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*Laser Physics Basics of Laser Physics Physics of Semiconductor Lasers Laser Physics Laser Physics Physics of Solid-State Laser Materials Semiconductor-Laser Physics The Physics of Laser Plasmas and Applications - Volume 1 Principles of Lasers Strong Field Laser Physics Optics, Light and Lasers Essentials of Lasers Lasers:Principles, Types and Applications Physics of and Science with X-Ray Free-Electron Lasers Advanced Lasers The Physics of Free Electron Lasers Atomic Physics of Lasers Semiconductor Disk Lasers Laser Physics and Spectroscopy Theoretical Femtosecond Physics Laser Physics Physics of Laser Crystals The Physics of Laser Radiation–Matter Interaction Advances In Laser Physics Laser Physics Optik, Licht und Laser The Physics and Engineering of Solid State Lasers Atoms in Intense Laser Fields Lasers Super-Intense Laser—Atom Physics Laser Experiments for Chemistry and Physics Laser Physics The Physics and Engineering of Compact Quantum Dot-based Lasers for Biophotonics Physics and Simulation of Semiconductor Lasers The Physics Of Laser Plasma Interactions Free Electron Lasers Springer Handbook of Lasers and Optics Crystalline Lasers Semiconductor-Laser Fundamentals Frontiers of Laser Physics and Quantum Optics*

*Atoms in Intense Laser Fields Jul 07 2020 The development of lasers capable of producing high-intensity pulses has opened a new area in the study of light-matter interactions. The corresponding laser fields are strong enough to compete with the Coulomb forces in controlling the dynamics of atomic systems and give rise to multiphoton processes. This book presents a unified account of this rapidly developing field of physics. The first part describes the fundamental phenomena occurring in intense laser-atom interactions and gives the basic theoretical framework to analyze them. The second part contains a detailed discussion of Floquet theory, the numerical integration of the wave equations and approximation methods for the low- and high-frequency regimes. In the third part, the main multiphoton processes are discussed: multiphoton ionization, high harmonic and attosecond pulse generation, and laser-assisted electron-atom collisions. Aimed at graduate students in atomic, molecular and optical physics, the book will also interest researchers working on laser interactions with matter.*

*Principles of Lasers Feb 23 2022 This fifth edition of Principles of Lasers includes corrections to the previous edition as well as being the first available as an ebook. Its mission remains to provide a broad, unified description of laser behavior, physics, technology, and applications.*

*Essentials of Lasers Nov 22 2021 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.*

*Laser Physics Mar 03 2020 This textbook originates from a lecture course in laser physics at the Karlsruhe School of Optics and Photonics at the Karlsruhe Institute of Technology (KIT). A main goal in the conception of this textbook was to describe the fundamentals of lasers in a uniform and especially lab-oriented notation and formulation as well as many currently well-known laser types, becoming more and more important in the future. It closes a gap between the measureable spectroscopic quantities and the whole theoretical description and modeling. This textbook contains not only the fundamentals and the context of laser physics in a mathematical and methodical approach important for university-level studies. It allows simultaneously, owing to its conception and its modern notation, to directly implement and use the learned matter in the practical lab work. It is presented in a format suitable for everybody who wants not only to understand the fundamentals of lasers but also use*

*modern lasers or even develop and make laser setups. This book tries to limit prerequisite knowledge and fundamental understanding to a minimum and is intended for students in physics, chemistry and mathematics after a bachelor degree, with the intention to create as much joy and interest as seen among the participants of the corresponding lectures. This university textbook describes in its first three chapters the fundamentals of lasers: light-matter interaction, the amplifying laser medium and the laser resonator. In the fourth chapter, pulse generation and related techniques are presented. The fifth chapter gives a closing overview on different laser types gaining importance currently and in the future. It also contains a set of examples on which the theory learned in the first four chapters is applied and extended.*

*Physics and Simulation of Semiconductor Lasers Jan 01 2020*

*Springer Handbook of Lasers and Optics Sep 28 2019 This new edition features numerous updates and additions. Especially 4 new chapters on Fiber Optics, Integrated Optics, Frequency Combs and Interferometry reflect the changes since the first edition. In addition, major complete updates for the chapters: Optical Materials and Their Properties, Optical Detectors, Nanooptics, and Optics far Beyond the Diffraction Limit. Features Contains over 1000 two-color illustrations. Includes over 120 comprehensive tables with properties of optical materials and light sources. Emphasizes physical concepts over extensive mathematical derivations. Chapters with summaries, detailed index Delivers a wealth of up-to-date references.*

