NANOMATERIALS AND NANOSTRUCTURES

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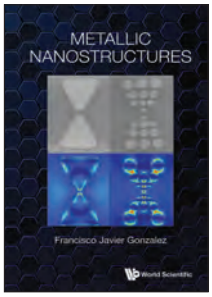


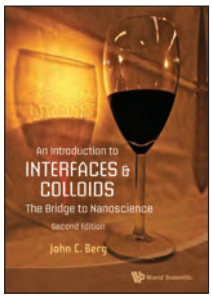
Metallic Nanostructures

by **Francisco Javier Gonzalez** *(University of Central Florida, USA)*

Metallic nanoparticles have a rich historical presence, having been utilized in ancient artifacts long before the advent of modern nanotechnology. Among these artifacts are the legendary Damascus sword, renowned for its strength and sharpness and the vibrant colors of stained-glass windows in medieval churches. It was not until the discovery of the scanning electron microscope that scientists began to understand the extraordinary properties of these ancient marvels. This book delves into the science behind why metallic nanostructures exhibit such exceptional behaviors, including their unique physical properties and the underlying principles that govern them. This book provides an in-depth look at the methods used to fabricate these structures, the techniques for characterizing and modeling them, and the wide range of applications they have in today's technology-driven world. From medical diagnostics and electromagnetic detection to energy storage, the potential of metallic nanostructures is vast and ever-expanding.

156pp	**Jun 2025**	
978-981-9811-77-9	**US$68**	**£65**
978-981-9811-79-3(ebook)	**US$27**	**£25**

Textbook



An Introduction to Interfaces and Colloids

The Bridge to Nanoscience
(2nd Edition)

by **John C Berg** *(University of Washington, USA)*

Reviews of the First Edition:

"it serves as an excellent entry into the field, giving the student more than enough support to understand the concepts ... Anyone working in the area of colloids/interfaces should have a copy of this book. It makes an excellent reference book if you are an advanced practitioner and an excellent text if you are just getting started."

Chemical Engineering Education

This textbook seeks to bring readers with no prior knowledge or experience in interfacial phenomena, colloid science or nanoscience to the point where they can comfortably enter the current scientific and technical literature in the area.

Designed as a pedagogical tool, this textbook recognizes the cross-disciplinary nature of the subject. To facilitate learning, the topics are developed from the beginning with ample cross-referencing. The understanding of concepts is enhanced by clear descriptions of experiments and provisions of figures and illustrations.

884pp	**May 2024**	
978-981-128-572-1	**US$198**	**£180**
978-981-128-640-7(pbk)	**US$78**	**£70**
978-981-128-574-5(ebook)	**US$62**	**£60**

World Scientific Series in Nanoscience and Nanotechnology - Vol 20

Soft Matter and Biomaterials on the Nanoscale

The WSPC Reference on Functional Nanomaterials — Part I
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Volume 2: Polymers on the Nanoscale: Nano-structured Polymers and Their Applications

Volume 3: Bio-Inspired Nanomaterials: Nanomaterials Built from Biomolecules and Using Bio-derived Principles

Volume 4: Nanomedicine: Nanoscale Materials in Nano/Bio Medicine

Editor-in-chief: **Oleg Gang** *(Columbia University, USA & Brookhaven National Laboratory, USA)*

by **Patrick Huber** *(Hamburg University of Technology, Germany)*, **Alamgir Karim** *(University of Houston, USA)*, **Irina Zvonkina** *(University of Houston, USA)*, **Seung-Wuk Lee** *(University of California Berkeley, USA)*, **Jin-Woo Kim** *(University of Arkansas, USA)*, **D Keith Roper** *(Utah State University, USA)* & **Wen J Li** *(City University of Hong Kong, Hong Kong)*

Soft and bio-nanomaterials offer a tremendously rich behavior due to the diversity and tailorability of their structures. Built from polymers, nanoparticles, small and large molecules, peptoids and other nanoscale building blocks, such materials exhibit exciting functions, either intrinsically or through the engineering of their organization and combination of blocks. The recent advances in understanding the behavior of soft matter and biomaterials are being actively translated into functional materials systems and devices, which take advantages of newly discovered and specifically created morphologies with desired properties.

