Fiber Bragg Gratings: Fundamentals and Applications in Telecommunications and Sensing

Full Matlab Code for Synthesis and Optimization of Bragg Gratings
Specially Optical Fibers Handbook: Planar Waveguides and other Confined Geometries
Plastic Optical Fiber Sensors Handbook
Fiber Bragg Grating Sensors: Recent Advancements, Industrial Applications and Market Exploitation
Current Trends in Short- and Long-period Fiber Gratings and Wavelength Filters in Fibre Optics
MID-INFRARED FIBER PHOTONICS
Fundamentals of Optical Fiber Sensors
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Optical Fiber Sensors for the Next Generation of Rehabilitation Robotics
Infrared Radiation
Optical Fiber Sensors
Fiber-Optic Sensors for Biomedical Applications
Handbook of Laser Technology
Fundamentals of Optical Fiber Sensors
Waveguides
Structuring and Bragg Grating Fabrication by Ultraviolet Light Induced Refractive Index Changes in Photosensitive Optical Materials
An Introduction to Optoelectronic Sensors
Optical Fiber Sensor Technology
Structural Health Monitoring
2006 Compendium On Electromagnetic Analysis
- From Electrostatics To Photonics
- Fundamentals And Applications For Physicists And Engineers
(5 Volumes)
- Bragg Gratings
- Photosensitivity, and Poling in Glass Fibers and Waveguides
- International Trends in Applied Optics
- Handbook of Laser Technology and Applications: Applications
- Fundamentals and Sensing Applications of 2D Materials
- Optical Fiber Biosensors
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- Tunable Fiber Bragg Grating Using Evanescent Field Coupling Sensors
- Fiber Bragg Grating Sensors: Development and Applications
- Life-Cycle Civil Engineering: Innovation, Theory and Practice
- Springer Handbook of Experimental Solid Mechanics
- Optomechatronics
- Fiber Bragg Grating Sensors and No-Core Fibre Sensors
Handbook of Optical Sensors
Fiber Bragg Grating Sensors and Systems
Fiber Bragg Grating Based Sensors and Systems
Polymer Optical Fibres
Specialty Optical Fibers Handbook
Planar Waveguides and other Confined Geometries
Plastic Optical Fiber Sensors
This book represents a collection of scientific articles covering the field of infrared radiation. It offers extensive information about current scientific research and engineering developments in this area. Each chapter has been thoroughly revised and each represents significant contribution to the scientific community interested in this matter. Developers of infrared technique, technicians using infrared equipment and scientists that have interest in infrared radiation and its interaction with medium will comprise the main readership as they search for current studies on the use of infrared radiation. Moreover this book can be useful to students and postgraduates with appropriate specialty and also for multifunctional workers.

