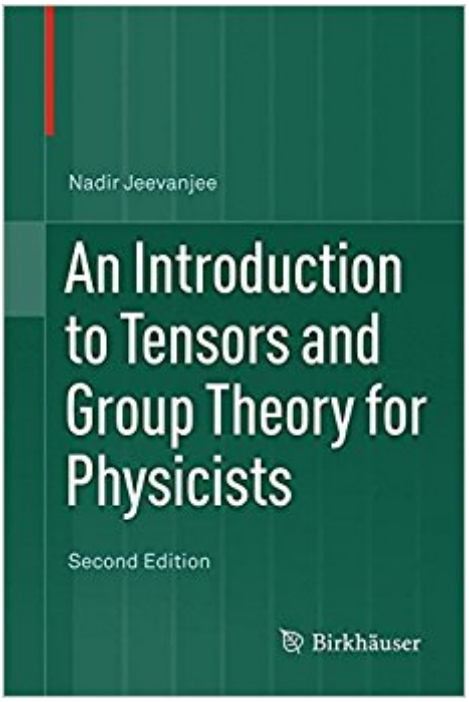
An Introduction To Tensors And Group Theory For Physicists



Synopsis

The second edition of this highly praised textbook provides an introduction to tensors, group theory, and their applications in classical and quantum physics. Both intuitive and rigorous, it aims to demystify tensors by giving the slightly more abstract but conceptually much clearer definition found in the math literature, and then connects this formulation to the component formalism of physics calculations. New pedagogical features, such as new illustrations, tables, and boxed sections, as well as additional Ã¢â ¬Å“invitationÃ¢â ¬Â• sections that provide accessible introductions to new material, offer increased visual engagement, clarity, and motivation for students.Part I begins with linear algebraic foundations, follows with the modern component-free definition of tensors, and concludes with applications to physics through the use of tensor products. Part II introduces group theory, including abstract groups and Lie groups and their associated Lie algebras, then intertwines this material with that of Part I by introducing representation theory.Ã Â Examples and exercises are provided in each chapter for good practice in applying the presented material and techniques.Prerequisites for this text include the standard lower-division mathematics and physics courses, though extensive references are provided for the motivated student who has not yet had these.Ã Â Advanced undergraduate and beginning graduate students in physics and applied mathematics will find this textbook to be a clear, concise, and engaging introduction to tensors and groups.Reviews of the First EditionÃ¢â ¬Å“[P]hysicist Nadir Jeevanjee has produced a masterly book that will help other physicists understand those subjects [tensors and groups] as mathematicians understand themÃ¢â ¬Â¦ From the first pages, Jeevanjee shows amazing skill in finding fresh, compelling words to bring forward the insight that animates the modern mathematical viewÃ¢â ¬Â¦[W]ith compelling force and clarity, he provides many carefully worked-out examples and well-chosen specific problemsÃ¢â ¬Â¦ JeevanjeeÃ¢â ¬â„¢s clear and forceful writing presents familiar cases with a freshness that will draw in and reassure even a fearful student.Ã Â [This] is a masterpiece of exposition and explanation that would win credit for even a seasoned author.Ã¢â ¬Â•Ã¢â ¬â ¢Physics Today"JeevanjeeÃ¢â ¬â„¢s [text] is a valuable piece of work on several counts, including its express pedagogical service rendered to fledgling physicists and the fact that it does indeed give pure mathematicians a way to come to terms with what physicists are saying with the same words we use, but with an ostensibly different meaning.Ã Â The book is very easy to read, very user-friendly, full of examples...and exercises, and will do the job the author wants it to do with style.Ã¢â ¬Â•Ã¢â ¬â ¢MAA Reviews

Book Information

Hardcover: 305 pages

Publisher: BirkhÃƒÆ'Ã Â¤user; 2nd ed. 2015 edition (March 12, 2015)

Language: English

ISBN-10: 3319147935

ISBN-13: 978-3319147932

Product Dimensions: 6.1 x 0.8 x 9.2 inches

Shipping Weight: 1.4 pounds (View shipping rates and policies)

Average Customer Review: 4.2 out of 5 stars 5 customer reviews

Best Sellers Rank: #181,411 in Books (See Top 100 in Books) #15 inÃ Â Books > Science & Math > Mathematics > Applied > Vector Analysis #91 inÃ Â Books > Science & Math > Physics > Mathematical Physics #100 inÃ Â Books > Science & Math > Mathematics > Pure Mathematics > Algebra > Linear

