

The Physics Of Waves And Oscillations N K Bajaj

Methods and the latest results of experimental studies of the strength properties, polymorphism and metastable states of materials and substances with extremely short durations of shock-wave action are presented. The author provides a comprehensive and theoretical description of specific features of the dynamics of elastoplastic shock compression waves in relaxing media. The presentation is preceded by a detailed description of the theoretical foundations of the method and a brief discussion of the basic methods of generating and diagnosing shock waves in solids. Key Selling Features: Addresses dynamic elastic-plastic response, spallation, and shock-induced phase transformation. Provides a centralized presentation of topics of interest to the shock physics community Presents new data on the mechanism and basic properties of sub-microsecond polymorphic transformations and phase transitions. Investigates destruction waves in shock-compressed glasses. Analyzes the behavior of highly hard brittle materials under shock-wave loading and ways to diagnose fracture. Nonlinear physics is a well-established discipline in physics today, and this book offers a comprehensive account of the basic soliton theory and its applications. Although primarily mathematical, the theory for nonlinear phenomena in practical environment.

This Book Explains The Various Dimensions Of Waves And Oscillations In A Simple And Systematic Manner. It Is An Unique Attempt At Presenting A Self-Contained Account Of The Subject With Step-By-Step Solutions Of A Large Number Of Problems Of Different Types. The Book Will Be Of Great Help Not Only To Undergraduate Students, But Also To Those Preparing For Various Competitive Examinations.

Brilliantly written undergraduate-level text emphasizes optics, acoustics; covers transverse waves on a string, acoustic plane waves, boundary-value problems, much more. Numerous problems (half with solutions).

Oscillations — Solitons — Chaos

Introduction to the Physics of Waves

Transformation Wave Physics

Oscillations, Waves and Acoustics

Shock Waves in Solid State Physics

Waves are everywhere in our daily life. We all experience sound and light with our ears and eyes, we use microwaves to cook, and radio waves are transmitted from and are received by our cell phones. These are just some examples of waves that carry energy from point A to B. However, we may not know details of the physics underlying all these waves. It is important to understand the mechanisms that generate wave dynamics for a given system. It is not straightforward to explain how an electromagnetic field becomes oscillatory and propagates as a wave. Waves sometimes represent the underlying dynamics of observed phenomena at a fundamental level of physics. This book is designed to explore these mechanisms by discussing various aspects of wave dynamics from as many perspectives as possible. The target audiences are undergraduate students majoring in engineering science and graduate students majoring in general engineering. Going beyond the typical approach to learning science, this book discusses wave dynamics and related concepts at various levels of mathematics and physics, sometimes touching on profound physics behind them. This book was written to help readers learn wave dynamics on a deep physical level, and develop innovative ideas in their own fields.

Space-time transformations as a design tool for a new class of composite materials (metamaterials) have proved successful recently. The concept is based on the fact that metamaterials can mimic a transformed but empty space. Light rays follow trajectories according to Fermat’ s principle in this transformed electromagnetic, acoustic, or elastic space instead of laboratory space. This allows one to manipulate wave behaviors with various exotic characteristics such as (but not limited to) invisibility cloaks. This book is a collection of works by leading international experts in the fields of electromagnetics, plasmonics, elastodynamics, and diffusion waves. The experimental and theoretical contributions will revolutionize ways to control the propagation of sound, light, and other waves in macroscopic and microscopic scales. The potential applications range from underwater camouflaging and electromagnetic invisibility to enhanced biosensors and protection from harmful physical waves (e.g., tsunamis and earthquakes). This is the first book that deals with transformation physics for all kinds of waves in one volume, covering the newest results from emerging topical subjects such as transformational plasmonics and thermodynamics.

Ideal as a classroom text or for individual study, this unique one-volume overview of classical wave theory covers wave phenomena of acoustics, optics, electromagnetic radiations, and more.

This textbook, addressed primarily to physics and engineering students, is a comprehensive introduction to waves and oscillations, both mechanical and electromagnetic. Elementary aspects of matter waves are also considered. One objective is to illustrate the physics involved in the description and analysis of waves through a wide range of examples, from purely mechanical and purely electromagnetic to coupled electro-mechanical waves, such as plasma oscillations and hydromagnetic waves. In this process, the use of complex amplitudes in the mathematical analysis is illuminated and encouraged to make tractable a wider range of problems than is ordinarily considered in an introductory text. General concepts and wave phenomena such as wave energy and momentum, interference, diffraction, scattering, dispersion, and the Doppler effect are illustrated by numerous examples and demonstrations. Among the special topics covered are waves on periodic structures and in solids, wave guides, a detailed analysis of light scattering from thermal fluctuations of a liquid surface, and feedback instabilities. Important ideas and equations are displayed in boxes for easy reference, and there are numerous examples throughout the text and exercises at the end of every chapter. Undergraduates and graduates should find this an indispensable account of this central subject in science and engineering.

