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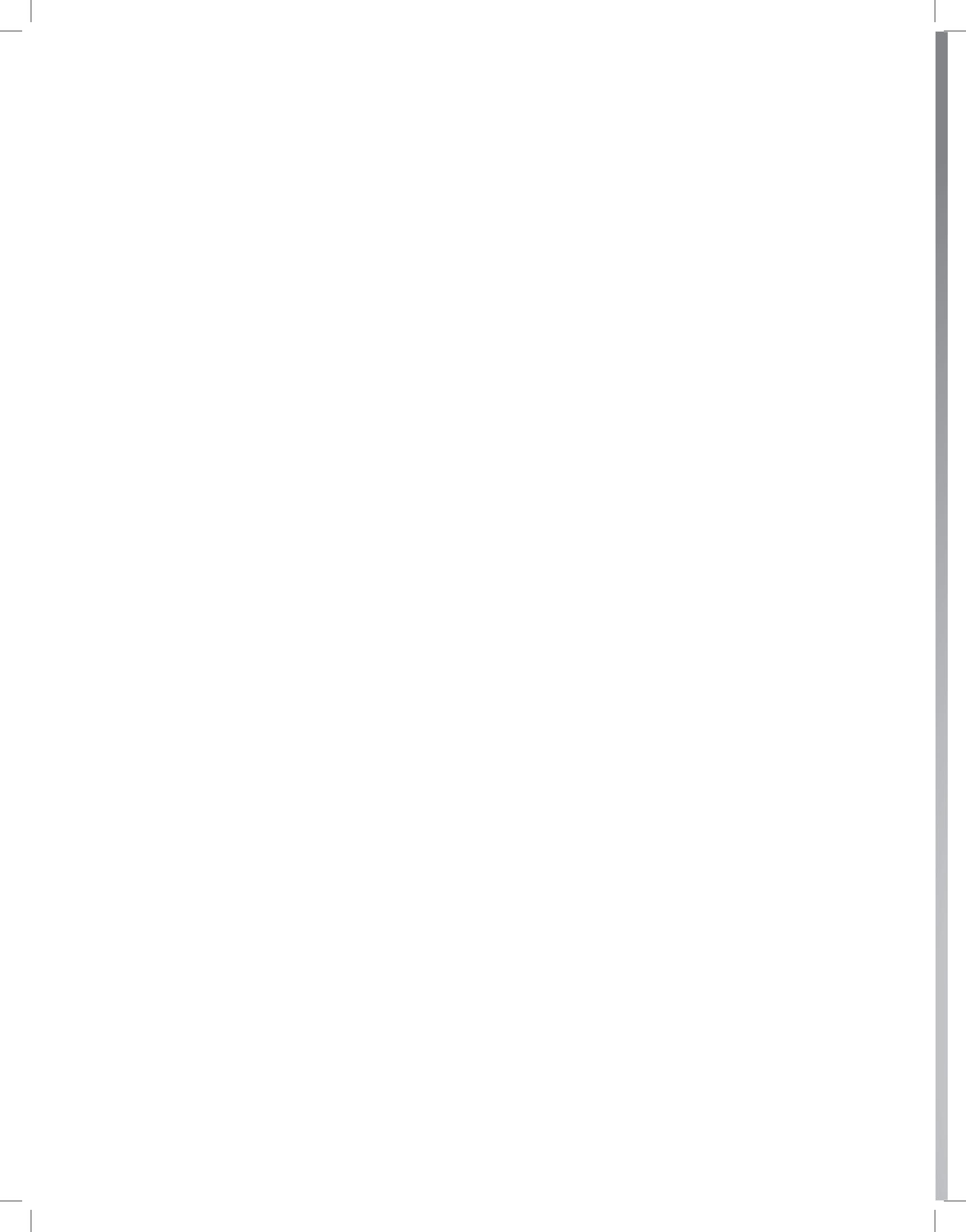
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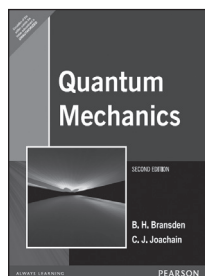
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PHYSICS



Classical/Quantum Mechanics



Quantum Mechanics, 2/e

B.H. Bransden
C.J. Joachain

ISBN: 9788131708392
© 2000
Pages: 808

About the Book

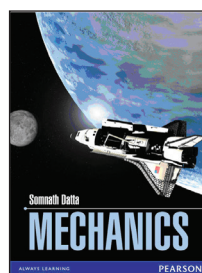
This book gives a modern, comprehensive introduction to the principles of quantum mechanics, to the main approximation methods and to the application of quantum theory to a wide variety of systems. The needs of students having an average mathematical ability are kept very much in mind, with the avoidance of complex mathematical arguments and any undue compression of material.

Features

- Comprehensive coverage of core material in quantum mechanics.
- Full and detailed explanations to help students of average mathematical ability.
- Additional topics covered in this edition include: Feynman's path integrals; the Berry phase; quantum dots; quantum jumps; and Bose-Einstein condensation.
- New chapter on relativistic quantum mechanics.
- Problems set to help students monitor their progress and increase understanding.

Contents

1. The origins of quantum theory.
2. The wave function and the uncertainty principle.
3. The Schrodinger equation.
4. One-dimensional examples.
5. The formalism of quantum mechanics.
6. Angular momentum.
7. The Schrodinger equation in three dimensions.
8. Approximation methods for stationary problems.
9. Approximation methods for time-dependent problems.
10. Several- and many-particle systems.
11. The interaction of quantum systems with radiation.
12. The interaction of quantum systems with external electric and magnetic fields.
13. Quantum collision theory.
14. Quantum statistics.
15. Relativistic quantum mechanics.
16. Further applications of quantum mechanics.
17. Measurement and interpretation.



Mechanics

Somnath Datta

ISBN: 9788131773734
© 2012
Pages: 650

About the Book

This book meets the requirement for an ideal text on Mechanics for undergraduate students. The book gives the readers a better understanding of topics like Rectilinear Motion, Conservation of Energy and Equation of Motion. Provides a good number of examples with good use real time illustration and exercises for practice and challenge.

Features

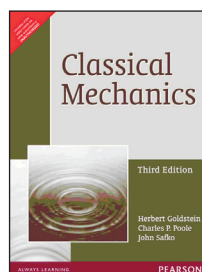
- Comprehensive coverage of Newton's Law of Motion.
- Detailed coverage on Conservation Laws of momentum, energy and Law of gravitation
- 180 worked out examples
- 185 end of chapter exercises

Contents

1. Introduction
2. Velocity and Acceleration in Rectilinear Motion
3. Vectors in Physics. Velocity and Acceleration as Vectors
4. Conservation of Momentum
5. Newton's Second Law of Motion
6. The Law of Universal Gravitation
7. Newton's Third Law of Motion
8. Work and Energy in One Dimensional Motion
9. Motion Under Central Forces
10. Work and Energy in 3-Dimensional Motion
11. Ideal Fluid at Rest and in Motion
12. Motion of a System of Particles. Rigid Body Rotating about a Fixed Axis
13. Accelerating and Rotating Frames of Reference
14. Relativistic Mechanics

About the Author

Dr Somnath Datta, Professor (Retired), Head of the Department of Science and Mathematics, and the Dean of instructions, Regional Institute of Education, (National Council of Educational Research and Training), Bhubaneswar 750007, Orissa, India. He also served as a visiting faculty, Department of Physics, Mysore University, Mysore.



Classical Mechanics, 3/e

Herbert Goldstein
Charles P. Poole
John Safko

ISBN: 9788131758915
© 2011
Pages: 664

About the Book

For 30 years, this classic text has been the acknowledged standard in classical mechanics courses. Classical Mechanics enables students to make connections between classical and modern physics " an indispensable part of a physicist's education. The authors have updated the topics, applications, and notations to reflect today's physics curriculum. They introduce students

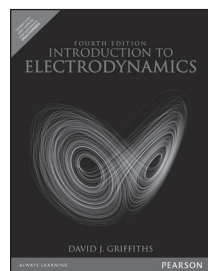
to the increasingly important role that nonlinearities play in contemporary applications of classical mechanics. New numerical exercises help students develop skills in the use of computer techniques to solve problems in physics. Mathematical techniques are presented in detail so that the text remains fully accessible to students who have not had an intermediate course in classical mechanics.

Features

- The classical approach of this leading text book has been revised and updated
- A section on the Euler and Lagrange exact solutions to the three-body problem
- A section on the damped driven oscillator as an example of the workings of the Josephson junction
- Chapter on canonical perturbation theory has been streamlined and the mathematics has been simplified
- Approximately 45 new problems, mostly in Chapters 1–8 and 11.
- Problems sets are now divided into “Derivations” and “Exercises”
- Solutions for 19 select problems have been provided in Appendix C

Contents

1. Survey of the Elementary Principles
2. Variational Principles and Lagrange’s Equations
3. The Central Force Problem
4. The Kinematics of Rigid Body Motion
5. The Rigid Body Equations of Motion
6. Oscillations
7. The Classical Mechanics of the Special Theory of Relativity
8. The Hamilton Equations of Motion
9. Canonical Transformations
10. Hamilton–Jacobi Theory and Action-Angle Variables
11. Classical Chaos
12. Canonical Perturbation Theory
13. Introduction to the Lagrangian and Hamiltonian Formulations for Continuous Systems and Fields



Introduction to Electrodynamics, 4/e

David J Griffiths

ISBN: 9789332550445
© 2015
Pages: 624



About the Book

For junior/senior-level electricity and magnetism courses. This book is known for its clear, concise, and accessible coverage of standard topics in a logical and pedagogically sound order. The highly polished **Fourth Edition** features a clear, easy-to-understand treatment of the fundamentals of electromagnetic theory, providing a sound platform for the exploration of related applications (AC circuits, antennas, transmission lines, plasmas, optics, etc.). Its lean and focused approach employs numerous new examples and problems.

Features

- The book features a **friendly, informal style**.
- **Focuses clearly on basic electromagnetic theory**, providing a sound platform for future exploration of related applications (such as AC circuits, antennas, transmission lines, plasmas, optics, etc.).
- **A large collection of problems** includes short, highly-focused problems that are placed immediately following the relevant text section while longer/more broadly-based problems are at the end of

the chapter.

- **Features a more extensive coverage of radiation theory** than most texts at this level.

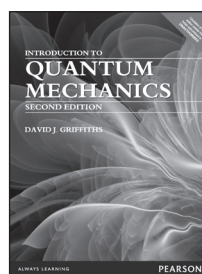
Contents

1. Vector Analysis
 2. Electrostatics
 3. Potentials
 4. Electric Fields in Matter
 5. Magnetostatics
 6. Magnetic Fields in Matter
 7. Electrodynamics
 8. Conservation Law.
 9. Electromagnetic Waves
 10. Potentials and Fields
 11. Radiation
 12. Electrodynamics and Relativity
- Appendix A: Vector Calculus in Curvilinear Coordinates
Appendix B: The Helmholtz Theorem
Appendix C: Units
Index

About the Author

David Griffiths received his BA and PhD from Harvard University. He held post-doctoral positions at the University of Utah and the University of Massachusetts (Amherst), and taught at Hampshire College, Mount Holyoke College, and Trinity College (Hartford) before joining the faculty at Reed College, where he has taught for over 30 years. In 2001–2002 he was visiting Professor of Physics at the Five Colleges (UMass, Amherst, Mount Holyoke, Smith, and Hampshire), and in the spring of 2007 he taught electrodynamics at Stanford.

Griffiths is a Consulting Editor of *The American Journal of Physics*, and a Fellow of the American Physical Society. In 1997 he was awarded the Millikan Medal by the American Association of Physics Teachers. He has spent sabbaticals at SLAC, Lawrence Berkeley Laboratory, and UC Berkeley. Although his PhD was in elementary particle theory, his recent research is in electrodynamics and quantum mechanics. He is the author of forty-five papers and three books: *Introduction to Electrodynamics* (Fourth Edition, Prentice Hall, 2013), *Introduction to Elementary Particles* (Second Edition, Wiley-VCH, 2008), and *Introduction to Quantum Mechanics* (Second Edition, Prentice Hall, 2005).



Introduction to Quantum Mechanics, 2/e

David J. Griffiths

ISBN: 9789332542891
© 2015
Pages: 496



About the Book

This text first teaches students how to apply the theories of quantum mechanics, and then provides them with a more insightful discussion of what it means. Fundamental principles are covered, quantum theory presented, and special techniques developed for solving realistic problems. The two-part coverage organizes topics under basic theory, and assembles an arsenal of approximation schemes with illustrative applications. The book avoids the temptation to include every possible relevant topic, in order to give students a complete treatment that is not oppressively long. It follows a straightforward writing style—entertains and informs without intimidating.

