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AN INTRODUCTION TO FIBER OPTICS

Cambridge University Press *Textbook on the physical principles of optical fibers - for advanced undergraduates and graduates in physics or electrical engineering.*

OPTICAL WAVEGUIDE THEORY

Springer Science & Business Media *This text is intended to provide an in-depth, self-contained, treatment of optical waveguide theory. We have attempted to emphasize the underlying physical processes, stressing conceptual aspects, and have developed the mathematical analysis to parallel the physical intuition. We also provide comprehensive supplementary sections both to augment any deficiencies in mathematical background and to provide a self-consistent and rigorous mathematical approach. To assist in understanding, each chapter concentrates principally on a single idea and is therefore comparatively short. Furthermore, over 150 problems with complete solutions are given to demonstrate applications of the theory. Accordingly, through simplicity of approach and numerous examples, this book is accessible to undergraduates. Many fundamental topics are presented here for the first time, but, more importantly, the material is brought together to give a unified treatment of basic ideas using the simplest approach possible. To achieve such a goal required a maturation of the subject, and thus the text was intentionally developed over a protracted period of the last 10 years.*

THE ELEMENTS OF NONLINEAR OPTICS

Cambridge University Press *This book is a self-contained account of the most important principles of nonlinear optics. Assuming a familiarity with basic mathematics, the fundamentals of nonlinear optics are developed from the basic concepts, introducing and explaining the essential quantum mechanical apparatus as it arises. Later chapters deal with the materials used and the constructions that are necessary to induce the effects.*

ELECTROMAGNETIC WAVE PROPAGATION, RADIATION, AND SCATTERING

FROM FUNDAMENTALS TO APPLICATIONS

John Wiley & Sons *One of the most methodical treatments of electromagnetic wave propagation, radiation, and scattering—including new applications and ideas Presented in two parts, this book takes an analytical approach on the subject and emphasizes new ideas and applications used today. Part one covers fundamentals of electromagnetic wave propagation, radiation, and scattering. It provides ample end-of-chapter problems and offers a 90-page solution manual to help readers check and comprehend their work. The second part of the book explores up-to-date applications of electromagnetic waves—including radiometry, geophysical remote sensing and imaging, and biomedical and signal processing applications. Written by a world renowned authority in the field of electromagnetic research, this new edition of Electromagnetic Wave Propagation, Radiation, and Scattering: From Fundamentals to Applications presents detailed applications with useful appendices, including mathematical formulas, Airy function, Abel's equation, Hilbert transform, and Riemann surfaces. The book also features newly revised material that focuses on the following topics: Statistical wave theories—which have been extensively applied to topics such as geophysical remote sensing, bio-electromagnetics, bio-optics, and bio-ultrasound imaging Integration of several distinct yet related disciplines, such as statistical wave theories, communications, signal processing, and time reversal imaging New phenomena of multiple scattering, such as coherent scattering and memory effects Multiphysics applications that combine theories for different physical phenomena, such as seismic coda waves, stochastic wave theory, heat diffusion, and temperature rise in biological and other media Metamaterials and solitons in optical fibers, nonlinear phenomena, and porous media Primarily a textbook for graduate courses in electrical engineering, Electromagnetic Wave Propagation, Radiation, and Scattering is also ideal for graduate students in bioengineering, geophysics, ocean engineering, and geophysical remote sensing. The book is also a useful reference for engineers and scientists working in fields such as geophysical remote sensing, bio-medical engineering in optics and ultrasound, and new materials and integration with signal processing.*

PRINCIPLES OF DIGITAL COMMUNICATION

Cambridge University Press *The renowned communications theorist Robert Gallager brings his lucid writing style to the study of the fundamental system aspects of digital communication for a one-semester course for graduate students. With the clarity and insight that have characterized his teaching and earlier textbooks, he develops a simple framework and then combines this with careful proofs to help the reader understand modern systems and simplified models in an intuitive yet precise way. A strong narrative and links between theory and practice reinforce this concise, practical presentation. The book begins with data compression for arbitrary sources. Gallager then describes how to modulate the resulting binary data for transmission over wires, cables, optical fibers, and wireless channels. Analysis and intuitive interpretations are developed for channel noise models, followed by coverage of the principles of detection, coding, and decoding. The various concepts covered are brought together in a description of wireless communication, using CDMA as a case study.*

