Mathematical Methods For Physicists 6th Edition By George B Arfken Hans J Weber 2005 Hardcover

Present Your Research to the World! The World Congress 2009 on Medical Physics and Biomedical Engineering – the triennial scientific meeting of the IUPESM - is the world's leading forum for presenting the results of current scientific work in health-related physics and technologies to an international audience. With more than 2,800 presentations it will be the biggest conference in the fields of Medical Physics and Biomedical Engineering in 2009! Medical physics, biomedical engineering and bioengineering have been driving forces of innovation and progress in medicine and healthcare over the past two decades. As new key technologies arise with significant potential to open new options in diagnostics and therapeutics, it is a multidisciplinary task to evaluate their benefit for medicine and healthcare with respect to the quality of performance and therapeutic output. Covering key aspects such as information and communication technologies, micro- and nanosystems, optics and biotechnology, the congress will serve as an inter- and multidisciplinary platform that brings together people from basic research, R&D, industry and medical application to discuss these issues. As a major event for science, medicine and technology the congress provides a comprehensive overview and in–depth, first-hand information on new developments, advanced technologies and current and future applications. With this Final Program we would like to give you an overview of the dimension of the congress and invite you to join us in Munich! Olaf Dössel Congress President Wolfgang C.

This book is a collection of problems that are intended to aid students in graduate and undergraduate courses in Classical and Quantum Physics. It is also intended to be a study aid for students that are preparing for the PhD qualifying exam. Many of the included problems are of a type that could be on a qualifying exam. Others are meant to elucidate important concepts. Unlike other compilations of problems, the detailed solutions are often accompanied by discussions that reach beyond the specific problem.The solution of the problem is only the beginning of the learning process--it is by manipulation of the solution and changing of the parameters that a great deal of insight can be gleaned. The authors refer to this technique as "massaging the problem," and it is an approach that the authors feel increases the pedagogical value of any problem.

The new standard reference on mathematical functions, replacing the classic but outdated handbook from Abramowitz and Stegun. Includes PDF version.

Designed for upper-level undergraduate and graduate students, Introductory Nanoscience asks key questions about the quantitative concepts that underlie this new field. How are the optical and electrical properties of nanomaterials dependent upon size, shape, and morphology? How do we construct nanometer-sized objects? Using solved examples thr

Now in its 7th edition, Mathematical Methods for Physicists continues to provide all the mathematical methods that aspiring scientists and engineers are likely to encounter as students and beginning researchers. This bestselling text provides mathematical relations and their proofs essential to the study of physics and related fields. While retaining the key features of the 6th edition, the new edition provides a more careful balance of explanation, theory, and examples. Taking a problem-solving-skills approach to incorporating theorems

with applications, the book's improved focus will help students succeed throughout their academic careers and well into their professions. Some notable enhancements include more refined and focused content in important topics, improved organization, updated notations, extensive explanations and intuitive exercise sets, a wider range of problem solutions, improvement in the placement, and a wider range of difficulty of exercises. Revised and updated version of the leading text in mathematical physics Focuses on problem-solving skills and active learning, offering numerous chapter problems Clearly identified definitions, theorems, and proofs promote clarity and understanding New to this edition: Improved modular chapters New up-to-date examples More intuitive explanations

This one-of-a-kind book presents many of the mathematical concepts, structures, and techniques used in the study of rays, waves, and scattering. Panoramic in scope, it includes discussions of how ocean waves are refracted around islands and underwater ridges, how seismic waves are refracted in the earth's interior, how atmospheric waves are scattered by mountains and ridges, how the scattering of light waves produces the blue sky, and meteorological phenomena such as rainbows and coronas. Rays, Waves, and Scattering is a valuable resource for practitioners, graduate students, and advanced undergraduates in applied mathematics, theoretical physics, and engineering. Bridging the gap between advanced treatments of the subject written for specialists and less mathematical books aimed at beginners, this unique mathematical compendium features problems and exercises throughout that are geared to various levels of sophistication, covering everything from Ptolemy's theorem to Airy integrals (as well as more technical material), and several informative appendixes. Provides a panoramic look at wave motion in many different contexts Features problems and exercises

throughout Includes numerous appendixes, some on topics not often covered An ideal reference book for practitioners Can also serve as a supplemental text in classical applied mathematics, particularly wave theory and mathematical methods in physics and engineering Accessible to anyone with a strong background in ordinary differential equations, partial differential equations, and functions of a complex variable