Fiber Bragg Grating Sensors: Recent Advancements, Industrial Applications and Market Exploitation
Provides an overview of Fiber Bragg Gratings (FBGs), from fundamentals to applications. Evaluates the advantages and disadvantages of particular applications, methods and techniques. Contains new chapters on sensing, femtosecond laser writing of FBGs and poling of glass and optical fibers. Includes a special version of the photonic simulator PicWave, allowing the reader to make live simulations of many of the example devices presented in the book. This fully revised, updated and expanded second edition covers the substantial advances in the manufacture and use of FBGs in the years since the publication of the pioneering first edition. It presents a comprehensive treatise on FBGs and addresses issues such as the merits of one solution over another; why particular fabrication methods are preferred; and what advantages a user may gain from certain techniques. Beginning with the principles of FBGs, the book progresses to discuss photosensitization of optical fibers, Bragg grating fabrication and theory, properties of gratings, specific applications, sensing technology, glass poling, advances in femtosecond laser writing of Bragg gratings and FBG measurement techniques. In addition to material on telecommunications usage of FBGs, application areas such as laser fibers and sensors are addressed in greater detail. This special version of Picwave is limited to modelling only the passive fibre devices covered in this book. However the full PicWave package is capable of modelling other non-linear and active devices such as laser diodes and SOAs as discussed in Chapter 8. More information about PicWave can be found at www.photond.com/products/picwave.htm. In addition to researchers, scientists, and graduate students, this book will be of interest to industrial practitioners in the field of fabrication of fiber optic materials and devices. Raman Kashyap, Canada Research Chair holder on Future Photonics Systems, and Professor at École Polytechnique, University of Montréal since 2003, has researched optical fibers and devices for over 30 years. He pioneered the fabrication of FBGs and applications in telecommunications and photonics. Provides an overview of Fiber Bragg Gratings (FBGs), from fundamentals to applications. Evaluates the advantages and disadvantages of particular applications, methods and techniques. Contains new chapters on sensing, femtosecond laser writing of FBGs and poling of glass and optical fibers. Includes a special version of the photonic simulator PicWave, allowing the reader to make live simulations of many of the example devices presented in the book.
Current Trends in Short- and Long-period Fiber Gratings Optical Fiber Sensor Technology, Advanced Applications - Bragg Gratings and Distributed Sensors, builds upon the foundations of the subject in the preceding four volumes of this series, concentrating as they do upon both applications and the technology of advanced optical fiber sensors. Previous volumes have covered the fundamentals of the field, devices and systems and chemical and environmental monitoring. This volume deals with a range of highly topical sensor devices and commercial systems, with considerable emphasis upon one of the most important areas, Bragg gratings in fibers, their fabrication and applications in advanced sensor systems and the principles and use of distributed fiber optic sensors. The volume is well illustrated and referenced, pointing to hundreds of key publications accessible in the open literature. It draws upon a group of authors with an international reputation for their work in the area, carefully edited into a coherent and logical text by the editors, based on their considerable experience in the field. This book series will provide an invaluable source for researchers, engineers and advanced students in the field of optical fibers, optoelectronics and measurement and sensing.

Wavelength Filters in Fibre Optics Fundamentals and Sensing Applications of 2D Materials provides a comprehensive understanding of a wide range of 2D materials. Examples of fundamental topics include: defect and vacancy engineering, doping and advantages of 2D materials for sensing, 2D materials and composites for sensing, and 2D materials in biosystems. A wide range of applications are addressed, such as gas sensors based on 2D materials, electrochemical glucose sensors, biosensors (enzymatic and non-enzymatic), and printed, stretchable, wearable and flexible biosensors. Due to their sub-nanometer thickness, 2D materials have a high packing density, thus making them suitable for the fabrication of thin film based sensor devices. Benefiting from their unique physical and chemical properties (e.g. strong mechanical strength, high surface area, unparalleled thermal conductivity, remarkable biocompatibility and ease of functionalization), 2D layered nanomaterials have shown great potential in designing high performance sensor devices. Provides a comprehensive overview of 2D materials systems that are relevant to sensing, including transition metal dichalcogenides, metal oxides, graphene and other 2D materials system includes information on potential applications, such as flexible sensors, biosensors, optical sensors, electrochemical sensors, and more Discusses graphene in terms of the lessons learned from this material for sensing applications and how these lessons can be applied to other 2D materials

MID-INFRARED FIBER PHOTONICS This book is a comprehensive contributed volume that aims to describe and explain the design, fabrication, operating characteristics, and specific applications of optical fibers. These specialty fibers include any kind of optical fiber that has been architecturally manipulated to diverge from a conventional structure. For instance, metal-coated fibers can be utilized for bandwidth improvement, and hollow core fibers offer more controllable dispersion for sensitive medical procedures. Applications for these specialty fibers abound in the biomedical, sensors, and industrial fields, as well as in more traditional communications capacities. This book will act as a “specialty fiber” guided tour, hosted by the top names in the discipline. The globally renowned editors, Drs. Mendez and Morse, have extensive experience in research, academia, and industry. *Completely covers biomedical and industrial sensor technology with emphasis on real world applications *Comparative studies of pros and cons of all fiber types with relation to test and measurement, mechanical properties and strength, and reliability *Easy to access essential facts and details at the beginning of each chapter

