Seeing The Light Optics In Nature Photography Color Vision And Holography

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From the Semi-classical Approach to Quantized Light Echo Point+ORM
Classical Charged Particle Beam Optics used in the design and operation of all present-day charged particle beam devices, from low energy electron microscopes to high energy particle accelerators, is entirely based on classical mechanics. A question of curiosity is: How is classical charged particle beam optics so successful in practice though the particles of the beam, like electrons, are quantum mechanical? Quantum Mechanics of Charged Particle Beam Optics answers this question with a comprehensive formulation of ‘Quantum Charged Particle Beam Optics’ applicable to any charged particle beam device.
Introduction to Modern Optics Springer-Praxis
Examination of the fundamental nature of light in mankind's history, world, and life.
Optics U of Minnesota Press
Equip the next generation of scientists with a brand new series from Chris Ferrie, the #1 science author for kids! Rainbows are beautiful! As Red Kangaroo admires one arching across the sky, she wonders where rainbows come from--luckily, Dr. Chris has the answer! With just two ingredients and three simple steps, Red Kangaroo learns all about the science behind these wonderful, colorful sights! Chris Ferrie offers a kid-friendly introduction to light refraction and optical physics in this installment of his new Everyday Science Academy series. Written by an expert, with real-world and practical examples, young readers will have a firm grasp of scientific and mathematical concepts to help answer many of their "why" questions. Perfect for elementary-aged children and supports the Common Core Learning Standards, Next Generation Science Standards, and the Science, Technology, Engineering, and Math (STEM) standards.
Subject Headings for Technical Libraries Courier Corporation
From the early wave-particle arguments to the mathematical theory of electromagnetism to Einstein's work on the quantization of light, different descriptions of what constitutes light have existed for over 300 years. Light - The Physics of the Photon examines the photon phenomenon from several perspectives. It demonstrates the importance of studyin
Illusions of Seeing Oxford University Press, USA
Why do we need two eyes? Why are all cats grey at night and appear to move faster the day? Why is the sky blue and the setting sun red? This book explains the multifaceted nature of perception, and discusses the mysteries of vision. It provides readers with experiments to help them discover optical illusions and the features of their own perception. Illusions of Seeing begins with a discussion on the essence of light and its perception to the human eye. It presents a comprehensive overview of the basic laws of human perception as well as the fundamentals of good gestalt. Subsequent chapters discuss geometric-optical illusions; the perception of form, brightness, and translucency and their interaction with each other; ambiguous perception, color vision, spatial vision. The book ends with a discussion of the perception of motion and its interaction with color, form, and spatial depth with a full chapter devoted to illusions in our everyday life. Consider this your travel guide in the marvelous world of sight, to experience a completely individual way to understand and improve your own perception. Illusions of Seeing will be of interest to psychologists, physicists, biologists, and undergraduate and graduate students within the field of cognitive psychology.
Quantum Mechanics of Charged Particle Beam Optics: Understanding Devices from Electron Microscopes to Particle Accelerators Seeing the LightOptics in Nature, Photography, Color, Vision, and Holography
City of Light tells the story of fiber optics, tracing its transformation from 19th-century parlor trick into the foundation of our global communications network. Written for a broad audience by a journalist who has covered the field for twenty years, the book is a lively account of both the people and the ideas behind this revolutionary technology. The basic concept underlying fiber optics was first explored in the 1840s when researchers used jets of water to guide light in laboratory demonstrations. The idea caught the public eye decades later when it was used to create stunning illuminated fountains at many of the great Victorian exhibitions. The modern version of fiber optics--using flexible glass fibers to transmit light--was discovered independently five times through the first half of the century, and one of its first key applications was the endoscope, which for the first time allowed physicians to look inside the body without surgery. Endoscopes became practical in 1956 when a college undergraduate discovered how to make solid glass fibers with a glass cladding. With the invention of the laser, researchers grew interested in optical communications. While Bell Labs and others tried to send laser beams through the atmosphere or hollow light pipes, a small group at Standard Telecommunication Laboratories looked at guiding light by transparent fibers. Led by the recipient of the 2009 Nobel Prize in Physics, Charles K. Kao, they proposed the idea of fiber-optic communications and demonstrated that contrary to what many researchers thought glass could be made clear enough to transmit light over great distances. Following these ideas, Corning Glass Works developed the first low-loss glass fibers in 1970. From this point fiber-optic communications developed rapidly. The first experimental phone links were tested on live telephone traffic in 1977 and within half a dozen years long-distance companies were laying fiber cables for their national backbone systems. In 1988, the first transatlantic fiber-optic cable connected Europe with North America, and now fiber optics are the key element in global communications. The story continues today as fiber optics spread through the communication grid that connects homes and offices, creating huge information pipelines and replacing copper wires. The book concludes with a look at some of the exciting potential developments of this technology.
