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Numerical Computations with GPUs - Volodymyr Kindratenko 2014-07-03
This book brings together research on numerical methods adapted for Graphics Processing Units (GPUs). It explains recent efforts to adapt classic numerical methods, including solution of linear equations and FFT, for massively parallel GPU architectures. This volume consolidates recent research and adaptations, covering widely used methods that are at the core of many scientific and engineering computations. Each chapter is written by authors working on a specific group of methods; these leading experts provide mathematical background, parallel algorithms and implementation details leading to reusable, adaptable and scalable code fragments. This book also serves as a GPU implementation manual for many numerical algorithms, sharing tips on GPUs that can increase application efficiency. The valuable insights into parallelization strategies for GPUs are supplemented by ready-to-use code fragments. Numerical Computations with GPUs targets professionals and researchers working in high performance computing and GPU programming. Advanced-level students focused on computer science and mathematics will also find this book useful as secondary text book or reference.
Advanced Fluid Mechanics - William Graebel 2007-06-21
Fluid mechanics is the study of how fluids behave and interact under various forces and in various applied situations, whether in liquid or gas state or both. The author of Advanced Fluid Mechanics compiles pertinent information that are introduced in the more advanced classes at the senior level and at the graduate level. “Advanced Fluid Mechanics courses typically cover a variety of topics involving fluids in various multiple states (phases), with both elastic and non-elastic qualities, and flowing in complex ways. This new text will integrate both the simple stages of fluid mechanics (“Fundamentals) with those involving more complex parameters, including Inviscid Flow in multi-dimensions, Viscous Flow and Turbulence, and a succinct introduction to Computational Fluid Dynamics. It will offer exceptional pedagogy, for both classroom use and self-instruction, including many worked-out examples, end-of-chapter problems, and actual computer programs that can be used to reinforce theory with real-world applications. Professional engineers as well as Physicists and Chemists working in the analysis of

fluid behavior in complex systems will find the contents of this book useful. All manufacturing companies involved in any sort of systems that encompass fluids and fluid flow analysis (e.g., heat exchangers, air conditioning and refrigeration, chemical processes, etc.) or energy generation (steam boilers, turbines and internal combustion engines, jet propulsion systems, etc.), or fluid systems and fluid power (e.g., hydraulics, piping systems, and so on)will reap the benefits of this text. Offers detailed derivation of fundamental equations for better comprehension of more advanced mathematical analysis Provides groundwork for more advanced topics on boundary layer analysis, unsteady flow, turbulent modeling, and computational fluid dynamics Includes worked-out examples and end-of-chapter problems as well as a companion web site with sample computational programs and Solutions Manual

Understanding Molecular Properties - John S. Avery 2012-12-06

"The Theory of Atomic Spectra", surrrrnanzlllg all that was then known about the quantum theory of free atoms; and in 1961, J.S. Griffith published "The Theory of Transition Metal Ions", in which he combined the ideas in Condon and Shortley's book with those of Bethe, Schlapp, Penney and Van Vleck. All this work, however, was done by physicists, and the results were reported in a way which was more accessable to physicists than to chemists. In the meantime, Carl J. Ballhausen had been studying quantum theory with W. Moffitt at Harvard; and in 1962 (almost simultaneously with Griffith) he published his extremely important book, "Introduction to Ligand Field Theory". This influential book was written from the standpoint of a chemist, and it became the standard work from which chemists learned the quantum theory of transition metal complexes. While it treated in detail the group theoretical aspects of crystal field theory, Carl J. Ballhausen's book also emphasized the limitations of the theory. As he pointed out, it is often not sufficient to treat the central metal ion as free (apart from the influence of the charges on the surrounding ligands): - In many cases hybridization of metal and ligand orbitals is significant. Thus, in general. a molecular orbital treatment is needed to describe transition metal complexes. However, much of the group theory developed In connection with crystal field theory can also be used in the molecular orbital treatment.