*Laser Experiments for Chemistry and Physics Apr 03 2020 A collection of experiments to introduce lasers into the undergraduate curricula in chemistry and physics. A variety of experiments are included with different levels of complexity. All have background information, experimental details and the theoretical background necessary to interpret the results.*

*Lasers Jun 05 2020 An introductory text on laser physics features an emphasis on basic laser principles and theory, without requiring a quantum mechanical background.*

*Semiconductor-Laser Physics Apr 27 2022 Semiconductor-Laser Physics discusses the underlying physics and operational principles of semiconductor lasers. The optical and electronic properties of the semiconductor medium are analyzed in detail, including quantum confinement and gain engineering effects. A semiclassical and a quantum version of the laser theory are presented, including an analysis of single- and multimode operation, instabilities, laser arrays, unstable resonators, and microcavity lasers.*

*The Physics of Laser Radiation–Matter Interaction Dec 12 2020 This textbook explains the fundamental processes involved in the interaction of electromagnetic radiation with matter. It leads students from a general discussion of electrodynamics, forming the mathematical foundation for the Maxwell equations, to key results such as the Fresnel equations, Snell's law, and the Brewster angle, deriving along the way the equations for accelerated charges and discussing dipole radiation, Bremsstrahlung and synchrotron radiation. By considering more and more interacting particles, the book advances its treatment of the subject, approaching the solid-state regime using both classical and quantum mechanical approaches to describe interaction paths with electromagnetic radiation. Finally, specific interactions of laser radiation with matter are explained such as ultrafast, coherent, and selective interaction. With an emphasis on achieving an intuitive grasp of the basic physics underlying common laser technology, this textbook is ideal for graduate students seeking both a better fundamental and applied understanding of laser–matter interaction.*

*Optik, Licht und Laser Sep 08 2020 Diese Einführung stellt die Konzepte der klassischen Optik für Physiker, andere Naturwissenschaftler und Ingenieure vor. Sie behandelt die Eigenschaften von Laser-Lichtquellen im Detail und schreitet bis zu optischen Detektoren und der nichtlinearen Optik voran. Ebenso beleuchtet wird die Verknüpfung traditioneller Themen mit ausgewählten Fällen moderner Forschungsarbeiten, um Begeisterung für neuere wissenschaftliche und technische Herausforderungen der Optik zu wecken.*

*Optics, Light and Lasers Dec 24 2021 Starting from the concepts of classical optics, Optics, Light and Lasers introduces in detail the phenomena of linear and nonlinear light matter interaction, the properties of modern laser sources, and the concepts of quantum optics. Several examples taken from the scope of modern research are provided to emphasize the relevance of optics in current developments within science and technology. The text has been written for newcomers to the topic and benefits from the author's ability to explain difficult sequences and effects in a straightforward and easily comprehensible way. To this second, completely updated and enlarged edition, new chapters on quantum optics, quantum information, matter waves, photonic fibres and materials have*

*been added, as well as more than 100 problems on laser physics and applied optics.*

*Laser Physics Feb 11 2021 Problems after each chapter.*

*Super-Intense Laser—Atom Physics May 05 2020 The rapid development of powerful pulsed lasers is at the origin of a conside rable interest in studying the response of an atom, a molecule (or a solid) to a strong electromagnetic field. It is now possible to produce at the laboratory scale, ultra-short 13 pulses with a duration of 100 femtoseconds (10- second) and a power of the order 12 of 1 terawatt (10 Watt). Under these conditions, very high peak intensities may be obtained and electric fields exceeding typical electron binding fields in atoms are generated. The interaction of an atom or a molecule with such electromagnetic fields has a highly non-linear character which leads to unexpected phenomena. Amongst them, - above-threshold ionization (ATI) i.e. the absorption of additional photons in excess of the minimal number necessary to overcome the ionization potential and its molecular counterpart, above-threshold dissociation (ATD); - generation of very high harmonics of the driving field; - stabilization of one-electron systems in strong fields. These processes were the main topics of two international meetings which were held in 1989 and 1991 in the United States under the common name SILAP (Super-Intense Laser-Atom Physics).*