Waves and Oscillations

Wave Motion in Elastic Solids

Vibrations and Waves in Physics

The Physics of Oscillations and Waves

Fundamentals of Waves and Oscillations

This fourth volume of a four-volume textbook covers the oscillations of systems with one or more degrees of freedom: the concept of waves, focusing on light and sound; phase and group velocities, their physical meaning, and their measurement; diffraction and interference of light; polarization phenomena; and the formation of images in the eye and in optical instruments. The textbook as a whole covers electromagnetism, mechanics, fluids and thermodynamics, and waves and light, and is designed to reflect the typical volumes, particular attention is paid to in-depth clarification of conceptual aspects, and to this end the historical roots of the principal concepts are traced. Emphasis is also consistently placed on the experimental basis of the concepts, highlighting the experimental nature of physics. Whenever feasible at the elementary level, concepts relevant to more advanced courses in quantum mechanics and atomic, solid state, nuclear, and particle physics are included. The textbook offers an ideal resource for physics students in physics.

Self-contained coverage of topics ranging from elementary theory of waves and vibrations in strings to three-dimensional theory of waves in thick plates. Over 100 problems.

Problems after each chapter

Third edition of one of our most successful undergraduate texts in physics.

Almost All about Waves

Wave Physics

Physical Science for Kids

Gravitational-Wave Physics and Astronomy

Waves and Oscillations in Plasmas

The Physics of Sound Waves: Music, Instruments, and Sound Equipment, Second Edition describes the properties of sound waves as they relate to the production of sound by musical instruments, the perception and interpretation of sound, fast Fourier transform analysis, recording and reproduction of musical sounds, and the quality of sound in both indoor and outdoor environments. Graphics and animations are used to explain sound production in strings, percussion and wind instruments, and this knowledge is applied to describe selected instruments. Each chapter has topics for further discussion and concludes with questions and problems. Solutions for all questions and problems as well as a mathematical description of waves are provided in the appendix. Key Features Provides the basic understanding of musical sounds and the nature of sound waves. Includes musical scales with examples from around the world. Discusses digital sounds and its relevance. The book provides many worked examples, and end of chapter problems with solutions in the appendix. Applicable equations are summarized at the end of each chapter.

"Powerful ocean waves fascinate the public, and they have made a lot of news lately." With that indisputable observation, scientist J. B. Zirker takes off on a whirlwind tour of the world of waves—from the “ordinary” waves that constantly churn the sea to the rogues or freaks that can rise up seemingly from nowhere to heights of 20 meters or more . . . and everything in between. Addressing questions most ocean visitors have had and offering new ones for our consideration, *The Science of Ocean Waves* explains in accessible language how waves are formed, how they move, how they become huge and destructive, and how they’re being studied now for clues that will help us plan for the future. Devoting chapters to wind, tides, currents, breakers, tsunamis, forecasting, renewable energy, and El Niño—as well as discussing the gentler properties of ocean waves which inspire us and offer opportunities for relaxation and recreation—Zirker explores the physical factors that create waves. Drawing on some of the recent storms that have devastated entire regions—such as Hurricane Katrina, the tsunami launched by the 2004 Sumatran earthquake, and the great tsunami that crushed the shore of Japan in 2011—Zirker explains the forces that cause these monster waves and reveals the toll they take on human lives. Enhanced by dozens of illustrations and a comprehensive glossary, *The Science of Ocean Waves* will fascinate anyone curious about the science behind the headlines. Praise for J. B. Zirker “Scientists know their stuff but are rarely good storytellers, whereas good storytellers rarely possess the necessary sweeping command of a scientific discipline. Zirker is that rare animal who can both communicate the most demanding technical detail and make it accessible.”—*New Scientist*

The most readable survey of the theoretical core of current knowledge available. The author gives a concise account of the classical theory necessary to an understanding of the subject and considers how this theory has been extended to solids.

