

# Semiconductor Spintronics De Gruyter Textbook

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## **Semiconductor Radiation Detectors** - Alan Owens

2019-05-31

Choice Recommended Title, July 2020 Bringing together material scattered across many disciplines, Semiconductor Radiation Detectors provides readers with a consolidated source of information on the properties of a wide range of semiconductors; their growth, characterization and the

fabrication of radiation sensors with emphasis on the X- and gamma-ray regimes. It explores the promise and limitations of both the traditional and new generation of semiconductors and discusses where the future in semiconductor development and radiation detection may lie. The purpose of this book is two-fold; firstly to serve as a text book for those new to the field of semiconductors and

radiation detection and measurement, and secondly as a reference book for established researchers working in related disciplines within physics and engineering. Features: The only comprehensive book covering this topic Fully up-to-date with new developments in the field Provides a wide-ranging source of further reference material

### Solid State Materials

Chemistry - Patrick M.

Woodward 2021-04

A modern and thorough treatment of the field for upper-level undergraduate and graduate courses in materials science and chemistry.

**Spintronics** - Tomasz Blachowicz 2019-05-06 Starting from quantum mechanical and condensed matter foundations, this book introduces into the necessary theory behind spin electronics (Spintronics). Equations of spin diffusion, -evolution and -tunelling are provided before an overview is given of simulation of spin transport at the atomic scale. Furthermore,

applications are discussed with a focus on elementary spintronics devices such as spin valves, memory cells and hard disk heads.

### Semiconductor Spintronics -

Thomas Schäpers 2016-04-25

As the first comprehensive introduction into the rapidly evolving field of spintronics, this textbook covers ferromagnetism in nano-electrodes, spin injection, spin manipulation, and the practical use of these effects in next-generation electronics. Based on foundations in quantum mechanics and solid state physics this textbook guides the reader to the forefront of research and development in the field, based on repeated lectures given by the author. From the content: Low-dimensional semiconductor structures Magnetism in solids Diluted magnetic semiconductors Magnetic electrodes Spin injection Spin transistor Spin interference Spin Hall effect Quantum spin Hall effect Topological insulators Quantum computation with electron

spins

## **Optical Angular Momentum**

- L. Allen 2016-04-19

Spin angular momentum of photons and the associated polarization of light has been known for many years.

However, it is only over the last decade or so that physically realizable laboratory light beams have been used to study the orbital angular momentum of light. In many respects, orbital and spin angular momentum behave in a similar manner, but they differ significantly in others. In particular, orbital angular momentum offers exciting new possibilities with respect to the optical manipulation of matter and to the study of the entanglement of photons.

Bringing together 44 landmark papers, *Optical Angular Momentum* offers the first comprehensive overview of the subject as it has developed. It chronicles the first decade of this important subject and gives a definitive statement of the current status of all aspects of optical angular momentum. In each chapter the editors

include a concise introduction, putting the selected papers into context and outlining the key articles associated with this aspect of the subject.

## **Advanced Material and Device Applications with Germanium**

- Sanghyun Lee 2018-10-03

Germanium is an elemental semiconductor, which played an important role in the birth of the semiconductor but soon was replaced with silicon. However, germanium is poised to make a remarkable comeback in the semiconductor industry. With this increasing attention, this book describes the fundamental aspects of germanium and its applications. The contributing authors are experts in their field with great in-depth knowledge. The authors strongly feel that this contribution might be of interest to readers and help to expand the scope of their knowledge.

## **Concepts, Strategies and Models to Enhance Physics Teaching and Learning**

- Eilish McLoughlin 2019-07-24

This book discusses novel

research on and practices in the field of physics teaching and learning. It gathers selected high-quality studies that were presented at the GIREP-ICPE-EPEC 2017 conference, which was jointly organised by the International Research Group on Physics Teaching (GIREP); European Physical Society - Physics Education Division, and the Physics Education Commission of the International Union of Pure and Applied Physics (IUPAP). The respective chapters address a wide variety of topics and approaches, pursued in various contexts and settings, all of which represent valuable contributions to the field of physics education research. Examples include the design of curricula and strategies to develop student competencies—including knowledge, skills, attitudes and values; workshop approaches to teacher education; and pedagogical strategies used to engage and motivate students. This book shares essential insights into current research