*Physics of and Science with X-Ray Free-Electron Lasers Sep 20 2021 Many X-Ray Free-Electron Lasers (X-FELs) have been designed, built and commissioned since the first lasing of the Linac Coherent Light Source in the hard and soft X-ray regions, and great progress has been made in improving their performance and extending their capabilities. Meanwhile, experimental techniques to exploit the unique properties of X-FELs to explore atomic and molecular systems of interest to physics, chemistry, biology and the material sciences have also been developed. As a result, our knowledge of atomic and molecular science has been greatly extended. Nevertheless, there is still much to be accomplished, and the potential for discovery with X-FELs is still largely unexplored. The next generation of scientists will need to be well versed in both particle beams/FEL physics and X-ray photon science. This book presents material from the Enrico Fermi summer school: Physics of and Science with X-Ray Free-Electron Lasers, held at the Enrico Fermi International School of Physics in Varenna, Italy, from 26 June - 1 July 2017. The lectures presented at the school were aimed at introducing graduate students and young scientists to this fast growing and exciting scientific area, and subjects covered include basic accelerator and FEL physics, as well as an introduction to the main research topics in X-FEL-based biology, atomic molecular optical science, material sciences, high-energy density physics and chemistry. Bridging the gap between accelerator/FEL physicists and scientists from other disciplines, the book will be of interest to all those working in the field.*

*Semiconductor-Laser Fundamentals Jul 27 2019 This in-depth title discusses the underlying physics and operational principles of semiconductor lasers. It analyzes the optical and electronic properties of the semiconductor medium in detail, including quantum confinement and gain-engineering effects. The text also includes recent developments in blue-emitting semiconductor lasers.*

*Lasers:Principles, Types and Applications Oct 22 2021 This Book On Lasers Is The Culmination Of Several Years Of Relentless Personal Research, Exhaustive Literature Survey, Critical Analysis Of All The Facets Of The Subject And Interactions With The Subject Experts And Students In India And Abroad, By The Author.This Book Has Been Very Systematically Structured And Organised. The Subject Has Been Divided Into Three Parts. Part A Deals With All The Established Principles And Theories Of Laser Science Prefixed With A Journey Through The Relevant Areas Of Optics And Modern Physics. Part B Presents A Galaxy Of All The Available Laser Schemes Of The Day, With A Peep Into The Future. Part C Deals With The Myriads Of Applications Of This 'Wonder Beam' In Every Walk Of Life.While Giving An Exhaustive Account About Lasers, The Book Also Covers All The, Relevant Aspects Of Related Subjects Such As Fibre Optics, Holography, Laser Safety Etc. Apart From The Excellent Presentation Of The Topics, As They Unfold, This Book Contains A Rich Fund Of Worked Out Examples And Student Exercises, With Answers.The Language Is Simple And Reader-Friendly, The Treatise Logical, And Even The Intricate Mathematical Derivations And Clear And Lucid. This Book Is Meant To Be A Very Valuable Guide To Students At Graduate And Postgraduate Levels And To Those Working Or Intending To Work In The Field Of Lasers, To Add To What They Already Know. This Is Perhaps The Only Book, At Present, On Lasers By An Indian Author With Such A Vast Coverage Of The Subject Itself And The Associated Disciplines.*

*Laser Physics and Spectroscopy Apr 15 2021 In this book emphasis is laid on laser including its operation, different types, properties like coherence and monochromaticity, beam propagation, theoretical treatment of*

*atom?field interaction, semi?classical laser theory, non?linear effects, quantum properties, photon concept and coherent states etc. Please note: Taylor & Francis does not sell or distribute the Hardback in India, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka.*

*Physics of Laser Crystals Jan 13 2021 Physics of laser crystals has been constantly developing since the invention of the laser in 1960. Nowadays, more than 1500 wide-band-gap and semiconductors crystals are suitable for the production of the laser effect. Different laser devices are widely used in science, medicine and communication systems according to the progress achieved in the development of laser crystal physics. Scintillators for radiation detection also gained benefit from these developments. Most of the optically active materials offer laser radiations within the 500 to 3000 nm region with various quantum efficiency which fit the usual applications. However, new crystals for laser emissions are needed either in the blue, UV and VUV - region or far IR- region, especially for medicine, computer microchip production and for undiscovered practical uses. Scientific problems of the growth and properties of laser crystals are discussed in numerous books and scientific journals by many scientists working in the field. Therefore, we thought that joint discussions of the scientific and technical problems in laser physics will be useful for further developments in this area. We have proposed to held a Workshop on Physics of Laser Crystals for attempting to induce additional advances especially in solid state spectroscopy. This NATO Advanced Research Workshop (ARW) was hold in Kharkiv • Stary Saltov th nd (Ukraine) on august 26 - September 2 , 2002, and was mainly devoted to the consideration 0 f modem approaches and Iast results in physics of laser crystals.*

