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Bibliography
Colossal Magnetoresistive Manganites
Handbook of Magnetism and Advanced Magnetic Materials, 5 Volume Set

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Properties Of Epitaxial
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Thin Film Metal-Oxides John Wiley & Sons

Nanostructured films and coatings possess unique properties due to both size and interface effects. They find many applications in areas such as electronics, catalysis, protection, data storage, optics and sensors. The focus of

the present book is on synthesis and processing; advanced characterization techniques; properties (including mechanical, chemical, electronic, thermal, catalytic, and magnetic); modelling of interlayer and intralayer interfaces; and applications.

Nano-Crystalline and Thin Film Magnetic Oxides Springer Science & Business Media

Photoactive nanomaterials have been receiving increasing attention due to

their potential application in the light-driven degradation of water and gas-phase pollutants. However, to exploit the great potential of photoactive materials and access their properties requires fine-tuning of their size/shape-dependent chemical-physical properties, and on the ability to integrate them in photoreactors or to deposit them onto large surfaces. Therefore, the synthetic approach as well as post-synthesis manipulation could strongly affect the final photocatalytic properties of the nanomaterial. The aim of the present Special Issue is to report on the most recent progress towards the application of photoactive nanomaterials and nanomaterial-based coatings in pollutant degradation, paying particular attention to cases close to real application:

scalable synthetic approaches to nanocatalysts, preparation of nanocatalyst-based coatings, degradation of real pollutants and bacterial inactivation, and application in building materials.

Physics of Manganites John Wiley & Sons
Semiconductors are at the heart of modern living. Almost everything we do, be it work, travel, communication, or entertainment, all depend on some feature of semiconductor technology. Comprehensive Semiconductor Science and Technology captures the breadth of this important field, and presents it in a single source to the large audience who study, make, and exploit semiconductors. Previous attempts at this achievement have been abbreviated, and have omitted

important topics. Written and Edited by a truly international team of experts, this work delivers an objective yet cohesive global review of the semiconductor world. The work is divided into three sections. The first section is concerned with the fundamental physics of semiconductors, showing how the electronic features and the lattice dynamics change drastically when systems vary from bulk to a low-dimensional structure and further to a nanometer size. Throughout this section there is an emphasis on the full understanding of the underlying physics. The second section deals largely with the transformation of the conceptual framework of solid state physics into devices and systems which require the growth of extremely high purity, nearly

defect-free bulk and epitaxial materials. The last section is devoted to exploitation of the knowledge described in the previous sections to highlight the spectrum of devices we see all around us. Provides a comprehensive global picture of the semiconductor world Each of the work's three sections presents a complete description of one aspect of the whole Written and Edited by a truly international team of experts
Electronic and Magnetic Properties of Pure and Structured Cuprate Superconductors Cuvillier Verlag
Perovskite-based ceramics are a significant class of innovative materials with fascinating physical properties, which are now receiving intensive research attention in condensed matter physics and in the area of practical

device applications. Perovskite Ceramics provides a state-of-the-art review on the latest advances in perovskite-based ceramic materials, as well as the development of devices from these materials for different applications. Perovskite Ceramics: Recent Advances and Emerging Applications is divided into two main parts. The first part focuses on the basics of perovskite-based ceramic materials and includes chapters on the fundamentals, synthesis and processing, characterization, and properties of these materials. Chapters are also included on bulk and thin materials, phase transitions, polaronic effects and the compensation and screening of ferroelectricity. This section will allow the reader to familiarize themselves with the standard traditional

approach, but it will also introduce new concepts that are fast evolving in this field. The second part presents an extensive review of up-to-date research on new and innovative advances in perovskite-based ceramic materials. Chapters cover multiferroic applications, lead-free perovskites, energy storage applications, perovskite-based memories, light manipulation and spectral modifications, and solar cells and fuel cells. All these fields of research are rapidly evolving, so the book acts a platform to showcase latest results on optical strategies and materials for light manipulation, and spectral up- and down-conversion too (mainly rare earth doped oxides and complexes). The book will be an essential reference resource for academic and industrial researchers

working in materials research and development particularly in functional and oxide ceramics and perovskites. A comprehensive and systematic review of advanced research in perovskite-based ceramics Covers both oxide and halide perovskites, their synthesis, processing, properties and applications Presents advanced methods of synthesis as well as latest applications Discusses all aspects from theory to production Covers the most important advances both in terms of new materials and application strategies

