

Nonlinear Optics Boyd Solution

An in-depth and wide-ranging introduction to the field of quantum optics.

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.

Since the early days of nonlinear optics in the 1960s, the field has expanded dramatically, and is now a vast and vibrant field with countless technological applications. Providing a gentle introduction to the principles of the subject, this textbook is ideal for graduate students starting their research in this exciting area. After basic ideas have been outlined, the book offers a thorough analysis of second harmonic generation and related second-order processes, before moving on to third-order effects, the nonlinear optics of short optical pulses and coherent effects such as electromagnetically-induced transparency. A simplified treatment of high harmonic generation is presented at the end. More advanced topics, such as the linear and nonlinear optics of crystals, the tensor nature of the nonlinear coefficients and their quantum mechanical representation, are confined to specialist chapters so that readers can focus on basic principles before tackling these more difficult aspects of the subject.

Guided Wave Optics and Photonic Devices introduces readers to a broad cross-section of topics in this area, from the basics of guided wave optics and nonlinear optics to biophotonics. The book is inspired by and expands on lectures delivered by distinguished speakers at a three-week school on guided wave optics and devices organized at the CSIR-Central Glass and Ceramic Research Institute in Kolkata in 2011.

Guided Wave Optics and Photonic Devices: Principles, Applications, and Future Directions The book discusses the concept of modes in a guided medium from first principles, emphasizing the importance of dispersion properties in optical fibers. It describes fabrication and characterization techniques of rare-earth-doped optical fibers for amplifiers and lasers, with an eye to future applications. Avoiding complex mathematical formalism, it also presents the basic theory and operational principles of fiber amplifiers and lasers. The book examines techniques for writing fiber Bragg gratings, which are of particular interest for smart sensing applications. A chapter focuses on the fundamental principles of Fourier optics and its implementation in guided wave optics. In addition, the book explains the critical phenomena of soliton dynamics and supercontinuum generation in photonic crystal fiber, including its fabrication process and characteristics. It also looks at plasmonics in guided media and nonlinearity in stratified media—both key areas for future research. The last chapter explores the importance of lasers in biophotonic applications. Written by experts engaged in teaching, research, and development in optics and photonics, this reference brings together fundamentals and recent advances in one volume. It offers a valuable overview of the field for students and researchers alike and identifies directions for future research in guided wave and photonic device technology.

Praise for the 1st Edition: "well written and up to date.... The problem sets at the end of each chapter reinforce and enhance the material presented, and may give students confidence in handling real-world problems." Optics & Photonics News "rigorous but simple description of a difficult field keeps the reader 's attention throughout.... serves perfectly for an introductory-level course." Physics Today This fully revised introduction enables the reader to understand and use the basic principles related to many phenomena in nonlinear optics and provides the mathematical tools necessary to solve application-relevant problems. The book is a pedagogical guide aimed at a diverse audience including engineers, physicists, and chemists who want a tiered approach to understanding nonlinear optics. The material is augmented by numerous problems, with many requiring the reader to perform real-world calculations for a range of fields, from optical communications to remote sensing and quantum information. Analytical solutions of equations are covered in detail and numerical approaches to solving problems are explained and demonstrated. The second edition expands the earlier treatment and includes: A new chapter on quantum nonlinear optics. Thorough treatment of parametric optical processes covering birefringent, tolerances and beam optimization to design and build high conversion efficiency devices. Treatment of numerical methods to solving sets of complex nonlinear equations. Many problems in each chapter to challenge reader comprehension. Extended treatment of four-wave mixing and solitons. Coverage of ultrafast pulse propagation including walk-off effects.