Features

- Completely rewritten chapter on the formalism of quantum mechanics -NEW
- Chapter on measurement and interpretation -NEW
- Additional problems and worked examples -NEW
- Concise yet comprehensive presentation
- Streamlines the treatment for more effective instructor presentation and student comprehension
- Introduces students to computer-based material using Mathematica

Contents

I. THEORY

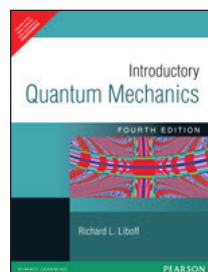
1. The Wave Function
 2. The Time-Independent Schrodinger Equation
 3. Formalism
 4. Quantum Mechanics in Three Dimensions
 5. Identical Particles
- ### II. APPLICATIONS
6. Time-Independent Perturbation Theory
 7. The Variational Principles
 8. The WKB Approximation
 9. Time-Dependent Perturbation Theory
 10. The Adiabatic Approximation
 11. Scattering
 12. Measurement and Interpretation

Appendix: Linear Algebra

Index

About the Author

David J. Griffiths, Reed College



Introductory Quantum Mechanics, 4/e

Richard Liboff

ISBN: 9788131704417

© 2003

Pages: 896

About the Book

Careful and detailed explanations of challenging concepts, and comprehensive and up-to-date coverage in this best-selling quantum mechanics text, continue to set the standard in physics education. In this new edition, a new chapter on the revolutionary topic of quantum computing (not currently covered in any other text at this level) and thorough updates to the rest of the text bring it up to date.

Features

- Introductory Quantum Mechanics, Fourth Edition is well known for its wealth of great problems (869 in total).
- Comprehensive coverage makes the book adaptable to any course.
- The book uses precise presentation and careful use of appropriate math.
- A new chapter on the revolutionary topic of quantum computing and numerous revisions throughout the rest of the book bring it up to date.
- More than 30 new problems have been added.

Contents

I. ELEMENTARY PRINCIPLES AND APPLICATIONS TO PROBLEMS IN ONE DIMENSION.

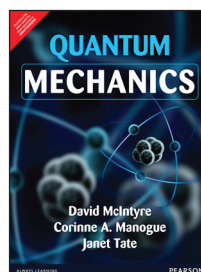
1. Review of Concepts of Classical Mechanics.
2. Historical Review: Experiments and Theories.
3. The Postulates of Quantum Mechanics: Operators, Eigenfunctions, and

Eigenvalues.

4. Preparatory Concepts: Function Spaces and Hermitian Operators.
 5. Time Development, Conservation Theorems, and Parity.
 6. Time Development, Conservation Theorems, and Parity.
 7. Additional One-Dimensional Problems: Bound and Unbound States.
 8. Finite Potential Well, Periodic Lattice, and Some Simple Problems with Two Degrees of Freedom.
- ### II. FURTHER DEVELOPMENT OF THE THEORY AND APPLICATIONS TO PROBLEMS IN THREE DIMENSIONS.
9. Angular Momentum.
 10. Problems in Three Dimensions.
 11. Elements of Matrix Mechanics: Spin Wavefunctions.
 12. Application to Atomic, Molecular, Solid-State, and Nuclear Physics: Elements of Quantum Statistics.
 13. Perturbation Theory.
 14. Scattering in Three Dimensions.
 15. Relativistic Quantum Mechanics.
 16. Quantum Computing.

About the Author

Dr. Richard Liboff is presently a Professor of Applied Physics, Applied Math, and Electrical Engineering at Cornell University. He has served as visiting professor at numerous universities and was awarded a Fulbright Scholarship in 1984 in support of a Visiting Professorship of Physics at Tel Aviv University. He has written over 100 scientific articles and has authored four textbooks. His research specialties include condensed-matter theory, kinetic theory, applied math, and elements of astrophysics.



Quantum Mechanics, 1/e

David McIntyre

ISBN: 9789332571648

© 2016

Pages: 624

New

About the Book

This innovative new text approaches Quantum Mechanics in a manner more closely aligned with the methods used in real modern physics research. Most texts start with a bit of history and then move directly to wave-particle problems with the incumbent heavy mathematical analysis; McIntyre, Manogue, and Tate aim to ground the student's knowledge in experimental phenomena and use a more approachable, less intimidating, more powerful mathematical matrix model. Beginning with the Stern-Gerlach experiments and the discussion of spin measurements, and using bra-ket notation, Quantum Mechanics introduces students to an important notational system that is used throughout quantum mechanics. This non-traditional presentation is designed to enhance students' understanding and strengthen their intuitive grasp of the subject, and has been class tested extensively. The text takes advantage of the versatile SPINS software, which allows the student to simulate Stern-Gerlach measurements in succession. This interaction gets to the heart of Quantum Mechanics, and introduces the student to the mathematics they will be using throughout the course. A solid alternative to the classical texts currently available, it is designed for junior- to senior-level Quantum Mechanics courses taken by physics majors.

Features

- A more moderate transition to the essential mathematics is characterized by the authors' new approach, which focuses on modern research (quantum computing, etc), along with coverage of bra-ket notation and matrix mechanics. Students who are able to take advantage of the strengths of matrices and bra-ket will likely find the complex mathematics less daunting than in a standard quantum text.
- The focus on modern experimental quantum mechanics makes the

material more engaging, and allows the student to stay connected with current research trends.

- A wide range of online activities are used to integrate and expand upon the features in the physical text. The activities on the website are organized both by topic, as well as by learning objective, allowing instructors to develop their course around topical knowledge or work on a specific learning objective.
- Online activities are organized in a wiki environment so that users can share their reflections on their use/adaptation of any one activity. Some activities take advantage of various pieces of software, such as SPINS, which is a cross-platform java program used to simulate Stern-Gerlach experiments. The online activities section, in the author's words, is a "living, growing thing," and the number of activities will grow as the website expands.
- The Web page as a whole serves not only as a resource for this Quantum book, which constitutes two pages within the wiki, but also for other courses in the Paradigms of Physics curriculum. In the physical text there is a concentration on making the mathematics of quantum mechanics easier to digest. Working with modern experimental quantum mechanics makes the material more engaging, and allows the student to stay connected with current research trends.

Contents

1. Stern-Gerlach Experiments
2. Operators And Measurement
3. Schrödinger Time Evolution
4. Quantum Spookiness
5. Quantized Energies: Particle in a Box
6. Unbound States
7. Angular Momentum
8. Hydrogen Atom
9. Harmonic Oscillator
10. Perturbation Theory
11. Hyperfine Structure and the Addition of Angular Momentum
12. Perturbation of Hydrogen
13. Identical Particles
14. Time dependent perturbation theory
15. Periodic Systems
16. Modern Applications

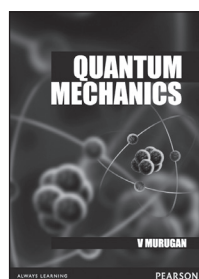
Appendices

About the Author

David H. McIntyre received a B.S. degree in physics from the University of Arizona and M.S. and Ph.D. degrees in physics from Stanford University. He has been on the physics faculty at Oregon State University since 1989 and is one of the original developers of the Paradigms in Physics program. His other teaching interests include computational physics, computer interfacing, and optical physics. His laboratory research interests are in laser spectroscopy and optical physics.

Corinne A. Manogue received an A.B. degree in mathematics and physics from Mount Holyoke College and a Ph.D. degree in physics from the University of Texas at Austin. She has been on the physics faculty at Oregon State University since 1988 and is the Director and one of the original developers of the Paradigms in Physics program. She is a Fellow of the American Physical Society and was awarded the Excellence in Undergraduate Physics Teaching Award from the American Association of Physics Teachers in 2008. She is coauthoring a textbook on The Geometry of Vector Calculus. Her theoretical research interests use the octonions to parameterize higher dimensional theories of particle physics.

Janet Tate received a B.Sc. degree in physics and chemistry from the University of Natal and M.S. and Ph.D. degrees in physics from Stanford University. She has been on the physics faculty at Oregon State University since 1989 and is one of the original developers of the Paradigms in Physics program. She is particularly interested in helping students to improve their critical thinking skills, especially through experimental work and writing. Her laboratory research interests are in experimental condensed matter physics.



Quantum Mechanics

V. Murugan

ISBN: 9788131773628

© 2014

Pages: 728

About the Book

Spread over 16 chapters, this book gives a comprehensive introduction to the fundamental postulates and the mathematical formalism of quantum mechanics. It spells the rules that facilitate translation of abstract mathematical information into physical terms to enable students understand the emergence of particle property in all quantum objects. With the right balance of theory and problems, this book gives an insight to the conceptual framework of quantum systems, which shaped our understanding of the physical universe and its evolution through the years. There are numerous worked-out examples and practice exercises to help students gain sufficient proficiency.

Features

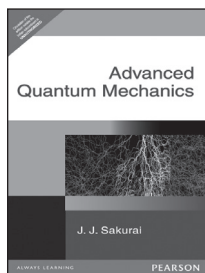
- Deals at length with Dirac's bra and ket vector notation and usage
- Discusses the Wentzel-Kramers-Brillouin approximation in detail
- Exclusive chapters on time-dependent perturbation theory and non-relativistic wave equation
- Presents the various theories behind wave scattering
- Over 300 worked-out examples and 250 end-of-chapter exercises

Contents

- 1 Evolution of Physics – Classical to Quantum
- 2 Schrodinger Equation
- 3 Simple Potentials
- 4 Mathematical Preliminaries
- 5 General Formalism
- 6 Simple Harmonic Oscillator
- 7 Orbital angular momentum
- 8 Time-Independent Schrödinger Equation in Three Dimensions
- 9 Bra and Ket Vector Formalism and Symmetries
- 10 Angular Momentum and rotation symmetry
- 11 Many particle systems and quantum statistics
- 12 Electron in magnetic fields and two state problems
- 13 Time - independent schrodinger equation - Approximations
- 14 Time dependent perturbation theory
- 15 The scattering theory
- 16 Relativistic wave equation

About the Author

Murugan V is retired as Professor and Head of the Department of Physics, Ramakrishna Mission Vivekananda College, Chennai.



Advanced Quantum Mechanics

J. J. Sakurai

ISBN: 9788177589160

© 1967

Pages: 336

About the Book

This widely-regarded classic presents the major advances in the fundamentals of quantum physics. No familiarity with relativistic quantum mechanics or quantum field theory is presupposed, but the reader is assumed to be familiar with non-relativistic quantum mechanics, classical thermodynamics and classical mechanics.

Contents

Part I: Classical Fields

1. Particles & Fields a Discrete and Continuous Mechanical Systems
2. Classical Scalar Fields
3. Classical Maxwell Fields
4. Vector Potentials in Quantum Mechanics.

Part II: The Quantum Theory of Radiation

5. Classical Radiation Field
6. Creation, Annihilation, and Number Operators
7. Quantized Radiation Field
8. Emission and Absorption of Photons by Atoms
9. Rayleigh Scattering, Thomson Scattering and the Rama Effect
10. Radiation Damping and Resonance Fluorescence
11. Dispersion Relations and Causality
12. The Self-energy of a Bound Electron; the Lamb Shift

Part III: Relativistic Quantum Mechanics of Spin-1/2 Particles

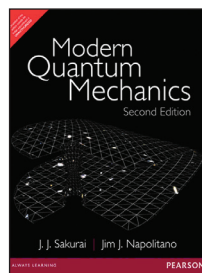
13. Probability Conservation in Relativistic Quantum Mechanics
14. The Dirac Equation
15. Simple Solutions; Non-Relativistic Approximations; Plane Waves
16. Relativistic Covariance
17. Bilinear Covariants
18. Dirac Operators in the Heisenberg Representation
19. Zitterbewegung and Negative-Energy Solutions
20. Central Force Problems; the Hydrogen Atom
21. Hole Theory and Charge Conjugation
22. Quantization of the Dirac Field
23. Weak Interactions and Parity Nonconservation; the Two-Component Neutrino

Part IV: Covariant Perturbation Theory

24. Natural Units and Dimensions
25. S-Matrix Expansion in the Interaction Representation + First Order Processes; Mott Scattering and Hyperon Decay
26. Two-photon annihilation and Compton Scattering; the Electron Propagator
27. Feynman's Space-Time Approach to the Electron Propagator
28. Moller Scattering and the Photon Propagator; One Meson Exchange Interactions
29. Mass and Charge Renormalization; Radiative Corrections

About the Author

The late **J. J. Sakurai**, noted theorist in particle physics, was born in Tokyo, Japan, in 1933. He received his B.A. from Harvard University in 1956, and his Ph. D. from Cornell University in 1958. Appointed assistant professor at the University of Chicago, he worked there until he became a professor at the University of California, Los Angeles in 1970. Sakurai died in 1982 while he was a visiting professor at CERN in Geneva, Switzerland.