The present book is meant for the students of undergraduate Science and Engineering courses. This course finds lots of applications, right from Mechanics, Sound, Optics, Solid State Physics, Electrodynamics to Electronics. The chapters cover a vast number of topics like free, forced, damped oscillations, normal modes of vibrations, sound waves, overdamped and ballistic oscillations, LCR circuits etc. In every chapter the topics are dealt with in detail followed by illustrated solved examples and unsolved exercises. Some previous experience with a Calculus course in which differential equations have been discussed is highly desirable. However, the details of the steps in arriving at final solutions are worked out in detail. The book, thus, acts like any textbook and at the same time no help book is needed for further details.

With Applications in Electricity and Mechanics

Matter

Physics Sound Waves Music Instruments Hb

An Introduction, Second Edition

Wave Propagation in Anisotropic, Anelastic, Porous and Electromagnetic Media

This lively textbook differs from others on the subject by its usefulness as a conceptual and mathematical preparation for the study of quantum mechanics, by its emphasis on a variety of learning tools aimed at fostering the student's self-awareness of learning, and by its frequent connections to current research.

This book covers all aspects of waves and optics ranging from one dimensional waves in a vibrating string, two dimensional waves in a vibrating membrane, both of which are transverse, three dimensional electromagnetic waves generated by radiating antennas and longitudinal sound/pressure waves in an air column. Note: T&F does not sell or distribute the Hardback in India, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka.

The M.I.T. Introductory Physics Series is the result of a program of careful study, planning, and development that began in 1960. The Education Research Center at the Massachusetts Institute of Technology (formerly the Science Teaching Center) was established to study the process of instruction, aids thereto, and the learning process itself, with special reference to science teaching at the university level. Generous support from a number of foundations provided the means for assembling and maintaining an experienced staff to co-operate with members of the Institute's Physics Department in the examination, improvement, and development of physics curricular materials for students planning careers in the sciences. After careful analysis of objectives and the problems involved, preliminary versions of textbooks were prepared, tested through classroom use at M.I.T. and other institutions, re-evaluated, rewritten, and tried again. Only then were the final manuscripts undertaken.

Emphasizing physics over mathematics, this popular, classroom-tested text helps advanced undergraduates acquire a sound physical understanding of wave phenomena. This second edition of Oscillations and Waves: An Introduction contains new widgets, animations in Python, and exercises, as well as updated chapter content throughout; continuing to ease the difficult transition for students between lower-division courses that mostly encompass algebraic equations and upper-division courses that rely on differential equations. Assuming familiarity with the laws of physics and college-level mathematics, the author covers aspects of optics that crucially depend on the wave-like nature of light, such as wave optics. Examples explore discrete mechanical, optical, and quantum mechanical systems; continuous gases, fluids, and elastic solids; electronic circuits; and electromagnetic waves. The text also introduces the conventional complex representation of oscillations and waves during the discussion of quantum mechanical waves. Features: Fully updated throughout and featuring new widgets, animations, and end of chapter exercises to enhance understanding Provides a clear, concise, systematic, and comprehensive treatment of the subject matter that emphasizes physics over mathematics Offers complete coverage of advanced topics in waves, such as electromagnetic wave propagation through the ionosphere Includes examples from mechanical systems, elastic solids, electronic circuits, optical systems, and other areas

Waves

Oscillations, Solutions, Chaos

With use of Matlab and Python

A Course in Classical Physics 4 - Waves and Light

The Science of Ocean Waves

Featuring more than five hundred questions from past Regents exams with worked out solutions and detailed illustrations, this book is integrated with APPlusPhysics.com website, which includes online questions and answer forums, videos, animations, and supplemental problems to help you master Regents Physics Essentials.

Waves and Oscillations in Plasmas addresses central issues in modern plasma sciences, within the context of general classical physics. The book is working gradually from an introductory to an advanced level. Addressing central issues in modern plasma sciences, including linear and nonlinear wave phenomena, this second edition has been fully updated and includes the latest developments in relevant fluid models as well as kinetic plasma models, including a detailed discussion of, for instance, collisionless Landau damping, linear as well as non-linear. The book is the result of many years of lecturing plasma sciences in Norway, Denmark, Germany, and also at the United States of America. Offering a clear separation of linear and nonlinear models, the book can be tailored for students of varying levels of expertise in plasma physics, in addition to areas as diverse as the space sciences, laboratory plasma processing, and more. Features: Presents a simple physical interpretation of basic problems in presented where possible Supplies a complete summary of classical papers and textbooks placed in the proper context Includes worked examples, exercises, and problems with general applicability

Waves and Wave Motion are the keys to communication but they can also help us understand the movement of storms and of planets.