*The Physics and Engineering of Solid State Lasers Aug 08 2020 Explains the mutual influences between the physical and dynamic processes in solids and their lasing properties. This book provides insight into the physics and engineering of solid state lasers by integrating information from several disciplines, including solid state physics, materials science, photophysics, and dynamic processes in solids.*

*Strong Field Laser Physics Jan 25 2022 Due to the rapid progress in laser technology a wealth of novel fundamental and applied applications of lasers in atomic and plasma physics have become possible. This book focuses on the interaction of high intensity lasers with matter. It reviews the state of the art of high power laser sources, intensity laser-atom and laser-plasma interactions, laser matter interaction at relativistic intensities, and QED with intense lasers.*

*Laser Physics Oct 10 2020*

*Physics of Semiconductor Lasers Sep 01 2022 Written for readers who have some background in solid state physics but do not necessarily possess any knowledge of semiconductor lasers, this book provides a comprehensive and concise account of fundamental semiconductor laser physics, technology and properties. The principles of operation of these lasers are therefore discussed in detail with the interrelations between their design and optical, electrical and thermal properties. The relative merits of a large number of laser structures and their parameters are described to acquaint the reader with the various aspects of the semiconductor lasers and the trends in their development.*

*Free Electron Lasers Oct 29 2019 The volume contains the proceedings of the 7th Course on Physics and Technology of Free Electron Lasers of the International School of Quantum Electronics, which was held in Erice (Italy) from 17 to 29 August 1980, under the auspices of the "Ettore Majorana" Centre for Scientific Culture. The level of this Course was much closer to a workshop than to a school, and "Advances in Free Electron Lasers" might have been an appropriate title. Many of the world's leading scientists in the field (among them, the inventor of FEL, J. M. J. Madey) were brought together to review the accomplishments of FEL experiments, as well various trends in FEL theory. In editing this material we did not modify the original manu scripts except to assist in uniformity of style. The papers. are presented without reference to the chronology of the Course but in the following topical arrangement: A. "Fundamentals of free electron lasers," a group of tutorial papers; B. "Free electron lasers operating in the Compton regime," where theories and experiments of FELs based on Compton scattering are reviewed; C. "Free electron lasers operating in the Raman regime," a dis cussion of FELs based on Raman scattering; D. "Optical klystrons," where the possibility of this class of FEL is discussed from a theoretical viewpoint; E.*

*Crystalline Lasers Aug 27 2019 By the end of the 1970s, crystalline lasers were widely used in science, engineering, medicine, and technology. The types of lasers used have continued to grow in number to include*

*newly discovered crystalline hosts, previously known compounds generating at other spectral wavelengths, and broadband tunable stimulated emission. This has led to the creation of an extremely promising new generation of crystalline lasers that are both highly efficient and more reliable. The major part of this book is devoted to describing multilevel operating laser schemes for stimulated emission excitation in insulating crystals doped with lanthanide ions. The first part of Crystalline Lasers deals with the history of the physics and spectroscopy of insulating laser crystals. The chapters in the second part of the book present results from the study of Stark-energy levels of generating ions in laser crystals and their radiative and nonradiative intermanifold transition characteristics. This section includes extensive tabular data and reference information. Popular and novel operating schemes of crystalline lasers are covered in Part 3. In the chapters in the fourth part of the book, the newest technologies in the physics and engineering of crystalline lasers are considered. The results of investigations into laser action under selective excitations, miniature crystalline lasers, and the properties of nonlinear activated laser crystals are presented and analyzed. Crystalline Lasers summarizes and reviews the results of many years of research and studies of activator ions and multilevel operating laser schemes, and discusses exciting prospects of using these systems to create new types of crystalline lasers. This book will be of use to laser scientists and engineers, physicists, and chemical engineers.*

*Theoretical Femtosecond Physics Mar 15 2021 This volume offers theoretical investigations of atoms and molecules interacting with pulsed or continuous wave lasers. Theoretical background is included, and the text incorporates several exercises. Additional calculations are performed in the appendices.*

