Band Structure Matlab

Design Optimisation and Validation of Phononic Crystal Plates for Manipulation of Elastodynamic Guided Waves
Information Science and Electronic Engineering
Advances in Architectural Geometry 2014
Advanced Nanoelectronics
Bands and Photons in III-V Semiconductor Quantum Structures
Introductory Solid State Physics with MATLAB Applications
Computational Nanotechnology
MATLAB/Simulink for Digital Signal Processing
Engineering Vibroacoustic Analysis
Recent Advances in Graphene Nanophotonics
Physics of Semiconductor Devices
Quantum Photonics
Periodic Materials and Interference Lithography
Semiconductors
Programmable Elastic Metamaterials for Wave Control and Device Applications
Artificial Intelligence Doctoral Symposium
Nanoelectronics Fundamentals
Fundamentals of Matrix Computations
Electronic Energy Bands in Solids
Fundamentals and Applications of Acoustic Metamaterials
Introductory Quantum Mechanics with MATLAB
Electronic Structure
Microgrids
Computational Methods in Band Theory
Modern Optics
Solid State Theory, Volume 1
Machine Learning for Environmental Noise Classification in Smart Cities
Photonic Crystals
Computational Liquid Crystal Photonics
Acoustic Waves in Periodic Structures, Metamaterials, and Porous Media
Abstract Book of the International Congress on Health Sciences and Medical Technologies 2018
Crystal Structure,Electronic and Optical Properties of Epitaxial Alkaline Earth Niobate Thin Films
Heat Transfer Physics
Optical And Microwave Technologies
Atomic Scale Images of Acceptors in III-V Semiconductors
RF Circuit Design Techniques for MF-UHF Applications
MATLAB
The Structural Representation of Proximity Matrices with MATLAB
Advanced Physics of Electron Transport in Semiconductors and Nanostructures
Introductory Quantum Mechanics with MATLAB

MICHAEL CURTIS

Design Optimisation and Validation of Phononic Crystal Plates for Manipulation of Elastodynamic Guided Waves CRC Press
Solid state physics, the study and prediction of the fundamental physical properties of materials, forms the backbone of modern materials science and has many technological applications. The unique feature of this text is the MATLAB®-based computational approach with several numerical techniques and simulation methods included. This is highly effective in addressing the need for visualization and a direct hands-on approach in learning the theoretical concepts of solid state physics. The code is freely available to all textbook users. Additional Features: Uses the pedagogical tools of computational physics that have become important in enhancing physics teaching of advanced subjects such as solid state physics Adds visualization and simulation to the subject in a way that enables students to participate actively in a hand-on approach Covers the basic concepts of solid state physics and provides students with a deeper understanding of the subject matter Provides unique example exercises throughout the text Obtains mathematical analytical solutions Carries out illustrations of important formulae results using programming scripts that students can run on their own and reproduce graphs and/or simulations Helps students visualize solid state processes and apply certain numerical techniques using MATLAB®, making the process of learning solid state physics much more effective Reinforces the examples discussed within the chapters through the use of end-of-chapter exercises Includes simple analytical and numerical examples to more challenging ones, as well as computational problems with the opportunity to run codes, create new ones, or modify existing ones to solve problems or reproduce certain results
Information Science and Electronic Engineering John Wiley & Sons
The most up-to-date treatment available on modern optics. The text gives an overview of the topics and an introduction to design practices for a number of applications. It provides the student with the foundations to enter into advanced courses in nonlinear optics, lens design, laser system design, and optical communications.
Advances in Architectural Geometry 2014 CRC Press
Magnetic resonance imaging, semiconductor processing, and RFID are some of the critical applications within the medium frequency (MF) to ultrahigh frequency (UHF) range that require RF designers to have a solid understanding of analytical and experimental RF techniques. Designers need to be able to design components and devices cost effectively, and integrate them with high efficiency, minimal loss, and required power. Computer-aided design (CAD) tools also play an important part in helping to reduce costs and improve accuracy through optimization. RF Circuit Design Techniques for MF-UHF Applications explains how to design, simulate, and implement RF/microwave components and devices for applications within the medium frequency (MF) to ultrahigh frequency (UHF) range. The book makes RF design simple by expertly blending theory, simulation, and practical application examples. A Practical Guide to RF Circuit Design in the MF-UHF Range: Theory, Simulation, and Real-World Application Examples After a review of network parameters used in the analysis of RF components and devices, the book examines MF-UHF design