ADVANCED MICRO- AND NANO-MANUFACTURING TECHNOLOGIES

APPLICATIONS IN BIOCHEMICAL AND BIOMEDICAL ENGINEERING

Springer Nature *This volume focuses on the fundamentals and advancements in micro and nanomanufacturing technologies applied in the biomedical and biochemical domain. The contents of this volume provide comprehensive coverage of the physical principles of advanced manufacturing technologies and the know-how of their applications in the fabrication of biomedical devices and systems. The book begins by documenting the journey of miniaturization and micro-and nano-fabrication. It then delves into the fundamentals of various advanced technologies such as micro-wire moulding, 3D printing, lithography, imprinting, direct laser machining, and laser-induced plasma-assisted machining. It also covers laser-based technologies which are a promising option due to their flexibility, ease in control and application, high precision, and availability. These technologies can be employed to process several materials such as glass, polymers: polycarbonate, polydimethylsiloxane, polymethylmethacrylate, and metals such as stainless steel, which are commonly used in the fabrication of biomedical devices, such as microfluidic technology, optical and fiber-optic sensors, and electrochemical bio-sensors. It also discusses advancements in various MEMS/NEMS based technologies and their applications in energy conversion and storage devices. The chapters are written by experts from the fields of micro- and nano-manufacturing, materials engineering, nano-biotechnology, and end-users such as clinicians, engineers, academicians of interdisciplinary background. This book will be a useful guide for academia and industry alike.*

PRINCIPLES OF LASERS

Springer *This book is the result of more than ten years of research and teaching in the field of quantum electronics. The purpose of the book is to introduce the principles of lasers, starting from elementary notions of quantum mechanics and electromagnetism. Because it is an introductory book, an effort has been made to make it self contained to minimize the need for reference to other works. For the same reason; the references have been limited (whenever possible) either to review papers or to papers of seminal importance. The organization of the book is based on the fact that a laser can be thought of as consisting of three elements: (i) an active material, (ii) a pumping system, and (iii) a suitable resonator. Accordingly, after an introductory chapter, the next three chapters deal, respectively, with the interaction of radiation with matter, pumping processes, and the theory of passive optical resonators.*

FIBER OPTIC SENSORS

CRC Press *The need for both intrinsic and extrinsic fiber optic sensor technologies continues to grow. To meet the demands of this fast expanding applications-driven market, Fiber Optic Sensors, Second Edition presents both the latest advances in fiber optic sensor technology, such as the application of photonic crystal fibers to fiber optic gyroscopes, and recent application opportunities, including the use of fiber optic sensors as a minimally invasive medical treatment. The new edition of this seminal work highlights the development of fiber optic sensors, while providing an overview of current methods for the construction of high-speed and high-capacity fiber optic systems. Two new chapters cover topics such as femtosecond laser illumination inscription and the growing application sector of fiber optic chemical and biological sensors. Adding significant new material, the book continues to provide a progressive history of each sensor type as well as basic principles and fundamental building blocks for practical applications in the electrical aerospace, defense and manufacturing, smart structure, undersea surveillance, medical, and gas and oil industries.*

FIBER OPTIC SENSORS AND FIBER LASERS

MDPI *The optical fiber industry is emerging from the market for selling simple accessories using optical fiber to the new optical-IT convergence sensor market combined with high value-added smart industries such as the bio industry. Among them, fiber optic sensors and fiber lasers are growing faster and more accurately by utilizing fiber optics in various fields such as shipbuilding, construction, energy, military, railway, security, and medical. This Special Issue aims to present novel and innovative applications of sensors and devices based on fiber optic sensors and fiber lasers, and covers a wide range of applications of optical sensors. In this Special Issue, original research articles, as well as reviews, have been published.*

OPTICAL FIBER SENSORS

ADVANCED TECHNIQUES AND APPLICATIONS

CRC Press *Optical Fiber Sensors: Advanced Techniques and Applications* describes the physical principles of, and latest developments in, optical fiber sensors. Providing a fundamental understanding of the design, operation, and practical applications of fiber optic sensing systems, this book: Discusses new and emerging areas of research including photonic crystal fiber sensors, micro- and nanofiber sensing, liquid crystal photonics, acousto-optic effects in fiber, and fiber laser-based sensing Covers well-established areas such as surface plasmon resonance sensors, interferometric fiber sensors, polymer fiber sensors, Bragg gratings in polymer and silica fibers, and distributed fiber sensors Explores humidity sensing applications, smart structure applications, and medical applications, supplying detailed examples of the various fiber optic sensing technologies in use *Optical Fiber Sensors: Advanced Techniques and Applications* draws upon the extensive academic and industrial experience of its contributing authors to deliver a comprehensive introduction to optical fiber sensors with a strong practical focus suitable for undergraduate and graduate students as well as scientists and engineers working in the field.