Journal de physique Woodhead Publishing

The exceptional properties of multicomponent oxides, combined with the inability of simpler materials to meet the increasing demands of the

electronics industry, have motivated tremendous interest and activity in utilizing multicomponent oxides for electronic applications. For these applications, it is often desirable to integrate complex oxides in thin-film form with other materials. This book focuses on common materials issues involved in the processing and characterization of multicomponent oxides and how these issues relate to device applications. Papers range from theoretical explanations of the magnetic and electronic properties of transition metal oxides, to integration with silicon technology. Noteworthy is the progress being made in the deposition and characterization of these complex materials, as well as their applicability in ferroelectric memories, MOSFETs, optical

devices, infrared imaging arrays, etc. Topics include: epitaxial multicomponent oxide film growth; properties, characterization and modeling; properties of multicomponent oxides; and multicomponent oxide devices.

Functional Metal Oxides Springer Science & Business Media

This volume provides a detailed treatment of half-metallic materials and their properties from both an experimental and theoretical point of view. It discusses the methods used to understand and predict the properties of half-metals and the gamut of other materials amenable to these techniques. It also offers an expansive bibliography to facilitate further and deeper research. This book provides the precise definitions of all key terminology used in

the vast and varied literature. This is the first comprehensive monograph on the subject and will serve as a starting point for graduate students and senior researchers who wish to enter the field. This book will also be an invaluable reference to those already working in the area of half-metallic materials. Contents: Introduction Methods of Studying Half-Metals Heusler Alloys Half-Metallic Oxides Half-Metals with Simple Structures Readership: Graduate students and researchers working in the field of half-metallic materials. Keywords: Half-Metals; Spintronics; Magneto-Electronics; Magnetism; Superlattices; Heterostructures Key Features: This book comprehensively covers the area of half-metallic materials, and discusses both

experimental and theoretical methods used to understand and predict the properties of these materials. This book provides a comprehensive bibliography to facilitate further research. It is written to serve a varied audience, from students to practising researchers in the field.

Studies of Nanoconstrictions, Nanowires and Fe₃O₄ Thin Films Newnes

This is the first text to cover all aspects of solution processed functional oxide thin-films. Chemical Solution Deposition (CSD) comprises all solution based thin-film deposition techniques, which involve chemical reactions of precursors during the formation of the oxide films, i. e. sol-gel type routes, metallo-organic decomposition routes, hybrid routes, etc. While the development of sol-gel type

processes for optical coatings on glass by silicon dioxide and titanium dioxide dates from the mid-20th century, the first CSD derived electronic oxide thin films, such as lead zirconate titanate, were prepared in the 1980's. Since then CSD has emerged as a highly flexible and cost-effective technique for the fabrication of a very wide variety of functional oxide thin films. Application areas include, for example, integrated dielectric capacitors, ferroelectric random access memories, pyroelectric infrared detectors, piezoelectric micro-electromechanical systems, antireflective coatings, optical filters, conducting-, transparent conducting-, and superconducting layers, luminescent coatings, gas sensors, thin film solid-oxide fuel cells, and

photoelectrocatalytic solar cells. In the appendix detailed “cooking recipes” for selected material systems are offered.

Comprehensive Semiconductor Science and Technology CRC Press Functional Materials from Carbon, Inorganic and Organic Sources: Methods and Advances describes the basic principles, mechanisms and theoretical background of functional materials. Sections cover Carbon-based functional materials, Inorganic functional materials for renewable and sustainable energy applications, and Organic and biological based functional materials. Applications such as energy storage and conversion, electronic and photonics devices, and in medicine are also explored. Sections dive into photovoltaic devices, light emitting devices, energy storage

materials and quantum dot devices, solar cell fundamentals and devices, perovskite materials and ceramic thin films. Final sections emphasize green approaches to synthesis in semiconductor nanoparticles, quinolone complexes, biomaterials and biopolymers. Introduces the reader to a wide range of the most relevant functional materials, including carbon-based materials, inorganic materials for energy applications, and organic and biological based materials Reviews the synthesis and characterization methods used to create, optimize and analyze functional materials properties Discusses the use of functional materials to enable emerging technologies, along with remaining barriers to commercial adoption and opportunities

Molecular Beam Epitaxy Springer
Science & Business Media

Solid state physics is the branch of physics primarily devoted to the study of matter in its solid phase, especially at the atomic level. This prestigious serial presents timely and state-of-the-art reviews pertaining to all aspects of solid state physics. Contributions from leading authorities informs and updates on all the latest developments in the field *Half-Metallic Materials and Their Properties* Springer Science & Business Media

This book provides readers with an overview of the design, fabrication, simulation, and reliability of nanoscale semiconductor devices, MEMS, and sensors, as they serve for realizing the next-generation internet of things. The

authors focus on how the nanoscale structures interact with the electrical and/or optical performance, how to find optimal solutions to achieve the best outcome, how these apparatus can be designed via models and simulations, how to improve reliability, and what are the possible challenges and roadblocks moving forward.

