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Nuclear Fusion by Inertial Confinement provides a comprehensive analysis of directly driven inertial confinement fusion. All important aspects of the process are covered, including scientific considerations that support the concept, lasers and particle beams as drivers, target fabrication, analytical and numerical calculations, and materials and engineering considerations. Authors from Australia, Germany, Italy, Japan, Russia, Spain, and the U.S. have contributed to the volume, making it an internationally significant work for all scientists working in the Inertial Confinement Fusion (ICF) field, as well as for graduate students in engineering and physics with interest in ICF.

The second edition of a bestseller, this book presents the latest innovative research methods that help break new ground by applying patterns, reuse, and design science to research. The book relies on familiar patterns to provide the solid fundamentals of various research philosophies and techniques as touchstones that demonstrate how to innovate research methods. Filled with practical examples of applying patterns to IT research with an emphasis on reusing research activities to save time and money, this book describes design science research in relation to other information systems research

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paradigms such as positivist and interpretivist research.

Nanoplasmonics is one of the most important growth areas of this century. It is part of nano-optics and nanophotonics and deals with oscillations of electrons in metallic nanoparticles and nanostructures. Also, it is a multidisciplinary subject covering atomic, molecular, and solid-state physics, as well as much of chemistry. Nanoplasmonics makes it possible to combine the nanoscale properties of smart devices with their optical frequencies of operation. Nanoplasmonics presents, for the first time, both the physical principles and mathematical descriptions of main nanoplasmonic effects that now are scattered over thousands of research articles. Importantly, it contains many methods, accompanied by diagrams, for fast estimations and calculations of main properties of nanoparticles of very different shapes and their clusters. It also presents the most important applications of nanoplasmonics, including in medicine, nanolasers, electronics, perfect lenses, and invisibility cloaks.

'It is an excellent, concise introduction to the topic. It presents mathematical treatments of abstract concepts in a clear and straightforward way. I think it will be most effective as a companion to other excellent introductory texts, but readers who want to review the material will find the author's treatment of

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electricity and magnetism refreshing.'Physics TodayThese lectures provide an introduction to a subject that together with classical mechanics, quantum mechanics, and modern physics lies at the heart of today's physics curriculum. This introduction to electricity and magnetism assumes only a good course in calculus, and familiarity with vectors and Newton's laws; it is otherwise self-contained. Furthermore, these lectures, although relatively concise, take one from Coulomb's law to Maxwell's equations and special relativity in a lucid and logical fashion. An extensive set of accessible problems enhances and extends the coverage. Review chapters spaced throughout the text summarize the material. Clear departure points for further study are indicated along the way. The principles of electromagnetism, as synthesized in Maxwell's equations and the Lorentz force, have such an astonishing range of applicability. A good introduction to this subject, even at the cost of some repetition, allows one to approach the many more advanced texts and monographs with better understanding and a deeper sense of appreciation that both students and teachers can share alike. Video clip of a NASA film highlights the time delay in communication between Apollo astronauts and Houston.

This book has a long history of more than 20 years. The first attempt to write a monograph on

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information-theoretic approach to thermodynamics was done by one of the authors (RSI) in 1974 when he published, in the preprint form, two volumes of the book "Information Theory and Thermodynamics" concerning classical and quantum information theory, [153] (220 pp.), [154] (185 pp.). In spite of the encouraging remarks by some of the readers, the physical part of this book was never written except for the first chapter. Now this material is written completely anew and in much greater extent. A few years earlier, in 1970, second author of the present book, (AK), a doctoral student and collaborator of RSI in Torun, published in Polish, also as a preprint, his habilitation dissertation "Information-theoretical decision scheme in quantum statistical mechanics" [196] (96 pp.). This small monograph presented his original results in the physical part of the theory developed in the Torun school. Unfortunately, this preprint was never published in English. The present book contains all these results in a much more modern and developed form.

