Physics And Music The Science Of Musical Sound Donald H White

This volume seeks to offer a new approach to the study of music through the lens of recent works in science and technology studies (STS), which propose that facts are neither absolute truths, nor completely relative, but emerge from an intensely collective process of construction. Applied to the study of music, this approach enables us to reconcile the human, social, factual, and technological aspects of the musical world, and opens the prospect of new areas of inquiry in musicology and sound studies. Rethinking Music through Science and Technology Studies draws together a wide range of both leading and emerging scholars to offer a critical survey of STS applications to music studies, considering topics ranging from classical music instrument-making to the ethos of DIY in punk music. The book’s four sections focus on key areas of music study that are impacted by STS: organology, sound studies, music history, and epistemology. Raising crucial methodological and epistemological questions about the study of music, this book will be relevant to scholars studying the interactions between music, culture, and technology from many disciplinary perspectives.

Examines the aims and tools of science for creating theories and explanations of phenomena, with an eye to answering the question of whether or not science actually leads to true comprehension of reality

Physics and MusicThe Science of Musical SoundCourier Corporation

More than fifty years ago, John Coltrane drew the twelve musical notes in a circle and connected them by straight lines, forming a five-pointed star. Inspired by Einstein, Coltrane put physics and geometry at the core of his music. Physicist and jazz musician Stephon Alexander follows suit, using jazz to answer physics' most vexing questions about the past and future of the universe. Following the great minds that first drew the links between music and physics-a list including Pythagoras, Kepler, Newton, Einstein, and Rakim-The Jazz of Physics reveals that the ancient poetic idea of the Music of the Spheres," taken seriously, clarifies confounding issues in physics. The Jazz of Physics will fascinate and inspire anyone interested in the mysteries of our universe, music, and life itself.

In this groundbreaking union of art and science, rocker-turned-neuroscientist Daniel J. Levitin explores the connection between music—its performance, its composition, how we listen to it, why we enjoy it—and the human brain. Taking on prominent thinkers who argue that music is nothing more than an evolutionary accident, Levitin poses that music is fundamental to our species, perhaps even more so than language. Drawing on the latest research and on musical examples ranging from Mozart to Duke Ellington to Van Halen, he reveals: • How composers produce some of the most pleasurable effects of listening to music by exploiting the way our brains make sense of the world • Why we are so emotionally attached to the music we listened to as teenagers, whether it was Fleetwood Mac, U2, or Dr. Dre • That practice, rather than talent, is the driving force behind musical expertise • How those insidious little jingles (called earworms) get stuck in our head A Los Angeles Times Book Award finalist, This Is Your Brain on Music will attract readers of Oliver Sacks and David Byrne, as it is an unprecedented, eye-opening investigation into an obsession at the heart of human nature.

The Physics of Music by ALEXANDER WOOD.PREFACE TO FIRST EDITION: I HOPE that this little book may serve as an introduction for some to the very interesting borderland between physics and music. It is a borderland in which the co-operation of musicians and physicists may have important results for the future of music. The typescript and proofs have been read by Miss Nancy Browne from the point of view of the general reader, and many obscure passages have been clarified. On the technical side I am indebted to Dr Pringle, who has read the proofs and given me valuable criticism and advice. Miss Cawkewell has helped me with the illustrations, Mr Cottingham has supplied the photographs for Figs. 1.7 to i. io, and my secretary. Miss Sindall, has been responsible for the typing and for the assembly and preparation of the material. Because of the help received from these and others the book is a much better book than it would otherwise have been. For its remaining imperfections I must take full

The answer is gastrophysics, the new area of sensory science pioneered by Oxford professor Charles Spence. Now he's stepping out of his lab to lift the lid on the entire eating experience how the taste, the aroma, and our overall enjoyment of food are influenced by all of our senses, as well as by our mood and expectations.

Intended for students in the visual arts and for others with an interest in art, but with no prior knowledge of physics, this book presents the science behind what and how we see. The approach emphasises phenomena rather than mathematical theories and the joy of discovery rather than the drudgery of derivations. The text includes numerous problems, and suggestions for simple experiments, and also considers such questions as why the sky is blue, how mirrors and prisms affect the colour of light, how compact disks work, and what visual illusions can tell us about the nature of perception. It goes on to discuss such topics as the optics of the eye and camera, the different sources of light, photography and holography, colour in printing and painting, as well as computer imaging and processing.

