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Advances in Image and Data Processing using VLSI Design, Volume 1

Editors：Sandeep Saini, Kusum Lata, Abhishek Sharma and G R Sinha

Published：December 2021

Online ISBN: 978-0-7503-3919-3 • Print ISBN: 978-0-7503-3917-9

VLSI is a well-established field of research that ignited the modern computing revolution. Serving as a guide to future developments, this book provides a framework for design, modeling concepts, and application of Image Processing based systems using VLSI design techniques. This volume focuses on a range of topics including object detection, recognition, smart traffic management, surveillance systems, face detection, gesture-based automated systems, and smart cities based on automated cameras. The book will help the research community to get in-depth knowledge of various systems that can be designed with image processing techniques using hardware. Part of IOP Series in Next Generation Computing.

全文：https://iopscience.iop.org/book/edit/978-0-7503-3919-3

Practical Terahertz Electronics: Devices and Applications, Volume 1：Solid-state devices and vacuum tubes

Author：Vinod Kumar Khanna

Published：December 2021

Online ISBN: 978-0-7503-3171-5 • Print ISBN: 978-0-7503-3169-2

This research and reference text provides a comprehensive and authoritative survey of the state-of-the-art in terahertz electronics research. Covering the fundamentals, operational principles, and theoretical aspects of the field, the book equips the reader to take the practical steps involved in the fabrication of devices that work in the terahertz frequency range. Volume one focuses on solid-state devices and vacuum

tubes, discussing Schottky, MIM, self-switching, geometric, resonant tunneling, IMPATT and Gunn diodes, HBTs, MOSFETs, and HEMTs, as well as traveling wave tubes, backward wave oscillators, gyrotrons and free electron lasers. Intended for researchers and professionals in the field, this text will be an essential reference for anyone working at the cutting edge of terahertz electronics.

全文：https://iopscience.iop.org/book/mono/978-0-7503-3171-5

Practical Terahertz Electronics: Devices and Applications, Volume 2：Optical devices and applications

Author：Vinod Kumar Khanna
Published：December 2021

Online ISBN: 978-0-7503-4886-7 • Print ISBN: 978-0-7503-4884-3

全文：https://iopscience.iop.org/book/mono/978-0-7503-4886-7

Rich Quasiparticle Properties of Low Dimensional Systems

Authors ： Chiun-Yan Lin, Cheng-Hsueh Yang, Chih-Wei Chiu, Hsien-Ching Chung, Shih-Yang Lin and Ming-Fa Lin

Online ISBN: 978-0-7503-3783-0 • Print ISBN: 978-0-7503-3781-6

This book discusses the essential properties of carbon nanotubes and 2D graphene systems. The book focuses on the fundamental excitation properties of a large range of graphene-related materials, presenting a new theoretical framework that couples electronic properties and e–e Coulomb interactions together in order to thoroughly explore Coulomb excitations and decay rates in carbon-nanotube-related systems. This book is aimed at researchers in nanomaterials and high-level students in physics, science and material engineering. It will serve as the ideal reference text for scientists working on carbon nanotubes, and will thoroughly expand the reader's knowledge of the application of carbon nanotube technology to graphene-based materials and the technological potential thereof.

全文：https://iopscience.iop.org/book/mono/978-0-7503-3783-0

Hot Carriers in Semiconductors

Author：David K Ferry
Published：December 2021

Online ISBN: 978-0-7503-3947-6 • Print ISBN: 978-0-7503-3945-2

This research and reference text provides up-to-date coverage of the latest research on hot carriers in semiconductors, with a focus on the background, theoretical approaches, measurements and physical understanding required to engage with the field. It equips researchers transitioning from optics to hot carrier solar cells to fully understand the role of hot carriers in semiconductors. Pitched at an introductory level, this is an essential reference text for researchers, a core text for graduate courses in hot carrier phenomena, and valuable supplementary reading for first year graduate courses in quantum mechanics, condensed matter physics, solid-state electronics and photovoltaics.

全文：https://iopscience.iop.org/book/mono/978-0-7503-3947-6

Semiconductors (Second Edition): Bonds and bands

Author：David K Ferry
Published：November 2019

Online ISBN: 978-0-7503-2480-9 • Print ISBN: 978-0-7503-2478-6

This second edition discusses the importance of semiconductors along with their newest applications. The book introduces the ever-changing field of semiconductors, before covering chapters on electronic structure, lattice dynamics, transport structures, optical properties and electron–electron interaction. This edition has been extensively updated with the addition of new chapters on statistics and optics, two expanded chapters on transport, and examples of the most recent applications of semiconductors. The book offers the deepest insight yet into the field of semiconductors, providing essential reading for graduate students and industry specialists.