This book examines the health effects of exposure to static electric and magnetic fields found in selected industries, such as medical facilities with magnetic resonance imaging (MRI), high-energy physics research facilities and some transportation systems. To date, research on their health effects lags far behind the rapid advances in technology. Electric and magnetic fields are generated by natural

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phenomena such as the Earth's magnetic field, thunderstorms, and by man-made sources that use electricity. When such fields do not vary with time they are referred to as static. For static electric fields, studies carried out to date suggest that the main effect is discomfort from electric discharges to the body. For static magnetic fields, acute effects are only likely to occur when there is movement of a person in the field. For example, a person moving within a relatively high field can experience sensations of vertigo and nausea, and sometimes a metallic taste in the mouth and perceptions of light flashes. Although only temporary, such effects may have a safety impact for workers executing delicate procedures, e.g. surgeons performing operations within MRI units. Even when at rest, a person will experience internal body movement, such as blood flow or heart beat. When placed within a high magnetic field, electrical fields and currents are generated around the heart and major blood vessels that can impede the flow of blood. Possible effects range from minor changes in heartbeat to an increase in the risk of abnormal heart rhythms that might be life threatening.

This book has two goals. One goal is to provide a means for those new to high-energy-density physics to gain a broad foundation from one text. The second goal is to provide a useful working reference for those in the field. This book has at least four possible applications in an academic context. It can be used for training in high-energy-density physics, in

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support of the growing number of university and laboratory research groups working in this area. It also can be used by schools with an emphasis on ultrafast lasers, to provide some introduction to issues present in all laser-target experiments with high-power lasers, and with thorough coverage of the material in Chap. 11 on relativistic systems. In addition, it could be used by physics, applied physics, or engineering departments to provide in a single course an introduction to the basics of fluid mechanics and radiative transfer, with dramatic applications. Finally, it could be used by astrophysics departments for a similar purpose, with the benefit of training the students in the similarities and differences between laboratory and astrophysical systems. The notation in this text is deliberately sparse and when possible a given symbol has only one meaning. A definition of the symbols used is given in Appendix A. In various cases, additional subscripts are added to distinguish among cases of the same quantity, as for example in the use of ρ and ρ_1 ρ_2 to distinguish the mass density in two different regions.

Understanding dissipative dynamics of open quantum systems remains a challenge in mathematical physics. This problem is relevant in various areas of fundamental and applied physics. Significant progress in the understanding of such systems has been made recently. These books present the mathematical theories involved in the modeling of such phenomena. They describe physically relevant models, develop their mathematical analysis and derive their physical implications.

Annotation The proceedings of the August 1996 conference, arranged in two volumes, focus on the physics baccalaureate as passport to the workplace; physics courses in service of students in other sciences and engineering; and the physics department's responsibility in pre- and in-service education of teachers. Issues include the changing goals of physics

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courses, the impact of physics education research on instruction, and applications of modern technologies. Volume 1 contains the presentations and poster papers; volume 2 contains description of 18 sample classes. No index.

Annotation c. by Book News, Inc., Portland, Or.

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 focuses on the physics of laser plasma interactions and presents a complementary and very useful numerical model of plasmas. It describes the linear theory of light wave propagation in plasmas, including linear mode conversion into plasma waves and collisional damping.

For the past two decades, Mark Danner has reported from Latin America, Haiti, the Balkans, and the Middle East. His perceptive, award-winning dispatches have not only explored the real consequences of American engagement with the world, but also the relationship between political violence and

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power. In *Stripping Bare the Body*, Danner brings together his best reporting from the world's most troubled regions—from the fall of the Duvalier dictatorship in Haiti to the tumultuous rise of Aristide; from the onset of the Balkan Wars to the painful fragmentation of Yugoslavia; and finally to the disastrous invasion of Iraq and the radical, destructive legacy of the Bush administration. At a time when American imperial power is in decline, there has never been a more compelling moment to read these urgent, fiercely intelligent reports.

This book is a comprehensive survey of most of the theoretical and experimental achievements in the field of quantum estimation of states and operations. Albeit still quite young, this field has already been recognized as a necessary tool for research in quantum optics and quantum information, beyond being a fascinating subject in its own right since it touches upon the conceptual foundations of quantum mechanics. The book consists of twelve extensive lectures that are essentially self-contained and modular, allowing combination of various chapters as a basis for advanced courses and seminars on theoretical or experimental aspects. The last two chapters, for instance, form a self-contained exposition on quantum discrimination problems. The book will benefit graduate students and newcomers to the field as a high-level but accessible textbook, lecturers in search for advanced course material and researchers wishing to consult a modern and authoritative source of reference.

