An Introduction to Quantum Physics-Stefanos Trachanas 2018-01-31 This modern textbook offers an introduction to quantum mechanics as a theory that underlies the world around us, from atoms and molecules to materials, lasers, and other applications. The main features of the book are: Emphasis on the key principles with minimal mathematical formalism Denying discussions of the key features of quantum mechanics, using simple analogies and an intuitive approach to explain concepts. It is aimed at advanced undergraduate students in physics, chemistry, and engineering. The book covers the topics of quantum mechanics, quantum electrodynamics, quantum field theory, and quantum information.

An Introduction to Quantum Mechanics-A. C. Phillips 2013-05-20 Introduction to Quantum Mechanics is an introduction to the principles of quantum mechanics. Assuming little in the way of prior knowledge, quantum concepts are carefully and precisely presented, and explored through numerous applications and problems. Some of the more challenging aspects of quantum mechanics, such as wave mechanics and quantum field theory, are covered in detail. The book is well-illustrated with a large number of worked examples and exercises, and includes an extensive list of recommended further reading. It is an excellent textbook for students taking quantum mechanics courses at the advanced undergraduate or beginning graduate level.

An Introduction to Quantum Mechanics-A. C. Phillips 2020-12-01 Introduction to Quantum Mechanics is an introduction to the principles of quantum mechanics. Assuming little in the way of prior knowledge, quantum concepts are carefully and precisely presented, and explored through numerous applications and problems. Some of the more challenging aspects of quantum mechanics, such as wave mechanics and quantum field theory, are covered in detail. The book is well-illustrated with a large number of worked examples and exercises, and includes an extensive list of recommended further reading. It is an excellent textbook for students taking quantum mechanics courses at the advanced undergraduate or beginning graduate level.

An Introduction To Quantum Physics The Mit Introductory Physics Series

Introducing Quantum Theory-J.P. McEvoy 2004-06-05 Quantum theory confronts us with bizarre paradoxes which contradict the logic of classical physics. At the subatomic level, one particle seems to determine the outcome of measurements on another particle which is light-years away. Bohr’s interpretation of quantum theory, introduced in the 1920s, addressed this and similar paradoxes in a radical way. This book unfolds and reformulates Bohr’s interpretation, discussing the work of many of the leading figures in the field. The author explains the paradoxes of quantum theory with the help of simple models, but also explains how it is possible to attack the problems of quantum theory from a non-trivial point of view. The book is written so that it is easy to follow the ideas and to work with the concepts presented. It is aimed at students who are taking a first course in quantum theory, and at physicists who are interested in understanding the current state of the art in quantum theory.

Introduction to Quantum Mechanics-David J. Griffiths 2018-12-07 This authoritative, advanced introduction provides a complete, modern perspective on quantum mechanics. It clarifies many common misconceptions regarding wave-particle duality and the correct interpretation of measurements. The author develops the text from the ground up, starting from the fundamentals and presenting information at an elementary level, avoiding unnecessary details and complicated calculations. Clear, simple explanations are used to help students understand the key concepts of quantum mechanics. The book includes numerous worked examples and exercises for each chapter, as well as a comprehensive set of problems at the end of each chapter. The authors is a highly respected physicist and educator, and the book is written in an engaging and accessible style. It is an excellent resource for students taking a course in quantum mechanics, and for physicists and engineers who wish to deepen their understanding of this fundamental theory.

An Introduction to Quantum Optics-Yanhua Shih 2018-12-07 Authored by a highly regarded international researcher and Fellow of the Royal Society, this textbook provides a clear and accessible introduction to the results and methods of quantum optics. It includes a wide range of topics, from the basics of quantum mechanics to more advanced concepts such as entanglement, quantum communication, and quantum computing. The book is written in an engaging and accessible style, and is supported by numerous worked examples and exercises. It is an excellent resource for students taking a course in quantum optics, and for researchers and professionals working in the field.

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An Introduction to Quantum Theory - F. S. Levin 2002: An introductory undergraduate quantum mechanics textbook with a large number of figures and exercises.