Mathematical Methods for PhysicistsA Comprehensive GuideAcademic Press

This book treats the topic of extending the adaptive filtering theory in the context of massive multichannel systems by taking into account a priori knowledge of the underlying system or signal. The starting point is exploiting the sparseness in acoustic multichannel system in order to solve the non-uniqueness problem with an efficient algorithm for adaptive filtering that does not require any modification of the loudspeaker signals. The book discusses in detail the derivation of general sparse representations of acoustic MIMO systems in signal or system dependent transform domains. Efficient adaptive filtering algorithms in the transform domains are presented and the relation between the signal- and the system-based sparse representations is emphasized. Furthermore, the book presents a novel approach to spatially preprocess the loudspeaker signals in a full-duplex communication system. The idea of the preprocessing is to prevent the echoes from being captured by the microphone array in order to support the AEC system. The preprocessing stage is given as an exemplarily application of a novel unified framework for the synthesis of sound figures. Finally, a multichannel system for the acoustic echo suppression is presented that can be used as a postprocessing stage for removing residual echoes. As first of its kind, it extracts the near-end signal from the microphone

signal with a distortionless constraint and without requiring a double-talk detector.

This volume is dedicated to Bill Helton on the occasion of his sixty fifth birthday. It contains biographical material, a list of Bill's publications, a detailed survey of Bill's contributions to operator theory, optimization and control and 19 technical articles. Most of the technical articles are expository and should serve as useful introductions to many of the areas which Bill's highly original contributions have helped to shape over the last forty odd years. These include interpolation, Szegö limit theorems, Nehari problems, trace formulas, systems and control theory, convexity, matrix completion problems, linear matrix inequalities and optimization. The book should be useful to graduate students in mathematics and engineering, as well as to faculty and individuals seeking entry level introductions and references to the indicated topics. It can also serve as a supplementary text to numerous courses in pure and applied mathematics and engineering, as well as a source book for seminars.

Extensively revised and updated, this new edition of a classic text presents a unified approach to crystallography and to the defects found within crystals. The book combines the classical and exact description of symmetry of a perfect crystal with the possible geometries of the major defects-dislocations, stacking faults, point defects, twins,

interfaces and the effects of martensitic transformations. A number of important concepts and exciting new topics have been introduced in this second edition, including piezoelectricity, liquid crystals, nanocrystalline concepts, incommensurate materials and the structure of foamed and amorphous solids. The coverage of quasicrystalline materials has been extended, and the data tables, appendices and references have been fully updated. Reinforcing its unrivalled position as the core text for teaching crystallography and crystal defects, each chapter includes problem sets with brief numerical solutions at the end of the book. Detailed worked solutions, supplementary lecture material and computer programs for crystallographic calculations are provided online (http://booksupport.wiley.com).
Mathematical Methods for Physical and Analytical Chemistry presents mathematical and statistical methods to students of chemistry at the intermediate, post-calculus level. The content includes a review of general calculus; a review of numerical techniques often omitted from calculus courses, such as cubic splines and Newton's method; a detailed treatment of statistical methods for experimental data analysis; complex numbers; extrapolation; linear algebra; and differential equations. With numerous example problems and helpful anecdotes, this text gives chemistry students the mathematical knowledge they need to

understand the analytical and physical chemistry professional literature.