*The Physics Of Laser Plasma Interactions Nov 30 2019 Based on a graduate course in plasma physics taught at University of California, Davis, this new book provides a concise overview and a physically-motivated treatment of the major plasma processes which determine the interaction of intense light waves with plasmas. It also includes a discussion of basic plasma concepts, plasma simulation using particle codes, and laser plasma experiments. This is the most elementary book currently available that successfully blends theory, simulation, and experiment and presents a clear exposition of the major physical processes involved in laser-plasma interactions. This is also the first book on the topic by anyone involved in the United States Laser Fusion Program. Dr. Kruer has more than 15 years of active participation in this field.*

*The Physics and Engineering of Compact Quantum Dot-based Lasers for Biophotonics Jan 31 2020 Written by a team of European experts in the field, this book addresses the physics, the principles, the engineering methods, and the latest developments of efficient and compact ultrafast lasers based on novel quantum-dot structures and devices, as well as their applications in biophotonics. Recommended reading for physicists, engineers, students and lecturers in the fields of photonics, optics, laser physics, optoelectronics, and biophotonics.*

*Laser Physics Nov 03 2022 Although the basic principles of lasers have remained unchanged in the past 20 years, there has been a shift in the kinds of lasers generating interest. Providing a comprehensive introduction to the operating principles and applications of lasers, this second edition of the classic book on the subject reveals the latest developments and applications of lasers. Placing more emphasis on applications of lasers and on optical physics, the book's self-contained discussions will appeal to physicists, chemists, optical scientists, engineers, and advanced undergraduate students.*

*Atomic Physics of Lasers Jun 17 2021*

*The Physics of Laser Plasmas and Applications - Volume 1 Mar 27 2022 The series of books discusses the physics of laser and matter interaction, fluid dynamics of high-temperature and high-density compressible plasma, and kinetic phenomena and particle dynamics in laser-produced plasma. The book (Vol.1) gives the physics of intense-laser absorption in matter and/or plasma in non-relativistic and relativistic laser-intensity regime. In many cases, it is explained with clear images of physics so that an intuitive understanding of individual physics is possible for non-specialists. For intense-laser of 1013-16 W/cm2, the laser energy is mainly absorbed via collisional process, where the oscillation energy is converted to thermal energy by non-adiabatic Coulomb collision with the ions. Collisionless interactions with the collective modes in plasma are also described. The main topics are the interaction of ultra-intense laser and plasma for the intensity near and over 1018W/cm2. In such regime, relativistic dynamics become essential. A new physics appears due to the relativistic effects, such as mass correction, relativistic nonlinear force, chaos physics of particle motions, and so on. The book provides clearly the theoretical base for challenging the laser-plasma interaction physics in the wide range of power*

*lasers. It is suitable as a textbook for upper-undergraduate and graduate students as well as for readers who want to understand the whole physics structure about what happen when an intense-laser irradiates any materials including solids, gas etc. Explaining the physics intuitively without complicated mathematics, it is also a valuable resource for engineering students and researchers as well as for self-study.*

*Frontiers of Laser Physics and Quantum Optics Jun 25 2019 Since the advent of the laser about 40 years ago, the fields of laser physics and quantum optics have evolved into a major disciplines. The early studies included optical coherence theory and semiclassical and quantum mechanical theories of the laser. More recently many new and interesting effects have been predicted. These include the role of coherent atomic effects in lasing without inversion and electromagnetically induced transparency, atom optics, laser cooling and trapping, teleportation, the single-atom micromaser and its role in quantum measurement theory, to name a few. The International Conference on Laser Physics and Quantum Optics was held in Shanghai, China, from August 25 to August 28,1999, to discuss these and many other exciting developments in laser physics and quantum optics. The international character of the conference was manifested by the fact that scientists from over 13 countries participated and lectured at the conference. There were four keynote lectures delivered by Nobel laureate Willis Lamb, Jr., Profs. H. Walther, A.E. Siegman,and M.O. Scully. In addition, there were 34 invited lectures, 27 contributed oral presentations, and 59 poster papers. We are grateful to all the participants of the conference and the contributors of this volume.*

*Basics of Laser Physics Oct 02 2022 This textbook provides an introductory presentation of all types of lasers. It contains a general description of the laser, a theoretical treatment and a characterization of its operation as it deals with gas, solid state, free-electron and semiconductor lasers. This expanded and updated second edition of the book presents a description of the dynamics of free-electron laser oscillation using a model introduced in the first edition that allows a reader to understand basic properties of a free-electron laser and makes the difference to "conventional" lasers. The discussions and the treatment of equations are presented in a way that a reader can immediately follow. The book addresses graduate and undergraduate students in science and engineering, featuring problems with solutions and over 400 illustrations.*

