Physics Department Seminar

Friday March 2nd, 2012

11:00am in PhSc 105

"Invariant Barriers To Reactive Front Propagation In Fluid Flows"

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Abstract:

The behavior of reaction fronts in isotropic media is well-described by FKPP theory. Here we consider the propagation of these fronts in a fluid that is simultaneously undergoing (chaotic) advection. This more complicated system yields a variety of interesting phenomena including "mode-locking". While previous computational efforts have revealed trends in these phenomena, no theory exists for their coherent treatment. In this work, we use a dynamical systems approach to draw out the key geometric structures responsible for these phenomena and establish the basis for a new perspective on advection reaction diffusion systems.