

# Frontlist 2014 Quarter 1

## Naturalsciences



## Biomedicine

M. Balali-Mood, M. Abdollahi (Eds.)

### Basic and Clinical Toxicology of Organophosphorus Compounds

This book explains the chemistry of Organophosphorus compounds (OPs), their mechanism of toxicity and the history of OPs from their initial discovery to the development of new compounds such as Novichoks. It details the harmful effects to human health both as a result of acute and chronic OP exposure and the necessary clinical management of affected patients to reduce their toxic side effects. The book also explains the detrimental effect that OPs have had on the environment and the efforts being made to prevent this in the future. Finally, the book looks at the incidents where OPs have been used as chemical warfare agents. Basic and Clinical Toxicology of Organophosphorus Compounds[...]

#### Features

This book explains the chemistry of organophosphorus compounds (OPs), their mechanism of toxicity and the history of OPs from their initial discovery to the development of new compounds such as Novichoks. It details the harmful effects to human health both as a result of acute and chronic OP exposure and the necessary clinical management of affected patients to reduce their toxic side effects. The book also [...]

#### Contents

Chemistry and classification of OP compounds.- History of use and epidemiology of organophosphorus poisoning.- Acute toxicity of organophosphorus compounds.- Chronic toxicity of organophosphorus compounds.- Toxicity and novel biomarkers of OP exposure.- Clinical management of acute OP pesticide poisoning.- Clinical management of organophosphorus nerve agents' poisonings.- Occupational and environmental aspects of organophosphorus compounds.- Summary, discussion and conclusions.

#### Fields of interest

Pharmacology / Toxicology; Emergency Medicine; Molecular Medicine; Biomedicine (general); Environmental Health

#### Target groups

Professional/practitioner

#### Type of publication

Professional book

More on [www.springer.com/978-1-4471-5624-6](http://www.springer.com/978-1-4471-5624-6)

#### Hardcover

2014. XII, 257 p. 31 illus., 6 illus. in color. ISBN 978-1-4471-5624-6

**Due: December 31, 2013**

D. Bar-Shalom, K. Rose, klausrose Consulting, Riehen, Switzerland (Eds.)

### Pediatric Formulations

#### A Roadmap

Until the 1990s, it was generally accepted that medicines were first developed for adults and their use in children was investigated later, if at all. One of the main tasks of hospital pharmacies was the manufacturing of child-appropriate formulations in a more or less makeshift way. The first change came in 1997 with U.S. legislation that rewarded manufacturers to do voluntary pediatric research. Ten years later, the European Union passed legislation that required manufacturers to discuss all pediatric aspects, including formulations, with the regulatory authorities as a condition of starting the registration procedure. In consequence, manufacturers must now cover all age groups.[...]

#### Features

As the first book that specifically addresses pediatric formulations in the context of drug development, Pediatric Formulations: A Roadmap covers anatomy and physiology of children as well as the technical state of the art, gives hints about where to find inspiration, and provides a suitable background on the regulatory framework. Existing books on pediatric formulations mainly discuss compounding at [...]

#### Contents

Pediatric Development: Anatomy.- Age, Weight, Body Surface and Stature, Organ Development.- Pediatric Development: Physiology, Enzymes, Drug Metabolism, Pharmacokinetics and Pharmacodynamics.- Pediatric Development – Gastrointestinal.- How to Estimate the Dose to be Given for the First Time to Pediatric Patients.- The Clinical Relevance of Pediatric Formulations.- General Considerations for Pediatric Oral Drug Formulation.- Orosensory Perception.- Flavor Is Not Just Taste: Taste Concealing.- Liquid Formulations.- Paediatric Solid Formulations.- Semi-Solid Formulations.- The Challenge of[...]

#### Fields of interest

Pharmaceutical Sciences / Technology; Pharmacy; Pediatrics

#### Target groups

Research

#### Type of publication

Contributed volume

More on [www.springer.com/978-1-4899-8010-6](http://www.springer.com/978-1-4899-8010-6)

#### Hardcover

2014. XX, 480 p. 42 illus., 25 illus. in color. (AAPS Advances in the Pharmaceutical Sciences Series, Vol. 11)

ISBN 978-1-4899-8010-6

**Due: February 28, 2014**

G.R. Bowman, University of California, Berkeley, Berkeley, USA; V.S. Pande, Stanford University, Stanford, USA; F. Noé, Freie Universität Berlin, Berlin, Germany (Eds.)

### An Introduction to Markov State Models and Their Application to Long Timescale Molecular Simulation

The aim of this book volume is to explain the importance of Markov state models to molecular simulation, how they work, and how they can be applied to a range of problems. The Markov state model (MSM) approach aims to address two key challenges of molecular simulation: 1) How to reach long timescales using short simulations of detailed molecular models. 2) How to systematically gain insight from the resulting sea of data. MSMs do this by providing a compact representation of the vast conformational space available to biomolecules by decomposing it into states sets of rapidly interconverting conformations and the rates of transitioning between states. This kinetic definition allows one to [...]

#### Features

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#### Contents

An overview and practical guide to building Markov state models.- Markov model theory.- Estimation and Validation of Markov models.- Uncertainty estimation.- Analysis of Markov models.- Transition Path Theory.- Understanding Protein Folding using Markov state models.- Understanding Molecular Recognition by Kinetic Network Models Constructed from Molecular Dynamics Simulations.- Markov State and Diffusive Stochastic Models in Electron Spin Resonance.- Software for building Markov state models.

#### Fields of interest

Molecular Medicine; Theoretical, Mathematical and Computational Physics; Computer Applications in Life Sciences; Physical Chemistry; Mathematics (general)

#### Target groups

Graduate

#### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-94-007-7605-0](http://www.springer.com/978-94-007-7605-0)

#### Hardcover

2014. XII, 139 p. 65 illus., 48 illus. in color. (Advances in Experimental Medicine and Biology, Vol. 797)

ISBN 978-94-007-7605-0

**usually dispatched within 3 to 5 business days  
December 31, 2013**

C. Carlberg, University of Eastern Finland, Kuopio, Finland; F. Molnár, University of Eastern Finland, Kuopio, Finland

## Mechanisms of Gene Regulation

This textbook aims to describe the fascinating area of eukaryotic gene regulation for graduate students in all areas of the biomedical sciences. Gene expression is essential in shaping the various phenotypes of cells and tissues and as such, regulation of expression is a fundamental aspect of nearly all processes in physiology, both in healthy and in diseased states. This pivotal role for the regulation of gene expression makes this textbook essential reading from students of all the biomedical sciences in order to be better prepared for their specialized disciplines. A complete understanding of transcription factors and the processes that alter their activity is a major goal of modern[...]

### Features

This textbook aims to describe the fascinating area of eukaryotic gene regulation for graduate students in all areas of the biomedical sciences. Gene expression is essential in shaping the various phenotypes of cells and tissues and as such, regulation of expression is a fundamental aspect of nearly all processes in physiology, both in healthy and in diseased states. This pivotal role for the [...]

### Contents

Overview: What is gene expression? - The impact of chromatin. - The basal transcriptional machinery. - Transcription factors. - Linking signal transduction and gene regulation. - Switching genes on and off at the example of nuclear receptors. - Mapping the genome. - Chromatin modifiers. - Genomic imprinting. - The epigenome. - Chromatin remodeling. - Chromatin architecture. - Regulatory RNA.

### Fields of interest

Gene Expression; Protein Structure

### Target groups

Graduate

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-94-007-7904-4](http://www.springer.com/978-94-007-7904-4)

### Hardcover

2014. XV, 210 p. 83 illus., 64 illus. in color.

ISBN 978-94-007-7904-4

**Due: December 31, 2013**

T.J. Cleophas, Department Medicine, Sliedrecht, Netherlands; A.H. Zwinderman, Department Biostatistics, Amsterdam, Netherlands

## Machine Learning in Medicine

### Part Three

Machine learning is concerned with the analysis of large data and multiple variables. It is also often more sensitive than traditional statistical methods to analyze small data. The first and second volumes reviewed subjects like optimal scaling, neural networks, factor analysis, partial least squares, discriminant analysis, canonical analysis, fuzzy modeling, various clustering models, support vector machines, Bayesian networks, discrete wavelet analysis, association rule learning, anomaly detection, and correspondence analysis. This third volume addresses more advanced methods and includes subjects like evolutionary programming, stochastic methods, complex sampling, optional[...]

### Features

Machine learning is concerned with the analysis of large data and multiple variables. It is also often more sensitive than traditional statistical methods to analyze small data. The first and second volumes reviewed subjects like optimal scaling, neural networks, factor analysis, partial least squares, discriminant analysis, canonical analysis, fuzzy modeling, various clustering models, support vector [...]

### Contents

Preface. - Introduction to Machine Learning Part Three. - Evolutionary Operations. - Multiple Treatments. - Multiple Endpoints. - Optimal Binning. - Exact P-Values. - Probit Regression. - Overdispersion. 10 Random Effects. - Weighted Least Squares. - Multiple Response Sets. - Complex Samples. - Runs Tests. - Decision Trees. - Spectral Plots. - Newton's Methods. - Stochastic Processes, Stationary Markov Chains. - Stochastic Processes, Absorbing Markov Chains. - Conjoint Models. - Machine Learning and Unsolved Questions. - Index.

### Fields of interest

Biomedicine (general); Medicine (general); Statistics (general); Computer Imaging, Vision, Pattern Recognition and Graphics

### Target groups

Upper undergraduate

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-94-007-7868-9](http://www.springer.com/978-94-007-7868-9)

### Hardcover

2013. XIX, 224 p. 41 illus.

ISBN 978-94-007-7868-9

**usually dispatched within 3 to 5 business days**

A.J. Domb, School of Pharmacy-Faculty of Medic, Jerusalem, Israel; W. Khan, School of Pharmacy-Faculty of Medicine, Jerusalem, Israel (Eds.)

## Focal Controlled Drug Delivery

The concept of focal controlled drug delivery has been applied for treating illnesses that are localized to a certain tissue or organ. These delivery systems are applied directly to the diseased site and deliver a desired dose for an extended time period while minimizing systemic distribution of toxic drug. Controlled drug delivery systems have been focused on oral extended release formulations and on systemic delivery of small drugs and peptides. Despite the upsurge of interest in focal targeted drug delivery, there is currently no single reference text on the subject. By comparison, there are numerous authored and edited books on oral, systemic and transdermal drug delivery or books[...]

### Features

The concept of Focal Drug Delivery has been applied for treating illnesses that are localized to a certain tissue or organ. These delivery systems are applied directly to the diseased site and deliver a desired dose for an extended time period while minimizing systemic distribution of toxic drug. Despite the upsurge of interest in focal targeted drug delivery, there is currently no single reference text on [...]

### Contents

Biodegradable Polymers for Focal Delivery Systems. - Implantable Medical Devices. - Systemic Targeting Systems-EPR Effect, Ligand Targeting Systems. - Liposomal formulations for Focal and Targeted Drug Delivery in Cancer and Other Diseases. - Polymer Drug Conjugate in Focal Drug Delivery. - Pharmacokinetic and Pharmacodynamic Aspects of Focal and Targeted Delivery of Drugs. - Treatment of Brain Tumors. - Intranasal Delivery of Neuropeptide-Loaded Nanoparticles and Their Application to Nervous System Therapeutics. - Focal Drug Delivery in Inner Ear Therapy. - Nanotechnology Based Ophthalmic Drug[...]

### Fields of interest

Pharmaceutical Sciences / Technology

### Target groups

Research

### Type of publication

Contributed volume

More on [www.springer.com/978-1-4614-9433-1](http://www.springer.com/978-1-4614-9433-1)

### Hardcover

2014. XIV, 736 p. 99 illus., 75 illus. in color. (Advances in Delivery Science and Technology)

ISBN 978-1-4614-9433-1

**Due: January 31, 2014**

B. Ferry, D. Gervasoni, C. Vogt, Claude Bernard University, Lyon, France

## Stereotaxic Neurosurgery in Laboratory Rodent

Handbook on Best Practices

Stereotaxic neurosurgery in rodents is used by a variety of people working at research laboratories (research staff, technicians, students at animal facilities...). The present handbook presents all the steps necessary to complete a stereotaxic neurosurgery protocol in accordance with current animal welfare guidelines. This book will guide surgeons step by step, from anesthesia to the post-surgery recovery procedures, including asepsis of the surgical tools and surgical zone, analgesia, correctly identifying the reference points on the skull and brain targets, etc. In keeping with the current international trends, the authors above all focus on the following points: the consideration[...]

### Features

Stereotaxic neurosurgery in rodents is used by a variety of people working at research laboratories (research staff, technicians, students at animal facilities...). The present handbook presents all the steps necessary to complete a stereotaxic neurosurgery protocol in accordance with current animal welfare guidelines. This book will guide surgeons step by step, from anesthesia to the post-surgery recovery [...]

### Contents

Regulatory and Ethical Considerations.- Elements of Descriptive Neuroanatomy.- Elements of Functional Neuroanatomy: The Major Neurotransmitter Systems.- Stereotaxic Approach of a Target Structure.- Preparation of the Stereotaxic Surgical Procedure.- Post-mortem examination of animals.

### Fields of interest

Neurosciences; Neurobiology; Neurosurgery; Animal Models; Surgery

### Target groups

Research

### Type of publication

Handbook

More on [www.springer.com/978-2-8178-0471-2](http://www.springer.com/978-2-8178-0471-2)

### Hardcover

Original French edition published by Editions Lavoisier, Cachan, 2012

2014. XII, 228 p. 146 illus., 128 illus. in color.

ISBN 978-2-8178-0471-2

**Due: February 28, 2014**

M. Hammarlund-Udenaes, Uppsala University, Uppsala, Sweden; E. de Lange, Leiden University, Leiden, Netherlands; R.G. Thorne, University of Wisconsin-Madison School of, Madison, USA (Eds.)

## Drug Delivery to the Brain

Physiological Concepts, Methodologies and Approaches

The development of new CNS drugs is notoriously difficult. Drugs must reach CNS target sites for action and these sites are protected by a number of barriers, the most important being the blood-brain barrier (BBB). Many factors are therefore critical to consider for CNS drug delivery, e.g. active/passive transport across the BBB, intra-brain distribution, and central/systemic pharmacokinetics, to name a few. Neurological disease and trauma conditions add further complexity because CNS barriers, drug distribution and pharmacokinetics are dynamic and often changed by disease/trauma. Knowledge of all these factors and their interplay in different conditions is of utmost importance for[...]

### Features

This book describes the different approaches for drug delivery to the brain with an emphasis on the physiology of the blood-brain barrier (BBB) and the governing principles and concepts for drug delivery across the BBB. It contains cutting-edge methods for studying drug delivery and administering drugs into the brain. The book also explores different approaches for predicting human brain concentrations as [...]

### Contents

Anatomy and physiology of the blood-brain barriers.- Recent Progress in Blood-Brain Barrier and Blood-CSF Barrier Transport Research: Pharmaceutical Relevance for Drug Delivery to the Brain.- Blood-Brain Barrier (BBB) Pharmacoproteomics: A New Research Field Opened up by Quantitative Targeted Absolute Proteomics (QTAP).- Drug Metabolism at the Blood-Brain and Blood-CSF Barriers.- Pharmacokinetic Concepts in Brain Drug Delivery.- In vitro models of blood-brain barriers.- In situ and in vivo animal models.- Principles of PET and its Role in Understanding Drug Delivery to the Brain.- PKPD[...]

### Fields of interest

Pharmaceutical Sciences / Technology; Biomedicine (general)

### Target groups

Research

### Type of publication

Contributed volume

More on [www.springer.com/978-1-4614-9104-0](http://www.springer.com/978-1-4614-9104-0)

### Hardcover

2014. XX, 731 p. 150 illus., 126 illus. in color. (AAPS Advances in the Pharmaceutical Sciences Series, Vol. 10)

ISBN 978-1-4614-9104-0

**usually dispatched within 3 to 5 business days  
December 31, 2013**

G.R. Lewin, B.D. Carter, Vanderbilt University School of Medicine, Nashville, USA (Eds.)

## Neurotrophic Factors

This book provides critical reviews of the role of neurotrophins and their receptors in a wide variety of diseases including neurodegenerative diseases like Huntington's syndrome, cognitive function, psychiatric disorders such as clinical depression, Rett syndrome, motoneurone disease, spinal cord injury, pain, metabolic disease and cardiovascular disease. It also contains contributions from leaders in the field dealing with the basic biology, transcriptional and post-translational regulation of the neurotrophins and their receptors. The present book will review all recent areas of progress in the study of neurotrophins and their biological roles.

### Features

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### Contents

The Neurotrophin Family: NGF, BDNF, NT3 and NT4.- Deciphering Proneurotrophin Actions.- Spatio-Temporal Intracellular Dynamics of Neurotrophins and Their Receptors. Implications for Neurotrophin Signaling and Neuronal Function.- Neurotrophins: Transcription and Translation.- Neurotrophin Receptors: Trk Receptors.- The Biological Functions and Signaling Mechanisms of the p75 Neurotrophin Receptor.- Sortilins in Neurotrophic Factor Signaling.- The Biology of Neurotrophins: Neurotrophins in the Regulation of Cellular Survival and Death.- BDNF and Synaptic Plasticity, Cognitive Function and[...]

### Fields of interest

Pharmacology / Toxicology; Molecular Medicine; Neurosciences

### Target groups

Research

### Type of publication

Handbook

More on [www.springer.com/978-3-642-45105-8](http://www.springer.com/978-3-642-45105-8)

### Hardcover

2014. XII, 613 p. 37 illus., 27 illus. in color. (Handbook of Experimental Pharmacology, Vol. 220)  
ISBN 978-3-642-45105-8

**Due: January 31, 2014**

E. Marani, EWI, MIRA, University Twente, Enschede, Netherlands;  
W.F.R.M. Koch, Medisch Centrum Alkmaar, Alkmaar, Netherlands

## The Pelvis

Structure, Gender and Society

This book offers a critical review of the pelvic sciences—past, present and future—from an anatomical and physiological perspective and is intended for researchers, medical practitioners and paramedical therapists in the fields of urology, gynecology and obstetrics, proctology, physiotherapy, as well as for patients. The book starts with a “construction plan” of the pelvis and shows its structural consequences. The historical background of pelvic studies proceeds from medieval and early Italian models to the definitive understanding of the pelvic anatomy in the Seventeenth century. During these eras of pelvic research, concepts and approaches developed that are illustrated with [...]

### Features

This book offers a critical review of the pelvic sciences—past, present and future—from an anatomical and physiological perspective and is intended for researchers, medical practitioners and paramedical therapists in the fields of urology, gynecology and obstetrics, proctology, physiotherapy, as well as for patients. The book starts with a “construction plan” of the pelvis and shows its [...]

### Contents

The Pelvis or My Pelvis.- “Construction Plan” of the Bony Pelvis.- The Pelvis at War.- The Birth Canal.- History.- Concepts and Approaches in the Study of the Pelvis.- Sexual Organs and Society.- Anatomy of the Pelvic Wall.- The Development of Uropoetic Structures.- Physiotherapy for Pelvic Muscles.- The Sub and Retroperitoneal Space.- Vision and Waist-to-Hip Ratio.- Male and Female Bladder.- The Pelvis and Herbal Medicine.- Innervation of the Mature Human Pelvis.- Electromyography of Smooth Muscle of Bladder and Uterus.- Reflexes or Controller Action?.- The Connective Tissue in the [...]

### Fields of interest

Human Physiology; Gynecology; Anatomy

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40005-6](http://www.springer.com/978-3-642-40005-6)

### Hardcover

2014. XVII, 541 p. 203 illus., 80 illus. in color.  
ISBN 978-3-642-40005-6

**Due: December 31, 2013**

J. Peltola, Tampere University Hospital, Tampere, Finland

## Clinical Management of Partial-Onset Seizures in Epilepsy

While tonic-clonic seizures are the most commonly recognized, approximately 60% of patients with epilepsy actually have partial-onset seizures, with one side of the brain being affected. While clinicians regularly see patients with partial-onset seizures, in both the community or office setting, it is often challenging to determine what the type of epilepsy is being experienced and which treatment should be administered. Written by a Dr Jukka Peltola, a renowned key thought leader, this concise high-quality pocket-sized book will be aimed at educating non-specialists how to accurately diagnose and classify partial-onset seizures, with a special focus on currently available and [...]

### Features

While tonic-clonic seizures are the most commonly recognized, approximately 60% of patients with epilepsy actually have partial-onset seizures, with one side of the brain being affected. While clinicians regularly see patients with partial-onset seizures, in both the community or office setting, it is often challenging to determine what the type of epilepsy is being experienced and which treatment should be [...]

### Contents

Introduction to partial-onset epilepsy.- Definition and classification of epileptic seizures.- Diagnosis and prognosis of epileptic syndromes.- Treatment options and long-term management.