Modern Quantum Mechanics: 2/e

J. J. Sakurai

Jim J. Napolitano

ISBN: 9789332519008

© 2014

Pages: 524

About the Book

This best-selling classic provides a graduate-level, non-historical, modern introduction of quantum mechanical concepts. The author, J. J. Sakurai, was a renowned theorist in particle theory. This revision by Jim Napolitano retains the original material and adds topics that extend the text's usefulness into the 21st century. The introduction of new material, and modification of existing material, appears in a way that better prepares the student for the next course in quantum field theory. Students will still find such classic developments as neutron interferometer experiments, Feynman path integrals, correlation measurements, and Bell's inequality. The style and treatment of topics is now more consistent across chapters.

The Second Edition has been updated for currency and consistency across all topics and has been checked for the right amount of mathematical rigor.

Features

- The chapter on scattering theory (Chapter 6 in this edition) is completely reorganized, with a new introduction based on time dependent perturbation theory.
- Explicit solutions to the Schrödinger Wave Equation have been added, including the linear potential, the simple harmonic oscillator using generating functions, and the derivation of spherical harmonics.
- A discussion of SO(4) symmetry and its application to solving the hydrogen atom and approximation techniques based on extreme time dependences have been added to early chapters.
- The chapter on identical particles (Chapter 7 in this edition) is now expanded to include the technique of second quantization and its application to electrons in solids and the quantized electromagnetic field.
- A new chapter on relativistic wave mechanics has been added (Chapter 8).
- Discussion, including literature references, of experimental demonstration of quantum mechanical phenomena is featured, including: the Stern-Gerlach experiment on cesium atoms, muon spin rotation and g-2, neutrino oscillations, "bouncing" ultracold neutrons, Berry's phase with neutrons, elastic scattering of protons from nuclei, the effects of exchange symmetry in nuclear decay, and the Casimir effect, among others.
- Advanced mathematical techniques (for example generating functions and contour integrals) associated with quantum mechanical calculations appear throughout.

Contents

1. Fundamental Concepts
2. Quantum Dynamics
3. Theory of Angular Momentum
4. Symmetry in Quantum Mechanics
5. Approximation Methods
6. Scattering Theory
7. Identical Particles
8. Relativistic Quantum Mechanics

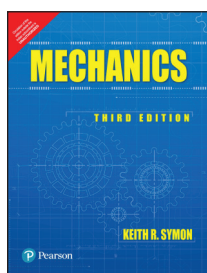
Appendices

- A. Electromagnetic Units
- B. Brief Summary of Elementary Solutions to Schrödinger's Wave Equation

About the Author

The late **J. J. Sakurai**, noted theorist in particle physics, was born in Tokyo, Japan in 1933. He received his B.A. from Harvard University in 1955 and his PhD

from Cornell University in 1958. He was appointed as an assistant professor at the University of Chicago, where he worked until he became a professor at the University of California, Los Angeles in 1970. Sakurai died in 1982 while he was visiting a professor at CERN in Geneva, Switzerland.



Mechanics, 3/e

Symon

ISBN: 9789332573918

© 2016

Pages: 656



About the Book

This text is intended as the basis for an intermediate course in mechanics at the undergraduate level. Such a course, as essential preparation for advanced work in physics, has several major objectives. It must develop in the student a thorough understanding of the fundamental principles of mechanics. It should treat in detail certain specific problems of primary importance in physics, for example, the harmonic oscillator and the motion of a particle under a central force

Features

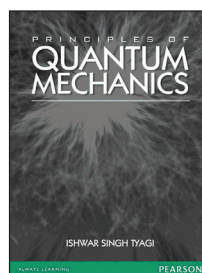
- The treatment throughout the book is intended to emphasize the modern point of view with mathematical rigor
- The examples treated in the text have been worked out so as to integrate as far as possible, the mathematical treatment with physical interpretation
- Two chapters on the theory of relativity has been added in this edition.
- The problems at end of each chapter requires more or less physical ingenuity in addition to an understanding of the text.

Contents

1. Elements of Newtonian Mechanics.
2. Motion of a Particle in One Dimension.
3. Motion of a Particle in Two or Three Dimensions.
4. The Motion of a System of Particles.
5. Rigid Bodies.
Rotation about an Axis.
Statics.
6. Gravitation.
7. Moving Coordinate Systems.
8. Introduction to the Mechanics of Continuous Media.
9. Lagrange's Equations.
10. Tensor Algebra.
11. Inertia and Stress Tensors.
The Rotation of a Rigid Body.
12. Theory of Small Vibrations.
13. Basic Postulates of the Special Theory of Relativity.
Relativistic Dynamics.
Bibliography.
Answers to Odd-Numbered Problems.

About the Author

Keith R. Symon, University of Wisconsin



Principles of Quantum Mechanics

Dr Ishwar Singh Tyagi

ISBN: 9788131773352

© 2013

Pages: 584

About the Book

Any course in physics cannot be completed without learning quantum mechanics. This subject helps in understanding the individual behaviour of the subatomic particles that constitute all forms of matter. Principles of Quantum Mechanics comprehensively covers all relevant topics to meet the requirements of both undergraduate and postgraduate students of physics. The initial chapters of the book introduce the basic fundamentals of the subject to help the first-time learners and the later chapters cover aspects that will prepare them to apply quantum mechanics to understand the various physical phenomena, for example, the working of micro- and nano-devices. The book includes a detailed discussion on why classical mechanics, which is applicable at macroscopic level, cannot be applicable at microscopic level.

Features

- A chapter on theory of measurement in quantum mechanics
- A chapter on quantum computing
- Applications of quantum mechanics dealt with numerous examples
- 270 problems with solutions
- 150 diagrams to illustrate the concepts

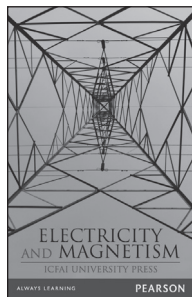
Contents

1. Introduction
 2. Wave-particle Duality
 3. Wave Packets and Uncertainty Principle
 4. Operators, Eigenstates, Eigenvalues and Schrodinger Equation
 5. One-dimensional Problems
 6. The Linear Harmonic Oscillator
 7. The Linear Vector Space
 8. The Linear Harmonic Oscillator - Revisited
 9. Angular Momentum
 10. Three-Dimensional Systems
 11. Angular Momentum - Revisited
 12. The Spin
 13. Addition of Angular Momenta
 14. WKB Approximation and Electron Tunneling
 15. Time - Independent Perturbation theory
 16. Time - Dependent Perturbation Theory
 17. Semiclassical Theory of Radiations
 18. Theory of Scattering
 19. Theory of Measurement in Quantum Mechanics
 20. Introduction to Quantum computing
- Appendices
- A. Early Quantum Mechanics
 - B. Some Supplemnetary Topics
 - C. Some Mathematical Relations
 - D. Various Tables

About the Author

Dr Ishwar Singh Tyagi is Emeritus Fellow at the Physics Dept. of IIT Roorkee. After completing his Ph.D. in 1976 from the University of Roorkee (now IIT Roorkee) he joined the Department of Physics as a faculty member in 1977 and became professor in 1996. His assignments as post-doctoral as well as visiting scientist took him to the New University of Ulster (NUU), Coleraine, in North Ireland and the Freie Universitat Berlin.

Electricity and Electromagnetism/ Electrodynamics



Electricity and Magnetism

ICFAI University Press

ISBN: 9788131773727

© 2012

Pages: 440

About the Book

Electricity and Magnetism is designed for undergraduate courses in Physics. It comprehensively covers the topics of electricity and magnetism and brings out the relationship between the two forces with adequate emphasis on principles, theory and pedagogy. Illustrations are specially made to suit classroom presentation. Written in a simple and lucid language, the book progresses from the basic laws, which help the students to stay focused on the key tenets, without getting lost in the maze of intricate details

Features

- It traces the origin of electromagnetic radiations, starting from the first principles.
- In-depth coverage of Current, Resistance and Electric Circuits, Gauss's Law and Magnetism
- Electric Charge and Electric Field and Electric Potential discussed in detail
- Student centric pedagogy with 90 solved examples and over 120 exercises.

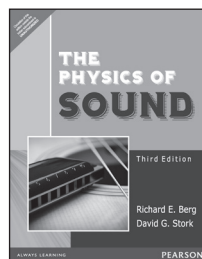
Contents

1. Electric Charge and Electric Field
2. Electric Potential
3. Current, Resistance and Electric Circuits
4. Gauss's Law
5. Capacitance and Dielectrics
6. Magnetism
7. Sources of Magnetic field
8. Electromagnetic Induction
9. Inductance
10. Alternating Current
11. Electromagnetic Waves

About the Author

ICFAI UNIVERSITY PRESS, Hyderabad

Intermediate Physics



The Physics of Sound, 3/e

Richard E Berg

ISBN: 9788131768587

© 2005

Pages: 416

About the Book

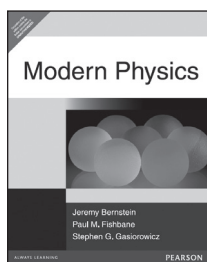
Using a hands-on and experimental approach, this book incorporates developments in digital audio technology including consumer products into a firm foundation of the physics of sound. Selected topics are interesting to a broad audience, with many applications of sound and waves beyond strictly musical applications. No background in physics, mathematics, or music is required

Features

- **Accessible mathematical level-**; Makes text useful for the basic college core course curriculum
- **Wide range of topics-**; Introduces students to other areas of sound beyond the physics of music concepts.
- **Many experiments that can be done readily in the classroom-**; Illustrate how the concepts discussed in the book can be applied and how many of the fundamental ideas about sound were developed.
- **Updates for recent information on the ear-**; Includes recent advances in cochlear implant technology

Contents

1. Simple Harmonic Motion and Applications
2. Waves and Sound
3. Standing Waves and the Overtone Series
4. Analysis and Synthesis of Complex Waves
5. Electronic Music and Synthesizers
6. The Human Ear and Voice
7. Sound Recording and Reproduction
8. Room and Auditorium Acoustics
9. Musical Temperament and Pitch
10. Woodwind Instruments
11. Brass Instruments
12. String Instruments
13. The Piano
14. Percussion Instruments



Modern Physics

Bernstein

ISBN: 9788131724668

© 2000

Pages: 624

About the Book

This comprehensive text provides a clear, correct, and up-to-date introduction and survey of the topics of importance to tomorrow's engineers and scientists. The presentation includes the description of the history of the topics, to show students how we got to where we are; it stresses the importance of observation and experiment; and it emphasizes numbers, so that students develop a feel for the magnitudes involved and for when different principles become important.

Features

- **Introductory review chapter**—Not found in other texts.
- **A well-defined four-part structure**—Special relativity; quantum mechanics; “applications” of quantum mechanics; and “frontier” subjects.
- **Presentation of the historical origin of topics**—Historical material is interwoven throughout the text for essentially every topic covered.
- **Claims backed by simple calculation/physical explanation.**
- **Original presentations of topics**—e.g., the application of the Bohr rules to non-Coulombic forces; “towards the Schrödinger equation;” the physical description of NMR; the demonstration of exchange forces; the radius of a neutron star; as well as a unique appendix.
- **Practical applications of the topics covered**—e.g., the Global Positioning System, lasers, quantum engineering, nuclear magnetic resonance.

Contents

I. A Review.

II. RELATIVITY.

2. The Basics of Relativity.
3. Consequences of Relativity.

III. THE ORIGINS OF QUANTUM MECHANICS.

4. Waves as Particles and Particles as Waves.
5. Atoms and the Bohr Model.
6. The Schrödinger Equation.
7. Classical and Unclassical behavior: Wave Packets and Uncertainty.
8. Barriers and Wells.
9. The Hydrogen Atom.
10. Many Particles.

IV. APPLICATIONS.

11. Complex Atoms and Molecules.
12. Statistical Physics.
13. Atoms, Radiation and Lasers.
14. Conductors, Insulators, and Superconductors.
15. The Atomic Nucleus.

V. FRONTIERS.

16. Elementary Particle Physics.
17. General Relativity.
18. Cosmology.

Appendix A: Physical Constants

Appendix B: Mathematics

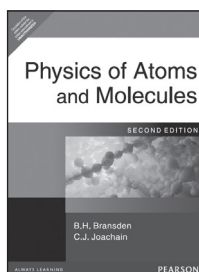
About the Author

Jeremy Bernstein has had a dual career in physics and writing. He was on the staff of the New Yorker from 1963 to 1993 and was a Professor of

Physics at the Stevens Institute of Technology from 1968 until his retirement in 1993, when he became Professor emeritus. He has won several awards for his writing about science and mountain travel. He has also published widely in both technical and non-technical journals. Some of his recent books are: An Introduction to Cosmology, Albert Einstein and the Frontiers of Physics, A Theory for Everything, In the Himalayas, and Dawning of the Raj.

