

## **Optical Communication Kaiser Book**

In the immediate aftermath of the armistice that ended the First World War, the Allied nations of Britain, France, and Italy agreed to put the fallen German Emperor Kaiser Wilhelm II on trial, in what would be the first ever international criminal tribunal. In Britain, Lloyd George campaigned for re-election on the slogan 'hang the Kaiser', but the Italians had only lukewarm support for a trial, and there was outright resistance from the United States. During the Peace Conference, international lawyers gathered for the first time to debate international criminal justice. They recommended trial of the Kaiser by an international tribunal for war crimes, and the Americans relented, agreeing to a trial for a 'supreme offence against international morality'. However, the Kaiser had fled to the Netherlands where he obtained asylum, and though the Allies threatened a range of measures if the former Emperor was not surrendered, the Dutch refused and the demands were dropped in March 1920. This book, from renowned legal scholar William A. Schabas, sheds light on perhaps the most important international trial that never was. Schabas draws on numerous primary sources hitherto unexamined in published work, including transcripts which vividly illuminate this period of international law making. As such, he has written a

book which constitutes a history of the very beginnings of international criminal justice, a history which has never before been fully told.

Adapted from a successful and thoroughly field-tested Italian text, the first edition of *Electromagnetic Waves* was very well received. Its broad, integrated coverage of electromagnetic waves and their applications forms the cornerstone on which the author based this second edition. Working from Maxwell's equations to applications in optical communications and photonics, *Electromagnetic Waves, Second Edition* forges a link between basic physics and real-life problems in wave propagation and radiation. Accomplished researcher and educator Carlo G. Someda uses a modern approach to the subject. Unlike other books in the field, it surveys all major areas of electromagnetic waves in a single treatment. The book begins with a detailed treatment of the mathematics of Maxwell's equations. It follows with a discussion of polarization, delves into propagation in various media, devotes four chapters to guided propagation, links the concepts to practical applications, and concludes with radiation, diffraction, coherence, and radiation statistics. This edition features many new and reworked problems, updated references and suggestions for further reading, a completely revised appendix on Bessel functions, and new definitions such as antenna effective height. Illustrating the concepts with examples in every chapter, *Electromagnetic*

Waves, Second Edition is an ideal introduction for those new to the field as well as a convenient reference for seasoned professionals.

This book explains physical principles, unique benefits, broad categories, implementation aspects, and performance criteria of distributed optical fiber sensors (DOFS). For each kind of sensor, the book highlights industrial applications, which range from oil and gas production to power line monitoring, plant and process engineering, environmental monitoring, industrial fire and leakage detection, and so on. The text also includes a discussion of such key areas as backscattering, launched power limitations, and receiver sensitivity, as well as a concise historical account of the field's development.

A thorough exposition of quantum computing and the underlying concepts of quantum physics, with explanations of the relevant mathematics and numerous examples. The combination of two of the twentieth century's most influential and revolutionary scientific theories, information theory and quantum mechanics, gave rise to a radically new view of computing and information. Quantum information processing explores the implications of using quantum mechanics instead of classical mechanics to model information and its processing. Quantum computing is not about changing the physical substrate on which computation is done from classical to quantum but about changing the notion of computation

itself, at the most basic level. The fundamental unit of computation is no longer the bit but the quantum bit or qubit. This comprehensive introduction to the field offers a thorough exposition of quantum computing and the underlying concepts of quantum physics, explaining all the relevant mathematics and offering numerous examples. With its careful development of concepts and thorough explanations, the book makes quantum computing accessible to students and professionals in mathematics, computer science, and engineering. A reader with no prior knowledge of quantum physics (but with sufficient knowledge of linear algebra) will be able to gain a fluent understanding by working through the book.