### Fields of interest

Neurosciences; Medicine (general); Pharmacotherapy

### Target groups

Professional/practitioner

### Type of publication

Handbook

More on [www.springer.com/978-3-319-02758-6](http://www.springer.com/978-3-319-02758-6)

### Softcover

2014. Approx. 100 p. 35 illus., 25 illus. in color.  
ISBN 978-3-319-02758-6

**Due: March 30, 2014**

D. Ribatti, University of Bari Medical School, Bari, Italy

## Angiogenesis and Anti-Angiogenesis in Hematological Malignancies

It has been generally accepted that angiogenesis is involved in the pathogenesis of hematological malignancies, like acute and chronic leukemia, lymphoma, myelodysplastic syndromes, myeloproliferative neoplasms and multiple myeloma. The extent of angiogenesis in the bone marrow has been correlated with disease burden, prognosis and treatment outcome. Reciprocal positive and negative interactions between tumor cells and bone marrow stromal cells, namely hematopoietic stem cells, fibroblasts, osteoblasts/osteoclasts, endothelial cells, endothelial progenitor cells, T cells, macrophages and mast cells, mediated by an array of cytokines, receptors and adhesion molecules, modulate the [...]

### Features

It has been generally accepted that angiogenesis is involved in the pathogenesis of hematological malignancies, like acute and chronic leukemia, lymphoma, myelodysplastic syndromes, myeloproliferative neoplasms and multiple myeloma. The extent of angiogenesis in the bone marrow has been correlated with disease burden, prognosis and treatment outcome. Reciprocal positive and negative interactions between tumor [...]

### Contents

Preface.- Introduction.- Angiogenesis in multiple myeloma.- Angiogenesis in lymphomas.- Angiogenesis in leukemia.- Antiangiogenesis.- Concluding remarks.- References.

### Fields of interest

Cancer Research; Oncology; Hematology; Life Sciences (general)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-017-8034-6](http://www.springer.com/978-94-017-8034-6)

### Hardcover

2014. I, 142 p. 44 illus., 30 illus. in color.  
ISBN 978-94-017-8034-6

**Due: January 31, 2014**

P. Ruben, Simon Fraser University, Burnaby, Canada (Ed.)

## Voltage Gated Sodium Channels

A number of techniques to study ion channels have been developed since the electrical basis of excitability was first discovered. Ion channel biophysicists have at their disposal a rich and ever-growing array of instruments and reagents to explore the biophysical and structural basis of sodium channel behavior. Armed with these tools, researchers have made increasingly dramatic discoveries about sodium channels, culminating most recently in crystal structures of voltage-gated sodium channels from bacteria. These structures, along with those from other channels, give unprecedented insight into the structural basis of sodium channel function. This volume of the Handbook of Experimental[...]

### Features

A number of techniques to study ion channels have been developed since the electrical basis of excitability was first discovered. Ion channel biophysicists have at their disposal a rich and ever-growing array of instruments and reagents to explore the biophysical and structural basis of sodium channel behavior. Armed with these tools, researchers have made increasingly dramatic discoveries about sodium [...]

### Contents

Overview: biophysical properties and structure of sodium channels.- The voltage sensor module in sodium channels.- Slow inactivation of Na<sup>+</sup> channels.- Regulation/modulation of sensory neuron sodium channels.- Ubiquitylation of voltage-gated sodium channels.- Probing gating mechanisms of sodium channel using pore blockers.- Animal toxins influence voltage-gated sodium channel function.- Voltage-sensor trapping toxins: Iso form-specific ligands for sodium channels.- Pharmacological insights and quirks of bacterial sodium channels.- The role of non-pore-forming  $\beta$  subunits in physiology and[...]

### Fields of interest

Pharmacology / Toxicology; Neurosciences; Cardiology; Membrane Biology; Protein Structure

### Target groups

Research

### Type of publication

Handbook

More on [www.springer.com/978-3-642-41587-6](http://www.springer.com/978-3-642-41587-6)

### Hardcover

2014. X, 334 p. 58 illus., 36 illus. in color. (Handbook of Experimental Pharmacology, Vol. 221)  
ISBN 978-3-642-41587-6

**Due: February 28, 2014**

J.G. Taylor, University of London, London, United Kingdom

## Solving the Mind-Body Problem by the CODAM Neural Model of Consciousness?

This book details a model of consciousness supported by scientific experimental data from the human brain. It presents how the Corollary Discharge of Attention Movement (CODAM) neural network model allows for a scientific understanding of consciousness as well as provides a solution to the Mind-Body problem. The book provides readers with a general approach to consciousness that is powerful enough to lead to the inner self and its ramifications for the vast range of human experiences. It also offers an approach to the evolution of human consciousness and features chapters on mental disease (especially schizophrenia) and on meditative states (including drug-induced states of mind).[...]

### Features

This book details a model of consciousness supported by scientific experimental data from the human brain. It presents how the Corollary Discharge of Attention Movement (CODAM) neural network model allows for a scientific understanding of consciousness as well as provides a solution to the Mind-Body problem. The book provides readers with a general approach to consciousness that is powerful enough to [...]

### Contents

Preface.- The Story of Consciousness.- The Search for Consciousness in the Brain.- Attention and Consciousness: Fused or Independent?.- Past & Current Neural Models of Consciousness.- The Control Nature of Attention.- The Full CODAM Model.- The Owner and CODAM.- Does I Really Exist?.- Does the Corollary Discharge of Attention Exist?.- Understanding Mental Diseases.- The Escape from Life through Meditation.- The Evolution of Human Consciousness.- Animal Consciousness.- Understanding Consciousness and Emotions.- Solving the Mind-Body Problem through CODAM.- Is there Free Will in CODAM?-[...]

### Fields of interest

Neurosciences; Evolutionary Biology; Simulation and Modeling; Philosophy of Mind; Popular Science in Mathematics / Natural Science / Technology; Mathematical Models of Cognitive Processes and Neural Networks

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-007-7644-9](http://www.springer.com/978-94-007-7644-9)

### Hardcover

2013. XX, 273 p. 28 illus., 16 illus. in color. (Springer Series in Cognitive and Neural Systems, Vol. 9)  
ISBN 978-94-007-7644-9

**usually dispatched within 3 to 5 business days January 31, 2014**

J. das Neves, B. Sarmiento, Instituto Superior de Ciências Saúde, Gandra, Portugal (Eds.)

## Mucosal Delivery of Biopharmaceuticals

### Biology, Challenges and Strategies

Biopharmaceutical medicines, the newest class of therapeutics, are quite heterogeneous and include a range of molecules such as proteins, peptides, vaccines and nucleic acids, with use in virtually all therapeutic fields (e.g. cancer and infectious diseases, vaccination, metabolic dysfunctions) and diagnostics. This edited book gives a concise and up-to-date overview of the biological features justifying the use of different human mucosa as delivery routes for biopharmaceuticals, the technological strategies that have been followed so far regarding the optimization of mucosal potentialities as well as the challenges that arise with the advent of new biopharmaceutical drugs and[...]

### Features

This book provides a concise and up-to-date overview of the biological features justifying the use of different human mucosa as delivery routes for biopharmaceuticals as well as the technological strategies that have been followed so far regarding the optimization of mucosal potentialities. The book also addresses the challenges that arise with the advent of new biopharmaceutical drugs and alternative means [...]

### Contents

Concepts in Mucosal Immunity and Mucosal Vaccines.- Mucoadhesion and Characterization of Mucoadhesive Properties.- Mucus as a Barrier for Biopharmaceuticals and Drug Delivery Systems.- Epithelial Permeation and Absorption Mechanisms of Biopharmaceuticals.- Oral Delivery of Biopharmaceuticals.- Buccal Delivery of Biopharmaceuticals: Vaccines and Allergens.- Pulmonary Delivery of Biopharmaceuticals.- Nasal Delivery of Biopharmaceuticals.- Ocular Delivery of Biopharmaceuticals.- Vaginal Delivery of Biopharmaceuticals.- Nanoparticles-in-Microsphere Oral Delivery Systems (NiMOS) for Nucleic[...]

### Fields of interest

Pharmaceutical Sciences / Technology; Pharmacology / Toxicology

### Target groups

Research

### Type of publication

Contributed volume

More on [www.springer.com/978-1-4614-9523-9](http://www.springer.com/978-1-4614-9523-9)

### Hardcover

2014. I, 789 p. 134 illus., 23 illus. in color.  
ISBN 978-1-4614-9523-9

**Due: January 31, 2014**

## Chemistry

M. Baranska, Jagiellonian University, Krakow, Poland (Ed.)

### Optical Spectroscopy and Computational Methods in Biology and Medicine

This multi-author contributed volume gives a comprehensive overview of recent progress in various vibrational spectroscopic techniques and chemometric methods and their applications in chemistry, biology and medicine. In order to meet the needs of readers, the book focuses on recent advances in technical development and potential exploitations of the theory, as well as the new applications of vibrational methods to problems of recent general interest that were difficult or even impossible to achieve in the not so distant past. Integrating vibrational spectroscopy and computational approaches serves as a handbook for people performing vibrational spectroscopy followed by chemometric[...]

#### Features

This multi-author contributed volume gives a comprehensive overview of recent progress in various vibrational spectroscopic techniques and chemometric methods and their applications in chemistry, biology and medicine. In order to meet the needs of readers, the book focuses on recent advances in technical development and potential exploitations of the theory, as well as the new applications of vibrational [...]

#### Contents

From the Contents: Raman and FT-IR spectroscopy: theory and general overview on application in biology and medicine.- Overview on computational techniques used for analysis of biological systems lub.- Application of computational techniques – quantum and molecular modeling – to study dynamics and spectroscopic properties of fluorescence probes in biological systems.- Raman imaging: experimental techniques and chemometric analysis.- Qualitative and quantitative FT-Raman analysis of plants.- Structural analysis of carotenoids in a single cells monitored by Raman spectroscopy supported by[...]

#### Fields of interest

Theoretical and Computational Chemistry; Medical Biochemistry; Spectroscopy / Spectrometry; Analytical Chemistry

#### Target groups

Research

#### Type of publication

Monograph

More on [www.springer.com/978-94-007-7831-3](http://www.springer.com/978-94-007-7831-3)

Worldwide rights

#### Hardcover

2014. XII, 540 p. 204 illus., 134 illus. in color. (Challenges and Advances in Computational Chemistry and Physics, Vol. 14)

ISBN 978-94-007-7831-3

usually dispatched within 3 to 5 business days

December 31, 2013

B.M. Bhanage, Institute of Chemical Technology, Mumbai, India; M. Arai, Hokkaido University, Sapporo, Japan (Eds.)

### Transformation and Utilization of Carbon Dioxide

Transformation and Utilization of Carbon Dioxide shows the various organic, polymeric and inorganic compounds which result from the transformation of carbon dioxide through chemical, photocatalytic, electrochemical, inorganic and biological processes. The book consists of twelve chapters demonstrating interesting examples of these reactions, depending on the types of reaction and catalyst. It also includes two chapters dealing with the utilization of carbon dioxide as a reaction promoter and presents a wide range of examples of chemistry and chemical engineering with carbon dioxide. Transformation and Utilization of Carbon Dioxide is a collective work of reviews illustrative of recent[...]

#### Features

Transformation and Utilization of Carbon Dioxide shows the various organic, polymeric and inorganic compounds which result from the transformation of carbon dioxide through chemical, photocatalytic, electrochemical, inorganic and biological processes. The book consists of twelve chapters demonstrating interesting examples of these reactions, depending on the types of reaction and catalyst. It also [...]

#### Contents

Part I Chemical Reactions.- Valorization of Carbon Dioxide to Organic Products with Organocatalysts.- Direct Transformation of Carbon Dioxide to Value-Added Products over Heterogeneous Catalysts.- Indirect Utilization of Carbon Dioxide in Organic Synthesis for Valuable Chemicals.- Hydrogenation and Related Reductions of Carbon Dioxide with Molecular Catalysts.- Latest Advances in the Catalytic Hydrogenation of Carbon Dioxide to Methanol/Dimethylether.- Syngas Production Using Carbon Dioxide Reforming: Fundamentals and Perspectives.- Carbon Dioxide as C-1 Block for the Synthesis of[...]

#### Fields of interest

Catalysis; Renewable and Green Energy; Environmental Chemistry; Industrial Chemistry / Chemical Engineering

#### Target groups

Research

#### Type of publication

Monograph

More on [www.springer.com/978-3-642-44987-1](http://www.springer.com/978-3-642-44987-1)

#### Hardcover

2014. XII, 390 p. 101 illus., 41 illus. in color. (Green Chemistry and Sustainable Technology)

ISBN 978-3-642-44987-1

Due: January 31, 2014

V. Dhir, Sikh National College Qadian, Lahore, India

### Physicochemical Interactions of Amino Acids and Peptides in Aqueous Media

The present work covers in detail the results of measurements of apparent molar volumes, viscosities and apparent molar adiabatic isothermal compressibility of various -amino acids and peptide in water and in aqueous sodium nitrate (NaNO<sub>3</sub>), potassium nitrate (KNO<sub>3</sub>) and magnesium nitrate hexahydrate [Mg(NO<sub>3</sub>)<sub>2</sub>·6H<sub>2</sub>O] solutions at different temperatures as follows. These data have been used to arrive at the various parameters like partial molar volumes, partial molar adiabatic compressibility capacities and viscosity B-coefficients and their corresponding transfer functions, side chain contributions, interaction coefficients, activation parameters and hydration numbers. These parameters[...]

#### Features

The present work covers in detail the results of measurements of apparent molar volumes, viscosities and apparent molar adiabatic isothermal compressibility of various -amino acids and peptide in water and in aqueous sodium nitrate (NaNO<sub>3</sub>), potassium nitrate (KNO<sub>3</sub>) and magnesium nitrate hexahydrate [Mg(NO<sub>3</sub>)<sub>2</sub>·6H<sub>2</sub>O] solutions at different temperatures as follows. These data have been used to arrive at the [...]

#### Contents

From the Contents: General Introduction.- Structure of Water.- Forces that Stabilize the Protein Structure.- Outline of the Present Research Work.- Review of Literature.- Experimental.- Sources & Grades of Chemicals.- Experimental Techniques.- Theoretical Background of Physico-Chemical Properties.- Results and Discussion.- Apparent Molar Volumes of α-Amino Acids and Diglycine in Aqueous Sodium Nitrate at Different Temperatures (T=288.15-318.15)K.- Apparent Molar Volumes of α-Amino Acids and Diglycine in Aqueous Potassium Nitrate at Different Temperatures (T=288.15-318.15)K.- Apparent[...]

#### Fields of interest

Physical Chemistry; Protein Structure; Analytical Chemistry

#### Target groups

Research

#### Type of publication

Monograph

More on [www.springer.com/978-1-907343-86-5](http://www.springer.com/978-1-907343-86-5)

#### Hardcover

2014. Approx. 300 p. 100 illus.

ISBN 978-1-907343-86-5

Due: March 28, 2014

D. Eibl, Zürcher Hochschule für Angew. Wissensch, Wädenswil, Switzerland; R. Eibl, Hochschule Wädenswil, Wädenswil, Switzerland (Eds.)

## Disposable Bioreactors II

Dynamic Single-Use Bioreactors Used in Modern Liter- and m<sup>3</sup>- Scale Biotechnological Processes: Engineering Characteristics and Scaling Up, by Christian Löffelholz, Stephan C. Kaiser, Matthias Kraume, Regine Eibl, Dieter Eibl Orbitally Shaken Single-Use Bioreactors, by Wolf Klöckner, Sylvia Diederichs, Jochen Büchs Therapeutic Human Cells: Manufacture for Cell Therapy/Regenerative Medicine by Christian van den Bos, Robert Keefe, Carmen Schirmaier, Michael McCaman Fast Single-Use VLP Vaccine Productions Based on Insect Cells and the Baculovirus Expression Vector System: Influenza as Case Study by Regine Eibl, Nina Steiger, Sabine Wellnitz, Tiago Vicente, Corinne John, Dieter Eibl Microbial [...]

### Features

Christian Löffelholz, Stephan C. Kaiser, Matthias Kraume, Regine, Eibl, Dieter Eibl Dynamic Single-Use Bioreactors Used in Modern Liter- and m<sup>3</sup>-Scale Biotechnological Processes: Engineering Characteristics and Scaling Up Wolf Klöckner, Sylvia Diederichs, Jochen Büchs, Orbitally Shaken Single-Use Bioreactors Christian van den Bos, Robert Keefe, Carmen Schirmaier, Michael [...]

### Fields of interest

Biotechnology; Cell Biology; Biomedical Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-45157-7](http://www.springer.com/978-3-642-45157-7)

### Hardcover

2014. VIII, 292 p. (Advances in Biochemical Engineering/Biotechnology, Vol. 138)  
ISBN 978-3-642-45157-7

**Due: January 31, 2014**

M. Fedotov, Borekov Catalysis Institute, Novosibirsk, Russian Federation

## NMR in Inorganic and Coordination Chemistry

The present text provides detailed information for the application of NMR in inorganic and coordination chemistry. Detailed, yet clear derivations of all relevant equations are provided throughout. These offer not only a very good introductory basis for those new to NMR, but also many practical work-ups for those already familiar with this technique but who wish to apply it to specific inorganic compounds. The reader is given in-depth background on NMR methods, its restrictions and advantages over other characterization methods. A convenient listing for isotopes of each element is provided as a handy reference. NMR data for compounds of all elements with numerous examples of [...]

### Features

The present text provides detailed information for the application of NMR in inorganic and coordination chemistry. Detailed, yet clear derivations of all relevant equations are provided throughout. These offer not only a very good introductory basis for those new to NMR, but also many practical work-ups for those already familiar with this technique but who wish to apply it to specific inorganic compounds. [...]

### Contents

Nuclear magnetic resonance – methodology and experiments.- Nuclear magnetic resonance of non-transitional elements.- Nuclear Magnetic Resonance of Transition Elements.- Some applications of NMR.

### Fields of interest

Inorganic Chemistry; Characterization and Evaluation of Materials; Spectroscopy and Microscopy; Spectroscopy / Spectrometry

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-907343-83-4](http://www.springer.com/978-1-907343-83-4)

### Hardcover

2014. Approx. 380 p. 100 illus..  
ISBN 978-1-907343-83-4

**Due: March 28, 2014**

F. Gatti, Université Montpellier 2, Montpellier Cedex, France (Ed.)

## Molecular Quantum Dynamics

From Theory to Applications

This book focuses on current applications of molecular quantum dynamics. Examples from all main subjects in the field, presented by the internationally renowned experts, illustrate the importance of the domain. Recent success in helping to understand experimental observations in fields like heterogeneous catalysis, photochemistry, reactive scattering, optical spectroscopy, or femto- and attosecond chemistry and spectroscopy underline that nuclear quantum mechanical effects affect many areas of chemical and physical research. In contrast to standard quantum chemistry calculations, where the nuclei are treated classically, molecular quantum dynamics can cover quantum mechanical effects [...]

### Features

This book focuses on current applications of molecular quantum dynamics. Examples from all main subjects in the field, presented by the internationally renowned experts, illustrate the importance of the domain. Recent success in helping to understand experimental observations in fields like heterogeneous catalysis, photochemistry, reactive scattering, optical spectroscopy, or femto- and attosecond [...]

### Contents

From the Contents: Introduction and Conceptual Background.- Elementary Molecule-Surface Scattering Processes relevant to Heterogeneous Catalysis: Insights from Quantum Dynamics Calculations.- Tunneling in Unimolecular and Bimolecular Reactions.- Reactive Scattering and Resonance.

### Fields of interest

Theoretical and Computational Chemistry; Physical Chemistry; Math. Applications in Chemistry; Quantum Computing; Spectroscopy / Spectrometry

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-45289-5](http://www.springer.com/978-3-642-45289-5)

### Hardcover

2014. X, 286 p. 100 illus., 62 illus. in color. (Physical Chemistry in Action)  
ISBN 978-3-642-45289-5

**Due: February 28, 2014**

R.S. Glass, University of Arizona, Tucson, USA

## Sulfur's Role in the Modern World

This book connects the chemistry and biochemistry of sulfur in order to understand these impacts and to inspire the rational discovery of further beneficial applications. Compounds and materials containing sulfur have an important impact on medicine and health, foods, new materials as well as our atmosphere. After a review of the chemical principles which provide the foundation for sulfur's unique contributions to the properties of its compounds, these principles will be used to interpret the application of these compounds. This book will not only provide a fundamental understanding of the properties of sulfur compounds but more importantly, inform about the rational development of[...]

### Features

Sulfur and its compounds play key roles in biochemistry, foods, medicine and health, polymers, nanomaterials and the atmosphere. Central to these roles is the chemistry of sulfur. This book endeavors to provide insight into the chemistry that underlies the gainful exploitation of sulfur by Nature and by man. Sulfur's Role in the Modern World reviews the chemical principles germane to sulfur's [...]