全文：https://iopscience.iop.org/book/mono/978-0-7503-2480-9

Topological Insulators

Author：Panagiotis Kotetes
Published：April 2019

Online ISBN: 978-1-68174-517-6 • Print ISBN: 978-1-68174-516-9

This book provides an introduction to topological matter with a focus on insulating bulk systems. A number of prerequisite concepts and tools are first laid out, including the notion of symmetry transformations, the band theory of semiconductors and aspects of electronic transport. The main part of the book discusses realistic models for both time-reversal-preserving and -violating topological insulators, as well as their characteristic responses to external perturbations. Special emphasis is given to the study of the anomalous electric, thermal, and thermoelectric transport properties, the theory of orbital magnetisation, and the polar Kerr effect. The topological models studied throughout this book become unified and generalised by means of the tenfold topological-classification framework and the respective systematic construction of topological invariants. This approach is further extended to topological superconductors and topological semimetals. This book covers a wide range of topics and aims at the transparent presentation of the technical aspects involved. For this purpose, homework problems are also provided in dedicated Hands-on sections. Given its structure and the required background level of the reader, this book is particularly recommended for graduate students or researchers who are new to the field.

全文：https://iopscience.iop.org/book/mono/978-1-68174-517-6

Organic Lasers and Organic Photonics

Editor：F J Duarte
Published：December 2018

Online ISBN: 978-0-7503-1572-2 • Print ISBN: 978-0-7503-1570-8

Organic Lasers and Organic Photonics is the first book, since the early 1990s, to address the technology and applications of organic dye lasers and provide an insightful perspective into the vast fields of organic lasers and their applications. The latest generation of organic lasers have opened the horizon to the realm of

miniaturized devices with their own array of applications. This book also provides a comprehensive insight into the world of organic dye molecules with chapters that also explore the exciting fields optogenetics, organic laser medicine, and quantum communications. This co-edited book has been compiled by leading experts in the field of organic lasers and organic photonics, each providing a unique insight into the practical applications of such lasers as well as electrically-pumped organic semiconductor coherent sources, their physics, technology and future prospects. Part of Series in Coherent Sources and Applications.

全文：https://iopscience.iop.org/book/edit/978-0-7503-1572-2

Single-photon Detection for Data Communication and Quantum Systems

Authors： Michael Hofbauer, Kerstin Schneider-Hornstein and Horst Zimmermann

Published：December 2021

Online ISBN: 978-0-7503-2584-4 • Print ISBN: 978-0-7503-2582-0

Many single photon detection systems are based on the technology of superconducting nanowires. But despite their high detection efficiency, the need of cooling them to cryogenic temperatures prohibits their widespread usage. This book shows the progress of integrated (thick) CMOS SPADs towards high photon detection probabilities and applications such as in low-cost consumer data communication and high-end single-photon counting for quantum applications. Newest research results are introduced and comprehensively detailed. Part of IOP Series in Advances in Optics, Photonics and Optoelectronics.

全文：https://iopscience.iop.org/book/mono/978-0-7503-2584-4

Ultrafast Spectroscopy：Quantum information and wavepackets

Authors： Joel Yuen-Zhou, Jacob J Krich, Ivan Kassal, Allan S Johnson and Alán Aspuru-Guzik

Published：September 2014

Online ISBN: 978-0-750-31062-8 • Print ISBN: 978-0-750-31063-5

This book provides a self-contained introduction to quantum process tomography and nonlinear spectroscopy, which underlie the study of excited state dynamics in molecular aggregates, such as photosynthetic complexes.

全文：https://iopscience.iop.org/book/mono/978-0-750-31062-8

Semiconductor Integrated Optics for Switching Light (Second Edition)

Author：Charlie Ironside

Published：May 2021

Online ISBN: 978-0-7503-3519-5 • Print ISBN: 978-0-7503-3517-1

Semiconductor Integrated Optics for Switching Light (Second Edition) provides concise description of the physics and engineering of semiconductor optical waveguides for photonic and electronic switching with a focus on optical communication applications. It provides Python notebooks that illustrate the concepts discussed in the book. The book includes the following topics: linear and nonlinear optics, linear electro-optic effect electroabsorption and electrorefraction, nonlinear refraction, nonlinear optical devices.

全文：https://iopscience.iop.org/book/mono/978-0-7503-3519-5

Lithium Niobate-Based Heterostructures: Synthesis, properties and electron phenomena

Author：Maxim Sumets

Published：August 2018

Online ISBN: 978-0-7503-1729-0 • Print ISBN: 978-0-7503-1727-6

With the use of ferroelectric materials in memory devices and the need for high speed integrated optics devices, the interest in ferroelectric thin films continues to grow. With their remarkable properties such as energy nonvolatility, fast switching, radiative stability, and unique optoacoustic and optoelectronic properties, Lithium Niobate-Based Heterostructures: Synthesis, properties and electron phenomena,

discusses why Lithium Niobate (LiNbO3) is one of the most promising of all ferroelectric materials. Based on years of study, this book presents the systematic characterization of substructure and electronic properties of a heterosystem formed in the deposition process of lithium niobate films onto the surface of silicon wafers.

全文：https://iopscience.iop.org/book/mono/978-0-7503-1729-0