City of Light

Coherent Optical Fiber Communications

Select Proceedings of VCAS 2018

UWB Communication Systems

An Introduction to Distributed Optical Fibre Sensors

*Quantum Optics and Nanophotonics consists of the lecture notes of the Les Houches Summer School 101 held in August 2013. Some of the most eminent experts in this flourishing area of research have contributed chapters lying at the intersection of basic quantum science and*

*advanced nanotechnology. The book is part of the renowned series of tutorial books that contain the lecture notes of all the Les Houches Summer Schools since the 1950's and cover the latest developments in physics and related fields.*

*This book constitutes the refereed proceedings of the First International Conference on Futuristic Trends in Network and Communication Technologies, FTNCT 2018, held in Solan, India, in February 2018. The 37 revised full papers presented were carefully reviewed and selected from 239 submissions. The prime aim of the conference is to invite researchers from different domains of network and communication technologies to a single platform to showcase their research ideas. The selected papers are organized in topical sections on communication technologies, Internet of Things (IoT), network technologies, and wireless networks.*

*As optical technologies move closer to the core of modern computer architecture, there arise many challenges in building optical capabilities from the network to the motherboard. Rapid advances in integrated optics technologies are making this a reality. However, no comprehensive, up-to-date reference is available to the technologies and principles underlying the field. The Encyclopedic Handbook of Integrated Optics fills this void, collecting the work of 53 leading experts into a compilation of the most important concepts, phenomena,*

*technologies, and terms covering all related fields. This unique book consists of two types of entries: the first is a detailed, full-length description; the other, a concise overview of the topic. Additionally, the coverage can be divided into four broad areas: A survey of the basics of integrated optics, exploring theory, practical concerns, and the fundamentals behind optical devices Focused discussion on devices and components such as arrayed waveguide grating, various types of lasers, optical amplifiers, and optoelectronic devices In-depth examination of subsystems including MEMS, optical pickup, and planar lightwave circuits Finally, systems considerations such as multiplexing, demultiplexing, 3R circuits, transmission, and reception Offering a broad and complete treatment of the field, the Encyclopedic Handbook of Integrated Optics is the complete guide to the fundamentals, principles, and applications of integrated optics technology.*

*Editorial Review Dr. Bakshi has compiled a thorough, clear reference text covering the important fields of EUV lithography for high-volume manufacturing. This book has resulted from his many years of experience in EUVL development and from teaching this subject to future specialists. The book proceeds from an historical perspective of EUV lithography, through source technology, optics, projection system design, mask, resist, and patterning performance, to cost of*

ownership. Each section contains worked examples, a comprehensive review of challenges, and relevant citations for those who wish to further investigate the subject matter. Dr. Bakshi succeeds in presenting sometimes unfamiliar material in a very clear manner. This book is also valuable as a teaching tool. It has become an instant classic and far surpasses others in the EUVL field. -- Dr. Akira Endo, Chief Development Manager, Gigaphoton Inc. Description Extreme ultraviolet lithography (EUVL) is the principal lithography technology aiming to manufacture computer chips beyond the current 193-nm-based optical lithography, and recent progress has been made on several fronts: EUV light sources, optics, optics metrology, contamination control, masks and mask handling, and resists. This comprehensive volume is comprised of contributions from the world's leading EUVL researchers and provides all of the critical information needed by practitioners and those wanting an introduction to the field. Interest in EUVL technology continues to increase, and this volume provides the foundation required for understanding and applying this exciting technology. About the editor of EUV Lithography Dr. Vivek Bakshi previously served as a senior member of the technical staff at SEMATECH; he is now president of EUV Litho, Inc., in Austin, Texas.

*Concepts to Applications*  
*Encyclopedic Handbook of Integrated Optics*

*Futuristic Trends in Network and Communication Technologies  
First International Conference, FTNCT 2018, Solan, India, February  
9–10, 2018, Revised Selected Papers  
Fiber-optic Communications Technology  
Fundamentals and Applications*

Lithography is a field in which advances proceed at a swift pace. This book was written to address several needs, and the revisions for the second edition were made with those original objectives in mind. Many new topics have been included in this text commensurate with the progress that has taken place during the past few years, and several subjects are discussed in more detail. This book is intended to serve as an introduction to the science of microlithography for people who are unfamiliar with the subject. Topics directly related to the tools used to manufacture integrated circuits are addressed in depth, including such topics as overlay, the stages of exposure, tools, and light sources. This text also contains numerous references for students who want to investigate particular topics in more detail, and they provide the experienced lithographer with lists of references by topic as well. It is expected that the reader of this book will have a foundation in basic physics and chemistry. No topics will require knowledge of mathematics beyond elementary calculus.