1876pp	**Aug 2020**	
978-981-121-791-3(Set)	**US$1480**	**£1360**
978-981-121-806-4(Set) (ebook-Institution)	**US$2368**	**£2180**

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Nanoreactors and Innovative Applications

by **GQ Max Lu** *(University of Wollongong, Australia)*, **Jian Liu** *(Inner Mongolia University, China)*

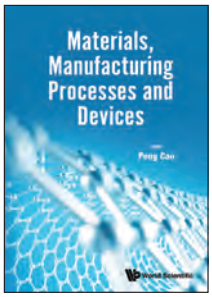
"The book addresses a burgeoning field with significant interest from academia, industry, and policymakers. Its comprehensive nature and focus on innovative applications position it as a go-to reference for professionals and researchers."

Donglu Shi
Professor of Materials Science and Engineering, University of Cincinnati, USA

This book presents a comprehensive review, analysis and synthesis of the advances in nanoreactors and their innovative applications in sustainable energy, environmental, and biomedical processes. It focuses on key synthetic strategies for controlling the size, composition, morphology, and functionalisation of nanoreactors.

250pp	**Jul 2026**	
978-981-9819-01-0	**US$98**	**£90**
978-981-9819-03-4(ebook)	**US$78**	**£70**

Materials, Manufacturing Processes and Devices

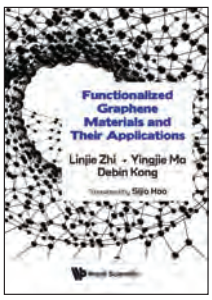


by **Peng Cao** *(University of Auckland, New Zealand)*

Materials, Manufacturing Processes and Devices brings together research that highlights the synergy between advanced materials, innovative fabrication methods, and real-world device applications. This book showcases how material design and manufacturing techniques can drive performance in cutting-edge technologies. Bridging academic research and industry relevance, this volume is an essential reference for materials scientists, engineers, and researchers aiming to design functional materials and devices.

272pp	**Aug 2025**	
978-981-9818-42-6	**US$88**	**£80**
978-981-9818-44-0(ebook)	**US$70**	**£65**

Functionalized Graphene Materials and Their Applications

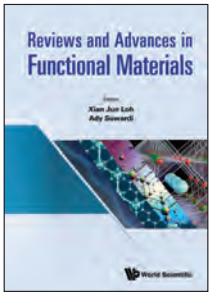


by **Linjie Zhi** *(China University of Petroleum (East China), China)*, **Yingjie Ma** *(National Center for Nanoscience and Technology, China)* & **Debin Kong** *(China University of Petroleum (East China), China)* Translated by: **Sijia Hao** *(Beijing Institute of Aeronautical Materials, China & Beijing Graphene Institute Co., Ltd., China)*

This book proposes the systematic classification and exact definition of all the products from graphene functionalization, which are illustrated by several representative examples. All the products from graphene functionalization are defined as functionalized graphene materials, which fall into two categories: functionalized graphene and functionalized graphene composite. The selection of preparation strategies depends on the application requirements, as different applications require different types of graphene.

332pp	**May 2025**	
978-981-9806-07-2	**US$118**	**£110**
978-981-9806-09-6(ebook)	**US$94**	**£85**

Reviews and Advances in Functional Materials



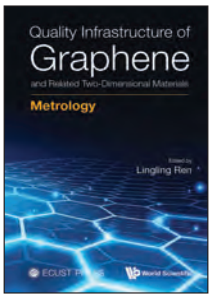
by **Xian Jun Loh** *(Institute of Materials Research and Engineering, Singapore & Nanyang Technological University, Singapore & National University of Singapore, Singapore)*, **Ady Suwardi** *(The Chinese University of Hong Kong (CUHK), Hong Kong)*

This book is a carefully curated selection of the most significant and timely articles from the publisher's premium journal, the *World Scientific Annual Review of Functional Materials*, which annually publishes invited contributions on the functional aspects of materials science. The journal affiliated to this book is increasingly recognized in the region as a platform for forward-thinking perspectives in materials science, to address global challenges such as sustainability, climate change, environmental protection, energy generation, storage and distribution, food and water safety and provision, global health, and healthcare. This book leads the way to reflect upon and celebrate the scholarly contributions.