CERAMIC FIBERS AND COATINGS

ADVANCED MATERIALS FOR THE TWENTY-FIRST CENTURY

National Academies Press *High-temperature ceramic fibers are the key components of ceramic matrix composites (CMCs). Ceramic fiber properties (strength, temperature and creep resistance, for example)-along with the debonding characteristics of their coatings-determine the properties of CMCs. This report outlines the state of the art in high-temperature ceramic fibers and coatings, assesses fibers and coatings in terms of future needs, and recommends promising avenues of research. CMCs are also discussed in this report to provide a context for discussing high-temperature ceramic fibers and coatings.*

ADVANCED OPTICAL COMMUNICATION SYSTEMS

This book presents a descriptive account on various latest advances in the field of optical communication systems. These systems are extremely essential for all types of networks and telecommunications. They comprise of a transmitter which encodes the message into an optical signal, a channel which carries the signal to its destination, and a receiver which reproduces the message from the received optical signal. This book provides updated results on communication systems, with elucidations on their relevance, provided by

veteran researchers in this field. It encompasses fundamental concepts of optical and wireless optical communication systems, optical multiplexing and demultiplexing for optical communication systems, optical amplifiers and networks, and network traffic engineering. Lately, wavelength conversion and other advanced signal processing functions have also been studied in detail for optical communications systems. The book emphasizes on wavelength conversion, demultiplexing in the time domain, switching and other optimized functions for optical communications systems. It is primarily aimed at assisting in advancement and research for a wide range of readers including design engineer teams in manufacturing industry, academia and telecommunications service operators/providers.

PRACTICAL GUIDE FOR CRACKING OPTICAL INTERVIEWS

Sanjay Yadav MapYourTech's Interview Buddy Series is an initiative to help Optical Fiber Communication Professionals increase their technical and behavioral interview skill sets which will help them excel in their professional career. In this series ,utmost care has been taken to include practical DWDM based questions that are asked in related industries during current time . Intend is to enable optical professionals interest and equipping them with right tools to excel in their career. DWDM (Dense Wavelength Division Multiplexing) is an interesting branch of Optical Fiber Communication which acts as a backbone to the telecom networks delivering high capacity and high speed data from one end to another.

INTRODUCTION TO OPTICS

Cambridge University Press Introduction to Optics is now available in a re-issued edition from Cambridge University Press. Designed to offer a comprehensive and engaging introduction to intermediate and upper level undergraduate physics and engineering students, this text also allows instructors to select specialized content to suit individual curricular needs and goals. Specific features of the text, in terms of coverage beyond traditional areas, include extensive use of matrices in dealing with ray tracing, polarization, and multiple thin-film interference; three chapters devoted to lasers; a separate chapter on the optics of the eye; and individual chapters on holography, coherence, fiber optics, interferometry, Fourier optics, nonlinear optics, and Fresnel equations.

SELF-HEALING MATERIALS

FUNDAMENTALS, DESIGN STRATEGIES, AND APPLICATIONS

John Wiley & Sons The book covers self-healing concepts for all important material classes and their applications: polymers,

ceramics, non-metallic and metallic coatings, alloys, nanocomposites, concretes and cements, as well as ionomers. Beginning with the inspiration from biological self-healing, its mimicry and conceptual transfer into approaches for the self-repair of artificially created materials, this book explains the strategies and mechanisms for the readers' basic understanding, then covers the different material classes and suitable self-healing concepts, giving examples for their application in practical situations. As the first book in this swiftly growing research field, it is of great interest to readers from many scientific and engineering disciplines, such as physics and chemistry, civil, architectural, mechanical, electronics and aerospace engineering.