Metamaterials—artificially structured materials with engineered electromagnetic properties—have enabled unprecedented flexibility in manipulating electromagnetic

waves and producing new functionalities. This book details recent advances in the study of optical metamaterials, ranging from fundamental aspects to up-to-date implementations, in one unified treatment. Important recent developments and applications such as superlens and cloaking devices are also treated in detail and made understandable. The planned monograph can serve as a very timely book for both newcomers and advanced researchers in this extremely rapid evolving field. This book comprises select proceedings of the International Conference on VLSI, Communication and Signal processing (VCAS 2018). It looks at latest research findings in VLSI design and applications. The book covers a wide range of topics in electronics and communication engineering, especially in the area of microelectronics and VLSI design, communication systems and networks, and image and signal processing. The contents of this book will be useful to researchers and professionals alike.

A comprehensive introduction to the fundamentals of optics

Optical Physics

Inhomogeneous Optical Waveguides

OFDM for Optical Communications

A Comprehensive Overview

The Kaiser's Army

Advances in VLSI, Communication, and Signal Processing

**The first book on optical OFDM by the leading pioneers in the field The only book**

**to cover error correction codes for optical OFDM Gives applications of OFDM to free-space communications, optical access networks, and metro and log haul transports show optical OFDM can be implemented Contains introductions to signal processing for optical engineers and optical communication fundamentals for wireless engineers This book gives a coherent and comprehensive introduction to the fundamentals of OFDM signal processing, with a distinctive focus on its broad range of applications. It evaluates the architecture, design and performance of a number of OFDM variations, discusses coded OFDM, and gives a detailed study of error correction codes for access networks, 100 Gb/s Ethernet and future optical networks. The emerging applications of optical OFDM, including single-mode fiber transmission, multimode fiber transmission, free space optical systems, and optical access networks are examined, with particular attention paid to passive optical networks, radio-over-fiber, WiMAX and UWB communications. Written by two of the leading contributors to the field, this book will be a unique reference for optical communications engineers and scientists. Students, technical managers and telecom executives seeking to understand this new technology for future-generation optical networks will find the book invaluable. William Shieh is an associate professor and reader in the electrical and electronic engineering department, The University of Melbourne, Australia. He received his M.S. degree in electrical engineering and Ph.D. degree in physics both from University of Southern California. Ivan Djordjevic is an Assistant Professor of Electrical and Computer Engineering at the University of Arizona,**

**Tucson, where he directs the Optical Communications Systems Laboratory (OCSL). His current research interests include optical networks, error control coding, constrained coding, coded modulation, turbo equalization, OFDM applications, and quantum error correction. "This wonderful book is the first one to address the rapidly emerging optical OFDM field. Written by two leading researchers in the field, the book is structured to comprehensively cover any optical OFDM aspect one could possibly think of, from the most fundamental to the most specialized. The book adopts a coherent line of presentation, while striking a thoughtful balance between the various topics, gradually developing the optical-physics and communication-theoretic concepts required for deep comprehension of the topic, eventually treating the multiple optical OFDM methods, variations and applications. In my view this book will remain relevant for many years to come, and will be increasingly accessed by graduate students, accomplished researchers as well as telecommunication engineers and managers keen to attain a perspective on the emerging role of OFDM in the evolution of photonic networks." -- Prof. Moshe Nazarathy, EE Dept., Technion, Israel Institute of Technology \* The first book on optical OFDM by the leading pioneers in the field \* The only book to cover error correction codes for optical OFDM \* Applications of OFDM to free-space communications, optical access networks, and metro and log haul transports show optical OFDM can be implemented \* An introduction to signal processing for optical communications \* An introduction to optical communication fundamentals for the wireless engineer**

**Advances in the quality and accessibility of computer graphics has provided new pictorial displays and the tools with which to control them. These new display technologies have focused interest on how to design the static and dynamic images they produce to ensure effective communication. This book, based on the conference on Spatial Displays and Spatial instruments held at the Asilomar Conference Centre in 1987, focuses on the geometry of this communication. It is intended to be a source book of theoretical analysis, experimental demonstrations and practical examples from a range of contributors interested in pictorial communication, from medical artists to astronauts. The book offers the theoretical background and practical guidance needed by designers of contemporary 2D and 3D graphical computer interfaces. Its major contribution lies in its outlining of the elements of human perception and motor control which underlie the geometric design of head-mounted graphics for virtual reality displays.**

**Combines theory with real-world case studies to give a comprehensive overview of modern optical wireless technology.**

**This volume covers a fascinating period in the history of the German army, a time in which machine guns, airplanes, and weapons of mass destruction were first developed and used. Eric Brose traces the industrial development of machinery and its application to infantry, cavalry, and artillery tactics. He examines the modernity versus anti-modernity debate that raged after the Franco-Prussian war, arguing that the residue of years of resistance to technological change**

seriously undermined the German army during World War I.