Customer Reviews

"Jeevanjee ’s An Introduction to Tensors and Group Theory for Physicists is a valuable piece of work on several counts, including its express pedagogical service rendered to fledgling physicists and the fact that it does indeed give pure mathematicians a way to come to terms with what physicists are saying with the same words we use, but with an ostensibly different meaning: it ’s the same meat and potatoes, really, but the flavoring is all different.Oh yes, one more thing. The book is very easy to read, very user-friendly, full of examples...and exercises, and will do the job the author wants it to do with style. I am indeed going to use it myself, hopefully to great advantage, in my upcoming dealings with my working-group." MAA ReviewsWith An Introduction to Tensors and Group Theory for Physicists, physicist Nadir Jeevanjee has produced a masterly book that will help other physicists understand those subjects [tensors and groups] as mathematicians understand them From the first pages, Jeevanjee shows amazing skill in finding fresh, compelling words to bring forward the insight that animates the modern mathematical view. In contrast to the usual description of a baffling beast bristling with indices, Jeevanjee describes how, as he puts it, tensors eat vectors and spit out numbers. He combines vivid use of language with coherent expositions of the detailed equations and expressions. Above all, with compelling force and clarity, he provides many carefully worked-out examples and well-chosen specific problems Jeevanjee ’s clear and forceful writing presents familiar cases with a freshness that will draw in and reassure even a fearful student. He does not stint the technical details, which are nicely embedded in the text so that they connect smoothly with the larger conceptual exposition An Introduction to Tensors and Group Theory for

Physicists, written during Jeevanjee ’s graduate studies at the University of California, Berkeley, is a masterpiece of exposition and explanation that would win credit for even a seasoned author. One can only hope that, after this prodigious first book, he will write many more. Physics Today "Jeevanjee ’s An Introduction to Tensors and Group Theory for Physicists is a valuable piece of work on several counts, including its express pedagogical service rendered to fledgling physicists and the fact that it does indeed give pure mathematicians a way to come to terms with what physicists are saying with the same words we use, but with an ostensibly different meaning: it ’s the same meat and potatoes, really, but the flavoring is all different. Oh yes, one more thing. The book is very easy to read, very user-friendly, full of examples...and exercises, and will do the job theFrom the reviews: With An Introduction to Tensors and Group Theory for Physicists, physicist Nadir Jeevanjee has produced a masterly book that will help other physicists understand those subjects [tensors and groups] as mathematicians understand them From the first pages, Jeevanjee shows amazing skill in finding fresh, compelling words to bring forward the insight that animates the modern mathematical view. In contrast to the usual description of a baffling beast bristling with indices, Jeevanjee describes how, as he puts it, tensors eat vectors and spit out numbers. He combines vivid use of language with coherent expositions of the detailed equations and expressions. Above all, with compelling force and clarity, he provides many carefully worked-out examples and well-chosen specific problems Jeevanjee s clear and forceful writing presents familiar cases with a freshness that will draw in and reassure even a fearful student. He does not stint the technical details, which are nicely embedded in the text so that they connect smoothly with the larger conceptual exposition An Introduction to Tensors and Group Theory for Physicists, written during Jeevanjee s graduate studies at the University of California, Berkeley, is a masterpiece of exposition and explanation that would win credit for even a seasoned author. One can only hope that, after this prodigious first book, he will write many more. Physics Today "Jeevanjee s An Introduction to Tensors and Group Theory for Physicists is a valuable piece of work on several counts, including its express pedagogical service rendered to fledgling physicists and the fact that it does indeed give pure mathematicians a way to come to terms with what physicists are saying with the same words we use, but with an ostensibly different meaning: it s the same meat and potatoes, really, but the flavoring is all different. Oh yes, one more thing. The book is very easy to read, very user-friendly, full of examples...and exercises, and will dFrom the reviews: With "An Introduction to Tensors and Group Theory for Physicists," physicist Nadir Jeevanjee has produced a masterly book that will help other physicists understand those subjects [tensors and groups] as mathematicians understand them From the first pages, Jeevanjee shows amazing skill in finding fresh, compelling

