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BIOMEMS AND BIOMEDICAL NANOTECHNOLOGY

VI: BIOMEDICAL & BIOLOGICAL NANOTECHNOLOGY. V2: MICRO/NANO TECHNOLOGY FOR GENOMICS AND PROTEOMICS. V3: THERAPEUTIC MICRO/NANOTECHNOLOGY. V4: BIOMOLECULAR SENSING, PROCESSING AND ANALYSIS

Springer **The frontiers of microtechnology and nanotechnology are changing the face of medicine through the efforts of researchers to build biomedical microelectromechanical systems, or bioMEMS - tiny working machines so small, they measure only a few millionths of a meter across. BIOMEMS AND BIOMEDICAL NANOTECHNOLOGY, edited by Mauro Ferrari, comprises the first comprehensive reference devoted to all aspects of research in the diagnostic and therapeutic applications of Micro-Electro-Mechanical Systems (MEMS), microfabrication, and nanotechnology. Contributions report on fundamental and applied investigations of the material science, biochemistry, and physics of biomedical microdevices. General subjects treated include the design, characterization, testing, modeling and clinical validation of microfabricated systems and their integration on-chip and in larger functional units. Intended to be accessible to professionals and researchers from both the center of this fast-developing technology and adjacent fields, BIOMEMS AND BIOMEDICAL NANOTECHNOLOGY delivers a valuable knowledge base of key research and applications articles from acknowledged experts on an international scope. Each volume is very well illustrated with many figures appearing in color. This major reference includes contributions from world renowned experts in the field and consists of four volumes: Volume I: BIOMEDICAL AND BIOLOGICAL NANOTECHNOLOGY (Volume Editors, Abraham Lee and James Lee) - focuses on synthetic nanodevices and the synthesis of nanomaterials and the generation of nanoscale features. The nanomaterials include polymeric microspheres and nanostructures, carbon nanotubes, silicon, silicon dioxide, and iron oxide. There is also a chapter on the characterization of critical nanostructures for bio applications such as nanochannels and nanopores. The second part involves hybrid synthetic-biomolecular nanodevices that utilize the self assembly properties of both biomolecules and synthetic materials. Volume II: MICRO/NANO TECHNOLOGY FOR GENOMICS AND PROTEOMICS (Volume Editors, Mihrimah Ozkan and Michael Heller) - reports on fundamental and applied investigations of the material science, biochemistry, and physics of biomedical microdevices with applications to Genomics and Proteomics. Topics include gene expression profiling utilizing microarray technology; imaging and sensing for gene detection and use in DNA analysis, and coverage of advanced microfluidic devices. Volume III: THERAPEUTIC MICRO/NANOTECHNOLOGY (Volume Editors, Tejal Desai and Sangeeta Bhatia) - treats the emerging area of therapeutic micro- and nanotechnology. Subjects covered include: cell-based therapeutics, regenerative medicine - merging cells with micro- and nanosystems, and integrating MEMS with cells and tissues; Drug delivery - intravascular nanoparticles for drug targeting and nonvascular delivery (implantable, oral, inhalable); molecular surface engineering for the biological interface, biomolecule patterning and cell patterning. Volume IV: BIOMOLECULAR SENSING, PROCESSING AND ANALYSIS (Volume Editors, Rashid Bashir and Steve Wereley) - is a balanced review of key aspects of BioMEMS sensors, including (i) BioMEMS sensors and materials, (ii) means of manipulating biological entities at the microscale, and (iii) micro-fluidics and characterization.**

BIOMEMS AND BIOMEDICAL NANOTECHNOLOGY

VI: BIOMEDICAL & BIOLOGICAL NANOTECHNOLOGY. V2: MICRO/NANO TECHNOLOGY FOR GENOMICS AND PROTEOMICS. V3: THERAPEUTIC MICRO/NANOTECHNOLOGY. V4: BIOMOLECULAR SENSING, PROCESSING AND ANALYSIS

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QUANTUM NANOSYSTEMS

STRUCTURE, PROPERTIES, AND INTERACTIONS

CRC Press **The need for economically feasible and multifunctional materials becomes more acute as the natural physical and chemical resources reveal either their limits or reveal the difficulties and increasing costs in storage, transport, and conversion. This reference presents the work from contributors from various fields, of various ages and from different countries, creating a valuable collection of research that will advance the fundamental and innovative techniques of nanosystems and their interactions. The authors cover self-assembly, self-regenerating, storage, and directional properties of intelligent materials. It helps readers respond to the challenges in this field.**