This book presents the current views of leading physicists on the bizarre property of quantum theory: nonlocality. Einstein viewed this theory as “spooky action at a distance” which, together with randomness, resulted in him being unable to accept quantum theory. The contributions in the book describe, in detail, the bizarre aspects of nonlocality, such as

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Einstein–Podolsky–Rosen steering and quantum teleportation—a phenomenon which cannot be explained in the framework of classical physics, due its foundations in quantum entanglement. The contributions describe the role of nonlocality in the rapidly developing field of quantum information. Nonlocal quantum effects in various systems, from solid-state quantum devices to organic molecules in proteins, are discussed. The most surprising papers in this book challenge the concept of the nonlocality of Nature, and look for possible modifications, extensions, and new formulations—from retrocausality to novel types of multiple-world theories. These attempts have not yet been fully successful, but they provide hope for modifying quantum theory according to Einstein’s vision.

This popular book incorporates modern approaches to physics. It not only tells readers how physics works, it shows them. Applications have been enhanced to form a bridge between concepts and reasoning.

This book covers the fundamental aspects of fiber lasers and fiber amplifiers, and includes a wide range of material from laser physics fundamentals to state-of-the-art topics in this rapidly growing field of quantum electronics. This expanded and updated new edition includes substantial new material on nonlinear frequency conversion and Raman fiber lasers and amplifiers, as well as an expanded list of references inclusive of the recent literature in the field. Emphasis is placed on the nonlinear processes taking place in fiber lasers and amplifiers, their similarities, differences to, and their advantages over other solid-state lasers. The reader will

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learn the basic principles of solid-state physics and optical spectroscopy of laser active centers in fibers, the main operational laser regimes, and will receive practical recommendations and suggestions on fiber laser research, laser applications, and laser product development. The book will be useful for students, researchers, and professional physicists and engineers who work with lasers in the optical and telecommunications field, as well as those in the chemical and biological industries.

Designed for teaching astrophysics to physics students at advanced undergraduate or beginning graduate level, this textbook also provides an overview of astrophysics for astrophysics graduate students, before they delve into more specialized volumes. Assuming background knowledge at the level of a physics major, the textbook develops astrophysics from the basics without requiring any previous study in astronomy or astrophysics. Physical concepts, mathematical derivations and observational data are combined in a balanced way to provide a unified treatment. Topics such as general relativity and plasma physics, which are not usually covered in physics courses but used extensively in astrophysics, are developed from first principles. While the emphasis is on developing the fundamentals thoroughly, recent important discoveries are highlighted at every stage.

This book constitutes the refereed proceedings of the 13th International Conference on the Quality of Information and Communications Technology, QUATIC 2020, held in Faro, Portugal*, in September 2020. The

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27 full papers and 12 short papers were carefully reviewed and selected from 81 submissions. The papers are organized in topical sections: quality aspects in machine learning, AI and data analytics; evidence-based software quality engineering; human and artificial intelligences for software evolution; process modeling, improvement and assessment; software quality education and training; quality aspects in quantum computing; safety, security and privacy; ICT verification and validation; RE, MDD and agile. *The conference was held virtually due to the COVID-19 pandemic.

Building upon Serway and Jewetta's solid foundation in the modern classic text, *Physics for Scientists and Engineers*, this first Asia-Pacific edition of *Physics* is a practical and engaging introduction to Physics. Using international and local case studies and worked examples to add to the concise language and high quality artwork, this new regional edition further engages students and highlights the relevance of this discipline to their learning and lives.

New Volume 2B edition of the classic text, now more than ever tailored to meet the needs of the struggling student.

RealTime Physics is a series of introductory laboratory modules that use computer data acquisition tools (microcomputer-based lab or MBL tools) to help students develop important physics concepts while acquiring vital laboratory skills. Besides data acquisition, computers are used for basic mathematical modeling, data analysis, and more simulations.

When a deadly plague is unleashed in the land of Muirwood, the fate of the world is placed in the hands of a young woman

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named Lia. Charged to be a magical protector, Lia volunteers to be sent on a desperate quest to rescue the squire Colvin, her love, and his pupil Ellowyn Demont, the alleged heir to the fallen kingdom of Pry-Ree. Still recovering from the injuries of her last adventures, Lia sets off across land and sea warning the kingdom of the oncoming plague. The journey leads her to Dochte Abbey, where her friends are supposedly held. Instead, though, a fallen enemy lies in wait for her, as well as an unbearable new truth. The revelation will force Lia to choose between the lives of her closest friends and her deepest desires.... Fantastically epic and at all times engaging, *The Scourge of Muirwood* is a monumental finish to the *Muirwood Trilogy*.

