
W. Thirring

A Course
in Mathematical Physics

Vol. 1

Classical Dynamical Systems

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Contents: Introduction. — Analysis on Manifolds. — Hamiltonian Systems. — Non-relativistic Motion. — Relativistic Motion. — The Structure of Space and Time. — References. — Index.

This is the first of a four-volume series of books discussing the fields of physics that have reached mathematical maturity: classical (nonquantum) mechanics, classical field theory, and quantum mechanics. The volume *Classical Dynamical Systems* starts with the development of the concept of a manifold which provides the abstract mathematical setting for all of mechanics. This is followed by a discussion of Hamiltonian systems, canonical transformations, constants of motion and perturbation theory. Certain specific problems are discussed in considerable detail: non-relativistic motion of particles and systems, relativistic motion in electromagnetic and gravitational fields, and the structure of black holes.



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