Physics and Technology of High-k Materials 9 Elsevier

The MRS Symposium Proceeding series is an internationally recognised reference suitable for researchers and practitioners.

Application of Photoactive Nanomaterials in Degradation of Pollutants Cambridge University Press

This book is a printed edition of the Special Issue "State-of-the-Art Materials

Science in Belgium 2017" that was published in *Materials Transmission Electron Microscopy Characterization of Nanomaterials* The Electrochemical Society

This work constitutes a detailed study of electrical and magnetic properties in nanometric materials with a range of scales: atomic-sized nanoconstrictions, micro- and nanowires and thin films. Firstly, a novel method of fabricating atomic-sized constrictions in metals is presented; it relies on measuring the conduction of the device while a focused-ion-beam etching process is in progress.

Chemical Solution Deposition of Functional Oxide Thin Films Springer Science & Business Media

The book aims to provide an overview of

recent progress in the understanding of magnetic properties in nanoscale through recent results of various theoretical and experimental investigations. The papers describe a wide range of physical aspects.

Journal of Experimental and Theoretical Physics Walter de Gruyter

This series of books, which is published at the rate of about one per year, addresses fundamental problems in materials science. The contents cover a broad range of topics from small clusters of atoms to engineering materials and involves chemistry, physics, materials science and engineering, with length scales ranging from Ångstroms up to millimeters. The emphasis is on basic science rather than on applications. Each book focuses on a single area of current

interest and brings together leading experts to give an up to date discussion of their work and the work of others. Each article contains enough references that the interested reader can access the relevant literature. Thanks are given to the Center for Fundamental Materials Research at Michigan State University for supporting this series. M. F. Thorpe, Series Editor E mail: thorpe@pa.msu.edu

V PREFACE This book records invited lectures given at the workshop on Physics of Manganites, held at Michigan State University, July 26-29, 1998. Doped manganites are an interesting class of compounds that show both metal insulator and ferromagnetic to paramagnetic transitions at the same temperature. This was discovered in the early 1950s by Jonker and van Santen

and basic theoretical ideas were developed by Zener (1951), Anderson and Hasegawa (1955), and deGennes (1960) to explain these transitions and related interesting observations.

Exchange Bias Woodhead Publishing Epitaxial Growth of Complex Metal Oxides, Second Edition reviews techniques and recent developments in the fabrication quality of complex metal oxides, which are facilitating advances in electronic, magnetic and optical applications. Sections review the key techniques involved in the epitaxial growth of complex metal oxides and explore the effects of strain and stoichiometry on crystal structure and related properties in thin film oxides. Finally, the book concludes by discussing selected examples of important

applications of complex metal oxide thin films, including optoelectronics, batteries, spintronics and neuromorphic applications. This new edition has been fully updated, with brand new chapters on topics such as atomic layer deposition, interfaces, STEM-EELS, and the epitaxial growth of multiferroics, ferroelectrics and nanocomposites. Examines the techniques used in epitaxial thin film growth for complex oxides, including atomic layer deposition, sputtering techniques, molecular beam epitaxy, and chemical solution deposition techniques Reviews materials design strategies and materials property analysis methods, including the impacts of defects, strain, interfaces and stoichiometry Describes key applications of epitaxially grown

metal oxides, including optoelectronics, batteries, spintronics and neuromorphic applications

Perovskite Ceramics Springer Science & Business Media

With the developing progress of materials fabrication, it is possible to produce materials with exciting electronic and magnetic properties which may be candidates for future device applications. One key class of these materials is the metallic magnetic oxide systems. This book focuses on colossal magnetoresistance (CMR) materials, including manganites and cobalites. Transport and magnetic properties and their dependence on stress, growth conditions, stoichiometry and elemental composition are explored quite extensively. However, the large

magnetic fields required to obtain the CMR effect have been perceived as a technological roadblock for commercialization of this phenomenon. This has motivated research aimed both at reducing the intrinsic field dependence as well as at developing novel device structures that will reduce the required effective field. Technologically useful devices will undoubtedly involve heterostructures. Since the magnetic and transport properties are extremely stress-dependent, CMR heterostructures will most likely involve other metallic or insulating oxide materials. Materials of interest include half-metallic ferromagnets, yttrium garnet materials and ferrites.