NONLINEAR OPTICAL MATERIALS

Springer Science & Business Media *Mathematical methods play a significant role in the rapidly growing field of nonlinear optical materials. This volume discusses a number of successful or promising contributions. The overall theme of this volume is twofold: (1) the challenges faced in computing and optimizing nonlinear optical material properties; and (2) the exploitation of these properties in important areas of application. These include the design of optical amplifiers and lasers, as well as novel optical switches. Research topics in this volume include how to exploit the magneto-optic effect, how to work with the nonlinear optical response of materials, how to predict laser-induced breakdown in efficient optical devices, and how to handle electron cloud distortion in femtosecond processes.*

LAB-ON-FIBER TECHNOLOGY

Springer *This book focuses on a research field that is rapidly emerging as one of the most promising ones for the global optics and photonics community: the "lab-on-fiber" technology. Inspired by the well-established "lab on-a-chip" concept, this new technology essentially envisages novel and highly functionalized devices completely integrated into a single optical fiber for both communication and sensing applications. Based on the R&D experience of some of the world's leading authorities in the fields of optics, photonics, nanotechnology, and material science, this book provides a broad and accurate description of the main developments and achievements in the lab-on-fiber technology roadmap, also highlighting the new perspectives and challenges to be faced. This book is essential for scientists interested in the cutting-edge fiber optic technology, but also for graduate students.*

OPTICAL FIBER SENSOR TECHNOLOGY

FUNDAMENTALS

Springer Science & Business Media *Fundamentals of Optical Fiber Sensor Technology* The field of optical fiber sensors continues to expand and develop, being increasingly influenced by new applications of the technologies that have been the topics of research for some years. In this way, the subject continues to mature and reach into new areas of engineering. This text in the series on Optical Fiber Sensor Technology provides a foundation for a better understanding of those developments in the basic science and its applications in fiber sensors, underpinning the subject today. This book builds upon the work in an earlier single volume which covered a broad area of the subject, but which now, in this, volume 1 of the series, focuses upon the fundamentals and essentials of the technology. Material which is included has been carefully reviewed and in most cases thoroughly revised and expanded to reflect the current state of the subject, and provide an essential background for the more applications-oriented content of the subsequent volumes of the series. This volume opens with a status paper on optical fiber sensor technology, by Kenneth Grattan and Tong Sun providing in it a flavor of the main topics in the field and giving an essential overview at the sort of systems which are discussed in more detail in the other chapters in the whole series. An extensive publication list of readily accessible papers reflecting these topics is included.

LASERS

FUNDAMENTALS AND APPLICATIONS

Springer Science & Business Media Ever since their invention in 1960, lasers have assumed tremendous importance in the fields of science, engineering and technology because of their use both in basic research and in various technological applications. *Lasers: Theory and Applications 2nd Edition* will provide a coherent presentation of the basic physics behind the working of the laser along with some of their most important applications. Numerical examples are scattered throughout the book for helping the student gain a better appreciation of the concepts and problems at the end of each chapter and provides the student a better understanding of the basics and help in applying the concepts to practical situations. This book serves as a text in a course on lasers and their applications for students majoring in various disciplines such as Physics, Chemistry and Electrical Engineering.

FIBER OPTIC SENSORS BASED ON PLASMONICS

World Scientific The book provides an introduction of surface plasmons and presents its applications in the sensing of various chemical and biological analyses using optical fiber technology. The field is developed by introducing the surface plasmons for semi-