techniques in detail. These include techniques for designing high-power microstrip circuits, directional couplers, transformers, composite and multilayer inductors, filters, combiners/dividers, and RFID systems. For every device, the book gives the required theory and then explains the verification process with CAD tools. In addition, each design is illustrated with real-life implementation examples that use a variety of CAD tools such as MATLAB®, Mathcad, HFSSTM, Ansoft Designer®, Sonnet®, and PSpice®. Design tables, curves, and charts are included to demonstrate an efficient design process. Throughout, the book also offers practical hints to help engineers shorten the design time. Design MF-UHF Devices More Cost-Effectively The book reflects the optimum design methodology used in RF engineering, from the application of theory, to simulation for verification, to experimentation. Packed with useful techniques, tips, and examples, it is an invaluable resource for engineers, researchers, and students working in the MF-UHF range.
Advanced Nanoelectronics BoD – Books on Demand
Information Science and Electronic Engineering is a collection of contributions drawn from the International Conference of Electronic Engineering and Information Science (ICEEIS 2016) held January 4-5, 2016 in Harbin, China. The papers in this proceedings volume cover various topics, including: - Electronic Engineering - Information Science and Information Technologies - Computational Mathematics and Data Mining - Image Processing and Computer Vision - Communication and Signal Processing - Control and Automation of Mechatronics - Methods, Devices and Systems for Measurement and Monitoring - Engineering of Weapon Systems - Mechanical Engineering and Material Science - Technologies of Processing. The content of this proceedings volume will be of interest to professionals and academics in the fields of Electronic Engineering, Computer Science and Mechanical Engineering.
Bands and Photons in III-V Semiconductor Quantum Structures John Wiley & Sons
The great interest in photonic crystals and their applications in the last 15 years is being expressed in the publishing of a large number of monographs, collections, textbooks and tutorials, where existing knowledge concerning - eration principles of photonic crystal devices and microstructured ?bers, their mathematicaldescription,well-knownandnovelapplicationsofsuchtechno- gies in photonics and optical communications are presented. They challenges authors of new books to cover the gaps still existing in the literature and highlight and popularize of already known material in a new and original manner.
Authorsofthisbookbelievethatthenextsteptowardswideapplicationof photoniccrystalsisthesolutionofmanypracticalproblemsofdesignandc- putation of the speci?c photonic crystal-based devices aimed at the speci?c technicalapplication.Inordertomakethisstep,itisnecessarytoincreasethe number of practitioners who can solve such problems independently. The aim of this book is to extend the group of researchers, developers and students, who could practically use the knowledge on the physics of photonic crystals together with the knowledge and skills of independent calculation of basic characteristics of photonic crystals and modeling of various elements of - tegrated circuits and optical communication systems created on the basis of photonic crystals. The book is intended for quali?ed readers, specialists in the ?eld of optics and photonics, students of higher courses, master degree students and PhD students. As an introduction to the snopest, the book contains the basics of wave optics and radiation propagation in simple guiding media such as planar waveguides and step-index ?bers.
Introductory Solid State Physics with MATLAB Applications Springer Nature
This volume contains the papers presented at the Conference on Computational Methods in Band Theory sponsored jointly by IBM and the American Physical Society and held at the IBM Thomas J. Watson Research Center, Yorktown Heights, New York, on May 14-15, 1970. The purpose of the conference was a sharing of information on the computational problems involved in relating models for the electron-electron and electron-ion interactions to experimentally measurable quantities. The papers comprising this volume therefore present up-to-date methodology for the calculation of single-particle energies and wave functions for periodic and near-periodic systems, the integration over these states required to describe experiment, and computationally practicable procedures for the introduction of exchange and correlation and the achievement of self-consistency. The proceedings is actually an expansion of the conference in that, unlike the oral presentations, the papers were not limited as to length. Furthermore, time was allowed after the conference to permit the papers to be written with the conference in retrospect, and five "prepared discussion" papers written by attendees of the conference but not on the original program are included. The latter are indicated in the table of contents by asterisks. The explicit emphasis of the conference on comparison of technique generated much lively argument, which is surely an indi cation of the current interest in the subject and the vigor of those working in it. It is our hope that the proceedings will make these comparisons available to the widest possible audience.
Computational Nanotechnology Frontiers Media SA
In the last few decades, metamaterials have revolutionized the ways in which waves are controlled, and applied in physics and practical situations. The extraordinary properties of metamaterials, such as their locally resonant structure with deep subwavelength band gaps and their ranges of frequency where propagation is impossible, have opened the way to a host of applications that were previously unavailable. Acoustic metamaterials have been able to replace traditional treatments in several sectors, due to their better performance in targeted and tunable frequency ranges with strongly reduced dimensions. This is a training book composed of nine chapters written by experts in the field, giving a broad overview of acoustic metamaterials and their uses. The book is divided into three parts, covering the state-of-the-art, the fundamentals and the real-life applications of acoustic metamaterials.
MATLAB/Simulink for Digital Signal Processing CRC Press
Physics of Semiconductor Devices covers both basic classic topics such as energy band theory and the gradual-channel model of the MOSFET as well as advanced concepts and devices such as MOSFET short-channel effects, low-dimensional devices and single-electron transistors. Concepts are introduced to the reader in a simple way, often using comparisons to everyday-life experiences such as simple fluid mechanics. They are then explained in depth and mathematical developments are fully described. Physics of Semiconductor Devices contains a list of problems that can be used as homework assignments or can be solved in class to exemplify the theory. Many of these problems make use of Matlab and are aimed at illustrating theoretical concepts in a graphical manner.
Engineering Vibroacoustic Analysis CRC Press