Introduction to Quantum Mechanics D. Brinkma Sako 2020-02-03 Quantum mechanics is the foundation of modern technology, due to its innumerable applications in physics, chemistry and biology. This second volume studies Schrödinger's equation and its applications in the study of wells, steps and potential barriers. It examines the properties of eigenvalues and eigenfunctions in the space of square-integrable wave functions and Dirac notations in the space of states. In this book the author focuses on the notions of the linear operators, the Hermitian operators, observables, Hermitian conjugation, commutators and the representation of bras, kets and operators in the space of states. The eigenvalue equation, the characteristic equation and the relevant equations in the context of the mean value of an observable is discussed. The book goes on to investigate the study of conservative systems through the time evolution operator and Ehrenfest's theorem. Finally, this second volume is completed by the introduction of the notions of quantum wells, semiconductor materials and quantum dots in the appendix.

Introduction to Quantum Mechanics Harald W. MÜLLER-Kirsten 2011-07-19 This text on quantum mechanics begins by covering all the main topics of an introduction to the subject. It then concentrates on newer developments. In particular it continues with the perturbative solution of the Schrödinger equation for various potentials and thereafter with the evaluation and integration of their path integral counterparts. Considerations of the large order behavior of the perturbation expansions show that in most applications these are asymptotic expansions. The parallel consideration of path integrals requires the evaluation of these around classical configurations, the fluctuation equations about which lead back to specific wave equations. The period of the classical configurations is related to temperature, and permits transitions to the thermal domain to be classified as phase transitions. In this second edition the important test applications and numerous examples have been added. In particular, the chapter on the Coulomb potential has been extended to include introduction to chemical bonds, the chapter on periodic potentials has been supplemented by a section on the band theory of metals and semiconductors, and in the chapter on large order behavior a section has been added illustrating the success of convergence factors in the evaluation of asymptotic expansions. Detail calculation permit the treating.

Quantum Mechanics David Ferry 2001-01-01 This textbook provides a complete course in quantum mechanics for students of semiconductor device physics and electrical engineering. It describes the basic quantum theory of the electronic system and is particularly useful for those going on to use the modern semiconductor device physics. The book is developed from a course the author has taught for many years with a style and order of presentation of material specifically designed for this audience. It introduces the main concepts of quantum mechanics which are important in everyday solid-state physics and electronics. Each topic includes examples which have been carefully chosen to draw upon relevant experimental research. It also includes problems with solutions to test understanding of theory. For the second edition significant new material has been added to each chapter, providing updated connections with relevant experiments and device concepts. Now references and new problems are included.

Introduction to Quantum Control and Dynamics-Domenico Alesandr 2007-08-03 The introduction of control theory in quantum mechanics has created a rich, new interdisciplinary scientific field, which is producing novel insights into important theoretical questions at the heart of quantum physics. Exploring this emerging subject, Introduction to Quantum Control and Dynamics presents the mathematical concepts and fundamental principles underlying the analysis and control of dynamical phenomena featuring the quantum mechanics behind the applications, the book derives a class of models for quantum control systems from fundamental physics. It examines the controllability and observability of quantum systems and the related problem of quantum state determination and measurement. The author also uses Lie group decompositions as tools to analyze dynamics and to design control algorithms. In addition, he describes various other control methods and discusses topics in quantum information theory that involve entanglement and entanglement dynamics. The final chapter covers the implementation of quantum control and dynamics in several fields. Armed with the basics of quantum control and dynamics, readers will invariably use this interdisciplinary knowledge in their mathematical, physical, and engineering work.