on physics education and will be of interest to physics teachers, teacher educators and physics education researchers around the world who are working to combine research and practice in physics teaching and learning. Magnetic Materials and Magnetic Levitation - Dipti Ranjan Sahu 2021-03-24 Magnetic materials are important materials for high-tech areas and technological development, which are being classified not only based on their origin but also by the nature of processing, properties, functions, and applications. This book presents an overview of the different types of new magnetic materials and hybrid structures that exhibit different magnetic phenomena and interesting properties. The reported materials are studied theoretically and experimentally, which are the building blocks of all technological innovations. Topics such as magnetic levitation are given for industrial applications. The

chapters of the book provide a key description of magnetic materials. This book is suitable for undergraduate and graduate students and professionals including engineers, scientists, researchers, technicians, and technology managers. This book gives an idea to readers for scientific innovation in this field.

Single-site Green Function of the Dirac Equation for Full-potential Electron Scattering - Pascal Kordt 2012

*Carbon-Based Smart Materials* - Constantinos A. Charitidis 2020-04-20

Presents technologies and key concepts to produce suitable smart materials and intelligent structures for sensing, information and communication technology, biomedical applications (drug delivery, hyperthermia therapy), self-healing, flexible memories and construction technologies. Novel developments of environmental friendly, cost-effective and scalable production processes

are discussed by experts in the field.

### **Modern Semiconductor Physics and Device Applications**

- Vitalii K Dugaev 2021-11-22

This textbook provides a theoretical background for contemporary trends in solid-state theory and semiconductor device physics. It discusses advanced methods of quantum mechanics and field theory and is therefore primarily intended for graduate students in theoretical and experimental physics who have already studied electrodynamics, statistical physics, and quantum mechanics. It also relates solid-state physics fundamentals to semiconductor device applications and includes auxiliary results from mathematics and quantum mechanics, making the book useful also for graduate students in electrical engineering and material science. Key Features: Explores concepts common in textbooks on semiconductors, in addition to topics not included in similar books

currently available on the market, such as the topology of Hilbert space in crystals  
Contains the latest research and developments in the field  
Written in an accessible yet rigorous manner

Magneto-optics - Paul Fumagalli 2021-12-20

Magneto-optics describes in general any interaction between electromagnetic radiation and a material which is magnetized. The book gives a concise but comprehensive introduction to theory, calculus, and typical experimental set-up used in magneto-optics. It includes a variety of practice problems with detailed solutions. The focus lies on the spectral range between near-infrared and near ultraviolet light because it is easily accessible in experiment using standard quartz optics.

### **Magnetic Nanoparticles** -

Sergey P. Gubin 2009-11-18  
This interdisciplinary approach to the topic brings together reviews of the physics, chemistry, fabrication and application of magnetic

nanoparticles and nanostructures within a single cover. With its discussion of the basics as well as the most recent developments, and featuring many examples of practical applications, the result is both a clear and concise introduction to the topic for beginners and a guide to relevant comprehensive physical phenomena and essential technological applications for experienced researchers.

### **On the Properties of Novel Superconductors** -

Heshmatollah Yavari  
2020-07-29

Since the discovery of superconductivity, a great number of theoretical and experimental efforts have been made to describe this new phase of matter that emerged in many body systems. In this regard, theoretical models have been presented; the most famous of which was the BCS theory that can only describe conventional superconductors. With the discovery of new class superconductors, the superconducting mechanism

became a new challenge in the field of condensed matter physics. This unexpected discovery opened a new area in the history of superconductivity, and experimental researchers started trying to find new compounds in this class of superconductors. These superconductors are often characterized by the anisotropic character in the superconducting gap function with nodes along a certain direction in the momentum space. Since the pairing interaction has an important role in the superconducting gap structure, its determination is very important to explain the basic pairing mechanism. In this regard, this book includes valuable theoretical and experimental discussions about the properties of superconductors. Here you will find valuable research describing the properties of unconventional superconductors.

### **Cadmium Telluride Quantum Dots** - John

Donegan 2016-04-19

In the last two decades, semiconductor quantum dots—small colloidal nanoparticles—have garnered a great deal of scientific interest because of their unique properties. Among nanomaterials, CdTe holds special technological importance as the only known II-VI material that can form conventional p-n junctions. This makes CdTe very important for the development of novel optoelectronic devices such as light-emitting diodes, solar cells, and lasers. Moreover, the demand for water-compatible light emitters and the most common biological buffers give CdTe quantum dots fields a veritable edge in biolabeling and bioimaging. Cadmium Telluride Quantum Dots: Advances and Applications focuses on CdTe quantum dots and addresses their synthesis, assembly, optical properties, and applications in biology and medicine. It makes for a very informative reading for anyone involved in nanotechnology and

will also benefit those scientists who are looking for a comprehensive account on the current state of quantum dot-related research.