564pp	**May 2025**	
978-981-9806-39-3	**US$158**	**£145**
978-981-9806-41-6(ebook)	**US$59.90**	**£59.90**

Quality Infrastructure of Graphene and Related Two-Dimensional Materials

Metrology



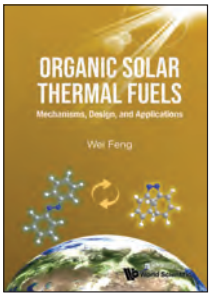
by **Lingling Ren** *(National Institute of Metrology, China)*

The rapid progress of graphene and related two-dimensional materials in both research and industrial applications necessitates robust support from metrology, standards, and conformity assessment, collectively known as national quality infrastructures (NQI). This book, using graphene and related two-dimensional materials as exemplars elaborates on various metrological techniques for the structural characterization of graphene and related materials, including Raman spectroscopy, X-ray diffraction, atomic force microscopy, and electron microscopy.

280pp	**Oct 2024**	
978-981-129-570-6	**US$98**	**£90**
978-981-129-572-0(ebook)	**US$78**	**£70**

Organic Solar Thermal Fuels

Mechanisms, Design, and Applications

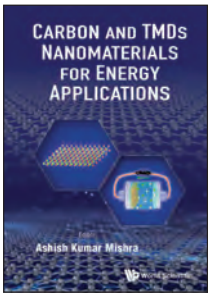


by **Wei Feng** *(Tianjin University, China)*

Organic Solar Thermal Fuels: Mechanisms, Design, and Applications offers a significant introductory overview of the key properties, mechanisms, applications, and research directions in this emerging field of photothermal conversion materials. This book explores the types, characteristics, preparation, testing, applications, and future trends of small organic molecules, polymers, and nanocomposites for solar heat storage. All the basic aspects and technology-oriented developments in this emerging discipline will be covered within this comprehensive and timely book.

496pp	**May 2024**	
978-981-128-584-4	**US$158**	**£145**
978-981-128-586-8(ebook)	**US$126**	**£115**

Textbook



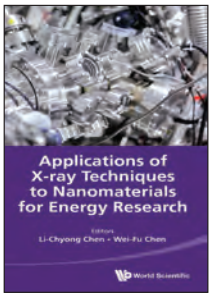
Carbon and TMDs Nanomaterials for Energy Applications

by **Ashish Kumar Mishra** *(Indian Institute of Technology, India)*

The world's increasing demand for energy is mainly being fulfilled by non-renewable fossil fuels. Its long-run usage is unsustainable due to depleting resources and adverse effects on the environment. To resolve these issues, researchers are transitioning toward high-performance renewable and sustainable energy sources and storage systems like electrochemical cells for hydrogen production, supercapacitors, batteries, and so forth. Carbon nanostructures (such as graphene and carbon nanotubes) and inorganic transition metal dichalcogenides (such as MoS2, WS2, MoSe2, etc.) are promising candidates for such energy applications owing to their unique properties and exceptional performance. This book summarizes the synthesis of carbon and TMDs to their applications in energy generation and storage.

312pp	**Feb 2024**	
978-981-128-339-0	**US$108**	**£100**
978-981-128-341-3(ebook)	**US$43**	**£40**

World Scientific Series in Nanoscience and Nanotechnology - Vol 24



Applications of X-ray Techniques to Nanomaterials for Energy Research

by **Li-Chyong Chen** *(National Taiwan University, Taiwan)*, **Wei-Fu Chen** *(Lyten Inc, USA)*

Nanomaterials have become a key component for energy-related applications. Their design principle, synthesis and applications are well discussed in various scientific and engineering books, but a gap remains in discussions regarding the application of cutting-edge X-ray techniques to these materials. This volume provides insights from the latest development of X-ray techniques to investigate nanomaterials in specific energy fields, bridging the gap between X-ray analytical scientists and material researchers. Among the applications emphasized by the chapters in this book are x-ray techniques in heterogeneous catalysis, electrocatalysis for fuel cells, photocatalysis for water splitting and carbon dioxide reduction, organic photovoltaics, and other energy-related applications.