This book is an interdisciplinary introduction to optical collapse of laser beams, which is modelled by singular (blow-up) solutions of the nonlinear Schr ödinger equation. With great care and detail, it develops the subject including the mathematical and physical background and the history of the subject. It combines rigorous analysis, asymptotic analysis, informal arguments, numerical simulations, physical modelling, and physical experiments. It repeatedly emphasizes the relations between these approaches, and the intuition behind the results. The Nonlinear Schr ödinger Equation will be useful to graduate students and researchers in applied mathematics who are interested in singular solutions of partial differential equations, nonlinear optics and nonlinear waves, and to graduate students and researchers in physics and engineering who are interested in nonlinear optics and Bose-Einstein condensates. It can be used for courses on paraxial differential equations, nonlinear waves, and nonlinear optics. Gad Fibich is a Professor of Applied Mathematics at Tel Aviv University. " This book provides a clear presentation of the nonlinear Schrödinger equation and its applications from various perspectives (rigorous analysis, informal analysis, and physics). It will be extremely useful for students and researchers who enter this field." Frank Merle, Université de Cergy-Pontoise and Institut des Hautes Études Scientifiques, France

Nonlinear Optics probes in great depth quadratic and cubic nonlinearities, photorefractive nonlinear optics, the nonlinear optical properties of nematic liquid crystals, and photonic bandgap structures. This reference places core physical principles and theoretical concepts in dialogue with contemporary applications and research and presents the essential physics behind the products and promise of this very fertile field. It presents new developments in the dispersion management in nonlinear optical fibers and the combined effects of quadratic and cubic nonlinearities on harmonic generation. Coverage includes a review of linear wave propagation and the origins of optical nonlinearity.

Modern Optics is a fundamental study of the principles of optics using a rigorous physical approach based on Maxwell's Equations. The treatment provides the mathematical foundations needed to understand a number of applications such as laser optics, fiber optics and medical imaging covered in an engineering curriculum as well as the traditional topics covered in a physics based course in optics. In addition to treating the fundamentals in optical science, the student is given an exposure to actual optics engineering problems such as paraxial matrix optics, aberrations with experimental examples, Fourier transform optics (Fresnel-Kirchoff formulation), Gaussian waves, thin films, photonic crystals, surface plasmons, and fiber optics. Through its many pictures, figures, and diagrams, the text provides a good physical insight into the topics covered. The course content can be modified to reflect the interests of the instructor as well as the student, through the selection of optional material provided in appendices.

Proceedings of the International Summer School, Aalborg, Denmark, July 31—August 4, 1989

Introduction to non-Kerr Law Optical Solitons

Nonlinear Optical Borate Crystals

Nonlinear Optics in Semiconductor Physics I

The Elements of Nonlinear Optics

Nonlinear Optical Waves

Biochemical Applications of Nonlinear Optical Spectroscopy

Physics of Light and Optics (Black & White)

Laser Beam Propagation in Nonlinear Optical Media

Contemporary Nonlinear Optics discusses the different activities in the field of nonlinear optics. The book is comprised of 10 chapters. Chapter 1 presents a description of the field of nonlinear guided-wave optics. Chapter 2 surveys a new branch of nonlinear optics under the heading optical solitons. Chapter 3 reviews recent progress in the field of optical phase conjugation. Chapter 4 discusses ultrafast nonlinear optics, a field that is growing rapidly with the ability of generating and controlling femtosecond optical pulses. Chapter 5 examines a branch of nonlinear optics that may be termed nonlinear quantum optics. Chapter 6 reviews the new field of photorefractive adaptive neural networks. Chapter 7 presents a discussion of recent successes in the development of nonlinear optical media based on organic materials. Chapter 8 reviews the field of nonlinear optics in quantum confined structures. Chapter 9 reviews the field of nonlinear laser spectroscopy, with emphasis on advances made during the 1980s. Finally, Chapter 10 reviews the field of nonlinear optical dynamics by considering nonlinear optical systems that exhibit temporal, spatial, or spatio-temporal instabilities. This book is a valuable source for physicists and other scientists interested in optical systems and neural networks.