Emerging from electromagnetic waves and fast extending to acoustic and elastic waves, metamaterials that exhibit extraordinary wave control abilities have been gaining soaring attention. Over the past two decades, elastic metamaterials with engineered microstructures have provided a variety of appealing solutions for controlling elastic waves and vibrations. By tailoring their internal microstructures at a subwavelength scale, elastic metamaterials fruitfully distinct themselves from traditional materials or phononic crystals by their striking functions in wave trajectory manipulation, cloaking, nonreciprocal and topological wave control, as well as low-frequency wave/vibration mitigation and absorption.
Recent Advances in Graphene Nanophotonics Springer Nature
This book covers the state of the art in the theoretical framework, computational modeling, and the fabrication and characterization of nanoelectronics devices. It addresses material properties, device physics, circuit analysis, system design, and a range of applications. A discussion on the nanoscale fabrication, characterization and metrology is also included. The book offers a valuable resource for researchers, graduate students, and senior undergraduate students in engineering and natural sciences, who are interested in exploring nanoelectronics from materials, devices, systems, and applications perspectives.
Physics of Semiconductor Devices CRC Press
There are growing advantages to the use of graphene-based nanophotonics in communication, sensing, security, safety, spectroscopy, manufacturing, biomedicine, agriculture, imaging, and other fields. These advantages, as well as the numerous challenges associated with this technology and proposed solutions to these challenges, are summarized in this book. The key objective of the book is to serve as a single-source reference for the rapidly expanding application aspects of the technology of graphene-based nanophotonics, as well as the number of modules required for their successful implementation. This book seeks to give readers a comprehensive understanding of several elements of graphene-based nanophotonics, such as emerging application areas, the design and modelling of sensors, absorbers, optical fiber, encoders, etc. A complete view of the progress and breakthroughs in novel materials for sensing, detecting and encoding technology is presented. The book also emphasizes the consequences of THz signals on human health, as well as the environmental components of THz. This book will be of tremendous value for those with an interest in electronic engineering, particularly those keeping an eye on this emerging technology.
Quantum Photonics Springer
This volume constitutes selected papers presented during the 5th Artificial Intelligence Doctoral Symposium, AID 2022, held in Algiers, Algeria, in September 2022. The 22 presented full papers were thoroughly reviewed and selected from the 38 qualified submissions. They are organized in the following topical sections: data mining; metaheuristics and swarm intelligence; computer vision; Artificial Intelligence applications; machine and deep learning; NLP and text mining.
Periodic Materials and Interference Lithography John Wiley & Sons
This book is a practical guide to optical, optoelectronic, and semiconductor materials and provides an overview of the topic from its fundamentals to cutting-edge processing routes to groundbreaking technologies for the most recent applications. The book details the characterization and properties of these materials. Chemical methods of synthesis are emphasized by the authors throughout the publication. Describes new materials and updates to older materials that exhibit optical, optoelectronic and semiconductor behaviors; Covers the structural and mechanical aspects of the optical, optoelectronic and semiconductor materials for meeting mechanical property and safety requirements; Includes discussion of the environmental and sustainability issues regarding optical, optoelectronic, and semiconductor materials, from processing to recycling.
Semiconductors Springer
Photonics is the discipline of electrons and photons working in tandem to create new physics, new devices and new applications. This textbook employs a pedagogical approach that facilitates access to the fundamentals of quantum photonics. Beginning with a review of the quantum properties of photons and electrons, the book then introduces the concept of their non-locality at the quantum level. It presents a determination of electronic band structure using the pseudopotential method, enabling the student to directly compute the band structures of most group IV, group III-V, and group II-VI semiconductors. The book devotes further in-depth discussion of second quantization of the electromagnetic field that describes spontaneous and stimulated emission of photons, quantum entanglement and introduces the topic of quantum cascade lasers, showing how electrons and photons interact in a quantum environment to create a practical photonic device. This extended second edition includes a detailed description of the link between quantum photon states and the macroscopic electric field. It describes the particle qualities of quantum electrons via their unique operator algebra and distinguishable behavior from photons, and employs these fundamentals to describe the quantum point contact, which is the quantum analogue of a transistor and the basic building block of all nanoscopic circuits, such as electron interferometers. Pearsall’s Quantum Photonics is supported by numerous numerical calculations that can be repeated by the reader, and every chapter features a reference list of state-of-the art research and a set of exercises. This textbook is an essential part of any graduate-level course dealing with the theory of nanophotonic devices or computational physics of solid-state quantum devices based on nanoscopic structures.
Programmable Elastic Metamaterials for Wave Control and Device Applications Oxford University Press
Written by the department head of materials science and engineering at MIT, this concise and stringent introduction takes readers from the fundamental theory to in-depth knowledge. It sets out with a theoretical scheme for the design of desirable periodic structures, then presents the experimental techniques that allow for fabrication of the periodic structure and exemplary experimental data. Subsequently, theory and numerical data are used to demonstrate how these periodic structures control the photonic, acoustic, and mechanical properties of materials, concluding with examples from these three important fields of applications. The result is must-have knowledge for both beginners and veterans in the field.
Artificial Intelligence Doctoral Symposium Springer Science & Business Media
This impressive thesis offers a comprehensive scientific study of the alkaline earth niobates and describes their nonlinear optical properties for the first time. It explores the crystal structure, electrical properties, optical absorption properties, hot carrier dynamics, nonlinear optical property and strain-induced metal to insulator transition of alkaline earth niobates using advanced experimental techniques. These alkaline earth niobates can have a strong plasmon resonance in the visible range due to their large carrier density, and this unique property gives rise to the emergent phenomenon of photocatalysis and nonlinear optical properties. This series of intrinsic plasmonic materials based on niobates, can be used as a photocatalyst to split water under sunlight, a novel saturable absorber in the high-power ultrashort pulsed laser system, and as a sensor in microelectromechanical systems.
Nanoelectronics Fundamentals CRC Press