**Fundamentals of Wireless Communication**

**The Story of Fiber Optics**

**Art of Doing Science and Engineering**

**The Politics of Military Technology in Germany during the Machine Age,  
1870-1918**

**Optical Communications Essentials**

**Principles of Lithography**

***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.***

***This book introduces senior-level and postgraduate students to the principles and applications of biophotonics. It also serves as a valuable reference resource or as a short-course textbook for practicing physicians, clinicians, biomedical researchers, healthcare professionals, and biomedical engineers and technicians dealing with the design, development, and application of photonics components and instrumentation to***

***biophotonics issues. The topics include the fundamentals of optics and photonics, the optical properties of biological tissues, light-tissue interactions, microscopy for visualizing tissue components, spectroscopy for optically analyzing the properties of tissue, and optical biomedical imaging. It also describes tools and techniques such as laser and LED optical sources, photodetectors, optical fibers, bioluminescent probes for labeling cells, optical-based biosensors, surface plasmon resonance, and lab-on-a-chip technologies. Among the applications are optical coherence tomography (OCT), optical imaging modalities, photodynamic therapy (PDT), photobiostimulation or low-level light therapy (LLLT), diverse microscopic and spectroscopic techniques, tissue characterization, laser tissue ablation, optical trapping, and optogenetics. Worked examples further explain the material and how it can be applied to practical designs, and the homework problems help test readers' understanding of the text.***

***This unique book reviews the future developments of short-***

***range wireless communication technologies Short-Range Wireless Communications: Emerging Technologies and Applications summarizes the outcomes of WWRF Working Group 5, highlighting the latest research results and emerging trends on short-range communications. It contains contributions from leading research groups in academia and industry on future short-range wireless communication systems, in particular 60 GHz communications, ultra-wide band (UWB) communications, UWB radio over optical fiber, and design rules for future cooperative short-range communications systems. Starting from a brief description of state-of-the-art, the authors highlight the perspectives and limits of the technologies and identify where future research work is going to be focused. Key Features: Provides an in-depth coverage of wireless technologies that are about to start an evolution from international standards to mass products, and that will influence the future of short-range communications Offers a unique and invaluable visionary overview from both industry and academia Identifies open research problems,***

***technological challenges, emerging technologies, and fundamental limits Covers ultra-high speed short-range communication in the 60 GHz band, UWB communication, limits and challenges, cooperative aspects in short-range communication and visible light communications, and UWB radio over optical fiber This book will be of interest to research managers, R&D engineers, lecturers and graduate students within the wireless communication research community. Executive managers and communication engineers will also find this reference useful.***

***Optical Fiber Communications captures the essence of this dynamic and exciting subject area by presenting the fundamental principles of optical fiber technology, and then gradually developing upon them to capture the most sophisticated modern communication networks.***

***The Trial of the Kaiser  
Principles and Practice***

***Signal Processing for Communications***

***Quantum Optics and Nanophotonics***

## ***Fibre Optic Communication Devices*** ***Fiber Optic Communications***

*This textbook takes a unified view of the fundamentals of wireless communication and explains cutting-edge concepts in a simple and intuitive way. An abundant supply of exercises make it ideal for graduate courses in electrical and computer engineering and it will also be of great interest to practising engineers.*

*This text presents the history of the development of fibre optic technology, explaining the scientific challenges that needed to be overcome, the range of applications and future potential for this fundamental communications technology.*

### ***Optical Fiber Communications***

*Photonic Crystal Fibres describes the fundamental properties of the optical waveguides known under the terms of photonic crystal fibres, microstructured fibres, or holey fibres. It outlines how the fibres are designed and fabricated, and how they are treated from a theoretical and numerical point of view. The book presents a detailed description of the different classes of photonic crystal and photonic bandgap fibres, and it broadens out a spectrum of novel applications and new fibre types.*

