

Title: Invariance of the Gibbs measures for the periodic generalized KdV equations.

Abstract: In this talk, we consider the periodic generalized Korteweg-de Vries equations (gKdV). In particular, we study gKdV with the Gibbs measure initial data. The main difficulty lies in constructing local-in-time dynamics in the support of the measure. Since gKdV is analytically ill-posed in the L^2 -based Sobolev support, we instead prove deterministic local well-posedness in some Fourier-Lebesgue spaces containing the support of the Gibbs measure. New key ingredients are bilinear and trilinear Strichartz estimates adapted to the Fourier-Lebesgue setting. Once we construct local-in-time dynamics, we apply Bourgain's invariant measure argument to prove almost sure global well-posedness of the defocusing gKdV and invariance of the Gibbs measure. Our result completes the program initiated by Bourgain (1994) on the invariance of the Gibbs measures for periodic gKdV equations. This talk is based on joint work with Nobu Kishimoto (RIMS, University of Kyoto).