This volume shares and makes accessible new research lines and recent results in several branches of theoretical and mathematical physics, among them Quantum Optics, Coherent States, Integrable Systems, SUSY Quantum Mechanics, and Mathematical Methods in Physics. In addition to a selection of the contributions presented at the "6th International Workshop on New Challenges in Quantum Mechanics: Integrability and Supersymmetry", held in Valladolid, Spain, 27-30 June 2017, several high quality contributions from other authors are also included. The conference gathered 60 participants from many countries working in different fields of Theoretical Physics, and was dedicated to Prof. Véronique Hussin—an internationally recognized expert in many branches of Mathematical Physics who has been making remarkable contributions to this field since the 1980s. The reader will find interesting reviews on the main topics from internationally recognized experts in each field, as well as other original contributions, all of which deal with recent applications or discoveries in the aforementioned areas.

A standalone text for courses on computational physics combining idiomatic Python, foundational numerical methods, and physics applications.

The emerging field of semiconductor quantum optics

combines semiconductor physics and quantum optics, with the aim of developing quantum devices with unprecedented performance. In this book researchers and graduate students alike will reach a new level of understanding to begin conducting state-of-the-art investigations. The book combines theoretical methods from quantum optics and solid-state physics to give a consistent microscopic description of light-matter- and many-body-interaction effects in low-dimensional semiconductor nanostructures. It develops the systematic theory needed to treat semiconductor quantum-optical effects, such as strong light-matter coupling, light-matter entanglement, squeezing, as well as quantum-optical semiconductor spectroscopy. Detailed derivations of key equations help readers learn the techniques and nearly 300 exercises help test their understanding of the materials covered. The book is accompanied by a website hosted by the authors, containing further discussions on topical issues, latest trends and publications on the field. The link can be found at www.cambridge.org/9780521875097.

Advances in Atomic, Molecular, and Optical Physics publishes reviews of recent developments in a field which is in a state of rapid growth, as new experimental and theoretical techniques are used on many old and new problems. Topics covered include related applied areas, such as atmospheric science,

astrophysics, surface physics and laser physics. Articles are written by distinguished experts, and contain both relevant review material and detailed descriptions of important recent developments. International experts Comprehensive articles New developments

Since it was first published in 1987, Galactic Dynamics has become the most widely used advanced textbook on the structure and dynamics of galaxies and one of the most cited references in astrophysics. Now, in this extensively revised and updated edition, James Binney and Scott Tremaine describe the dramatic recent advances in this subject, making Galactic Dynamics the most authoritative introduction to galactic astrophysics available to advanced undergraduate students, graduate students, and researchers. Every part of the book has been thoroughly overhauled, and many sections have been completely rewritten. Many new topics are covered, including N-body simulation methods, black holes in stellar systems, linear stability and response theory, and galaxy formation in the cosmological context. Binney and Tremaine, two of the world's leading astrophysicists, use the tools of theoretical physics to describe how galaxies and other stellar systems work, succinctly and lucidly explaining theoretical principles and their applications to observational phenomena. They provide readers with an understanding of stellar

dynamics at the level needed to reach the frontiers of the subject. This new edition of the classic text is the definitive introduction to the field. ? A complete revision and update of one of the most cited references in astrophysics Provides a comprehensive description of the dynamical structure and evolution of galaxies and other stellar systems Serves as both a graduate textbook and a resource for researchers Includes 20 color illustrations, 205 figures, and more than 200 problems Covers the gravitational N-body problem, hierarchical galaxy formation, galaxy mergers, dark matter, spiral structure, numerical simulations, orbits and chaos, equilibrium and stability of stellar systems, evolution of binary stars and star clusters, and much more Companion volume to Galactic Astronomy, the definitive book on the phenomenology of galaxies and star clusters

Mathematics for Physicists is a relatively short volume covering all the essential mathematics needed for a typical first degree in physics, from a starting point that is compatible with modern school mathematics syllabuses. Early chapters deliberately overlap with senior school mathematics, to a degree that will depend on the background of the individual reader, who may quickly skip over those topics with which he or she is already familiar. The rest of the book covers the mathematics that is usually compulsory for all students in their first two years of a typical university physics degree, plus a little more. There are worked examples throughout the text, and chapter-end problem sets. Mathematics for Physicists features: Interfaces with modern school mathematics

syllabuses All topics usually taught in the first two years of a physics degree Worked examples throughout Problems in every chapter, with answers to selected questions at the end of the book and full solutions on a website This text will be an excellent resource for undergraduate students in physics and a quick reference guide for more advanced students, as well as being appropriate for students in other physical sciences, such as astronomy, chemistry and earth sciences.

