

PREFACE

This volume is based on series of lectures given by the first author at the Universities of Arkansas, Puerto Rico, and Rochester, and evolved from the Ph.D thesis research of the second author. More importantly, it reflects the learning experience of all three authors over the past several years.

Our goal is to introduce the basic ideas of chaotic dynamics, as clearly and succinctly as we can, to graduate students and researchers in atomic and molecular physics, quantum optics, and laser physics. Much of this volume might also be useful for newcomers to chaos from other areas of physics.

Reviews and monographs on chaotic dynamics have usually been confined to either dissipative or Hamiltonian systems. Both are important to the theory of laser-matter interactions, and so we have given approximately equal emphasis to each, although most of the research on chaos in optical systems to date has focused on dissipative systems.

Our list of references is by no means exhaustive. Aside from some of the standard references on things like routes to chaos, the literature cited reflects mainly our own reading in the field. We apologize to the many authors whose work is not directly cited.

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