POLYMERIC NANOSYSTEMS

THERANOSTIC NANOSYSTEMS, VOLUME 1

Academic Press **Polymeric Nanosystems: Theranostic Nanosystems, Volume One examines the applications of nanotherapeutic systems and nanodiagnostics in relation to polymeric nanosystems. In the last decade, numerous biopolymers have been utilized to prepare polymeric nanosystems for therapeutic applications. These biopolymers include polylactic acid, polylactide-co-glycolide, polycaprolactone, acrylic polymers, cellulose and cellulose derivatives, alginates, chitosan, gellan gum, gelatin, albumin, chontroitin sulfate, hyaluronic acid, guar gum, gum Arabic, gum tragacanth, xanthan gum, and starches. Besides these biopolymers, grafted polymers are also being used as advanced polymeric materials to prepare many theranostic nanocarriers and nanoformulations. This book explores the array of polymeric nanosystems to understand therapeutic potentials. It will be useful to pharmaceutical scientists, including industrial pharmacists and analytical scientists, health care professionals, and regulatory scientists actively involved in the pharmaceutical**

product and process development of tailor-made polysaccharides in drug delivery applications. Contains in-depth discussions of polymeric nanosystems, including high-quality graphics, flow charts and graphs for enhanced understanding Reviews literature on polymeric nanosystems while also suggesting new avenues Includes contributions in all areas of polymeric nanosystems, providing a thorough and interdisciplinary work

BIO-NANO INTERFACE

APPLICATIONS IN FOOD, HEALTHCARE AND SUSTAINABILITY

Springer Nature **This book discusses the unique interactions of nanoparticles with various biomolecules under different environmental conditions. It describes the consequences of these interactions on other biological aspects like flora and fauna of the niche, cell proliferation, etc. The book provides information about the novel and eco-friendly nanoparticle synthesis methods, such as continuous synthesis of nanoparticles using microbial cells. Additionally, the book discusses nanoparticles' potential impact in different areas of biological sciences like food, medicine, agriculture, and the environment. Due to their advanced physicochemical properties, nanoparticles have revolutionized biomedical and pharmaceutical sciences. Inside the biological milieu, nanoparticles interact with different moieties to adopt stable shape, size, and surface functionalities and form nano-biomolecular complexes. The interaction pattern at the interface form complexes determines the fate of interacting biomolecules and nanoparticles inside the biological system. Understanding the interaction pattern at the nano-bio interface is crucial for the safe use of nanoparticles in natural sciences. This book rightly addresses all questions about the interaction and the ensuing structure and function of these nano-biomolecular complexes. This book caters to students and researchers in the area of biotechnology, microbiology, and pharmaceutical sciences.**

NANOCARRIERS FOR DRUG DELIVERY

NANOSCIENCE AND NANOTECHNOLOGY IN DRUG DELIVERY

Elsevier **Nano-carriers for Drug Delivery: Nanoscience and Nanotechnology in Drug Delivery presents recent discoveries in research on the pharmaceutical applications of the various types of nanosystem-based drug delivery systems. As many nanosystems have reached the market over the past decade, this book proves their benefits to patients. It explores these new carriers and the advances in drug delivery they have facilitated. Reflecting the interdisciplinary nature of the subject matter, the book includes experts from different fields, and with various backgrounds and expertise. It will appeal to researchers and students from different disciplines, such as materials science, technology and various biomedical fields. Coverage includes industrial applications that bridge the gap between lab-based research and practical industrial use. The resulting work is a reference and practical source of guidance for researchers, students and scientists working in the fields of nanotechnology, materials science and technology and biomedical science. Enables readers from different fields to access recent research and protocols across traditional boundaries Focuses on protocols and techniques, as well as the knowledge base of the field, thus enabling those in R&D to learn about, and successfully deploy, cutting-edge techniques Includes sections on nanocarrier systems**

INORGANIC NANOSYSTEMS

THERANOSTIC NANOSYSTEMS, VOLUME 2

Academic Press **Inorganic Nanosystems: Theranostic Nanosystems, Volume Two examines the applications of nanotherapeutic systems and nanodiagnostics in relation to polymeric nanosystems. In the last decade, numerous biopolymers have been utilized to prepare polymeric nanosystems for therapeutic applications. These biopolymers include polylactic acid, polylactide-co-glycolide, polycaprolactone, acrylic polymers, cellulose and cellulose derivatives, alginates, chitosan, gellan gum, gelatin, albumin, chontroitin sulfate, hyaluronic acid, guar gum, gum Arabic, gum tragacanth, xanthan gum, and starches. Besides these biopolymers, grafted polymers are also being used as advanced polymeric materials to prepare many theranostic nanocarriers and nanoformulations. This book explores the array of polymeric nanosystems to understand therapeutic potentials. It will be useful to pharmaceutical scientists, including industrial pharmacists and analytical scientists, health care professionals, and regulatory scientists actively involved in the pharmaceutical product and process development of tailor-made polysaccharides in drug delivery applications. Contains in-depth discussions of polymeric nanosystems, including high-quality graphics, flow charts and graphs for enhanced understanding Reviews literature on polymeric nanosystems while also suggesting new avenues Includes contributions in all areas of polymeric nanosystems, providing a thorough and interdisciplinary work**