This comprehensive text on African Mathematics addresses some of the problematic issues in the field, such as attitudes, curriculum development, educational change, academic achievement, standardized and other tests, performance factors, student characteristics, cross-cultural differences and studies, literacy, native speakers, social class and differences, equal education, teaching methods, and more.

An expansive and conceptually unifying textbook of fundamental and theoretical physics, describing elementary particles and their interactions.

This unique two-volume set presents the subjects of stochastic processes, information theory, and Lie groups in a unified setting, thereby building bridges between fields that are rarely studied by the same people. Unlike the many excellent formal treatments available for each of these subjects individually, the emphasis in both of these volumes is on the use of stochastic, geometric, and group-theoretic concepts in the modeling of physical phenomena. Stochastic Models, Information Theory, and Lie Groups will be of interest to advanced undergraduate and graduate students, researchers, and practitioners working in applied mathematics, the physical sciences, and engineering. Extensive exercises and motivating examples make the work suitable as a textbook for use in courses that emphasize applied stochastic processes or differential geometry.

An introduction to the quantitative modeling of biological

processes, presenting modeling approaches, methodology, practical algorithms, software tools, and examples of current research. The quantitative modeling of biological processes promises to expand biological research from a science of observation and discovery to one of rigorous prediction and quantitative analysis. The rapidly growing field of quantitative biology seeks to use biology's emerging technological and computational capabilities to model biological processes. This textbook offers an introduction to the theory, methods, and tools of quantitative biology. The book first introduces the foundations of biological modeling, focusing on some of the most widely used formalisms. It then presents essential methodology for model-guided analyses of biological data, covering such methods as network reconstruction, uncertainty quantification, and experimental design; practical algorithms and software packages for modeling biological systems; and specific examples of current quantitative biology research and related specialized methods. Most chapters offer problems, progressing from simple to complex, that test the reader's mastery of such key techniques as deterministic and stochastic simulations and data analysis. Many chapters include snippets of code that can be used to recreate analyses and generate figures related to the text. Examples are presented in the three popular computing languages: Matlab, R, and Python. A variety of online resources supplement the the text. The editors are long-time organizers of the Annual q-bio Summer School, which was founded in 2007. Through the school, the editors have helped to train more than 400 visiting students in Los Alamos, NM, Santa Fe, NM, San Diego, CA, Albuquerque, NM, and Fort Collins, CO. This book is inspired by the school's curricula, and most of the contributors have participated in the school as students, lecturers, or both. Contributors John H. Abel, Roberto Bertolusso, Daniela Besozzi, Michael L. Blinov, Clive G.

Bowsher, Fiona A. Chandra, Paolo Cazzaniga, Bryan C. Daniels, Bernie J. Daigle, Jr., Maciej Dobrzynski, Jonathan P. Doye, Brian Drawert, Sean Fancer, Gareth W. Fearnley, Dirk Fey, Zachary Fox, Ramon Grima, Andreas Hellander, Stefan Hellander, David Hofmann, Damian Hernandez, William S. Hlavacek, Jianjun Huang, Tomasz Jetka, Dongya Jia, Mohit Kumar Jolly, Boris N. Kholodenko, Markek Kimmel, Micha? Komorowski, Ganhui Lan, Heeseob Lee, Herbert Levine, Leslie M Loew, Jason G. Lomnitz, Ard A. Louis, Grant Lythe, Carmen Molina-París, Ion I. Moraru, Andrew Mugler, Brian Munsky, Joe Natale, Ilya Nemenman, Karol Niena?towski, Marco S. Nobile, Maria Nowicka, Sarah Olson, Alan S. Perelson, Linda R. Petzold, Sreenivasan Ponnambalam, Arya Pourzanjani, Ruy M. Ribeiro, William Raymond, William Raymond, Herbert M. Sauro, Michael A. Savageau, Abhyudai Singh, James C. Schaff, Boris M. Slepchenko, Thomas R. Sokolowski, Petr Šulc, Andrea Tangherloni, Pieter Rein ten Wolde, Philipp Thomas, Karen Tkach Tuzman, Lev S. Tsimring, Dan Vasilescu, Margaritis Voliotis, Lisa Weber ?????

