Speaker: Tadahiro Oh (The University of Edinburgh)

Title: On the transport property of Gaussian measures under Hamiltonian PDE dynamics

Abstract: Transport properties of Gaussian measures under different transformations have been studied in probability theory. In this talk, we discuss transport properties of Gaussian measures on periodic functions under nonlinear Hamiltonian PDE dynamics such as the nonlinear Schrödinger equations and nonlinear wave equations.

Lebowitz-Rose-Speer '88, Bourgain '94, and McKean '95 initiated the study of invariant Gibbs measures for dispersive Hamiltonian PDEs. In the first part of the talk, we give a review on the construction of invariant Gibbs measures and discuss how it lead to a recent development of probabilistic construction of solutions in late 2000's.

In the second part, we discuss the quasi-invariance property of Gaussian measures on Sobolev spaces under certain dispersive Hamiltonian PDEs. We also discuss the importance of dispersion in this quasi-invariance result by showing that the transported measure and the original Gaussian measure are mutually singular when we turn off dispersion. The second part of the talk is based on a joint work with Nikolay Tzvetkov (Université Cergy-Pontoise) and Philippe Sosoe (Harvard University).