Interdisciplinary Nonlinear Dynamics

ESAM 438

Fall 2000

Hermann Riecke

This class gives an introduction to nonlinear dynamical systems as they arise in a wide range of areas of science and engineering. While the main goal of the class is to present the concepts and techniques needed for dealing with these systems it will do so from an applied perspective making contact with physical systems wherever possible. The course will follow the textbook *Nonlinear Dynamics and Chaos: With Applications to Physics, Biology, Chemistry and Engineering* by S. Strogatz.

The Fall Quarter course will be followed by a projects-based course in Winter Quarter (??????????) on ?????????????, which will be directed by M. Johnson (BME, 467-7143) and S. Lichter (ME, 467-1885).

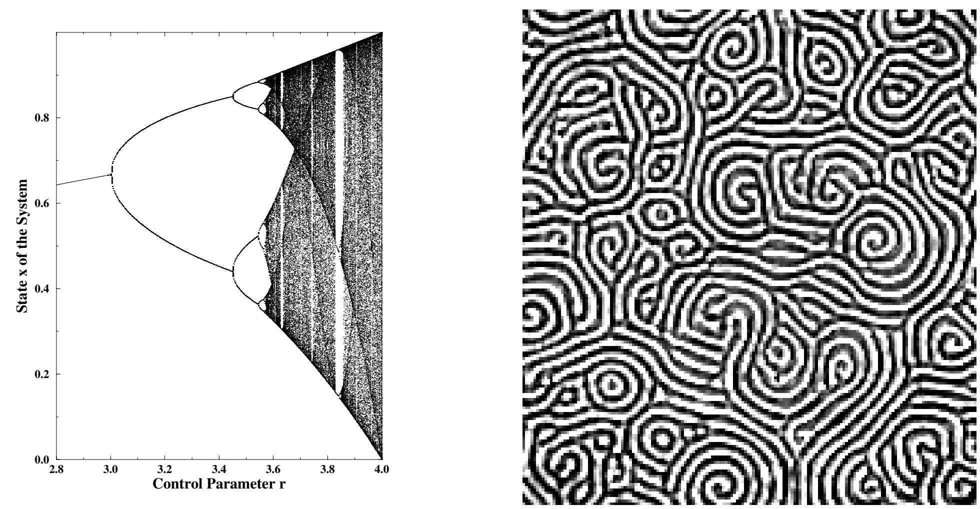

Figure 1: a) Period-doubling cascade and chaos in logistic map. b) Snapshot of spiral-defect chaos in fluid convection.

Key topics and issues to be discussed include

- Phase space representation of dynamical systems
- Bifurcations
- Nonlinear oscillators
- Weakly nonlinear theory, center manifold reduction
- Pattern formation
- Chaos, strange attractors

Location and time: TuTh 10:30-12:00 TCH M152

For more information call or send e-mail:
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