### Contents

Review of Chemical Principles Relevant to Sulfur's Properties.- Use of Sulfur in Organic Synthesis.- Metal-Sulfur Compounds.- Occurrence and Role of Sulfur in Biochemistry: Sulfur, the Life of the Party.- Sulfur and the Origin of Life.- Sulfur Compounds in Medicine and Health.- Toxicology and Sulfur.- Sulfur Compounds in Food: The Taste and Smell of Sulfur.- Sulfur in Nanotechnology and Materials Science: From Pigments to Quantum Dots.- Sulfur Cycles – Atmospheric Impact.

### Fields of interest

Organic Chemistry; Environmental Chemistry; Biochemistry; Earth Sciences (general)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-90-481-3837-1](http://www.springer.com/978-90-481-3837-1)

### Hardcover

2014. Approx. 350 p.  
ISBN 978-90-481-3837-1

**Due: July 28, 2014**

R. Guevara-Gonzalez, Queretaro Autonomous University, Queretaro, Mexico; I. Torres-Pacheco, Queretaro Autonomous University, Queretaro, Mexico (Eds.)

## Biosystems Engineering

### Biofactories for Food Production in the XXI Century

This book presents new food production systems (for plants and animals) involving agrochemicals that increase in a controlled manner the bioactives content, under greenhouse conditions. Moreover, conception and design of new instrumentation for precision agriculture and aquaculture contributing in food production is also highlighted in this book.

### Features

This book presents new food production systems (for plants and animals) involving agrochemicals that increase in a controlled manner the bioactives content, under greenhouse conditions. Moreover, conception and design of new instrumentation for precision agriculture and aquaculture contributing in food production is also highlighted in this book.

### Contents

Plant Biosystems: From conventional to new Food production systems.- Agriculture for nutraceuticals.- The Plant immune system and Food Production.- Mathematical modelling for Biosystems.- Plant Bionics as tool for Food Production Biosystems.- Exploring aquaculture as Food Biosystem.- Prototypes for aquaculture-plant Biosystems.- b.3. Aquaculture Bionics.- Perspectives of Biosystems as sustainable strategy for Food Production in century XXI.- Concluding Remarks.

### Fields of interest

Food Science; Industrial and Production Engineering; Biotechnology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03879-7](http://www.springer.com/978-3-319-03879-7)

### Hardcover

2014. Approx. 300 p.  
ISBN 978-3-319-03879-7

**Due: February 28, 2014**

E. Jabbari, University of South Carolina, Columbia, USA

## Modeling and Simulation of Polymerization Reactions

While there are many excellent textbooks and reference books covering the chemistry, physics, rheology, processing, and characterization of polymers, this textbook is the first treatment in one place of the modeling and simulation of polymerization reactions. This is the very model of a textbook; not only is it single-authored, but also it comes with chapter introductions, chapter summaries, worked examples, exercises, and many references to the literature.

In addition, this book will serve as a reference for students, researchers, post-doctoral workers, and polymer scientists both inside and outside of academia. Courses using the book may be found in departments of polymer[...]

### Features

While there are many excellent textbooks and reference books covering the chemistry, physics, rheology, processing, and characterization of polymers, this textbook is the first treatment in one place of the modeling and simulation of polymerization reactions. This is the very model of a textbook; not only is it single-authored, but also it comes with chapter introductions, chapter [...]

### Contents

Introduction to polymerization reactions.- Functions with distributed variables.- Properties of z-transforms.- Conservation of moments.- Models for elementary reactions.- Modeling addition polymerization systems with the method of Moments.- Modeling diffusion-controlled polymerization reactions.- Simulation of reactions by the Monte Carlo method.- Monte Carlo simulation of branching in emulsion polymerization of butadiene.- Monte Carlo simulation of degradation of porous poly(lactide) scaffolds.- The statistical method of Markov chain.- Modeling copolymerization by the method of a[...]

### Fields of interest

Polymer Sciences; Math. Applications in Chemistry; Industrial Chemistry / Chemical Engineering; Probability Theory and Stochastic Processes; Mathematical Modeling and Industrial Mathematics; Theoretical and Computational Chemistry

### Target groups

Graduate

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-0-387-76791-8](http://www.springer.com/978-0-387-76791-8)

### Hardcover

2014. Approx. 500 p. 100 illus..  
ISBN 978-0-387-76791-8

**Due: February 28, 2014**

K. Kondo, Osaka Prefecture University, Osaka, Japan; R.N. Akolkar, Intel Corporation, Hillsboro, USA; D.P. Barkey, M. Yokoi, Industrial Technology Support Institute, Osaka Prefecture, Japan (Eds.)

## Copper Electrodeposition for Nanofabrication of Electronics Devices

This book discusses the scientific mechanism of copper electrodeposition and its wide range of applications. The book will cover everything from the basic fundamentals to practical applications. In addition, the book will also cover important topics such as: • ULSI wiring material based upon copper nanowiring • Printed circuit boards • Stacked semiconductors • Through Silicon Via • Smooth copper foil for Lithium-Ion battery electrodes. This book is ideal for nanotechnologists, industry professionals, and practitioners.

### Features

This book discusses the scientific mechanism of copper electrodeposition and its wide range of applications. The book will cover everything from the basic fundamentals to practical applications. In addition, the book will also cover important topics such as: • ULSI wiring material based upon copper nanowiring • Printed circuit boards • Stacked semiconductors • Through Silicon Via • [...]

### Contents

Copper Electrodeposition.- Suppression Effect and Additive Chemistry.- Acceleration Effect.- Modeling and Simulation.- Frontiers of Cu Electrodeposition and Electroless Plating for On-Chip Interconnects.- Microstructure of Evolution of Copper in Nanoscale Interconnect Features.- Direct Copper Plating.- Through Silicon Via.- Build-up Printed Wiring Boards.- Copper Foil Smooth on Both Sides for Lithium Ion Battery.- Through Hole Plating.

### Fields of interest

Electrochemistry; Nanotechnology; Electronics and Microelectronics, Instrumentation; Solid State Physics

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-1-4614-9175-0](http://www.springer.com/978-1-4614-9175-0)

### Hardcover

2014. VIII, 282 p. 190 illus., 75 illus. in color. (Nanotechnology Science and Technology, Vol. 171)  
ISBN 978-1-4614-9175-0

**usually dispatched within 3 to 5 business days**

W. Kurdowski, Instytut Szkieł i Materiałów Budowlanych, Kraków, Poland

## Cement and Concrete Chemistry

This monograph describes cement clinker formation. It covers multicomponent systems, clinker phase structures and their reactions with water, hydrate composition and structure, as well as their physical properties. The mineral additions to cement are described as are their influence on cement-paste properties. Special cements are also discussed. The microstructure of concrete is then presented, and special emphasis is given to the role of the interfacial transition zone, and the corrosion processes in the light of cement-phase composition, mineral additions and w/c ratio. The admixtures' role in modern concrete technology is described with an emphasis on superplasticizer chemistry and [...]

### Features

This monograph describes cement clinker formation. It covers multicomponent systems, clinker phase structures and their reactions with water, hydrate composition and structure, as well as their physical properties. The mineral additions to cement are described as are their influence on cement-paste properties. Special cements are also discussed. The microstructure of concrete is then presented, and special [...]

### Contents

Cement Kinds and Principles of their Classification.- Portland Cement Clinker.- Hydration of Clinker Phases.- Cement Hydration.- The Properties of Cement Paste.- Concrete Properties.- Mineral Additions for Cement Production.- Hydration of Cements with Mineral Additions.- Special Cements.- New Concretes.

### Fields of interest

Industrial Chemistry / Chemical Engineering; Ceramics, Glass, Composites, Natural Materials; Building Materials

### Target groups

Research

### Type of publication

Handbook

More on [www.springer.com/978-94-007-7944-0](http://www.springer.com/978-94-007-7944-0)

### Hardcover

2014. X, 496 p. 465 illus.  
ISBN 978-94-007-7944-0

**Due: February 28, 2014**

A. Lavacchi, ICCOM-CNR, Sesto Fiorentino, Italy; H. Miller, ICCOM-CNR, Sesto Fiorentino (FI), Italy; F. Vizza, ICCOM-CNR, Sesto Fiorentino, Italy

## Nanotechnology in Electrocatalysis for Energy

This book focuses on nanotechnology in electrocatalysis for energy applications. In particular the book covers nanostructured electrocatalysts for low temperature fuel cells, low temperature electrolyzers and electrochemical valorization. The function of this book is to provide an introduction to basic principles of electrocatalysis, together with a review of the main classes of materials and electrode architectures. This book will illustrate the basic ideas behind material design and provide an introductory sketch of current research focuses. The easy-to-follow three part book focuses on major formulas, concepts and philosophies. This book is ideal for professionals and researchers [...]

### Features

This book focuses on nanotechnology in electrocatalysis for energy applications. In particular, the book covers nanostructured electrocatalysts for low temperature fuel cells, low temperature electrolyzers and electrochemical valorization. The function of this book is to provide an introduction to basic principles of electrocatalysis, together with a review of the main classes of materials and electrode [...]

### Contents

Introduction.- A bird's eye view of energy related electrochemistry.- Electrochemical device for energy conversion and storage.- Factors affecting design.- Carbon based nanomaterials.- Other Support Nanomaterials.- Supported metal nanoparticles.- Shape and structure controlled metal nanoparticles.- Monolayer decorated core shell and hollow nanoparticles.- Molecular complexes in electrocatalysis for energy production and storage.- Concluding Remarks.

### Fields of interest

Electrochemistry; Energy Systems; Waste Water Technology / Water Pollution Control / Water Management / Aquatic Pollution; Nanotechnology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4899-8058-8](http://www.springer.com/978-1-4899-8058-8)

### Hardcover

2014. XI, 333 p. 131 illus., 48 illus. in color. (Nanotechnology Science and Technology, Vol. 170)  
ISBN 978-1-4899-8058-8

**Due: December 31, 2013**

J.J. Li, University of San Francisco, San Francisco, USA

## Name Reactions

A Collection of Detailed Mechanisms and Synthetic Applications Fifth Edition

In this fifth edition of Jack Jie Li's seminal "Name Reactions", the author has added twenty-seven new name reactions to reflect the recent advances in organic chemistry. As in previous editions, each reaction is delineated by its detailed step-by-step, electron-pushing mechanism and supplemented with the original and the latest references, especially from review articles. Now with addition of many synthetic applications, this book is not only an indispensable resource for advanced undergraduate and graduate students, but is also a good reference book for all organic chemists in both industry and academia. Unlike other books on name reactions in organic chemistry, Name Reactions, A[...]

### Features

In this fifth edition of Jack Jie Li's seminal "Name Reactions", the author has added twenty-seven new name reactions to reflect the recent advances in organic chemistry. As in previous editions, each reaction is delineated by its detailed step-by-step, electron-pushing mechanism and supplemented with the original and the latest references, especially from review articles. Now with addition of many [...]

### Contents

From the Contents: Alder ene reaction.- Baran Reagents.- Bargellini Reaction.- Barton-Zard reaction.- Beirut reaction.- Boyland-Sims oxidation.- Cattallani Reaction.- Danheiser annulation.- Kolbe-Schmitt Reaction.- Larock Indole Synthesis.- Li A3 Reaction.- McMillan Catalyst.- Meth-Cohn Quinoline Synthesis.- Sanford Reaction.- Shi-White Reagent.- Stevens Rearrangement.- Stork-Danheiser alkylation.- Weinreb Amide.- Yu C-H Activation.- Zaitsev Elimination.- Zinin Benzidine Rearrangement (Semidine Rearrangement).

### Fields of interest

Organic Chemistry; Inorganic Chemistry; Biochemistry

### Target groups

Graduate

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-3-319-03978-7](http://www.springer.com/978-3-319-03978-7)

### Hardcover

2014. 700 p. 5000 illus.  
ISBN 978-3-319-03978-7

Due: February 28, 2014

S. Margadonna, University of Edinburgh, Edinburgh, United Kingdom (Ed.)

## Fullerene-Related Materials

"Fullerene-Related Materials" provides an in-depth coverage of the essential break-throughs in the Chemistry and Physics of fullerene related materials over the last five years. It includes materials such as: Metal intercalated fullerides Endohedral fullerenes Higher fullerenes Non-conventional carbon cages. The first part of the text explores the structural, electronic and magnetic phase diagrams of fullerene derivatives and pays special attention to metal intercalated fullerenes. The second part covers the recent advances in synthesis, reactivity and applications of fullerene related materials. "Fullerene-Related Materials" forms an invaluable resource for academics and researchers[...]

### Features

"Fullerene-Related Materials" provides an in-depth coverage of the essential break-throughs in the Chemistry and Physics of fullerene related materials over the last five years. It includes materials such as: Metal intercalated fullerides Endohedral fullerenes Higher fullerenes Non-conventional carbon cages. The first part of the text explores the [...]

### Contents

Synthesis and Application of open-cage fullerenes.- Open Cage fullerene derivatives.- Formation processes of fullerenes and single wall nanotubes.- Covalent and non covalent modification of [60] fullerene for material science applications.- Pressure-induced polymers of C60.- Expanded fullerides and Mott-Hubbard transition.- Negative Thermal expansion and valence transition in rare-earth fullerides.- Photoemission spectroscopy of fullerene derivatives.- Theoretical aspects of highly correlated fullerides: metal insulator transition.- Order and disorder in magnetic fullerides.- FETs based[...]

### Fields of interest

Organic Chemistry; Atomic, Molecular, Optical and Plasma Physics; Physical Chemistry

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4020-4458-8](http://www.springer.com/978-1-4020-4458-8)

### Hardcover

2014.  
ISBN 978-1-4020-4458-8

Due: April 28, 2014

P.F. McMillan, University College London, London, United Kingdom; F. Meersman, Rousselot - Expertise Center, Gent, Belgium

## High Pressure Chemistry and Biology

A monograph spanning solid state and materials chemistry. Aimed to prime those who have just entered the research field (must have a thorough grounding in theory); also beneficial to researchers with a focus on new directions in HPC.

### Features

A monograph spanning solid state and materials chemistry. Aimed to prime those who have just entered the research field (must have a thorough grounding in theory); also beneficial to researchers with a focus on new directions in HPC.

### Contents

Basic principles of high pressure.- Solid state chemistry, geochemistry and mineralogy.- Molecular chemistry: electronic structure and reaction pathways.- Biological molecules under pressure.- New directions.- Epilogue.

### Fields of interest

Physical Chemistry; Materials Science (general); Bioorganic Chemistry

### Target groups

Research

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-90-481-3868-5](http://www.springer.com/978-90-481-3868-5)

### Hardcover

2014. Approx. 300 p.  
ISBN 978-90-481-3868-5

Due: July 28, 2014

R. Moore, University of Stirling, Stirling, United Kingdom; Y. Ge, Cranfield University, Bedfordshire, Montserrat; L. Li, Guangdong University of Technology, Guangzhou, China (P.R.); X. Wang, Beijing University of Technology, Beijing, China (P.R.) (Eds.)

## Nanomedicine

### Principles and Perspectives

Nano-scale science and technology have revolutionized medicine by enabling researchers to gain a deeper understanding of many diseases and offers new insights in fields as diverse as diagnostics, therapy, imaging, drug delivery, and regenerative medicine. Increasing demand and awareness of applications of nanotechnology in medicine has resulted in the emergence of a new fast-growing discipline – nanomedicine. This book offers a comprehensive and diverse perspective on the new discipline. It aims to bridge the gap between nanotechnology and medicine through contributions by world-renowned experts from academia, industry, government agency and the healthcare system. Each contribution[...]

### Features

Nano-scale science and technology have revolutionized medicine by enabling researchers to gain a deeper understanding of many diseases and offers new insights in fields as diverse as diagnostics, therapy, imaging, drug delivery, and regenerative medicine. Increasing demand and awareness of applications of nanotechnology in medicine has resulted in the emergence of a new fast-growing discipline – nanomedicine. [...]

### Contents

Nanomedicine: a revolutionary interdisciplinary.- From biotechnology to nanotechnology.- Nanos-structure design and computational modelling.- Nanobiology in medicine.- Medical nanomaterials.- Nanotechnology in regenerative medicine.- Medical nanobiosensors.- Nano-theranostics and imaging.- Nanotechnology and medical devices.- Nanopharmaceuticals.- Nanotoxicology and safety concerns.- Nanoethics and regulations.

### Fields of interest

Biotechnology; Nanotechnology; Molecular Medicine; Industrial Chemistry / Chemical Engineering; Medicinal Chemistry; Imaging / Radiology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-2139-9](http://www.springer.com/978-1-4614-2139-9)

### Hardcover

2014. 600p. 65 illus., 25 illus. in color. (Nanotechnology Science and Technology)  
ISBN 978-1-4614-2139-9

**Due: February 28, 2014**

I. Omae, Omae Research Laboratories, Sayama, Japan

## Cyclometalation Reactions

### Five-Membered Ring Products as Universal Reagents

This book provides a review of cyclometalation reactions and organometallic intramolecular-coordination five-membered ring products, the most active type of reactions in synthetic organic reactions and their products. Included is the discovery of intramolecular-coordination bonds in cyclometalation reactions and the characteristics of those reactions, as well as the reasons that their five-membered ring compounds are very easily synthesized through such reactions. In addition, the applications of cyclometalation reactions and five-membered ring products, synthetic applications, catalysts, and other products are described. These topics are of special interest for industrial researchers.

### Features

This book provides a review of cyclometalation reactions and organometallic intramolecular-coordination five-membered ring products, the most active type of reactions in synthetic organic reactions and their products. Included is the discovery of intramolecular-coordination bonds in cyclometalation reactions and the characteristics of those reactions, as well as the reasons that their five-membered ring [...]

### Contents

From the Contents: Discovery of Intramolecular-Coordination Bonds in Cyclometalation Reactions with Main Group Metal Compounds.- Verification of the Formation of Intramolecular-Coordination Bonds in Cyclometalation Reactions with Transition Metal Compounds.- Organometallic Intramolecular-Coordination Compounds.- Characteristics of Cyclometalation Reactions for Organometallic Intramolecular-Coordination Five-Membered Ring Compounds.- Reasons That Organometallic Intramolecular-Coordination Five-Membered Ring Compounds Are Very Easily Synthesized Through Cyclometalation Reactions.- Applications.

### Fields of interest

Organometallic Chemistry; Catalysis

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-4-431-54603-0](http://www.springer.com/978-4-431-54603-0)

### Hardcover

2014. XV, 252 p. 270 illus., 1 illus. in color.  
ISBN 978-4-431-54603-0

**Due: February 28, 2014**

M. Pekař, I. Samohýl, Institute of Chemical Technology, Prague 6, Czech Republic

## The Thermodynamics of Linear Fluids and Fluid Mixtures

In this book, Samohýl and Pekař offer a consistent and general non-equilibrium thermodynamic description for a model of chemically reacting mixtures. This type of model is frequently encountered in practice and up until now, chemically reacting systems (out of equilibrium) have rarely been described in books on non-equilibrium thermodynamics. Readers of this book benefit from the systematic development of the theory; this starts with general principles, going through the applications to single component fluid systems, and finishing with the theory of mixtures, including chemical reactions. The authors describe the simplest mixture model – the linear fluid – and highlight many[...]

### Features

In this book, Samohýl and Pekař offer a consistent and general non-equilibrium thermodynamic description for a model of chemically reacting mixtures. This type of model is frequently encountered in practice and up until now, chemically reacting systems (out of equilibrium) have rarely been described in books on non-equilibrium thermodynamics. Readers of this book benefit from the systematic development of the [...]

### Contents

Thermodynamics and its Concepts in Non-equilibrium.- Thermodynamics of Uniform Systems.- Continuum Thermodynamics of a Single Fluid.- Continuum Thermodynamics of Mixtures of Linear Fluids.

### Fields of interest

Physical Chemistry; Thermodynamics; Surfaces and Interfaces, Thin Films; Industrial Chemistry / Chemical Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02513-1](http://www.springer.com/978-3-319-02513-1)

### Hardcover

2014. X, 308 p. 3 illus.  
ISBN 978-3-319-02513-1

**usually dispatched within 3 to 5 business days**

F. Wambugu, Africa Harvest Biotech Foundation, Nairobi, Kenya;  
D. Kamanga, Africa Harvest Biotech Foundation, Nairobi, Kenya  
(Eds.)

## Biotechnology in Africa

### Emergence, Initiatives and Future

In this book, Florence Wambugu and Daniel Kamanga of Africa Harvest Biotech Foundation International bring together expert African authorities to critique various biotechnology initiatives and project future developments in the field in Africa. For the first time, African voices from multidisciplinary fields as diverse as economics, agriculture, biotechnology, law, politics and academia, demand to be allowed to set the continent's biotech development agenda. This book argues that there is a great future for biotechnology in Africa which sidesteps western interests that do not match those of the local populace. In these diverse chapters, Africa's political and scientific leaders demand[...]

