Mini-meeting in Quantum Chaos - Schedule

Survey Talks

Nicolas Burq, Université de Paris-Sud, Orsay

Title: *Resolvent estimates, non-concentration and evolution PDEs*

Abstract: In this lecture, I will present various resolvent estimates in different geometries, starting with basic and robust observation estimates (geometric control) and showing how, in some cases, favourable geometries (such as tori or product manifolds) allow us to improve these estimates. These are linked to both the behaviour of eigenfunctions on manifolds, and more generally quasi-modes, and the behaviour of evolution equations (such as the wave or Schrödinger) at different time scales.

Stéphane Nonnenmacher, Université de Paris-Sud, Orsay

Title: *Open quantum chaotic systems*

Abstract: In this talk, I will describe the framework of quantum chaotic open systems (mostly in the case of scattering systems) and address some of the spectral questions pertaining to them. In particular, I will consider the distribution of quantum resonances, the structure of the associated resonant states, but also of the scattering states (deformed plane waves), and their relations with the set of trapped classical trajectories.

I will explain the extension to the setting of damped quantum systems, and also explain how this semiclassical framework can be adapted to study the distribution of classical (Ruelle-Pollicott) resonances for Anosov or Axiom A flows, which govern the long time mixing.

Pär Kurlberg, KTH, Stockholm

Title: Eigenfunctions of toral point scatterers

Abstract: We will discuss properties of eigenfunctions of "toral point scatterers", i.e., the Laplacian perturbed by a delta potential on a torus (it can also be viewed as a quantization of the Sinai billiard when the circular obstacle shrinks with the wave length). After reviewing some recent results on quantum ergodicity and scarring in this setting we will discuss some open problems, such as the value distribution and random wave model predictions (in particular nodal line lengths) for the eigenfunctions.

Luc Hillairet, Université d'Orléans

Title: *On the spectral theory of triangles*

Abstract: I will present some results about the spectrum of Euclidean and Hyperbolic triangles. By focusing on degenerating families, we will have to address phenomena of semiclassical flavour for which specific methods can be used. I will then give several natural open questions.

Schedule

Thursday, 12/17/15

9:00 - 9:30 : **Welcome reception**, with an introduction from the director of the Heilbronn Institute, Professor Jon Keating (Howard House, 2nd floor seminar room)

9:30 - 10:30 : **Nicolas Burq** (Howard House, 2nd floor seminar room)

10:30 - 11:30 : **Stéphane Nonnenmacher** (Howard House, 2nd floor seminar room)

11:30 - 12:30: **Open discussions and brainstorming** (2nd floor seminar room, 4th floor lounge, 6th floor meeting rooms)

12:30 - 14:30: **Lunch** (Terrace Bar)

14:30 - 15:30: **Pär Kurlberg** (Howard House, 2nd floor seminar room)

15:30 - 16:30: **Luc Hillairet** (Howard House, 2nd floor seminar room)

16:30 - 17:30: **Open discussions and brainstorming** (2nd floor seminar room, 4th floor lounge, 6th floor meeting rooms)

18:00 - 19:00: **Prosecco reception** (Howard House)

19:00 - : **Dinner at Lido**

Friday, 12/18/15

9:00 - 9:30 : **Coffee reception**

9:30 - 12:30: **Open discussions and brainstorming** (2nd floor seminar room, 4th floor lounge, 6th floor meeting rooms)

12:30 - 14:30: **Lunch** (Terrace Bar)

14:30 - : **Open discussions and brainstorming** (2nd floor seminar room, 4th floor lounge, 6th floor meeting rooms)