This book uses acoustics, psychophysics, and neurobiology to explore the physical systems and biological processes that intervene when we hear music. It incorporates the latest findings in brain science and tone generation in musical instruments.

This the first book on the physics of sound for the nonspecialist to empower readers with a hands-on, ears-open approach that includes production, analysis, and perception of sound. The book makes possible a deep intuitive understanding of many aspects of sound, as opposed to the usual approach of mere description. This goal is aided by

hundreds of original illustrations and examples, many of which the reader can reproduce and adjust using the same tools used by the author. Readers are positioned to build intuition by participating in discovery. This introduction to sound engages and informs amateur and professional musicians, performers, teachers, sound engineers, students of many stripes, and indeed anyone interested in the auditory world. The book does not hesitate to follow entertaining and sometimes controversial side trips into the history and world of acoustics, reinforcing key concepts. You will discover how musical instruments really work, how pitch is perceived, and how sound can be amplified with no external power source.
What human qualities are needed to make scientific discoveries, and which to make great art? Many would point to 'imagination' and 'creativity' in the second case but not the first. This book challenges the assumption that doing science is in any sense less creative than art, music or fictional writing and poetry, and treads a historical and contemporary path through common territories of the creative process. The methodological process called the 'scientific method' tells us how to test ideas when we have had them, but not how to arrive at hypotheses in the first place. Hearing the stories that scientists and artists tell about their projects reveals commonalities: the desire for a goal, the experience of frustration and failure, the incubation of the problem, moments of sudden insight, and the experience of the beautiful or sublime. Selected themes weave the practice of science and art together: visual thinking and metaphor, the transcendence of music and mathematics, the contemporary rise of the English novel and experimental science, and the role of aesthetics and desire in the creative process. Artists and scientists make salient comparisons: Defoe and Boyle; Emmerson and Humboldt, Monet and Einstein, Schumann and Hadamard. The book draws on medieval philosophy at many points as the product of the last age that spent time in inner contemplation of the mystery of how something is mentally brought out from nothing. Taking the phenomenon of the rainbow as an example, the principles of creativity within constraint point to the scientific imagination as a parallel of poetry.
Nebula Award Finalist: A genetic engineering breakthrough may portend the destruction of humanity in this cyberpunk novel by the author of The Forge of God. This Hugo and Nebula Award finalist follows present-day events in which the fears concerning the nuclear annihilation of the world subsided after the Cold War and the fear of chemical warfare spilled over into the empty void it left behind. An amazing breakthrough in genetic engineering made by Vergil Ulam is considered too dangerous for further research, but rather than destroy his work, he injects himself with his creation and walks out of his lab, unaware of just how his actions will change the world. Author Greg Bear’s treatment of the traditional tale of scientific hubris is both suspenseful and a compelling portrait of a new intelligence emerging amongst us, irrevocably changing our world.
This book offers a lively exploration of the mathematics, physics, and neuroscience that underlie music. Written for

musicians and music lovers with any level of science and math proficiency, including none, Music, Math, and Mind demystifies how music works while testifying to its beauty and wonder.

This book deals with the physical systems and physiological processes that intervene in music. It analyzes what objective, physical properties of sound are associated with what subjective psychological sensations of music, and it describes how these sound patterns are actually generated in musical instruments, how they propagate through the environment, and how they are detected by the ear and interpreted in the brain. Using the precise language of science, but without complicated mathematics, the author weaves a close mesh of the physics, psychophysics and physiology relevant to music. A prior knowledge of physics, mathematics, physiology or psychology is not required to understand most of the book; it is, however, assumed that the reader is familiar with music - in particular, with musical notation, musical scales and intervals, and some of the basics of musical instruments. --From publisher's description.

Expanding the Space for Improvisation Pedagogy in Music is a critical, research-based anthology exploring improvisation in music pedagogy. The book broadens the understanding of the potentials and possibilities for improvisation in a variety of music education contexts and stimulates the development of knowledge and reflection on improvisation. The book critically examines the challenges, cultural values, aims and methods involved in improvisation pedagogy. Written by international contributors representing a variety of musical genres and research methodologies, it takes a transdisciplinary approach and outlines a way ahead for improvisation pedagogy and research, by providing a space for the exchange of knowledge and critique. This book will be of great interest to scholars, researchers, and postgraduate students in the fields of arts education, music education, improvisation, music psychology, musicology, ethnomusicology, artistic research and community music. It will also appeal to music educators on all levels in the field of music education and music psychology.

