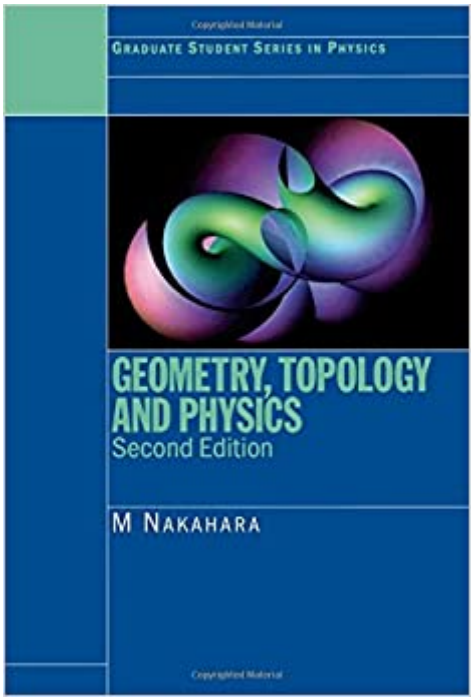
Geometry, Topology And Physics, Second Edition (Graduate Student Series In Physics)



Synopsis

Differential geometry and topology have become essential tools for many theoretical physicists. In particular, they are indispensable in theoretical studies of condensed matter physics, gravity, and particle physics. Geometry, Topology and Physics, Second Edition introduces the ideas and techniques of differential geometry and topology at a level suitable for postgraduate students and researchers in these fields.The second edition of this popular and established text incorporates a number of changes designed to meet the needs of the reader and reflect the development of the subject. The book features a considerably expanded first chapter, reviewing aspects of path integral quantization and gauge theories. Chapter 2 introduces the mathematical concepts of maps, vector spaces, and topology. The following chapters focus on more elaborate concepts in geometry and topology and discuss the application of these concepts to liquid crystals, superfluid helium, general relativity, and bosonic string theory. Later chapters unify geometry and topology, exploring fiber bundles, characteristic classes, and index theorems. New to this second edition is the proof of the index theorem in terms of supersymmetric quantum mechanics. The final two chapters are devoted to the most fascinating applications of geometry and topology in contemporary physics, namely the study of anomalies in gauge field theories and the analysis of Polakov's bosonic string theory from the geometrical point of view.Geometry, Topology and Physics, Second Edition is an ideal introduction to differential geometry and topology for postgraduate students and researchers in theoretical and mathematical physics.

Book Information

Series: Graduate Student Series in Physics
Paperback: 596 pages
Publisher: CRC Press; 2 edition (June 6, 2003)
Language: English
ISBN-10: 0750306068
ISBN-13: 978-0750306065
Product Dimensions: 6.1 x 1.4 x 9.1 inches
Shipping Weight: 1.8 pounds (View shipping rates and policies)
Average Customer Review: 3.7 out of 5 stars 19 customer reviews
Best Sellers Rank: #526,148 in Books (See Top 100 in Books) #56 inÃ Â Books > Science & Math > Mathematics > Geometry & Topology > Differential Geometry #101 inÃ Â Books > Science & Math > Mathematics > Geometry & Topology > Topology #300 inÃ Â Books > Textbooks >

Customer Reviews

"a very impressive book.." -- Australian and New Zealand Physicists" The clarity of the presentation is enhanced by explicit calculations and diagrams; the proof of a theorem is given only when it is instructive and not very technical. There is also a large number of exercises and problems, and last but not least, an index superb layout" -- Zentralblatt fur Mathematick un ihre Grenzgebiete "I believe that the book will not only boost modernization of the traditional courses of theoretical physics but will prompt the specialist in topology and differential geometry to have a closer look at the applications. So I welcome this second edition." --Christopher Gilmour

The book is well explained. Topics are introduced in a progressive way, allowing the reader to adjust to new concepts before applying them in more elaborate scenarios. The author often mention practical applications of mathematical concepts that otherwise look disconnected to physics or any other field. There are few typos and, from my point of view, many figures need a better caption-description.

This is the best book of its type, that is, a book that contains almost all if not all the advance mathematics a theoretical physicist should know. I have studied chapters 2-9 and it has the perfect balance between rigorous presentation of topics and practical uses with examples. The level is for advance graduate students. The range of topics covered is wide including Topology topics like Homotopy, Homology, Cohomology theory and others like Manifolds, Riemannian Geometry, Complex Manifolds, Fibre Bundles and Characteristics Classes. I believe this book gives you a solid base in the modern mathematics that are being used among the physicists and mathematicians that you certainly may need to know and from where you will be in a position to further extent (if you wish) into more technical advanced mathematical books on specific topics, also it is self contained but the only shortcoming is that it brings not many exercises but still my advice, get it is a superb book!

A most valuable resource for any theoretical physicist.

Seriously, this book has every piece of mathematical knowledge i’ve ever needed to know to understand my graduate texts on Quantum Field Theory and String Theory. To top it all off the book

has excellent examples and exercises and literally the best notation i've ever seen used to the topics. I think every theoretical physicist, graduate student, and mathematician interested in physics should probably have a copy. This book will probably never leave my office.

I bought this book to supplement my knowledge of mathematics which frequently is involved in understanding Particle physics concepts. The book is terse, but peppered with examples and insights about the definitions, and so far it is really fun to read. Seems like a good investment.

A mandatory book on physics that covers all elemental and advanced topics in geometry and topology. I recomend this volume for ungraduate and graduate students in physics and mathematics.

This text acts as a well-rounded introduction and overview of much of the mathematics underlying modern physics. While far from rigorous, the physics student will come away with a good understanding of how to use a wide variety of mathematical tools. This book is a necessity for every theoretical physicist. When used in a course (probably advanced undergrad or beginning grad), it should definitely be supplemented with more thorough texts, such as Geometry of Physics by Frankel. After such a course, one should be fully prepared for texts such as Spin Geometry by Michelson & Lawson, and String Theory by Polchinski. As for the mathematics presented in the book, go to one of the many excellent intro books to algebraic topology (Fulton, Munkres, Massey, Bott & Tu) and fibre bundles (Steenrod, Husemoller) for proper treatments of the subjects.

good

Contemporary Physics) Glencoe Geometry, Student Edition (MERRILL GEOMETRY) Geometry, Student Edition (MERRILL GEOMETRY) Geometry: Integration, Applications, Connections Student Edition (MERRILL GEOMETRY) McDougal Littell High School Math Florida: Student Edition Geometry 2004 (Larson Geometry 2001) Holt Geometry: Student Edition Geometry 2003 Insider's Guide to Graduate Programs in Clinical and Counseling Psychology: 2016/2017 Edition (Insider's Guide to Graduate Programs in Clinical & Counseling Psychology) Algebraic Topology: A Student's Guide (London Mathematical Society Lecture Note Series) Superfluidity and Superconductivity (Graduate Student Series in Physics) Graduate Admissions Essays, Fourth Edition: Write Your Way into the Graduate School of Your Choice