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Speaker: Dr. Etienne Farcot

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Date: Friday, November 4, 2011

Time: 2:00 p.m.

Room: HH-3017

Title: *Piecewise affine models of gene regulatory networks*

Abstract:

It is known since the early 1960's that the products of genes can regulate the expression of other genes, or themselves. This has led to the notion of gene regulatory network, for whose different models have been proposed in the last decades. Among those, a particular class of piecewise affine differential equations has attracted various researches. One the most appealing aspect of this class of models is its underlying discrete structure, which facilitates both algorithmic and mathematical analysis. In this talk one will show how this fact applies to the description of orbits in these systems. In particular, one will describe a coarse, but general bound on their topological entropy. Then, some results about periodic orbits will be explained, as well as a recent construction method, similar to a horseshoe. Some elements for a proof that systems obtained by this method are chaotic will be provided.