*How Understanding Your Partner's Brain and Attachment Style Can Help You Defuse Conflict and Build a*

*Fiber Optics Handbook: Fiber, Devices, and Systems for Optical Communications*  
*Quantum Computing*  
*Advanced Optical and Wireless Communications Systems*  
*Optical Fibre Communication*  
*Short-Range Wireless Communications*

The third edition of this popular text and reference book presents the fundamental principles for understanding and applying optical fiber technology to sophisticated modern telecommunication systems. Optical-fiber-based telecommunication networks have become a major information-transmission-system, with high capacity links encircling the globe in both terrestrial and undersea installations. Numerous passive and active optical devices within these links perform complex transmission and networking functions in the optical domain, such as signal amplification, restoration, routing, and switching. Along with the need to understand the functions of these devices comes the necessity to measure both component and network performance, and to model and stimulate the complex behavior of reliable high-capacity networks.

"What the heck is my partner thinking?" is a common refrain in romantic relationships, and with good reason. Every person is wired for love differently, with different habits, needs, and reactions to conflict. The good news is that most people's minds work in predictable ways and respond well to security, attachment, and rituals, making it possible to actually neurologically prime the brain for greater

love and fewer conflicts. *Wired for Love* is a complete insider's guide to understanding a partner's brain and promoting love and trust within a romantic relationship. Readers learn ten scientific principles they can use to avoid triggering fear and panic in their partners, manage their partners' emotional reactions when they do become upset, and recognize when the brain's threat response is hindering their ability to act in a loving way. By learning to use simple gestures and words, readers can learn to put out emotional fires and help their partners feel more safe and secure. The no-fault view of conflict in this book encourages readers to move past a "warring brain" mentality and toward a more cooperative "loving brain" understanding of the relationship. Based in the sound science of neurobiology, attachment theory, and emotion regulation research, this book is essential reading for couples and others interested in understanding the complex dynamics at work behind love and trust in intimate relationships.

Highly effective thinking is an art that engineers and scientists can be taught to develop. By presenting actual experiences and analyzing them as they are described, the author conveys the developmental thought processes employed and shows a style of thinking that leads to successful results is something that can be learned. Along with spectacular successes, the author also conveys how failures contributed to shaping the thought processes. Provides the reader with a style of thinking that will enhance a person's ability to function as a problem-solver of complex technical issues. Consists of a collection of stories about the author's participation in significant discoveries, relating how those discoveries came about

and, most importantly, provides analysis about the thought processes and reasoning that took place as the author and his associates progressed through engineering problems.

Frequency spectrum is a limited and valuable resource for wireless communications. A good example can be observed among network operators in Europe for the prices to pay for UMTS-frequency bands. Therefore, the first goal when designing future wireless communication systems (e.g. 4G - fourth generation) has to be the increase in spectral efficiency. The development in digital communications in the past years has enabled efficient modulation and coding techniques for robust and spectral efficient data, speech, audio and video transmission. These are the multi-carrier modulation (e.g. OFDM) and the spread spectrum technique (e.g. DS-CDMA), where OFDM was chosen for broadcast applications (DVB, DAB) as well as for broadband wireless indoor standards (ETSI HIPERLAN-II, IEEE-802.11) and the DS-CDMA was selected in mobile communications (IS-95, third generation mobile radio systems world wide, UMTS/IMT 2000). Since 1993 various combinations of multi-carrier (MC) modulation and the spread spectrum (SS) technique have been introduced and the field of MC-SS communications has become an independent and important research topic with increasing activities. New application fields have been proposed such as high rate cellular mobile, high rate wireless indoor and LMDS. It has been shown that MC-SS offers the high spectral efficiency, robustness and flexibility that is required for the next generation systems. Meanwhile, different alternative hybrid schemes such as

OFDM/OFDMA, MC-TDMA, etc. have been deeply analysed and adopted in different international standards (ETSI-BRAN, IEEE-802 & MMAC). Multi-Carrier & Spread-Spectrum: Analysis of Hybrid Air Interfaces draws together all of the above mentioned hybrid schemes therefore providing a greatly needed resource for system engineers, telecommunication designers and researchers in order to enable them to develop, build and deploy several schemes based on MC-transmission for the next generation systems (which will be an integration of broadband multimedia services covering both 4G mobile and fixed wireless systems). \* Offers a complete treatment of multi-carrier, spread-spectrum (SS) and time division multiplexing (TDM) techniques \* Provides an in-depth insight into hybrid multiple access techniques based on multi-carrier (MC) transmission \* Presents numerous hybrid multiple access and air interface architectures including OFDM/CDMA, MC-CDMA, MC-DS-CDMA and MT-CDMA \* Covers new techniques such as space-time coding and software radio Telecommunications engineers, hardware & software system designers and researchers as well as students, lecturers and technicians will all find this an invaluable addition to their bookshelf.