infinite metal-dielectric interface with discussion of their propagation length and penetration depth. Practical issues with the excitation of surface plasmons in different configurations and in various geometries including various means of their excitation have also been included. The book discusses the essential components of fiber optic sensors, their functions and the performance parameters along with the theoretical description of fiber optic Surface Plasmon Resonance (SPR) sensors with respect to various light launching conditions. The fabrication methods and protocols used for the fabrication of the fiber optic SPR chemical and biosensors have been described. Some fiber optic sensing applications based on SPR phenomena and various issues, such as sensitivity enhancement, influence of external stimuli etc, have been an important part of the book. The book will help beginners as well as established researchers in understanding the fundamentals and advancements of optical fiber plasmonic sensor technology. The book contains both the rigorous theory and the experimental techniques of SPR and related variety of sensors. Contents: Introduction Physics of Plasmons Characteristics and Components of Fiber Optic Sensor Theory of SPR-based Optical Fiber Sensor Fabrication and Functionalization Methods SPR based Sensing Applications SPR based Fiber Optic Sensors: Factors Affecting Performance Future Scope of Research Appendices: Dispersion Relations of Dielectric Materials and Metals List of Constants Readership: Beginners as well as established researchers who are interested in the fundamentals and advancements of optical fiber plasmonic sensor technology. Key Features: All the contents in this book are totally different from the topics covered in other books on fiber optic sensors as we focus on chemical and biochemical sensing applications of fiber optic plasmonic sensors The book discusses the fiber optic chemical and biosensors based on plasmonics which is one of the hottest topics of research these days. Further, the book includes sensor fabrication methods apart from just adding sensors based on surface interactions The book includes not only the basics of surface plasmons but also the chemical and bio-chemical sensing applications using optical fiber technology The book covers the state of art work on fiber optic sensors utilizing surface plasmon resonance technique The authors have carried out tremendous amount of research on this area during the last 10 years and their work has extensively been cited in the literature Keywords: Optical Fiber; Sensor; Surface Plasmon; Plasmonics

OPTICAL SENSORS

BASICS AND APPLICATIONS

John Wiley & Sons *Providing an overview of the necessary components and the range of applications from light-barriers to high-resolution surface-scanning interferometers, this is a valuable introduction to the technology of optical sensors as well as a reference for experienced practitioners. The first part of the book introduces readers to the basics of sensor principles by describing the most important components that can be found in all optical sensors. Based on this opto-electronic toolbox, the second part then goes on to*

give numerous examples of optical sensors with respect to their applications.

DIGITAL COMMUNICATIONS AND SIGNAL PROCESSING (SECOND EDITION)

Universities Press

EMERGING TECHNOLOGY TRENDS IN ELECTRONICS, COMMUNICATION AND NETWORKING

THIRD INTERNATIONAL CONFERENCE, ET2ECN 2020, SURAT, INDIA, FEBRUARY 7-8, 2020, REVISED SELECTED PAPERS

Springer Nature *This book constitutes refereed proceedings of the Third International Conference on Emerging Technology Trends in Electronics, Communication and Networking, ET2ECN 2020, held in Surat, India, in February 2020. The 17 full papers and 6 short papers presented were thoroughly reviewed and selected from 70 submissions. The volume covers a wide range of topics including electronic devices, VLSI design and fabrication, photo electronics, systems and applications, integrated optics, embedded systems, wireless communication, optical communication, free space optics, signal processing, image/ audio/ video processing, wireless sensor networks, next generation networks, network security, and many others.*

OPTICAL TWEEZERS

PRINCIPLES AND APPLICATIONS

Cambridge University Press *A comprehensive guide to the theory, practice and applications of optical tweezers, combining state-of-the-art research with a strong pedagogic approach.*

OPTICAL NETWORKS

A PRACTICAL PERSPECTIVE

Morgan Kaufmann *The third edition of Optical Networks continues to be the authoritative source for information on optical networking technologies and techniques. Componentry and transmission are discussed in detail with emphasis on practical networking issues that affect organizations as they evaluate, deploy, or develop optical networks. New updates in this rapidly changing technology are introduced. These updates include sections on pluggable optical transceivers, ROADM (reconfigurable optical*

add/drop multiplexer), and electronic dispersion compensation. Current standards updates such as G.709 OTN, as well as, those for GPON, EPON, and BPON are featured. Expanded discussions on multimode fiber with additional sections on photonic crystal and plastic fibers, as well as expanded coverage of Ethernet and Multiprotocol Label Switching (MPLS). This book clearly explains all the hard-to-find information on architecture, control and management. It serves as your guide at every step of optical networking-- from planning to implementation through ongoing maintenance. This book is your key to thoroughly understanding practical optical networks. In-depth coverage of optimization, design, and management of the components and transmission of optical networks. Filled with examples, figures, and problem sets to aid in development of dependable, speedy networks. Focuses on practical, networking-specific issues: everything you need to know to implement currently available optical solutions.