An essential textbook on the mathematical methods used in geophysics and space physics Graduate students in the natural sciences—including not only geophysics and space physics but also atmospheric and planetary physics, ocean sciences, and astronomy—need a broad-based mathematical toolbox to facilitate their research. In addition, they need to survey a wider array of mathematical methods that, while outside their particular areas of expertise, are important in related ones. While it is unrealistic to expect them to develop an encyclopedic knowledge of all the methods that are out there, they need to know how and where to obtain reliable and effective insights into these broader areas. Here at last is a graduate textbook that provides these students with the mathematical skills they need to succeed in today's highly

interdisciplinary research environment. This authoritative and accessible book covers everything from the elements of vector and tensor analysis to ordinary differential equations, special functions, and chaos and fractals. Other topics include integral transforms, complex analysis, and inverse theory; partial differential equations of mathematical geophysics; probability, statistics, and computational methods; and much more. Proven in the classroom, Mathematical Methods for Geophysics and Space Physics features numerous exercises throughout as well as suggestions for further reading. Provides an authoritative and accessible introduction to the subject Covers vector and tensor analysis, ordinary differential equations, integrals and approximations, Fourier transforms, diffusion and dispersion, sound waves and perturbation theory, randomness in data, and a host of other topics Features numerous exercises throughout Ideal for students and researchers alike An online illustration package is available to professors
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Makes Numerical Programming More Accessible to a Wider AudienceBearing in mind the evolution of modern programming, most specifically emergent programming languages that reflect modern practice, Numerical Programming: A Practical Guide for Scientists and Engineers Using Python and C/C++ utilizes the author's many years of practical research and tea

Providing coverage of the mathematics necessary

for advanced study in physics and engineering, this text focuses on problem-solving skills and offers a vast array of exercises, as well as clearly illustrating and proving mathematical relations.

The 21st century ushered in a new era of technology that has been reshaping everyday life, simplifying outdated processes, and even giving rise to entirely new business sectors. Today, contemporary users of products and services expect more and more personalized products and services that can meet their unique needs. In that sense, it is necessary to further develop existing methods, adapt them to new applications, or even discover new methods. This book provides a thorough review of some methods that have an increasing impact on humanity today and that can solve different types of problems even in specific industries. Upgrading with Fourier Transformation gives a different meaning to these methods that support the development of new technologies and have a good projected acceleration in the future.

Parallel Scientific Computing and Optimization introduces new developments in the construction, analysis, and implementation of parallel computing algorithms. This book presents 23 self-contained chapters, including survey chapters and surveys, written by distinguished researchers in the field of parallel computing. Each chapter is devoted to some aspects of the subject: parallel algorithms for matrix

computations, parallel optimization, management of parallel programming models and data, with the largest focus on parallel scientific computing in industrial applications. This volume is intended for scientists and graduate students specializing in computer science and applied mathematics who are engaged in parallel scientific computing.

This book puts the focus on serving human listeners in the sound field synthesis although the approach can be also exploited in other applications such as underwater acoustics or ultrasonics. The author derives a fundamental formulation based on standard integral equations and the single-layer potential approach is identified as a useful tool in order to derive a general solution. He also proposes extensions to the single-layer potential approach which allow for a derivation of explicit solutions for circular, planar, and linear distributions of secondary sources. Based on above described formulation it is shown that the two established analytical approaches of Wave Field Synthesis and Near-field Compensated Higher Order Ambisonics constitute specific solutions to the general problem which are covered by the single-layer potential solution and its extensions.