words to bring forward the insight that animates the modern mathematical view. In contrast to the usual description of a baffling beast bristling with indices, Jeevanjee describes how, as he puts it, tensors eat vectors and spit out numbers. He combines vivid use of language with coherent expositions of the detailed equations and expressions. Above all, with compelling force and clarity, he provides many carefully worked-out examples and well-chosen specific problems Jeevanjee s clear and forceful writing presents familiar cases with a freshness that will draw in and reassure even a fearful student. He does not stint the technical details, which are nicely embedded in the text so that they connect smoothly with the larger conceptual exposition "An Introduction to Tensors and Group Theory for Physicists," written during Jeevanjee s graduate studies at the University of California, Berkeley, is a masterpiece of exposition and explanation that would win credit for even a seasoned author. One can only hope that, after this prodigious first book, he will write many more. Physics Today "Jeevanjee s "An Introduction to Tensors and Group Theory for Physicists" is a valuable piece of work on several counts, including its express pedagogical service rendered to fledgling physicists and the fact that it does indeed give pure mathematicians a way to come to terms with what physicists are saying with the same words we use, but with an ostensibly different meaning: it s the same meat and potatoes, really, but the flavoring is all different.Oh yes, one more thing. The book is very easy to read, very user-friendly, full of examples...and exercises, and will do the job the author wants it to do with style. I am indeed going to use it myself, hopefully to great advantage, in my upcoming dealings with my working-group." MAA Reviews The book is divided into two distinct parts, the first one (Chapters 1-3) dealing with linear algebra and tensors, the second focusing on group theory in physics (Chapter 4-6). provide a solid background for students, helping them to understand the more advanced literature on the subject without formal difficulties. this book not only fills a considerable pedagogical gap in the physical and mathematical literature, but also shows to what extent the material arises naturally within any consistent model of natural phenomena. (Rutwig Campoamor-Stursberg, Mathematical Reviews, Issue 2012 i) The aim of the monograph is to fill a definite gap in literature by connecting the component formalism intrinsic to physical computations to the abstract but more conceptual formulations of mathematical literature and to present interconnections between tensor analysis and group theory, to demonstrate their physical applications. It is destined for students of advanced-undergraduate level. Every chapter in endowed by exercises and problems. (Boris V. Loginov, Zentralblatt MATH, Vol. 1229, 2012)"

The second edition of this highly praised textbook provides an introduction to tensors, group theory, and their applications in classical and quantum physics.Ã Â Both intuitive and rigorous, it aims to

demystify tensors by giving the slightly more abstract but conceptually much clearer definition found in the math literature, and then connects this formulation to the component formalism of physics calculations.Ã Â New pedagogical features, such as new illustrations, tables, and boxed sections, as well as additional Ã¢â ¬Å“invitationÃ¢â ¬Â• sections that provide accessible introductions to new material, offer increased visual engagement, clarity, and motivation for students.Ã Â Ã Â Part I begins with linear algebraic foundations, follows with the modern component-free definition of tensors, and concludes with applications to physics through the use of tensor products. Part II introduces group theory, including abstract groups and Lie groups and their associated Lie algebras, then intertwines this material with that of Part I by introducing representation theory.Ã Â Examples and exercises are provided in each chapter for good practice in applying the presented material and techniques.Ã Â Prerequisites for this text include the standard lower-division mathematics and physics courses, though extensive references are provided for the motivated student who has not yet had these.Ã Â Advanced undergraduate and beginning graduate students in physics and applied mathematics will find this textbook to be a clear, concise, and engaging introduction to tensors and groups.Reviews of the First EditionÃ¢â ¬Å“[P]hysicist Nadir Jeevanjee has produced a masterly book that will help other physicists understand those subjects [tensors and groups] as mathematicians understand themÃ¢â ¬Â¦ From the first pages, Jeevanjee shows amazing skill in finding fresh, compelling words to bring forward the insight that animates the modern mathematical viewÃ¢â ¬Â¦[W]ith compelling force and clarity, he provides many carefully worked-out examples and well-chosen specific problemsÃ¢â ¬Â¦ JeevanjeeÃ¢â ¬â„¢s clear and forceful writing presents familiar cases with a freshness that will draw in and reassure even a fearful student.Ã Â [This] is a masterpiece of exposition and explanation that would win credit for even a seasoned author.Ã¢â ¬Â• Ã¢â ¬â ¢Physics Today "JeevanjeeÃ¢â ¬â„¢s [text] is a valuable piece of work on several counts, including its express pedagogical service rendered to fledgling physicists and the fact that it does indeed give pure mathematicians a way to come to terms with what physicists are saying with the same words we use, but with an ostensibly different meaning.Ã Â The book is very easy to read, very user-friendly, full of examples...and exercises, and will do the job the author wants it to do with style.Ã¢â ¬Â• Ã¢â ¬â ¢MAA Reviews

Actually shows you what other books merely gloss over or hand-wave at, in full detail. Plenty of exercises and solved examples too.