### Features

In this book, Florence Wambugu and Daniel Kamanga of Africa Harvest Biotech Foundation International bring together expert African authorities to critique various biotechnology initiatives and project future developments in the field in Africa. For the first time, African voices from multidisciplinary fields as diverse as economics, agriculture, biotechnology, law, politics, and academia, demand to [...]

### Contents

Introduction: The Importance of Political Will in furthering Agricultural Biotechnology for Economic Growth, Food and Nutritional Security in Africa.- Commercialized Genetically Modified Crops: Biotech (Bt) Cotton in Burkina Faso Demonstrates that Political Will is Key for Biotechnology to Benefit Commercial Agriculture in Africa.- Opportunities and Challenges of Commercializing Biotech Products in Egypt: Biotech (Bt) Maize: A Case Study.- Genetically Modified Crops Commercialized in South Africa.- Building the Bio-economy and Commercialization Challenges: Moving Africa Towards a [...]

### Fields of interest

Biotechnology; R & D / Technology Policy; Plant Sciences; Agriculture; Environmental Management; Pharmacy

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-04000-4](http://www.springer.com/978-3-319-04000-4)

### Hardcover

2014. 380 p. 150 illus., 50 illus. in color. (Science Policy Reports, Vol. 7)  
ISBN 978-3-319-04000-4

**Due: March 31, 2014**

## Energy

H. Chen, Institute of Process Engineering, CAS, Beijing, China  
(P.R.)

## Biotechnology of Lignocellulose

### Theory and Practice

This book presents and summarizes the new thoughts, new methods and new achievements that have emerged in the biotechnology of lignocellulose in recent years. It proposes new concepts including the primary refining, fractionation, multi-level utilization and selective structural separation of lignocellulose, etc. By approaching lignocellulose as a multi-level resource, biotechnology could have a significant effect on ecological agriculture, bio-energy, the chemical and paper making industries, etc., ultimately establishing distinctive eco-industrial parks for lignocellulose. Additionally, this book provides systematic research methods for the biotechnology of lignocellulose including[...]

### Features

This book presents and summarizes the new thoughts, new methods and new achievements that have emerged in the biotechnology of lignocellulose in recent years. It proposes new concepts including the primary refining, fractionation, multi-level utilization and selective structural separation of lignocellulose, etc. By approaching lignocellulose as a multi-level resource, biotechnology could have a significant [...]

### Contents

Brief Introduction to the Biotechnology of Lignocellulose.- Chemical Composition and Structure of Natural Lignocellulose.- Biological Fundamentals for Biotechnology of Lignocellulose.- Pretreatment and Primary Refining of Lignocelluloses.- Applications of Lignocellulose Biotechnology in Ecological Agriculture.- Applications of Lignocellulose Biotechnology in Bioenergy.- Applications of Lignocellulose Biotechnology in Chemical Industry.- Applications of Lignocellulose Biotechnology in Other Industries.- Ecological [...]

### Fields of interest

Renewable and Green Energy; Plant Breeding / Biotechnology; Biochemical Engineering; Biomaterials; Microbial Ecology; Microengineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-007-6897-0](http://www.springer.com/978-94-007-6897-0)

Distribution rights in China: Chemical Industrial Press

### Hardcover

Originally Chinese version Xianweisu Shengwu Jishu, 2nd ed., published by Chemical Industry Press, 2011. Jointly published with Chemical Industry Press  
2014. X, 569 p. 71 illus., 28 illus. in color.  
ISBN 978-94-007-6897-0

**Due: March 28, 2014**

M. Jacobson, D. Ciolkosz (Eds.)

## Wood-Based Energy in the Northern Forests

This unique book provides the first comprehensive overview of wood based bioenergy in the northern hardwood forests of the Eastern United States. This includes a holistic look at the topic of wood based bioenergy, as well as focused analyses of key topics. This book is relevant to engineers, project developers, foresters, economists, sociologists, environmental scientists and natural resource managers. Most chapters also provide practical hands-on advice for the practitioner, and provide a valuable resource for anyone who is considering developing a woody bioenergy project.

### Features

This unique book provides the first comprehensive overview of wood based bioenergy in the northern hardwood forests of the Eastern United States. This includes a holistic look at the topic of wood based bioenergy, as well as focused analyses of key topics.

This book is relevant to engineers, project developers, foresters, economists, sociologists, environmental scientists and natural resource managers. [...]

### Contents

Introduction and Overview.- Forestry in the Northeast.- Biomass Availability, Supply and Demand.- Carbon Cycle Implications of Forest Bioenergy Production.- Breeding and Genetics for Future Feedstocks.- Biomass Harvesting Systems and Logistics.- Residential Wood Heat in the Northeast.- Commercial Combustion and CHP systems.- The Wood Pellet Industry in the Northeast.- Biofuel Production.- Emissions and Health Impacts of Wood Biomass Combustion.- Social Considerations.- Financing for Project Development.

### Fields of interest

Renewable and Green Energy; Energy Policy, Economics and Management; Renewable and Green Energy; Forestry Management; Wood Science & Technology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9477-5](http://www.springer.com/978-1-4614-9477-5)

### Hardcover

2013. XVII, 235 p. 64 illus., 42 illus. in color.  
ISBN 978-1-4614-9477-5

**usually dispatched within 3 to 5 business days  
December 31, 2013**

H.-W. Schock, Helmholtz-Zentrum, Berlin, Germany; J. Windeln, STSM a. Member IBM Academy of Technology, Mainz, Germany (Eds.)

## Computational Materials Science for Thin-Film Solar Cells

### How to Increase Efficiency

Scientists and engineers in academic and industrial research experience a strong evolving discipline: Computational Materials Science. This discipline provides materials insights that are not readily achievable by experiments, and it offers the opportunity to design materials and composites "ab-initio". This book presents the methods and the practical use of Computational Materials Science using two distinct examples: the development of optimized or alternative materials for CIGS (Copper-Indium-Gallium-di-Selenide) photovoltaics and the optimization of CIGS thin film solar cells for maximum efficiency. After a general introduction the theoretical background of the book is illustrated:[...]

### Features

Scientists and engineers in academic and industrial research experience a strong evolving discipline: Computational Materials Science. This discipline provides materials insights that are not readily achievable by experiments, and it offers the opportunity to design materials and composites "ab-initio". This book presents the methods and the practical use of Computational Materials Science using two [...]

### Contents

High Performance Computing.- Thin Film Solar Cells.- Density Functional Theory.- Monte Carlo Simulations.- Cluster Expansions.- Software.- Simulations.- Implications for Thin Film Cell Process Optimizations.

### Fields of interest

Renewable and Green Energy; Optical and Electronic Materials; Renewable and Green Energy; Computational Science and Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-24284-7](http://www.springer.com/978-3-642-24284-7)

### Hardcover

2014. 300 p. 55 illus., 5 illus. in color.  
ISBN 978-3-642-24284-7

**Due: March 28, 2014**

V.P. Utgikar, University of Idaho, Idaho Falls, Idaho Falls, USA

## Hydrogen

Science, Engineering, and Energy Systems

The limitations of fossil fuel supply and the need for decarbonization of energy systems presage the dawn of the hydrogen economy. However, realizing this vision will require developing and implementing solutions to engineering and technology challenges in hydrogen production, storage, utilization and distribution. "Hydrogen: Science, Engineering, and Energy Systems" presents a comprehensive overview of these issues. Hydrogen production alternatives are examined and the competing options analyzed on the basis of fundamental scientific principles. Similar discussions are included on other aspects of the hydrogen economy, not only answering questions of "how" and "what", but also [...]

### Features

The limitations of fossil fuel supply and the need for decarbonization of energy systems presage the dawn of the hydrogen economy. However, realizing this vision will require developing and implementing solutions to engineering and technology challenges in hydrogen production, storage, utilization and distribution. "Hydrogen: Science, Engineering, and Energy Systems" presents a comprehensive overview of [...]

### Contents

Fossil Energy Resources.- Climate Change.- Hydrogen Characteristics.- Hydrogen Production Principles.- Production from Carbon Compounds.- Production from Water.- Hydrogen Utilization - Transportation and Power.- Hydrogen Storage.- Primary Energy Alternatives.- Environmental Impact of Hydrogen.- Hydrogen Safety.- Infrastructure for Hydrogen Economy.- Techno-Economic Considerations.- The Future of Hydrogen in Energy Systems.

### Fields of interest

Renewable and Green Energy; Renewable and Green Energy; Industrial Chemistry / Chemical Engineering; Economic Growth; Climate Change; Automotive Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-84800-392-7](http://www.springer.com/978-1-84800-392-7)

### Hardcover

2014. 600 p. 115 illus.  
ISBN 978-1-84800-392-7

**Due: December 29, 2013**

## Engineering

N.W. Adelman-Larsen, Flex Acoustics, Kgs. Lyngby, Denmark

## Rock & Pop Venues

### Acoustic and Architectural Design

Popular music plays a substantial role in most people's life. The demand and financial revenue of Rock and pop concerts is large and still increasing. Though 80% of the music turnover is done in Rock and Pop Music, books assess only Classical concert and opera houses. However, the requirements for pop music halls are different from classical Music and opera houses. This book closes this gap including the following features: In part one, the book A. Gives a objective methodology to assess Rock and Pop Music Venues B. Shows essential construction details and choices of building materials in the design of new venues or the renovation of old ones. In part two, the book C. Presents a set of [...]

### Features

Popular music plays a substantial role in most people's life. The demand and financial revenue of Rock and pop concerts is large and still increasing. Though 80% of the music turnover is done in Rock and Pop Music, books assess only Classical concert and opera houses. However, the requirements for pop music halls are different from classical Music and opera houses. This book closes this gap including [...]

### Contents

History of Pop and Rock Sound.- Terms, Language.- The Gallery of Rock, Pop and Jazz Venues.- Acoustical Principles.- Assessment of Real Halls.- Design Principles.- The Acoustics during a Gig.

### Fields of interest

Engineering Acoustics; Building Types and Functions; Acoustics; Building Construction, HVAC, Refrigeration

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-3-642-45235-2](http://www.springer.com/978-3-642-45235-2)

### Hardcover

2014. Approx. 400 p.  
ISBN 978-3-642-45235-2

**Due: February 28, 2014**

A. Adhikari, Parvatibai Chowgule College, Margao, India; J. Adhikari, W. Pedrycz, University of Alberta, Edmonton, Canada

## Data Analysis and Pattern Recognition in Multiple Databases

Pattern recognition in data is a well known classical problem that falls under the ambit of data analysis. As we need to handle different data, the nature of patterns, their recognition and the types of data analyses are bound to change. Since the number of data collection channels increases in the recent time and becomes more diversified, many real-world data mining tasks can easily acquire multiple databases from various sources. In these cases, data mining becomes more challenging for several essential reasons. We may encounter sensitive data originating from different sources - those cannot be amalgamated. Even if we are allowed to place different data together, we are certainly[...]

### Features

Pattern recognition in data is a well known classical problem that falls under the ambit of data analysis. As we need to handle different data, the nature of patterns, their recognition and the types of data analyses are bound to change. Since the number of data collection channels increases in the recent time and becomes more diversified, many real-world data mining tasks can easily acquire multiple [...]

### Contents

From the Contents: Synthesizing Different Extreme Association Rules in Multiple Data Sources.- Clustering items in time-stamped databases induced by stability.- Mining global patterns in multiple large databases.- Clustering Local Frequency Items in Multiple Data Sources.- Mining Patterns of Select Items in Different Data Sources.

### Fields of interest

Computational Intelligence; Pattern Recognition; Data Mining and Knowledge Discovery

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03409-6](http://www.springer.com/978-3-319-03409-6)

### Hardcover

2014. XIII, 238 p. 97 illus. (Intelligent Systems Reference Library, Vol. 61)

ISBN 978-3-319-03409-6

**Due: December 31, 2013**

C. Al-Ekabi, ESPI - European Space Policy Institute, Vienna, Austria; B. Baranes, ESPI - European Space Policy Institute, Vienna, Austria; P. Hulsroj, ESPI - European Space Policy Institute, Vienna, Austria; A. Lahcen, ESPI - European Space Policy Institute, Vienna, Austria (Eds.)

## Yearbook on Space Policy 2011/2012

### Space in Times of Financial Crisis

The Yearbook on Space Policy is the reference publication analyzing space policy developments. Each year it presents issues and trends in space policy and the space sector as a whole. Its scope is global and its perspective is European. The Yearbook also links space policy with other policy areas. It highlights specific events and issues, and provides useful insights, data and information on space activities. The Yearbook on Space Policy is edited by the European Space Policy Institute (ESPI) based in Vienna, Austria. It combines in-house research and contributions of members of the European Space Policy Research and Academic Network (ESPRAN), coordinated by ESPI. The Yearbook is[...]

### Features

The Yearbook on Space Policy is the reference publication analyzing space policy developments. Each year it presents issues and trends in space policy and the space sector as a whole. Its scope is global and its perspective is European. The Yearbook also links space policy with other policy areas. It highlights specific events and issues, and provides useful insights, data and information on space activities. [...]

### Contents

From the Contents: Part I European Space Activities in the Global Context.- Developments in Space Policies, Programmes and Technologies throughout the World and in Europe.- Part II The Effect of the Financial Crisis on Political Decision-Making.- The Psychology and Reality of the Financial Crisis in Terms of Space Cooperation.- Part III Chronology: June 2011 - May 2012.- Bibliography of Space Policy Publications July 2011 - June 2012.

### Fields of interest

Aerospace Technology and Astronautics; Political Science, general; Law of the Sea, Air and Outer Space; R & D / Technology Policy

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-7091-1648-7](http://www.springer.com/978-3-7091-1648-7)

### Hardcover

2014. X, 420 p. 57 illus., 47 illus. in color. (Yearbook on Space Policy)

ISBN 978-3-7091-1648-7

**Due: January 31, 2014**

M. Alioto, Università di Siena, Siena, Italy; E. Consoli, Maxim Integrated, Catania, Italy; G. Palumbo, University of Catania, Catania, Italy

## Flip-Flop Design in Nanometer CMOS -

### from High Speed to Low Energy

This book provides a unified treatment of Flip-Flop/latch design and selection in nanometer CMOS VLSI systems. The design aspects related to the energy-delay tradeoff in Flip-Flops and latches are discussed, given their optimal selection according to the application, and the detailed circuit design in nanometer CMOS VLSI systems. Design strategies are derived in a coherent framework that includes explicitly nanometer effects, including leakage, layout parasitics and process/voltage/temperature variations. The related design tradeoffs are explored in a wide range of applications and energy-performance targets. A wide range of existing and recently proposed Flip-flop and latch[...]

### Features

This book provides a unified treatment of Flip-Flop/latch design and selection in nanometer CMOS VLSI systems. The design aspects related to the energy-delay tradeoff in Flip-Flops and latches are discussed, given their optimal selection according to the application, and the detailed circuit design in nanometer CMOS VLSI systems. Design strategies are derived in a coherent framework that includes explicitly [...]

### Contents

The Logical Effort Method.- Design in the Energy-Delay Space.- Clocked Storage Elements.- Flip-Flop Optimized Design.- Analysis and Comparison in the Energy Delay-Area Domain.- Energy-Efficient Clock Slope.- Ultra-Fast and Energy-Efficient Pulsed Latch Topologies.- Impact of Variations and Comparative Analysis.

### Fields of interest

Circuits and Systems; Electronic Circuits and Devices; Processor Architectures; Nanotechnology and Microengineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-01996-3](http://www.springer.com/978-3-319-01996-3)

### Hardcover

2014. 300 p. 150 illus.

ISBN 978-3-319-01996-3

**Due: April 28, 2014**

F. Amato, R. Ambrosino, M. Ariola, C. Cosentino, G. De Tommasi, Università degli Studi di Napoli, Napoli, Italy

## Finite-Time Stability and Control

Finite-time stability (FTS) is a more practical concept than classical Lyapunov stability, useful for checking whether the state trajectories of a system remain within pre-specified bounds over a finite time interval. In a linear systems framework, FTS problems can be cast as convex optimization problems and solved by the use of effective off-the-shelf computational tools such as LMI solvers. Finite-time Stability and Control exploits this benefit to present the practical applications of FTS and finite-time control-theoretical results to various engineering fields. The text is divided into two parts: linear systems; and hybrid systems. The building of practical[...]

### Features

Finite-time stability (FTS) is a more practical concept than classical Lyapunov stability, useful for checking whether the state trajectories of a system remain within pre-specified bounds over a finite time interval. In a linear systems framework, FTS problems can be cast as convex optimization problems and solved by the use of effective off-the-shelf computational tools such as LMI solvers. Finite-time [...]

### Contents

Part I: Linear Systems.- Finite-time Stability Analysis of Continuous-Time Linear Systems.- Controller Design for the Finite-Time Stabilization of Continuous-Time Linear Systems.- Robustness Issues.- Finite-time Stability of Discrete-Time Linear Systems.- Finite-time Stability Analysis via PQLFs.- Part II: Hybrid Systems.- Finite-time Stability of Impulsive Dynamical Linear Systems.- Controller Design for the Finite-time Stability of Impulsive Dynamical Linear Systems.- Robustness Issues for Impulsive Dynamical Linear Systems.

### Fields of interest

Control; Systems Theory, Control; Industrial Chemistry / Chemical Engineering; Automotive Engineering; Aerospace Technology and Astronautics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-5663-5](http://www.springer.com/978-1-4471-5663-5)

### Softcover

2014. XII, 146 p. 37 illus., 14 illus. in color. (Lecture Notes in Control and Information Sciences, Vol. 453) ISBN 978-1-4471-5663-5

usually dispatched within 3 to 5 business days  
December 31, 2013

H.M. Ammari, University of Michigan-Dearborn, Dearborn, USA (Ed.)

## The Art of Wireless Sensor Networks

### Volume 1: Fundamentals

During the last one and a half decades, wireless sensor networks have witnessed significant growth and tremendous development in both academia and industry. "The Art of Wireless Sensor Networks: Volume 1 - Fundamentals" focuses on the fundamentals concepts in the design, analysis, and implementation of wireless sensor networks. It covers the various layers of the lifecycle of this type of network from the physical layer up to the application layer. Its rationale is that the first volume covers contemporary design issues, tools, and protocols for radio-based two-dimensional terrestrial sensor networks. All the book chapters in this volume include up-to-date research work spanning[...]

### Features

During the last one and a half decades, wireless sensor networks have witnessed significant growth and tremendous development in both academia and industry. "The Art of Wireless Sensor Networks: Volume 1 - Fundamentals" focuses on the fundamentals concepts in the design, analysis, and implementation of wireless sensor networks. It covers the various layers of the lifecycle of this type of network [...]

### Contents

Part I Introduction and Applications.- Part II Wireless Communications and Medium Access Control.- Part III Routing.- Part IV Topology and Mobility Management.- Part V Localization and Task Management.- Part VI Data Management.- Part VII Data Gathering.- Part VIII Security.- Part IX Middleware.- Part X Sensor Technology, Standards, and Operating Systems.

### Fields of interest

Communications Engineering, Networks; Circuits and Systems; Signal, Image and Speech Processing

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40008-7](http://www.springer.com/978-3-642-40008-7)

### Hardcover

2014. XIII, 829 p. 293 illus., 146 illus. in color. (Signals and Communication Technology) ISBN 978-3-642-40008-7

Due: December 16, 2013

H.M. Ammari (Ed.)

## The Art of Wireless Sensor Networks

### Volume 2: Advanced Topics and Applications

During the last one and a half decades, wireless sensor networks have witnessed significant growth and tremendous development in both academia and industry. A large number of researchers, including computer scientists and engineers, have been interested in solving challenging problems that span all the layers of the protocol stack of sensor networking systems. Several venues, such as journals, conferences, and workshops, have been launched to cover innovative research and practice in this promising and rapidly advancing field. Because of these trends, I thought it would be beneficial to provide our sensor networks community with a comprehensive reference on as much of the findings as[...]

### Features

During the last one and a half decades, wireless sensor networks have witnessed significant growth and tremendous development in both academia and industry. A large number of researchers, including computer scientists and engineers, have been interested in solving challenging problems that span all the layers of the protocol stack of sensor networking systems. Several venues, such as journals, conferences, [...]

### Contents

Part I Introduction and Stochastic Modeling.- Part II Barrier and Spatiotemporal Coverage.- Part III Tracking, Estimation, and Counting.- Part IV Coverage and Localization in Three-Dimensional Wireless Sensor Networks.- Part V Topology Control and Routing in Three-Dimensional Wireless Sensor Networks.- Part VI Underground and Underwater Sensor Networks.- Part VII Multimedia and Body Sensor Networks.- Part VIII Social Sensing.