COMPUTATIONAL STRATEGIES FOR SPECTROSCOPY

FROM SMALL MOLECULES TO NANO SYSTEMS

John Wiley & Sons **Computational spectroscopy is a rapidly evolving field that is becoming a versatile and widespread tool for the assignment of experimental spectra and their interpretation as related to chemical physical effects. This book is devoted to the most significant methodological contributions in the field, and to the computation of IR, UV-VIS, NMR and EPR spectral parameters with reference to the underlying vibronic and environmental effects. Each section starts with a chapter written by an experimental spectroscopist dealing with present challenges in the different fields; comprehensive coverage of conventional and advanced spectroscopic techniques is provided by means of dedicated chapters written by experts. Computational chemists, analytical chemists and spectroscopists, physicists, materials scientists, and graduate students will benefit from this thorough resource.**

THERMODYNAMICS AND BIOPHYSICS OF BIOMEDICAL NANOSYSTEMS

APPLICATIONS AND PRACTICAL CONSIDERATIONS

Springer **This book highlights the recent advances of thermodynamics and biophysics in drug delivery nanosystems and in biomedical nanodevices. The up-to-date book provides an in-depth knowledge of bio-inspired nanotechnological systems for pharmaceutical applications. Biophysics and thermodynamics, supported by mathematics, are the locomotive by which the drug transportation and the targeting processes will be achieved under the light of the modern pharmacotherapy. They are considered as scientific tools that promote the understanding of physicochemical and thermotropic functionality and behavior of artificial cell membranes and structures like nanoparticulate systems. Therefore, this book focusses on new aspects of biophysics and thermodynamics as important elements for evaluating biomedical nanosystems, and it correlates their physicochemical, biophysical and thermodynamical behaviour with those of a living organism. In 2018, Prof. Demetzos was honored with an award by the Order of Sciences of the Academy of Athens for his scientific contribution in Pharmaceutical Nanotechnology.**

ATOMIC-SCALE MODELING OF NANOSYSTEMS AND NANOSTRUCTURED MATERIALS

Springer **Understanding the structural organization of materials at the atomic scale is a lo- standing challenge of condensed matter physics and chemistry. By reducing the size of synthesized systems down to the nanometer, or by constructing them as collection of nanoscale size constitutive units, researchers are faced with the task of going beyond models and interpretations based on bulk behavior. Among the wealth of new materials having in common a “nanoscale” ngerprint, one can encounter systems intrinsically extending to a few nanometers (clusters of various compo- tions), systems featuring at least one spatial dimension not repeated periodically in space and assemblies of nanoscale grains forming extended compounds. For all these cases, there is a compelling need of an atomic-scale information combining knowledge of the topology of the system and of its bonding behavior, based on the electronic structure and its interplay with the atomic con gurations. Recent dev- opments in computer architectures and progresses in available computational power have made possible the practical realization of a paradygma that appeared totally unrealistic at the outset of computer simulations in materials science. This consists inbeing able to parallel (at least inprinciple) any experimental effort by asimulation counterpart, this occurring at the scale most appropriate to complement and enrich the experiment.**

ISSUES IN DRUG MANAGEMENT, TOXICOLOGY, MONITORING, RESISTANCE, AND SAFETY: 2011 EDITION

ScholarlyEditions **Issues in Drug Management, Toxicology, Monitoring, Resistance, and Safety: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Drug Management, Toxicology, Monitoring, Resistance, and Safety. The editors have built Issues in Drug Management, Toxicology, Monitoring, Resistance, and Safety: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Drug Management, Toxicology, Monitoring, Resistance, and Safety in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Drug Management, Toxicology, Monitoring, Resistance, and Safety: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.**

HANDBOOK OF PERSONALIZED MEDICINE

ADVANCES IN NANOTECHNOLOGY, DRUG DELIVERY, AND THERAPY

CRC Press **This book compiles multidisciplinary efforts to conceptualize the environment in research and clinical setting that creates the fertile ground for the practical utility of personalized medicine decisions and also enables clinical pharmacogenomics for establishing pharmacotyping in drug prescription. Its covers innovative drug formulations and nanotheranostics, molecular imaging and signatures, translational nanomedicine and informatics, stem cell therapy approaches, modeling and predictability of drug response, pharmacogenetics-guided drug prescription, pediatric drug dosing, pharmacovigilance and regulatory aspects, ethical and cost-effectiveness issues, pharmacogenomics knowledge bases, personal genome sequencing, molecular diagnostics, as well as information-based medicine.**