Paul Fishbane has been teaching undergraduate courses at the University of Virginia, where he is Professor of Physics, for some 25 years. He received his doctoral degree from Princeton University in 1967 and has published some 100 papers in his field, theoretical high energy physics. He is co-author of Physics for Scientists and Engineers with Stephen Gasiorowicz and Stephen Thornton. P.

Stephen Gasiorowicz was born in Poland and received his Ph.D. in physics at the University of California, Los Angeles in 1952. After spending 8 years at the Lawrence Radiation Laboratory in Berkeley, California, he joined the faculty of the University of Minnesota, where his field of research is theoretical high energy physics. As a visiting professor, he has traveled to the Niels Bohr Institute, NORDITA in Copenhagen, the Max Planck Institute for Physics and Astrophysics in Munich, DESY in Hamburg, Fermilab in Batavia, and the Universities of Marseille and Tokyo.



Physics of Atoms and Molecules, 2e

B.H. Bransden

C.J. Joachain

ISBN: 9788177582796

© 2003

Pages: 1128

About the Book

The study of atomic and molecular physics is a key component of undergraduate courses in physics, because of its fundamental importance to the understanding of many aspects of modern physics. The aim of this new edition is to provide a unified account of the subject within an undergraduate framework, taking the opportunity to make improvements based on the teaching experience of users of the first edition, and cover important new developments in the subject.

Features

- Revised material on molecular structure and spectra.
- Extended material on electronic and atomic collisions.
- A new chapter describing applications based on the use of the maser and the laser, including laser spectroscopy, laser cooling and trapping of atoms, Bose Einstein condensation, atom lasers and atomic systems in intense laser fields.
- A new chapter describing other applications, including magnetic resonance, atom optics, atoms in cavities, ions in traps, atomic clocks and astrophysics.
- Revised appendices include new material on molecules and updated tables of physical constants.
- Solutions of selected problems.

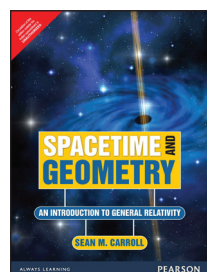
Contents

1. Electrons, photons and atoms.
2. The elements of quantum mechanics.
3. One-electron atoms.
4. Interaction of one-electron atoms with electromagnetic radiation.
5. One-electron atoms: fine structure and hyperfine structure.
6. Interaction of one-electron atoms with external electric and magnetic fields.
7. Two-electron atoms.
8. Many-electron atoms.

9. Interaction of many-electron atoms with electromagnetic radiation and with static electric and magnetic fields.
10. Molecular structure.
11. Molecular spectra.
12. Atomic collisions: basic concepts and potential scattering.
13. Electron-atom collisions and atomic photoionisation.
14. Atom-atom collisions.
15. Masers, lasers and their interaction with atoms and molecules.
16. Further developments and applications of atomic and molecular physics.
17. Appendices.

About the Author

B.H. Bransden, Department of Physics, University of Durham
C.J. Joachain, Physique Theorique, Universite Libre de Bruxelles



Spacetime and Geometry: An Introduction to General Relativity, 1/e

Sean Carroll

ISBN: 9789332571655

© 2016

Pages: 536



About the Book

Spacetime and Geometry: An Introduction to General Relativity provides a lucid and thoroughly modern introduction to general relativity for advanced undergraduates and graduate students. It introduces modern techniques and an accessible and lively writing style to what can often be a formal and intimidating subject. Readers are led from physics of flat spacetime (special relativity), through the intricacies of differential geometry and Einstein's equations, and on to exciting applications such as black holes, gravitational radiation, and cosmology. Subtle points are illuminated throughout the text by careful and entertaining exposition. A straightforward and lucid approach, balancing mathematical rigor and physical insight, are hallmarks of this important text.

Features

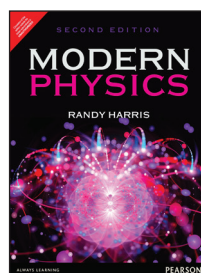
- This is the most up-to-date text available on general relativity.
- A very accessible and lively writing style provides a refreshing change for what can be a formal and intimidating subject.
- Spacetime and Geometry provides an excellent balance and blend of mathematical rigor and physical insight.
- Explanations of complex theory are exceptionally clear.

Contents

1. Special Relativity and Flat Spacetime.
2. Manifolds.
3. Curvature.
4. Gravitation.
5. The Schwarzschild Solution.
6. More General Black Holes.
7. Perturbation Theory and Gravitational Radiation.
8. Cosmology.
9. Quantum Field Theory in Curved Spacetime.
10. Appendices.

About the Author

Sean Carroll, University of Chicago



Modern Physics, 2/e

Randy Harris

ISBN: 9789332570962

© 2016

Pages: 640



About the Book

Modern Physics, Second Edition provides a clear, precise, and contemporary introduction to the theory, experiment, and applications of modern physics. Ideal for both physics majors and engineers, this eagerly awaited second edition puts the modern back into modern physics courses. Pedagogical features throughout the text focus the reader on the core concepts and theories while offering optional, more advanced sections, examples, and cutting-edge applications to suit a variety of students and courses. Critically acclaimed for his lucid style, in the second edition, Randy Harris applies the same insights into recent developments in physics, engineering, and technology.

Features

- A contemporary approach that incorporates recent developments in physics and up-to-date applications in engineering and technology make the physics relevant and engaging.
- Critically acclaimed for a lucid and precise style, the book carefully balances concepts, theory, experimental data, and theory. It strives for complete exposition of fundamental ideas while addressing common misconceptions.
- Progress and Applications sections survey current applications of the theories described in the chapter. Students see how what they learn applies to their chosen career and the opportunities available for professional physicists and engineers.
- Worked Examples in the text carefully walk students step-by-step through solving problems to better prepare them to tackle the end-of-chapter problems.
- Optional/Advanced sections are clearly labeled so that professors can pick and choose sections to optimally match the level, scope, and emphasis of their course.
- Chapter Outlines and brief introductions give students a learning roadmap to the chapter ahead.
- Chapter Summaries now incorporate a Basic Equations section to show how each equation relates to the key topics in the chapter, and to one another.
- Challenge Problems are highlighted so professors can easily build assignments of ideal level, and know where they can push their best students.

Contents

1. Dawn of a New Age
2. Special Relativity
3. Waves and Particles I: Electromagnetic Radiation Behaving as Particles
4. Waves and Particles II: Matter Behaving as Waves
5. Bound States: Simple Cases
6. Unbound States: Obstacles, Tunneling and Particle-Wave Propagation
7. Quantum Mechanics in Three Dimensions and The Hydrogen Atom
8. Spin and Atomic Physics
9. Statistical Mechanics
10. Bonding: Molecules and Solids
11. Nuclear Physics
12. Fundamental Particles and Interactions
13. Appendices

About the Author



Gravity: An Introduction to Einstein's General Relativity

James B. Hartle

ISBN: 9789332535084

© 2014

Pages: 560

About the Book

Einstein's theory of general relativity is a cornerstone of modern physics. It also touches upon a wealth of topics that students find fascinating—black holes, warped spacetime, gravitational waves, and cosmology. Until now, it has not been included in the curriculum of many undergraduate physics courses because the required math is too advanced. The aim of this ground-breaking new text is to bring general relativity into the undergraduate curriculum and make this fundamental theory accessible to virtually all physics majors. Using a “physics first” approach to the subject, renowned relativist James Hartle provides a fluent and accessible introduction that uses a minimum of new mathematics and illustrates a wealth of applications. Recognizing that there is typically not enough time in a short introductory course for the traditional, math-first, approach to the subject, Hartle presents a physics-first introduction to general relativity that begins with the essential physical applications.

Features

- Examples come first, derivations later. In this “physics first” approach, relevant simple solutions of the Einstein equation are presented first, before introducing the field equations of general relativity and their supporting mathematics. This brings the student to the heart of the physical phenomena as quickly as possible.
- The emphasis is on the exciting phenomena of gravitational physics and the growing connection between theory and observation. Global positioning system, black holes, X-ray sources, pulsars, quasars, gravitational waves, the big bang, and the large scale structure of the universe, for example, are used to illustrate the widespread role of how general relativity describes a wealth of everyday and exotic phenomena.
- Novel and simple examples are presented to keep the presentation concise and accessible: for instance, Schwarzschild black hole, spherical stars, weak gravitational waves in flat spacetime.
- Mathematics, beyond the typical advanced calculus knowledge, is kept to a minimum. Only absolutely essential new mathematical concepts are introduced, and these only when needed.
- The text's layered structure allows the text to be used for a range of courses depending on the length and level of the course—from junior level to introductory graduate level in physics and astronomy. After just the first few chapters, a student will take away a broad introduction to some of the basic phenomena of gravitational physics, and not just mathematical tools.
- Illustrative boxes are interspersed throughout, providing students with applications, experiments, ideas, examples, and interesting sidelights that extend and complement concepts presented in the basic text without interrupting its flow

Contents

I. SPACE AND TIME IN NEWTONIAN PHYSICS AND SPECIAL RELATIVITY.

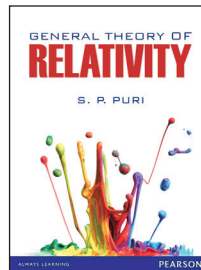
1. Gravitational Physics.
2. Geometry as Physics.
3. Newtonian Physics.
4. Principles of Special Relativity.
5. Special Relativistic Mechanics.

II. THE CURVED SPACETIMES OF GENERAL RELATIVITY.

6. Gravity as Geometry.
7. Description of Curved Spacetime.
8. Geodesics.
9. The Geometry Outside a Spherical Star.
10. Solar System Tests.
11. Relativistic Gravity in Action.
12. Black Holes.
13. Astrophysical Black Holes.
14. A Little Rotation.
15. Rotating Black Holes.
16. Gravitational Waves.
17. The Universe Observed.
18. Cosmological Models.
19. Which Universe and Why?

III. THE EINSTEIN EQUATION.

20. A Little More Math.
21. Curvature and the Einstein Equation.
22. The Source of Curvature.
23. Gravitational Wave Emission.
24. Relativistic Stars.



General Theory of Relativity

Dr. S P Puri

ISBN: 9788131795682

© 2013

Pages: 368

About the Book

General Theory of Relativity is the generalization of special relativity to include gravitation. It emphasizes that the law of Physics must be same for all observers and thereby extended it to non-inertial frames. This text is intended as a textbook for the students of Physics at the undergraduate and postgraduate level. It gives equal importance to the mathematical and physical aspects of general theory of relativity and hence strengthening the foregrounds.

Features

- Detailed study of Tensor analysis
- In-depth coverage on cosmology
- An introductory chapter on Special Theory of Relativity
- 36 figures, 18 solved problems and 82 unsolved problems with answers

Contents

Historical Perspective

1. A Brief Review on Special Relativity

2. Tensor Analysis and Riemannian Geometry

Part 1. Line Element

Part 2. Geodesic Curves. Covariant Differentiation

Part 3. Curvature Tensor

3. Einstein's Field Equations

4. Einstein's Law of Gravitation for Empty Space. Schwarzschild Solution

5. Einstein's Law of Gravitation for Non-empty Space

6. Gravitational Waves

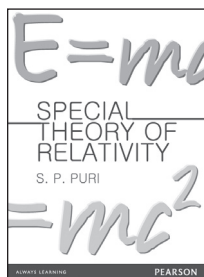
7. Black Holes

8. Cosmology

9. Astrophysics

About the Author

SP Puri is a former U.G.C Emeritus Fellow. He was also a Professor and Chairman at Department of Physics in Panjab University, Chandigarh.



Special Theory of Relativity

Dr. S P Puri

ISBN: 9788131785010

© 2013

Pages: 232

About the Book

Special Theory of Relativity is primarily intended as a textbook for the students of physics at the undergraduate level. Examining developments in the field as well as the predictions of special relativity that have taken place since 1959, its comprehensive coverage includes engaging explanations of the mathematical treatment as well as the applications of the special theory of relativity.

Features

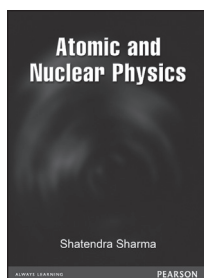
- Includes applications of special theory of relativity in a chapter
- 45 solved problems and 100 unsolved problems for practice
- Answers to unsolved problems included

Contents

1. Newtonian Mechanics and Galilean Principle of Relativity
2. Lorentz Transformations and Its Kinematic Consequences, Intervals, Causality
3. Mathematical Background
4. Relativistic Mechanics of a Particle, Collisions and Conservation Laws
5. Optical Applications of Lorentz Transformation
6. Covariant Electrodynamics
7. Applications of Special Theory of Relativity
8. Introduction to General Relativity

About the Author

Prof. S. P. Puri, ex U.G.C. Emeritus Fellow, was Professor and Chairman, Department of Physics, Punjab University, Chandigarh.