Extensively revised from a successful first edition, this book features a wealth of clear illustrations, numerous worked examples, and many problem sets. It provides the quantitative perspective missing from more descriptive texts, without requiring an advanced background in mathematics, and as such will be welcomed for use in courses such as biomechanics and orthopedics, rehabilitation and industrial engineering, and occupational or sports medicine.

This volume describes many of the key practical theoretical techniques that have been developed to treat chemical dynamics problems in many-atom systems. It contains thorough treatments of fundamental theory and prescriptions for performing computations. The selection of methods, ranging from gas phase bimolecular reactions to complex processes in condensed phases, reflects the breadth of the field. The book is an excellent reference for proven and accepted methods as well as for theoretical approaches that are still being developed. It is appropriate for graduate students and other ?novices? who wish to begin working in chemical dynamics as well as active researchers who wish to acquire a wider knowledge of the field.

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The main objectives of this introductory physics book are twofold: to provide the student with a clear and logical presentation of the basic concepts and principles of physics, and to strengthen an understanding of the concepts and principles through a broad range of interesting applications to the real world. In order to meet these objectives, emphasis is placed on sound physical arguments and discussions of everyday experiences and observations. At the same time, we motivate the student through practical examples that demonstrate the role of physics in other disciplines. The sixth edition features new pedagogy in keeping with the findings in physics education research. The rich new pedagogy has been integrated within the framework of an established and reliable text, facilitating its use by instructors. The full COLLEGE PHYSICS text, which covers the standard topics in classical physics and 20th century physics, is divided into six parts. COLLEGE PHYSICS, VOLUME 2 covers three of those six parts, including electricity and magnetism (Part IV); properties of light and the field of geometric and wave optics (Part V); and an introduction to special relativity, quantum physics, and atomic and nuclear physics (Part VI). Teaching text developed by U.S. Air Force Academy and designed as a first course emphasizes the universal variable formulation. Develops the basic two-body and n-body equations of motion; orbit determination; classical orbital elements, coordinate transformations; differential correction; more. Includes specialized applications to lunar and interplanetary flight, example problems, exercises. 1971 edition.

The raw numbers of high-energy-density physics are amazing: shock waves at hundreds of km/s (approaching a million km per hour), temperatures of millions of degrees, and pressures that exceed 100 million atmospheres. This title surveys the production of high-energy-density conditions, the

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fundamental plasma and hydrodynamic models that can describe them and the problem of scaling from the laboratory to the cosmos. Connections to astrophysics are discussed throughout. The book is intended to support coursework in high-energy-density physics, to meet the needs of new researchers in this field, and also to serve as a useful reference on the fundamentals. Specifically the book has been designed to enable academics in physics, astrophysics, applied physics and engineering departments to provide in a single-course, an introduction to fluid mechanics and radiative transfer, with dramatic applications in the field of high-energy-density systems. This second edition includes pedagogic improvements to the presentation throughout and additional material on equations of state, heat waves, and ionization fronts, as well as problem sets accompanied by solutions. It is beneficial for technical personnel working in the field of microelectronic, optoelectronic, and photonic semiconductor devices to get a good understanding of the physical foundations of modern semiconductor devices. Questions that technical personnel may ask are: How are electrons propagating in the periodic potential of a semiconductor crystal lattice? What are the foundations of semiconductor heterostructure devices? How does quantum mechanics relate to semiconductor heterostructure devices? This book tries to answer questions such as these. The book provides a basis for the understanding of modern semiconductor devices that have dimensions in the nanometer range, i.e. comparable to the electron de Broglie wavelength. Classical and semi-classical physics no longer gives a full description of a number of physical processes. The inclusion of quantum mechanical principles becomes mandatory and

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provides a useful description of many physical processes in electronic, optoelectronic, and photonic heterostructure devices. The first part of the book (Chapters 1 – 11) teaches quantum-mechanical principles, including the postulates of quantum mechanics, operators, the uncertainty principle, the Schrödinger equation, non-periodic and periodic potentials, quantum wells, and perturbation theory. The second part of the book (Chapters 12 – 20) applies these principles to semiconductor devices and discusses the density of states, semiconductor statistics, carrier concentrations, doping, tunneling, and some aspects of heterostructure devices. The book may be of particular interest to individuals working in the fields of microelectronics, optoelectronics, and photonics with an educational background in Electrical Engineering, Applied Physics, or Materials Science.

