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Raman Spectroscopy and its Application in Nanostructures

Author(s):Shu-Lin Zhang
First published:20 January 2012
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About this book

Raman Spectroscopy and its Application in Nanostructures is an original and timely contribution to a very active area of physics and materials science research. This book presents the theoretical and experimental phenomena of Raman spectroscopy, with specialized discussions on the physical fundamentals, new developments and main features in low-dimensional systems of Raman spectroscopy.

In recent years physicists, materials scientists and chemists have devoted increasing attention to low-dimensional systems and as Raman spectroscopy can be used to study and analyse such materials as carbon nanotubes, quantum wells, silicon nanowires, etc., it is fast becoming one of the most powerful and sensitive experimental techniques to characterize the qualities of such nanostructures.

Recent scientific and technological developments have resulted in the applications of Raman spectroscopy to expand. These developments are vital in providing information for a very broad field of applications: for example in microelectronics, biology, forensics and archaeology. Thus, this book not only introduces these important new branches of Raman spectroscopy from both a theoretical and practical view point, but the resulting effects are fully explored and relevant representative models of Raman spectra are described in-depth with the inclusion of theoretical calculations, when appropriate.

全文：https://onlinelibrary.wiley.com/doi/book/10.1002/9781119961659

Nanomaterials, Polymers, and Devices: Materials Functionalization

and Device Fabrication

Editor(s):Eric S.W. Kong
First published:20 April 2015
Print ISBN:9780470048061 |Online ISBN:9781118867204 |DOI:10.1002/9781118867204

About this book

Providing an eclectic snapshot of the current state of the art and future implications of the field, Nanomaterials, Polymers, and Devices: Materials Functionalization and Device Fabrication presents topics grouped into three categorical focuses:

The synthesis, mechanism and functionalization of nanomaterials, such as carbon nanotubes, graphene, silica, and quantum dots

Various functional devices which properties and structures are tailored with emphasis on nanofabrication. Among discussed are light emitting diodes, nanophotonic, nano-optical, and photovoltaic devices

Nanoelectronic devices, which include semiconductor, nanotube and nanowire-based electronics, single-walled carbon-nanotube based nanoelectronics, as well as thin-film transistors

全文：https://onlinelibrary.wiley.com/doi/book/10.1002/9781118867204

Handbook of Wafer Bonding

Editor(s):Dr. Peter Ramm, Prof. Dr. James Jian-Qiang Lu, Dr. Maaike M. V. Taklo
First published:11 January 2012
Print ISBN:9783527326464 |Online ISBN:9783527644223 |DOI:10.1002/9783527644223

About this book

The focus behind this book on wafer bonding is the fast paced changes in the research and development in three-dimensional (3D) integration, temporary bonding and micro-electro-mechanical systems (MEMS) with new functional layers. Written by authors and edited by a team from microsystems companies and industry-near research organizations, this handbook and reference presents dependable, first-hand

information on bonding technologies.

Part I sorts the wafer bonding technologies into four categories: Adhesive and Anodic Bonding; Direct Wafer Bonding; Metal Bonding; and Hybrid Metal/Dielectric Bonding. Part II summarizes the key wafer bonding applications developed recently, that is, 3D integration, MEMS, and temporary bonding, to give readers a taste of the significant applications of wafer bonding technologies.

全文：https://onlinelibrary.wiley.com/doi/book/10.1002/9783527644223

Density Functional Theory: A Practical Introduction

Author(s):David S. Sholl, Janice A. Steckel

First published:30 March 2009

Print ISBN:9780470373170 |Online ISBN:9780470447710 |DOI:10.1002/9780470447710

About this book

Density Functional Theory: A Practical Introduction offers a concise, easy-to-follow introduction to the key concepts and practical applications of DFT, focusing on plane-wave DFT. The authors have many years of experience introducing DFT to students from a variety of backgrounds. The book therefore offers several features that have proven to be helpful in enabling students to master the subject, including:

Problem sets in each chapter that give readers the opportunity to test their knowledge by performing their own calculations

Worked examples that demonstrate how DFT calculations are used to solve real-world problems

Further readings listed in each chapter enabling readers to investigate specific topics in greater depth

This text is written at a level suitable for individuals from a variety of scientific, mathematical, and engineering backgrounds. No previous experience working with DFT calculations is needed.

