
Principles Of Lasers Library

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Lasers and Optoelectronics
Princeton University Press
An introductory text on laser physics features an emphasis on basic laser principles and theory, without requiring a quantum mechanical background.

[Laser Refractography](#) Springer

This Guide provides an overview on the essential types of lasers and their key properties as well as an introduction into the most important physical and technological aspects of lasers. Apart from describing the basic principles (such as stimulated emission and the properties of optical resonators), this Guide discusses the numerous important properties of laser crystals, the impact of thermal effects on laser performance, methods of wavelength tuning and pulse generation, and laser noise. Practitioners will also gain valuable insight from remarks on laser safety and obtain new ideas about how to make the laser development process more efficient.

Fundamentals of Light Sources and Lasers Scarecrow Press

This timely book combines theory, applications, and projections on ultrafast diode lasers (UDL). A comprehensive treatment of UDLs

from basic physical principles to applications in optical fiber communications and ultrafast electronics.

Laser Surgery in Veterinary Medicine
University Science Books

This monograph is devoted to the description of the physical fundamentals of laser refractography—a novel informational-measuring technique for the diagnostics of optically inhomogeneous media and flows, based on the idea of using spatially structured probe laser radiation in combination with its digital recording and computer techniques for the differential processing of refraction patterns. Considered are the physical fundamentals of this technique, actual optical schemes, methods of processing refraction patterns, and possible applications. This informational technique can be employed in such areas of science and technology as require remote nonperturbative monitoring of optical, thermophysical, chemical, aerohydrodynamic, and manufacturing processes. The monograph can also be recommended for students and postgraduates of - formational, laser, electro-optical, thermophysical, chemical, and other specialties. Laser refractography is a conceptually novel refraction method for the diagnosis of inhomogeneous media, based on the idea of using spatially structured probe laser radiation in combination with its digital recording and

computer techniques for the differential processing of refraction patterns.

Lasers in Dentistry John Wiley & Sons

The book addresses issues associated with physics and technology of injection lasers based on self-organized quantum dots. Fundamental and technological aspects of quantum dot edge-emitting lasers and VCSELs, their current status and future prospects are summarized and reviewed.

The theoretically predicted advantages of an ideal QD array for laser applications are discussed. Basic principles of QD formation using self-organization phenomena are reviewed. Structural and optical properties of self-organized QDs are considered with a number of examples in different materials systems. Recent achievements in controlling the QD properties including the effects of vertical stacking, changing the matrix bandgap and the surface density of QDs are reviewed. The authors focus on the use of self-organized quantum dots in laser structures, fabrication and characterization of edge- and surface-emitting diode lasers, their properties and optimization with special attention paid to the relationship between structural and electronic properties of QDs and laser characteristics. The threshold and power characteristics of the state-of-the-art QD lasers are demonstrated. Issues related to the long-wavelength (1.3- μm) lasers on a GaAs substrate are also addressed and recent results on InGaAsN-based diode lasers presented for the purpose of comparison.

Scientific and Technical Aerospace Reports John Wiley & Sons

This book reviews basic electromagnetic (EM) wave theory and applies it specifically to lasers in order to give the reader not only tangible examples of how the theory is manifested in real life, but also practical knowledge about lasers, and their operation and usage. The latter can be useful for those involved with using lasers. As a short treatise on this subject matter, this book is not intended to dwell deeply into the details of EM waves nor lasers. A bibliography is provided for those who wish to explore in more depth the topics covered in this book. Rather the aim of this book is to offer a quick overview, which will allow the reader to gain a competent general understanding of EM waves and lasers.

Advanced Laser Surgery in Dentistry CRC Press
Laser Induced Breakdown Spectroscopy (LIBS) is an emerging technique for determining elemental composition. With the ability to analyse solids, liquids and gases with little or no sample preparation, it is more versatile than conventional methods and is ideal for on-site analysis. This is a comprehensive reference explaining the fundamentals of the LIBS phenomenon, its history and its fascinating applications across eighteen chapters written by recognized leaders in the field. Over 300 illustrations aid understanding. This book will be of significant interest to researchers in chemical and materials analysis within academia and industry.

Principles of Lasers Elsevier

This book highlights the industrial potential and explains the physics behind laser metal deposition (LMD) technology. It describes the laser metal deposition (LMD) process with the help of numerous diagrams and photographs of real-world process situations, ranging from the fabrication of parts to the repair of existing products, and includes case studies from current research in this field. Consumer demand is moving away from standardized products to customized ones, and to remain competitive manufacturers require manufacturing processes that are flexible and able to meet consumer demand at low cost and on schedule. Laser metal deposition (LMD) is a promising alternative manufacturing process in this context. This book enables researchers and professionals in industry gain a better understanding of the LMD process, which they can then use in real-world applications. It also helps spur on further innovations.