### Fields of interest

Communications Engineering, Networks; Circuits and Systems; Signal, Image and Speech Processing

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40065-0](http://www.springer.com/978-3-642-40065-0)

### Hardcover

2014. XII, 696 p. 250 illus., 151 illus. in color. (Signals and Communication Technology) ISBN 978-3-642-40065-0

Due: December 16, 2013

M. Angelillo, University of Salerno, Fisciano, Italy (Ed.)

## Mechanics of Masonry Structures

The experience of people working with different perspectives in different fields of masonry modeling, from mathematics to applied engineering and practice, is brought together in this book. It presents both the theoretical background and an overview of the state-of-the-art in static and dynamic masonry modeling.

### Features

The experience of people working with different perspectives in different fields of masonry modeling, from mathematics to applied engineering and practice, is brought together in this book. It presents both the theoretical background and an overview of the state-of-the-art in static and dynamic masonry modeling.

### Contents

Masonry behavior and modeling.- Mathematics of the masonry-like model and limit analysis.- A numerical method for solving BVP of masonry-like solids.- Practical applications of unilateral models to Masonry Equilibrium.- Modeling the interfaces in masonry structures.- Micro, macro and multiscale models for masonry structures.- Homogenization and seismic assessment: review and recent trends.

### Fields of interest

Structural Mechanics; Continuum Mechanics and Mechanics of Materials; Building Construction, HVAC, Refrigeration; Theoretical and Applied Mechanics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-7091-1773-6](http://www.springer.com/978-3-7091-1773-6)

### Hardcover

2014. VI, 350 p. 170 illus. (CISM International Centre for Mechanical Sciences, Vol. 551)  
ISBN 978-3-7091-1773-6

**Due: April 28, 2014**

G. Antonelli, Università di Cassino, Cassino, Italy

## Underwater Robots

This book, now at the third edition, addresses the main control aspects in underwater manipulation tasks. The mathematical model with significant impact on the control strategy is discussed. The problem of controlling a 6-degrees-of-freedom autonomous underwater vehicle is deeply investigated and a survey of fault detection/tolerant strategies for unmanned underwater vehicles is provided. Inverse kinematics, dynamic and interaction control for underwater vehicle-manipulator systems are then discussed. The code used to generate most of the numerical simulations is made available and briefly discussed.

### Features

This book, now at the third edition, addresses the main control aspects in underwater manipulation tasks. The mathematical model with significant impact on the control strategy is discussed. The problem of controlling a 6-degrees-of-freedom autonomous underwater vehicle is deeply investigated and a survey of fault detection/tolerant strategies for unmanned underwater vehicles is provided. Inverse [...]

### Contents

Modelling of Underwater Robots.- Dynamic Control of 6-DOF AUVs.- Fault Detection/Tolerance Strategies for AUVs and ROVs.- Experiments of Dynamic Control of a 6-DOF AUV.- Kinematic Control of UVMs.- Dynamic Control of UVMs.- Interaction Control of UVMs.- Dynamic Control of 6-DOF AUVs.- Fault Detection/Tolerance Strategies for AUVs and ROVs.- Experiments of Dynamic Control of a 6-DOF AUV.- Kinematic Control of UVMs.- Dynamic Control of UVMs.- Interaction Control of UVMs.

### Fields of interest

Robotics and Automation; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02876-7](http://www.springer.com/978-3-319-02876-7)

### Hardcover

2014. XXVII, 279 p. 151 illus., 62 illus. in color. (Springer Tracts in Advanced Robotics, Vol. 96)  
ISBN 978-3-319-02876-7

**usually dispatched within 3 to 5 business days**

H. Arslan, University of South Florida, Tampa, USA

## Modeling, Simulation, Testing, and Measurements of Wireless Communication Systems

### A Laboratory-Based Approach

The high demand for communications anywhere and anytime has been the driving force for the development of wireless services and technologies. Wireless technologies and services have evolved significantly over the last couple of decades, from simple paging to real-time voice communication and recently to very high rate data communications. This dramatic change has an effect on society in many aspects, enabling people to communicate in ways unimaginable in the past and contributing to the quality of life that is enjoyed today by many. In this book, wireless communication systems and concepts are introduced from a practical and laboratory perspective with a goal to provide readers with [...]

### Features

The high demand for communications anywhere and anytime has been the driving force for the development of wireless services and technologies. Wireless technologies and services have evolved significantly over the last couple of decades, from simple paging to real-time voice communication and recently to very high rate data communications. This dramatic change has an effect on society in many aspects, [...]

### Contents

Radios and SDR – relation to Lab equipments.- Modern Measurement Tools and Equipments.- Understanding Various System.- Measurements and Techniques Testing a basic radio system, sub-system, and components.- Digital Modulation.- Pulse Shaping Filtering.- Multi-Dimensional Signal Analysis.- Joint Time-Frequency Analysis.- Radio Channel and sounding.- Synchronization to digital signals.- Interference and its effect on the system.- Impairments in communication systems and modeling the impairments.- Understanding nonlinear distortions in the RF front end.

### Fields of interest

Communications Engineering, Networks; Coding and Information Theory

### Target groups

Research

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-94-007-3954-3](http://www.springer.com/978-94-007-3954-3)

### Hardcover

2014. 300p.  
ISBN 978-94-007-3954-3

**Due: March 28, 2014**

P. Babarczi, Budapest University of Technology and, Budapest, Hungary; J. Tapolcai, Budapest University of Technology and Ec, Budapest, Hungary; P.-H. Ho, University of Waterloo, Waterloo, Canada

## Internet Optical Infrastructure

### Issues on Monitoring and Failure Restoration

This book covers the issues of monitoring, failure localization, and restoration in the Internet optical backbone, and focuses on the progress of state-of-the-art in both industry standard and academic research. The authors summarize, categorize, and analyze the developed technology in the context of Internet fault management and failure recovery under the Generalized Multi-Protocol Label Switching (GMPLS), via both aspects of network operations and theories.

### Features

This book covers the issues of monitoring, failure localization, and restoration in the Internet optical backbone, and focuses on the progress of state-of-the-art in both industry standard and academic research. The authors summarize, categorize, and analyze the developed technology in the context of Internet fault management and failure recovery under the Generalized Multi-Protocol Label Switching (GMPLS), [...]

### Contents

Part I Fault Management under Generalized Multi-Protocol Label Switching (GMPLS).- GMPLS for Internet Control and Management – An Overview.- Fault Management under GMPLS.- Part II Monitoring and Failure Localization in All-Optical Networks.- Failure Localization via a Central Controller.- Distributed Failure Localization.- Monitoring Burst (m-burst).- Part III An All-Optical Restoration Framework with M-Trails.- Framework Introduction.- Monitoring Resource Hidden.

### Fields of interest

Microwaves, RF and Optical Engineering; Communications Engineering, Networks; Information Systems and Communication Service

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-7737-2](http://www.springer.com/978-1-4614-7737-2)

### Hardcover

2014. 300 p. 80 illus.  
ISBN 978-1-4614-7737-2

**Due: June 15, 2014**

Y. Baek, Boise State University, Boise, USA; R. Ko, University of Waikato, Hamilton, New Zealand; T. Marsh, James Cook University, Townsville, Australia (Eds.)

## Trends and Applications of Serious Gaming and Social Media

This book highlights the challenges and potential of educational learning or industry-based training using serious games and social media platforms. In particular, the book addresses applications used in businesses and education-related organizations in Asia, where the framework and experience of serious games have been used to address specific problems in the real world. The topics that will be present in this book includes future of serious games and immersive technologies and their impact on society; online and mobile games; achievement systems in serious games; persuasive technology and games for saving and money management; malware analytics for social networking; serious games[...]

### Features

This book highlights the challenges and potential of educational learning or industry-based training using serious games and social media platforms. In particular, the book addresses applications used in businesses and education-related organizations in Asia, where the framework and experience of serious games have been used to address specific problems in the real world. The topics that will be present in [...]

### Contents

The Future of Serious Games and Immersive Technologies and their Impact on Society.- The road to e-services: online and mobile games as enablers.- Achievement Systems Explained Identifying Triggers within Persuasive Technology and Games For Saving and Money Management.- Malware Analytics for Social Networking.- Serious Games and the Gamification of Mental Health Interventions.- Educational Implications Of Social Network Games.- An Analysis Of A Social Network Game In View Of Consumption Education Class.- Learning subject knowledge and acquiring 21st century skills through game[...]

### Fields of interest

Computational Intelligence; User Interfaces and Human Computer Interaction; Educational Technology; Media Sociology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-981-4560-25-2](http://www.springer.com/978-981-4560-25-2)

### Hardcover

2014. 180 p. 50 illus., 20 illus. in color. (Gaming Media and Social Effects)  
ISBN 978-981-4560-25-2

**Due: July 28, 2014**

R. Balasubramanian, V.J. Santos, Arizona State University, Tempe, USA (Eds.)

## The Human Hand as an Inspiration for Robot Hand Development

“The Human Hand as an Inspiration for Robot Hand Development” presents an edited collection of authoritative contributions in the area of robot hands. The results described in the volume are expected to lead to more robust, dependable, and inexpensive distributed systems such as those endowed with complex and advanced sensing, actuation, computation, and communication capabilities. The twenty-four chapters discuss the field of robotic grasping and manipulation viewed in light of the human hand’s capabilities and push the state-of-the-art in robot hand design and control. Topics discussed include human hand biomechanics, neural control, sensory feedback and perception, and robotic[...]

### Features

“The Human Hand as an Inspiration for Robot Hand Development” presents an edited collection of authoritative contributions in the area of robot hands. The results described in the volume are expected to lead to more robust, dependable, and inexpensive distributed systems such as those endowed with complex and advanced sensing, actuation, computation, and communication capabilities. The twenty-four chapters [...]

### Contents

Constraints and Flexibility in Cortical Control of the Hand.- Synergistic Control of Hand Muscles Through Common Neural Input.- Transmission of Musculotendon Forces to the Index Finger.- The Control and Perception of Finger Forces.

### Fields of interest

Robotics and Automation; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03016-6](http://www.springer.com/978-3-319-03016-6)

### Hardcover

2014. XI, 427 p. 210 illus., 97 illus. in color. (Springer Tracts in Advanced Robotics, Vol. 95)  
ISBN 978-3-319-03016-6

**Due: January 31, 2014**

M. Benson

## The Art of Software Thermal Management for Embedded Systems

This book introduces Software Thermal Management (STM) as a means of reducing power consumption in a computing system in order to manage heat, improve component reliability and increase system safety. Readers will benefit from this pragmatic guide to the field of STM for embedded systems and its catalog of software power management techniques. Since thermal management is a key bottleneck in embedded systems design, this book focuses on root cause of heat in embedded systems: power. Since software has an enormous impact on power consumption in an embedded system, this book urges software engineers to manage heat effectively by understanding, categorizing and developing new ways to[...]

### Features

This book introduces Software Thermal Management (STM) as a means of reducing power consumption in a computing system, in order to manage heat, improve component reliability, and increase system safety. Readers will benefit from this pragmatic guide to the field of STM for embedded systems and its catalog of software power management techniques. Since thermal management is a key bottleneck in embedded [...]

### Contents

Introduction to Software Thermal Management.- Landscape: History, Present Barriers and The Road Forward.- Roots: a Bedrock of Giants.- Techniques: Putting the Silicon to Work.- Frameworks: Choreographing the Parts.- Frontiers: The Future of Software Thermal Management.

### Fields of interest

Circuits and Systems; Electronics and Microelectronics, Instrumentation; Software Engineering; Energy Efficiency (incl. Buildings)

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-1-4939-0297-2](http://www.springer.com/978-1-4939-0297-2)

### Hardcover

2014. XIII, 137 p. 51 illus., 2 illus. in color.  
ISBN 978-1-4939-0297-2

**Due: January 31, 2014**

Y. Bestaoui Sebbane, Université d'Evry Val-d'Essonne, Evry, France

## Planning and Decision Making for Aerial Robots

This book provides an introduction to the emerging field of planning and decision making for aerial robots. An aerial robot is the ultimate form of Unmanned Aerial Vehicle, an aircraft endowed with built-in intelligence, requiring no direct human control and able to perform a specific task. It must be able to fly within a partially structured environment, to react and adapt to changing environmental conditions and to accommodate for the uncertainty that exists in the physical world. An aerial robot can be termed as a physical agent that exists and flies in the real 3D world, can sense its environment and act on it to achieve specific goals. So throughout this book, an aerial robot[...]

### Features

This book provides an introduction to the emerging field of planning and decision making for aerial robots. An aerial robot is the ultimate form of Unmanned Aerial Vehicle, an aircraft endowed with built-in intelligence, requiring no direct human control and able to perform a specific task. It must be able to fly within a partially structured environment, to react and adapt to changing environmental [...]

### Contents

Preface.- 1 Introduction.- 2 Motion Planning.- 3 Deterministic Decision Making.- 4 Decision Making Under Uncertainty.- 5 Multi Aerial Robot Planning.- 6 General Conclusions.- Index.

### Fields of interest

Control, Robotics, Mechatronics; Aerospace Technology and Astronautics; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03706-6](http://www.springer.com/978-3-319-03706-6)

### Hardcover

2014. XIII, 439 p. 17 illus., 14 illus. in color. (Intelligent Systems, Control and Automation: Science and Engineering, Vol. 71)  
ISBN 978-3-319-03706-6

**Due: January 31, 2014**

F. Brandonisio, Tyndall National Institute, Cork, Ireland; M.P. Kennedy, University College Cork, Cork, Ireland

## Noise-Shaping All-Digital Phase-Locked Loops

### Modeling, Simulation, Analysis and Design

This book presents a novel approach to the analysis and design of all-digital phase-locked loops (ADPLLs), technology widely used in wireless communication devices. The authors provide an overview of ADPLL architectures, time-to-digital converters (TDCs) and noise shaping. Realistic examples illustrate how to analyze and simulate phase noise in the presence of sigma-delta modulation and time-to-digital conversion. Readers will gain a deep understanding of ADPLLs and the central role played by noise-shaping. A range of ADPLL and TDC architectures are presented in unified manner. Analytical and simulation tools are discussed in detail. Matlab code is included that can be reused to[...]

### Features

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### Contents

Introduction.- Phase Digitization in All-Digital PLLs.- A Unifying Framework for TDC Architectures.- Analytical Predictions of Phase Noise in ADPLLs.- Advantages of Noise Shaping and Dither.- Efficient Modeling and Simulation of Accumulator-Based ADPLLs.- Modelling and Estimating Phase Noise with Matlab.

### Fields of interest

Circuits and Systems; Signal, Image and Speech Processing; Electronics and Microelectronics, Instrumentation

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03658-8](http://www.springer.com/978-3-319-03658-8)

### Hardcover

2014. XIII, 177 p. 145 illus., 79 illus. in color. (Analog Circuits and Signal Processing)  
ISBN 978-3-319-03658-8

**Due: January 31, 2014**

K. Bruegel, Delft University of Technology, Delft, Netherlands;  
E.A.B. Koenders, Delft University of Technology, Delft, Netherlands

## Testing, Modelling and Engineering of Young Concrete

From Fundamentals to Practical Application

The book contains an overview and description of the main issues that go along with the hardening process of early age concrete. The book contains 9 chapters which, in general terms, reflect the main results deduced from work done by the authors in collaboration with their PhD students. The purpose of the work is to provide researchers and PhD students a general basis of knowledge in the field of hardening concrete and to bridge the gap between academic research results and applicability in practice. The book is intended for academic students and practitioners.

### Features

The book contains an overview and description of the main issues that go along with the hardening process of early age concrete. The book contains 9 chapters which, in general terms, reflect the main results deduced from work done by the authors in collaboration with their PhD students. The purpose of the work is to provide researchers and PhD students a general basis of knowledge in the field of [...]

### Contents

Temperature and shrinkage deformations.- Development of mechanical properties.- Stresses and Cracking in Early-Age Concrete.- Cracking probability of hardening concrete.- Reinforced high strength concrete.- Permeability.- From micro to macrolevel.- Practical application of theoretical models.

### Fields of interest

Building Materials; Characterization and Evaluation of Materials; Structural Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4020-8687-8](http://www.springer.com/978-1-4020-8687-8)

### Hardcover

2014. Approx. 195 p.  
ISBN 978-1-4020-8687-8

**Due: March 28, 2014**

A.L. Brooks, S. Brahmam, Missouri State University, Springfield, USA; L.C. Jain, University of Canberra, Canberra, Australia (Eds.)

## Technologies of Inclusive Well-Being

Serious Games, Alternative Realities, and Play Therapy

This book is the first single volume that brings together the topics of serious games, alternative realities, and play therapy. The focus is on the use of digital media for the therapeutic benefit and well-being of a wide range of people—spanning those with special needs to the elderly to entire urban neighborhoods. This book brings together these topics to demonstrate the increasing trans/inter/multi-disciplinary initiatives apparent today in science, medicine, and academic research—interdisciplinary initiative that are already profoundly impacting society.

### Features

This book is the first single volume that brings together the topics of serious games, alternative realities, and play therapy. The focus is on the use of digital media for the therapeutic benefit and well-being of a wide range of people—spanning those with special needs to the elderly to entire urban neighborhoods. This book brings together these topics to demonstrate the increasing [...]

### Contents

Part 1: Technologies for Rehabilitation .- Part 2: Technologies for Music Therapy and Expression .- Part 3: Technologies for Well-Being .- Part 4: Technologies for Education & Education for Rehabilitative Technologies .- Part 5: Disruptive Innovation.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics); Biomedical Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-45431-8](http://www.springer.com/978-3-642-45431-8)

### Hardcover

2014. XI, 355 p. 73 illus., 54 illus. in color. (Studies in Computational Intelligence, Vol. 536)  
ISBN 978-3-642-45431-8

**Due: January 31, 2014**

C.I.R.P., C.I.R.P. Office, Paris, France (Ed.)

## CIRP Encyclopedia of Production Engineering

The CIRP Encyclopedia covers the state-of-art of advanced technologies, methods and models for production, production engineering and logistics. While the technological and operational aspects are in the focus, economical aspects are addressed too. The entries for a wide variety of terms were reviewed by the CIRP-Community, representing the highest standards in research. Thus, the content is not only evaluated internationally on a high scientific level but also reflects very recent developments.

### Features

The CIRP Encyclopedia covers the state-of-art of advanced technologies, methods and models for production, production engineering and logistics. While the technological and operational aspects are in the focus, economical aspects are addressed too. The definitions and short explanations for a wide variety of terms were reviewed by the CIRP-Community, representing the highest standards in research. Thus, the [...]

### Contents

Cutting.- Forming.- Assembly.- Manufacturing Systems.- Engineering Design.- Electro-Physical and Chemical Processes.- Abrasive Processes.- Machine Tools.- Precision Engineering and Metrology.- Surface Engineering.

### Fields of interest

Industrial and Production Engineering; Production / Logistics; Computer-Aided Engineering (CAD, CAE) and Design; Industrial Chemistry / Chemical Engineering

### Target groups

Research

### Type of publication

Encyclop(a)edia

More on [www.springer.com/978-3-642-20616-0](http://www.springer.com/978-3-642-20616-0)

### Hardcover

2014. 1500 p. 400 illus., 250 illus. in color. In 2 volumes, not available separately.  
ISBN 978-3-642-20616-0

**Due: March 2014**

### Hardcover

2014. 1500 p. 400 illus., 250 illus. in color. Print + eReference.  
ISBN 978-3-642-20618-4

**Due: March 2014**

P. Castaldo, University of Salerno, Salerno, Italy

## Integrated Seismic Design of Structure and Control Systems

The structural optimization procedure presented in this book makes it possible to achieve seismic protection through integrated structural/control system design. In particular, it is explained how slender structural systems with a high seismic performance can be achieved through inclusion of viscous and viscoelastic dampers as an integral part of the system. Readers are provided with essential introductory information on passive structural control and passive energy dissipation systems. Dynamic analyses of both single and multiple degree of freedom systems are performed in order to verify the achievement of pre-assigned performance targets, and it is explained how the optimal[...]

### Features

The structural optimization procedure presented in this book makes it possible to achieve seismic protection through integrated structural/control system design. In particular, it is explained how slender structural systems with a high seismic performance can be achieved through inclusion of viscous and viscoelastic dampers as an integral part of the system. Readers are provided with essential introductory [...]

### Contents

Passive Structural Control.- Passive Energy Dissipation Devices.- Dynamic Response of Systems Equipped with Viscous and Viscoelastic Dampers.- Modeling of Viscoelastic Dissipative Bracing Systems.- Integrated Design of Proportionally Damped Framed Structural Systems Equipped with Viscous Dampers.- Applying the Optimal Integrated Design Methodology.