Atomic and Nuclear Physics

Shatendra K. Sharma

ISBN: 9788131719244

© 2008

Pages: 620

About the Book

The book describes the basics of Atomic and Nuclear Physics, related phenomena, and the physics of Nuclear Reactors and the Instruments and Applications for the same. The flow of the chapters in the book gradually moves from Atomic Physics, then to Quantum Physics, and finally to Nuclear Physics.

Features

- The book has 20 chapters out of which 2 chapters each deal with Introductory Concepts and Atomic Physics. One chapter each is devoted to X-Rays, Quantum Mechanics, Lasers, and Instruments and their Applications. Five chapters cover Radioactivity. Seven chapters are devoted to Nuclear Physics.
- Radioactivity is covered in 5 chapters
- Chapter on LASERS covers principles of their operation including light amplification techniques, population inversion, and the mechanism of

pumping.

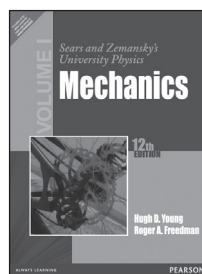
- The chapter Instruments and Applications deals with important instruments, such as TEM, SEM, Multichannel Analyzers, and Electron Microprobe Analyzer, and contemporary techniques such as ESR, NMR, and CAT scan. This chapter also covers Diagnostic Radiology, Nuclear Techniques in Medicine, and Radiation Therapy.
- A comprehensive set of appendices covering Mathematical Tools, Fundamental Physical Constants, Standard Notations of Units of Measure, SI Units of Physical Quantities and their Notations, and Conversion Factors of Units of Measurement is present in the book.

Contents

1. Basic Concepts
2. Special Theory of Relativity
3. Atomic Structure
4. Introduction to X-Rays
5. Introduction to Quantum Mechanics
6. Lasers
7. Radioactivity
8. Radioactive Decay Theory
9. Interaction of Radiation with Matter
10. Atomic Inner-Shell Excitation and De-Excitation Processes
11. Radiation Detectors 255
12. The Structure of Nucleus
13. Nuclear Forces 315
14. Nuclear Fission and Fusion
15. Nuclear Reactions with Neutrons
16. Nuclear Reactor Physics
17. Elementary Particles and Nucleon Structure
18. Cosmic Rays
19. Radiation Safety and Health Physics
20. Instruments and Applications

About the Author

Professor Shatendra Sharma has more than 28 years of experience in teaching, R & D, and educational planning. He has held various positions, such as Advisor and Director, All India Council of Technical Education (AICTE); Associate Professor, University Science Instrumentation Centre (USIC) at Jawaharlal Nehru University (JNU). He has also been associated with Defence Research and Development Organization (DRDO). Currently, he is Professor and Director at USIC, JNU.



Sears and Zemansky's University Physics-Volume I : Mechanics

Hugh D. Young
Roger A. Freedman

ISBN: 9788131759851

© 2011

Pages: 544

About the Book

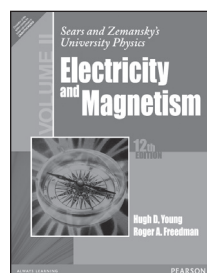
University Physics " Mechanics, encapsulated the chapters relating to Mechanics from Sears and Zemansky's University Physics Twelfth Edition. The book continues an unmatched history of innovation and careful execution that was established by the bestselling eleventh edition. Assimilating the best ideas from education research, this new edition provides enhanced problem-solving instruction, pioneering visual and conceptual pedagogy, the first systematically enhanced problems, and the most pedagogically proven and widely used homework and tutorial systems available.

Features

- The acclaimed, consistent, and explicit four-step problem-solving framework (Identity, Set Up, Execute, and Evaluate) is used throughout every worked example, chapter-specific problem-solving strategy, and solution. Worked examples incorporate vivid sketches to guide you through this important step
- Student interest in the subject is kindled by a thought-provoking probe which kicks off each new chapter. Based on real life situations, these questions, pertinent to the topic under discussion, are convincingly addressed at the chapter-end and enable you to correlate observed effects with physical causes
- A streamlined and systematic learning path of instruction followed by practice includes Learning Goals at the start of each chapter and Visual Chapter Summaries that consolidates each concept in figures, math, and words
- The instructional power of figures is enhanced by using the research proven technique of “annotation” (chalkboard-style commentary integrated into the figures to guide you in interpreting the figure)
- Renowned for providing the widest ranging and most effective problems available, the twelfth edition goes further “ it provides the first library of physics problems systematically enhanced based on feedback about students performance
- There is also a Chapter Opening Question and a list of Learning Goals to make the reader think about the subject matter of the chapter ahead. (To find the answer for the question, look for the ? icon
- At the end of each chapter is a collection of Discussion Questions that probe and extend the student’s conceptual understanding

Contents

1. Physical Quantities and Vectors
2. Motion along a Straight Line
3. Motion in Two or Three Dimensions
4. Newton’s Laws of Motion
5. Applying Newton’s Laws
6. Work and Kinetic Energy
7. Potential Energy and Energy Conservation
8. Momentum, Impulse, and Collisions
9. Rotation of Rigid Bodies
10. Dynamics of Rotational Motion
11. Equilibrium and Elasticity
12. Gravitation
13. Periodic Motion
14. Fluid Mechanics



Sears and Zemansky’s University Physics “Volume II : Electricity and Magnetism

Hugh D. Young
Roger A. Freedman

ISBN: 9788131758625
© 2011
Pages: 452

About the Book

University Physics “ Mechanics, encapsulated the chapters relating to Mechanics from Sears and Zemansky’s University Physics Twelfth Edition. The book continues an unmatched history of innovation and careful execution that was established by the bestselling eleventh edition. Assimilating the best ideas from education research, this new edition provides enhanced problem-solving instruction, pioneering visual and conceptual pedagogy, the first systematically enhanced problems, and the most pedagogically proven and

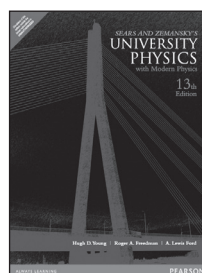
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Features

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Contents

1. Electric Charge and Electric Field
2. Gauss’s Law
3. Electric Potential
4. Capacitance and Dielectrics
5. Current, Resistance, and Electromotive Force
6. Direct-Current Circuits
7. Magnetic Field and Magnetic Forces
8. Sources of Magnetic Field
9. Electromagnetic Induction
10. Inductance
11. Alternating Current
12. Electromagnetic Waves



Sears’ and Zemansky’s University Physics with Modern Physics, 13/e

Young
Freedman
Ford

ISBN: 9788131790274
© 2013
Pages: 1600

About the Book

University Physics with Modern Physics, Thirteenth Edition continues to set the benchmark for clarity and rigor combined with effective teaching and research-based innovation.

University Physics is known for its uniquely broad, deep, and thoughtful set of worked examples key tools for developing both physical understanding and problem-solving skills. The Thirteenth Edition revises all the Examples and

Problem-Solving Strategies to be more concise and direct while maintaining the Twelfth Edition's consistent, structured approach and strong focus on modeling as well as math. To help students tackle challenging as well as routine problems, the Thirteenth Edition adds Bridging Problems to each chapter, which poses a difficult, multiconcept problem and provide a skeleton solution guide in the form of questions and hints.

The text's rich problem sets developed and refined over six decades are upgraded to include larger numbers of problems that are biomedically oriented or require calculus.

Complementing the clear and accessible text, the figures use a simple graphic style that focuses on the physics. They also incorporate explanatory annotations a technique demonstrated to enhance learning.

Features

- Deep and extensive problem sets covers a wide range of difficult and exercise both physical understanding and problem - solving expertise. Many problems are based on complex real life situation
- This text offers a larger number of examples and conceptual examples than any other leading calculus - based text, allowing it to explore problem solving challenges not addressed in other texts.
- A research based problem solving approach is used not just in every example but also in problem solving strategies.
- Problem solving strategies coach students in how to approach specific types of problems
- The figures use a simplified graphical style to focus on the physics of a situation, and they incorporate explanatory annotation. Both techniques have been demonstrated to have a strong positive effect on learning.
- Figures that illustrate example solution often take the form of black and white pencil sketches, which directly represents what a student should draw in solving such a problem.
- The popular caution paragraphs focus on typical misconceptions and student problem areas.
- End of section test your understanding questions let students check their grasp of the material and use a multiple choice or ranking task format to probe for common misconceptions.
- Visual summaries at the end of each chapter present the key ideas in words, equation, and thumbnail pictures, helping students to review more effectively

Contents

1. Units , Physical Quantities and Vectors
2. Motion along straight Line
3. Motion in two or three dimensions
4. Newton's law of motion
5. Applying Newton's law
6. Work and Kinetic Energy
7. Potential energy and Energy Conservation
8. Momentum, Impulse and Collision
9. Rotation of Rigid Bodies
10. Dynamics of Rotational Motion
11. Equilibrium and Elasticity
12. Fluid Mechanics
13. Gravitation
14. Periodic Motion
15. Mechanical Waves
16. Sound and Hearing
17. Temperature and Heat
18. Thermal Properties of Matter
19. The first law of Thermodynamics
20. The Second law of Thermodynamics
21. Electric charge and Electric Field
22. Gauss's Law
23. Electric Potential
24. Capacitance and Dielectrics
25. Current, Resistance, and Electromotive Force
26. Direct - Current Circuits

27. Magnetic Field and Magnetic Forces
28. Sources of Magnetic Field
29. Electromagnetic Induction
30. Inductance
31. Alternating Current
32. Electromagnetic Waves
33. The nature and propagation of Light
34. Geometric Optics
35. Interference
36. Diffraction
37. Relativity
38. Photon: Light Waves behaving as particle
39. Particle behaving as waves
40. Quantum Mechanics
41. Molecules and Condensed Matter
42. Nuclear Physics
43. Particle Physics and Cosmology

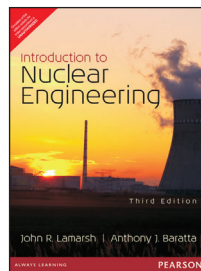
About the Author

Hugh D.Young - Carnegie Mellon University

Roger A. Freedman - University of California, Santa Barbara

A. Lewis Ford - Texas A&M University

Nuclear Physics/Engineering



Introduction to Nuclear Engineering, 3/e

John R. Lamarsh
Anthony J. Baratta

ISBN: 9789332536708

© 2014

Pages: 744

About the Book

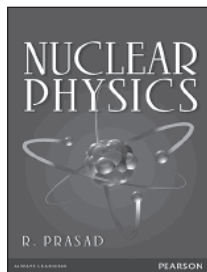
The text is designed for junior and senior level Nuclear Engineering students. The third edition of this highly respected text offers the most current and complete introduction to nuclear engineering available. Introduction to Nuclear Engineering has been thoroughly updated with new information on French, Russian, and Japanese nuclear reactors. All units have been revised to reflect current standards. In addition to the numerous end-of-chapter problems, computer exercises have been added.

Features

- NEW - Discussions of new reactor types including the AP600, ABWR, and SBWR as well as an extensive section on non-US design reactors.
- NEW - The authors have added a discussion on the nuclear Navy and its impact on the development of nuclear energy.
- NEW - Basic nuclear theory chapters include additional discussions on binding energy and such topics as the semi-empirical mass formula and elementary quantum mechanics.
- NEW - Changes in reactor theory sections include a more complete discussion of solutions to the diffusion equation and a more general derivation of the point kinetics equation.
- NEW - Chapter on radiation effects updated to include the latest standards—Both SI and conventional units are discussed and used in examples and problems in this chapter.
- NEW - Topics in reactor safety now include a complete discussion of the Chernobyl accident and an updated section on TMI and the use of computer codes in safety analysis.

Contents

1. Nuclear Engineering.
2. Atomic and Nuclear Physics.
3. Interaction of Radiation with Matter.
4. Nuclear Reactors and Nuclear Power.
5. Neutron Diffusion and Moderation.
6. Nuclear Reactor Theory.
7. The Time-Dependent Reactor.
8. Heat Removal from Nuclear Reactors.
9. Radiation Protection.
10. Radiation Shielding.
11. Reactor Licensing, Safety, and the Environment.