How music has influenced mathematics, physics, and astronomy from ancient Greece to the twentieth century Music is filled with mathematical elements. The works of Bach are often said to possess a math-like logic, and Arnold Schoenberg, Iannis Xenakis, and Karlheinz Stockhausen wrote music explicitly based on mathematical principles. Yet Eli Maor argues that it is music that has had the greater influence on mathematics, not the other way around. Starting with Pythagoras, proceeding through Schoenberg, and bringing the story up to the present with contemporary string theory, Music by the Numbers tells a fascinating story of composers, scientists, inventors, and eccentrics who have played a role in the age-old relationship between music, mathematics, and the physical sciences. Weaving compelling stories of historical episodes with Maor's personal reflections as a mathematician and lover of classical music, this book will delight anyone who loves math and music.

What type of practice makes a musician perfect? What sort of child is most likely to succeed on a musical instrument? What practice strategies yield the fastest improvement in skills such as sight-reading, memorization, and intonation? Scientific and psychological research can offer answers to these and other questions that musicians face every day. In The Science and Psychology of Music Performance, Richard Parncutt and Gary McPherson assemble relevant current research findings and make them accessible to musicians and music educators. This book describes new approaches to teaching music, learning music, and making music at all educational and skill levels. Each chapter represents the collaboration between a music researcher (usually a music psychologist) and a performer or music educator. This combination of expertise results in excellent practical advice. Readers will learn, for example, that they are in the majority (57%) if they experience rapid heartbeat before performances; the chapter devoted to performance anxiety will help them decide whether beta-blocker medication, hypnotherapy, or the Alexander Technique of relaxation might alleviate their stage fright. Another chapter outlines a step-by-step method for introducing children to musical notation, firmly based on research in cognitive development. Altogether, the 21 chapters cover the personal, environmental, and acoustical influences that shape the learning and performance of music.

The authors have presented and interpreted Johannes Kepler's Latin text to English readers by putting it into the kind of clear but earnest language they suppose Kepler would have used if he had been writing today.

Revision of the best selling introduction to acoustion, appropriate for physics of Sound/Musical acoustics for young adults. New edition stresses modern instruments.

From the primitive reed pipe to modern music "written" by computers is quite a journey. Here, in informal text and about a score of plates, is a story that takes the teenage layman on this interesting trip.The younger reader, like a good musicologist, follows the steps in the evolution of the most important instruments that make up today's symphony orchestra, and the development of music itself (scales, modes, keys, and temperaments).Physics and music is also a source, although, of necessity a modest one, of information about the music research that has been underway in the Soviet Union, especially in the scientific manufacture of the violin, and in electrophonic and synthetic music. This is why the foreign reader might think of a degree of "bias" on the part of the author. Yet, it gives him an insight into what is going on in a country that has given the world quite a number of great composers. About the AuthorGleb Anfilov was a prominent Soviet journalist and writer on popular science. Educated as a physicist, he contributed to Knowledge Is Strength, a popular science magazine for youth

The Physics of Music and Color deals with two subjects, music and color - sound and light in the physically objective sense - in a single volume. The basic underlying physical principles of the two subjects overlap greatly: both music and color are manifestations of wave phenomena, and commonalities exist as to the production, transmission, and detection of sound and light. This book aids readers in studying both subjects, which involve nearly the entire gamut of the fundamental laws of classical as well as modern physics. Where traditional introductory physics and courses are styled so that the basic principles are introduced first and are then applied wherever possible, this book is based on a motivational approach: it introduces a subject by demonstrating a set of related phenomena, challenging readers by calling for a physical basis for what is observed. The Physics of Music and Color is written at level suitable for college students without any scientific background, requiring only simple algebra and a passing familiarity with trigonometry. It contains numerous problems at the end of each chapter that help the reader to fully grasp the subject.

Musical Sound, Instruments, and Equipment' offers a basic understanding of sound, musical instruments and music equipment, geared towards a general audience and non-science majors. The book begins with an introduction of the fundamental properties of sound waves, and the perception of the characteristics of sound. The relation between intensity and loudness, and the relation between frequency and pitch are discussed. The basics of propagation of sound waves, and the interaction of sound waves with objects and structures of various sizes are introduced. Standing waves, harmonics and resonance are explained in simple terms, using graphics that provide a visual understanding.