Except for digressions in Chapters 8 and 17, this book is a highly unified treatment of simple oscillations and waves. The phenomena treated are ‘simple’ in that they are describable by linear equations, almost all occur in one dimension, and the dependent variables are scalars instead of vectors or something else (such as electromagnetic waves) with geometric complications. The book omits such complicated cases in order to deal thoroughly with properties shared by all linear os cillations and waves. The first seven chapters are a sequential treatment of electrical and mechanical oscillating systems, starting with the simplest and proceeding to systems of coupled oscillators subjected to arbitrary driving forces. Then, after a brief discussion of nonlinear oscillations in Chapter 8, the concept of normal modes of motion is introduced and used to show the relationship between oscillations and waves. After Chapter 12, properties of waves are explored by whatever mathematical techniques are applicable. The book ends with a short discussion of three-dimensional viii Preface problems (in Chapter 16), and a study of a few aspects of non linear waves (in Chapter 17).

Wave Phenomena

The Physics of Waves

Oscillations and Waves

Ripples, Tsunamis, and Stormy Seas

Waves and Optics

Matter: Physical Science for Kids from the Picture Book Science series gets kids excited about science! What’s the matter? Everything is matter! Everything you can touch and hold is made up of matter—including you, your dog, and this book! Matter is stuff that you can weigh and that takes up space, which means pretty much everything in the world is made of matter. In Matter: Physical Science for Kids, kids ages 5 to 8 explore the definition of matter and the different states of matter, plus the stuff in our world that isn’t matter, such as sound and light! In this nonfiction picture book, children are introduced to physical science through detailed illustrations paired with a compelling narrative that uses fun language to convey familiar examples of real-world science connections. By recognizing the basic physics concept of matter and identifying the different ways matter appears in real life, kids develop a fundamental understanding of physical science and are impressed with the idea that science is a constant part of our lives and not limited to classrooms and laboratories. Simple vocabulary, detailed illustrations, easy science experiments, and a glossary all support exciting learning for kids ages 5 to 8. Perfect for beginner readers or as a read aloud nonfiction picture book! Part of a set of four books in a series called Picture Book Science that tackles different kinds of physical science (waves, forces, energy, and matter). Matter offers beautiful pictures and simple observations and explanations. Quick STEM activities such as weighing two balloons to test if air is matter help readers cross the bridge from conceptual to experiential learning and provide a foundation of knowledge that will prove invaluable as kids progress in their science education. Perfect for children who love to ask, “Why?” about the world around them, Matter satisfies curiosity while encouraging continual student-led learning.

Balancing concise mathematical analysis with real-world examples and practical applications, to provide a clear and approachable introduction to wave phenomena.

Authored by the internationally renowned José M. Carcione, *Wave Fields in Real Media: Wave Propagation in Anisotropic, Anelastic, Porous and Electromagnetic Media* examines the differences between an ideal and a real description of wave propagation, starting with the introduction of relevant stress–strain relations. The combination of this relation and the equations of momentum conservation lead to the equation of motion. The differential formulation is written in terms of memory variables, and Biot’s theory is used to describe wave propagation in porous media. For each rheology, a plane–wave analysis is performed in order to understand the physics of wave propagation. This book contains a review of the main direct numerical methods for solving the equation of motion in the time and space domains. The emphasis is on geophysical applications for seismic exploration, but researchers in the fields of earthquake seismology, rock acoustics, and material science – including many branches of acoustics of fluids and solids – may also find this text useful. New to this edition: This new edition presents the fundamentals of wave propagation in Anisotropic, Anelastic, Porous Media while also incorporating the latest research from the past 7 years, including that of the author. The author presents all the equations and concepts necessary to understand the physics of wave propagation. These equations form the basis for modeling and inversion of seismic and electromagnetic data. Additionally, demonstrations are given, so the book can be used to teach post-graduate courses. Addition of new and revised content is approximately 30%. Examines the fundamentals of wave propagation in anisotropic, anelastic and porous media Presents all equations and concepts necessary to understand the physics of wave propagation, with examples Emphasizes geophysics, particularly, seismic exploration for hydrocarbon reservoirs, which is essential for exploration and production of oil

This comprehensive introduction to classical electromagnetic theory covers the major aspects, including scalar fields, vectors, laws of Ohm, Joule, Coulomb, Faraday, Maxwell’s equation, and more. With numerous diagrams and illustrations.