300pp	**Feb 2024**	
978-981-128-463-2	**US$108**	**£100**
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"With 50 chapters written by 168 international experts, this 4 volumes set is a 'must read' for anyone interested in coordination chemistry and nanomaterials, enzymatic and organic systems, catalytic systems and materials or biomass and waste valorisation..."

Pierre Braunstein
University of Strasbourg and CNRS

2100pp	**Mar 2024**	
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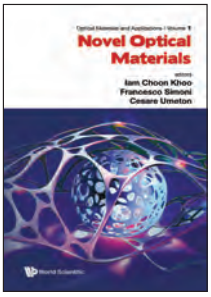
Optical Materials and Applications - Vol 1



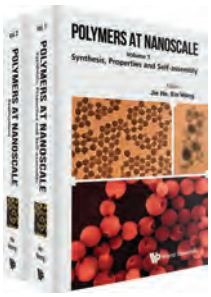
Novel Optical Materials

by **Iam Choon Khoo** *(The Pennsylvania State University, USA)*, **Francesco Simoni** *(Università Politecnica delle Marche, Italy)* & **Cesare Umeton** *(Universitàdella Calabria, Italy)*

The investigation on novel optical materials with unprecedented optical properties is of paramount importance for the development of advanced applications in many fields having a strong impact on our everyday lives such as biomedicine, food and agriculture security, optical communication and information technology. This book comprises timely contributions from active research groups covering several classes of materials and processes including nano-structured plasmonic and photonic materials, 2-D materials, photo-polymers, liquid crystals, photo-sensitive and opto-thermal, and other specially engineered materials.

324pp	**Dec 2023**	
978-981-128-059-7	**US$118**	**£110**
978-981-128-061-0(ebook)	**US$94**	**£85**

Polymers at Nanoscale



(In 2 Volumes)
Volume 1: Synthesis, Properties and Self-assembly
Volume 2: Applications

by **Jie He** *(University of Connecticut, USA)*, **Xin Wang** *(Songshan Lake Materials Laboratory, China)*

This book seeks to uncover the basics and recent advances in polymer nanoparticles, including polymer synthesis, self-assembly, properties, and applications. It showcases a wide range of advanced applications of polymer nanoparticles in several fields that include pharmaceutics (drug and nucleotide delivery), biomedicals (bioimaging, diagnosis, and therapeutics), energy (batteries and solar cells) and environmental (catalysis and water purification).

676pp	**Dec 2023**	
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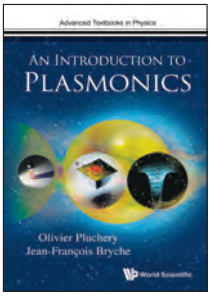

An Introduction to Plasmonics

by **Olivier Pluchery** *(Sorbonne University, France)*, **Jean-François Bryche** *(CNRS, France & Sherbrooke University, Canada)*

This book begins by exploring the concepts behind waves, and the electromagnetic description of light when it interacts with metals; it dedicates every chapter thereafter to all aspects of plasmonics. In particular, the surface plasmon polariton wave is explained in full detail, as well as the localized surface plasmon resonance of metallic nanoparticles. The active research area opened by plasmonics, as well as its applications, are also briefly explained, such as advanced biosensing, subwavelength waveguiding, quantum plasmonics, nanoparticle-based cancer therapies, optical nano-antenna and high-efficiency photovoltaic cells.

356pp	**Sep 2023**	
978-1-80061-339-3	**US$98**	**£90**
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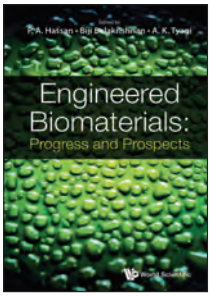
Engineered Biomaterials: Progress and Prospects



by **P A Hassan**, **Biji Balakrishnan** & **A K Tyagi** *(Bhabha Atomic Research Centre, India)*

Engineered Biomaterials: Progress and Prospects presents state-of-the-art developments in the area of biomaterials research exemplified by experts in the fields of tissue engineering, wound healing, bio-diagnostics, novel therapeutics and advanced drug delivery systems. It provides a comprehensive account of preparation, characterisation, properties, processing, biological and clinical evaluation of a large variety of materials for specific biomedical applications. Basic concepts related to wound healing, tissue engineering and drug delivery systems, and the principal role played by macro, micro and nano scaled structures in biomaterials are presented in a clear manner.