A Practical, Interdisciplinary Guide to Advanced Mathematical Methods for Scientists and Engineers Mathematical Methods in Science and Engineering, Second Edition, provides students and scientists

with a detailed mathematical reference for advanced analysis and computational methodologies. Making complex tools accessible, this invaluable resource is designed for both the classroom and the practitioners; the modular format allows flexibility of coverage, while the text itself is formatted to provide essential information without detailed study. Highly practical discussion focuses on the “how-to” aspect of each topic presented, yet provides enough theory to reinforce central processes and mechanisms. Recent growing interest in interdisciplinary studies has brought scientists together from physics, chemistry, biology, economy, and finance to expand advanced mathematical methods beyond theoretical physics. This book is written with this multi-disciplinary group in mind, emphasizing practical solutions for diverse applications and the development of a new interdisciplinary science. Revised and expanded for increased utility, this new Second Edition: Includes over 60 new sections and subsections more useful to a multidisciplinary audience Contains new examples, new figures, new problems, and more fluid arguments Presents a detailed discussion on the most frequently encountered special functions in science and engineering Provides a systematic treatment of special functions in terms of the Sturm-Liouville theory Approaches second-order differential equations of physics and engineering from the

factorization perspective Includes extensive discussion of coordinate transformations and tensors, complex analysis, fractional calculus, integral transforms, Green's functions, path integrals, and more Extensively reworked to provide increased utility to a broader audience, this book provides a self-contained three-semester course for curriculum, self-study, or reference. As more scientific disciplines begin to lean more heavily on advanced mathematical analysis, this resource will prove to be an invaluable addition to any bookshelf.

Introduction to the Fast Multipole Method introduces the reader to the theory and computer implementation of the Fast Multipole Method. It covers the topics of Laplace’s equation, spherical harmonics, angular momentum, the Wigner matrix, the addition theorem for solid harmonics, and lattice sums for periodic boundary conditions, along with providing a complete, self-contained explanation of the math of the method, so that anyone having an undergraduate grasp of calculus should be able to follow the material presented. The authors derive the Fast Multipole Method from first principles and systematically construct the theory connecting all the parts. Key Features Introduces each topic from first principles Derives every equation presented, and explains each step in its derivation Builds the necessary theory in order to understand, develop, and use the method Describes the conversion from

theory to computer implementation Guides through code optimization and parallelization ??????????????????

Fundamentals of Physics is a component of Encyclopedia of Physical Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty Encyclopedias. The Theme on Fundamentals of Physics provides an overview of the modern areas in physics, most of which had been crystallized in the 20th century, is given. The Theme on Fundamentals of Physics deals, in three volumes and cover several topics, with a myriad of issues of great relevance to our world such as: Historical Review of Elementary Concepts in Physics; Laws of Physical Systems; Particles and Fields; Quantum Systems; Order and Disorder in Nature; Topical Review: Nuclear Processes, which are then expanded into multiple subtopics, each as a chapter. These three volumes are aimed at the following five major target audiences: University and College Students, Educators, Professional Practitioners, Research Personnel and Policy Analysts, Managers, and Decision Makers, NGOs and GOs.

This first volume in the treatise on the Physics of Lakes deals with the formulation of the mathematical and physical background. A large number of lakes on Earth are described, presenting their morphology as well as the causes of their response to the driving environment. Because the physics of lakes cannot be described without the language used in mathematics, these subjects are introduced first by using the simplest approach and with utmost care, assuming only a limited college knowledge of classical Newtonian physics, and continues with increasing complexity and elegance, starting with the fundamental equations of Lake Hydrodynamics in the form of ‘primitive equations’ and leading to a detailed

treatment of angular momentum and vorticity. Following the presentation of these fundamentals turbulence modeling is introduced with Reynolds, Favre and other non-ergodic filters. The derivation of averaged field equations is presented with different closure schemes, including the k-? model for a Boussinesq fluid and early anisotropic closure schemes. This is followed by expositions of surface gravity waves without rotation and an analysis of the role played by the distribution of mass within water bodies on the Earth, leading to a study of internal waves. The vertical structure of wind-induced currents in homogeneous and stratified waters and the Ekman theory and some of its extensions close this first volume of Physics of Lakes. The last chapter collects formulas for the phenomenological coefficients of water.