Chemistry HL - Alexandra Juniper 2011-01

Nonlinear Functional Analysis and Its Applications - Radu Precup 2021-04-14

This book consists of nine papers covering a number of basic ideas, concepts, and methods of nonlinear analysis, as well as some current research problems. Thus, the reader is introduced to the fascinating theory around Brouwer's fixed point theorem, to Granas' theory of topological transversality, and to some advanced techniques of critical point theory and fixed point theory. Other topics include discontinuous differential equations, new results of metric fixed point theory, robust tracker design problems for various classes of nonlinear systems, and periodic solutions in computer virus propagation models.

Wake Up, Woods - Michael A. Homoya 2019-10

Early in the year, our North American forests come to life as native wildflowers start to push up through patches of snow. With longer days and sunlight streaming down through bare branches of towering trees, life on the forest floor awakens from its winter sleep. Plants such as green dragon, squirrel corn, and bloodroot interact with their pollinators and seed dispersers and rush to create new life before the trees above leaf out and block the sun's rays. Wake Up, Woods showcases the splendor of our warming forests and offers clues to nature's annual springtime floral show as we walk in our parks and wilderness areas, or even in shade gardens around our homes. Readers of Wake Up, Woods will see that Gillian Harris, Michael Homoya and Shane Gibson, through illustrations and text, present a captivating look into our forests' biodiversity, showing how species depend on plants for food and help assure plant reproduction. This book celebrates some of nature's most fascinating moments that happen in forests where we live and play.

English Language and Literature for the IB Diploma - Brad Philpot 2011-07-14

For students studying the new Language A Language and Literature

syllabus for the IB Diploma. Written by an experienced, practising IB English teacher, this new title is an in-depth and accessible guide for Standard and Higher Level students of the new Language A Language and Literature syllabus for the IB Diploma. This lively, well structured coursebook is available in both print and e-book formats and includes: key concepts in studying language and literature; text extracts from World literature (in English and in translation); international media and language sources; a wide variety of activities to build skills; materials for exam preparation; guidance on assessment; Theory of Knowledge links; and Extended essay opportunities.

Disciple IV - Abingdon Press 2005-05

DISCIPLE IV UNDER THE TREE OF LIFE is the final study in the four-phase DISCIPLE program and is prepared for those who have completed BECOMING DISCIPLES THROUGH BIBLE STUDY. The study concentrates on the Writings (Old Testament books not in the Torah or the Prophets), the Gospel of John, and Revelation. Emphasis on the Psalms as Israel's hymnbook and prayer book leads natural to an emphasis on worship in the study. Present through the entire study is the sense of living toward completion - toward the climax of the message and the promise, extravagantly pictured in Revelation. The image of the tree and the color gold emphasize the prod and promise in the Scriptures for DISCIPLE IV: UNDER THE TREE OF LIFE. The word under in the title is meant to convey invitation, welcome, sheltering, security, and rest - home at last. Commitment and Time Involved 32 week study Three and one-half to four hours of independent study each week (40 minutes daily for leaders and 30 minutes daily for group members) in preparation for weekly group meetings. Attendance at weekly 2.5 hour meetings. DVD Set Four of the five videos in this set contain video segments of approximately ten minutes each that serve as the starting point for discussion in weekly study sessions. The fifth video is the unique component that guides an interactive worship experience of the book of Revelation. Under the Tree of Life Scriptures lend themselves to videos with spoken word, art, dance, music, and drama. Set decorations differs from segment to segment depending on the related Scripture and its time period. Set decoration for video segments related to the Writings generally has a Persian theme. Set decoration for the New Testament video segments emphasizes the simpler life of New Testament times.

