Candidate Colloquium

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Tuesday, January 15th
Room P1100F, Calhoun Garage *
1:30 – 2:30 pm

Invariant Manifolds and Dynamics of Dispersive Hamiltonian PDEs

Dispersive Hamiltonian PDEs arise from Bose–Einstein condensate, water waves, optics and so on. Among various types of solutions, solitons are special solutions which maintain their shape while they propagate in constant velocities, and play crucial roles in the dynamics of dispersive PDEs.

Stability of solitons has been a central problem in the study of dynamics of dispersive PDEs for several decades. For an unstable soliton, classical instability results indicate that there exist solutions starting arbitrarily close to the soliton, but eventually get away. Naturally, one may raise the question: whether there exist solutions starting near the soliton behave differently? Furthermore, how are all different types of solutions organized near the soliton?

In this talk, we will first use the supercritical gKDV equation as an example to discuss how to use local invariant manifolds to give a detailed description of local dynamics near unstable solitons. Then we will discuss how invariant manifolds may be used to serve as boundaries of different types of global dynamics. This talk is mostly for general audience, no background on invariant manifold theory or dispersive PDEs is needed.

Refreshments will be 2:45pm-3:15pm pm in the Faculty & Graduate
Student Lounge Room 4118 French Hall West

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*This is the ROTC building in between Edwards Center and the Soccer Field.
It is at the corner of Dennis St. and Corry Blvd. UCID may be needed to enter.