NONREGULAR NANOSYSTEMS

THEORY AND APPLICATIONS

Springer **This book presents a systemic view of nanophenomena in terms of disordered condensed media with characteristics arising at various hierarchical levels from nanoagents/nanoparticles through multiple technological interfaces to the creation of micro- or mesostructures with essential nanodimensional effects. These properties can be seen in various schemes for the functionalization of nanocarbon systems, namely, CNTs, GNRs, GNFs, carbon-based nanoaerogels, nanofoams, and so on, where nonregularities characterize surface nanointeractions and various nanointerconnects, resulting in both predictable and unpredictable effects. Beginning with nanosensing and finishing with other forms of functionalized nanomaterials, these effects will define the prospective qualities of future consumer nanoproducts and nanodevices. This book covers all aspects of nonregular nanosystems arising from the fundamental properties of disordered nanosized media, from electronic structure, surface nanophysics, and allotropic forms of carbon such as graphene and fullerenes including defect characterization, to spintronics and 3D device principles. Nonregular Nanosystems will be of interest to students and specialists in various fields of nanotechnology and nanoscience, experts on surface nanophysics and nanochemistry, as well as managers dealing with marketing of nanoproducts and consumer behavior research.**

MAGNETOCHEMISTRY

MATERIALS AND APPLICATIONS

Materials Research Forum LLC **The book covers the entire spectrum of magnetic nanomaterials and their highly interesting properties. It also discusses engineering strategies and current applications of magnetic nanomaterials in analytical chemistry, spintronics, biomedical science, electrochemistry, energy storage and conversion, membranes and fuel cells. Keywords: Magnetic Nanomaterials, Analytical Chemistry, Biomedical Science, Spintronics, Electrochemistry, Energy Storage, Energy Conversion, Membranes, Fuel Cells, Bio-Sensors, Electrocatalysis, Separation Processes, Hydrogen Storage, Supercapacitors, SERS Effect.**

ADVANCED NANOFORMULATIONS

THERANOSTIC NANOSYSTEMS, VOLUME 3

Academic Press **Advanced Nanoformulations: Theranostic Nanosystems, Volume Three examines the applications of nanotherapeutic systems and nanodiagnostics in relation to polymeric nanosystems. In the last decade, numerous biopolymers have been utilized to prepare polymeric nanosystems for therapeutic applications. These biopolymers include polylactic acid, polylactide-co-glycolide, polycaprolactone, acrylic polymers, cellulose and cellulose derivatives, alginates, chitosan, gellan gum, gelatin, albumin, chontroitin sulfate, hyaluronic acid, guar gum, gum Arabic, gum tragacanth, xanthan gum, and starches. Besides these biopolymers, grafted polymers are also being used as advanced polymeric materials to prepare many theranostic nanocarriers and nanoformulations. This book explores the array of polymeric nanosystems to understand therapeutic potentials. It will be useful to pharmaceutical scientists, including industrial pharmacists and analytical scientists, health care professionals, and regulatory scientists actively involved in the pharmaceutical product and process development of tailor-made polysaccharides in drug delivery applications. Contains in-depth discussions of polymeric nanosystems, including high-quality graphics, flow charts and graphs for enhanced understanding Reviews literature on polymeric nanosystems while also suggesting new avenues Includes contributions in all areas of polymeric nanosystems, providing a thorough and interdisciplinary work**

NANOPARTICLES FOR BRAIN DRUG DELIVERY

CRC Press **In an era wherein nanotechnology has sparked a huge research interest, brain drug delivery is not an exception. Aiming at fighting several central nervous system (CNS) conditions, tailored nanoparticles open new avenues to address several challenges in the fields of drug delivery and brain targeting. This book gathers contributions from experts in different, complementary fields, having in common their interest in developing new strategies for brain delivery based on nanotechnologies. The book encompasses general aspects pertaining to fundamental development, including tripartite in silico–in vitro–in vivo approaches. It also covers a diversity of nanomedicines applied in treatment and/or diagnosis and monitoring of CNS disorders. Aspects concerning their translation from the bench to clinical practice are also seamlessly discussed. This book will inspire readers to discover possible approaches to holistically delivering drugs into the brain. Edited by Carla Vitorino, Andreia Jorge and Alberto Pais, this book will appeal to anyone involved in nanomedicine, pharmaceutics, neurological and cancer therapies, drug delivery research and computational and regulatory sciences.**

ADVANCES IN MULTIPLE SCLEROSIS RESEARCH—SERIES I

MDPI **Designing immunotherapeutics, drugs, and anti-inflammatory reagents has been at the forefront of autoimmune research, in particular multiple sclerosis, for over 20 years. Delivery methods that are used to modulate effective and long-lasting immune responses have been the major focus. This Special Issue focused on delivery methods to be used for vaccines, immunotherapeutic approaches, drug design, and anti-inflammatories and their outcomes in preclinical studies and clinical trials.**