### Fields of interest

Vibration, Dynamical Systems, Control; Control; Building Construction, HVAC, Refrigeration; Geotechnical Engineering & Applied Earth Sciences

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02614-5](http://www.springer.com/978-3-319-02614-5)

### Hardcover

2014. XI, 220 p. 236 illus. (Springer Tracts in Mechanical Engineering)  
ISBN 978-3-319-02614-5

**usually dispatched within 3 to 5 business days**

H. Chen, Jilin University, Changchun, China (P.R.); B. Gao, Jilin University, Changchun, China (P.R.)

## Nonlinear Estimation and Control of Automotive Drivetrains

Nonlinear Estimation and Control of Automotive Drivetrains discusses the control problems involved in automotive drivetrains, particularly in hydraulic Automatic Transmission (AT), Dual Clutch Transmission (DCT) and Automated Manual Transmission (AMT). Challenging estimation and control problems, such as driveline torque estimation and gear shift control, are addressed by applying the latest nonlinear control theories, including constructive nonlinear control (Backstepping, Input-to-State Stable) and Model Predictive Control (MPC). The estimation and control performance is improved while the calibration effort is reduced significantly. The book presents many detailed examples of[...]

### Features

Nonlinear Estimation and Control of Automotive Drivetrains discusses the control problems involved in automotive drivetrains, particularly in hydraulic Automatic Transmission (AT), Dual Clutch Transmission (DCT) and Automated Manual Transmission (AMT). Challenging estimation and control problems, such as driveline torque estimation and gear shift control, are addressed by applying the latest [...]

### Contents

Introduction.- Pressure estimation of wet clutch.- Torque phase control of clutch-to-clutch shift process.- Inertia phase control of clutch-to-clutch shift process.- Torque estimation of vehicle drive shaft.- Clutch disengagement timing control of AMT gear shift.- Clutch engagement control of AMT gear shift.- Data-driven start-up control of AMT vehicle.- Appendix.

### Fields of interest

Automotive Engineering; Control; Mechatronics; Vibration, Dynamical Systems, Control

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-41571-5](http://www.springer.com/978-3-642-41571-5)

Distribution rights in China mainland: Science Press

### Hardcover

Jointly published with Science Press Beijing, Beijing, China  
2014. XII, 260 p. 110 illus.  
ISBN 978-3-642-41571-5

**Due: January 31, 2014**

A. Choukchou-Braham, University of Aboubekr Belkaid, Chetouane, Algeria; B. Cherki, University of Aboubekr Belkaid, Chetouane, Algeria; M. Djemai, K. Busawan

## Analysis and Control of Underactuated Mechanical Systems

This monograph provides readers with tools for the analysis, and control of systems with fewer control inputs than degrees of freedom to be controlled, i.e., underactuated systems. The text deals with the consequences of a lack of a general theory that would allow methodical treatment of such systems and the ad hoc approach to control design that often results, imposing a level of organization whenever the latter is lacking. The authors take as their starting point the construction of a graphical characterization or control flow diagram reflecting the transmission of generalized forces through the degrees of freedom. Underactuated systems are classified according to the three main[...]

### Features

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### Contents

Introduction.- Generalities and State-of-the-Art on the Control of Underactuated Mechanical Systems.- Underactuated Mechanical Systems from the Lagrangian formalism.- Classification of Underactuated Mechanical Systems.- Control Design Schemes for Underactuated Mechanical Systems.- Appendices: Theoretical Background on Nonlinear System Stability and Control.- Limits of Linearization and Dangers of Destabilization.- Differential Geometry.- Controllability of Continuous Systems.

### Fields of interest

Robotics and Automation; Aerospace Technology and Astronautics; Automotive Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02635-0](http://www.springer.com/978-3-319-02635-0)

### Hardcover

2014. XV, 138 p. 55 illus., 10 illus. in color.  
ISBN 978-3-319-02635-0

**usually dispatched within 3 to 5 business days**

R. Cipolla, S. Battiato, Università di Catania, Catania, Italy; G.M. Farinella, Università di Catania, Catania, Italy (Eds.)

## Registration and Recognition in Images and Videos

Computer vision is the science and technology of making machines that see. It is concerned with the theory, design and implementation of algorithms that can automatically process visual data to recognize objects, track and recover their shape and spatial layout. The International Computer Vision Summer School - ICVSS was established in 2007 to provide both an objective and clear overview and an in-depth analysis of the state-of-the-art research in Computer Vision. The courses are delivered by world renowned experts in the field, from both academia and industry and cover both theoretical and practical aspects of real Computer Vision problems. The school is organized every year by[...]

### Features

Computer vision is the science and technology of making machines that see. It is concerned with the theory, design and implementation of algorithms that can automatically process visual data to recognize objects, track and recover their shape and spatial layout. The International Computer Vision Summer School - ICVSS was established in 2007 to provide both an objective and clear overview and an [...]

### Contents

The Visual Field: Simultaneous Order in Immediate Visual Awareness.- A Primer for Colour Computer Vision Descriptor learning for omnidirectional image matching.- Visual Correspondence, the Lambert-Ambient Shape Space and the Systematic Design of Feature Descriptors.- Classemes: A Compact Image Descriptor for Efficient Novel-Class Recognition and Search.- The Enhanced Flock of Trackers Registration and Segmentation in Medical Imaging.- Clustering Games About 3D Faces Socially-driven Computer Vision for Group Behavior Analysis.- Mobile Computational Photography with FCam.

### Fields of interest

Computational Intelligence; Image Processing and Computer Vision; Pattern Recognition; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-44906-2](http://www.springer.com/978-3-642-44906-2)

### Hardcover

2014. XVIII, 283 p. 111 illus., 81 illus. in color. (Studies in Computational Intelligence, Vol. 532)  
ISBN 978-3-642-44906-2

**usually dispatched within 3 to 5 business days**

F. Concha

## Solid-Liquid Separation in the Mining Industry

This book covers virtually all of the engineering science and technological aspects of separating water from particulate solids in the mining industry. It starts with an introduction to the field of mineral processing and the importance of water in mineral concentrators. The consumption of water in the various stages of concentration is discussed, as is the necessity of recovering the majority of that water for recycling. The book presents the fundamentals under which processes of solid-liquid separation are studied, approaching mixtures of discrete finely divided solid particles in water as a basis for dealing with sedimentation in particulate systems. Suspensions, treated as[...]

### Features

This book covers virtually all of the engineering science and technological aspects of separating water from particulate solids in the mining industry. It starts with an introduction to the field of mineral processing and the importance of water in mineral concentrators. The consumption of water in the various stages of concentration is discussed, as is the necessity of recovering the majority of that water [...]

### Contents

Preface.- 1 Introduction.- 2 Theory of Mixtures.- 3 Particulate Systems.- 4 Sedimentation of Particulate Systems.- 5 Kynch Theory of Sedimentation.- 6 Flow Through Rigid Porous Media.- 7 Particle Aggregation by Coagulation and Flocculation.- 8 Thickening.- 9 Filtration.- 10 Suspension Rheology.- 11 Transporting Concentrates and Tailings.

### Fields of interest

Engineering Fluid Dynamics; Computational Science and Engineering; Fluid- and Aerodynamics; Operating Procedures, Materials Treatment

### Target groups

Research

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-3-319-02483-7](http://www.springer.com/978-3-319-02483-7)

### Hardcover

2014. XV, 431 p. 324 illus., 189 illus. in color. (Fluid Mechanics and Its Applications, Vol. 105)  
ISBN 978-3-319-02483-7

**Due: December 31, 2013**

J. Dai, University of Maryland, College Park, USA; M.M. Ohadi, D. Das, University of Maryland, College Park, USA; M.G. Pecht

## Optimum Cooling of Data Centers

Application of Risk Assessment and Mitigation Techniques

This book describes the use of free air cooling to improve the efficiency of, and cooling of, equipment for use in telecom infrastructures. Discussed at length is the cooling of communication installation rooms such as data centers or base stations, and this is intended as a valuable tool for the people designing and manufacturing key parts of communication networks. This book provides an introduction to current cooling methods used for energy reduction, and also compares present cooling methods in use in the field. The qualification methods and standard reliability assessments are reviewed, and their inability to assess the risks of free air cooling is discussed. The method of[...]

### Features

This book provides data center designers and operators with methods by which to assess and mitigate the risks associated with utilization of optimum cooling solutions. The goal is to provide readers with sufficient knowledge to implement measures such as free air cooling or direct liquid immersion cooling properly, or combination of existing and emerging cooling technologies in data centers, base stations, [...]

### Contents

Overview of Telecom Industry and Data Centers.- Cooling Methods to Improve Energy Efficiency in Telecom Industry and Data Centers.- Free Air Cooling.- Standards for Telecom Equipment and Data Centers.- Risks of Free Air Cooling.- Steps to Assess Parts for use under Free Air Cooling Condition.- Guidelines for Part Reliability Assessment.- Introduction to PHM.- Development of Sub-system and System for Free Air Cooling.- Future Trends.

### Fields of interest

Building Construction, HVAC, Refrigeration; Communications Engineering, Networks; Performance and Reliability

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-5601-8](http://www.springer.com/978-1-4614-5601-8)

### Hardcover

2014. XIV, 186 p. 74 illus., 36 illus. in color.  
ISBN 978-1-4614-5601-8

**usually dispatched within 3 to 5 business days**

M. Dascălu

## Analyzing Discourse and Text Complexity for Learning and Collaborating

A Cognitive Approach Based on Natural Language Processing

With the advent and increasing popularity of Computer Supported Collaborative Learning (CSCL) and e-learning technologies, the need of automatic assessment and of teacher/tutor support for the two tightly intertwined activities of comprehension of reading materials and of collaboration among peers has grown significantly. In this context, a polyphonic model of discourse derived from Bakhtin's work as a paradigm is used for analyzing both general texts and CSCL conversations in a unique framework focused on different facets of textual cohesion. As specificity of our analysis, the individual learning perspective is focused on the identification of reading strategies and on providing a [...]

### Features

With the advent and increasing popularity of Computer Supported Collaborative Learning (CSCL) and e-learning technologies, the need of automatic assessment and of teacher/tutor support for the two tightly intertwined activities of comprehension of reading materials and of collaboration among peers has grown significantly. In this context, a polyphonic model of discourse [...]

### Contents

Individual Learning.- Collaborative Learning.- Overview of Empirical Studies.- Dialogism.

### Fields of interest

Computational Intelligence; Language Translation and Linguistics; Learning and Instruction; Complexity; Philosophy of Language

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03418-8](http://www.springer.com/978-3-319-03418-8)

### Hardcover

2014. XIV, 279 p. 75 illus., 4 illus. in color. (Studies in Computational Intelligence, Vol. 534)

ISBN 978-3-319-03418-8

**usually dispatched within 3 to 5 business days**

J.P. Davim, University of Aveiro, Aveiro, Portugal (Ed.)

## Modern Mechanical Engineering

Research, Development and Education

This book covers modern subjects of mechanical engineering such as nanomechanics and nanotechnology, mechatronics and robotics, computational mechanics, biomechanics, alternative energies, sustainability as well as all aspects related with mechanical engineering education. The chapters help enhance the understanding of both the fundamentals of mechanical engineering and its application to the solution of problems in modern industry. This book is suitable for students, both in final undergraduate mechanical engineering courses or at the graduate level. It also serves as a useful reference for academics, mechanical engineering researchers, mechanical, materials and manufacturing [...]

### Features

This book covers modern subjects of mechanical engineering such as nanomechanics and nanotechnology, mechatronics and robotics, computational mechanics, biomechanics, alternative energies, sustainability as well as all aspects related with mechanical engineering education. The chapters help enhance the understanding of both the fundamentals of mechanical engineering and its application to the solution of [...]

### Contents

Sustainability in mechanical engineering discipline.- Application of solar distillation and solar drying technologies with phase change material storage.- Magneto-rheological fluid technology.- Tribological behaviour of rare-earth lubricating oils.- Structural dynamics and viscoelastic passive damping treatments.- Thermomechanical modeling of multiphase steels: Classical and modern engineering analysis.- Optimal real-time management automated production lines.- Modeling optimization of mechanical systems and processes.- Implementing STEP-NC: Exploring possibilities for the future of [...]

### Fields of interest

Mechanical Engineering; Nanotechnology; Control, Robotics, Mechatronics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-45175-1](http://www.springer.com/978-3-642-45175-1)

### Hardcover

2014. VIII, 468 p. 360 illus. (Materials Forming, Machining and Tribology)

ISBN 978-3-642-45175-1

**Due: January 31, 2014**

B. Derby, University of Manchester, Manchester, United Kingdom; A. Akhtar, University of Liverpool, Liverpool, United Kingdom

## Mechanical Properties of Aging Soft Tissues

This book is unique because it is the first to focus on both the structure and mechanics of ageing soft tissues, encompassing a range of tissues including skin, tendons, vasculature and plantar soft tissues. This book provides an overview of in vivo and in vitro measurement techniques including state-of-the-art methodologies, as well as focusing on the structural changes that occur within the main components of these tissues resulting in the detrimental mechanical property changes. The book is highly beneficial to a range of disciplines including materials scientists and engineers interested in biomechanics, structural biologists and clinicians. The book does not focus on one [...]

### Features

This book is unique because it is the first to focus on both the structure and mechanics of ageing soft tissues, encompassing a range of tissues including skin, tendons, vasculature and plantar soft tissues. This book provides an overview of in vivo and in vitro measurement techniques including state-of-the-art methodologies, as well as focusing on the structural changes that occur within the main components [...]

### Fields of interest

Biomedical Engineering; Geriatrics / Gerontology; Physiotherapy; Aging

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03969-5](http://www.springer.com/978-3-319-03969-5)

### Hardcover

2014. 300 p. (Engineering Materials and Processes)

ISBN 978-3-319-03969-5

**Due: April 22, 2014**

R.C. Dewar, Australian National University, Canberra, Australia; C.H. Lineveaver, R.K. Niven, University of New South Wales at ADFA, Canberra, Australia; K. Regenauer-Lieb, University of Western Australia, Crawley, Australia (Eds.)

## Beyond the Second Law

### Entropy Production and Non-equilibrium Systems

The Second Law, a cornerstone of thermodynamics, governs the average direction of dissipative, non-equilibrium processes. But it says nothing about their actual rates or the probability of fluctuations about the average. This interdisciplinary book, written and peer-reviewed by international experts, presents recent advances in the search for new non-equilibrium principles beyond the Second Law, and their applications to a wide range of systems across physics, chemistry and biology. Beyond The Second Law brings together traditionally isolated areas of non-equilibrium research and highlights potentially fruitful connections between them, with entropy production playing the unifying[...]

#### Features

The Second Law, a cornerstone of thermodynamics, governs the average direction of dissipative, non-equilibrium processes. But it says nothing about their actual rates or the probability of fluctuations about the average. This interdisciplinary book, written and peer-reviewed by international experts, presents recent advances in the search for new non-equilibrium principles beyond the Second Law, and their [...]

#### Contents

Introduction.- Theoretical perspectives on entropy production.- Applications to non-equilibrium systems.

#### Fields of interest

Complexity; Nonlinear Dynamics

#### Target groups

Research

#### Type of publication

Monograph

More on [www.springer.com/978-3-642-40153-4](http://www.springer.com/978-3-642-40153-4)

#### Hardcover

2014. XIV, 434 p. 99 illus., 19 illus. in color. (Understanding Complex Systems)  
ISBN 978-3-642-40153-4

**usually dispatched within 3 to 5 business days January 4, 2014**

M.-G. Di Benedetto, University of Rome, Di Benedetto, Italy; F. Bader (Eds.)

## Cognitive Communication and Cooperative HetNet Coexistence

This book, written by experts from universities and major industrial research laboratories, is devoted to the very hot topic of cognitive radio and networking for cooperative coexistence of heterogeneous wireless networks. Selected highly relevant advanced research is presented on spectrum sensing and progress toward the realization of accurate radio environment mapping, biomimetic learning for self-organizing networks, security threats (with a special focus on primary user emulation attack), and cognition as a tool for green next-generation networks. The research activities covered include work undertaken within the framework of the European COST Action IC0902, which is geared[...]

#### Features

This book, written by experts from universities and major industrial research laboratories, is devoted to the very hot topic of cognitive radio and networking for cooperative coexistence of heterogeneous wireless networks. Selected highly relevant advanced research is presented on spectrum sensing and progress toward the realization of accurate radio environment mapping, biomimetic learning for self-organizing [...]

#### Contents

Recent Advances on Wideband Spectrum Sensing for Cognitive Radio.- Complexity of Spectrum Activity and its effect on Opportunistic Access.- Analysis and Optimization of Energy Detection for Non-Flat Spectral Characteristics.- Spectrum Sensing Algorithms for Cognitive White-Space Systems.- New Blind Free Bands Detectors Exploiting Cyclic Autocorrelation Function Sparsity.- Intersystem Coexistence and Cooperation Through Cognitive Control Channels.- Cooperative Spectrum Sensing with Censoring of Cognitive Radios in Rayleigh Fading Under Majority Logic Fusion.- Medium Access Control in[...]

#### Fields of interest

Communications Engineering, Networks; Signal, Image and Speech Processing; Artificial Intelligence (incl. Robotics)

#### Target groups

Research

#### Type of publication

Monograph

More on [www.springer.com/978-3-319-01401-2](http://www.springer.com/978-3-319-01401-2)

#### Hardcover

2014. X, 349 p. 129 illus., 7 illus. in color. (Signals and Communication Technology)  
ISBN 978-3-319-01401-2

**Due: January 31, 2014**

M.-G. Di Benedetto, Sapienza University of Rome, Rome, Italy; A. Cattoni, Aalborg University, Aalborg, Denmark; J. Fiorina, Supélec, Paris, France; F. Bader, École Supérieure d'Électricité, Rennes, France; L. De Nardis, Sapienza University of Rome, Rome, Italy (Eds.)

## Cognitive Radio and Networking for Heterogeneous Wireless Networks

### Recent Advances and Visions for the Future

This book, written by leading experts from academia and industry, offers a condensed overview on hot topics among the Cognitive Radios and Networks scientific and industrial communities (including those considered within the framework of the European COST Action IC0902) and presents exciting visions for the future. Examples of the subjects considered include the design of new filter bank-based air interfaces for spectrum sharing, medium access control design protocols, the design of cloud-based radio access networks, an evolutionary vision for the development and deployment of cognitive TCP/IP, and regulations relevant to the development of a spectrum sharing market. The concluding[...]

#### Features

This book, written by leading experts from academia and industry, offers a condensed overview on hot topics among the Cognitive Radios and Networks scientific and industrial communities (including those considered within the framework of the European COST Action IC0902) and presents exciting visions for the future. Examples of the subjects considered include the design of new filter bank-based air interfaces [...]

#### Contents

New types of air interface based on Filter Banks for spectrum sharing and coexistence by Medjahdi Y et al.- Cognitive Interference Alignment for Spectral Coexistence Interference Management Techniques by Krishna Sharma S et al.- Cooperative Spectrum Sensing in Cognitive Radio Networks by Tugcu T, et al.- Medium Access Control Protocols in Cognitive Radio Networks by Gavrilovska L et al.- Dynamic Channel Selection for Cognitive Femtocells by Cattani A et al.- Challenges Towards a Cloud-RAN Realization by Andreas Georgakopoulos A et al.- Automatic best wireless network selection based on[...]

#### Fields of interest

Communications Engineering, Networks; Artificial Intelligence (incl. Robotics); Signal, Image and Speech Processing

#### Target groups

Research

#### Type of publication

Monograph

More on [www.springer.com/978-3-319-01717-4](http://www.springer.com/978-3-319-01717-4)

#### Hardcover

2014. Approx. 300 p. 120 illus. (Signals and Communication Technology)  
ISBN 978-3-319-01717-4

**Due: April 4, 2014**

P. Di Giambardino, Sapienza Università di Roma, Rome, Italy; D. Iacoviello, Sapienza Università di Roma, Rome, Italy; R. Natal Jorge, Universidade do Porto, Porto, Portugal; J.M.R.S. Tavares, Universidade do Porto, Porto, Portugal (Eds.)

## Computational Modeling of Objects Presented in Images

Fundamentals, Methods and Applications

This book contains extended versions of selected papers from the 3rd edition of the International Symposium CompIMAGE. These contributions include cover methods of signal and image processing and analysis to tackle problems found in medicine, material science, surveillance, biometric, robotics, defence, satellite data, traffic analysis and architecture, image segmentation, 2D and 3D reconstruction, data acquisition, interpolation and registration, data visualization, motion and deformation analysis and 3D vision.

### Features

This book contains extended versions of selected papers from the 3rd edition of the International Symposium CompIMAGE. These contributions include cover methods of signal and image processing and analysis to tackle problems found in medicine, material science, surveillance, biometric, robotics, defence, satellite data, traffic analysis and architecture, image segmentation, 2D and 3D reconstruction, [...]