**Understanding Solid State Physics** - Sharon Ann Holgate  
2021-04-22

Keeping the mathematics to a minimum yet losing none of the required rigor, *Understanding Solid State Physics, Second Edition* clearly explains basic physics principles to provide a firm grounding in the subject. This new edition has been fully updated throughout, with recent developments and literature in the field, including graphene and the use of quasicrystalline materials, in addition to featuring new journalistic boxes and the reciprocal lattice. The author underscores the technological applications of the physics discussed and emphasizes the multidisciplinary nature of scientific research. After introducing students to solid state physics, the text examines the various ways in which atoms bond together to form crystalline and

amorphous solids. It also describes the measurement of mechanical properties and the means by which the mechanical properties of solids can be altered or supplemented for particular applications. The author discusses how electromagnetic radiation interacts with the periodic array of atoms that make up a crystal and how solids react to heat on both atomic and macroscopic scales. She then focuses on conductors, insulators, semiconductors, and superconductors, including some basic semiconductor devices. The final chapter addresses the magnetic properties of solids as well as applications of magnets and magnetism. This accessible textbook provides a useful introduction to solid state physics for undergraduates who feel daunted by a highly mathematical approach. By relating the theories and concepts to practical applications, it shows how physics is used in the real world. Key features: Fully updated throughout, with new

journalistic boxes and recent applications Uses an accessible writing style and format, offering journalistic accounts of interesting research, worked examples, self-test questions, and a helpful glossary of frequently used terms

Highlights various technological applications of physics, from locomotive lights to medical scanners to USB flash drives

**Electrons in Solids** - Hendrik Bluhm 2019-04-01

As a continuation of classical condensed matter physics texts, this graduate textbook introduces advanced topics of correlated electron systems, mesoscopic transport, quantum computing, optical excitations and topological insulators. The book is focusing on an intuitive understanding of the basic concepts of these rather complex subjects.

**Encyclopedia of Interfacial Chemistry** - 2018-03-29

Encyclopedia of Interfacial Chemistry: Surface Science and Electrochemistry summarizes current, fundamental knowledge of

interfacial chemistry, bringing readers the latest developments in the field. As the chemical and physical properties and processes at solid and liquid interfaces are the scientific basis of so many technologies which enhance our lives and create new opportunities, its important to highlight how these technologies enable the design and optimization of functional materials for heterogeneous and electro-catalysts in food production, pollution control, energy conversion and storage, medical applications requiring biocompatibility, drug delivery, and more. This book provides an interdisciplinary view that lies at the intersection of these fields. Presents fundamental knowledge of interfacial chemistry, surface science and electrochemistry and provides cutting-edge research from academics and practitioners across various fields and global regions

**Semiconductor Spintronics** -

Thomas Schäpers 2021-05-10

This revised and expanded edition of the first

comprehensive introduction to the rapidly-evolving field of spintronics covers ferromagnetism in nano-electrodes, spin injection, spin manipulation, and the practical use of these effects in next-generation electronics.

Moreover, the book now also includes spin-based optics, topological materials and insulators, and the quantum spin Hall effect.

*High Sensitivity*

*Magnetometers* - Asaf Grosz  
2016-09-20

This book gathers, for the first time, an overview of nearly all of the magnetic sensors that exist today. The book is offering the readers a thorough and comprehensive knowledge from basics to state-of-the-art and is therefore suitable for both beginners and experts. From the more common and popular AMR magnetometers and up to the recently developed NV center magnetometers, each chapter is describing a specific type of sensor and providing all the information that is necessary to understand the magnetometer

behavior including theoretical background, noise model, materials, electronics, design and fabrication techniques, etc.