Quantum Physics - Konstantin V. Kazakov 2014-06-26 Quantum mechanics is one of the most fascinating, and at the same time most controversial, branches of contemporary science. Despite its scientific significance, this subject is hard to learn and has not been widely used, except in the field of quantum electronics. Uncommon Paths in Quantum Physics allows the reader to contemplate deeply some ideas and methods that are seldom met in the current literature. Instead of widespread recipes of mathematical techniques, the book follows logic and partly intuitional derivations of non-commutative algebra. Readers can directly penetrate the abstract world of quantum mechanics. First book that treats this newly developed area of mathematics and physics, the book will thus provide a fascinating overview of the prospective applications of this area, strongly founded on the most advanced and recent results in quantum theory.

How to Understand Quantum Mechanics: John-Paul Salamatin 2018-05-08 How to Understand Quantum Mechanics presents an accessible introduction to understanding quantum mechanics in a natural and intuitive way, which was advocated by Erwin Schrödinger and Albert Einstein. A theoretical physicist reveals dozens of easy tricks that avoid long calculations, makes complicated simple statements, and bypass the worthless quandaries of famous scientists who died in anguish. The author’s approach is light-hearted, and the book is written to be read without equations, however all relevant equations still appear with explanations as to what they mean. The book extensively presents quantum information, the MKS unit system (obsolete), noncommutative algebra, the holes of the ‘uncertainty principle’ (it is just a math relation), and the accumulated junk-DNA that got into the quantum operating system by misreporting it. The order of presentation is new and also unique by warning about traps to be avoided, while exploring new topics such as quantum probabilities that are not typical for the usual textbooks. The book is designed to teach the reader to comprehend the modern quantum physics and to understand the physical meaning of the solutions. The tutorial on special topics is an effort to lead to development of "quantum mechanical intuition" as well as learning mathematical techniques for problem solving. Most importantly, the book is not flooded with numerous free objects, but the reader can move and straighten problems in the book, while the most important topics are discussed at a deeper level. The understanding of quantum mechanics is incomplete without understanding the early ideas and experiments that lead to the development of the quantum theory. Thus, the first two chapters of the book are dedicated to such topics. The key features of this book are: A simplified, structured, and step-by-step introduction to quantum mechanics. The simplification is attained through use of a simplified, step-by-step approach to important topics in a simplified, step-by-step approach to important topics in the visualization of the physical phenomenon, and demonstration of the application of mathematics: An in-depth discussion of the wave-particle duality, measurement problem and their philosophical implications in Chapter 2 provides an understanding of the broader meaning of quantum theory. How to Understand Quantum Mechanics presents an accessible introduction to understanding quantum mechanics in a natural and intuitive way, which was advocated by Erwin Schrödinger and Albert Einstein. A theoretical physicist reveals dozens of easy tricks that avoid long calculations, makes complicated simple statements, and bypass the worthless quandaries of famous scientists who died in anguish. The author’s approach is light-hearted, and the book is written to be read without equations, however all relevant equations still appear with explanations as to what they mean. The book extensively presents quantum information, the MKS unit system (obsolete), noncommutative algebra, the holes of the ‘uncertainty principle’ (it is just a math relation), and the accumulated junk-DNA that got into the quantum operating system by misreporting it. The order of presentation is new and also unique by warning about traps to be avoided, while exploring new topics such as quantum probabilities that are not typical for the usual textbooks. The book is designed to teach the reader to comprehend the modern quantum physics and to understand the physical meaning of the solutions. The tutorial on special topics is an effort to lead to development of "quantum mechanical intuition" as well as learning mathematical techniques for problem solving. Most importantly, the book is not flooded with numerous free objects, but the reader can move and straighten problems in the book, while the most important topics are discussed at a deeper level. The understanding of quantum mechanics is incomplete without understanding the early ideas and experiments that lead to the development of the quantum theory. Thus, the first two chapters of the book are dedicated to such topics. The key features of this book are: A simplified, structured, and step-by-step introduction to quantum mechanics. The simplification is attained through use of a simplified, step-by-step approach to important topics in a simplified, step-by-step approach to important topics in the visualization of the physical phenomenon, and demonstration of the application of mathematics: An in-depth discussion of the wave-particle duality, measurement problem and their philosophical implications in Chapter 2 provides an understanding of the broader meaning of quantum theory.
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