EUV Lithography

Advanced Optical Wireless Communication Systems

Electromagnetic Waves

Multi-Carrier and Spread Spectrum Systems

Wired for Love

Optical Fiber Communications

## Read PDF Optical Communication Kaiser Book

Fiber optics is the hottest topic in communications and this book from the world's leading experts clearly lays out all the details of optical communications engineering \* Essential technical guide and solutions kit for the super-fast, super-broad fiber systems and devices powering the fast-growing communications infrastructure \* Methods for generating above peak performance \* Clear explanations and answers to tough challenges for WDM, DWDM, amplifiers, solitons, and other key technologies

Ultrawideband (UWB) communication systems offer an unprecedented opportunity to impact the future communication world. The enormous available bandwidth, the wide scope of the data rate range trade-off, as well as the potential for very low-cost operation leading to pervasive usage present a unique opportunity for UWB systems to impact the way people and intelligent machines communicate and interact with their environment. The aim of this book is to provide an overview of the state of the art of UWB systems from theory to applications. Due to the rapid progress in multidisciplinary UWB research, such an overview can only be achieved by combining the areas of expertise of several scientists in the field. More than 30 leading UWB researchers and practitioners have contributed to this book covering the major topics relevant to UWB. These topics include UWB signal processing, UWB channel measurement and modeling, higher-layer protocol issues, spatial aspects of UWB signaling, UWB regulation and standardization, implementation issues, and UWB applications as well as positioning. The book is targeted at advanced academic researchers, wireless designers, and graduate students wishing to greatly enhance their knowledge of all aspects of UWB systems

Optoelectronic devices and fibre optics are the basis of cutting-edge communication systems. This monograph deals with the various components of these systems, including lasers, amplifiers,

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modulators, converters, filters, sensors, and more.

CD-ROM contains: a software package for designing fiber-optic communication systems called "OptiSystem Lite" and a set of problems for each chapter.

Optical Metamaterials

Photonic Crystal Fibres

Biophotonics

Pictorial Communication In Real And Virtual Environments

A Gentle Introduction

Optics in Our Time

*With a novel, less classical approach to the subject, the authors have written a book with the conviction that signal processing should be taught to be fun. The treatment is therefore less focused on the mathematics and more on the conceptual aspects, the idea being to allow the readers to think about the subject at a higher conceptual level, thus building the foundations for more advanced topics. The book remains an engineering text, with the goal of helping students solve real-world problems. In this vein, the last chapter pulls together the individual topics as discussed throughout the book into an in-depth look at the development of an end-to-end communication system, namely, a modem for communicating digital information*

*over an analog channel.*

*This book highlights the fundamental principles of optical fiber technology required for understanding modern high-capacity lightwave telecom networks. Such networks have become an indispensable part of society with applications ranging from simple web browsing to critical healthcare diagnosis and cloud computing. Since users expect these services to always be available, careful engineering is required in all technologies ranging from component development to network operations. To achieve this understanding, this book first presents a comprehensive treatment of various optical fiber structures and diverse photonic components used in optical fiber networks. Following this discussion are the fundamental design principles of digital and analog optical fiber transmission links. The concluding chapters present the architectures and performance characteristics of optical networks.*

*Light and light based technologies have played an important role in transforming our lives via scientific contributions spanned over thousands of years. In this book we present a vast collection of articles on various aspects of light and its*