968pp	**Sep 2023**	
978-981-127-200-4	**US$228**	**£210**
978-981-127-202-8(ebook)	**US$182**	**£165**

Nanothermodynamics

Theory and Applications

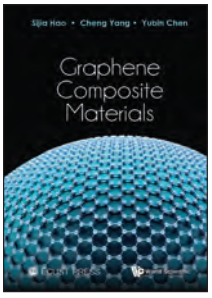
by **Dick Bedeaux**, **Signe Kjelstrup** & **Sondre K Schnell** *(Norwegian University of Science and Technology, Norway)*

"The present book by Bedeaux, Kjelstrup, and Schnell introduces this important subject by expounding Hill's theory in great details. Being leading scientists themselves working on thermodynamics of surface and interface, the authors combined their own expertise with Hill's seminal work into a modernized version of thermodynamics."

Hong Qian
University of Washington

416pp	**Aug 2023**	
978-981-127-499-2	**US$148**	**£135**
978-981-127-501-2(ebook)	**US$118**	**£110**

Graphene Composite Materials



by **Sijia Hao**, **Cheng Yang** & **Yubin Chen** *(Beijing Institute of Aeronautical Materials, China & Beijing Institute of Graphene Technology Co. Ltd., China)*

This unique compendium introduces in detail the basic theory, process methods, property evaluation, research progress, development trend, and basic scientific issues in the combination of graphene and its composite materials in recent years.

352pp	**Jul 2023**	
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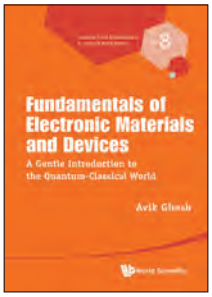

Lessons from Nanoscience: A Lecture Notes Series - Vol 8

Fundamentals of Electronic Materials and Devices

A Gentle Introduction to the Quantum-Classical World

by **Avik Ghosh** *(University of Virginia, USA)*

"... a superb compendium of modern and important topics in classical and quantum device physics ... will quickly impart to the uninitiated a sound understanding of modern device principles and applied physics.

Supriyo Bandyopadhyay
Virginia Commonwealth University

This book combines top-down classical device physics with bottom-up quantum transport in a single venue to provide the basis for such a scientific exploration.

348pp	**Feb 2023**	
978-981-126-595-2	**US$108**	**£100**
978-981-126-657-7(pbk)	**US$38**	**£35**
978-981-126-597-6(ebook)	**US$30**	**£30**

Materials and Energy - Vol 12

World Scientific Handbook of Organic Optoelectronic Devices

(Volumes 3 & 4)
Volume 3: OLEDs
Volume 4: Flexible Bioelectronics

Editor-in-chief: **Franky So** *(North Carolina State University, USA)*
by **Dongge Ma** *(South China University of Technology, China)*, **Tae-Woo Lee** *(Seoul National University, South Korea)*

World Scientific Handbook of Organic Optoelectronic Devices provides a comprehensive coverage of the state-of-the-art in an accessible format. It presents the most widely recognized fundamentals, principles, and mechanisms along with representative examples, key experimental data, and over 200 illustrative figures.

1144pp	**Jul 2022**	
978-981-124-029-4(Set)	**US$890**	**£820**
978-981-12-4030-0(Set) (ebook-Institution)	**US$1424**	**£1310**

World Scientific Series in Nanoscience and Nanotechnology - Vol 22

World Scientific Reference on Plasmonic Nanomaterials

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Volume 2: Plasmonic Nanoparticles: Synthesis and (Bio)functionalization
Volume 3: Self-Assembly of Plasmonic Nanostructures
Volume 4: Nanoparticle-Cell Interactions
Volume 5: Plasmonics in Diagnostics and Therapy

Editor-in-chief: **Luis M Liz-Marzán** *(CIC biomaGUNE, Spain)*
by **Jwa-Min Nam** *(Seoul National University, Korea)*, **Jianfang Wang** *(The Chinese University of Hong Kong, China)*, **Zhihong Nie** *(Fudan University, China)*, **Kimberly Hamad-Schifferli** *(University of Massachusetts Boston, USA & Massachusetts Institute of Technology, USA)* & **Sebastian Schlücker** *(University of Duisburg-Essen, Germany)*

A book collection that encompasses multiple aspects of the exciting and timely field of nanoplasmonics, under the coordination of international plasmonic nanomaterials expert, Dr Luis Liz-Marzán. Plasmonics has a long history, from stained glass in ancient cathedrals, through pioneering investigations by Michael Faraday, all the way into the nanotechnology era.