Laser Physics Artech House Publishers

This book provides the information necessary for the reader to achieve a thorough

understanding of all aspects of QW lasers - from the basic mechanism of optical gain, through the current technological state of the art, to the future technologies of quantum wires and quantum dots. In view of the growing importance of QW lasers, this book should be read by all those with an active interest in laser science and technology, from the advanced student to the experienced laser scientist. * The first comprehensive book-length treatment of quantum well lasers * Provides a detailed treatment of quantum well laser basics * Covers strained quantum well lasers * Explores the different state-of-the-art quantum well laser types * Provides key information on future laser technologies

Ultrafast Diode Lasers John Wiley & Sons

A comprehensive introduction to the burgeoning field of photonics. The field of photonics is finding increasing applications across a broad range of industries. While many other books provide an overview of the subject, *Fundamentals of Light Sources and Lasers* closes a clear gap in the current literature by concentrating on the principles of laser operation as well as providing coverage of important concepts necessary to fully understand the principles involved. The scope of the book includes everything a professional needs to get up to speed in the field, as well as all the material necessary to serve as an excellent introductory laser course for students. Ideal for self-study as well as structured coursework, the book offers thorough coverage of: * The nature of light and atomic emission * Basic quantum mechanics and laser processes * Cavity optics, fast-pulse production, and nonlinear optical phenomena * Laser technology, including visible gas lasers, UV gas lasers, infrared gas lasers, solid-state lasers, semiconductor lasers and tunable dye lasers. Extensive real-world case studies are included to help readers appreciate the practical applications of the material covered. * An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department.

Distributed Feedback Semiconductor Lasers CRC Press

Essentials of Lasers outlines the essential principles upon which laser action depends. This book is

organized into two parts encompassing 18 chapters that specifically discuss the basic theory of lasers and resonator theory. The first part deals with the principles and application of several types of lasers, including crystalline solid, gas, and semiconductor lasers. The second part describes first the features and uses of infrared and optical lasers. These topics are followed by reviews of the different components of lasers, such as amplifier and interferometer. Considerable chapters in this part contain experiments concerning the fluorescent relaxation processes and infrared emission from trivalent uranium. The remaining chapters deal with the coherent light emission from GaAs junctions and the burning hole effects in He-Ne optical laser. This book will prove useful to laser scientists, physicists, and researchers.

National Library of Medicine Current Catalog

Cambridge University Press

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

Handbook of Laser Technology and Applications: Principles IET

With emphasis on the physical and engineering principles, this book provides a comprehensive and highly accessible treatment of modern lasers and optoelectronics. Divided into four parts, it explains laser fundamentals, types of lasers, laser electronics & optoelectronics, and laser applications, covering each of the topics in their entirety, from basic fundamentals to advanced concepts. Key features include: exploration of technological and

application-related aspects of lasers and optoelectronics, detailing both existing and emerging applications in industry, medical diagnostics and therapeutics, scientific studies and Defence. simple explanation of the concepts and essential information on electronics and circuitry related to laser systems illustration of numerous solved and unsolved problems, practical examples, chapter summaries, self-evaluation exercises, and a comprehensive list of references for further reading. This volume is a valuable design guide for R&D engineers and scientists engaged in design and development of lasers and optoelectronics systems, and technicians in their operation and maintenance. The tutorial approach serves as a useful reference for under-graduate and graduate students of lasers and optoelectronics, also PhD students in electronics, optoelectronics and physics.

Lasers: Principles, Types and Applications
John Wiley & Sons

Unifying Physics of Accelerators, Lasers and Plasma introduces the physics of accelerators, lasers and plasma in tandem with the industrial methodology of inventiveness, a technique that teaches that similar problems and solutions appear again and again in seemingly dissimilar disciplines. This unique approach builds bridges and enhances connection

The Principles of Semiconductor Laser Diodes and Amplifiers Springer

Includes, beginning Sept. 15, 1954 (and on the 15th of each month, Sept.-May) a special section: School library journal, ISSN 0000-0035, (called Junior libraries, 1954-May 1961). Also issued separately.