Fundamentals of Optical Fiber Sensors This book presents a theoretical description of fiber Bragg gratings, focusing on channels' densification and the tunability of Bragg filters. It also includes a full Matlab code for the synthesis and optimization of several kinds of fiber Bragg gratings by using the directed tabu search, the simulated annealing method and the genetic algorithm. Physical and optical parameters of uniform, chirped and sampled fiber Bragg gratings are then reconstructed with these algorithms.

Optical Fiber Sensor Technology This book focuses on the development and set-up of fibre Bragg grating (FBG) and no-core fibre (NCF) sensors. It discusses the properties of the sensors and modelling of the resulting devices, which include electronic, optoelectronic, photovoltaic, and spintronic devices. In addition to providing detailed explanations of the properties of FBG and NCF sensors, it features a wealth of instructive illustrations and tables, helping to visualize the respective devices' functions.

Bragg Gratings, Photosensitivity, and Poling in Glass Fibers and Waveguides Printed Edition of the Special Issue Published in Sensors

Optical Fiber Sensors for the Next Generation of Rehabilitation Robotics This is the fifth in a series initiated in 1989 by the International Commission for Optics (ICO). These books, which are published every three years, highlight the advances in optics that are underway at the time of their publication. These are a collection of significant contributions from leading scientists and engineers throughout the world. It shows the diverse role optics play in modern society, with optics now taking its place along with mechanical, thermal, electrical and electronic options, in order to bring solutions. The world is coming to recognize the ubiquitous nature of optics and its primarily enabling role in our everyday world.

Infrared Radiation

Optical Fiber Sensors Handbook of Optical Sensors provides a comprehensive and integrated view of optical sensors, addressing the fundamentals, structures, technologies, applications, and future perspectives. Featuring chapters authored by recognized experts and major contributors to the field, this essential reference: Explains the basic aspects of optical sensors and Fiber-Optic Sensors for Biomedical Applications This book describes the latest development in optical fiber devices, and their applications to sensor technology. Optical fiber sensors, an important application of the optical fiber, have experienced fast development, and attracted wide attentions in basic science as well as in practical applications. Sensing is often likened to human sense organs. Optical fiber can not only transport information acquired by sensors at high speed and large volume, but also can play the roles of sensing element itself. Compared with electric and other types of sensors, fiber sensor technology has unique merits. It has advantages over conventional bulky optic sensors, such as combination of sensing and signal transportation, smaller size, and possibility of building distributed systems. Fiber sensor technology has been used in various areas of industry, transportation, communication,
security and defense, as well as daily life. Its importance has been growing with the advancement of the technology and the expansion of the scope of its application, a growth this book fully describes.


Fundamentals of Optical Fiber Sensors This book is a collection of papers that originated as a Special Issue, focused on some recent advances related to fiber Bragg grating-based sensors and systems. Conventionally, this book can be divided into three parts: intelligent systems, new types of sensors, and original interrogators. The intelligent systems presented include evaluation of strain transition properties between cast-in FBGs and cast aluminum during uniaxial straining, multi-point strain measurements on a containment vessel, damage detection methods based on long-gauge FBG for highway bridges, evaluation of a coupled sequential approach for rotocraft landing simulation, wearable hand modules and real-time tracking algorithms for measuring finger joint angles of different hand sizes, and glass icing detection of 110 kV composite insulators. New types of sensors are reflected in multi-point strain measurements on a containment vessel, multi-point and temperature-independent FBG dynamical demodulator using pulse-width modulation; and dual wavelength differential detection of FBG sensors with a pulsed DFB laser.