2328pp	**May 2022**	
978-981-123-513-9(Set)	**US$1950**	**£1795**
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Emerging Technologies in Biophysical Sciences: A World Scientific Reference

(In 3 Volumes)

Volume 1: Emerging Technologies for Biofabrication and Biomanufacturing

Volume 2: Emerging Technologies for Fertility

Volume 3: Emerging Technologies for Diagnostics

Editor-in-chief: **Utkan Demirci** *(Stanford University, USA)*

by **Utkan Demirci** *(Stanford University, USA)*, **Rami El Assal** *(Stanford University, USA)*, **Pu Chen** *(Wuhan University, China)*, **Waseem Asghar** *(Florida Atlantic University, USA)*, **Fatih Inci** *(Bilkent University-UNAM, Turkey & Stanford University, USA)* & **Shuqi Wang** *(Sichuan University, China)*

This book provides an integrated overview of recent advancements in biofabrication, reproductive technologies, and diagnostic innovations. It examines key developments in 3D bioprinting, fertility enhancement systems, and biosensor-based point-of-care diagnostics, offering a comprehensive reference on emerging tools and methodologies that are reshaping biomedical research and clinical practice.

1080pp	**Jan 2023**	
978-981-122-565-9(Set)	**US$1200**	**£1105**
978-981-12-2568-0(Set)(ebook-Institution)	**US$1920**	**£1765**

World Scientific Series in Nanoscience and Nanotechnology - Vol 18

Handbook of Synthetic Methodologies and Protocols of Nanomaterials

(In 4 Volumes)

Volume 1: Solution Phase Synthesis of Nanomaterials

Volume 2: Gas Phase Synthesis of Nanomaterials

Volume 3: Unconventional Methods for Nanostructure Fabrication

Volume 4: Characterization Methods for Nanostructures

Editor-in-chief: **Yadong Yin** *(University of California, Riverside, USA)*

by **Yu Lu** *(University of California, Riverside, USA)*, **Yat Li** *(University of California, Santa Cruz, USA)*, **Yiding Liu** *(Southwest Petroleum University, China)*, **Le He** *(Soochow University, China)*, **Yihan Zhu** *(Zhejiang University of Technology, China)* & **Yu Han** *(King Abdullah University of Science and Technology, Saudi Arabia)*

This comprehensive book set includes four volumes, covering the methods and protocols for the synthesis, fabrication, and characterization of nanomaterials.

2376pp	**Oct 2019**	
978-981-3277-78-6(Set)	**US$1950**	**£1795**
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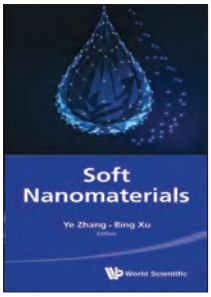
Soft Nanomaterials



by **Ye Zhang** *(Okinawa Institute of Science and Technology, Japan)*, **Bing Xu** *(Brandeis University, USA)*

Soft materials with nanometer scale aspects have been heavily used in biomedical science. Instead of providing a broad introduction of soft materials and their biomedical applications, this book focuses on the preparation of molecular assemblies of biotechnologically relevant biomimetic systems with an emphasis on medical applications.

220pp	**Sep 2019**	
978-981-120-102-8	**US$98**	**£90**
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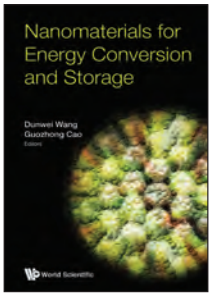
Nanomaterials for Energy Conversion and Storage



by **Dunwei Wang** *(Boston College, USA)*, **Guozhong Cao** *(University of Washington, USA)*

This book looks at the most recent research on the topic, with particular focus on artificial photosynthesis and lithium-ion batteries as the most promising technologies to date. Research on the broad subject of energy conversion and storage calls for expertise from a wide range of backgrounds, from the most fundamental perspectives of the key catalytic processes at the molecular level to device scale engineering and optimization.

