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Chaotic dynamical systems, SF2720, fall 2014

1. One dimensional maps

- a) Symbolic dynamics; conjugations
- b) The Feigenbaum perioddoublings
- c) Chaotic behavior

2. Dynamics in higher dimensions

- a) Smale's horseshoe
- b) Torus maps
- c) Stable and unstable manifolds
- d) Attractors; Hénon map
- e) Bifurcation theory

3a. Complex dynamics

- a) Julia sets
- b) The quadratic family; The Mandelbrot set

3b. Time continuous systems and ordinary differential equations

- 1) The Poincar-Bendixsson theorem
- 2) Stable and unstable manifold theory for flows (=time continuous dynamical systems)

OBS. Only one of the alternatives 3a and 3b will be covered in the course. The choice of which one depends on the interests of the participants.