### Contents

Preface.- The surveying and representation process applied to archaeology: a quest for invariants in a highly variable context, by Carlo Bianchini, Francesco Borgogni, Alfonso Ippolito, Luca J. Senatore.- Architectural heritage and 3D models, by Mario Centofanti, Stefano Brusaporci and Vittorio Lucchese.- Flow patterns in aortic circulation associated to the Mustard procedure, by Giuseppe D'Avenio, Salvatore Donatiello, Aurelio Secinaro, Alessandro Palombo, Bruno Marino, Antonio Amodeo, Mauro Grigioni.- Fuzzy image segmentation: an automatic unsupervised method, by Silvana G. [...]

### Fields of interest

Signal, Image and Speech Processing; Computer Imaging, Vision, Pattern Recognition and Graphics; Imaging / Radiology; Materials Science (general); Mathematics (general)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-04038-7](http://www.springer.com/978-3-319-04038-7)

### Hardcover

2014. 300 p. (Lecture Notes in Computational Vision and Biomechanics, Vol. 15)  
ISBN 978-3-319-04038-7

**Due: February 28, 2014**

A. Dillmann, Deutsches Zentrum für Luft- und Raumfahrt, Göttingen, Germany; G. Heller, Airbus Deutschland, Bremen, Germany; E. Krämer, Universität Stuttgart, Stuttgart, Germany; H.-P. Kreplin, Deutsches Zentrum für Luft- und Raumfahrt, Göttingen, Germany; W. Nitsche, TU Berlin, Nitsche, Germany; U. Rist, Universität Stuttgart, Stuttgart, Germany (Eds.)

## New Results in Numerical and Experimental Fluid Mechanics IX

Contributions to the 18th STAB/DGLR Symposium, Stuttgart, Germany, 2012

This book presents contributions to the 18th biennial symposium of the German Aerospace Aerodynamics Association (STAB). The individual chapters reflect ongoing research conducted by the STAB members in the field of numerical and experimental fluid mechanics and aerodynamics, mainly for (but not limited to) aerospace applications, and cover both nationally and EC-funded projects. By addressing a number of essential research subjects, together with their related physical and mathematics fundamentals, the book provides readers with a comprehensive overview of the current research work in the field, as well as its main challenges and new directions. Current work on e.g. high aspect-ratio [...]

### Features

This book presents contributions to the 18th biennial symposium of the German Aerospace Aerodynamics Association (STAB). The individual chapters reflect ongoing research conducted by the STAB members in the field of numerical and experimental fluid mechanics and aerodynamics, mainly for (but not limited to) aerospace applications, and cover both nationally and EC-funded projects. By addressing a number of [...]

### Contents

Airplane Aerodynamics.- Optimization.- Laminar Flow Control and Transition.- Rotorcraft Aerodynamics.- Convective Flows.- Aerodynamics and Aeroacoustics of Ground Vehicles.- Aeroelasticity and Structural Dynamics.- Numerical Simulation.- Experimental Simulation and Test Techniques.- Aeroacoustics.- Biofluid Mechanics.

### Fields of interest

Engineering Fluid Dynamics; Numerical and Computational Physics; Aerospace Technology and Astronautics; Fluid- and Aerodynamics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03157-6](http://www.springer.com/978-3-319-03157-6)

### Hardcover

2014. XIII, 551 p. 427 illus., 105 illus. in color. (Notes on Numerical Fluid Mechanics and Multidisciplinary Design, Vol. 124)  
ISBN 978-3-319-03157-6

**Due: January 31, 2014**

G. Dimitrakopoulos, Democritus University of Thrace, Xanthi, Greece

## Microarchitecture of Network-on-Chip Routers

This book provides a unified overview of network-on-chip router micro-architecture, the corresponding design opportunities and challenges, and existing solutions to overcome these challenges. The discussion focuses on the heart of a NoC, the NoC router, and how it interacts with the rest of the system. Coverage includes both basic and advanced design techniques that cover the entire router design space including router organization, flow control, pipelined operation, buffering architectures, as well as allocators' structure and algorithms. Router micro-architectural options are presented in a step-by-step manner beginning from the basic design principles. Even highly sophisticated [...]

### Features

This book provides a unified overview of network-on-chip router micro-architecture, the corresponding design opportunities and challenges, and existing solutions to overcome these challenges. The discussion focuses on the heart of a NoC, the NoC router, and how it interacts with the rest of the system. Coverage includes both basic and advanced design techniques that cover the entire router design space [...]

### Contents

Link-level flow control.- Link sharing.- Step-by-step Baseline Router Design.- Advanced Router design techniques.- Virtual-Channel-based Routers.- Pipelined Routers.- Allocators micro-architecture.- Merged Switch allocation and traversal.- Switch Radix-Latency-Throughput tradeoffs.

### Fields of interest

Circuits and Systems; Electronics and Microelectronics, Instrumentation; Processor Architectures

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-4300-1](http://www.springer.com/978-1-4614-4300-1)

### Hardcover

2014. Approx. 300 p. 150 illus.  
ISBN 978-1-4614-4300-1

**Due: March 31, 2014**

Th.J. Dolan, University of Illinois, Urbana, USA; R.W. Moir, Vallecitos Molten Salt Research, Livermore, USA; W. Manheimer, L.C. Cadwallader, M.J. Neumann

## Magnetic Fusion Technology

Magnetic Fusion Technology describes the technologies that are required for successful development of nuclear fusion power plants using strong magnetic fields. These technologies include: • magnet systems, • plasma heating systems, • control systems, • energy conversion systems, • advanced materials development, • vacuum systems, • cryogenic systems, • plasma diagnostics, • safety systems, and • power plant design studies. Magnetic Fusion Technology will be useful to students and to specialists working in energy research.

### Features

Magnetic Fusion Technology describes the technologies that are required for successful development of nuclear fusion power plants using strong magnetic fields. These technologies include: • magnet systems, • plasma heating systems, • control systems, • energy conversion systems, • advanced materials development, • vacuum systems, • cryogenic systems, • plasma diagnostics, • safety systems, and • power plant [...]

### Contents

Technology Issues.- Pulsed and Water-Cooled Magnets.- Superconducting Magnets.- Plasma Heating and Current Drive.- First Wall, Blanket, and Shield.- Control Systems.- Materials Issues.- Vacuum Systems.- Cryogenic Systems.- Plasma Diagnostic Systems.- Safety and Environment.- Power Plant Designs.- Fusion-Fission Hybrids.

### Fields of interest

Nuclear Engineering; Nuclear Energy; Magnetism, Magnetic Materials; Nuclear Physics, Heavy Ions, Hadrons; Nuclear Fusion; Plasma Physics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-5555-3](http://www.springer.com/978-1-4471-5555-3)

### Hardcover

Originally published by Pergamon Press, New York, 1982

2014. XXV, 799 p. 505 illus. With online files/update. (Lecture Notes in Energy, Vol. 19)

ISBN 978-1-4471-5555-3

**Due: January 31, 2014**

A.L. Dorfmann, Tufts University, Medford, USA; R.W. Ogden

## Nonlinear Theory of Electroelastic and Magnetoelastic Interactions

This book provides a unified theory on nonlinear electro-magnetomechanical interactions of soft materials capable of large elastic deformations. The authors include an overview of the basic principles of the classic theory of electromagnetism from the fundamental notions of point charges and magnetic dipoles through to distributions of charge and current in a non-deformable continuum, time-dependent electromagnetic fields and Maxwell's equations. They summarize relevant theories of continuum mechanics, required to account for the deformability of material and present a constitutive framework for the nonlinear magneto- and electroelastic interactions in a highly deformable material. The[...]

### Features

This book provides a unified theory of nonlinear electro-magnetomechanical interactions of soft materials capable of large elastic deformations. The authors include an overview of the basic principles of the classical theory of electromagnetism from the fundamental notions of point charges and magnetic dipoles through to distributions of charge and current in a non-deformable continuum, time-dependent [...]

### Contents

Introduction.- Electromagnetic Theory.- Nonlinear Elasticity Background.- Nonlinear Electroelastic Interactions.- Electroelastic Boundary-Value Problems.- Nonlinear Magnetoelastic Interactions.- Magnetoelastic Boundary-Value Problems.- Variational Formulations in Electroelasticity and Magnetoelasticity.- Incremental Equations.- Electroelastic Stability.- Magnetoelastic Wave Propagation.- Basic Vector and Tensor Operations.- Index.

### Fields of interest

Electrical Engineering; Theoretical and Applied Mechanics; Continuum Mechanics and Mechanics of Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9595-6](http://www.springer.com/978-1-4614-9595-6)

### Hardcover

2014. X, 314 p. 19 illus.

ISBN 978-1-4614-9595-6

**Due: February 28, 2014**

S. Dua, Louisiana Tech University, Ruston, USA; U.R. Acharya, P. Dua, Louisiana Tech University, Ruston, USA (Eds.)

## Machine Learning in Healthcare Informatics

The book is a unique effort to represent a variety of techniques designed to represent, enhance, and empower multi-disciplinary and multi-institutional machine learning research in healthcare informatics. The book provides a unique compendium of current and emerging machine learning paradigms for healthcare informatics and reflects the diversity, complexity and the depth and breath of this multi-disciplinary area. The integrated, panoramic view of data and machine learning techniques can provide an opportunity for novel clinical insights and discoveries.

### Features

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### Contents

From the Contents.- Introduction to Machine Learning in Healthcare Informatics.- Wavelet-Based Machine Learning Techniques for ECG Signal Analysis.- Application of Fuzzy Logic Control for Regulation of Glucose Level of Diabetic Patient.- A Study on Machine Learning in EEG Signal Analysis.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40016-2](http://www.springer.com/978-3-642-40016-2)

### Hardcover

2014. XII, 332 p. 119 illus., 50 illus. in color. (Intelligent Systems Reference Library, Vol. 56)

ISBN 978-3-642-40016-2

**Due: December 31, 2013**

P.S. Dutta, Rensselaer Polytechnic Institute, Troy, USA

## Optoelectronics and Photonics Engineering

Optoelectronics and Photonics Engineering presents the fundamental physics concepts for modern optoelectronic and photonic devices. Rather than taking a traditional physics based approach to optoelectronics, the material presented here not only takes into consideration the underlying physics principles, but offers an engineering system design based approach. Coverage includes device designs necessary for various technological applications such as solid state lighting, light wave communication, display and photovoltaic energy generation. In addition, material presented encompasses integration processes for optical, electrical and opto-electronic components for specific systems[...]

### Features

Optoelectronics and Photonics Engineering presents the fundamental physics concepts for modern optoelectronic and photonic devices. Rather than taking a traditional physics based approach to optoelectronics, the material presented here not only takes into consideration the underlying physics principles, but offers an engineering system design based approach. Coverage includes device designs necessary [...]

### Contents

Introduction to Optoelectronics and Photonics Technologies.- Fundamentals of Light.- Optoelectronic and Photonic Materials.- Light Sources.- Photodetectors.- Solar Cells.- Optical Waveguides and Fibers.- Light Modulation.- Optoelectronic Integrated Circuits (OEICs).- Optoelectronic and Photonic Systems.

### Fields of interest

Microwaves, RF and Optical Engineering; Laser Technology and Physics, Photonics; Applied Optics, Optoelectronics, Optical Devices; Optical and Electronic Materials

### Target groups

Graduate

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-1-4614-2082-8](http://www.springer.com/978-1-4614-2082-8)

### Hardcover

2015. 950p.

ISBN 978-1-4614-2082-8

**Due: March 31, 2015**

M. Emam, Université Catholique de Louvain, Louvain-la-Neuve, Belgium; C. Roda Neve, Université Catholique de Louvain, Louvain-la-Neuve, Belgium; J.-P. Raskin, Université Catholique de Louvain, Louvain-la-Neuve, Belgium

## RF Semiconductor Devices

This book covers the RF domain from the very basics to the more complicated, from the device level to the integrated circuits level. The discussion takes the reader from the beginning of conceiving an optimized silicon wafer for RF applications, through the RF oriented device conception and the in-depth RF device characterization, in order to achieve a fully optimized, RF integrated circuit. Throughout this cycle, performance optimization is addressed from various perspectives, including high temperature (an unavoidable side effect in today's devices), low power consumption (required in all portable applications), noise, nonlinearities, crosstalk, etc.

### Features

This book covers the RF domain from the very basics to the more complicated, from the device level to the integrated circuits level. The discussion takes the reader from the beginning of conceiving an optimized silicon wafer for RF applications, through the RF oriented device conception and the in-depth RF device characterization, in order to achieve a fully optimized, RF integrated circuit. Throughout this [...]

### Contents

High frequency behavior of semiconductor devices.- Wideband characterization methodology: Hands-on.- A wide variety of MOSFET Technologies.- Integration of RF Passive Elements.- Towards a Successful RF Circuit Design.

### Fields of interest

Circuits and Systems; Microwaves, RF and Optical Engineering; Semiconductors; Characterization and Evaluation of Materials

### Target groups

Professional/practitioner

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-4246-2](http://www.springer.com/978-1-4614-4246-2)

### Hardcover

2014. Approx. 300 p. 150 illus.

ISBN 978-1-4614-4246-2

**Due: March 3, 2014**

J.M. Framiñán Torres, Universidad de Sevilla, Isla de la Cartuja, Sevilla, Spain; R. Leisten, Universität Duisburg-Essen, Duisburg, Germany; R. Ruiz García, Universidad Politécnica de Valencia, Valencia, Spain

## Manufacturing Scheduling Systems

### An Integrated View on Models, Methods and Tools

The book is devoted to the problem of manufacturing scheduling, which is the efficient allocation of jobs (orders) over machines (resources) in a manufacturing facility. It offers a comprehensive and integrated perspective on the different aspects required to design and implement systems to efficiently and effectively support manufacturing scheduling decisions. Obtaining economic and reliable schedules constitutes the core of excellence in customer service and efficiency in manufacturing operations. Therefore, scheduling forms an area of vital importance for competition in manufacturing companies. However, only a fraction of scheduling research has been translated into practice, due[...]

### Features

The book is devoted to the problem of manufacturing scheduling, which is the efficient allocation of jobs (orders) over machines (resources) in a manufacturing facility. It offers a comprehensive and integrated perspective on the different aspects required to design and implement systems to efficiently and effectively support manufacturing scheduling decisions. Obtaining economic and reliable schedules [...]

### Contents

Part I: Introduction and Context.- Introduction to Manufacturing Scheduling.- Manufacturing Scheduling in Context.- Part II: Scheduling Models.- Introduction to Scheduling Models.- Scheduling Constraints.- Objectives.- Part III: Scheduling Methods.- Overview of Scheduling Methods.- Exact Procedures.- Approximate Methods.- Multiobjective Scheduling.- Part IV: Scheduling Tools.- Introduction to Scheduling Tools.- Advanced Design of Scheduling Tools.- Part V: Scheduling Systems.- Overview of Scheduling Systems.- A Roadmap for Developing Scheduling Systems.

### Fields of interest

Industrial and Production Engineering; Operation Research / Decision Theory; Manufacturing, Machines, Tools

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-6271-1](http://www.springer.com/978-1-4471-6271-1)

### Hardcover

2014. XII, 456 p. 106 illus., 51 illus. in color.

ISBN 978-1-4471-6271-1

**Due: February 28, 2014**

P. Frisco, Heriot-Watt University, Eindhoven, United Kingdom; M. Gheorghie, M.J. Pérez-Jiménez, Universidad de Sevilla, Sevilla, Spain (Eds.)

## Applications of Membrane Computing in Systems and Synthetic Biology

Membrane Computing was introduced as a computational paradigm in Natural Computing. The models introduced, called Membrane (or P) Systems, provide a coherent platform to describe and study living cells as computational systems. Membrane Systems have been investigated for their computational aspects and employed to model problems in other fields, like: Computer Science, Linguistics, Biology, Economy, Computer Graphics, Robotics, etc. Their inherent parallelism, heterogeneity and intrinsic versatility allow them to model a broad range of processes and phenomena, being also an efficient means to solve and analyze problems in a novel way. Membrane Computing has been used to model[...]

### Features

Membrane Computing was introduced as a computational paradigm in Natural Computing. The models introduced, called Membrane (or P) Systems, provide a coherent platform to describe and study living cells as computational systems. Membrane Systems have been investigated for their computational aspects and employed to model problems in other fields, like: Computer Science, Linguistics, Biology, Economy, [...]

### Contents

From the Contents: A P Systems based Tool for Systems and Synthetic Biology.- Statistical Model Checking of Membrane Systems with Peripheral Proteins: Quantifying the Role of Estrogen in Cellular Mitosis and DNA Damage.- Molecular Diffusion and Compartmentalization in Signal Transduction Pathways: An Application of Membrane Systems to the Study of Bacterial Chemotaxis.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics); Complexity

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03190-3](http://www.springer.com/978-3-319-03190-3)

### Hardcover

2014. XVII, 266 p. 100 illus., 61 illus. in color. (Emergence, Complexity and Computation, Vol. 7) ISBN 978-3-319-03190-3

**Due: February 2014**

M.W. Fu, The Hong Kong Polytechnic University, Hong Kong, China (P.R.); W.L. Chan, The Hong Kong Polytechnic University, Hong Kong, China (P.R.)

## Micro-scaled Products Development via Microforming

Deformation Behaviours, Processes, Tooling and its Realization

'Micro-scaled Products Development via Microforming' presents state-of-the-art research on microforming processes, and focuses on the development of micro-scaled metallic parts via microforming processes. Microforming refers to the fabrication of microparts via micro-scaled plastic deformation and presents a promising micromanufacturing process. When compared to other micromanufacturing processes, microforming offers advantages such as high productivity and good mechanical properties of the deformed microparts. This book provides extensive and informative illustrations, tables and photos in order to convey this information clearly and directly to readers. Although the knowledge of[...]

### Features

'Micro-scaled Products Development via Microforming' presents state-of-the-art research on microforming processes, and focuses on the development of micro-scaled metallic parts via microforming processes. Microforming refers to the fabrication of microparts via micro-scaled plastic deformation and presents a promising micromanufacturing process. When compared to other micromanufacturing processes, [...]

### Contents

Size Effect in Micro-scaled Plastic Deformation.- Size Effect in Interfacial Friction Behavior.- Microforming Processes.- Microformed Product Quality.- BMG Microparts Fabrication.- Micropart Handling.

### Fields of interest

Nanotechnology and Microengineering; Quality Control, Reliability, Safety and Risk; Characterization and Evaluation of Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-6325-1](http://www.springer.com/978-1-4471-6325-1)

### Hardcover

2014. VIII, 168 p. 191 illus., 131 illus. in color. (Springer Series in Advanced Manufacturing) ISBN 978-1-4471-6325-1

**Due: January 10, 2014**

S.L. Futerer

## Lean Six Sigma Case Studies in the Healthcare Enterprise

This book provides a detailed description of how to apply Lean Six Sigma in the health care industry, with a special emphasis on process improvement and operations management in hospitals. The book begins with a description of the Enterprise Performance Excellence (EPE) improvement methodology developed by the author that links several methodologies including systems thinking, theory of constraints, Lean and Six Sigma to provide an enterprise-wide prioritization and value-chain view of health care. The EPE methodology helps to improve flow at the macro or value-chain level, and then identifies Lean Six Sigma detailed improvements that can further improve processes within the[...]

### Features

This book provides a detailed description of how to apply Lean Six Sigma in the health care industry, with a special emphasis on process improvement and operations management in hospitals. The book begins with a description of the Enterprise Performance Excellence (EPE) improvement methodology developed by the author that links several methodologies including systems thinking, theory of constraints, Lean [...]

### Contents

Introduction.- Underlying Concepts Evolving to Business Architecture.- Phase I: Enterprise Planning.- Phase II: Strategic Business Process Architecture Modeling.- Lean Six Sigma.- Conclusions.

### Fields of interest

Engineering Economics, Organization, Logistics, Marketing; Organization / Planning; Health Administration

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-1-4471-5582-9](http://www.springer.com/978-1-4471-5582-9)

### Hardcover

2014. XVIII, 390 p. 315 illus., 159 illus. in color. ISBN 978-1-4471-5582-9

**usually dispatched within 3 to 5 business days**

G. Genta, Politecnico di Torino, Torino, Italy; L. Morello, Politecnico di Torino, Torino, Italy; F. Cavallino, Politecnico di Torino, Torino, Italy; L. Filtri, Politecnico di Torino, Torino, Italy

## The Motor Car

### Past, Present and Future

This book is an introduction to automotive engineering, to give freshmen ideas about this technology. The text is subdivided in parts that cover all facets of the automobile, including legal and economic aspects related to industry and products, product configuration and fabrication processes, historic evolution and future developments. The first part describes how motor vehicles were invented and evolved into the present product in more than 100 years of development. The purpose is not only to supply an historical perspective, but also to introduce and discuss the many solutions that were applied (and could be applied again) to solve the same basic problems of vehicle engineering.[...]