全文：https://onlinelibrary.wiley.com/doi/book/10.1002/9780470447710

GaN Transistors for Efficient Power Conversion, Third Edition

Author(s):Alex Lidow, Michael de Rooij, Johan Strydom, David Reusch, John Glaser
First published:30 August 2019
Print ISBN:9781119594147 |Online ISBN:9781119594406 |DOI:10.1002/9781119594406

About this book

GaN Transistors for Efficient Power Conversion, 3rd Edition brings key updates to the chapters of Driving GaN Transistors; Modeling, Simulation, and Measurement of GaN Transistors; DC-DC Power Conversion; Envelope Tracking; and Highly Resonant Wireless Energy Transfer. It also offers new chapters on Thermal Management, Multilevel Converters, and Lidar, and revises many others throughout.

Written by leaders in the power semiconductor field and industry pioneers in GaN power transistor technology and applications

Updated with 35% new material, including three new chapters on Thermal Management, Multilevel Converters, Wireless Power, and Lidar

Features practical guidance on formulating specific circuit designs when constructing power conversion systems using GaN transistors

A valuable resource for professional engineers, systems designers, and electrical engineering students who need to fully understand the state-of-the-art.

全文：https://onlinelibrary.wiley.com/doi/book/10.1002/9781119594406

Fundamentals of Infrared and Visible Detector Operation and Testing, Second Edition

Author(s):John David Vincent, Steven E. Hodges, John Vampola, Mark Stegall, Greg Pierce
First published:5 October 2015
Print ISBN:9781118094884 |Online ISBN:9781119011897 |DOI:10.1002/9781119011897

About this book

Chapter 1 contains introductory material. Radiometry is covered in Chapter 2. The author examines Thermal detectors in Chapter 3; the “Classical” photon detectors –

simple photoconductors and photovoltaics in Chapter 4; and “Modern Photon Detectors” in Chapter 5. Chapters 6 through 8 consider respectively individual elements and small arrays of elements the “readouts” (ROICs) used with large imaging arrays; and Electronics for FPA Operation and Testing. The Test Set and The Testing Process are analyzed in Chapters 9 and 10, with emphasis on uncertainty and trouble shooting. Chapters 11 through 15 discuss related skills, such as Uncertainty, Cryogenics, Vacuum, Optics, and the use of Fourier Transforms in the detector business. Some highlights of this new edition are that it

Discusses radiometric nomenclature and calculations, detector mechanisms, the associated electronics, how these devices are tested, and real-life effects and problems

Examines new tools in Infrared detector operations, specifically: selection and use of ROICs, electronics for FPA operation, operation of single element and very small FPAs, microbolometers, and multi-color FPAs

Contains five chapters with frequently sought-after information on related subjects, such as uncertainty, optics, cryogenics, vacuum, and the use of Fourier mathematics for detector analyses

全文：https://onlinelibrary.wiley.com/doi/book/10.1002/9781119011897

Handbook of Nitride Semiconductors and Devices: Materials Properties, Physics and Growth, Volume 1

Author(s):Prof. Dr. Hadis Morkoç

First published:26 March 2008

Print ISBN:9783527408375 |Online ISBN:9783527628438 |DOI:10.1002/9783527628438

About this book

The three volumes of this handbook treat the fundamentals, technology and nanotechnology of nitride semiconductors with an extraordinary clarity and depth. They present all the necessary basics of semiconductor and device physics and engineering together with an extensive reference section. Volume 1 deals with the properties and growth of GaN. The deposition methods considered are: hydride VPE, organometallic CVD, MBE, and liquid/high pressure growth. Additionally, extended defects and their electrical nature, point defects, and doping are reviewed.