Climate Change - A. Barrie Pittock 2013-11-26

It is widely accepted in the scientific community that climate change is a reality, and that changes are happening with increasing rapidity. In this second edition, leading climate researcher Barrie Pittock revisits the effects that global warming is having on our planet, in light of ever-evolving scientific research. Presenting all sides of the arguments about the science and possible remedies, Pittock examines the latest analyses of climate change, such as new and alarming observations regarding Arctic sea ice, the recently published IPCC Fourth Assessment Report, and the policies of the new Australian Government and how they affect the implementation of climate change initiatives. New material focuses on massive investments in large-scale renewables, such as the kind being taken up in California, as well as many smaller-scale activities in individual homes and businesses which are being driven by both regulatory and market mechanisms. The book includes extensive endnotes with links to ongoing and updated information, as well as some new illustrations. While the message is clear that climate change is here (and in some areas, might already be having disastrous effects), there is still hope for the future, and the ideas presented here will inspire people to take action. Climate Change: The Science, Impacts and Solutions is an important reference for students in environmental or social sciences, policy makers, and people who are genuinely concerned about the future of our environment.

IB Chemistry Course Book - Sergey Bylikin 2014-01

The most comprehensive match to the new 2014 Chemistry syllabus, this completely revised edition gives you unrivalled support for the new concept-based approach, the Nature of science. The only DP Chemistry resource that includes support directly from the IB, focused exam practice, TOK links and real-life applications drive achievement.

Numerical Algorithms - Justin Solomon 2015-06-24

Numerical Algorithms: Methods for Computer Vision, Machine Learning,

and Graphics presents a new approach to numerical analysis for modern computer scientists. Using examples from a broad base of computational tasks, including data processing, computational photography, and animation, the textbook introduces numerical modeling and algorithmic desig

Biology SL - Guy Décarie 2011-01

Rietveld Refinement - Robert E. Dinnebier 2018-12-17

Almost 50 years have passed since the famous papers of Hugo Rietveld from the late sixties where he describes a method for the refinement of crystal structures from neutron powder diffraction data. Soon after, the potential of the method for laboratory X-ray powder diffraction was discovered. Although the method is now widely accepted, there are still many pitfalls in the theoretical understanding and in practical daily use. This book closes the gap with a theoretical introduction for each chapter followed by a practical approach.The flexible macro type language of the Topas Rietveld software can be considered as the defacto standard.

Out of Poverty - Benjamin Powell 2014-03-17

This book explores how sweatshops provide the best opportunity to workers and the role they play in the process of development.

Parabolic Equations in Biology - Benoît Perthame 2015-09-09

This book presents several fundamental questions in mathematical biology such as Turing instability, pattern formation, reaction-diffusion systems, invasion waves and Fokker-Planck equations. These are classical modeling tools for mathematical biology with applications to ecology and population dynamics, the neurosciences, enzymatic reactions, chemotaxis, invasion waves etc. The book presents these aspects from a mathematical perspective, with the aim of identifying those qualitative properties of the models that are relevant for biological applications. To do so, it uncovers the mechanisms at work behind Turing instability, pattern formation and invasion waves. This involves several mathematical tools, such as stability and instability analysis, blow-up in finite time, asymptotic methods and relative entropy properties. Given the content presented, the book is well suited as a textbook for master-level coursework.

Modeling in Fluid Mechanics - Igor Gaissinski 2018-06-13

This volume is dedicated to modeling in fluid mechanics and is divided into four chapters, which contain a significant number of useful exercises with solutions. The authors provide relatively complete references on relevant topics in the bibliography at the end of each chapter.

Problems and Solutions on Optics - Yung-Kuo Lim 1991-02-28

The material for these volumes has been selected from the past twenty years' examination questions for graduate students at University of California at Berkeley, Columbia University, the University of Chicago, MIT, State University of New York at Buffalo, Princeton University and University of Wisconsin.

Bioactive Conformation I - Thomas Peters 2006-12-08

This series presents critical reviews of the present position and future trends in modern chemical research. It contains short and concise reports on chemistry, each written by the world renowned experts – it is still valid and useful after 5 or 10 years. More information as well as the electronic version of the whole content available at: springerlink.com. The book will appeal to scientists and practitioners in the mentioned fields and in industry.