Waveguide Structuring and Bragg Grating Fabrication by Ultraviolet Light Induced Refractive Index Changes in Photosensitive Optical Materials Optical Fiber Biosensors: Device Platforms, Biorecognition, Applications provides a comprehensive overview of the field of fiber optic sensors using an interdisciplinary approach that covers the fabrication of sensing devices and optical hardware, the functionalization to perform selective biorecognition, and the main applications of biosensors, with a present and a future outlook. Chapters discuss the principles of light propagation and the sensing devices suitable to perform biosensing with optical fibers, the process to functionalize the previous devices to selective biosensing, and applications in cells, small molecules, biomarkers and protein sensing, with a birds eye view on the most important results. This book provides a coherent picture of fiber optic biosensors, from the start (the device) to the end (the application), explaining in simple terms what is the whole process for development of a biosensor. The book also contains practical material (e.g. commercial instruments, fabrication instructions, medical standards for biocompatibility) that cannot be easily found elsewhere, and this is very useful for researchers to plan their development and build their labs. Covers the technologies and operating principles of optical fiber devices used in biosensing Contains chapters on the chemistry and operational strategy to functionalize a fiber device to become an effective biosensor Addresses the main applications of fiber optic biosensors and their specialization

An Introduction to Optoelectronic Sensors The book is an exciting source of information for individuals interested in learning about and marketing sensors. The book focuses on scientific and commercial advances in Fiber Bragg Grating (FBG) sensor technology since its discovery over 30 years ago.

Structural Health Monitoring 2006 The invention of the laser was one of the towering achievements of the twentieth century. At the opening of the twenty-first century we are witnessing the burgeoning of the myriad technical innovations to which that invention has led. The Handbook of Laser Technology and Applications is a practical and long-lasting reference source for scientists and engineers who work with lasers. The Handbook provides, a comprehensive guide to the current status of lasers and laser systems; it is accessible to science or engineering graduates needing no more than standard undergraduate knowledge of optics. Whilst being a self-contained reference work, the Handbook provides extensive references to contemporary work, and is a basis for studying the professional journal literature on the subject. It covers applications through detailed case studies, and is therefore well suited to readers who wish to use it to solve specific problems of their own. The first of the three volumes comprises an introduction to the basic scientific principles of lasers, laser beams and nonlinear optics. The second volume describes the mechanisms and operating characteristics of specific types of laser including crystalline solid - state lasers, semiconductor diode lasers, fibre lasers, gas lasers, chemical lasers, dye lasers and many others as well as detailing the optical and electronic components which tailor the laser’s performance and beam delivery systems. The third volume is devoted to case studies of applications in a wide range of subjects including materials processing, optical measurement techniques, medicine, telecommunications, data storage, spectroscopy, earth sciences and astronomy, and plasma fusion research. This vast compendium of knowledge on laser science and technology is the work of over 130 international experts, many of whom are recognised as the world leaders in their respective fields. The reader is engaged in the science, technology, industrial or medical applications of lasers or is researching the subject as a manager or investor in technical enterprises they cannot fail to be informed and enlightened by the wide range of information the Handbook supplies.

Compendium On Electromagnetic Analysis - From Electrostatics To Photonics: Fundamentals And Applications For Physicists And Engineers (In 5 Volumes) In this work, we present experimental results on tenability of fiber Bragg grating incorporating evanescent field coupling. Evanescent field is the exponentially decaying part of an optical mode formed in a waveguide. A section of fiber with a Bragg grating written in it is side-polished until most of the cladding is removed. The evanescent field is modified by applying different index matching oil and by placing a dielectric material on the polished area of the fiber. A tunability as much as 5 nm was demonstrated as the applied index matching oil varied from n = 1.40 to n = 1.45. Polarization dependent behavior of the device was also measured and it was found out that the polarization component that is perpendicular to the polished surface experiences severe loss. A prototype tunable grating device incorporating a MEMS structure is also discussed.