TAILORED FUNCTIONAL OXIDE NANOMATERIALS

FROM DESIGN TO MULTI-PURPOSE APPLICATIONS

John Wiley & Sons **Tailored Functional Oxide Nanomaterials A comprehensive exploration of the preparation and application of metal oxide nanomaterials Tailored Functional Oxide Nanomaterials: From Design to Multi-Purpose Applications delivers a one-of-a-kind**

discussion of the fundamentals and key applications of metal oxide nanomaterials. The book explores everything from their preparation to the mastering of their characteristics in an interdisciplinary view. The distinguished authors address theoretical research and advanced technological utilizations, illustrating key issues for the understanding and real-world end-uses of the most important class of inorganic materials. The interplay between the design, preparation, chemico-physical characterization, and functional behaviors of metal oxide nanomaterials in a variety of fields is presented. Up-to-date work and knowledge on these materials is also described, with fulsome summaries of important applications that are relevant to researchers pursuing safety, sustainability, and energy end-uses. Readers will also find: A thorough introduction to vapor phase growth of metal oxide thin films and nanostructures Comprehensive explorations of addressing complex transition metal oxides at the nanoscale, including bottom-up syntheses of nano-objects and properties Practical discussions of nanosized oxides supported on mats of carbon nanotubes, including synthesis strategies and performances of Ti/CNT systems In-depth examinations of computational approaches to the study of oxide nanomaterials and nanoporous oxides Perfect for materials scientists, inorganic chemists, physicists, catalytic chemists, and chemical engineers, Tailored Functional Oxide Nanomaterials will also earn a place in the libraries of solid-state chemists.

NANO TECHNOLOGY

BASIC SCIENCE TO EMERGING TECHNOLOGY

APH Publishing **Nanotechnology is the minisaturisation of technology to the billionth of a meter (the nanometer) to the molecular level. It is the design and manufacturing of intelligent miniature machines, programmed to perform specific tasks. Nanoscience and technology are emerging arenas of research and development with tremendous potential to improve the human condition along with some real possibilities of significantly worsening mankindý́s situation. The emergence of nanoscience portends a revolution in technology that will soon impact virtually every facet of our technological lives. Yet there is little understanding of what it is among the public and often among scientists and engineers in other disciplines. The present publication is an introductory text on manotechnology, covering all basic aspects, including molecular nanotechnology, nanomaterials, nanopowders, nanoelectronics, optics, photonics, solar energy and nanobiomimetrics. It provides a scientifically sound treatment accessible, students and all who are interested in ýthe technology of the futureý́.**

COMPLEX MAGNETIC NANOSTRUCTURES

SYNTHESIS, ASSEMBLY AND APPLICATIONS

Springer **This book offers a detailed discussion of the complex magnetic behavior of magnetic nanosystems, with its myriad of geometries (e.g. core-shell, heterodimer and dumbbell) and its different applications. It provides a broad overview of the numerous current studies concerned with magnetic nanoparticles, presenting key examples and an in-depth examination of the cutting-edge developments in this field. This contributed volume shares the latest developments in nanomagnetism with a wide audience: from upper undergraduate and graduate students to advanced specialists in both academia and industry. The first three chapters serve as a primer to the more advanced content found later in the book, making it an ideal introductory text for researchers starting in this field. It provides a forum for the critical evaluation of many aspects of complex nanomagnetism that are at the forefront of nanoscience today. It also presents highlights from the extensive literature on the topic, including the latest research in this field.**

SINGLE PARTICLE TRACKING AND SINGLE MOLECULE ENERGY TRANSFER

John Wiley & Sons **Closing a gap in the literature, this handbook gathers all the information on single particle tracking and single molecule energy transfer. It covers all aspects of this hot and modern topic, from detecting virus entry to membrane diffusion, and from protein folding using spFRET to coupled dye systems, as well recent achievements in the field. Throughout, the first-class editors and top international authors present content of the highest quality, making this a must-have for physical chemists, spectroscopists, molecular physicists and biochemists.**

VIRTUAL SYNTHESIS OF NANOSYSTEMS BY DESIGN

FROM FIRST PRINCIPLES TO APPLICATIONS

Elsevier **This is the only book on a novel fundamental method that uses quantum many body theoretical approach to synthesis of nanomaterials by design. This approach allows the first-principle prediction of transport properties of strongly spatially non-uniform systems, such as small QDs and molecules, where currently used DFT-based methods either fail, or have to use empirical parameters. The book discusses modified algorithms that allow mimicking experimental synthesis of novel nanomaterials---to compare the results with the theoretical predictions--and provides already developed electronic templates of sub-nanoscale systems and molecules that can be used as components of larger materials/fluidic systems. The only publication on quantum many body theoretical approach to synthesis of nano- and sub-nanoscale systems by design. Novel and existing many-body field theoretical, computational methods are developed and used to realize the theoretical predictions for materials for IR sensors, light sources, information storage and processing, electronics, light harvesting, etc. Novel algorithms for EMD and NEMD molecular simulations of the materials' synthesis processes and charge-spin transport in synthesized systems are developed and described. Includes the first ever models of Ni-O quantum wires supported by existing experimental data. All-inclusive analysis of existing experimental data versus the obtained theoretical predictions and nanomaterials templates.**