I just started it but it seems really good.

If you’re looking to get into theoretical physics for real (and if you already have a solid background in multivariable calculus and linear algebra), then START WITH THIS BOOK. I can’t praise it highly enough.Once you’re proficient in advanced calculus and abstract LA (vector spaces and transformations), your next steps in theoretical physics are to learn tensors and group theory/representation theory. The latter will let you move forward in studying General Relativity, the former will let you move forward with the math behind the standard model, particle physics, etc. as well as comprehend relativity topics (both Special and General) on a deeper level.And since this book teaches both topics - tensors and group/representation theory pretty much from the ground up - this is the doorway that leads to all those riches! And unlike most other books I’ve come across (though to be fair there is PLENTY of great pedagogical material in theoretical physics), Jeevanjee’s door isn’t left just slightly ajar. It’s wide open. Which is to say: it’s fun but challenging, fairly rigorous (for physics) but fascinating, formal but conversational.In short: this is as close as theoretical physics ever gets to "breezy", but somehow without sacrificing the main objective, which is to drive home a deep understanding. It’s a great balance of conceptual understanding (through well-formulated definitions, discussions, and examples) and calculational proficiency (through well-chosen exercises).If you’ve delved into these topics before and found yourself staring dumbly at a definition of a tensor or a Lie algebra, wondering "Okay, so but what IS it actually? And why do I care? And how will it help me to better understand THE UNIVERSE AT THE DEEPEST AND HIGHEST LEVELS WHICH IS WHY I STARTED DOWN THIS ROAD IN THE FIRST PLACE????" - well, then, this book is just for you.P.S. When you’re "done" with this one (you’ll find yourself going back to it again and again and again), I highly recommend moving on to a couple of other Springer titles: "Physics from Symmetry" and "Symmetry and the Standard Model."

The copy of this hardcover book which I obtained from the library is poorly manufactured in the following way. The print of each page is not properly centered on the page. The inside margin (near the center or binding of the book) is too small, maybe only a centimeter. I have to use one hand to hold the book down in the center so that I can read the text all the way to the inside margin. The outside margin is fully an inch, wider than necessary.Aside from this superficial observation, the book may be wonderful.

A brilliant book that teaches by beeing explicit. Really the one book that phycisists need to read about group theory!

An Introduction to Tensors and Group Theory for Physicists Vectors and Tensors By Example: Including Cartesian Tensors, Quaternions, and Matlab Examples Group Theory in a Nutshell for Physicists Joining Together: Group Theory and Group Skills (11th Edition) Transformations Of Coordinates, Vectors, Matrices And Tensors Part I: LAGRANGEÃ¢â ¬â„¢S EQUATIONS, HAMILTONÃ¢â ¬â„¢S EQUATIONS, SPECIAL THEORY OF RELATIVITY AND CALCULUS ... Mathematics From 0 And 1 Book 16) The Genesis of the Abstract Group Concept: A Contribution to the History of the Origin of Abstract Group Theory (Dover Books on Mathematics) Tensor Analysis: Spectral Theory and Special Tensors The Predictors: How a Band of Maverick Physicists Used Chaos Theory to Trade Their Way to a Fortune on Wall Street Cartesian Tensors: An Introduction (Dover Books on Mathematics) Aerodynamic Noise: An Introduction for Physicists and Engineers (Springer Aerospace Technology) Mathematical Methods for Physicists: A Concise Introduction General Relativity: An Introduction for Physicists Alfred's Group Piano for Adults Student Book 1 (Second Edition): An Innovative Method Enhanced With Audio and Midi Files for Practice and Performance (Alfred's Group Piano for Adults) Group Dynamics in Occupational Therapy: The Theoretical Basis and Practice Application of Group Intervention Curriculum-Based Motivation Group: A Five Session Motivational Interviewing Group Intervention Alfred's Basic Group Piano Course, Bk 1: A Course Designed for Group Instruction Using Acoustic or Electronic Instruments (Alfred's Basic Piano Library) Wild at Heart: A Band of Brothers Small Group Participant's Guide (Small Group Resources) Vectors, Tensors and the Basic Equations of Fluid Mechanics (Dover Books on Mathematics) Structural Geology Algorithms: Vectors and Tensors Tensors, Differential Forms, and Variational Principles (Dover Books on Mathematics)