Bragg Gratings, Photosensitivity, and Poling in Glass Fibers and Waveguides Optical Fiber Sensors for the Next Generation of Rehabilitation Robotics presents development concepts and applications of optical fiber sensors made of compliant materials in rehabilitation robotics. The book provides methods for the instrumentation of novel compliant devices. It presents the development, characterization and application of optical fiber sensors in robotics, ranging from conventional robots with rigid structures to novel wearable systems with soft structures, including smart textiles and intelligent structures for healthcare. Readers can look to this book for help in designing robotic structures for different applications, including problem-solving tactics in soft robotics. This book will be a great resource for mechanical, electrical and electronics engineers and photonic and optical sensing engineers. Addresses optical fiber sensing solutions in wearable systems and soft robotics Presents developments—from foundational, to novel and future applications—of optical fiber sensors in the next generation of robotic devices Provides methods for the instrumentation of novel compliant devices

International Trends in Applied Optics Fiber Bragg gratings are flexible, cost-effective and highly efficient, with a vast range of potential applications. This timely new work provides a comprehensive description of the principles and practical applications of this latest technology, which has the potential to revolutionize telecommunications and significantly impact optical fiber sensing. Here the authors explain the underlying physics and practical aspects in a clear and unambiguous manner.

Handbook of Laser Technology and Applications: Applications 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.

Fundamentals and Sensing Applications of 2D Materials Optical Fiber Biosensors 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.

**Fiber Optic Sensors**

Sensors are the most important component in any system and engineers in any field need to understand the fundamentals of how these components work, how to select them properly and how to integrate them into an overall system. This book has outlined the fundamentals, analytical concepts, modelling and design issues, technical details and practical applications of different types of sensors, electromagnetic, capacitive, ultrasonic, vision, terahertz, displacement, fibre-optic, and so on. The book addresses the identification, modeling, selection, operation and integration of a wide variety of sensors, demonstrates the concepts of different sensors technology through simulation, design and real implementations, discusses the design and fabrication of high performance modern sensors technology, presents a selection of cutting-edge applications. Written by experts in their area of research, this book will be useful reference book for engineers and scientists especially the post-graduate students find this book as reference book for their research.

**Tunable Fiber Bragg Grating Using Evanescent Field Coupling**

This book provides a comprehensive overview of the theoretical concepts and experimental applications of planar waveguides and other confined geometries, such as optical fibres. Covering a broad array of advanced topics, it begins with a sophisticated discussion of planar waveguide theory, and covers subjects including efficient production of planar waveguides, materials selection, nonlinear effects, and applications including species analytics down to single-molecule identification and optical switching using planar waveguides. Written by specialists in the techniques and applications covered, this book will be a useful resource for advanced graduate students and researchers studying planar waveguides and optical fibers.

**Life-Cycle Civil Engineering: Innovation, Theory and Practice**

In this book the reader will find a collection of chapters written by different experts around the world, describing the current research trends in both short- and long-period fiber grating technology. This work is mainly addressed to researchers already working in this area, but it is also accessible to anyone with a scientific background who desires to have an updated overview of the recent progress in this domain. It will also be valuable to scientists and engineers who have become newly involved in this field. Each chapter is self-contained and can be read independently of the others. This book intends to provide highlights of the current research in this area, showing the recent advances in the field of fiber gratings.

**Springer Handbook of Experimental Solid Mechanics**

Plastic Optical Fiber Sensors cover the fundamentals and applications of a new class of fiber sensors. With contributions from leading academics in the area, this book covers the theory of plastic optical fiber sensors or (POFs), as well as applications in oil, gas, biotechnology, and energy fields. Using multiple examples, the editors showcase the advantageous characteristics of POFs, such as ease of handling, large diameter, inexpensive peripheral components and simple termination tools. By doing so, the editors assert that there has been a proliferation of the use of POFs in new consumer products. The book also highlights uses for building various products, such as a POF sensor for oil trucker valve monitoring, a monitoring system for high voltage substation switch, an oil leaking sensor for offshore platforms and a solar tracker for illumination. Including over 300 black and white images, this book would be highly beneficial for professionals in manufacturing as well as academics in universities, particularly those who use optical fiber sensors on a regular basis.

