中央研究院數學研究所
Institute of Mathematics
Academia Sinica

國立台灣大學數學系
Department of Mathematics
National Taiwan University

Lakeside Lecture Series

Speaker: Professor Peter Bates (Michigan State University)

Title: Global Invariant Manifolds and Eternal Spike States

Abstract:

Singularly perturbed elliptic equations often give rise to solutions that are almost constant except for one or more localized large amplitude excursions, so-called spike layers. Here we consider the corresponding parabolic equations and show the existence of moving spike layer solutions – existing and retain that shape for all negative as well as positive time. In fact, the resulting dynamics is a rather nice purely geometric flow, which itself is of independent interest.

This PDE to ODE reduction result is made possible by first proving an abstract theorem on the existence of a normally hyperbolic invariant manifold for a semiflow in Banach space when one only has an approximation of such. This abstract result is applicable in a wide variety of settings and the ideas behind its proof will comprise approximately half of this talk. The results represent joint work with Kening Lu and Chongchun Zeng.

Date: April 8th ,2013

Time: 14:00-15:00

Venue: Room 202, 2/F, Astro-Math. Building

Refreshment: 13:30-14:00

Organizers: Yi-Chiuan Chen, Kin-Ming Hui, Jenn-Nan Wang, Jeremy Wong