Nuclear Physics

R Prasad

ISBN: 9789332522657

© 2014

Pages: 504

About the Book

Nuclear Physics provides a clear and concise introduction to the subject. Fundamentals aside, the book reviews the evolution of the subject from its emergence to its present-day advancements and critically examines the future directions of nuclear and particle physics. The book brings together the essence of nuclear, particle and cosmic ray physics, serving as an ideal text for undergraduate students

Features

- Exclusive chapters on elementary particles and cosmic rays
- Focus on contemporary developments like heavy ion reactions, incomplete fusion, neutrino oscillations, big accelerators, colliding beam experiments & Higg's particle
- Over 220 illustrations
- Rich pedagogy comprising over 300 multiple choice questions and problems for practice

Contents

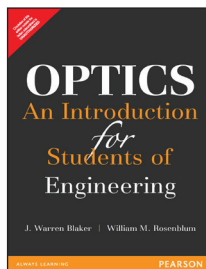
1. The Birth of the Nucleus
2. Basic Properties of the Nucleus and their Determination
3. Force between Nucleons
4. Quantum Mechanical analysis of some Nuclear systems
5. characteristics of stable Nuclei and Nuclear Models
6. radioactive Decay
7. Nuclear radiations and Detectors
8. Nuclear reactions
9. Particle accelerators
10. Nuclear energy
11. Fundamentals of elementary Particles
12. Cosmic rays

About the Author

R. Prasad has more than 40 years experience of teaching physics and nuclear physics to graduate and postgraduate students. He is an ex-professor of nuclear physics at the Aligarh Muslim University, Aligarh, India. Throughout his career, Prof. Prasad supervised half a dozen Ph.D, about two dozen M.Phil, large number of M.Sc projects, eleven research projects funded by various agencies in India and carried out post doctoral research at many international and national institutes/universities including the First Institute of Experimental Physics, University of Hamburg, Germany and Atom Institute, Technical Universities of Austria, Vienna, Austria among many. He has also attended and chaired sessions of a large number of international and national conferences, seminars and symposia and delivered invited talks. He has

published more than 80 research papers in various reputed international and national journals and presented six science-based television films under the UGC higher education programme. He is a recipient of prestigious DAAD (German) Fellowship, Post-doc fellowship of the Government of Austria, and Emeritus fellowship of UGC, India. He is a life member of many academic societies of the country.

Optics



Optics: An Introduction for Students of Engineering

JW Blaker

Robert Rosenblum

ISBN: 9789332559431

© 2016

Pages: 336



About the Book

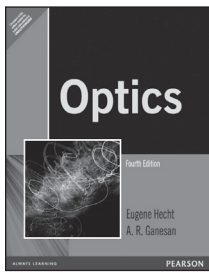
This book provides a concise overview of optic design and a thorough examination of engineering applications.

Features

- uses traditional ray and wave (physical) models to illustrate optical phenomena.
- covers key design elements such as fibers, lasers, and holography.
- addresses such topics as the laws of reflection and refraction, the two ways in which matrices can be written, an introduction to optical design, the optical wave model, and interferometry and diffraction effects.

Contents

1. Introduction.
 2. The Geometric Modal.
 3. Paraxial Ray-Tracing.
 4. Designing Lenses.
 5. Optical Instruments.
 6. Optical Waves.
 7. Applications of Interferometry.
 8. Diffraction.
 9. Light Sources-Lasers.
 10. Fiber Optics and Fiber Optics Systems.
 11. Optics as a Linear System, Fourier Optics, Optical Computing Devices.
 12. Image Recording and Holography.
- Appendix I. Matrices.
Appendix II. The Diffraction Integrals.
Appendix III. The Fourier Transform.
Appendix IV. Waves in Material Media. - See more at: <http://www.pearsonhighered.com/educator/product/Optics-An-Introduction-for-Students-of-Engineering/9780023106408.page#sthash.vtTr3dxU.dpuf>



Optics, 4/e

Eugene Hecht
A. R. Ganesan

ISBN: 9788131718070

© 2008

Pages: 650

About the Book

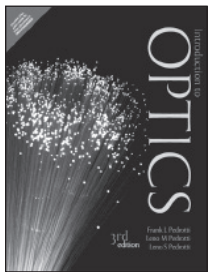
Accurate, authoritative, and comprehensive, *Optics*, Fourth Edition has been revised to provide students with the most up-to-date coverage of optics. The market leader for over a decade, this text provides a balance of theory and instrumentation, while also including the necessary classical background. The writing style is lively and accessible.

Features

- **NEW AND UPDATED!** New illustrations and photos, as well as revised art, are included throughout enhancing the already outstanding visual pedagogy of this textbook.
- **UPDATED!** Chapter 3 Electromagnetic Theory, Photons, and Light has been fully revised and updated to reflect advances in the field.
- The text employs a careful balance of theory and instrumentation and provides students with the necessary classical background.
- Coherence is introduced early on in the text and leads immediately into a discussion of Young's Experiments. To underscore the quantum mechanical nature of interference, many optical interference photos are accompanied by equivalent material particle fringe patterns.

Contents

1. A Brief History.
2. Wave Motion.
3. The Propagation of Light.
4. Geometrical Optics.
5. More on Geometrical Optics.
6. The Superposition of Waves.
7. Polarization.
8. Interference.
9. Diffraction.
10. Fourier Optics.
11. Basics of Coherence Theory.
12. Modern Optics: Lasers and Other Topics.



Introduction to Optics, 3/e

Frank L. Pedrotti
Leno M. Pedrotti
Leno S. Pedrotti

ISBN: 9789332534995

© 2014

Pages: 672

About the Book

The text is a comprehensive and up-to-date introduction to optics suitable for one- or two-term intermediate and upper level undergraduate physics and engineering students.

The reorganized table of contents provides instructors the flexibility to tailor the chapters to meet their individual needs.

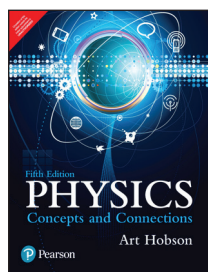
Features

- **New Problems-** The third edition contains over 50 new Problems. Figures accompany end-of-chapter Problems to help students visualize the situation.
- **Improved Art Program-** The third edition includes over 50 new and revised figures. Electronic versions of most figures will be available to instructors for presentation.
- **Chapter 6, Laser Basics** – Formerly introduced in Chapter 21, lasers are now introduced early which establishes the importance of the laser as an optical instrument; allows for early introduction of various applications, demonstrations, and discussions that build on the use of a laser. Chapter 6 includes updates to semiconductor lasers, introduction of fiber lasers, and addition of more solid state lasers.
- **Thoroughly Updated-** In addition to Chapter 6 on Laser Basics, chapters on Optical Interferometry (9), Fiber Optics (10), and Holography (15) have been updated. Updates include a modernization of the treatment and the addition of modern applications.
- **New Applications-** Modern applications have been added to make the material relevant and interesting. Applications include: Liquid Crystal Displays, CCD's, CD and DVD Technology, Optical Parametric Oscillators and Amplifiers as Tunable Sources of Radiation, Near Field Microscopy, Ultra Short Pulses, Manipulation of Atoms with Lasers (Optical Tweezers, Optical Cooling and Trapping), selected applications in Nanophotonics and Biophotonics, more extensive treatment of communication systems using optical fibers, and Wavelength Division Multiplexing.

Contents

- 1 Nature of Light
- 2 Geometrical Optics
- 3 Optical Instrumentation
- 4 Properties of Lasers
- 5 Wave Equations
- 6 Superposition of Waves
- 7 Interference of Light
- 8 Optical Interferometry
- 9 Coherence
- 10 Fiber Optics
- 11 Fraunhofer Diffraction
- 12 The Diffraction Grating
- 13 Fresnel Diffraction
- 14 Matrix Treatment of Polarization
- 15 Production of Polarized Light
- 16 Holography
- 17 Optical Detectors and Displays
- 18 Matrix Methods in Paraxial Optics
- 19 Optics of the Eye
- 20 Aberration Theory
- 21 Fourier Optics
- 22 Theory of Multilayer Films
- 23 Fresnel Equations
- 24 Nonlinear Optics and the Modulation of Light
- 25 Optical Properties of Materials
- 26 Laser Operation
- 27 Characteristics of Laser Beams

Physics Fundamentals



Physics: Concepts and Connections, 5e

Art Hobson

ISBN: 9789332575769

© 2016

Pages: 536



About the Book

Written for the non-science major, this text emphasizes modern physics and the scientific process—and engages students by drawing connections between physics and everyday experience. Hobson takes a conceptual approach, with an appropriate focus on quantitative skills. The Fifth Edition increases coverage of key environmental topics such as global warming and energy, and adds new topics such as momentum. Hobson's text remains the least expensive textbook available for students taking nonmajors physics.

Features

- Modern physics is introduced early in the text and integrated throughout.
- The “great ideas” of physics are covered in depth—versus an encyclopedic approach to all of the topics of physics.
- “How Do We Know...?” sections emphasize the process of science throughout. An interesting question is posed with a conclusion which provides scientific evidence.
- Making Estimates examples and exercises help students develop the ability to make “back of the envelope calculations”—often a goal of this course.
- Concept Checks, integrated throughout each chapter, prompt students to stop and check their understanding of key concepts. Answers are provided at the end of each chapter.
- End-of-chapter Review Questions, Conceptual Exercises, and Problems can be assigned as homework or used by students for self-study.

Contents

Part 1: Prelude: Of Stars and Atoms

Ch 1: The Way of Science: Experience and Reason

Ch 2: Atoms: The Nature of Things

Part 2: The Newtonian Universe: A Clockwork Kingdom

Ch 3: How Things Move: Galileo Asks the Right Questions

Ch 4: Why Things Move as They Do

Ch 5: Newton's Universe

Part 3: Transition to the New Physics

Ch 6: Conservation of Energy: You Can't Get Ahead

Ch 7: Second Law of Thermodynamics: and you Can't Even Break Even

Ch 8: Light and Electromagnetism

Ch 9: Electromagnetism Radiation and Global Climate Change

Part 4: The Post-Newtonian Universe: The Observer Intrudes

Ch 10: The Special Theory of Relativity

Ch 11: The General Theory of Relativity and the New Cosmology

Ch 12: The Quantum Idea

Ch 13: The Quantum Universe

Part 5: Within the Atom: Fire of the Nucleus, Fire of the Sun

Ch 14: The Nucleus and Radioactivity: An New Force

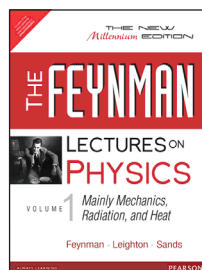
Ch 15: Fusion and Fission: and a New Energy

Ch 16: The Energy Challenge

Ch 17: Quantum Fields: Relativity Meets the Quantum

About the Author

Art Hobson, University of Arkansas



The Feynman Lectures on Physics: Volume I: The New Millennium Edition: Mainly Mechanics, Radiation, and Heat

Richard P. Feynman

Robert B. Leighton

Matthew Sands

ISBN: 9788131792117

© 2012

Pages: 560

About the Book

Timeless and collectible, The Feynman Lectures on Physics are essential reading, not just for students of Physics, but for anyone seeking an insightful introduction to the field from the inimitable Richard P. Feynman.

“When I look at The Feynman Lectures on Physics, I feel a very personal sense of closeness to them,” said Feynman, looking back at the origins of these books. Ranging from Newton's laws through the special theory of relativity, optics, statistical mechanics, and thermodynamics, the lectures collected in Volume I of The Feynman Lectures on Physics stand as a monument to clear exposition and deep insight and to Feynman's deep connection with the field.

Contents

1. Atoms in Motion
2. Basic Physics
3. The Relation of Physics to Other Sciences
4. Conservation of Energy
5. Time and Distance
6. Probability
7. The Theory of Gravitation
8. Motion
9. Newton's Laws of Dynamics
10. Conservation of Momentum
11. Vectors
12. Characteristics of Force
13. Work and Potential Energy (A)
14. Work and Potential Energy (conclusion)
15. The Special Theory of Relativity
16. Relativistic Energy and Momentum
17. Space-Time
18. Rotation in Two Dimensions
19. Center of Mass: Moment of Inertia
20. Rotation in Space
21. The Harmonic Oscillator
22. Algebra
23. Resonance
24. Transients
25. Linear Systems and Review
26. Optics: The Principle of Least Time
27. Geometrical Optics
28. Electromagnetic Radiation
29. Interference
30. Diffraction
31. The Origin of the Refractive Index
32. Radiation Damping: Light Scattering

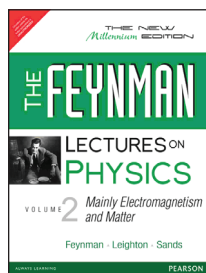
33. Polarization
34. Relativistic Effects in Radiation
35. Color Vision
36. Mechanisms on Seeing
37. Quantum Behavior
38. The Relation of Wave and Particle Viewpoints
39. The Kinetic Theory of Gases
40. The Principles of Statistical Mechanics
41. The Brownian Movement
42. Application of Kinetic Theory
43. Diffusion
44. The Laws of Thermodynamics
45. Illustrations of Thermodynamics
46. Ratchet and Pawl
47. Sound: The Wave Equation
48. Beats
49. Modes
50. Harmonics
51. Waves
52. Symmetry in Physical Laws

About the Author

Richard P. Feynman was a professor of physics at Caltech from 1959 to 1988. In 1965 he shared a Nobel Prize in Physics for his work on the development of quantum electrodynamics.

