



PURDUE UNIVERSITY

Department of Mathematics Special Colloquium

Speaker: Dr. Kevin Lin, Courant Institute, NYU
Title: “Reliable and Unreliable Dynamics in Driven Oscillator Networks”
Date: Monday, February 12, 2007
Time: 4:30 P.M.
Place: BRNG B242

Abstract

This talk concerns the reliability of coupled oscillator networks in response to fluctuating inputs. Reliability means that repeated presentations of an input elicit essentially identical responses regardless of the system’s state at the onset of the input. This work is motivated by basic questions from neuroscience.

I will begin by showing how the concept of reliability can be formulated precisely in the framework of random dynamical systems theory, and recall the well-known fact that single phase oscillators are reliable. Our first new result is that unreliability can occur even in a 2-oscillator system; we propose a geometric mechanism for the observed phenomena. The rest of the talk concerns larger networks, including a natural condition which precludes unreliable behavior.

This is joint work with Eric Shea-Brown and Lai-Sang Young.