



Hamiltonian Structures and Generating Families

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Benenti, Sergio

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About this textbook

This book is an enhanced version of an earlier Russian edition. Besides thorough revisions, more emphasis was put on reordering the topics according to a category-theoretical view. This allows the mathematical results to be stated, proved, and understood in a much easier and elegant way.

From the reviews of the Russian edition:

"The main accent is shifted to the application ... in geometrical optics, thermostatics and control theory, and not to the Hamiltonian mechanics only. To make the book fairly self-contained, full details of basic definitions and all proofs are included. In this way, the majority of the text can be read without the prerequisite of a course in geometry. The excellent collection of examples illustrates the relatively hard and highly abstract mathematical theory and its hidden difficulties. The book can rise real interest for specialists. The ... book is a significant input in the modern symplectic geometry and its applications."

(Andrey Tsiganov, St. Petersburg State University)

Sergio Benenti is a professor of mathematical physics at Università di Torino, Italy. His current fields of research include symplectic geometry with applications to physical theories, Riemannian geometry with applications to the theory of the separation of variables in the Hamilton-Jacobi equation and in other relevant differential equations of physics, and mathematical models of the dynamics of non-holonomic systems.

Content Level » Graduate

Keywords » Control of static mechanical systems - Control of thermostatic systems - Geometrical optics - Hamilton-Jacobi equation - Symplectic Relations - Symplectic geometry

Related subjects » Analysis - Applications - Geometry & Topology

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