Frontiers in Magnetic Materials Springer

Science & Business Media

From the first application of the oxide magnetite as a compass in China in ancient times, and from the early middle ages in Europe, magnetic materials have become an indispensable part of our daily life. Magnetic materials are used ubiquitously in the modern world, in fields as diverse as, for example, electrical energy transport, high-power electro-motors and generators, telecommunication systems, navigation equipment, aviation and space operations, micromechanical automation, medicine, magnetocaloric refrigeration, computer science, high density recording, non-destructive testing of materials, and in many household applications. Research in many of these areas continues apace.

The progress made in recent years in computational sciences and advanced material preparation techniques has dramatically improved our knowledge of fundamental properties and increased our ability to produce materials with highly-tailored magnetic properties, even down to the nanoscale dimension. Containing approximately 120 chapters written and edited by acknowledged world leaders in the field, The Handbook of Magnetism and Advanced Magnetic Materials provides a state-of-the-art, comprehensive overview of our current understanding of the fundamental properties of magnetically ordered materials, and their use in a wide range of sophisticated applications. The Handbook is published in five themed volumes, as follows: Volume 1-

Fundamentals and Theory Volume 2- Micromagnetism Volume 3- Novel Techniques for Characterizing and Preparing Samples Volume 4- Novel Materials Volume 5- Spintronics and Magnetoelectronics

State-of-the-Art Materials Science in Belgium 2017 Springer Science & Business Media

Explore the state of the art in multiferroic materials with this cutting-edge resource Nanostructured Multiferroics delivers an overview of recent research developments in the area of nanostructured multiferroics, along with their preparation, characterization, and applications. Covering single-phase and composite multiferroics, nanomultiferroics, and multiferroic composites, the book

explains their physical properties, the underlying physical principles, and the technology and application aspects of the materials, including energy harvesting and spintronics. With multiferroics undergoing a renaissance of renewed interest and development in the past few years, and with promising new breakthroughs in areas like superconductivity, spintronics, and quantum computing, Nanostructured Multiferroics offers both experienced scientists and young researchers inspirational and informative resources likely to spark ideas for further research. Along with chapters discussing topics such as the specific heat and magnetocaloric properties of manganite-based multiferroics for cryo-cooling applications and the multiferroic

properties of barium-doped BiFeO₃ particles, further topics are: * A comprehensive discussion about the physical properties of multiferroic nanocomposites * An exploration of the basic theory underpinning a variety of multiferroic interactions * An in-depth analysis of the engineering functionality in nanomultiferroics * An introduction to nanostructured multiferroics accompanied by discussions of their synthesis, characterization, and common applications * A treatment of multiferroic materials, as well as single-phase and composite multiferroics * An examination of the use of nanostructured multiferroics in the field of spintronics Perfect for materials scientists, Nanostructured Multiferroics will also earn a place in the libraries of

solid-state physicists and chemists who seek to improve their understanding of the fundamentals of, and recent advances made in, multiferroics. The information contained within will inform anyone working in areas involving superconductivity, quantum computing, and spintronics.

Epitaxial Magnetic Oxide

Heterostructures Academic Press

MODERN FERRITES, Volume 1 A robust exploration of the basic principles of ferrimagnetics and their applications In Modern Ferrites Volume 1: Basic Principles, Processing and Properties, renowned researcher and educator Vincent G. Harris delivers a comprehensive overview of the basic principles and ferrimagnetic phenomena of modern ferrite materials. Volume 1

explores the fundamental properties of ferrite systems, including their structure, chemistry, and magnetism; the latest in processing methodologies; and the unique properties that result. The authors explore the processing, structure, and property relationships in ferrites as nanoparticles, thin and thick films, compacts, and crystals and how these relationships are key to realizing practical device applications laying the foundation for next generation technologies. This volume also includes: Comprehensive investigation of the historical and scientific significance of ferrites upon ancient and modern societies; Neel's expanded theory of molecular field magnetism applied to ferrimagnetic oxides together with theoretic advances in density functional

theory; Nonlinear excitations in ferrite systems and their potential for device technologies; Practical discussions of nanoparticle, thin, and thick film growth techniques; Ferrite-based electronic band-gap heterostructures and metamaterials. Perfect for RF engineers and magneticians working in the field of RF electronics, radar, communications, and spintronics as well as other

emerging technologies. Modern Ferrites will earn a place on the bookshelves of engineers and scientists interested in the ever-expanding technologies reliant upon ferrite materials and new processing methodologies. Modern Ferrites Volume 2: Emerging Technologies and Applications is also available (ISBN: 9781394156139).