**Optomechatronics Life-Cycle Civil Engineering: Innovation, Theory and Practice**

This contains the lectures and papers presented at IALCCE2020, the Seventh International Symposium on Life-Cycle Civil Engineering, held in Shanghai, China, October 27-30, 2020. It consists of a book of extended abstracts and a USB card containing the full papers of 230 contributions, including the Fazlur R. Khan lecture, eight keynote lectures, and 221 technical papers from all over the world. All major aspects of life-cycle engineering are addressed, with special emphasis on life-cycle design, assessment, maintenance and management of structures and infrastructure systems under various deterioration mechanisms due to various environmental hazards.
is expected that the proceedings of IALCCE2020 will serve as a valuable reference to anyone interested in life-cycle of civil infrastructure systems, including students, researchers, engineers and practitioners from all areas of engineering and industry.

Fiber Bragg Grating Based Sensors and Systems This book describes the latest development in optical fiber devices, and their applications to sensor technology. Optical fiber sensors, an important application of the optical fiber, have experienced fast development, and attracted wide attentions in basic science as well as in practical applications. Sensing is often likened to human sense organs. Optical fiber can not only transport information acquired by sensors at high speed and large volume, but also can play the roles of sensing element itself. Compared with electric and other types of sensors, fiber sensor technology has unique merits. It has advantages over conventional bulky optic sensors, such as combination of sensing and signal transportation, smaller size, and possibility of building distributed systems. Fiber sensor technology has been used in various areas of industry, transportation, communication, security and defense, as well as daily life. Its importance has been growing with the advancement of the technology and the expansion of the scope of its application, a growth this book fully describes.

Fiber Bragg Gratings

Fibre Bragg Grating and No-Core Fibre Sensors This book presents the basic principles of optical sensor technology in line with the tremendous development in the concept of optical fibers. In the first four chapters, the book discusses the basic principles of optical sensor technology in a simplified manner, making it suitable for all levels of study and research. The seven remaining chapters are concerned with the practical applications of optical sensor technology in all fields such as oil and gas, civil engineering, medical and military fields and harsh environments.

Handbook of Optical Sensors Polymer Optical Fibres: Fibre Types, Materials, Fabrication, Characterization, and Applications explores polymer optical fibers, specifically their materials, fabrication, characterization, measurement techniques, and applications. Optical effects, including light propagation, degrading effects of attenuation, scattering, and dispersion, are explained. Other important parameters like mechanical strength, operating temperatures, and processability are also described. Polymer optical fibers (POF) have a number of advantages over glass fibers, such as low cost, flexibility, low weight, electromagnetic immunity, good bandwidth, simple installation, and mechanical stability. Provides systematic and comprehensive coverage of materials, fabrication, properties, measurement techniques, and applications of POF Focuses on industry needs in communication, illumination and sensors, the automotive industry, and medical and biotechnology Features input from leading experts in POF technology, with experience spanning optoelectronics, polymer, and textiles Explains optical effects, including light propagation, degrading effects of attenuation, scattering, and dispersion

Fiber Bragg Gratings 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.

Polymer Optical Fibres As a reference book, the Springer Handbook provides a comprehensive exposition of the techniques and tools of experimental mechanics. An informative introduction to each topic is provided, which advises the reader on suitable techniques for practical applications. New topics include biological materials, MEMS and NEMS, nanoindentation, digital photomechanics, photoacoustic characterization, and atomic force microscopy in experimental solid mechanics. Written and compiled by internationally renowned experts in the field, this book is a timely, updated reference for both practitioners and researchers in science and engineering.

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