1046-E1-1695   **Itai Seggev*** (`iseggev@knox.edu`), Knox College Box 80, 2 E. South St., Galesburg, IL 61401.
Using 3-Dimensional Bifurcation Diagrams to Enhance Student Learning.

One of the basic phenomena of differential equations is bifurcation: that small changes in a parameter can cause large, qualitative changes in the global behavior of solutions. Traditionally, the structure of bifurcations is depicted using one of two 2-dimensional representations. If the dependent variable is y, its rate of change is y', and c is the parameter, then one representation is to plot several curves of y' versus y for several values of c on the same set of axes. The other is to plot y_{eq} (the equilibrium value of y, where y' is zero) versus c and somehow indicate which branches contain stable equilibria and which branches contain unstable equilibria. Students find both of these representations difficult to interpret. Instead, I suggest using a three dimensional plot showing the relationship between all three variables at once. This contains all the information of both 2D plots and more. With modern software, such plots are relatively easy to create, and students find them much easier to interpret. The talk will include Mathematica demonstrations. (Received September 16, 2008)