*The DARPA Model for Transformative Technologies: Perspectives on the U.S.*

*Defense Advanced Research Projects Agency* - William Boone Bonvillian  
2020-01-09

The authors have done a masterful job of charting the important story of DARPA, one of the key catalysts of technological innovation in US recent history. By plotting the development, achievements and structure of the leading world agency of this kind, this book stimulates new thinking in the field of technological innovation with bearing on how to respond to climate change, pandemics, cyber security and other global problems of our time. The DARPA Model provides a useful guide for governmental agency and policy leaders, and for anybody interested in the role of governments in technological innovation. —Dr. Kent Hughes, Woodrow Wilson International Center for Scholars This

volume contains a remarkable collection of extremely insightful articles on the world's most successful advanced technology agency. Drafted by the leading US experts on DARPA, it provides a variety of perspectives that in turn benefit from being presented together in a comprehensive volume. It reviews DARPA's unique role in the U.S. innovation system, as well as the challenges DARPA and its clones face today. As the American model is being considered for adoption by a number of countries worldwide, this book makes a welcome and timely contribution to the policy dialogue on the role played by governments in stimulating technological innovation. — Prof. Charles Wessner, Georgetown University

The U.S. Defense Advanced Research Projects Agency (DARPA) has played a remarkable role in the creation of new transformative technologies, revolutionizing defense with drones and precision-guided munitions,

and transforming civilian life with portable GPS receivers, voice-recognition software, self-driving cars, unmanned aerial vehicles, and, most famously, the ARPANET and its successor, the Internet. Other parts of the U.S. Government and some foreign governments have tried to apply the 'DARPA model' to help develop valuable new technologies. But how and why has DARPA succeeded? Which features of its operation and environment contribute to this success? And what lessons does its experience offer for other U.S. agencies and other governments that want to develop and demonstrate their own 'transformative technologies'? This book is a remarkable collection of leading academic research on DARPA from a wide range of perspectives, combining to chart an important story from the Agency's founding in the wake of Sputnik, to the current attempts to adapt it to use by other federal agencies. Informative and insightful, this guide is essential reading for political and policy leaders, as

well as researchers and students interested in understanding the success of this agency and the lessons it offers to others.

**Quantum Theory of Condensed Matter** - Bertrand I. Halperin 2010

Ever since 1911, the Solvay Conferences have shaped modern physics. The 24th edition chaired by Bertrand Halperin did not break the tradition. Held in October 2008, it gathered in Brussels most of the leading figures working on the quantum theory of condensed matter, addressing some of the most profound open problems in the field. The proceedings contain the rapporteur talks giving a broad overview with unique insights by distinguished renowned scientists. These lectures cover the five sessions treating: mesoscopic and disordered systems; exotic phases and quantum phase transitions in model systems; experimentally realized correlated-electron materials; quantum Hall systems, and one-dimensional systems;

systems of ultra-cold atoms, and advanced computational methods. In the Solvay tradition, the proceedings include also the prepared comments to the rapporteur talks. The discussions among the participants ? some of which are quite lively and involving dramatically divergent points of view ? have been carefully edited and reproduced in full.

*Optical Electronics* - Jixiang Yan 2019

This book discusses light transmission and extends to more applied fields of laser and laser technology, photoelectric detection and devices, photoelectric imaging and systems with explanations on theories and engineering applications. Addressing the intersection between optics and electrical engineering, the textbook prepares graduate students to photoelectronics and can also be used as reference for engineers.

**The Physics of Solids** - John Boyd Ketterson 2016

This text offers a broad coverage of the physical

properties of solids at fundamental level. The quantum-mechanical origins that lead to a wide range of observed properties are discussed. The book also includes a modern treatment of unusual physical states.

*Surface Plasmon*

*Nanophotonics* - Mark L. Brongersma 2007-09-18

This book discusses a new class of photonic devices, known as surface plasmon nanophotonic structures. The book highlights several exciting new discoveries, while providing a clear discussion of the underlying physics, the nanofabrication issues, and the materials considerations involved in designing plasmonic devices with new functionality. Chapters written by the leaders in the field of plasmonics provide a solid background to each topic.

*High Temperature*

*Superconducting Magnetic Levitation* - Jia-Su Wang 2017-12-18

The authors begin this book with a systematic overview of superconductivity,

superconducting materials, magnetic levitation, and superconducting magnetic levitation - the prerequisites to understand the latter part of the book - that forms a solid foundation for further study in High Temperature Superconducting Magnetic Levitation (HTS Maglev). This book presents our research progress on HTS Maglev at Applied Superconductivity Laboratory (ASCLab) of Southwest Jiaotong University (SWJTU), China, with an emphasis on the findings that led to the world's first manned HTS Maglev test vehicle "Century". The book provides a detailed description on our previous work at ASCLab including the designing of the HTS Maglev test and measurement method as well as the apparatus, building "Century", developing the HTS Maglev numerical simulation system, and making new progress on HTS Maglev. The final parts of this book discuss research and prototyping efforts at ASCLab in several adjacent fields including HTS