Fundamental University Physics - 1982

Potential Theory in Gravity and Magnetic Applications - Richard J. Blakely 1996-09-13

This text bridges the gap between the classic texts on potential theory and modern books on applied geophysics. It opens with an introduction to potential theory, emphasising those aspects particularly important to earth scientists, such as Laplace's equation, Newtonian potential, magnetic and electrostatic fields, and conduction of heat. The theory is then applied to the interpretation of gravity and magnetic anomalies, drawing on examples from modern geophysical literature. Topics explored include regional and global fields, forward modeling, inverse methods, depth-to-source estimation, ideal bodies, analytical continuation, and spectral analysis. The book includes numerous

exercises and a variety of computer subroutines written in FORTRAN. Graduate students and researchers in geophysics will find this book essential.

Pressure Vessel Design Manual - Dennis R. Moss 2012-12-31

Pressure vessels are closed containers designed to hold gases or liquids at a pressure substantially different from the ambient pressure. They have a variety of applications in industry, including in oil refineries, nuclear reactors, vehicle airbrake reservoirs, and more. The pressure differential with such vessels is dangerous, and due to the risk of accident and fatality around their use, the design, manufacture, operation and inspection of pressure vessels is regulated by engineering authorities and guided by legal codes and standards. Pressure Vessel Design Manual is a solutions-focused guide to the many problems and technical challenges involved in the design of pressure vessels to match stringent standards and codes. It brings together otherwise scattered information and explanations into one easy-to-use resource to minimize research and take readers from problem to solution in the most direct manner possible. Covers almost all problems that a working pressure vessel designer can expect to face, with 50+ step-by-step design procedures including a wealth of equations, explanations and data Internationally recognized, widely referenced and trusted, with 20+ years of use in over 30 countries making it an accepted industry standard guide Now revised with up-to-date ASME, ASCE and API regulatory code information, and dual unit coverage for increased ease of international use

Stage 2 disinfectants and disinfection byproducts rule initial distribution system evaluation. -

Applications of High-Tc Superconductivity - Adir Luiz 2011-06-27

This book is a collection of the chapters intended to study only practical applications of HTS materials. You will find here a great number of research on actual applications of HTS as well as possible future applications of HTS. Depending on the strength of the applied magnetic field, applications of HTS may be divided in two groups: large scale applications (large magnetic fields) and small scale applications (small magnetic fields). 12 chapters in the book are fascinating studies about large scale applications as well as small scale applications of HTS. Some chapters are presenting interesting research on the synthesis of special materials that may be useful in practical applications of HTS. There are also research about properties of high-Tc superconductors and experimental research about HTS materials with potential applications. The future of practical applications of HTS materials is very exciting. I hope that this book will be useful in the research of new radical solutions for practical applications of HTS materials and that it will encourage further experimental research of HTS materials with potential technological applications.

Mathematics for the International Student: Worked solutions - 2005

Complex Numbers from A to ...Z - Titu Andreescu 2007-10-08

* Learn how complex numbers may be used to solve algebraic equations, as well as their geometric interpretation * Theoretical aspects are augmented with rich exercises and problems at various levels of difficulty * A special feature is a selection of outstanding Olympiad problems solved by employing the methods presented * May serve as an engaging supplemental text for an introductory undergrad course on complex numbers or number theory

NMR: Principles and Applications to Biomedical Research - Jay W. Pettegrew 2012-12-06

Nuclear magnetic resonance (NMR) is having an enormous liTIpact on biomedical research both at the basic science and clinical levels. In order to appreciate the elegance and power of this technology a historical perspective is in order. In 1924 Pauli suggested that hydrogen nuclei might possess a magnetic IIlOlllent. This was in fact confinned by Rabbi in 1939 who demonstrated that a beam of hydrogen molecules in the presence of a magnetic field could be mutated by radio frequency fields resonating at the Iarmor frequency. 'Ihe first successful NMR experiments in condensed matter were independently conducted in late