HANDBOOK OF OPTOFLUIDICS

CRC Press **Optofluidics is an emerging field that involves the use of fluids to modify optical properties and the use of optical devices to detect flowing media. Ultimately, its value is highly dependent on the successful integration of photonic integrated circuits with microfluidic or nanofluidic systems. Handbook of Optofluidics provides a snapshot of the s**

COLLOIDAL FOUNDATIONS OF NANOSCIENCE

Elsevier **Colloidal Foundations of Nanoscience, Second Edition explores the theory and concepts of colloid chemistry and its applications to nanoscience and nanotechnology. The book provides the essential conceptual and methodological tools to approach nano-research issues. The authors' expertise in colloid science will contribute to the understanding of basic issues involved in research. Each chapter covers a classical subject of colloid science in simple and straightforward terms, addressing its relevance to nanoscience before introducing case studies. Sections cover colloids rheology, electrokinetics, nanoparticle tracking analysis (NTA), bio-layer interferometry, and the treatment of inter-particle interactions and colloidal stability. Gathers, in a single volume, information currently scattered across various sources Provides a straightforward introduction on theoretical concepts and in-depth case studies to help readers understand molecular mechanisms and master advanced techniques Includes examples showing the applications of classical concepts to real-world cutting-edge research Edited and written by highly respected quality scientists**

ADVANCED 3D-PRINTED SYSTEMS AND NANOSYSTEMS FOR DRUG DELIVERY AND TISSUE ENGINEERING

Elsevier **Advanced 3D-Printed Systems and Nanosystems for Drug Delivery and Tissue Engineering explores the intricacies of nanostructures and 3D printed systems in terms of their design as drug delivery or tissue engineering devices, their further evaluations and diverse applications. The book highlights the most recent advances in both nanosystems and 3D-printed systems for both drug delivery and tissue engineering applications. It discusses the convergence of biofabrication with nanotechnology, constructing a directional customizable biomaterial arrangement for promoting tissue regeneration, combined with the potential for controlled bioactive delivery. These discussions provide a new viewpoint for both biomaterials scientists and pharmaceutical scientists. Shows how nanotechnology and 3D printing are being used to create systems which are intelligent, biomimetic and customizable to the patient Explores the current generation of nanostructured 3D printed medical devices Assesses the major challenges of using 3D printed nanosystems for the manufacture of new pharmaceuticals**

EMERGING TECHNOLOGIES FOR NANOPARTICLE MANUFACTURING

Springer Nature **This book provides an overview of nanoparticle production methods, scale-up issues drawing attention to industrial applicability, and addresses their successful applications for commercial use. There is a need for a reference book which will address various aspects of recent progress in the methods of development of nanoparticles with a focus on polymeric and lipid nanoparticles, their scale-up techniques, and challenges in their commercialization. There is no consolidated reference book that discusses the emerging technologies for nanoparticle manufacturing. This book focuses on the following major aspects of emerging technologies for nano particle manufacturing. I. Introduction and Biomedical Applications of Nanoparticles II. Polymeric Nanoparticles III. Lipid Nanoparticles IV. Metallic Nanoparticles V. Quality Control for Nanoparticles VI. Challenges in Scale-Up Production of Nanoparticles VII. Injectable Nanosystems VIII. Future Directions and Challenges Leading scientists are selected as chapter authors who have contributed significantly in this field and they focus more on emerging technologies for nanoparticle manufacturing, future directions, and challenges.**

NANOTRIBOLOGY AND NANOMECHANICS

AN INTRODUCTION

Springer **This volume serves as a timely, practical introduction to the principles of nanotribology and nanomechanics and applications to magnetic storage systems and MEMS/NEMS. Assuming some familiarity with macrotribology/mechanics, the book comprises chapters by internationally recognized experts, who integrate knowledge of the field from the mechanics and materials-science perspectives. Graduate students, research workers, and practicing engineers will find the book of value.**

