NORTHERN ARIZONA UNIVERSITY

Department of Mathematics and Statistics
Colloquium
Tuesday September 5
AMB 164 4:00 pm

Synchrony and Anti-Synchrony in Difference-Coupled Cell Networks

Jim Swift

Northern Arizona University

Abstract

Consider the coupled van der Pol oscillator system

$$\ddot{x}_i = (1 - x_i^2)\dot{x}_i - x_i + \sum_{j \in N(i)} 0.5(x_j - x_i), \quad i \in \{1, 2, \ldots, n\},$$

where i labels the cells, and $N(i)$ is the set of cells coupled to cell i. This is an example of a Difference-Coupled cell network, which is the focus of my recent work with Nándor Sieben and John Neuberger. We concentrate on describing the synchrony ($x_i = x_j$) and anti-synchrony ($x_i = -x_j$) that is forced to occur for all systems of this type. The general results are illustrated by cool animations of numerical solutions of systems of coupled van der Pol oscillators.

Refreshments at 3:45