This best-selling title provides in one handy volume the essential mathematical tools and techniques used to solve problems in physics. It is a vital addition to the bookshelf of any serious student of physics or research professional in the field. The authors have put considerable effort into revamping this new edition. Updates the leading graduate-level text in mathematical physics Provides comprehensive coverage of the mathematics necessary for advanced study in physics and engineering Focuses on problem-solving skills and offers a vast array of exercises Clearly illustrates and proves mathematical relations New in the Sixth Edition: Updated content throughout, based on users' feedback More advanced sections, including differential forms and the elegant forms of Maxwell's equations A new chapter on probability and statistics More elementary sections have been deleted

This book gives a readable introduction to the important, rapidly developing, field of nanophotonics. It provides a quick understanding of the basic elements of the field, allowing students and newcomers to progress rapidly to the frontiers of

their interests. Topics include: The basic mathematical techniques needed for the study of the materials of nanophotonic technology; photonic crystals and their applications as laser resonators, waveguides, and circuits of waveguides; the application of photonic crystals technology in the design of optical diodes and transistors; the basic properties needed for the design and understanding of new types of engineered materials known as metamaterials; and a consideration of how and why these engineered materials have been formulated in the lab, as well as their applications as negative refractive index materials, as perfect lens, as cloaking devices, and their effects on Cherenkov and other types of radiation. Additionally, the book introduces the new field of plasmonics and reviews its important features. The role of plasmon-polaritons in the scattering and transmission of light by rough surfaces and the enhanced transmission of light by plasmon-polariton supporting surfaces is addressed. The important problems of subwavelength resolution are treated with discussions of applications in a number of scientific fields. The basic principles of near-field optical microscopy are presented with a number of important applications. The basics of atomic cavity physics, photonic entanglement and its relation to some of the basic properties of quantum computing, and the physics associated with the study of optical lattices are presented.

Proceedings of the 3rd China Satellite Navigation Conference (CSNC2012) presents selected research papers from CSNC2012, held on 15-19 May in Guanzhou, China. These papers discuss the technologies and applications of the Global Navigation Satellite System (GNSS), and the latest progress made in the China BeiDou system especially. They are divided into 9 topics to match the corresponding sessions in CSNC2012, which broadly covered key topics in GNSS. Readers can learn about the BeiDou system and keep

abreast of the latest advances in GNSS techniques and applications. SUN Jiadong is the Chief Designer of the Compass/BeiDou system, and the Academician of Chinese Academy of Sciences; LIU Jingnan is a professor at Wuhan University, and the Academician of Chinese Academy of Engineering; YANG Yuanxi is a professor at China National Administration of GNSS and Applications, and the Academician of Chinese Academy of Sciences; FAN Shiwei is a researcher on satellite navigation.

Requiring no advanced knowledge of wave propagation, An Introduction to Metamaterials and Waves in Composites focuses on theoretical aspects of metamaterials, periodic composites, and layered composites. The book gives novices a platform from which they can start exploring the subject in more detail. After introducing concepts related to elasticity, acoustics, and electrodynamics in media, the text presents plane wave solutions to the equations that describe elastic, acoustic, and electromagnetic waves. It examines the plane wave expansion of sources as well as scattering from curved interfaces, specifically spheres and cylinders. The author then covers electrodynamic, acoustic, and elastodynamic metamaterials. He also describes examples of transformations, aspects of acoustic cloaking, and applications of pentamode materials to acoustic cloaking. With a focus on periodic composites, the text uses the Bloch-Floquet theorem to find the effective behavior of composites in the quasistatic limit, presents the quasistatic equations of elastodynamic and electromagnetic waves, and investigates Brillouin zones and band gaps in periodic structures. The final chapter discusses wave propagation in smoothly varying layered media, anisotropic density of a periodic layered medium, and quasistatic homogenization of laminates. This book provides a launch pad for research into elastic and acoustic metamaterials. Many of the ideas presented have

yet to be realized experimentally—the book encourages readers to explore these ideas and bring them to technological maturity.