*Semiconductor Disk Lasers May 17 2021 This timely publication presents a review of the most recent developments in the field of Semiconductor Disk Lasers. Covering a wide range of key topics, such as operating principles, thermal management, nonlinear frequency conversion, semiconductor materials, short pulse generation, electrical pumping, and laser applications, the book provides readers with a comprehensive account of the fundamentals and latest advances in this rich and diverse field. In so doing, it brings together contributions from world experts at major collaborative research centers in Europe and the USA. Each chapter includes a tutorial style introduction to the selected topic suitable for postgraduate students and scientists with a basic background in optics - making it of interest to a wide range of scientists, researchers, engineers and physicists working and interested in this rapidly developing field. It will also serve as additional reading for students in the field.*

*Physics of Solid-State Laser Materials May 29 2022 This graduate-level text presents the fundamental physics of solid-state lasers, including the basis of laser action and the optical and electronic properties of laser materials. After an overview of the topic, the first part begins with a review of quantum mechanics and solid-state physics, spectroscopy, and crystal field theory; it then treats the quantum theory of radiation, the emission and absorption of radiation, and nonlinear optics; concluding with discussions of lattice vibrations and ion-ion interactions, and their effects on optical properties and laser action. The second part treats specific solid-state laser materials, the prototypical ruby and Nd-YAG systems being treated in greatest detail; and the book concludes with a discussion of novel and non-standard materials. Some knowledge of quantum mechanics and solid-state physics is assumed, but the discussion is as self-contained as possible, making this an excellent reference, as well as useful for independent study.*

*Laser Physics Jun 29 2022 An up-to-date perspective on laser technology for students at advanced undergraduate or introductory graduate level. The principles of operation and applications of modern laser systems are analysed in detail. The text has over 300 diagrams and each chapter is accompanied with questions (solutions available on application).*

*Advanced Lasers Aug 20 2021 Presenting a blend of applied and fundamental research in highly*

*interdisciplinary subjects of rapidly developing areas, this book contains contributions on the frontiers and hot topics of laser physics, laser technology and laser engineering, and covers a wide range of laser topics, from all-optical signal processing and chaotic optical communication to production of superwicking surfaces, correction of extremely high-power beams, and generation of ultrabroadband spectra. It presents both review-type contributions and well researched and documented case studies, and is intended for graduate students, young scientist, and emeritus scientist working/studying in laser physics, optoelectronics, optics, photonics, and adjacent areas. The book contains both experimental and theoretical studies, as well as combinations of these two, which is known to be a most useful and interesting form of reporting scientific results, allowing students to really learn from each contribution. The book contains over 130 illustrations.*

*Advances In Laser Physics Nov 10 2020 The birth of quantum electronics in the middle of the 20th century and the subsquent discovery of the laser led to new trends in physics and a number of photonic technolgies. This volume is dedicated to Peter Franken, a pioneer of nonlinear optics, and includes papers by the founders of quantum electronics, Aleksandr Prokhorov, Nicolaas Blombergen, and Norman Ramsey. The topics covered range from astronomy to nuclear and semiconductor physics, and from fundamental problems in quantum mechanics to applications in novel laser materials and nanoscience.*

*The Physics of Free Electron Lasers Jul 19 2021 The Free Electron Laser (FEL) will be a crucial tool for research and industrial applications. This book describes the physical fundamentals of FELs on the basis of classical mechanics, electrodynamics, and the kinetic theory of charged particle beams, and will be suitable for graduate students and scientists alike. After a short introduction, the book discusses the theory of the FEL amplifier and oscillator, diffraction effects in the amplifier, and waveguide FEL.*

*Laser Physics Jul 31 2022 This book treats the interaction of radiation with matter, particular attention being paid to the laser. Knowledge is assumed of the usual half-year introduction of quantum mechanics found in undergraduate physics curricula. The material can be covered in two semesters, or, alternatively, the first part (Chaps 1-13) can be used as a one-semester course in which quantum mechanical aspects of the electromagnetic field are ignored. Each chapter is accompanied by problems that illustrate the text and give useful (occasionally new) results. Existing laser media are intrinsically quantum mechanical and are most easily studied with the quantum theory. Understanding the laser along these lines enlivens one's understanding of quantum mechanics itself. In fact, the material constitutes a viable, applied alternative for the usual second and third semesters of quantum mechanics.*