全文：https://onlinelibrary.wiley.com/doi/book/10.1002/9783527628438

Nitride Semiconductor Technology: Power Electronics and Optoelectronic Devices

Editor(s):Fabrizio Roccaforte, Mike Leszczynski
First published:3 August 2020
Print ISBN:9783527347100 |Online ISBN:9783527825264 |DOI:10.1002/9783527825264

About this book

The book "Nitride Semiconductor Technology" provides an overview of nitride semiconductors and their uses in optoelectronics and power electronics devices. It explains the physical properties of those materials as well as their growth methods. Their applications in high electron mobility transistors, vertical power devices, LEDs, laser diodes, and vertical-cavity surface-emitting lasers are discussed in detail. The book further examines reliability issues in these materials and puts forward perspectives of integrating them with 2D materials for novel high-frequency and high-power devices.

全文：https://onlinelibrary.wiley.com/doi/book/10.1002/9783527825264

Silicon Photonics: Fundamentals and Devices

Author(s):M. Jamal Deen, P. K. Basu
First published:29 March 2012
Print ISBN:9780470517505 |Online ISBN:9781119945161 |DOI:10.1002/9781119945161

About this book

The creation of affordable high speed optical communications using standard semiconductor manufacturing technology is a principal aim of silicon photonics research. This would involve replacing copper connections with optical fibres or waveguides, and electrons with photons. With applications such as telecommunications and information processing, light detection, spectroscopy,

holography and robotics, silicon photonics has the potential to revolutionise electronic-only systems. Providing an overview of the physics, technology and device operation of photonic devices using exclusively silicon and related alloys, the book includes:

Basic Properties of Silicon

Quantum Wells, Wires, Dots and Superlattices

Absorption Processes in Semiconductors

Light Emitters in Silicon

Photodetectors , Photodiodes and Phototransistors

Raman Lasers including Raman Scattering

Guided Lightwaves

Planar Waveguide Devices

Fabrication Techniques and Material Systems

全文：https://onlinelibrary.wiley.com/doi/book/10.1002/9781119945161

Semiconductor Terahertz Technology: Devices and Systems at Room Temperature Operation

Editor(s):Guillermo Carpintero, Luis Enrique García Muñoz, Hans L. Hartnagel, Sascha Preu, Antti V. Räisänen

First published:23 July 2015

Print ISBN:9781118920428 |Online ISBN:9781118920411 |DOI:10.1002/9781118920411

About this book

Key advances in Semiconductor Terahertz (THz) Technology now promises important new applications enabling scientists and engineers to overcome the challenges of accessing the so-called "terahertz gap". This pioneering reference explains the fundamental methods and surveys innovative techniques in the generation, detection and processing of THz waves with solid-state devices, as well as illustrating their potential applications in security and telecommunications, among other fields.

With contributions from leading experts, Semiconductor Terahertz Technology: Devices and Systems at Room Temperature Operation comprehensively and systematically covers semiconductor-based room temperature operating sources

such as photomixers, THz antennas, radiation concepts and THz propagation as well as room-temperature operating THz detectors.

The second part of the book focuses on applications such as the latest photonic and electronic THz systems as well as emerging THz technologies including: whispering gallery resonators, liquid crystals, metamaterials and graphene-based devices.

This book will provide support for practicing researchers and professionals and will be an indispensable reference to graduate students in the field of THz technology.

Key features:

Includes crucial theoretical background sections to photomixers, photoconductive switches and electronic THz generation & detection.

Provides an extensive overview of semiconductor-based THz sources and applications.

Discusses vital technologies for affordable THz applications.

Supports teaching and studying increasingly popular courses on semiconductor THz technology.

全文：https://onlinelibrary.wiley.com/doi/book/10.1002/9781118920411