Robert B. Leighton was a physicist and astronomer, an esteemed teacher and textbook author, and professor at Caltech for many years.

Matthew Sands has been a professor at Caltech, deputy director of the Stanford Linear Accelerator Centre, and vice chancellor for science at the University of California, Santa Cruz



The Feynman Lectures on Physics: Volume II :The New Millennium Edition: Mainly Electromagnetism and Matter

Richard P. Feynman
Robert B. Leighton
Matthew Sands

ISBN: 9788131792124

© 2012

Pages: 592

About the Book

Timeless and collectible, The Feynman Lectures on Physics are essential reading, not just for students of Physics, but for anyone seeking an insightful introduction to the field from the inimitable Richard P. Feynman.

“When I look at The Feynman Lectures on Physics, I feel a very personal sense of closeness to them,” said Feynman, looking back at the origins of these books. Ranging from Gauss’s law and Maxwell’s electrodynamics to waveguides, dielectrics, magnetic materials, and elasticity, the lectures collected in Volume II of The Feynman Lectures on Physics stand as a monument to clear exposition and deep insight and to Feynman’s deep connection with the field.

Contents

1. Electromagnetism
2. Differential Calculus of Vector Fields
3. Vector Integral Calculus
4. Electrostatics
5. Application of Gauss’ Law
6. The Electric Field in Various Circumstances

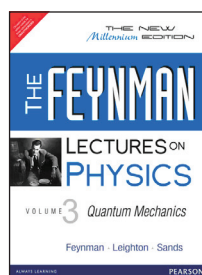
7. The Electric Field in Various Circumstances (Continued)
8. Electrostatic Energy
9. Electricity in the Atmosphere
10. Dielectrics
11. Inside Dielectrics
12. Electrostatic Analogs
13. Magnetostatics
14. The Magnetic Field in Various Situations
15. The Vector Potential
16. Induced Currents
17. The Laws of Induction
18. The Maxwell Equations
19. The Principle of Least Action
20. Solutions of Maxwell’s Equations in Free Space
21. Solutions of Maxwell’s Equations with Currents and Charges
22. AC Circuits
23. Cavity Resonators
24. Waveguides
25. Electrodynamics in Relativistic Notation
26. Lorentz Transformations of the Momentum
27. Field Energy and Field Momentum
28. Electromagnetic Mass
29. The Motion of Charges in Electric and magnetic Field
30. The Internal Geometry of Crystals
31. Tensors
32. Refractive Index of Dense Materials
33. Reflection from Surfaces
34. The Magnetism of Matter
35. Paramagnetism and Magnetic Resonance
36. Ferromagnetism
37. Magnetic Materials
38. Elasticity
39. Elastic Materials
40. The Flow of Dry Water
41. The Flow of Wet Water
42. Curved Space

About the Author

Richard P. Feynman was a professor of physics at Caltech from 1959 to 1988. In 1965 he shared a Nobel Prize in Physics for his work on the development of quantum electrodynamics.

Robert B. Leighton was a physicist and astronomer, an esteemed teacher and textbook author, and professor at Caltech for many years.

Matthew Sands has been a professor at Caltech, deputy director of the Stanford Linear Accelerator Centre, and vice chancellor for science at the University of California, Santa Cruz.



The Feynman Lectures on Physics: Volume III :The New Millennium Edition: Quantum Mechanics

Richard P. Feynman
Robert B. Leighton
Matthew Sands

ISBN: 9788131792131

© 2012

Pages: 400

About the Book

Timeless and collectible, The Feynman Lectures on Physics are essential reading, not just for students of Physics, but for anyone seeking an insightful introduction to the field from the inimitable Richard P. Feynman.

“When I look at The Feynman Lectures on Physics, I feel a very personal sense of closeness to them,” said Feynman, looking back at the origins of these books. Ranging from probability amplitudes to spin, two-state systems, propagation in a crystal lattice, semiconductors, symmetry, and conservation laws, the lectures collected in Volume III of The Feynman Lectures on Physics stand as a monument to clear exposition and deep insight and to Feynman’s deep connection with the field.

Contents

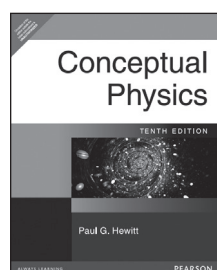
1. Quantum Behavior
2. The Relation of waves and Particles Viewpoints
3. Probability Amplitudes
4. Identical Particles
5. Spin One
6. Spin One-Half
7. The Dependence of Amplitudes on Time
8. The Hamiltonian Matrix
9. The Ammonia Maser
10. Other Two-State Systems
11. More Two-State Systems
12. The Hyperfine Splitting in Hydrogen
13. Propagation in a Crystal Lattice
14. Semiconductors
15. The Independent Particle Approximation
16. The Dependence of Amplitudes on Position
17. Symmetry and Conservation Laws
18. Angular Momentum
19. The Hydrogen Atom and The Periodic Table
20. Operators
21. The Schrodinger Equation in a Classical Context: A Seminar on Superconductivity

About the Author

Richard P. Feynman was a professor of physics at Caltech from 1959 to 1988. In 1965 he shared a Nobel Prize in Physics for his work on the development of quantum electrodynamics.

Robert B. Leighton was a physicist and astronomer, an esteemed teacher and textbook author, and professor at Caltech for many years.

Matthew Sands has been a professor at Caltech, deputy director of the Stanford Linear Accelerator Centre, and vice chancellor for science at the University of California, Santa Cruz.



Conceptual Physics, 10e

Hewitt

ISBN: 9788131715536

© 2007

Pages: 824

About the Book

Since defining this course 30 years ago, Paul Hewitt’s best-selling text continues to be the benchmark book that two-thirds of professors use and by which all others are judged. In the Tenth edition of Conceptual Physics, Paul Hewitt shows how a compelling text and the most advanced media can be integrated to empower professors to bring physics to life for non-science majors in and out of class. For the Tenth edition, Hewitt helps students connect physics to their everyday experiences and the world around them with additional help on solving more mathematical problems.

Hewitt’s text is famous for engaging students with analogies and imagery from real-world situations that build a strong conceptual understanding of physical principles ranging from classical mechanics to modern physics. With this strong foundation, students are better equipped to understand the

equations and formulas of physics, and motivated to explore the thought-provoking exercises and fun projects in each chapter. Icons in the text direct students to fun and effective interactive on-line activities on The Physics Place website. This highly acclaimed website now features, by popular demand, three new interactive and animated tutorials (bringing the total to 20) that coach students through core topics, as well as video demonstrations, and hundreds of problems and activities to help students effectively review the material.

Features

- **An extensive full-color line art and photo program** includes the author’s highly acclaimed, amusing, and informative cartoons.
- **Fun and easy-to-perform projects** involve students in exploration and observation.
- **Critically acclaimed exercises and questions refined** through use by more than 750,000 students.
- **Problem sets have been expanded and revised** in each chapter, including many new numerical problems.
- **Check Yourself and Check Your Answer boxes** embedded within the text help students gauge their level of understanding of the material just covered.
- **Practicing Physics boxes** allow students to work a problem or experiment based on the material covered in each chapter.

Contents

I. MECHANICS

2. Newton’s First Law of Motion: Inertia
3. Linear Motion
4. Newton’s Second Law of Motion: Force and Acceleration
5. Newton’s Third Law of Motion: Action and Reaction
6. Momentum
7. Energy
8. Rotational Motion
9. Gravity
10. Projectile and Satellite Motion

II. PROPERTIES OF MATTER

11. Atomic Nature of Matter
12. Solids
13. Liquids
14. Gases and Plasmas

III. HEAT

15. Temperature, Heat and Expansion
16. Heat Transfer
17. Change of Phase
18. Thermodynamics

IV. SOUND

19. Vibrations and Waves
20. Sound
21. Musical Sounds

V. ELECTRICITY AND MAGNETISM

22. Electrostatics
23. Electric Current
24. Magnetism
25. Electromagnetic Induction

VI. LIGHT

26. Properties of Light
27. Color
28. Reflection and Refraction
29. Light Waves
30. Light Emission
31. Light Quanta

VII. ATOMIC AND NUCLEAR PHYSICS

32. The Atom and the Quantum
33. Atomic Nucleus and Radioactivity
34. Nuclear Fission and Fusion

VIII. RELATIVITY

35. Special Theory of Relativity

36. General Theory of Relativity

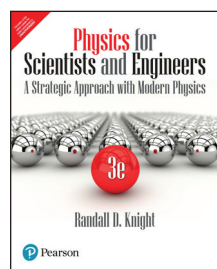
APPENDICES

- A. Systems of Measurement
- B. More About Motion
- C. Graphing
- D. More About Vectors
- E. Exponential Growth and Doubling Time

About the Author

Paul G. Hewitt was a Silver Medalist flyweight Boxing Champion for New England States at the age of 17. He was then a cartoonist, sign painter, and uranium prospector before beginning his physics studies.

Conceptual Physics was first published in 1971, while Hewitt was teaching at City College of San Francisco. He has also served as a guest lecturer at the University of California at Berkeley, the University of California at Santa Cruz, the University of Hawaii at Manoa, and the University of Hawaii at Hilo. Hewitt returned to San Francisco to teach at the City College and the well-known science museum, The Exploratorium. He retired from full-time teaching in 2000, and currently resides in St. Petersburg, Florida.



Physics for Scientists and Engineers: A Strategic Approach with Modern Physics, 3/e

Randall D. Knight

ISBN: 9789332575721

© 2016

Pages: 1472



About the Book

Were you looking for the book with access to MasteringPhysics? This product is the book alone, and does NOT come with access to MasteringPhysics. Buy the book and access card package to save money on this resource.

As the most widely adopted new physics book in more than 50 years, Knight's *Physics for Scientists and Engineers* was published to widespread critical acclaim from professors and students. In the Third Edition, Knight builds on the research-proven instructional techniques he introduced in the first and second editions, as well as national data of student performance, to take student learning even further. Knight's unparalleled insight into student learning difficulties, and his impeccably skillful crafting of text and figures at every level—from macro to micro—to address these difficulties, results in a uniquely effective and accessible book, leading students to a deeper and better-connected understanding of the concepts and more proficient problem-solving skills.

For the Third Edition, Knight continues to apply the best results from educational research, and to refine and tailor them for this course and its students. New pedagogical features (Chapter Previews, Challenge Examples, and Data-based Examples), end-of-chapter problem sets enhanced through analysis of national student metadata, and fine-tuned and streamlined content take the hallmarks of the previous editions—exceptionally effective conceptual explanation and problem-solving instruction—to a new level.

Features

- Builds problem-solving skills and confidence using an explicit, methodical, and consistent approach.
- A consistent 4-step approach provides a problem-solving framework throughout the book (and all supplements): students learn the importance of making assumptions (in the MODEL step) and gathering information and making sketches (in the VISUALIZE step) before treating the problem mathematically (SOLVE) and then analyzing their result (ASSESS).

- Detailed problem-solving strategies for different topics and categories of problems are developed throughout the book, each one built on the MODEL/VISUALIZE/SOLVE/ASSESS framework.
- Tactics Boxes give step-by-step procedures for developing specific skills (drawing free-body diagrams, using ray tracing, etc.).
- Worked examples follow the 4-step strategies and include careful explanations of the underlying, and often unstated, reasoning.
- The Student Workbook provides straightforward confidence- and skill-building exercises, bridging the gap between worked examples and end-of-chapter problems. Worksheets following the MODEL/VISUALIZE/SOLVE/ASSESS framework provide tear-out templates for students to follow when practicing solving problems.
- Promotes a deeper and better-connected understanding using a structured learning path and an inductive approach with exceptional clarity.
- Each chapter begins with a roadmap of the upcoming material (see “Chapter Previews” below). Looking Back references consolidate connections with previous topics.
- Unique and critically acclaimed visual chapter summaries consolidate understanding by providing each concept in words, math, and figures and organizing these into a vertical hierarchy—from General Principles (top) to Applications (bottom).
- The student's understanding of groups of chapters is also consolidated. Each Part begins with a two-page introductory Overview of the chapters ahead. Each Part ends with a Summary that draws together key concepts from the preceding chapter into a visual Knowledge Structure.
- New concepts are introduced through observations about the real world and theories grounded by making sense of observations. This inductive approach illustrates how science operates, and has been shown to improve student learning by reconciling new ideas with what they already know.
- NOTE paragraphs throughout guide students away from known preconceptions and around common sticking points and highlight many math- and vocabulary-related issues that have been proven to cause difficulties.
- Stop to Think questions at the end of a section allow students to quickly check their understanding. Using powerful ranking-task and graphical techniques, they are designed to efficiently probe key misconceptions and encourage active reading. (Answers are provided at the end of the chapter.)
- Hand-drawn sketches are incorporated into select worked examples to provide a clear model of what students should draw during their own problem solving.
- Pioneers the implementation of proven visual techniques that cognitive science has shown significantly increase engagement, assimilation, and retention of science concepts.
- Figures are carefully streamlined in detail and color so students focus on the physics—or instance, the object of interest in mechanics.
- Explicit instruction as annotations directly on figures helps students to interpret figures and graphs.
- Extensive use is made of multiple representations — placing different representations side by side to help students develop the key skill of translating between words, math, and figures. Essential to good problem-solving, this skill is overlooked in most physics textbooks.
- Analogy is used throughout the text and figures to consolidate student understanding by comparing with a more familiar concept or situation.
- Provides research-enhanced problems for optimized assessment and practice — Unprecedented analysis of national student metadata (including time spent, most common wrong answers, and comment rate) has allowed every problem to be systematically enhanced for educational effectiveness and accurately calibrated in difficulty (shown in the book) and duration (provided in MasteringPhysics®). Similar analysis has allowed the problem sets in every chapter to be revised to ensure ideal topic coverage, balance of qualitative and quantitative problems, and range of difficulty and duration.
- Conceptual Questions require careful reasoning and can be used for

group discussions or individual work.

