



PURDUE UNIVERSITY

Department of Mathematics Special Colloquium

Speaker: Professor Patrick De Leenheer, University of Florida
Title: "Mathematical Tools for the Analysis of Biochemical Reaction Networks"
Date: Tuesday, February 27, 2007
Time: 10:30 A.M.
Place: BRNG 1238

Abstract

Understanding the behavior of biochemical reaction networks is difficult for several reasons. One is that the graphs of these networks are huge, which leads to large systems of ODE's. Another is that the functions describing the reaction rates are poorly or not known at all. What is often known on the other hand, is that the presence of one chemical either increases or decreases the production rate of another chemical. This type of qualitative information suggests the use of monotone systems for the analysis of reaction networks. The interplay of this theory with graphical properties of the network will allow us to make conclusions about the asymptotic behavior of the system. To illustrate the results we will discuss a model of a reasonably sized network which is ubiquitous in cell biology, as it appears in several signal transduction processes.

This is joint work with David Angeli (University of Firenze) and Eduardo Sontag (Rutgers University).