This self-contained treatment of field quantization requires no prior knowledge of nonlinear optics. Supplemented by end-of-chapter exercises and detailed examples of calculation techniques in different systems, it is a valuable resource for graduate students and researchers in nonlinear optics, condensed matter physics, quantum information and atomic physics.

With the emergence of nanoscience and technology in the 21st century, research has shifted its focus on the quantum and optical dynamical properties of matter such as atoms, molecules, and solids which are properly characterized in their dynamic state. Quantum and Optical Dynamics of Matter for Nanotechnology carefully addresses the general key concepts in this field and expands to more complex discussions on the most recent advancements and techniques related to quantum dynamics within the confines of physical chemistry. This book is an essential reference for academics, researchers, professionals, and advanced students interested in a modern discussion of a niche area of nanotechnology.

In recent years we have witnessed in physics a substantial increase in interest in carrying out fundamental studies in the nonlinear optics of condensed matter. At the Danish universities, this increase has been especially pronounced at the Institute of Physics at the University of Aalborg, where the main activities are centered around fundamental research within the domains of nonlinear quantum optics, nonlinear optics of metals and superconductors, and nonlinear surface optics. In recognition of this it was decided to arrange the first international summer school on nonlinear optics in Denmark at the Institute of Physics at the University of Aalborg. This book is based on the lectures and contributed papers presented at this international summer school, which was held in the period 31 July-4 Au gust 1989. About 60 experienced and younger scientists from 12 different countries participated. Twenty-eight lectures were given by 14 distinguished scientists from the United States, Italy, France, Germany, Scotland, England, and Denmark. In addition to the lectures given by the invited speakers, 11 contributed papers were presented. The programme of the summer school em phasized a treatment of basic physical properties of the nonlinear interaction of light and condensed matter and both theoretical and experimental aspects were covered. Furthermore, general principles as well as topics of current interest in the research literature were discussed.

Recent years have witnessed rapid advances in the development of solid state, fiber, semiconductor, and parametric sources of coherent radiation, which are opening up new opportunities for laser applications. Laser Sources and Applications provides a natural introduction to the basic principles of these developments at a level suitable for postgraduate research students and others with a basic knowledge of lasers and nonlinear optics. Encompassing both the physics and engineering aspects of the field, the book covers the nature of nonlinear optical interactions; solid state, fiber, and semiconductor lasers; optical parametric oscillators; and ultrashort pulse generation and applications. It also explores applications of current interest, such as electromagnetically induced transparency, atomic trapping, and soliton optical communications.

Presents a clear systematic molecular-based description of nonlinear optical polarization analysis of chemical and biological assemblies.

This is very unique and promises to be an extremely useful guide to a host of workers in the field. They have given a generalized presentation likely to cover most if not all situations to be encountered in the laboratory, yet also highlight several specific examples that clearly illustrate the methods. They have provided an admirable contribution to the community. If someone makes their living by designing lasers, optical parametric oscillators or other devices employing nonlinear crystals, or designing experiments incorporating laser beam propagation through linear or nonlinear media, then this book will be a welcome addition to their bookshelf." —Richard Sutherland, Mount Vernon Nazarene University, Ohio, USA Laser Beam Propagation in Nonlinear Optical Media provides a collection of expressions, equations, formulas, and derivations useful for various nonlinear optical and nonlinear media which are useful for predicting experimental results. The authors address light propagation in anisotropic media, oscillation directions of the electric field and displacement vectors, the walk-off angles between the Poynting and propagation vectors, and effective values of the d coefficient for biaxial, uniaxial, and isotropic crystals. They delve into solutions of the coupled three wave mixing equations for various nonlinear optical processes, including quasi-phase matching and optical parametric oscillation, and discuss focusing effects and numerical techniques used for beam propagation analysis in nonlinear media, and phase retrieval technique. The book also includes examples of MATLAB and FORTRAN computer programs for numerical evaluations. An ideal resource for students taking graduate level courses in nonlinear optics, Laser Beam Propagation in Nonlinear Optical Media can also be used as a reference for practicing professionals.