Let's Make a Rainbow! SPIE Press
With a taut, poetic style, Lippit produces speculative readings of secret and shadow archives and visual structures or phenomenologies of the inside, charting the materiality of what both can and cannot be seen in the radioactive light of the twentieth century.
The Practical Approach to Modern Aspects of Photonics and Laser Physics Morgan & Claypool Publishers
Optics has been part of scientific enquiry from its beginning and remains a key element of modern science. This book provides a concise treatment of physical optics starting with a brief summary of geometrical optics. Scalar diffraction theory is introduced to describe wave propagation and diffraction effects and provides the basis for Fourier methods for treating more complex diffraction problems. The rest of the book treats the physics underlying some important instruments for spectral analysis and optical metrology, reflection and transmission at dielectric surfaces and the polarization of light. This undergraduate-level text aims to aid understanding of optical applications in physical, engineering and life sciences or more advanced topics in modern optics.
Problems and Solutions Jeff Hecht
This book provides a step-by-step discussion through each topic of fiber optics. Each chapter explores theoretical concepts of principles and then applies them by using experimental cases with numerous illustrations. The book works systematically through fiber optic cables, advanced fiber optic cables, light attenuation in optical components, fiber optic cable types and installations, fiber optic connectors, passive fiber optic devices, wavelength division multiplexing, optical amplifiers, optical receivers, opto-mechanical switches, and optical fiber communications. It includes important chapters in fiber optic lighting, fiber optics testing, and laboratory safety.
Seeing the Light Cambridge University Press
Light is an element that draws together many areas of human knowledge: physics, chemistry, biology, astronomy, engineering, and art. Moreover, optical phenomena and the technologies based on them are widespread in our daily lives. However, it can be difficult to understand or explain these phenomena. What is light? Where are optics and photonics present in our lives and in nature? What lies behind different optical phenomena? What is an optical instrument? How does the eye resemble an optical instrument? How can we explain human vision?
Light Science John Wiley & Sons Incorporated
Seeing the Light is the most accessible and comprehensive study of optics and light on the market. Each chapter is a self-contained lesson, making it easy to learn about specific optical concepts. Diagrams, photos, and illustrations help bring concepts to life, and sections at the ends of chapters explore the more advanced aspects of each topic.
A Manual for Teachers on Light and Optics Springer Science & Business Media
The most complete and lucid nonmathematical study of light available. Chapters are self-contained, making the book flexible and easy to read. Coverage includes such non-traditional topics as processes of vision and the eye, atmospherical optical phenomena, color perception and illusions, color in nature and in art, Kirilian photography, and holography. Includes experiments that can be carried out with simple equipment. Chapters contain optional advanced sections, and appendixes review the mathematics for quantitative aspects. Illustrated, including a four-color insert.
Principles and Advanced Practices, Second Edition Courier Corporation
Polarized Light and Optical Systems presents polarization optics for undergraduate and graduate students in a way which makes classroom teaching relevant to current issues in optical engineering. This curriculum has been developed and refined for a decade and a half at the University of Arizona’s College of Optical Sciences. Polarized Light and Optical Systems provides a reference for the optical engineer and optical designer in issues related to building polarimeters, designing displays, and polarization critical optical systems. The central theme of Polarized Light and Optical Systems is a unifying treatment of polarization elements as optical elements and optical elements as polarization elements.