Maglev bearing, Flywheel Energy Storage System (FESS) and HTS maglev launch technology. We hope this book becomes a valuable source for researchers and engineers working in the fascinating field of HTS Maglev science and engineering. Contents  
Fundamentals of superconductivity  
Superconducting materials  
Magnetic levitation  
Superconducting magnetic levitation  
HTS Maglev experimental methods and set-up  
First manned HTS Maglev vehicle in the world  
Numerical simulations of HTS Maglev  
New progress of HTS Maglev vehicle  
HTS Maglev bearing and flywheel energy storage system  
HTS Maglev launch technology

Radiative Decay Engineering - Chris D. Geddes 2007-12-11  
During recent years our enthusiasm for this field has continually increased. This book presents expert contributions describing the fundamental principles for the widespread use of radiative decay engineering in the

biological sciences and nanotechnology.

*Beautiful Visualization* - Julie Steele 2010-04-23

Visualization is the graphic presentation of data -- portrayals meant to reveal complex information at a glance. Think of the familiar map of the New York City subway system, or a diagram of the human brain. Successful visualizations are beautiful not only for their aesthetic design, but also for elegant layers of detail that efficiently generate insight and new understanding. This book examines the methods of two dozen visualization experts who approach their projects from a variety of perspectives -- as artists, designers, commentators, scientists, analysts, statisticians, and more. Together they demonstrate how visualization can help us make sense of the world. Explore the importance of storytelling with a simple visualization exercise  
Learn how color conveys information that our brains recognize before we're fully aware of it

Discover how the books we buy and the people we associate with reveal clues to our deeper selves Recognize a method to the madness of air travel with a visualization of civilian air traffic Find out how researchers investigate unknown phenomena, from initial sketches to published papers Contributors include: Nick Bilton, Michael E. Driscoll, Jonathan Feinberg, Danyel Fisher, Jessica Hagy, Gregor Hochmuth, Todd Holloway, Noah Iliinsky, Eddie Jabbour, Valdean Klump, Aaron Koblin, Robert Kosara, Valdis Krebs, JoAnn Kuchera-Morin et al., Andrew Odewahn, Adam Perer, Anders Persson, Maximilian Schich, Matthias Shapiro, Julie Steele, Moritz Stefaner, Jer Thorp, Fernanda Viegas, Martin Wattenberg, and Michael Young.

**Halide Perovskites** - Tze-Chien Sum 2019-03-25  
Real insight from leading experts in the field into the causes of the unique photovoltaic performance of perovskite solar cells,

describing the fundamentals of perovskite materials and device architectures. The authors cover materials research and development, device fabrication and engineering methodologies, as well as current knowledge extending beyond perovskite photovoltaics, such as the novel spin physics and multiferroic properties of this family of materials. Aimed at a better and clearer understanding of the latest developments in the hybrid perovskite field, this is a must-have for material scientists, chemists, physicists and engineers entering or already working in this booming field.

**Magnetic Nanoparticles in Biosensing and Medicine** - Nicholas J. Darton 2019

**Semiconductor Physics** - Karl W. Böer 2018-03-18

This handbook gives a complete survey of the important topics and results in semiconductor physics. It addresses every fundamental principle and most research topics and areas of application

in the field of semiconductor physics. Comprehensive information is provided on crystalline bulk and low-dimensional as well as amorphous semiconductors, including optical, transport, and dynamic properties.

**Introduction to Quantum Computing** - Ray LaPierre  
2021-09-27

This book provides a self-contained undergraduate course on quantum computing based on classroom-tested lecture notes. It reviews the fundamentals of quantum mechanics from the double-slit experiment to entanglement, before progressing to the basics of qubits, quantum gates, quantum circuits, quantum key distribution, and some of the famous quantum algorithms. As well as covering quantum gates in depth, it also describes promising platforms for their physical implementation, along with error correction, and topological quantum computing. With quantum computing expanding rapidly in the private sector,

understanding quantum computing has never been so important for graduates entering the workplace or PhD programs. Assuming minimal background knowledge, this book is highly accessible, with rigorous step-by-step explanations of the principles behind quantum computation, further reading, and end-of-chapter exercises, ensuring that undergraduate students in physics and engineering emerge well prepared for the future.