NANO- AND MICRO-ELECTROMECHANICAL SYSTEMS

FUNDAMENTALS OF NANO- AND MICROENGINEERING, SECOND EDITION

CRC Press **Society is approaching and advancing nano- and microtechnology from various angles of science and engineering. The need for further fundamental, applied, and experimental research is matched by the demand for quality references that capture the multidisciplinary and multifaceted nature of the science. Presenting cutting-edge information that is applicable to many fields, Nano- and Micro-Electromechanical Systems: Fundamentals of Nano and Microengineering, Second Edition builds the theoretical foundation for understanding, modeling, controlling, simulating, and designing nano- and microsystems. The book focuses on the fundamentals of nano- and microengineering and nano- and microtechnology. It emphasizes the multidisciplinary principles of NEMS and MEMS and practical applications of the basic theory in engineering practice and technology development. Significantly revised to reflect both fundamental and technological aspects, this second edition introduces the concepts, methods, techniques, and technologies needed to solve a wide variety of problems related to high-performance nano- and microsystems. The book is written in a textbook style and now includes homework problems, examples, and reference lists in every chapter, as well as a separate solutions manual. It is designed to satisfy the growing demands of undergraduate and graduate students, researchers, and professionals in the fields of nano- and microengineering, and to enable them to contribute to the nanotechnology revolution.**

NANOFABRICATION TOWARDS BIOMEDICAL APPLICATIONS

TECHNIQUES, TOOLS, APPLICATIONS, AND IMPACT

John Wiley & Sons **This book focuses on the materials, synthetic methods, tools and techniques being developed in the nanoregime towards the life sciences -- in particular biology, biotechnology and medicine. Readers from materials science, engineering, chemistry, biology and medical backgrounds will find detailed accounts of the design and synthesis of nanomaterials and the tools and techniques involved in their production for applications in biology, biotechnology and medicine.**

COMPUTATIONAL MODELING OF INORGANIC NANOMATERIALS

CRC Press **Computational Modeling of Inorganic Nanomaterials provides an accessible, unified introduction to a variety of methods for modeling inorganic materials as their dimensions approach the nanoscale. With contributions from a team of international experts, the book guides readers on choosing the most appropriate models and methods for studying the structure and properties (such as atomic structure, optical absorption and luminescence, and electrical and heat transport) of a varied range of inorganic nanomaterial systems. Divided into three sections, the book first covers different types of inorganic nanosystems with increasing dimensionality. The second section explains how to computationally describe properties and phenomena associated with inorganic nanomaterials, including the modeling of melting and phase transitions, crystallization, and thermal, mechanical, optical, and excited state properties. The final section highlights a diverse range of important recent case studies of systems where modeling the properties and structures of inorganic nanomaterials is fundamental to their understanding. These case studies illustrate the use of computational techniques to model nanostructures in a range of applications and environments, from heterogeneous catalysis to astrochemistry. Largely due to their extremely reduced dimensions, inorganic nanomaterials are difficult to characterize accurately in experiments. Computational modeling, therefore, often provides unrivaled, detailed insights to complement and guide experimental research on these small-scale materials. This book shows how computational modeling is critical for understanding inorganic nanomaterials and their future development.**

NANOTRIBOLOGY AND NANOMECHANICS

AN INTRODUCTION

Springer **This volume serves as a timely, practical introduction to the principles of nanotribology and nanomechanics and applications to magnetic storage systems and MEMS/NEMS. Assuming some familiarity with macrotribology/mechanics, the book comprises chapters by internationally recognized experts, who integrate knowledge of the field from the mechanics and materials-science perspectives. Graduate students, research workers, and practicing engineers will find the book of value.**

MORPHING WING TECHNOLOGIES

LARGE COMMERCIAL AIRCRAFT AND CIVIL HELICOPTERS

Butterworth-Heinemann **Morphing Wings Technologies: Large Commercial Aircraft and Civil Helicopters offers a fresh look at current research on morphing aircraft, including industry design, real manufactured prototypes and certification. This is an invaluable reference for students in the aeronautics and aerospace fields who need an introduction to the morphing discipline, as well as senior professionals seeking exposure to morphing potentialities. Practical applications of morphing devices are presented—from the challenge of conceptual design incorporating both structural and aerodynamic studies, to the most promising and potentially flyable solutions aimed at improving the performance of commercial aircraft and UAVs. Morphing aircraft are multi-role aircraft that change their external shape substantially to adapt to a changing mission environment during flight. The book consists of eight sections as well as an appendix which contains both updates on main systems evolution (skin, structure, actuator, sensor, and control systems) and a survey on the most significant achievements of integrated systems for large commercial aircraft. Provides current worldwide status of morphing technologies, the industrial development expectations, and what is already available in terms of flying systems Offers new perspectives on wing structure design and a new approach to general structural design Discusses hot topics such as multifunctional materials and auxetic materials Presents practical applications of morphing devices**

BERKSHIRE ENCYCLOPEDIA OF SUSTAINABILITY 4/10

NATURAL RESOURCES AND SUSTAINABILITY

Berkshire Publishing Group **Natural Resources and Sustainability explores how human needs and desires, from sustenance and shelter to recreation and travel, have spurred the consumption of Earth's material resources. Scientists, ecologists, and other expert authors present the historical impact of commercial activities (in industries as varied as fisheries, agriculture, energy, and mineral extraction), discuss the global distribution and use of renewable and nonrenewable resources, and focus on innovative approaches for the future. Readers will learn why renewal doesn't necessarily put a resource beyond harm and why the no-free-lunch adage applies to all natural resources.**