Seeing the Light Instructor's Manual Springer
A complete basic undergraduate course in modern optics for students in physics, technology, and engineering. The first half deals with classical physical optics; the second, quantum nature of light. Solutions.
The Science of Light Princeton University Press
Covering a number of important subjects in quantum optics, this textbook is an excellent introduction for advanced undergraduate and beginning graduate students, familiarizing readers with the basic concepts and formalism as well as the most recent advances. The first part of the textbook covers the semi-classical approach where matter is quantized, but light is not. It describes significant phenomena in quantum optics, including the principles of lasers. The second part is devoted to the full quantum description of light and its interaction with matter, covering topics such as spontaneous emission, and classical and non-classical states of light. An overview of photon entanglement and applications to quantum information is also given. In the third part, non-linear optics and laser cooling of atoms are presented, where using both approaches allows for a comprehensive description. Each chapter describes basic concepts in detail, and more specific concepts and phenomena are presented in 'complements'.
Light and Optics Morgan & Claypool Publishers
We live in a world of optical marvels - from the commonplace but beautiful rainbow, to the rare and eerie superior mirage. But how many of us really understand how a rainbow is formed, why the setting sun is red and flattened, or even why the sky at night is not absolutely black? This beautiful and informative guide provides clear explanations to all naturally occurring optical phenomena seen with the naked eye, including shadows, halos, water optics, mirages and a host

of other spectacles. Separating myth from reality, it outlines the basic principles involved, and supports them with many figures and references. A wealth of rare and spectacular photographs, many in full color, illustrate the phenomena throughout. In this new edition of the highly-acclaimed guide to seeing, photographing and understanding nature's optical delights, the authors have added over 50 new images and provided new material on experiments you can try yourself.
Optics in Nature, Photography, Color, Vision, and Holography Everyday Science Academy
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.

Seeing the Light World Scientific Publishing Company
Principles of Optics: Electromagnetic Theory of Propagation, Interference and Diffraction of Light, Sixth Edition covers optical phenomenon that can be treated with Maxwell’s phenomenological theory. The book is comprised of 14 chapters that discuss various topics about optics, such as geometrical theories, image forming instruments, and optics of metals and crystals. The text covers the elements of the theories of interference, interferometers, and diffraction. The book tackles several behaviors of light, including its diffraction when exposed to ultrasonic waves. The selection will be most useful to researchers whose work involves understanding the behavior of light.
Understanding Optics Without the Mathematics R. Cartier
Topology is the study of properties of geometrical objects that remain invariant as the object is bent, twisted, or otherwise continuously deformed. It has been an indispensable tool in particle physics and solid state physics for decades, but in recent years it has become increasingly relevant in classical and quantum optics as well. It makes appearances through such diverse phenomena as Pancharatnam-Berry phases, optical vortices and solitons, and optical simulations of solid-state topological phenomena. This book concisely provides the necessary mathematical background needed to understand these developments and to give a rapid survey of some of the optical applications where topological issues arise.
Understanding Devices from Electron Microscopes to Particle Accelerators John Wiley & Sons
This manual is designed to help instructors using Seeing the Light in their courses.Finally, a book on the physics of light that doesn't require advanced mathematics to understand. Seeing the Light is the most accessible and comprehensive study of optics and light on the market. With a focus on conceptual study, Seeing the Light leaves the heavy-duty mathematics behind, instead using practical analogies and simple empirical experiments to teach the material. Each chapter is a self-contained lesson, making it easy to learn about specific optical concepts without having to read the whole book over. Inside you'll find clear and easy-to-understand explanations of topics, including:¿ Processes of vision and the eye¿ Atmospherical optical phenomena¿ Color perception and illusions¿ Color in nature and in art¿ Digital photography¿ Holography¿ And moreDiagrams, photos, and illustrations help bring difficult concepts to life, and optional sections at the ends of chapters explore the more advanced aspects of each topic. A truly one of a kind book for physics students and teachers, Seeing the Light is a primer on optics not to be missed.