Directed toward physicists and engineers interested in the device applications enabled by nonlinear optics, this text is suitable for advanced undergraduates and graduate students. Its content is presented entirely on a classical basis and requires only an elementary knowledge of quantum mechanics. The authors demonstrate how real laboratory situations can diverge from ideal theory, acquainting readers with the kinds of problems common to construction of a nonlinear device. They also offer a detailed discussion of the practical problems and characteristics of nonlinear materials, as well as the selection procedures necessary to ensure the use of good material. Their treatment begins with an introduction to the theories of linear and nonlinear optics, along with the basic ideas behind them. Succeeding chapters explore phase matching and nonlinear materials, followed by detailed treatments of second-harmonic generation, parametric up-conversion, and optical parametric amplification and oscillation. Appendixes offer a comprehensive list of materials and their properties; the text concludes with references and an index.

Contemporary Nonlinear Optics

Quantum and Optical Dynamics of Matter for Nanotechnology

From molecules to condensed phases

Principals and Applications

Quantum Optics

The Quantum Theory of Nonlinear Optics

Nonlinear Optics

Modern Optics

Physics of Nonlinear Optics

This clear and self-contained review of the last four decades of research highlights in the hot field of nonlinear optical (NLO) crystals, particularly of borate-based ultraviolet and deep-ultraviolet NLO crystals, covers three major subjects: the structure-property relationship in borate crystals, the structural and optical characteristics of various promising borate crystals, and their fruitful applications in a wide range of scientific and technological fields. Edited by the discoverers and users of these optical borate crystals, this is a readily accessible reading for semiconductor, applied and solid state physicists, materials scientists, solid state chemists, manufacturers of optoelectronic devices, and those working in the optical industry.

One of the Top Selling Physics Books according to YBP Library Services The exotic effects of slow light have been widely observed in the laboratory. However, current literature fails to explore the wider field of slow light in photonic structures and optical fibers. Reflecting recent research, Slow Light: Science and Applications presents a comprehensive introduction to slow light and its potential applications, including storage, switching, DOD applications, and nonlinear optics. The book covers fundamentals of slow light in various media, including atomic media, semiconductors, fibers, and photonic structures. Leading authorities in such diverse fields as atomic vapor spectroscopy, fiber amplifiers, and integrated optics provide an interdisciplinary perspective. They uncover potential applications in both linear and nonlinear optics. While it is impossible to account for all the captivating developments that have occurred in the last few years, this book provides an exceptional survey of the current state of the slow light field.

Rapid development of optoelectronic devices and laser techniques poses an important task of creating and studying, from one side, the structures capable of effectively converting, modulating, and recording optical data in a wide range of radiation energy densities and frequencies, from another side, the new schemes and approaches capable to activate and simulate the modern features. It is well known that nonlinear optical phenomena and nonlinear optical materials have the promising place to resolve these complicated technical tasks. The advanced idea, approach, and information described in this book will be fruitful for the readers to find a sustainable solution in a fundamental study and in the industry approach. The book can be useful for the students, post-graduate students, engineers, researchers and technical officers of optoelectronic universities and companies.

Ideal for cell biologists, life scientists, biomedical engineers, and clinicians, this handbook provides comprehensive treatment of the theories, techniques, and biomedical applications of nonlinear optics and microscopy. A non-linear wave is one of the fundamental objects of nature. They are inherent to aerodynamics and hydrodynamics, solid state physics and plasma physics, optics and field theory, chemistry reaction kinetics and population dynamics, nuclear physics and gravity. All non-linear waves can be divided into two parts: dispersive waves and dissipative ones. The history of investigation of these waves has been lasting about two centuries. In 1834 J. S. Russell discovered the extraordinary type of waves without the dispersive broadening. In 1965 N. J. Zabusky and M. D. Kruskal found that the Korteweg-de Vries equation has solutions of the solitary wave form. This solitary wave demonstrates the particle-like properties, i. e. , stability under propagation and the elastic interaction under collision of the solitary waves. These waves were named solitons. In succeeding years there has been a great deal of progress in understanding of soliton nature. Now solitons have become the primary components in many important problems of nonlinear wave dynamics. It should be noted that non-linear optics is the field, where all soliton features are exhibited to a great extent. This book had been designed as the tutorial to the theory of non-linear waves in optics. The first version was projected as the book covering all the problems in this field, both analytical and numerical methods, and results as well. However, it became evident in the process of work that this was not a real task.

