Heilbronn Institute for Mathematical Research

University of BRISTOL

Titles and abstracts for the workshop on “Spiking and collapsing in large noise limits of SDE's”

Organiser: Joseph Najnudel

Monday 29 October, Heilbronn Seminar Room (G.07), Fry Building

10am - 11am Reda Chhaibi
11am - 12pm Raphael Chetrite
2pm - 3pm Cedric Bernardin
3:30pm - 4:30pm Tristan Benoist

Spiking and collapsing in large noise limits of SDE's
Reda Chhaibi, Université Paul Sabatier, Toulouse

We analyze strong noise limit of some stochastic differential equations. We focus on the particular case of Belavkin equations, arising from quantum measurements, where Bauer and Bernard pointed out an intriguing behavior. As the noise grows larger, the solutions exhibits locally a collapsing, that is to say converge to jump processes, very reminiscent of a metastability phenomenon. But surprisingly the limiting jump process is decorated by a spike process. We completely prove these statements for an archetypal one dimensional diffusion. The proof is robust and can easily be adapted to a large class of one dimensional diffusions.

Analytical Large Deviation and Uncertainly Relations
Raphael Chetrite, Université de Nice Sophia-Antipolis (France)

In this talk, I will talk about the theory of large deviations. After a general introduction, I will present some recent developments on the large deviations at large time associated with a Markov process and on applications for thermodynamic uncertainty relations.

Gamma convergence for large deviations problems in interaction diffusion processes
Cedric Bernardin, Université de Nice Sophia-Antipolis (France)

We consider extended slow-fast systems of N interacting diffusions. The typical behavior of the empirical density is described by a nonlinear McKean-Vlasov equation depending on e , the scaling parameter separating the time scale of the slow variable from the time scale of the fast variable. Its atypical behavior is encapsulated in a large N Large Deviation Principle (LDP) with a rate functional. We study the Γ-convergence of as e → 0 and show it converges to the rate functional appearing in the Macroscopic Fluctuations Theory (MFT) for diffusive systems.

Invariant measure of quantum trajectories

Tristan Benoist, Université Paul Sabatier, Toulouse

I will explain the proof of the uniqueness of the invariant measure for quantum trajectories. This proof is based on an estimation of the trajectory and a well known ergodicity of a related dynamical system. Paywall free version of the article: [1703.10773] Invariant Measure for Quantum Trajectories