**Introduction to Solid State Physics for Materials Engineers** - Emil Zolotoyabko  
2021-06-28

A concise, accessible, and up-to-date introduction to solid state physics. Solid state physics is the foundation of many of today's technologies including LEDs, MOSFET transistors, solar cells, lasers, digital cameras, data storage and processing. Introduction to Solid State Physics for Materials Engineers offers a guide to basic concepts and provides an accessible framework for understanding

this highly application-relevant branch of science for materials engineers. The text links the fundamentals of solid state physics to modern materials, such as graphene, photonic and metamaterials, superconducting magnets, high-temperature superconductors and topological insulators. Written by a noted expert and experienced instructor, the book contains numerous worked examples throughout to help the reader gain a thorough understanding of the concepts and information presented. The text covers a wide range of relevant topics, including propagation of electron and acoustic waves in crystals, electrical conductivity in metals and semiconductors, light interaction with metals, semiconductors and dielectrics, thermoelectricity, cooperative phenomena in electron systems, ferroelectricity as a cooperative phenomenon, and more. This important book: Provides a big picture view of solid state physics Contains examples of basic concepts and

applications Offers a highly accessible text that fosters real understanding Presents a wealth of helpful worked examples Written for students of materials science, engineering, chemistry and physics, Introduction to Solid State Physics for Materials Engineers is an important guide to help foster an understanding of solid state physics.

**Spintronics** - Tomasz Blachowicz 2019-05-06 Starting from quantum mechanical and condensed matter foundations, this book introduces into the necessary theory behind spin electronics (Spintronics). Equations of spin diffusion, -evolution and -tunnelling are provided before an overview is given of simulation of spin transport at the atomic scale. Furthermore, applications are discussed with a focus on elementary spintronics devices such as spin valves, memory cells and hard disk heads.

*Applied Superconductivity* - Rudolf Gross 2016-01-01

The title discusses mainly weak

superconductivity, in particular the foundations of Josephson effects and their applications in superconducting devices and circuits. One of the most prominent topics in low temperature study, Superconductivity, is presented by the renowned scientist Rudolf Gross, Director of the Walther-Meissner-Institute for Low Temperature Research in Garching, Munich, and his two fellow scientists."

Spin Current - Sadamichi Maekawa 2012-07-26

Since the discovery of the giant magnetoresistance (GMR) effect in magnetic multilayers in 1988, a new branch of physics and technology, called spin-electronics or spintronics, has emerged, where the flow of electrical charge as well as the flow of electron spin, the so-called "spin current", are manipulated and controlled together. Recent progress in the physics of magnetism and the application of spin current has progressed in tandem with the nanofabrication technology of magnets and the engineering of interfaces and

thin films. This book is intended to provide an introduction and guide to the new physics and applications of spin current. The emphasis is placed on the interaction between spin and charge currents in magnetic nanostructures.

**Nanomaterials** - Engg Kamakhya Prasad Ghatak 2018-11-05

The work studies under different physical conditions the carrier contribution to elastic constants in heavily doped optoelectronic materials. In the presence of intense photon field the authors apply the Heisenberg Uncertainty Principle to formulate electron statistics. Many open research problems are discussed and numerous potential applications as quantum sensors and quantum cascade lasers are presented.

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**Organic Spintronics** - Zeev Valy Vardeny 2010-04-09

Present worldwide funding in organic electronics is poised to stimulate major research and development efforts in organic materials research for lighting, photovoltaic, and other optoelectronic applications.

The field of organic

spintronics, in particular, has flourished in the area of organic magneto-transport. Reflecting the main avenues of substantial advances in this arena, Organic Spintronics is an up-to-date summary of the experimental and theoretical aspects of the field. With contributions by a panel of international experts on the cutting edge of research, this volume explores: Spin injection and manipulation in organic spin valves The magnetic field effect in organic light-emitting diodes (OLEDs) The spin transport effect in relation to spin manipulation Organic magnets as spin injection electrodes in organic spintronics devices The coherent control of spins in organic devices using the technique of electronically detected magnetic resonance The possibility of using organic spin valves as sensors Balancing practical experimentation with analytical constructs, the book covers both the theoretical aspects of spin injection, transport, and detection in organic spin valves

as well as the underlying mechanism of the magnetoresistance and magneto-electroluminescence in OLEDs. The first book of its kind on this specialized area,

this volume is destined to provide researchers and students with the impetus to develop new channels of inquiry in an area that has almost limitless potential.