Proceedings of the NATO Advanced Research Workshop, Tashkent, Uzbekistan, 2-8 October 2001

A comprehensive treatment of nonlinear optics emphasizing physical concepts and the relationship between theory and experiment. Systematically describes a number of sub-topics in the field. Up-to-date references and numerous illustrations will help both beginners and practitioners interested in gaining a more thorough understanding of the subject.

The Optical Society of America (OSA) and SPIE – The International Society for Optical Engineering have awarded Robert Boyd with an honorable mention for the Joseph W. Goodman Book Writing Award for his work on Nonlinear Optics, 2nd edition. Nonlinear optics is essentially the study of the interaction of strong laser light with matter. It lies at the basis of the field of photonics, the use of light fields to control other light fields and to perform logical operations. Some of the topics of this book include the fundamentals and applications of optical systems based on the nonlinear interaction of light with matter. Topics to be treated include: mechanisms of optical nonlinearity, second-harmonic and sum- and difference-frequency generation, photonics and optical logic, optical self-action effects including self-focusing and optical soliton formation, optical phase conjugation, stimulated Brillouin and stimulated Raman scattering, and selection criteria of nonlinear optical materials. • Covers all the latest topics and technology in this ever-evolving area of study that forms the backbone of the major applications of optical technology • Offers first-rate instructive style making it ideal for self-study • Emphasizes the fundamentals of non-linear optics rather than focus on particular applications that are constantly changing

Nonlinear Fiber Optics

Nonlinear Optical Properties of Matter

Nonlinear Optical Polarization Analysis in Chemistry and Biology

Quantum Photonics: Pioneering Advances and Emerging Applications

Phenomena, Materials and Devices

Fiber Optics Yellow Pages

Theory, Numerical Modeling, and Applications

Characterization Techniques and Tabulations for Organic Nonlinear Optical Materials

Guided Wave Optics and Photonic Devices

This book assembles both theory and application in this field, to interest experimentalists and theoreticians alike. Part 1 is concerned with the theory and computing of non-linear optical (NLO) properties while Part 2 reviews the latest developments in experimentation. This book will be invaluable to researchers and students in academia and industry, particularlyrly to anyone involved in materials science and computational chemistry, chemical physics, and molten char physics. Since the 3rd edition appeared, a fast evolution of the field has occurred. The fourth edition of this classic work provides an up-to-date account of the nonlinear phenomena occurring inside optical fibers. The contents include such important topics as self- and cross-phase modulation, stimulated Raman and Brillouin scattering, four-wave mixing, modulation instability, and optical solitons. Many new figures have been added to help illustrate the concepts discussed in the book. New to this edition are chapters on highly nonlinear fibers and the novel nonlinear effects that have been observed in these fibers since 2000. Such a chapter should be of interest to people in the field of new wavelengths generation, which has potential application in medical diagnosis and treatments, spectroscopy, new wavelength lasers and light sources, etc. Continues to be industry bestseller providing unique source of comprehensive coverage on the subject of nonlinear fiber optics Fourth Edition is a completely up-to-date treatment of the nonlinear phenomena occurring inside optical fibers Includes 2 NEW CHAPTERS on the properties of highly nonlinear fibers and their novel nonlinear effects