1945 by Purcell, Torrey and PoUnd and by Bloch, Hansen and Packard. 'Ihe Purcell group detected proton NMR in solid paraffin and the Bloch group detected proton in liquid water. Bloch and Purcell received the Nobel Prize in physics in 1952 for these observations . Until about 1952, studies of liquids and solids with broad resonance lines dominated the field of NMR. However, the reports of 3 1 P NMR chemical shifts in several corrpounds in 1949 by Khight, of 14 N resonances in several ions by Proctor and Yu in 1950, and of 1 9 F resonances in several corrpounds in 1950 by Dickinson led to the development of high resolution NMR in Itquids. since the molecular motions in liquids result in very narrow lines compared to those in solids, :much smaller chemical shifts could be detected.

Mathematical Control Theory - Jerzy Zabczyk 2009-11-03

Mathematical Control Theory: An Introduction presents, in a mathematically precise manner, a unified introduction to deterministic control theory. In addition to classical concepts and ideas, the author covers the stabilization of nonlinear systems using topological methods, realization theory for nonlinear systems, impulsive control and positive systems, the control of rigid bodies, the stabilization of infinite dimensional systems, and the solution of minimum energy problems. "Covers a remarkable number of topics....The book presents a large amount of material very well, and its use is highly recommended." -- Bulletin of the AMS

Elements of Nuclear Physics - W. E. Burcham 1979

Science Focus - Rochelle Manners 2010

The Science Focus Second Edition is the complete science package for the teaching of the New South Wales Stage 4 and 5 Science Syllabus. The Science Focus Second Edition package retains the identified strengths of the highly successful First Edition and includes a number of new and exciting features, improvements and components. The innovative Teacher Edition with CD allows a teacher to approach the teaching and learning of Science with confidence as it includes pages from the student book with wrap around teacher notes including answers, hints, strategies and teaching and assessment advice.

Ordinary Level Physics - A. F. Abbott 1977

Ceramic Materials and Components for Engines - Jürgen G. Heinrich 2008-11-21

Several ceramic parts have already proven their suitability for serial application in automobile engines in very impressive ways, especially in Japan, the USA and in Germany. However, there is still a lack of economical quality assurance concepts. Recently, a new generation of ceramic components, for the use in energy, transportation and environment systems, has been developed. The efforts are more and more system oriented in this field. The only possibility to manage this complex issue in the future will be interdisciplinary cooperation. Chemists, physicists, material scientists, process engineers, mechanical engineers and engine manufacturers will have to cooperate in a more intensive way than ever before. The R&D activities are still concentrating on gas turbines and reciprocating engines, but also on brakes, bearings, fuel cells, batteries, filters, membranes, sensors and actuators as well as on shaping and cutting tools for low expense machining of ceramic components. This book summarizes the scientific papers of the 7th International Symposium "Ceramic Materials and Components for Engines". Some of the most fascinating new applications of ceramic meterials in energy, transportation and environment systems are presented. The proceedings shall lead to new ideas for interdisciplinary activities in the future.

Topological Insulators and Topological Superconductors - B. Andrei Bernevig 2013-04-07