OPTICAL SENSORS

INDUSTRIAL ENVIRONMENTAL AND DIAGNOSTIC APPLICATIONS

Springer Science & Business Media *This interesting book covers latest aspects of a highly sophisticated technology; results treated in critical detail; demonstrates applicability of this technology to practical problems in process control, biochip methods, clinical analysis, environmental sciences*

OPTICAL FIBER COMMUNICATIONS

PRINCIPLES AND PRACTICE

Pearson Education *This text succeeds in giving a practical introduction to the fundamentals, problems and techniques of the design and utilisation of optical fiber systems. This edition retains all core features, while incorporating recent improvements and developments in the field.*

INTRODUCTION TO FIBER OPTICS

Elsevier *Introduction to Fiber Optics is well established as an introductory text for engineers, managers and students. It meets the needs of systems designers, installation engineers, electronic engineers and anyone else looking to gain a working knowledge of fiber optics with a minimum of maths. Review questions are included in the text to enable the reader to check their understanding as they work through the book. The new edition of this successful book is now fully up to date with the new standards, latest technological developments and includes a new chapter on specifying optical components. Whether you are looking for a complete self-study course*

*in fiber optics, a concise reference text to dip into, or a readable introduction to this fast moving technology, this book has the solution. * A practical, no-nonsense guide to fiber optics * Up-to-date coverage that minimises mathematics * New material on specifying optical components*

SEMICONDUCTOR OPTOELECTRONIC DEVICES

The first true introduction to semiconductor optoelectronic devices, this book provides an accessible, well-organized overview of optoelectric devices that emphasizes basic principles. Coverage begins with an optional review of key concepts—such as properties of compound semiconductor, quantum mechanics, semiconductor statistics, carrier transport properties, optical processes, and junction theory—then progress gradually through more advanced topics. The Second Edition has been both updated and expanded to include the recent developments in the field.

FIBRE STRUCTURE

Elsevier *Fibre Structure* is a 19-chapter text that emerged from lectures presented at the Manchester College of Science and Technology. The interest of fiber studies lies to some extent in the important part textile materials play in general living and in industrial products and operations. The first chapters deal with the chemistry of fiber-forming polymers, followed by considerable chapters on the controversial subject of the fine structure of fibers. The remaining chapters describe the special features of all the important fibers, including glass and asbestos. Textile scientists, researchers, and manufacturers will find this book invaluable.

OPTICAL PROPERTIES OF SOLIDS

Academic Press *Optical Properties of Solids* covers the important concepts of intrinsic optical properties and photoelectric emission. The book starts by providing an introduction to the fundamental optical spectra of solids. The text then discusses Maxwell's equations and the dielectric function; absorption and dispersion; and the theory of free-electron metals. The quantum mechanical theory of direct and indirect transitions between bands; the applications of dispersion relations; and the derivation of an expression for the dielectric function in the self-consistent field approximation are also encompassed. The book further tackles current-current correlations; the fluctuation-dissipation theorem; and the effect of surface plasmons on optical properties and photoemission. People involved in the study of the optical properties of solids will find the book invaluable.

INTRODUCTION TO LENS DESIGN

WITH PRACTICAL ZEMAX EXAMPLES

INDIA PHOTONICS

CONSTRUCTING ARCHITECTURE

MATERIALS, PROCESSES, STRUCTURES

Springer Science & Business Media Now in its second edition: the trailblazing introduction and textbook on construction includes a new section on translucent materials and an article on the use of glass.

ELECTROSPUN NANOFIBERS

Woodhead Publishing *Electrospun Nanofibers* covers advances in the electrospinning process including characterization, testing and modeling of electrospun nanofibers, and electrospinning for particular fiber types and applications. *Electrospun Nanofibers* offers systematic and comprehensive coverage for academic researchers, industry professionals, and postgraduate students working in the field of fiber science. Electrospinning is the most commercially successful process for the production of nanofibers and rising demand is driving research and development in this field. Rapid progress is being made both in terms of the electrospinning process and in the production of nanofibers with superior chemical and physical properties. Electrospinning is becoming more efficient and more specialized in order to produce particular fiber types such as bicomponent and composite fibers, patterned and 3D nanofibers, carbon nanofibers and nanotubes, and nanofibers derived from chitosan. Provides systematic and comprehensive coverage of the manufacture, properties, and applications of nanofibers Covers recent developments in nanofibers materials including electrospinning of bicomponent, chitosan, carbon, and conductive fibers Brings together expertise from academia and industry to provide comprehensive, up-to-date information on nanofiber research and development Offers systematic and comprehensive coverage for academic researchers, industry professionals, and postgraduate students working in the field of fiber science

