The Physics Of Music And Color

An Experiential Approach to Sound, Music, and Psychoacoustics
The Physics and Neuroscience of Music
Good Vibrations
The Science and Psychology of Music: From Beethoven at the Office to Beyoncé at the Gym
Musical Sound
How Music Works
The Physics of Music and Color
Music, Math, and Mind
Sound, Physics and Music
Pioneering Discoveries in the New Science of Song
Music by the Numbers
The Science of Musical Sound
Body, Sound and Space in Music and Beyond: Multimodal Explorations
Rethinking Music through Science and Technology Studies
The Physics of Music and the Nature of Timbre
The Physics of Musical Instruments
From Pythagoras to Schoenberg
Why You Hear what You Hear
The Power of Music
The Science of Music
Revised Edition
Physics and Music
The Emergence of Sound in 20th- and 21st-Century Music
The Secret Link Between Music and the Structure of the Universe
Measured Tones
Essential Connections and Illuminating Excursions

JENNINGS MCMAHON

An Experiential Approach to Sound, Music, and Psychoacoustics Springer Science & Business Media
This book provides a broad introduction to the scientific and psychological study of music, exploring how music is processed by our brains, affects us emotionally, shapes our personal and cultural identities, and can be used in therapeutic and educational contexts. Why are some people tone deaf and others musical savants? What do our musical preferences say about our personality and the culture in which we were raised? Why do certain songs remind us so strongly of particular people, places, or events? How can music be therapeutically used to help those with autism, Parkinson's, and other medical conditions? The Science and Psychology of Music: From Beethoven at the Office to Beyoncé at the Gym answers these and other questions. This book provides a broad and accessible introduction to the fascinating field of music psychology. Despite its name, music psychology includes a number of fields, including neuroscience, psychology, social psychology, sociology, and health. Through a collection of thematically organized chapters, readers will discover how our brains recognize elements of music, how music can affect us and shape our identities, and the many real-world applications for such information. Explores a topic that is of great interest to both psychology students and the general public through accessible and engaging content Provides a conceptual framework

for readers and through a multi-part format allows them to focus their attention on their particular areas of interest Furthers readers' understanding of how music can affect our wellbeing as it includes both our physical and psychological health Reflects the subject knowledge of contributing experts in a wide variety of academic disciplines

The Physics and Neuroscience of Music Courier Corporation

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

Good Vibrations Oxford University Press

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.

The Science and Psychology of Music: From Beethoven at the Office to Beyoncé at the Gym JHU Press

DIVPsychoacoustics, loudness, influences of hall, electroacoustic structure, similar topics. Non-technical. 111 figures. /div

Musical Sound Cognella Academic Publishing

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.

How Music Works Morgan & Claypool Publishers
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.
The Physics of Music and Color Springer Science & Business Media
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).
Music, Math, and Mind Basic Books
Physics and MusicThe Science of Musical SoundCourier Corporation
Sound, Physics and Music CreateSpace
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.

Pioneering Discoveries in the New Science of Song Princeton University Press

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.

Music by the Numbers Physics and MusicThe Science of Musical Sound

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.

The Science of Musical Sound Taylor & Francis

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.

Body, Sound and Space in Music and Beyond: Multimodal Explorations Springer Science & Business Media

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.

Rethinking Music through Science and Technology Studies Taylor & Francis

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 Physics of Music and the Nature of Timbre Springer Nature

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.

The Physics of Musical Instruments Springer Nature
Physics in the Arts is a concise, 328-page four-color entry in the Complementary Science Series, designed for science enthusiasts and liberal arts students requiring or desiring a well-developed discussion 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. The material covered is at a level appropriate for self-study or as a complementary textbook. A typical course on sound and light for non-science majors covers the nature of sound and sound perception as well as important concepts and topics including light and light waves, reflection and refraction; lenses; the eye and the ear; photography; color and color vision; and additive color mixing; subtractive color mixing. There are also discussions on color generating mechanisms; periodic oscillations; simple harmonic motion; damped oscillations and resonance; vibration of strings; Fourier analysis; musical scales; and musical instruments. Problems with solutions are presented. For teaching purposes, all figures in the book as well as hints on how to build labs are provided at http://www.elsevierdirect.com/companion.jsp?ISBN=9780123918789. This book will be helpful to non-science students in courses related to the study of physics with light and sound. Offers an alternative route to science literacy for those interested in the arts, music and photography Popular science book with wide readership beyond the classroom at an accessible level Material covered at a level appropriate for self-study or as a complementary textbook For teaching purposes, all figures in the book as well as hints on how to build labs (including seven new labs in March 2012!)
From Pythagoras to Schoenberg ABC-CLIO
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.
Why You Hear what You Hear Morgan & Claypool Publishers
A clearly written and organized text on the production, propagation, and perception of the sound we call music. Organized into six major parts (each with three chapters) treating the sources of sound and production of musical sound; the propagation of sound and those environmental features that have an immediate influence on the sound that is propagated; and the perceptual aspects of the musical sound. The second edition

includes new material on the human voice as a musical instrument, digital recording, and the use of the computer in composing music.

The Power of Music Courier Corporation
Principles of Musical Acoustics focuses on the basic principles in the science and technology of music. Musical examples and specific musical instruments demonstrate the principles. The book begins with a study of vibrations and waves, in that order. These topics constitute the basic physical properties of sound, one of two pillars supporting the science of musical acoustics. The second pillar is the human element, the physiological and psychological aspects of acoustical science. The perceptual topics include loudness, pitch, tone color, and localization of sound. With these two pillars in place, it is possible to go in a variety of directions. The book treats in turn, the topics of room acoustics, audio both analog and digital, broadcasting, and speech. It ends with chapters on the traditional musical instruments, organized by family. The mathematical level of this book assumes that the reader is familiar with elementary algebra. Trigonometric functions, logarithms and powers also appear in the book, but computational techniques are included as these concepts are introduced, and there is further technical help in appendices.

The Science of Music Ashgate Publishing, Ltd.
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.

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