This graduate-level textbook is the first pedagogical synthesis of the field of topological insulators and superconductors, one of the most exciting areas of research in condensed matter physics. Presenting the latest developments, while providing all the calculations necessary for a self-contained and complete description of the discipline, it is ideal for graduate students and researchers preparing to work in this area, and it will be an essential reference both within and outside the classroom. The

book begins with simple concepts such as Berry phases, Dirac fermions, Hall conductance and its link to topology, and the Hofstadter problem of lattice electrons in a magnetic field. It moves on to explain topological phases of matter such as Chern insulators, two- and three-dimensional topological insulators, and Majorana p-wave wires. Additionally, the book covers zero modes on vortices in topological superconductors, time-reversal topological superconductors, and topological responses/field theory and topological indices. The book also analyzes recent topics in condensed matter theory and concludes by surveying active subfields of research such as insulators with point-group symmetries and the stability of topological semimetals. Problems at the end of each chapter offer opportunities to test knowledge and engage with frontier research issues. Topological Insulators and Topological Superconductors will provide graduate students and researchers with the physical understanding and mathematical tools needed to embark on research in this rapidly evolving field.

Problems and Solutions on Atomic, Nuclear and Particle Physics - Yung-Kuo Lim 2000-03-04

This book, part of the seven-volume series Major American Universities PhD Qualifying Questions and Solutions contains detailed solutions to 483 questions/problems on atomic, molecular, nuclear and particle physics, as well as experimental methodology. The problems are of a standard appropriate to advanced undergraduate and graduate syllabi, and blend together two objectives — understanding of physical principles and practical application. The volume is an invaluable supplement to textbooks.

Kippy Koala - Maurice Pledger 2001

This title features the adventures of Kippy Koala. There are pop-up surprises hidden behind simple flaps and a pop-up finale to finish the heart-warming tale.

Spark Family Fun - Chronicle Books 2019-03-05

Family entertainment in a box: Full of easy offline activities that will encourage connection and fun for all ages, this attention-grabbing and affordable box of prompts makes an excellent gift. It's the gift of inspiration, with prompts and talking points that will get loved ones laughing, connecting, and playing together. Includes 50 faux matchsticks with printed prompts. Fans of Spark Creativity or Spark Happiness will love this gift. This gift is ideal for: • Parents • Family gatherings • Childcare workers • Gift for Mother's Day or Father's Day

Quantum Physics: The Bottom-Up Approach - Dirk Dubbers 2013-01-11

This concise tutorial provides the bachelor student and the practitioner with a short text on quantum physics that allows them to understand a wealth of quantum phenomena based on a compact, well readable, yet still concise and accurate description of nonrelativistic quantum theory. This “quadrature of the circle” is achieved by concentrating first on the simplest quantum system that still displays all basic features of quantum theory, namely, a system with only two quantized energy levels. For most readers it is very helpful to understand such simple systems before slowly proceeding to more demanding topics like particle entanglement, quantum chaos, or the use of irreducible tensors. This tutorial does not intend to replace the standard textbooks on quantum mechanics, but will help the average student to understand them, often for the first time.

Mathematics Higher Level (core) - John Gibson 1999

Quantum Harmonic Analysis - Maurice A. de Gosson 2021-07-05

Quantum mechanics is arguably one of the most successful scientific theories ever and its applications to chemistry, optics, and information theory are innumerable. This book provides the reader with a rigorous treatment of the main mathematical tools from harmonic analysis which play an essential role in the modern formulation of quantum mechanics. This allows us at the same time to suggest some new ideas and methods, with a special focus on topics such as the Wigner phase space formalism and its applications to the theory of the density operator and its entanglement properties. This book can be used with profit by advanced undergraduate students in mathematics and physics, as well as by confirmed researchers.

Immunoassay and Other Bioanalytical Techniques - Jeanette M. van Emon 2016-04-19

Taking an interdisciplinary approach that emphasizes the adaptability of immunochemical and related bioanalytical methods to a variety of matrices, Immunoassay and Other Bioanalytical Techniques describes the strength and the versatility of these methods in a wide range of environmental and biological measurement applications. With contribut

Oxford IB Diploma Programme: IB Prepared: Chemistry (Online) - Sergey Bylikin 2019-02-21

Offering an unparalleled level of assessment support, IB Prepared: Chemistry has been developed directly with the IB to provide the most up-to-date, authentic and authoritative guidance on DP assessment.