Applications of nanotechnology continue to fuel significant innovations in areas ranging from electronics, microcomputing, and biotechnology to medicine, consumer supplies, aerospace, and energy production. As progress in nanoscale science and engineering leads to the continued development of advanced materials and new devices, improved methods of modeling and simulation are required to achieve a more robust quantitative understanding of matter at the nanoscale. Computational Nanotechnology: Modeling and Applications with MATLAB® provides expert insights into current and emerging methods, opportunities, and challenges associated with the computational techniques involved in nanoscale research. Written by, and for, those working in the interdisciplinary fields that comprise nanotechnology—including engineering, physics, chemistry, biology, and medicine—this book covers a broad spectrum of technical information, research ideas, and practical knowledge. It presents an introduction to computational methods in nanotechnology, including a closer look at the theory and modeling of two important nanoscale systems: molecular magnets and semiconductor quantum dots. Topics covered include: Modeling of nanoparticles and complex nano and MEMS systems Theory associated with micromagnetics Surface modeling of thin films Computational techniques used to validate hypotheses that may not be accessible through traditional experimentation Simulation methods for various nanotubes and modeling of carbon nanotube and silicon nanowire transistors In regard to applications of computational nanotechnology in biology, contributors describe tracking of nanoscale structures in cells, effects of various forces on cellular behavior, and use of protein-coated gold nanoparticles to better understand protein-associated nanomaterials. Emphasizing the importance of MATLAB for biological simulations in nanomedicine, this wide-ranging survey of computational nanotechnology concludes by discussing future directions in the field, highlighting the importance of the algorithms, modeling software, and computational tools in the development of efficient nanoscale systems.

Fundamentals of Matrix Computations Springer Nature

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Electronic Energy Bands in Solids John Wiley & Sons

The book describes analytical methods (based primarily on classical modal synthesis), the Finite Element Method (FEM), Boundary Element Method (BEM), Statistical Energy Analysis (SEA), Energy Finite Element Analysis (EFEA), Hybrid Methods (FEM-SEA and Transfer Path Analysis), and Wave-Based Methods. The book also includes procedures for designing noise and vibration control treatments, optimizing structures for reduced vibration and noise, and estimating the uncertainties in analysis results. Written by several well-known authors, each chapter includes theoretical formulations, along with practical applications to actual structural-acoustic systems. Readers will learn how to use vibroacoustic analysis methods in product design and development; how to perform transient, frequency (deterministic and random), and statistical vibroacoustic analyses; and how to choose appropriate structural and acoustic computational methods for their

applications. The book can be used as a general reference for practicing engineers, or as a text for a technical short course or graduate course.

Fundamentals and Applications of Acoustic Metamaterials Springer Nature

Abstract Book of the International Congress on Health Sciences and Medical Technologies 2018