

**Schuster, Heinz Georg**

**Deterministic chaos. An introduction. 1st repr. of 2nd rev. ed.** (English) Zbl 0709.58002  
Weinheim: VCH Verlagsgesellschaft mbH. xxiii, 270 p. DM 108.00 (1989).

This monograph is an up-to-date, complete, and selfcontained exposition of the deterministic chaos.

The first chapter is concerned with the description of some experiments in which deterministic chaos has been detected. Then, some simple systems which exhibit chaos and which can be treated analytically are considered. The second chapter studies properties of some simple one-dimensional piecewise linear maps (extremely useful models to explain the mechanism which leads to deterministic chaos). It includes a discussion of triangular map and deterministic diffusion.

The third chapter is concerned with logistic map, pitchfork bifurcation, parallels between the Feigenbaum route to chaos, and ordinary equilibrium second-order phase transitions. The fourth chapter deals with the transition to chaos via intermittency representing one of the rare examples where the linearized renormalization-group equations can be solved exactly.

The fifth chapter shows that the nonlinear dissipative dynamical systems lead naturally to the concept of a strange attractor. The reconstruction of the trajectory in phase space from the measured time series of a single variable is presented. Generalized dimensions and entropies, as well as strange attractors and fractal boundaries are exposed. The sixth chapter is a study of the universal properties of the transition from quasiperiodicity to chaos via circle maps.

The seventh chapter discusses regular and irregular motion in conservative systems. The last chapter analyses the hypothesis of the existence of chaos in quantum systems.

The book is well and carefully written; it is completed with pictures of strange attractors and fractal boundaries, an appendix, remarks and references, and a subject index.

Reviewer: A.A.Adăscăliței

**MSC:**

- [37-01](#) Introductory exposition (textbooks, tutorial papers, etc.) pertaining to dynamical systems and ergodic theory
- [37D45](#) Strange attractors, chaotic dynamics of systems with hyperbolic behavior
- [37E25](#) Dynamical systems involving maps of trees and graphs
- [81Q50](#) Quantum chaos
- [70K55](#) Transition to stochasticity (chaotic behavior) for nonlinear problems in mechanics

Cited in **2** Reviews  
Cited in **24** Documents

**Keywords:**

[deterministic chaos](#); [nonlinear dissipative dynamical systems](#); [strange attractor](#)