

<<物理学家的几何学>>

图书基本信息

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内容概要

This book is intended to provide a working knowledge of those parts of exterior differential forms , differential geometry , algebraic and differential topology , Lie groups , vector bundles , and Chern forms that are essential for a deeper understanding of both classical and modern physics and engineering.

Included are discussions of analytical and fluid dynamics , electromagnetism (in flat and curved space) , thermodynamics , elasticity theory , the geometry and topology of Kirchhoff ' s electric circuit laws , soap films , special and general relativity , the Dirac operator and spinors , and gauge fields , including Yang-Mills , the Aharonov-Bohm effect , Berry phase , and instanton winding numbers , quarks , and the quark model for mesons.

Before a discussion of abstract notions of differential geometry , geometric intuition is developed through a rather extensive introduction to the study of surfaces in ordinary space ; consequently , the book should be of interest also to mathematics students.

This book will be useful to graduate and advanced undergraduate students of physics , engineering , and mathematics.

It can be used as a course text or for self-study.

This second edition includes three new appendices , Appendix C , Symmetries , Quarks , and Meson Masses (which concludes with the famous Gell-Mann/Okubo mass formula) ; Appendix D , Representations and Hyperelastic Bodies ; and Appendix E , Orbits and Morse-Bott Theory in Compact Lie Groups.

Both Appendix C and D involve results from the theory of representations of compact Lie groups , which are developed here.

Appendix E delves deeper into the geometry and topology of compact Lie groups.

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书籍目录

Preface to the Second Edition
Preface to the Revised Printing
Preface to the First Edition
Manifolds, Tensors, and Exterior Forms
1 Manifolds and Vector Fields
2 Tensors and Exterior Forms
3 Integration of Differential Forms
4 The Lie Derivative
5 The Poincaré Lemma and Potentials
6 Holonomic and Nonholonomic Constraints
Geometry and Topology
7 \mathbb{R}^3 and Minkowski Space
8 The Geometry of Surfaces in \mathbb{R}^3
9 Covariant Differentiation and Curvature
10 Geodesics
11 Relativity, Tensors, and Curvature
12 Curvature and Topology: Synge's Theorem
13 Betti Numbers and De Rham's Theorem
14 Harmonic Forms
Lie Groups, Bundles, and Chern Forms
15 Lie Groups
16 Vector Bundles in Geometry and Physics
17 Fiber Bundles, Gauss-Bonnet, and Topological Quantization
18 Connections and Associated Bundles
19 The Dirac Equation
20 Yang-Mills Fields
21 Betti Numbers and Covering Spaces
22 Chern Forms and Homotopy Groups

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