This extraordinarily comprehensive text, requiring no special background, discusses the nature of sound waves, musical instruments, musical notation, acoustic materials, elements of sound reproduction systems, and electronic music. Includes 376 figures.

Physics in the Arts, Third Edition gives science enthusiasts and liberal arts students an engaging, accessible exploration of physical phenomena, particularly with regard to sound and light. This book offers an alternative route to science literacy for those interested in the arts, music and photography. Suitable for a typical course on sound and light for non-science majors, Gilbert and Haeberli’s trusted text covers the nature of sound and sound perception as well as important concepts and topics such as light and light waves, reflection and refraction, lenses, the eye and the ear, photography, color and color vision, and additive and subtractive color mixing. Additional sections cover color generating mechanisms, periodic oscillations, simple harmonic motion, damped oscillations and resonance, vibration of strings, Fourier analysis, musical scales and musical instruments. Offers an alternative route to science literacy for those interested in the visual arts, music and photography Includes a new and unique quantitative encoding approach to color vision, additive and subtractive color mixing, a section on a simplified approach to quantitative digital photography, how the ear-brain system works as a Fourier analyzer, and updated and expanded exercises and solutions Provides updated online instructor resources, including labs, chapter image banks, practice problems and solutions

The Music Export Business examines the workings of the fast-changing world of music industry exports. The music industry is in a state of flux, resulting from changes in technology, markets, government policies and most recently the COVID-19 pandemic. In analysing the ability of organisations to access international markets from inception, this book assesses global trends in music industry business models, including streaming and national export policies. The book deploys author interviews with industry insiders including musicians, managers, record labels and government stakeholders, using case studies to highlight cultural and economic value creation in a global value chain Providing research-based insights into "export readiness" in the global music industry, this book reassesses the "born global" phenomenon, providing a unique and valuable resource for scholars and reflective practitioners interested in the evolving relationship between music industries, national economies, government policies and cultural identity. .

What makes a musical note different from any other sound? How can you tell if you have perfect pitch? Why do 10 violins sound only twice as loud as one? Do your Bob Dylan albums sound better on CD or vinyl? John Powell, a scientist and musician, answers these questions and many more in HOW MUSIC WORKS, an intriguing and original guide to acoustics. In a clear, accessible, and engaging voice, Powell fascinates the reader with his delightful descriptions of the science and psychology lurking beneath the surface of music. With lively discussions of the secrets behind harmony, timbre, keys, chords, loudness, musical composition, and more, HOW MUSIC WORKS will be treasured by music lovers everywhere.

This book explores the fascinating and intimate relationship between music and physics. Over millennia, the playing of, and listening to music have stimulated creativity and curiosity in people all around the globe. Beginning with the basics, the authors first address the tonal systems of European-type music, comparing them with those of other, distant cultures. They analyze the physical principles of common musical instruments with emphasis on sound creation and particularly charisma. Modern research on the psychology of musical perception the field known as psychoacoustics is also described. The sound of orchestras in concert halls is discussed, and its psychoacoustic effects are explained. Finally, the authors touch upon the role of music for our mind and society. Throughout the book, interesting stories and anecdotes give insights into the musical activities of physicists and their interaction with composers and musicians.

While the history of musical instruments is nearly as old as civilisation itself, the science of acoustics is quite recent. By understanding the physical basis of how instruments are used to make music, one hopes ultimately to be able to give physical criteria to distinguish a fine instrument from a mediocre one. At that point science may be able to come to the aid of art in improving the design and performance of musical instruments. As yet, many of the subtleties in musical sounds of which instrument makers and musicians are aware remain beyond the reach of modern acoustic measurements. This book describes the results of such acoustical investigations - fascinating intellectual and practical exercises. Addressed to readers with a reasonable grasp of physics who are not put off by a little mathematics, this book discusses most of the traditional instruments currently in use in Western music. A guide for all who have an interest in music and how it is produced, as well as serving as a comprehensive reference for those undertaking research in the field.

Peppered throughout with anecdotes and examples illustrating key concepts, this invitingly written book provides a firm grounding in the actual and theoretical physics of music.

As the foundation for other natural sciences, physics helps us interpret both our most basic and complex observations of the natural world. Physics encompasses such topics as mechanics, relativity, thermodynamics, and electricity, among others, all of which elucidate the nature of matter, its motion, and its relationship to force and energy. This engaging volume surveys some of the major branches of physics, the laws, and theories significant to each. Also chronicled are some of the historical milestones in the field by such great minds as Galileo and Isaac Newton.

