

Applied Math 3010—Fall 2016

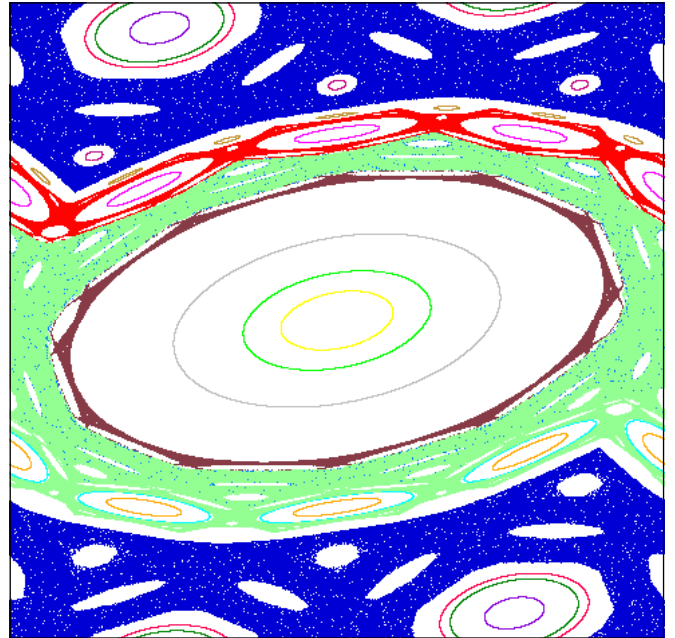
Nonlinear Dynamical Systems and Chaos

Class: MWF 12:00-12:50
Instructor: James Meiss

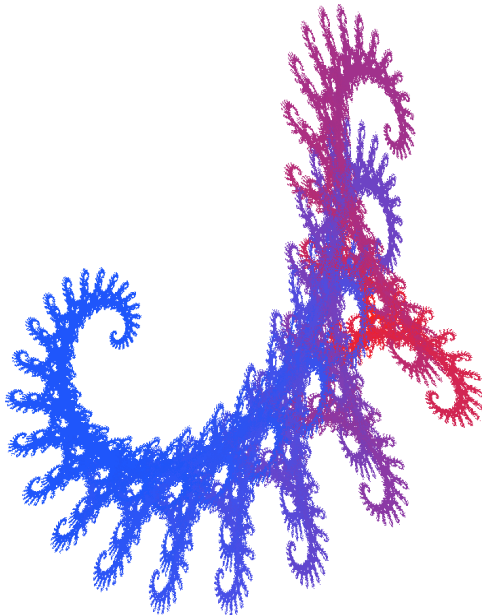
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Text: Nonlinear Dynamics and Chaos S. Strogatz
(Addison-Wesley, Reading)

Chaos is a relatively new area of applied mathematics that has influenced everything from spacecraft trajectories, the design of lasers, ultrafast spectroscopy, the design of micro-mixers, and stock market analysis to even psychology, drama, and literature.¹ Our study will begin with simplest of systems—one dimensional dynamics and progress to systems with more degrees of freedom (We will not progress linearly through the text!). Our study include differential equations and maps, bifurcations and catastrophes, and the qualitative analysis of dynamical



systems. The emphasis will be on dynamics that model real world phenomena.



Assignments & Grading

Grades will be based on HW assignments and a project. The project will be due at the end of the semester and given as a presentation to the class during the last week. There will be no exams.

¹ See, e.g., Chaos theory and the interpretation of literary texts : the case of Kurt Vonnegut by K. Boon, Chaos theory, the stock market, and short term predictability by C. Taubel and Chaos theory in psychology edited by F. Abraham and A. Gilgen