*applications in the contemporary world at a popular or semi-popular level. These articles are written by the world authorities in their respective fields. This is therefore a rare volume where the world experts have come together to present the developments in this most important field of science in an almost pedagogical manner. This volume covers five aspects related to light. The first presents two articles, one on the history of the nature of light, and the other on the scientific achievements of Ibn-Haitham (Alhazen), who is broadly considered the father of modern optics. These are then followed by an article on ultrafast phenomena and the invisible world. The third part includes papers on specific sources of light, the discoveries of which have revolutionized optical technologies in our lifetime. They discuss the nature and the characteristics of lasers, Solid-state lighting based on the Light Emitting Diode (LED) technology, and finally modern electron optics and its relationship to the Muslim golden age in science. The book's fourth part discusses various applications of optics and light in today's world, including biophotonics, art, optical communication, nanotechnology, the eye as an optical instrument,*

*remote sensing, and optics in medicine. In turn, the last part focuses on quantum optics, a modern field that grew out of the interaction of light and matter. Topics addressed include atom optics, slow, stored and stationary light, optical tests of the foundation of physics, quantum mechanical properties of light fields carrying orbital angular momentum, quantum communication, and Wave-Particle dualism in action.*

*This textbook introduces the advanced topics of: (i) wireless communications, (ii) free-space optical (FSO) communications, (iii) indoor optical wireless (IR) communications, and (iv) fiber-optics communications and presents these different types of communication systems in a unified fashion for better practical use. Fundamental concepts, such as propagation principles, modulation formats, channel coding, diversity principles, MIMO signal processing, multicarrier modulation, equalization, adaptive modulation and coding, detection principles, and software defined transmission are first described and then followed up with a detailed look at each particular system. The book is self-contained and structured to provide straightforward guidance to readers looking to capture*

*fundamentals and gain theoretical and practical knowledge about wireless communications, optical communications, and fiber-optics communications, all which can be readily applied in studies, research, and practical applications. The textbook is intended for an upper undergraduate or graduate level course in optical communication. It features problems, an appendix with all background material needed, and homework.*

*Learning to Learn*

*Fiber-optic Communication Systems*

*Emerging Technologies and Applications*

A useful source of information to anyone who works with fiber optics, this state-of-the-art guide covers the newest technological innovations in fibers, systems and networks, and provides a solid foundation in the basics with lots of examples, practical applications, graphical presentations, and solutions to problems that simulate those found in the workplace. Devotes complete chapters to optical fibers, singlemode fibers, light sources and transmitters, photodetectors and receivers, and more. Provides real data and specification sheets to help users hone their ability to read data sheets and integrate concepts - a critical skill for practicing engineers. Offers a "two-level discussion" in each chapter: a "Basics"

section introduces the main ideas and principles involved in the devices covered, and "A Deeper Look" section offers a more theoretical and detailed discussion of the same material. Describes the test, measurement, and troubleshooting of fiber optics communications systems based on existing standards and commercially available equipment. Integrates many pictures of commercially available devices and equipment throughout. For professionals in the electronic technology industry.

The propagation of electromagnetic waves in "square-law" media, i.e., media characterized by a quadratic spatial variation of the dielectric constant, has been a favorite subject of investigation in electromagnetic theory. However, with the recent fabrication of glass fibers with a quadratic radial variation of the dielectric constant and the application of such fibers to optical imaging and communications, this subject has also assumed practical importance.

Comparison of experimental results on propagation, resolution, and pulse distortion in such inhomogeneous waveguides with theory has put the field on a sound base and spurred further work. The present book aims at presenting a unified view of important aspects of our knowledge of inhomogeneous optical waveguides. A brief discussion of homogeneous dielectric waveguides is unavoidable, since it forms a basis for the appreciation of inhomogeneous

waveguides. A short course based on some chapters of this book was offered to graduate students at IIT Delhi and was well received. We consider that despite the unavoidable mathematical nature of the present book, the comparison of experimental results with theory throughout and the description of fabrication technology (Appendices A and B) should make its appeal universal. The authors are grateful to Dr. K. Thyagarajan for writing most of Chapter 9 and to their colleagues Dr. I. C. Goyal, Dr. B. P. Pal, and Dr. A.

- \* The most comprehensive introduction to optical communications available anywhere--from the author of *Optical Fiber Communications*, the field's leading text
- \* Concise, illustrated module-style chapters quickly bring non-specialists up-to-speed
- \* Extensive DWDM (Dense Wavelength Division Multiplexing) coverage
- \* Advanced topics and limited math covered in side-bars'
- \* Free space optical (wireless fiber optics)