Comprehensive and accessible, this foundational text surveys general principles of sound, musical scales, characteristics of instruments, mechanical and electronic recording devices, and many other topics. More than 300 illustrations plus questions, problems, and projects.

There are deep and fascinating links between heavy metal and quantum physics. No, really! While teaching at the University of Nottingham, physicist Philip Moriarty noticed something odd, a surprising number of his students were heavily into metal music. Colleagues, too: a Venn diagram of physicists and metal fans would show a shocking amount of overlap. What's more, it turns out that heavy metal music is uniquely well-suited to explaining quantum principles. In When the Uncertainty Principle Goes to Eleven, Moriarty explains the mysteries of the universe's inner workings via drum beats and feedback: You'll discover how the Heisenberg uncertainty principle comes into play with every chugging guitar riff, what wave interference has to do with Iron Maiden, and why metalheads in mosh pits behave just like molecules in a gas. If you're a metal fan trying to grasp the complexities of quantum physics, a quantum physicist baffled by heavy metal, or just someone who'd like to know how the fundamental science underpinning our world connects to rock music, this book will take you, in the words of Pantera, to "A New Level." For those who think quantum physics is too mind-bendingly complex to grasp, or too focused on the invisibly small to be relevant to our full-sized lives, this funny, fascinating book will show you that physics is all around us . . . and it rocks.

Viii book we shall refer a great deal to the discipline of psycho physics, which in a broad sense tries to establish in a quan titative form the causal relationship between the "physical" input from our senses and the psychological sensations and physiological reactions evoked in our mind and body, re spectively. Actually, we shall try to weave a rather close mesh between physics and psychophysics-or, more pre cisely, psychoacoustics. After all, they appear naturally interwoven in music itself: not only pitch, loudness and timbre are a product of physical and psychoacoustical proc esses, but so are the sensations related to consonance and dissonance, tonic dominance, trills and ornamentation, vibrato, phrasing, beats, tone attack, duration and decay, rhythm, and so on. Many books on physics of music or musical acoustics are readily available. An up-to-date text is the treatise of John Backus (1969). No book on psychoacoustics is available at the elementary level, though. Several review articles on pertinent topics can be found in Tobias (1970) and in Plomp and

Smoorenburg (1970). A comprehensive discussion is given in Flanagan's book on speech (1972). And, of course, there is the classical treatise of von Bekesy (1960). A com prehensive up-to-date analysis of general brain processes can be found in Sommerhoff (1974); musical psychology is discussed in classical terms in Lundin (1967).

In this inspiring coming-of-age memoir, a world-renowned astrophysicist emerges from an impoverished childhood and crime-filled adolescence to ascend through the top ranks of research physics. “You’ll encounter one extraordinary turn of events after another, as the extraordinary chess player, puzzle solver, and occasional grifter works his way from grinding poverty and deep despair to worldwide acclaim as a physicist.”—Bill Nye, CEO of The Planetary Society Navigating poverty, violence, and instability, a young James Plummer had two guiding stars—a genius IQ and a love of science. But a bookish nerd is a soft target, and James faced years of bullying and abuse. As he struggled to survive his childhood in some of the country’s toughest urban neighborhoods in New Orleans, Houston, and LA, and later in the equally poor backwoods of Mississippi, he adopted the persona of “gangsta nerd”—dealing weed in juke joints while winning state science fairs with computer programs that model Einstein’s theory of relativity. Once admitted to the elite physics PhD program at Stanford University, James found himself pulled between the promise of a bright future and a dangerous crack cocaine habit he developed in college. With the encouragement of his mentor and the sole Black professor in the physics department, James confronted his personal demons as well as the entrenched racism and classism of the scientific establishment. When he finally seized his dream of a life in astrophysics, he adopted a new name, Hakeem Muata Oluseyi, to honor his African ancestors. Alternately heartbreaking and hopeful, A Quantum Life narrates one man’s remarkable quest across an ever-expanding universe filled with entanglement and choice.

This text has been out of print since 1990; it was originally published by Solomon Press in 1987. Several experts in the field have verified that the information in the book remains constant; nothing has, or will, change in the basic science of musical sound. It explains the science of musical sound without the encumbrance of detailed mathematics. It will appeal to music lovers as well as students of music and students of physics. It can easily be promoted with our physics program.