ELECTROCHEMICAL NANOTECHNOLOGIES

Springer Science & Business Media **In this book, the term "electrochemical nanotechnology" is defined as nanoprocessing by means of electrochemical techniques. This introductory book reviews the application of electrochemical nanotechnologies with the aim of understanding their wider applicability in evolving nanoindustries. These advances have impacted microelectronics, sensors, materials science, and corrosion science, generating new fields of research that promote interaction between biology, medicine, and microelectronics. This volume reviews nanotechnology applications in selected high technology areas with particular emphasis on advances in such areas. Chapters are classified under four different headings: Nanotechnology for energy devices - Nanotechnology for magnetic storage devices - Nanotechnology for bio-chip applications - Nanotechnology for MEMS/Packaging.**

ACTA NUMERICA 2005: VOLUME 14

Cambridge University Press **A high-impact factor, prestigious annual publication containing invited surveys by subject leaders: essential reading for all practitioners and researchers.**

IMMUNE MECHANISMS IN THE PATHOLOGIC RESPONSE TO PARTICLES, FIBERS, AND NANOMATERIALS

Frontiers Media SA

NANO-BIOPESTICIDES TODAY AND FUTURE PERSPECTIVES

Academic Press **Nano-Biopesticides Today and Future Perspectives is the first single-volume resource to examine the practical development, implementation and implications of combining the environmentally aware use of biopesticides with the potential power of nanotechnology. While biopesticides have been utilized for years, researchers have only recently begun exploring delivery methods that utilize nanotechnology to increase efficacy while limiting the negative impacts traditionally seen through the use of pest control means. Written by a panel of global experts, the book provides a foundation on nano-biopesticide development paths, plant health and nutrition, formulation and means of delivery. Researchers in academic and commercial settings will value this foundational reference of insights within the biopesticide realm. Provides comprehensive insights, including relevant information on environmental impact and safety, technology development, implementation, and intellectual property Discusses the role of nanotechnology and its potential applications as a nanomaterial in crop protection for a cleaner and greener agriculture Presents a strategic, comprehensive and forward-looking approach**

QUANTUM AND OPTICAL DYNAMICS OF MATTER FOR NANOTECHNOLOGY

IGI Global **With the emergence of nanoscience and technology in the 21st century, research has shifted its focus on the quantum and optical dynamical properties of matter such as atoms, molecules, and solids which are properly characterized in their dynamic state. Quantum and Optical Dynamics of Matter for Nanotechnology carefully addresses the general key concepts in this field and expands to more complex discussions on the most recent advancements and techniques related to quantum dynamics within the confines of physical chemistry. This book is an essential reference for academics, researchers, professionals, and advanced students interested in a modern discussion of a niche area of nanotechnology.**

ADVANCES IN PROCESSING TECHNOLOGIES FOR BIO-BASED NANOSYSTEMS IN FOOD

CRC Press **Nanotechnology can be used to address challenges faced by the food and bioprocessing industries for developing and implementing improved or novel systems that can produce safer, nutritious, healthier, sustainable, and environmental-friendly food products. This book overviews the most recent advances made on the field of nanoscience and nanotechnology that significantly influenced the food industry. Advances in Processing Technologies for Bio-Based Nanosystems in Food provides a multidisciplinary review of the complex mechanisms involved in the research, development, production and legislation of food containing nanostructures systems. Features: Presents the most recent advances made in the field of nanoscience and nanotechnology as applied to the food industry Discusses innovative approaches and processing technologies Shows how nanotechnology can be used to produce safer, nutritious, healthier, sustainable and environmental-friendly food products Covers the complex mechanisms involved in the research, development, production and legislation of food containing nanostructures Selected examples of nanotechnology applications in food industry are shown, focusing on advanced aspects of food packaging, processing and preservation; followed by one contribution that presents the potential commercialization and the main challenges for scale-up. Comprised of 15 chapters, this book provides much-needed and up-to-date information on the use of emergent technologies in bio-based nanosystems for foods, and serves as an ideal reference for scientists, regulators, industrialists, and consumers that conduct research and development in the food processing industry.**

APPLIED MATHEMATICAL MODELS AND EXPERIMENTAL APPROACHES IN CHEMICAL SCIENCE

CRC Press **This new book focuses on nanomaterial development as well as investigations of combustion and explosion processes. It presents valuable information on the modeling of processes and on quantum chemical calculations and leading-edge research from around the world in this dynamic field, focusing on concepts above formal experimental techniques and theoretical methods of chemical physics for micro- and nanotechnologies. Also presented are non-linear kinetic appearances and their possible applications.**