836pp	**Jan 2018**	
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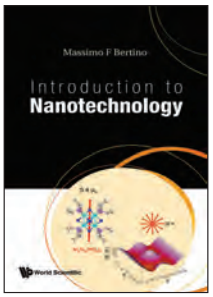
Textbook

Introduction to Nanotechnology



by **Massimo F Bertino** *(Virginia Commonwealth University, USA)*

The book was written with the fact that nanotechnology is a vast field where the applications range from paint to nanomedicine, through plasmonics and catalysis. This textbook focuses on the key physical and chemical principles and uses many formulas and equations within with the one-semester time constraint.

236pp	**Feb 2022**	
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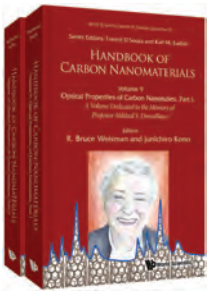

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Volume 10: Optical Properties of Carbon Nanotubes, Part II: A Volume Dedicated to the Memory of Professor Mildred S Dresselhaus

by **R Bruce Weisman** & **Junichiro Kono** *(Rice University, USA)*

This volume is a tribute to the career of Prof. Mildred Dresselhaus. It focuses on the optical properties and spectroscopy of single-wall carbon nanotubes. It contains chapters on diverse experimental and theoretical aspects of the field, written by internationally recognized experts.

812pp	**Mar 2019**	
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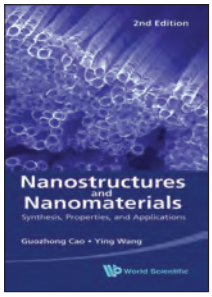

by **Guozhong Cao** *(University of Washington, USA)*, **Ying Wang** *(Louisiana State University, USA)*

Reviews of the First Edition:

"This book does an excellent job of assembling a wide variety of synthetic techniques and describing how they can be applied to a range of materials for design on the nanoscale. The references range from the classic to the very recent, giving a broad perspective of the area, and an index provides cross-referencing."

Journal of the American Chemical Society

This important book focuses not only on the synthesis and fabrication of nanostructures and nanomaterials, but also includes properties and applications of nanostructures and nanomaterials, particularly inorganic nanomaterials.

596pp	**Jan 2011**	
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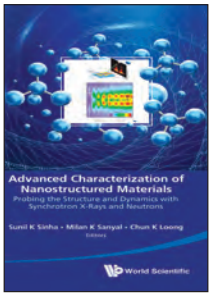
Probing the Structure and Dynamics with Synchrotron X-Rays and Neutrons



by **Sunil K Sinha** *(University of California San Diego, USA)*, **Milan K Sanyal** *(Saha Institute of Nuclear Physics, India)* & **Chun K Loong** *(The Chinese University of Hong Kong, Hong Kong)*

Advanced Characterization of Nanostructured Materials — Probing the Structure and Dynamics with Synchrotron X-Rays and Neutrons is a collection of chapters which review the characterization of the structure and internal dynamics of a wide variety of nanostructured materials using various synchrotron X-ray and neutron scattering techniques. The authors are well-known practitioners in their fields of research who provide detailed and authoritative accounts of how these techniques have been applied to study systems ranging from thin films and monolayers on solid surfaces and at liquid-air, liquid-liquid and solid-liquid interfaces; nanostructured composite materials; battery materials, and catalytic materials. This book should provide an incentive and a reference for researchers in nanomaterials for using these techniques as a powerful way to characterize their samples. It should also help to popularize the use of synchrotron and neutron facilities by the nanoscience community.

432pp	**Apr 2021**	
978-981-123-150-6	**US$148**	**£135**
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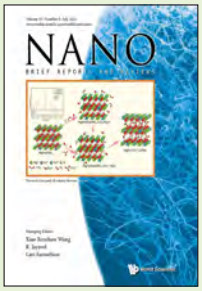

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