Physics of Waves

Understanding Waves and Wave Motion

The Physics of Vibrations and Waves

Introduction to the Mathematical Physics of Nonlinear Waves

A Prelude to Quantum Mechanics

Low-frequency wave modes of magnetized inhomogeneous plasmas have been subject to intense study in the last decade because they play important roles in the transport of energy in the plasmas. The “Alfvén wave heating” scheme has been investigated as a supplementary heating scheme for fusion plasma devices, and it has been invoked as a model of the heating of the solar and stellar coronae. This book covers the latest research into the properties and applications of low-frequency wave modes in magnetized plasmas, the Alfvén waves and magneto-acoustic waves, in the context of laboratory, space and astrophysical plasmas. In particular, non-ideal effects on the dispersion relation and absorption properties of linear and non-linear waves are included, such as ion-cyclotron effects, friction between the ionized plasma and a background gas of neutral atoms, and the interaction of the plasma with dust particles. The book also surveys the theory of Alfvén and magnetoacoustic waves in inhomogeneous plasmas, as occur in realistic laboratory, space and astrophysical plasmas, with resulting localized wave modes such as surface waves. Waves are considered under a variety of plasma conditions, ranging from cold cosmic plasmas, to hot laboratory and solar plasmas, to the relativistic plasmas around pulsars.

The main theme of this highly successful book is that the transmission of energy by wave propagation is fundamental to almost every branch of physics. Therefore, besides giving students a thorough grounding in the theory of waves and vibrations, the book also demonstrates the pattern and unity of a large part of physics. This new edition has been thoroughly revised and has been redesigned to meet the best contemporary standards. It includes new material on electron waves in solids using the Kronig-Penney model to show how their allowed energies are limited to Brillouin zones. The role of phonons is also discussed. An Optical Transform is used to demonstrate the modern method of lens testing. In the last two chapters the sections on chaos and solitons have been reduced but their essential contents remain. As with earlier editions, the book has a large number of problems together with hints on how to solve them. The Physics of Vibrations and Waves, 6th Edition will prove invaluable for students taking a first full course in the subject across a variety of disciplines particularly physics, engineering and mathematics.

This introductory text emphasises physical principles, rather than the mathematics. Each topic begins with a discussion of the physical characteristics of the motion or system. The mathematics is kept as clear as possible, and includes elegant mathematical descriptions where possible. Designed to provide a logical development of the subject, the book is divided into two sections, vibrations followed by waves. A particular feature is the inclusion of many examples, frequently drawn from everyday life, along with more cutting-edge ones. Each chapter includes problems ranging in difficulty from simple to challenging and includes hints for solving problems. Numerous worked examples included throughout the book.

In this textbook a combination of standard mathematics and modern numerical methods is used to describe a wide range of natural wave phenomena, such as sound, light and water waves, particularly in specific popular contexts, e.g. colors or the acoustics of musical instruments. It introduces the reader to the basic physical principles that allow the description of the oscillatory motion of matter and classical fields, as well as resulting concepts including interference, diffraction, and coherence. Numerical methods offer new scientific insights and make it possible to handle interesting cases that can’t readily be addressed using analytical mathematics; this holds true not only for problem solving but also for the description of phenomena. Essential physical parameters are brought more into focus, rather than concentrating on the details of which mathematical trick should be used to obtain a certain solution. Readers will learn how time-resolved frequency analysis offers a deeper understanding of the interplay between frequency and time, which is relevant to many phenomena involving oscillations and waves. Attention is also drawn to common misconceptions resulting from uncritical use of the Fourier transform. The book offers an ideal guide for upper-level undergraduate physics students and will also benefit physics instructors. Program codes in Matlab and Python, together with interesting files for use in the problems, are provided as free supplementary material.

Localized Waves

Fundamentals and Dynamics

Physics of Oscillations and Waves

Electromagnetics, Elastodynamics, and Thermodynamics

Vibrations and Waves

This textbook is intended for those second year undergraduates in science and engineering who will later need an understanding of electromagnetic theory and quantum mechanics. The classical physics of oscillations and waves is developed at a more advanced level than has been customary for the quantum mechanics that follows. In this new edition the Green’s function is explained, reinforcing the integration of quantum mechanics with classical physics. The text may also form the basis of an “introductory” course for physics majors. The concluding chapters give special attention to topics in current wave physics: nonlinear waves, solitons, and chaotic behavior.