This book, provides a general introduction to the ideas and methods of statistical mechanics with the principal aim of meeting the needs of Master’s students in chemical, mechanical, and materials science engineering. Extensive introductory information is presented on many general physics topics in which students in engineering are inadequately trained, ranging from the Hamiltonian formulation of classical mechanics to basic quantum mechanics, electromagnetic fields in matter, intermolecular forces, and transport phenomena. Since engineers should be able to apply physical concepts, the book also focuses on the practical applications of statistical physics to material science and to cutting-edge technologies, with brief but informative sections on, for example, interfacial properties, disperse systems, nucleation, magnetic materials, superfluidity, and ultralow temperature technologies. The book adopts a graded approach to learning, the opening four basic-level chapters being followed by advanced “starred” sections in which special topics are discussed. Its relatively informal style, including the use of musical metaphors to guide the reader through the text, will aid self-learning.

Sound is invisible waves moving through the air around us. In the same way that ocean waves are made of ocean water, sound waves are made of the air (or water or whatever) they are moving through. When something vibrates, it disturbs the air molecules around it. The disturbance moves through the air in waves - each vibration making its own wave in the air - spreading out from the thing that made the sound, just as water waves spread out from a stone that's been dropped into a pond. This books explains acoustics (the physics of sound waves) as it relates to music and musical instruments. At also includes suggestions for explaining these concepts to younger audiences. Catherine Schmidt-Hones is a music teacher from Champaign, Illinois and she has been a pioneer in open education since 2004. She is currently a doctoral candidate at the University of Illinois in the Open Online Education program with a focus in Curriculum and Instruction. Undergraduate-level text examines waves in air and in three dimensions, interference patterns and diffraction, and acoustic impedance, as illustrated in the behavior of horns. 1951 edition.

This undergraduate textbook aids readers in studying music and color, which involve nearly the entire gamut of the fundamental laws of classical as well as atomic physics. The objective bases for these two subjects are, respectively, sound and light. Their corresponding underlying physical principles overlap greatly: Both music and color are manifestations of wave phenomena. As a result, commonalities exist as to the production, transmission, and detection of sound and light. Whereas traditional introductory physics textbooks are styled so that the basic principles are introduced first and are then applied, this book is based on a motivational approach: It introduces a subject with a set of related phenomena, challenging readers by calling for a physical basis for what is observed. A novel topic in the first edition and this second edition is a non-mathematical study of electric and magnetic fields and how they provide the basis for the propagation of electromagnetic waves, of light in particular. The book provides details for the calculation of color coordinates and luminosity from the spectral intensity of a beam of light as well as the relationship between these coordinates and the color coordinates of a color monitor. The second edition contains corrections to the first edition, the addition of more than ten new topics, new color figures, as well as more than forty new sample problems and end-of-chapter problems. The most notable additional topics are: the identification of two distinct spectral intensities and how they are related, beats in the sound from a Tibetan bell, AM and FM radio, the spectrogram, the short-time Fourier transform and its relation to the perception of a changing pitch, a detailed analysis of the transmittance of polarized light by a Polaroid sheet, brightness and luminosity, and the mysterious behavior of the photon. The Physics of Music and Color is written at a level suitable for college students without any scientific background, requiring only simple algebra and a passing familiarity with trigonometry. The numerous problems at the end of each chapter help the reader to fully grasp the subject.

Most books concerned with physics and music take an approach that puts physical theory before application. Consequently, these works tend to dampen aesthetic fascination with preludes burdened by an overabundance of algebraic formulae. In Measured Tones: The Interplay of Physics and Music Third Edition, Ian Johnston a professor of astrophysics and a connoisseur of music, offers an informal historical approach that shows the evolution of both theory and application at the intersection of physics and music. Exceptionally accessible, insightful, and now updated to consider modern technology and recent advances, the new edition of this critically acclaimed and bestselling classic — Features a greater examination of psycho-acoustics and its role in the design of MP3s Includes expanded information on the gamelan and other Asian percussion instruments Introduces detailed discussions of binary notation, digitization, and electronic manipulation of music We believe that order exists, and we look for it. In that respect the aims of science and of music are identical—the desire to find harmony. And surely, without that very human desire, science would be a cold and sterile undertaking. With myriad illustrations and historical anecdotes, this volume will delight those student required to approach this topic from either a physics and music concentration, as well as anyone who is fascinated with concepts of harmony expressed in nature, as well as in the instruments and composition of human expression’s purest form. A complementary website provides sound files, further reading, and instructional support.