Handbook of Laser Technology and Applications New Age International

This comprehensive handbook gives a fully updated guide to lasers and laser technologies, including the complete range of their technical applications. The first volume outlines the fundamental components of lasers, their properties, and working principles. Key Features: • Offers a complete update of the original, bestselling work, including many

brand-new chapters. • Deepens the introduction to fundamentals, from laser design and fabrication to host matrices for solid-state lasers, energy level diagrams, hosting materials, dopant energy levels, and lasers based on nonlinear effects. • Covers new laser types, including quantum cascade lasers, silicon-based lasers, titanium sapphire lasers, terahertz lasers, bismuth-doped fiber lasers, and diode-pumped alkali lasers. • Discusses the latest applications, e.g., lasers in microscopy, high-speed imaging, attosecond metrology, 3D printing, optical atomic clocks, time-resolved spectroscopy, polarization and profile measurements, pulse measurements, and laser-induced fluorescence detection. • Adds new sections on laser materials processing, laser spectroscopy, lasers in imaging, lasers in environmental sciences, and lasers in communications. This handbook is the ideal companion for scientists, engineers, and students working with lasers, including those in optics, electrical engineering, physics, chemistry, biomedicine, and other relevant areas.

Essentials of Lasers John Wiley & Sons

Laser beam combining techniques allow increasing the power of lasers far beyond what it is possible to obtain from a single conventional laser. One step further, coherent beam combining (CBC) also helps to maintain the very unique properties of the laser emission with respect to its spectral and spatial properties. Such lasers are of major interest for many applications, including industrial, environmental, defense, and scientific applications. Recently, significant progress has been made in coherent beam combining lasers, with a total output power of 100 kW already achieved. Scaling analysis indicates that further increase of output power with excellent beam quality is feasible by using existing state-of-the-art lasers. Thus, the knowledge of coherent beam combining techniques will become crucial for the design of next-generation highpower lasers. The purpose of this book is to

present the more recent concepts of coherent beam combining by world leader teams in the field.

Laser Metal Deposition Process of Metals, Alloys, and Composite Materials SPIE-International Society for Optical Engineering

Concentrating on presenting a thorough analysis of DFB lasers from a level suitable for research students, this book emphasises and gives extensive coverage of computer aided modeling techniques.

Lasers Springer Science & Business Media

This new, updated and enlarged edition of the successful and exceptionally well-structured textbook features new chapters on such hot topics as optical angular momentum, microscopy beyond the resolution limit, metamaterials, femtocombs, and quantum cascade lasers. It provides comprehensive and coherent coverage of fundamental optics, laser physics, and important modern applications, while equally including some traditional aspects for the first time, such as the Collins integral or solid immersion lenses. Written for newcomers to the topic who will benefit from the author's ability to explain difficult theories and effects in a straightforward and readily comprehensible way.

Laser Systems for Applications Elsevier

Expand your skills in the rapidly growing field of laser dentistry! The new second edition of Principles and Practice of Laser Dentistry contains everything you need to know about the latest laser procedures across all areas of dentistry. With vivid clinical photos and easy-to-follow writing, Dr. Robert A. Convissar and his team of dental experts walk you through the most common uses of lasers in areas like:

periodontics, periodontal surgery, oral pathology, implantology, fixed and removable prosthetics, cosmetic procedures, endodontics, operative dentistry, pediatrics, orthodontics, and oral and maxillofacial surgery. The book also covers topics such as the history of lasers in dentistry, laser research, the latest laser equipment, and how to go about incorporating lasers into your practice, so that you are fully

equipped to use lasers successfully in your treatments. The latest evidence-based, authoritative information is written by experts from all areas of dentistry (periodontics, orthodontics, oral surgery, prosthodontics, implants, endodontics, and pediatric and general dentistry). Case studies reflect treatment planning and the use of lasers for a variety of pathologies. Detailed, full-color art program clearly illustrates preoperative, intraoperative, and postoperative procedures. Summary tables and boxes provide easy-to-read summaries of essential information. Clinical Tips and Caution boxes interspersed throughout the text highlight key clinical points. Glossary at the end of the book provides definitions of laser terminology. Chapter on Introducing Lasers into the Dental Practice provides guidelines for the investment into lasers. NEW! Updated content on regenerative laser periodontal therapy, lasers in implant dentistry, lasers in restorative dentistry, low-level lasers in dentistry, and laser dentistry research reflects the latest technology advancements in the field. NEW! More clinical photos, equipment photos, and conceptual illustrations offer a detailed look at how equipment is used and how procedures are completed.