- Exercises (for each section) allow students to build up their skills and confidence with straightforward, one-step questions.
- Problems (spanning concepts from the whole chapter), require in-depth reasoning and planning, and allow students to practice their problem-solving strategies. Context-rich problems require students to simplify and model more complex real-world situations. Specifically labeled problems integrate concepts from multiple previous chapters.
- Challenge Problems push the best students even further.
- The end-of-chapter problems are rated by students to show difficulty level with the variety expanded to include more real-world, challenging, and explicitly calculus-based problems.
- The revised Workbook is tightly integrated with the main text—following the same textbook strategies, and is explicitly referenced throughout the text.

Contents

Part I. Newton's Laws

1. Concepts of Motion
2. Kinematics in One Dimension
3. Vectors and Coordinate Systems
4. Kinematics in Two Dimensions
5. Force and Motion
6. Dynamics I: Motion Along a Line
7. Newton's Third Law
8. Dynamics II: Motion in a Plane

Part II. Conservation Laws

9. Impulse and Momentum
10. Energy
11. Work

Part III. Applications of Newtonian Mechanics

12. Rotation of a Rigid Body
13. Newton's Theory of Gravity
14. Oscillations
15. Fluids and Elasticity

Part IV. Thermodynamics

16. A Macroscopic Description of Matter
17. Work, Heat, and the First Law of Thermodynamics
18. The Micro/Macro Connection
19. Heat Engines and Refrigerators

Part V. Waves and Optics

20. Traveling Waves
21. Superposition
22. Wave Optics
23. Ray Optics
24. Optical Instruments

Part VI. Electricity and Magnetism

25. Electric Charges and Forces
26. The Electric Field
27. Gauss's Law
28. The Electric Potential
29. Potential and Field
30. Current and Resistance
31. Fundamentals of Circuits
32. The Magnetic Field
33. Electromagnetic Induction
34. Electromagnetic Fields and Waves
35. AC Circuits

Part VII. Relativity and Quantum Physics

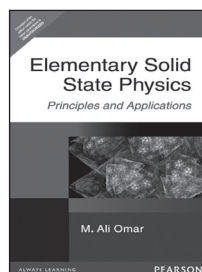
36. Relativity
37. The Foundations of Modern Physics

38. Quantization
39. Wave Functions and Uncertainty
40. One-Dimensional Quantum Mechanics
41. Atomic Physics
42. Nuclear Physics

About the Author

Randy Knight has taught introductory physics for nearly 30 years at Ohio State University and California Polytechnic University, where he is currently Professor of Physics and Director of the Minor in Environmental Studies. Randy received a Ph.D. in physics from the University of California, Berkeley, and was a post-doctoral fellow at the Harvard-Smithsonian Center for Astrophysics before joining the faculty at Ohio State University. It was at Ohio State, under the mentorship of Professor Leonard Jossem, that he began to learn about the research in physics education that, many years later, led to *Five Easy Lessons: Strategies for Successful Physics Teaching* and this book. Randy's research interests are in the field of lasers and spectroscopy. When he's not in the classroom or in front of a computer, you can find Randy hiking, sea kayaking, playing the piano, or spending time with his wife Sally and their seven cats.

Solid State Physics



Elementary Solid State Physics

M. Ali Omar

ISBN: 9788177583779

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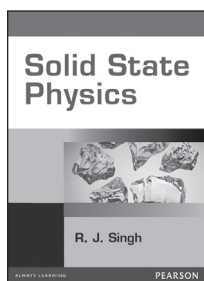
Pages: 699

About the Book

The volume is intended to serve as a general text in solid state physics for undergraduates in physics, applied physics, engineering, and other related scientific disciplines. It covers a wide range of topics with as many practical applications as possible.

Contents

1. Crystal Structures and Interatomic Forces
2. X-Ray, Neutron, and Electron Diffraction in Crystals
3. Lattice Vibrations: Thermal, Acoustic, and Optical Properties
4. Metals I: The Free-Electron Model
5. Metals II: Energy Bands in Solids
6. Semiconductors I: Theory
7. Semiconductors II: Devices
8. Dielectric and Optical Properties of Solids
9. Magnetism and Magnetic Resonances
10. Superconductivity
11. Topics in Metallurgy and Defects in Solids
12. Materials and Solid-State Chemistry
13. Solid-State Biophysics



Solid State Physics

R J Singh

ISBN: 9788131754016

© 2011

Pages: 608

About the Book

Solid state Physics forms important part of the undergraduate syllabi of Physics in most of the universities. The existing competing books by Indian authors have too complex technical language which makes them abstractive to Indian students who use English as their secondary language.

This book is written as per the core module syllabus of the major universities and targets undergraduate B.Sc students. The book uses lecture style in explaining the concepts which would facilitate easy understanding of the concepts. The topics have been dealt with precision and provide adequate knowledge of the subject.

Contents

1. Crystal Structure
2. Crystal Structure Determination
3. Crystal Binding
4. Lattice Vibrations
5. Thermal Properties of Solids
6. Dielectric Properties of Solids
7. Free electron theory of metals-Static Properties
8. Free electron theory of metals- Transport Properties
9. Energy bands in solids
10. Band theory of insulators and semiconductors
11. Magnetism
12. Magnetic Resonances
13. Superconductivity
14. Optical Properties of solids

About the Author

R. J. Singh received his education, intermediate to Ph.D., from Banaras Hindu University and completed his Post-doctoral program from Leningrad University (U.S.S.R.). He retired as Professor from Aligarh Muslim University after working there for nearly 35 years. His interests lie in nuclear magnetic resonance, electron paramagnetic resonance, optical spectroscopy, X-ray diffraction, electroluminescence, high-temperature superconductivity, magnetoresistance, etc. He has around 100 research publications to his credit.

understanding of the subject. Solved numerical problems interspersed within the chapters will help the students to understand the physical significance of the mathematical derivations.

Features

- A separate chapter on Joule-Thomson Cooling
- Data tables, graphs and illustrations for easy understanding.
- Each chapter has:
 - Solved examples (165 in total)
 - Answers to the unsolved problems (125 in total)
 - Review questions
 - Summary
 - Key terms

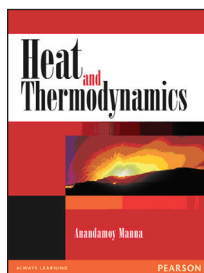
Contents

1. Mathematical Preliminaries
2. Thermometry
3. The Mechanical Equivalent of Heat
4. Kinetic Theory of Gases
5. Equations of State
6. Change of State
7. The Joule-Thomson Cooling Effect
8. First law of Thermodynamics
9. The Second law of Thermodynamics
10. Thermodynamic Relations
11. Conduction of Heat
12. Radiation
13. introduction to Statistical Thermodynamics

About the Author

Anandamoy Manna passed B.Sc with honours in physics and M.Sc. in pure physics obtaining first class in both from Calcutta University. He started teaching career as a lecturer in physics at Ramakrishna Mission Residential College, Narendrapur, obtained Ph.D. degree of Calcutta University under the guidance of Professor B.N.Srivastava at Indian Association for the Cultivation of Science. Later he joined Jadavpur University in 1972 and retired as Professor of Physics in 2007. He had been a visiting research fellow at Leeds University, UK with Professor Peter Gray FRS under the Commonwealth Bursary Scheme of Royal Society and Nuffield Foundation. He has published more than fifty papers in national and international journal and has authored five books. Three students were awarded PhD degree under his supervision. He is a fellow of National Environmental Science Academy, New Delhi and has honorary appointment to the Research Board of Advisors of the American Biographical Institute. He is still teaching physics honorarily in Ramakrishna Mission Residential College, his Alma Mater.

Thermal Physics/Thermodynamics



Heat and Thermodynamics

Anandamoy Manna

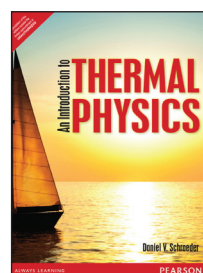
ISBN: 9788131754009

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Pages: 508

About the Book

The book is meant for an introductory course on Heat & Thermodynamics. Emphasis has been given to the fundamentals of thermodynamics. The book uses variety of diagrams, charts and learning aids to enable easy



An Introduction to Thermal Physics

Daniel V. Schroeder

ISBN: 9789332535077

© 2014

Pages: 336

About the Book

This text provides a balanced, well-organized treatment of thermodynamics and statistical mechanics, making thermal physics interesting and accessible to anyone who has completed a year of calculus-based introductory physics. Part I introduces essential concepts of thermodynamics and statistical mechanics from a unified view, applying concepts in a select number of illustrative examples. Parts II and III explore further applications of classical thermodynamics and statistical mechanics. Throughout, the emphasis is on

real-world applications.

Features

- A balanced treatment of both classical thermodynamics and statistical mechanics, showing the relation between them without confusing the student.
- A rich supply of applications capture students' attention and show how thermal physics relates to engineering, chemistry, earth science, condensed matter physics, astrophysics, and everyday life.
- Integrated problems at the ends of sections and subsections encourage students to actively apply what they have been reading and check their understanding.
- The text includes many problems that require the use of the computer; for instance, spreadsheet calculations, plotting, numerical integration, root finding, and Monte Carlo simulation.
- Designed primarily for a one-semester course, the text also contains sufficient material for longer courses and advanced projects.
- The text is accessible to anyone who has completed a year of calculus-based introductory physics.
- A clear and lively writing style engages readers.

Contents

I. FUNDAMENTALS.

1. Energy in Thermal Physics.
2. The Second Law.
3. Engines and Refrigerators.

II. THERMODYNAMICS.

4. Interactions and Implications.
5. Free Energy and Chemical Thermodynamics.

III. STATISTICAL MECHANICS.

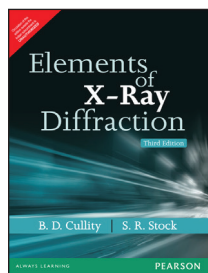
6. Boltzmann Statistics.
7. Quantum Statistics.

- **The book is written entirely in terms of the Bragg law** and can be read without any knowledge of the reciprocal lattice.

Contents

1. Properties of X-rays.
2. Geometry of Crystals.
3. Diffraction I: Directions of Diffracted Beams.
4. Diffraction II: Intensities of Diffracted Beams.
5. Diffraction III: Non-Ideal Samples.
6. Laue Photographs.
7. Powder Photographs.
8. Diffractometer and Spectrometer.
9. Orientation and Quality of Single Crystals.
10. Structure of Polycrystalline Aggregates.
11. Determination of Crystal Structure.
12. Precise Parameter Measurements.
13. Phase-Diagram Determination.
14. Order-Disorder Transformation.
15. Chemical Analysis of X-ray Diffraction.
16. Chemical Analysis by X-ray Spectrometry.
17. Measurements of Residual Stress.
18. Polymers.
19. Small Angle Scatters.
20. Transmission Electron Microscope.

X-Ray



Elements of X-Ray Diffraction, 3/e

B.D. Cullity
S.R. Stock

ISBN: 9789332535169

© 2014

Pages: 656

About the Book

This revision of a classical text is intended to acquaint the reader, who has no prior knowledge of the subject, with the theory of x-ray diffraction, the experimental methods involved, and the main applications. The text is a collection of principles and methods designed directly for the student and not a reference tool for the advanced reader

Features

- **No metallurgical data are given beyond that necessary to illustrate the diffraction methods involved.**
- **X-ray diffraction is stressed** rather than metallurgy.
- **The book is divided into three main parts**—Fundamentals; experimental methods; and applications.
- **The subject of crystal structure is approached through, and, based on, the concept of the point lattice (Bravais lattice),** because the point lattice of a substance is so closely related to its diffraction pattern.



AUTHOR INDEX

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