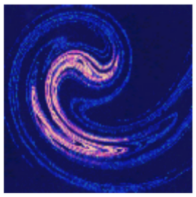
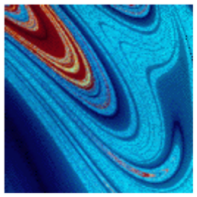
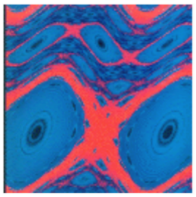
Chaotic Attractor



Basin of Attraction



KAM Islands



COURSE ANNOUNCEMENT - FALL 2014

CHAOTIC DYNAMICS

Co-listed as PHYS 715 and ENEE 789 O

Instructor: Edward Ott (edott@umd.edu)

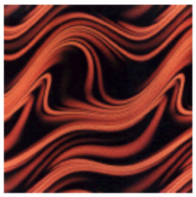
Time and Place: 11:00-12:15 Tues./Thurs. @PHYS 1201

Course description: Chaotic time evolution is now recognized as a widespread phenomenon with strong consequences for science and engineering. This course will introduce students to the types of phenomena that result from chaotic dynamics and the methods that have been created to analyze and understand these phenomena. Both basic mathematical concepts and their applications will be emphasized. The goal is to provide students with the tools necessary for applying chaotic dynamics to applications in their research and for contributing to the future basic development of chaotic dynamics.

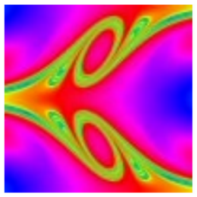
Text: E. Ott, Chaos in Dynamical Systems, 2nd edition, Cambridge University Press.

Topics Covered:

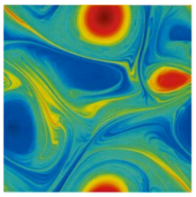
- One dimensional maps.
- Strange attractors.
- Fractal dimension.
- Embedding.
- Lyapunov exponents.
- Controlling chaos.
- Fractal basin boundaries.
- Chaotic scattering.
- Hamiltonian chaos.
- Quantum chaos.
- Chaos in fluids.



Chaotic Advection of a Passive Scalar



Chaotic Scattering from 4 spheres



2D Turbulence