Discusses harmonic oscillation, forced oscillation, continuum limit, longitudinal oscillations and sound, traveling waves, signals, Fourier analysis, polarization, interference, and diffraction

This most up-to-date, one-stop reference combines coverage of both theory and observational techniques, with introductory sections to bring all readers up to the same level. Written by outstanding researchers directly involved with the scientific program of the Laser Interferometer Gravitational-Wave Observatory (LIGO), the book begins with a brief review of general relativity before going on to describe the physics of gravitational waves and the astrophysical sources of gravitational radiation. Further sections cover gravitational wave detectors, data analysis, and the outlook of gravitational-wave astronomy and astrophysics.

The first book on Localized Waves—a subject of phenomenal worldwide research with important applications from secure communications to medicine Localized waves—also known as non-diffractive waves—are beams and pulses capable of resisting diffraction and dispersion over long distances even in non-guiding media. Predicted to exist in the early 1970s and obtained theoretically and experimentally as solutions to the wave equations starting in 1992,

localized waves now garner intense worldwide research with applications in all fields where a role is played by a wave equation. From electromagnetism to acoustics and quantum physics. In the electromagnetics areas, they are paving the way, for instance, to ubiquitous secure communications in the range of millimeter waves, terahertz frequencies, and optics. At last, the localized waves with an envelope at rest are expected to have important applications in medicine. Localized Waves brings together the world’s most productive researchers in the field to offer a well-balanced presentation of theory and experiments in this new and exciting subject. Composed of thirteen chapters, this dynamic volume: Presents a thorough review of the theoretical foundation and historical aspects of localized waves Explores the interconnections of the subject with other technologies and scientific areas Analyzes the effect of arbitrary anisotropies on both continuous-wave and pulsed non-diffracting fields Describes the physical nature and experimental implementation of localized waves Provides a general overview of wave localization, for example in photonic crystals, which have received increasing attention in recent years Localized Waves is the first book to cover this emerging topic, making it an indispensable resource in particular for researchers in electromagnetics, acoustics, fundamental physics, and free-space communications, while also serving as a requisite text for graduate students.

Stress Waves in Solids

Electromagnetic Fields and Waves

The Physics of Alfvén Waves

Applusphysics

Wave Fields in Real Media

Humans receive the vast majority of sensory perception through the eyes and ears. This non-technical book examines the everyday physics behind hearing and vision to help readers understand more about themselves and their physical environment. It begins wit

This is a text for the third semester of undergraduate physics for students in accel erated programs who typically are preparing for advanced degrees in science or engineering. The third semester is often the only opportunity for physics depart ments to present to those of these students who are not physics majors a coherent background in the physics of waves required later for confident handling of applied problems, especially applications based on quantum mechanics. Physics is an integrated subject. It is often found that the going gets easier as one goes deeper, learning the mathematical connections tying together the vari ous phenomena. Even so, the steps that took us from classical wave physics to Heisenberg’s “Physical Principles of Quantum Theory” were, as a matter of his tory, harder to take than later steps dealing with detailed applications. With these considerations in mind, the classical physics of oscillations and waves is devel oped here at a more advanced mathematical level than is customary in second year courses. This is done to explain the classical phenomena, but also to provide background for the introductory wave mechanics, leading to a logical integration of the latter subject into the presentation. The concluding chapters on nonlinear waves, solitons, and chaos broaden the previously established concepts of wave behavior, while introducing the reader to important topics in current wave physics.

This text considers waves the great unifying concept of physics. With minimal mathematics, it emphasizes the behavior common to specific phenomena?earthquake waves studied by seismologists; waves and ripples on oceans, lakes, and ponds; waves of sound that travel through the air; mechanical waves in stretched strings and in quartz crystals that can be used to control the frequency of radio transmitters; electromagnetic waves that constitute light, and that are radiated by radio transmitters and received by radio receivers; and the waves of probability employed in quantum mechanics to predict the behavior of electrons, atoms, and complex substances. Starting with a look at the strength and power of sinusoidal waves, author John R. Pierce explores wave media and modes, phase velocity and group velocity, vector and complex representation, energy and momentum, coupled modes and coupling between modes, polarization, diffraction, and radiation. References and an index appear at the end of the book.

The Everyday Physics of Hearing and Vision

An Introduction to Theory, Experiment and Data Analysis

Your Guide to Regents Physics Essentials