LIGHT-EMITTING DIODES

Cambridge University Press Revised and fully updated, the second edition of this graduate textbook offers a comprehensive explanation of the technology and physics of LEDs such as infrared, visible-spectrum, ultraviolet, and white LEDs made from III-V

semiconductors. Elementary properties such as electrical and optical characteristics are reviewed, followed by the analysis of advanced device structures. With nine additional chapters, the treatment of LEDs has been vastly expanded, including new material on device packaging, reflectors, UV LEDs, III-V nitride materials, solid-state sources for illumination applications, and junction temperature. Radiative and non-radiative recombination dynamics, methods for improving light extraction, high-efficiency and high-power device designs, white-light emitters with wavelength-converting phosphor materials, optical reflectors, and spontaneous recombination in resonant-cavity structures are discussed in detail. With exercises, solutions, and illustrative examples, this textbook will be of interest to scientists and engineers working on LEDs and graduate students in electrical engineering, applied physics, and materials science.

EMERGING WAVEGUIDE TECHNOLOGY

BoD - Books on Demand Recently, the rapid development of radiofrequency (RF)/microwave and photonic/optical waveguide technologies has had a significant impact on the current electronic industrial, medical and information and communication technology (ICT) fields. This book is a self-contained collection of valuable scholarly papers related to waveguide design, modeling, and applications. This book contains 20 chapters that cover three main subtopics of waveguide technologies, namely RF and microwave waveguide, photonic and optical waveguide and waveguide analytical solutions. Hence, this book is particularly useful to the academics, scientists, practicing researchers and postgraduate students whose work relates to the latest waveguide technologies.

FIBER-OPTIC COMMUNICATION SYSTEMS

The Institute of Optics, University of Rochester * ".readers searching for a wide ranging and up-date view of fibre optic communication systems would do well to purchase this book."--International Journal of Electrical Engineering Education (on the Second Edition) * This comprehensive, up-to-date account of fiber-optic communication focuses on the physics and technology behind fiber-optic communication systems while covering both the systems and components aspects * Provides extensive details on the WDM technology and system design issues that have developed since the last edition.

MODERN TECHNIQUES OF SPECTROSCOPY

BASICS, INSTRUMENTATION, AND APPLICATIONS

Springer Nature The book highlights recent developments in the field of spectroscopy by providing the readers with an updated and

high-level of overview. The focus of this book is on the introduction to concepts of modern spectroscopic techniques, recent technological innovations in this field, and current examples of applications to molecules and materials relevant for academia and industry. The book will be beneficial to researchers from various branches of science and technology, and is intended to point them to modern techniques, which might be useful for their specific problems. Spectroscopic techniques, that are discussed include, UV-Visible absorption spectroscopy, XPS, Raman spectroscopy, SERS, TERS, CARS, IR absorption spectroscopy, SFG, LIBS, Quantum cascade laser (QCL) spectroscopy, fluorescence spectroscopy, ellipsometry, cavity-enhanced absorption spectroscopy, such as cavity ring-down spectroscopy (CRDS) and evanescent wave-CRDS both in gas and condensed phases, time-resolved spectroscopy etc. Applications introduced in the different chapters demonstrates the usefulness of the spectroscopic techniques for the characterization of fundamental properties of molecules, e.g. in connection with environmental impact, bio-activity, or usefulness for pharmaceutical drugs, and materials important e.g. for nano-science, nuclear chemistry, or bio-applications. The book presents how spectroscopic techniques can help to better understand substances, which have also great impact on questions of social and economic relevance (environment, alternative energy, etc.).

SCHLIEREN AND SHADOWGRAPH TECHNIQUES

VISUALIZING PHENOMENA IN TRANSPARENT MEDIA

Springer Science & Business Media *Schlieren and shadowgraph techniques are basic and valuable tools in various scientific and engineering disciplines. They allow us to see the invisible: the optical inhomogeneities in transparent media like air, water, and glass that otherwise cause only ghostly distortions of our normal vision. These techniques are discussed briefly in many books and papers, but there is no up-to-date complete treatment of the subject before now. The book is intended as a practical guide for those who want to use these methods, as well as a resource for a broad range of disciplines where scientific visualization is important. The colorful 400-year history of these methods is covered in an extensive introductory chapter accessible to all readers.*