrite Patterns Using Graph Laplacians

4:30–6:00 *Welcome Reception and Poster Session*

Tuesday February 10, 2009

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Terence Tao** (University of California, Los Angeles (UCLA))
Harmonic functions on groups of polynomial growth

10:00–10:15 *Break*

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10:15–11:15 **Kate Okikiolu** (University of California, San Diego (UCSD))
The sum of squares of wavelengths of a closed surface

11:30–1:00 *Lunch (on your own)*

1:00–2:00 **Alex Bronstein** (Novafora Inc.)
A metric approach to nonrigid shape analysis

2:00–2:15 *Break*

2:15–3:15 **Martin Reuter** (Massachusetts Institute of Technology)
Spectral Methods for Non-Rigid Shape Analysis

3:15–3:30 *Break*

3:30–4:30 **Francois Meyer** (University of Colorado, Boulder)
Image de-noising on the manifold of patches: a spectral approach

Wednesday February 11, 2009

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Pabitra Sen** (Schlumberger-Doll Research)
Time-dependent Diffusion, Dispersion and Decay as a Probe of Geometry

10:00–10:15 *Break*

10:15–11:15 **Denis Grebenkov** (École Polytechnique)
Laplacian Eigenfunctions in NMR

11:30–1:00 *Lunch (on your own)*

1:00–2:00 **Bedros Afeyan** (Polymath Research, Inc.)
Near Stochastic Resonance between Surface Perturbations Could Cause Imploding Shell Breakup of an Inertial Confinement Fusion Target

2:00–2:15 *Break*

2:15–3:15 **Krzysztof Burdzy** (University of Washington)
On the Robin problem in fractal domains

3:15–3:30 *Break*

3:30–4:30 **Stephane Nonnenmacher** (Service de Physique Theorique CEN Saclay)
Mode localization on chaotic manifolds: an entropy approach (Collab. with N.Anantharaman)

Thursday February 12, 2009

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Bernard Sapoval** (École Polytechnique)
Localisation of eigenfunctions and increased dissipation in irregular resonators. Applications to wave absorption.

10:00–10:15 *Break*

10:15–11:15 **Marcel Filoche** (École Polytechnique)
The toposcopy: how to deduce the shape of an electrode from a black box measurement

11:30–1:00 *Lunch (on your own)*

1:00–2:00 **Alex Barnett** (Dartmouth College)
Computing eigenmodes on the torus: photonic crystals using second-kind integral equations

2:00–2:15 *Break*

2:15–3:15 **Gregory Beylkin** (University of Colorado, Boulder)
On approximation of operators by Gaussians

3:15–3:30 *Break*

3:30–4:30 **Carlos Alves** (Technical University of Lisbon)
Computing eigensolutions with meshless methods - advantages and difficulties.

Friday February 13, 2009

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Michel Lapidus** (University of California, Riverside (UC Riverside))
Spectra of Laplacians on Fractal Domains

10:00–10:15 *Break*

10:15–11:15 **Maciej Zworski** (University of California, Berkeley (UC Berkeley))
Resonances for chaotic open systems

11:30–1:00 *Lunch (on your own)*

1:00–2:00 **Arnd Backer** (Technishche Universtitat Dresden)
Surprises in the time-evolution of wave-packets

2:00–2:15 *Break*

2:15–3:15 **Nalini Anantharaman** (École Polytechnique)
Semiclassical measures for the time-dependent Schroedinger equation

3:15–3:30 *Break*

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3:30–4:30 **Ilya Gruzberg** (University of Chicago)
Anderson transitions, critical wave functions, and conformal invariance.