A prominent aspect of quantum theory, tunneling arises in a variety of contexts across several fields of study, including nuclear, atomic, molecular, and optical physics and has led to technologically relevant applications in mesoscopic science. Exploring mechanisms and consequences, *Dynamical Tunneling: Theory and Experiment* presents the work of international experts who discuss the considerable progress that has been achieved in this arena in the past two decades.

Highlights in this volume include: A historical introduction and overview of dynamical tunneling, with case histories ranging from simple and emblematic to complex and involving experimental counterparts An emphasis on the semiclassical theory of tunneling put forth by various

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research groups using different approaches

Developments in tunneling with cold atoms and molecular manifestations Advances in our ability to perform delicate and precise experiments in atomic systems The visualization and control of photonic tunneling The role of dynamical tunneling on energy flow and localization in large molecules In the near future, complex tunneling processes occurring in few and many-body systems will be able to be predicted, understood, and controlled. Comprising all relevant topics and authors in the context of present-day research on dynamical tunneling, this self-contained volume provides readers with the basis for further discovery into the potential of this powerful phenomenon.

Amy's life has drastically changed. She's found herself taking on the huge responsibility of running Heartland, the horse refuge that was her mother's life work. The one constant for Amy has been her friendship with Ty, Heartland's 17-year-old stable hand. But the arrival of a new hand, Ben, throws everything off balance. By the time Amy realizes she's taken Ty for granted, it could be too late.

It is widely recognized nowadays that conical intersections of molecular potential-energy surfaces play a key mechanistic role in the spectroscopy of polyatomic molecules, photochemistry and chemical kinetics. This invaluable book presents a systematic exposition of the current state of knowledge about conical intersections, which has been elaborated in research papers scattered throughout the chemical physics literature. Section I of the book provides a comprehensive analysis of the

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electronic-structure aspects of conical intersections.

Section II shows the importance of conical intersections in chemical reaction dynamics and gives an overview of the computational techniques employed to describe the dynamics at conical intersections. Finally, Section III deals with the role of conical intersections in the fields of molecular spectroscopy and laser control of chemical reaction dynamics. This book has been selected for coverage in: • CC / Physical, Chemical & Earth Sciences • Chemistry Citation Index(tm) • Index to Scientific Book Contents® (ISBC) Contents: Fundamental Concepts and Electronic Structure Theory Conical Intersections in Photoinduced and Collisional Dynamics Detection and Control of Chemical Dynamics at Conical Intersections Readership: Researchers in theoretical chemistry, molecular spectroscopy and photochemistry.

Keywords: Conical

Intersections; Photochemistry; Chemical Reaction Dynamics; Photo-dissociation; Diabetic

There are many excellent books on quantum theory from which one can learn to compute energy levels, transition rates, cross sections, etc. The theoretical rules given in these books are routinely used by physicists to compute observable quantities. Their predictions can then be compared with experimental data. There is no fundamental disagreement among physicists on how to use the theory for these practical purposes. However, there are profound differences in their opinions on the ontological meaning of quantum theory. The purpose of this book is to clarify the conceptual meaning of quantum theory, and to explain some of the mathematical

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methods which it utilizes. This text is not concerned with specialized topics such as atomic structure, or strong or weak interactions, but with the very foundations of the theory. This is not, however, a book on the philosophy of science. The approach is pragmatic and strictly instrumentalist. This attitude will undoubtedly antagonize some readers, but it has its own logic: quantum phenomena do not occur in a Hilbert space, they occur in a laboratory.

This book provides a cross-disciplinary overview of permafrost and the carbon cycle by providing an introduction into the geographical distribution of permafrost, with a focus on the distribution of permafrost and its soil carbon reservoirs. The chapters explain the basic physical properties and processes of permafrost soils: ice, mineral and organic components, and how these interact with climate, vegetation and geomorphological processes. In particular, the book covers the role of the large quantities of ice in many permafrost soils which are crucial to understanding carbon cycle processes. An explanation is given on how permafrost becomes loaded with ice and carbon. Gas hydrates are also introduced. Structures and processes formed by the intense freeze-thaw action in the active layer are considered (e.g. ice wedging, cryoturbation), and the processes that occur as the permafrost thaws, (pond and lake formation, erosion). The book introduces soil carbon accumulation and decomposition mechanisms and how these are modified in a permafrost environment. A separate chapter deals with deep permafrost carbon, gas reservoirs and recently

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discovered methane emission phenomena from regions such as Northwest Siberia and the Siberian yedoma permafrost.

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