For a host of reasons, nonlinear optical spectroscopy is a valuable tool for biochemical applications where minimally invasive diagnostics is desired. Biochemical Applications of Nonlinear Optical Spectroscopy presents the latest technological advances and offers a perspective on future directions in this important field. Written by an international panel of experts, this volume begins with a comparison of nonlinear optical spectroscopy and x-ray crystallography. The text examines the use of multiphoton fluorescence to study chemical phenomena in the skin, the use of nonlinear optics to enhance traditional optical spectroscopy, and the multimodal approach, which incorporates several spectroscopic techniques in one instrument. Later chapters explore Raman microscopy, third-harmonic generation microscopy, and non-linear Raman microscopy. The text explores the promise of beam shaping and the use of broadband laser pulse generated through continuum generation and an optical pulse shaper. Lastly, the book discusses the effects of spatial beam shaping on the generated nonlinear Raman signals in a tightly focused geometry and provides insight into the extension of nonlinear optical spectroscopy to the nanoscale through the use of plasmonic tip-enhanced arrangement. With novel experimental approaches to this technology expanding day-by-day, the book's balanced coverage from a wide range of international contributors not only elucidates important achievements, but also outlines future directions in this dynamic and promising field. ""Furnishes basic of nonlinear optical properties of organic substances as well as experimental procedures for measuring the nonlinearity of the elements tabulated, including composite materials-offering support for scientists and engineers involved in characterizing, optimizing, and producing materials for manufacturing optical devices.

This book is based on tried and tested courses taught by the author, George Stegeman, who is one of the experimental pioneers in nonlinear optics. The book starts with second order phenomena, goes on to explain the derivation of nonlinear susceptibilities, and finishes with a thorough discussion of third order nonlinear effects. Included is a simple "electron on a spring" model which helps readers begin their journey through the field of nonlinear optics.

This book presents an overview of the state of the art of nonlinear optics from weak light nonlinear optics, ultrafast nonlinear optics to electro-optical theory and applications. Topics range from the fundamental studies of the interaction between matter and radiation to the development of devices, components, and systems of tremendous commercial interest for widespread applications in optical telecommunications, medicine, and biotechnology. Nonlinear Optics, Fourth Edition, is a tutorial-based introduction to nonlinear optics that is suitable for graduate-level courses in electrical and electronic engineering, and for electronic and computer engineering departments, physics departments, and as a reference for industry practitioners of nonlinear optics. It will appeal to a wide audience of optics, physics and electrical and electronic engineering students, as well as practitioners in related fields, such as materials science and chemistry. Presents an introduction to the entire field of optical physics from the perspective of nonlinear optics Combines first-rate pedagogy with a treatment of the fundamental aspects of nonlinear optics Covers all the latest topics and technology in this ever-evolving industry Contains a strong emphasis on fundamentals

This graduate-level textbook gives an introductory overview of the fundamentals of quantum nonlinear optics. It deals with the organization of radiation field, interaction between electronic system and radiation field, statistics of light, and mutual manipulation of light and matter. It also covers laser oscillation, dynamics of light, nonlinear optical response, and nonlinear spectroscopy, as well as ultrashort and ultrastrong laser pulse. In addition, latest results of the frontier of this science are presented. Problems and solutions help the reader to master and review the material.

