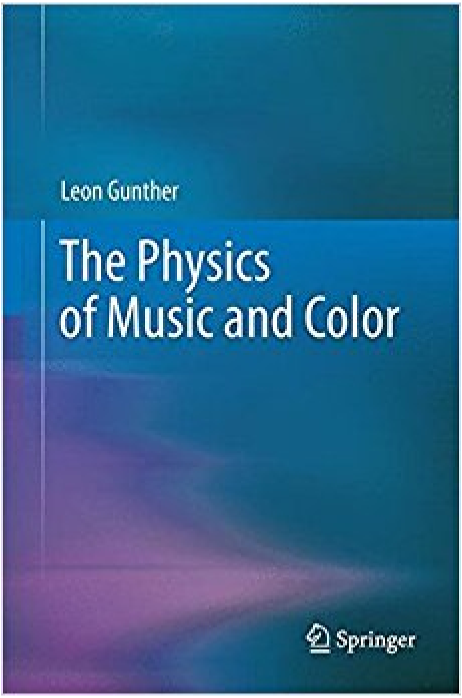
The Physics Of Music And Color



Synopsis

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.

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Customer Reviews

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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 book is based upon a course on the physics of music and color that has been taught at Tufts University since 1973, when the course was introduced by Gary Goldstein and the author.Topics that are unusual for a book at this level and breadth include: a detailed non-mathematical summary of the principles of electricity and magnetism with the goal of understanding the basis for various audio devices as well as the physical essence of light and how it propagates as a wave; extensive details on the calculation of color coordinates from a spectral intensity with different choices of primaries; the relationship between color coordinates on a computer and the color seen on a monitor. References to recent developments include the connection between the blueness of the ocean and the psycho-acoustic perception of combination tones in a sound wave. A major goal is to provide an understanding of basic principles, both conceptual and quantitative, that will allow the reader to have increased awareness of audial and visual experiences and to understand phenomena not discussed in the book.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. It contains numerous problems at the end of each chapter that help the reader to fully grasp the subject. The book can also serve as a reference of basic principles for those involved in sound production and color management.About the AuthorLeon Gunther has been on the Physics Department faculty at Tufts University since 1965. He got his PhD in Physics from MIT in 1964 and has published over 100 articles, the vast majority being in the field of Condensed Matter Theory. Having begun studies of the violin at the age of seven, he has played in numerous Community Symphony Orchestras, most notably the Newton Symphony, where he was the principal second violinist for ten years, from 1974-1984. In 1994, he founded the community chorus of Temple Emunah in Lexington, MA, known as the Mak’haylah. Programs include music of a wide range of genres - folk, liturgical, and classical. His compositions and arrangements include Hebrew renditions of three movements of the Brahms Requiem.

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I was very happy to finally see the materials for this course in an actual text book (updated since the time I took the course sans any textbook). As advertised, this is a text for a first level physics course for college - typically liberal arts majors, e.g., freshman year, (satisfying their science distribution requirement). While not as calculus/vector/formula 'centric as traditional physics courses, I agree with the introduction that this text delivers an introductory level understanding of physics. My experience from taking this course is that it certainly can be more effective for liberal arts majors compared to a more traditional (and dry) physics textbook.To put it another way, science/engineering majors will find the presentation less theoretical/mathematical compared to physics for their more technical track. However, the book is nonetheless worthwhile (and should be fun) even for scientists/engineers precisely because of its focus on presenting physics principles in the context of modeling the transmission/perception of music and color. In particular, anyone interested in the underlying science of audio/music and light/images/video should get something out of this book, e.g., where the relationships between how music and light are transmitted via waves/packets are explored, and how the human ear/eye/brain system perceives them. Is the ear an integrator and the eye a differentiator? - and how do these models account for optical and auditory illusions and perceptions? I do not know of many introductory physics textbooks that include the physics of the ear and the eye as an integral part of the curriculum. By framing the overall context (music/color), and furthermore posing specific questions to be answered (sometimes as a thought experiment) based upon everyday experience, I think the book succeeds with its targeted approach compared to a glut of introductory physics textbooks that re-hash the same material (devoid of such interesting context).This text would also be excellent choice for a first year physics course for audio engineering and/or video production students. The material in this text book motivated me as an undergraduate to further study engineering, audio engineering, and music; it is a unique and valuable text from my experience as both a student (and now also as a teacher of college level audio students).

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