Quantum Nonlinear Optics

Handbook of Nonlinear Optics

Applied Nonlinear Optics

Nonlinearity and Disorder: Theory and Applications

Fundamentals of Nonlinear Optics

Advances in Nonlinear Optics

Introduction to Nonlinear Optics

The Nonlinear Schrödinger Equation

The Principles of Nonlinear Optics

"The book is designed to serve as a textbook for courses offered to upper-undergraduate students enrolled in physics. The first edition of this book was published in 2014. As there is a demand for the next edition, it is quite natural to take note of the several advances that have occurred in the subject over the past five years and to decide which of these are appropriate for inclusion at the textbook level, given the fundamental nature and the significance of the subject area. This is the prime motivation for bringing out a revised second edition. Among the newer mechanisms and materials, the book introduces the super-continuum generation, which arises from an excellent interplay of the various mechanisms of optical nonlinearity. Topics covered in this book are quantum mechanics of nonlinear interaction of matter and radiation, formalism and phenomenology of nonlinear wave mixing processes, optical phase conjugation and applications, self-focusing and self-phase modulation and their role in pulse modification, nonlinear absorption mechanisms, and optical limiting applications, photonic switching and bi-stability, and physical mechanisms leading to a nonlinear response in a variety of materials. This book has emerged from an attempt to address the requirement of presenting the subject at the college level. This textbook includes rigorous features such as the elucidation of relevant basic principles of physics: a clear exposition of the ideas involved at an appropriate level; coverage of the physical mechanisms of non-linearity; updates on physical mechanisms and emerging photonic materials and emphasis on the experimental study of nonlinear interactions. The detailed coverage and pedagogical tools make this an ideal textbook for students and researchers enrolled in physics and related courses."--

This book brings together reviews by internationally renowned experts on quantum optics and photonics. It describes novel experiments at the limit of single photons, and presents advances in this emerging research area. It also includes reprints and historical descriptions of some of the first pioneering experiments at a single-photon level and nonlinear optics, performed before the inception of lasers and modern light detectors, often with the human eye serving as a single-photon detector. The book comprises 19 chapters, 10 of which describe modern quantum photonics results, including single-photon sources, direct measurement of the photon's spatial wave function, nonlinear interactions and non-classical light, nanophotonics for room-temperature single-photon sources, time-multiplexed methods for optical quantum information processing, the role of photon statistics in visual perception, light-by-light coherent control using metamaterials, nonlinear nanoplasmonics, nonlinear polarization optics, and ultrafast nonlinear optics in the mid-infrared. This book, intended for students, researchers and engineers, is a collection of classic papers on photorefractive nonlinear optics. Included are landmark papers on fundamental photorefractive phenomena, two-wave mixing, four-wave mixing, phase conjugators and resonators, material growth and physics, and applications in image processing, optical storage and optical computing.

Since its inception in 1966, the series of numbered volumes known as Semiconductors and Semimetals has distinguished itself through the careful selection of well-known authors, editors, and contributors. The "Willardson and Beer" Series, as it is widely known, has succeeded in publishing numerous landmark volumes and chapters. Not only did many of these volumes make an impact at the time of their publication, but they continue to be well-cited years after their original release. Recently, Professor Eicke R. Weber of the University of California at Berkeley joined as a co-editor of the series. Professor Weber, a well-known expert in the field of semiconductor materials, will further contribute to continuing the series' tradition of publishing timely, highly relevant, and long-impacting volumes. Some of the recent volumes, such as Hydrogen in Semiconductors, Imperfections in III-V Materials, Epitaxial Microstructures, High-Speed Heterostructure Devices, Oxygen in Silicon, and others promise that this tradition will be maintained and even expanded. Reflecting the truly interdisciplinary nature of the field that the series covers, the volumes in Semiconductors and Semimetals have been and will continue to be of great interest to physicists, chemists, materials scientists, and device engineers in modern industry. Despite remarkable developments in the field, a detailed treatment of non-Kerr law media has not been published. Introduction to non-Kerr Law Optical Solitons is the first book devoted exclusively to optical soliton propagation in media that possesses non-Kerr law nonlinearities. After an introduction to the basic features of fiber-optic com Examining classic theories, experimental methods, and practical formulas for exploration of the core topics in nonlinear optics, the second edition of this acclaimed text was extensively revised to reflect recent advances in the analysis and modification of material properties for application in frequency conversion, optical switching and limiting.

Slow Light

Landmark Papers on Photorefractive Nonlinear Optics

Science and Applications

Handbook of Biomedical Nonlinear Optical Microscopy

Nonlinear Optics In Solids

Laser Sources and Applications

Singular Solutions and Optical Collapse

Nonlinear Optics in Semiconductors I