### Features

This book is an introduction to automotive engineering, to give freshmen ideas about this technology. The text is subdivided in parts that cover all facets of the automobile, including legal and economic aspects related to industry and products, product configuration and fabrication processes, historic evolution and future developments. The first part describes how motor vehicles were invented and [...]

### Contents

Economic figures.- Vehicle and parts manufacturers.- Impact on economy.- Product development and marketing.- Vehicle diffusion.- Regulations.- Type approval and production conformity.- Environmental protection.- Occupants and pedestrians safety.- Body.- Body in white.- Interiors.- Body systems.- Chassis.- Tire.- Suspension.- Steering system.- Braking system.- Powertrain mounts.- Transmission.- Powertrain.- ICE working cycles.- ICE design.- ICE ancillaries.- Manual gearboxes.- Automatic gearboxes.- Full electric powertrains.- Hybrid powertrains.- Production systems and materials and[...]

### Fields of interest

Automotive Engineering; Industrial and Production Engineering; Characterization and Evaluation of Materials; Machinery and Machine Elements

### Target groups

Research

### Type of publication

Professional book

More on [www.springer.com/978-94-007-8551-9](http://www.springer.com/978-94-007-8551-9)

### Hardcover

2014. XXIV, 662 p. 418 illus. (Mechanical Engineering Series)

ISBN 978-94-007-8551-9

**Due: January 31, 2014**

C.C. Gillispie, R. Pisano, Université de Nantes, Nantes, France

## Lazare and Sadi Carnot

### A Scientific and Filial Relationship

Lazare Carnot was the unique example in the history of science of someone who inadvertently owed the scientific recognition he eventually achieved to earlier political prominence. He and his son Sadi produced work that derived from their training as engineering and went largely unnoticed by physicists for a generation or more, even though their respective work introduced concepts that proved fundamental when taken up later by other hands. There was, moreover, a filial as well as substantive relation between the work of father and son. Sadi applied to the functioning of heat engines the analysis that his father had developed in his study of the operation of ordinary machines.[...]

### Features

Lazare Carnot was the unique example in the history of science of someone who inadvertently owed the scientific recognition he eventually achieved to earlier political prominence. He and his son Sadi produced work that derived from their training as engineers and went largely unnoticed by physicists for a generation or more, even though their respective work introduced concepts that proved fundamental when [...]

### Contents

From the Contents: Biographical Sketch of Lazare Carnot.- The Science Of Machines: Summary of *Essai sur les machines en général*.- Geometric motions.- Moment-of-Momentum.- Moment-of-Activity-The concept of work.- Practical conclusions.- The Development Of Carnot's Mechanics: Argument of the 1778 Memoir on theory of machines.- Argument of the 1780 Memoir.

### Fields of interest

Engineering (general); History of Science; History of Mathematics; Epistemology

### Target groups

Graduate

### Type of publication

Monograph

More on [www.springer.com/978-94-017-8010-0](http://www.springer.com/978-94-017-8010-0)

### Hardcover

2014. XVI, 490 p. 111 illus., 34 illus. in color. (History of Mechanism and Machine Science, Vol. 19)

ISBN 978-94-017-8010-0

**Due: December 31, 2013**

R. Giorgi, University of Siena, Siena, Italy (Ed.)

## Multi-core and Many-core Computers

### Dataflow Parallelism in Teradevice Computing

This book provides the most up-to-date overview of EU-funded research on Multi- and Many-core Computing Systems. Several relevant projects are considered, each of them providing a unique integrated or focused team involving leading European Universities, Institutions and Industries that attack the challenges and provide different solutions to realize future computers.

### Features

This book provides the most up-to-date overview of EU-funded research on Multi- and Many-core Computing Systems. Several relevant projects are considered, each of them providing a unique integrated or focused team involving leading European Universities, Institutions and Industries that attack the challenges and provide different solutions to realize future computers.

### Contents

PRO3D.- APPLE-CORE.- SoOS.- ENCORE.- COM-CAS.- IOLANES.- ADVANCE.- HiPEAC.- EURO-CLOUD.- PEPPIER.- 2PARMA.- EURETILE.

### Fields of interest

Circuits and Systems; Electronics and Microelectronics, Instrumentation; Processor Architectures

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-1483-4](http://www.springer.com/978-1-4614-1483-4)

### Hardcover

2014. 300p. 125 illus..

ISBN 978-1-4614-1483-4

**Due: December 31, 2013**

V. González-Prida Díaz, Universidad de Sevilla, Sevilla, Spain; A. Crespo Márquez, Universidad de Sevilla, Sevilla, Spain

## After-sales Service of Engineering Industrial Assets

### A Reference Framework for Warranty Management

This book explores the practical implementation of an advanced after-sales management framework devoted to warranty management. The framework is intended for companies producing either standardized or customized products and such a management tool will facilitate organizational improvement and support innovative decision making processes for technical assistance in after-sales services. "After-sales Service of Engineering Industrial Assets" comprises a proposal for a warranty management framework, with an account of the different methods that can be used to improve decision making in the different stages of the after-sales service management process, and strategies for strengthening[...]

### Features

This book explores the practical implementation of an advanced after-sales management framework devoted to warranty management. The framework is intended for companies producing either standardized or customized products, and such a management tool will facilitate organizational improvement and support innovative decision making processes for technical assistance in after-sales services. "After-sales [...]"

### Contents

1. Introduction.- 2. Current Issues in Warranty Management.- 3. A Reference Framework for Warranty Management.- 4. Development of the Framework Stages.- 5. Extensions to the Framework.- 6. Results and Conclusions.

### Fields of interest

Quality Control, Reliability, Safety and Risk; Engineering Economics, Organization, Logistics, Marketing; Technology Management

### Target groups

Professional/practitioner

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03709-7](http://www.springer.com/978-3-319-03709-7)

### Hardcover

2014. XVIII, 429 p. 106 illus., 4 illus. in color.  
ISBN 978-3-319-03709-7

**Due: December 24, 2013**

E.S. Gopi, National Institute of Technology Trichy, Trichy, India

## Digital Speech Processing Using Matlab

Digital Speech Processing Using Matlab deals with digital speech pattern recognition, speech production model, speech feature extraction, and speech compression. The book is written in a manner that is suitable for beginners pursuing basic research in digital speech processing. Matlab illustrations are provided for most topics to enable better understanding of concepts. This book also deals with the basic pattern recognition techniques (illustrated with speech signals using Matlab) such as PCA, LDA, ICA, SVM, HMM, GMM, BPN, and KSOM.

### Features

Digital Speech Processing Using Matlab deals with digital speech pattern recognition, speech production model, speech feature extraction, and speech compression. The book is written in a manner that is suitable for beginners pursuing basic research in digital speech processing. Matlab illustrations are provided for most topics to enable better understanding of concepts. This book also deals with the [...]

### Contents

Pattern Recognition for Speech Detection.- Speech Production Model.- Feature Extraction of the Speech Signal.- Speech Compression.- Appendix A: Constrained Optimization using Lagrangian Techniques.- Appendix B: Expectation-Maximization Algorithm.- Appendix C: Diagonalization of the Matrix.- Appendix D: Condition Number.- Appendix E: Spectral Flatness.- Appendix F: Functional Blocks of the Vocal Tract and the Ear.

### Fields of interest

Signal, Image and Speech Processing; Pattern Recognition; Biomedical Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-81-322-1676-6](http://www.springer.com/978-81-322-1676-6)

### Hardcover

2014. XVI, 182 p. 103 illus. (Signals and Communication Technology)  
ISBN 978-81-322-1676-6

**usually dispatched within 3 to 5 business days  
December 31, 2013**

A. Groysman, ORT Braude College of Engineering, Karmiel, Israel

## Corrosion in Systems for Storage and Transportation of Petroleum Products and Biofuels

### Identification, Monitoring and Solutions

This book treats corrosion as it occurs and affects processes in real-world situations, and thus points the way to practical solutions. Topics described include the conditions in which petroleum products are corrosive to metals; corrosion mechanisms of petroleum products; which parts of storage tanks containing crude oils and petroleum products undergo corrosion; dependence of corrosion in tanks on type of petroleum products; aggressiveness of petroleum products to polymeric material; how microorganisms take part in corrosion of tanks and pipes containing petroleum products; which corrosion monitoring methods are used in systems for storage and transportation of petroleum[...]

### Features

This book treats corrosion as it occurs and affects processes in real-world situations, and thus points the way to practical solutions. Topics described include the conditions in which petroleum products are corrosive to metals; corrosion mechanisms of petroleum products; which parts of storage tanks containing crude oils and petroleum products undergo corrosion; dependence of corrosion in tanks on type of [...]

### Contents

Preface.- 1 Physico-Chemical Properties and Corrosiveness of Crude Oils and Petroleum Products.- 2 Fuel Additives.- 3 Fuel Oxygenates.- 4 Biofuels.- 5 Corrosion of Metallic Constructions and Equipment in Petroleum Products.- 6 Polymeric Materials in Systems for Transportation and Storage of Fuels.- 7 Corrosion Prevention and Control in Systems Containing Fuels.- 8 Monitoring and Nondestructive Testing in Systems Containing Fuels.- 9 Cases of Typical and Unusual Corrosion of Tanks.- 10 History of Crude Oil and Petroleum Products.- Appendices.- Index.

### Fields of interest

Engineering Design; Tribology, Corrosion and Coatings; Industrial Chemistry / Chemical Engineering; Fossil Fuels (incl. Carbon Capture)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-007-7883-2](http://www.springer.com/978-94-007-7883-2)

### Hardcover

2014. X, 243 p. 75 illus., 25 illus. in color.  
ISBN 978-94-007-7883-2

**Due: January 31, 2014**

M. Guiggiani, Università di Pisa, Pisa, Italy

## The Science of Vehicle Dynamics

Handling, Braking, and Ride of Road and Race Cars

Vehicle dynamics is often perceived as a quite intuitive subject. As a matter of fact, lots of people are able to drive a car. Nevertheless, without a rigorous mathematical formulation it is very difficult to truly understand the physical phenomena involved in the motion of a road vehicle. In this book, mathematical models of vehicles are developed, always paying attention to state the relevant assumptions and to provide explanations for each step. This approach allows for a deep, yet simple, analysis of the dynamics of vehicles, without having to resort to foggy concepts. The reader will soon achieve a clear understanding of the subject, which will be of great help both in dealing[...]

### Features

Vehicle dynamics is often perceived as a quite intuitive subject. As a matter of fact, lots of people are able to drive a car. Nevertheless, without a rigorous mathematical formulation it is very difficult to truly understand the physical phenomena involved in the motion of a road vehicle. In this book, mathematical models of vehicles are developed, always paying attention to state the relevant [...]

### Contents

Preface.- 1 Introduction.- 1.1 Vehicle Definition.- 1.2 Vehicle Basic Scheme.- References.- 2 Mechanics of the Wheel with Tire.- 2.1 The Tire as a Vehicle Component.- 2.2 Rim Position and Motion.- 2.3 Carcass Features.- 2.4 Contact Patch.- 2.5 Footprint Force.- 2.5.1 Perfectly Flat Road Surface.- 2.6 Tire Global Mechanical Behavior.- 2.6.1 Tire Transient Behavior.- 2.6.2 Tire Steady-State Behavior.- 2.6.3 Rolling Resistance.- 2.6.4 Speed Independence (Almost).- 2.6.5 Pure Rolling (not Free Rolling).- 2.7 Tire Slips.- 2.7.1 Rolling Velocity.- 2.7.2 Definition of Tire Slips.- 2.7.3 Slip[...]

### Fields of interest

Automotive Engineering; Vibration, Dynamical Systems, Control; Mechanical Engineering

### Target groups

Graduate

### Type of publication

Monograph

More on [www.springer.com/978-94-017-8532-7](http://www.springer.com/978-94-017-8532-7)

### Hardcover

2014. XII, 378 p. 255 illus.

ISBN 978-94-017-8532-7

**Due: January 31, 2014**

H.R. Hamidzadeh, L. Dai, R.N. Jazar

## Wave Propagation in Solid and Porous Half-Space Media

This book covers advanced topics in dynamic modeling of soil-foundation interaction, as well as the response of elastic semi-infinite media from an applications viewpoint. Advanced concepts such as solutions for analysis of elastic semi-infinite media, fluid motion in porous media, and nonlinearities in dynamic behavior are explained in great detail. Related theories and numerical analysis for vertical vibration, and rocking vibration of a rigid rectangular mass-less plate, and horizontal vibration of a rigid mass-less plate are presented. Throughout the book, a strong emphasis is placed on applications, and a laboratory model for elastic half-space medium is provided.

### Features

This book covers advanced topics in dynamic modeling of soil-foundation interaction, as well as the response of elastic semi-infinite media from an applications viewpoint. Advanced concepts such as solutions for analysis of elastic semi-infinite media, fluid motion in porous media, and nonlinearities in dynamic behavior are explained in great detail. Related theories and numerical analysis for vertical [...]

### Contents

Part I: Wave Propagation in Solid Media.- Introduction.- Dynamic Response of the Surface of an Elastic Half-Space due to an External Harmonic Disturbance.- Response of the Surface of an Elastic Half-Space due to a Vertical Harmonic Point Force.- Response of the Surface of an Elastic Half-Space due to a Horizontal Harmonic Point Force.- Dynamic Response of a Rigid Massive Base on an Elastic Half-Space.- Coupled Horizontal and Rocking Vibration of Rectangular Footing.- Response of Two Massive Bases on an Elastic Half-Space Medium.- Laboratory Model for Elastic Half-Space Medium.

### Fields of interest

Vibration, Dynamical Systems, Control; Microwaves, RF and Optical Engineering; Geotechnical Engineering & Applied Earth Sciences; Soft and Granular Matter, Complex Fluids and Microfluidics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9268-9](http://www.springer.com/978-1-4614-9268-9)

### Hardcover

2014. 400 p. 50 illus.

ISBN 978-1-4614-9268-9

**Due: July 31, 2014**

W. Hauschild, E. Lemke

## High-Voltage Test and Measuring Techniques

It is the intent of this book to combine high-voltage (HV) engineering with HV testing technique and HV measuring technique. Based on long-term experience gained by the authors as lecturer and researcher as well as member in international organizations, such as IEC and CIGRE, the book will reflect the state of the art as well as the future trends in testing and diagnostics of HV equipment to ensure a reliable generation, transmission and distribution of electrical energy. The book is intended not only for experts but also for students in electrical engineering and high-voltage engineering.

### Features

It is the intent of this book to combine high-voltage (HV) engineering with HV testing technique and HV measuring technique. Based on long-term experience gained by the authors as lecturer and researcher as well as member in international organizations, such as IEC and CIGRE, the book will reflect the state of the art as well as the future trends in testing and diagnostics of HV equipment to ensure a reliable [...]

### Contents

Basics of HV Test Techniques.- Tests with High Alternating Voltages (HVAC).- Tests with High Direct Voltages (HVDC).- Tests with High Lightning and Switching Voltages (LI/SI).- Tests with Combined and Composite Test Voltages.- HV Test Laboratories and Testing Site.

### Fields of interest

Power Electronics, Electrical Machines and Networks; Energy Technology; Measurement Science, Instrumentation

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-3-642-45351-9](http://www.springer.com/978-3-642-45351-9)

### Hardcover

2014. XIV, 239 p. 360 illus.

ISBN 978-3-642-45351-9

**Due: January 31, 2014**

A.-V.A. Ho, S. Hirai, Ritsumeikan University, Shiga, Japan

## Mechanics of Localized Slippage in Tactile Sensing and Application to Soft Sensing Systems

Localized slippage occurs during any relative sliding of soft contacts, ranging from human fingertips to robotic fingertips. Although this phenomenon is dominant for a very short time prior to gross slippage, localized slippage is a crucial factor for any to-be-developed soft sensing system to respond to slippage before it occurs. The content of this book addresses all aspects of localized slippage, including modeling and simulating it, as well as applying it to the construction of novel sensors with slip tactile perception.

### Features

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### Contents

- Chapter 1: Introduction.-- Chapter 2: Two Dimensional Beam Bundle Model of a Frictional Sliding Soft Fingertip.-- Chapter 3: Three-Dimensional Beam Bundle Model of a Sliding Soft Fingertip.-- Chapter 4: Modeling of a Sliding Human Fingertip.-- Chapter 5: Tactile Sensing via Micro Force/Moment Sensor.-- Chapter 6: Slip Perception via Soft Robotic Skin Made of Electroconductive Yarn.-- Chapter 7: Slip Perception using a Tactile Array Sensor.-- Chapter 8: Concluding Remarks.-- Appendix A: Continuous Modeling 2D Elastic[...]

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-04122-3](http://www.springer.com/978-3-319-04122-3)

### Hardcover

2014. XII, 184 p. (Springer Tracts in Advanced Robotics, Vol. 99)

ISBN 978-3-319-04122-3

**Due: January 31, 2014**

Y. Ito, Tokyo Institute of Technology, Tokyo, Japan (Ed.)

## Thought-Evoking Approaches in Engineering Problems

In creating the value-added product in not distant future, it is necessary and inevitable to establish a holistic and thought-evoking approach to the engineering problem, which should be at least associated with the inter-disciplinary knowledge and thought processes across the whole engineering spheres. It is furthermore desirable to integrate it with trans-disciplinary aspects ranging from manufacturing culture, through liberal-arts engineering and industrial sociology. The thought-evoking approach can be exemplified and typified by representative engineering problems: unveiling essential features in 'Tangential Force Ratio and Interface Pressure', prototype development for [...]

### Features

In creating the value-added product in not distant future, it is necessary and inevitable to establish a holistic and thought-evoking approach to the engineering problem, which should be at least associated with the inter-disciplinary knowledge and thought processes across the whole engineering spheres. It is furthermore desirable to integrate it with trans-disciplinary aspects ranging from manufacturing [...]

### Contents

1. Tangential Force Ratio and Its Applications to Industrial Technologies – Anti-vibration steel plate for refrigerator and derailment of rolling stock.- 2. In-process Measurement for Machining States – Sensing technology in noisy space.- 3. Ultrasonic Waves Method for Interface Pressure Measurement – What is Acceptable Definition of Interface Pressure.- 4. The Painless Injection Tube – From biomimetic technology to medical engineering.- 5. Water-jet Machining and Its Applications - Relaxation of stress concentration in cylindrical roller bearing and preferable finish of artificial[...]

### Fields of interest

Engineering Design; Technology Management; Interdisciplinary Studies

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-04119-3](http://www.springer.com/978-3-319-04119-3)

### Hardcover

2014. V, 245 p. 265 illus., 144 illus. in color. With online files/update.

ISBN 978-3-319-04119-3

**Due: April 28, 2014**

M. Ivanović, University of Novi Sad, Novi Sad, Serbia (Yugoslavia); L.C. Jain, University of Canberra, Canberra, Australia (Eds.)

## E-Learning Paradigms and Applications

### Agent-based Approach

Teaching and learning paradigms have attracted increased attention especially in the last decade. Immense developments of different ICT technologies and services have paved the way for alternative but effective approaches in educational processes. Many concepts of the agent technology, such as intelligence, autonomy and cooperation, have had a direct positive impact on many of the requests imposed on modern e-learning systems and educational processes. This book presents the state-of-the-art of e-learning and tutoring systems and discusses their capabilities and benefits that stem from integrating software agents. We hope that the presented work will be of a great use to our colleagues [...]

### Features

Teaching and learning paradigms have attracted increased attention especially in the last decade. Immense developments of different ICT technologies and services have paved the way for alternative but effective approaches in educational processes. Many concepts of the agent technology, such as intelligence, autonomy, and cooperation, have had a direct positive impact on many of the requests imposed on [...]

### Contents

Robo Newbie: A Framework for Experiments with Simulated Humanoid Robots.- Designing Intelligent Agent in Multilevel Game-based Modules for E-Learning Computer Science courses.- E-Learning and the Process of Studying in Virtual Contexts.- Inter-university Virtual Learning Environment.- An Agent based E-learning Framework for Grid Environment.- Determining the Usability Effect of Pedagogical Interface Agents on Adult Computer Literacy Training.- MASECO a Multi-Agent System for Evaluation and Classification of OERs and OCW Based on Quality Criteria.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-41964-5](http://www.springer.com/978-3-642-41964-5)

### Hardcover

2014. XVII, 273 p. 97 illus. (Studies in Computational Intelligence, Vol. 528)

ISBN 978-3-642-41964-5

**usually dispatched within 3 to 5 business days January 6, 2014**

M. Janić, Delft University of Technology, Delft, Netherlands

## Advanced Transport Systems

Analysis, Modeling, and Evaluation of Performances

This book provides a systematic analysis, modeling and evaluation of the performance of advanced transport systems. It offers an innovative approach by presenting a multidimensional examination of the performance of advanced transport systems and transport modes, useful for both theoretical and practical purposes. Advanced transport systems for the twenty-first century are characterized by the superiority of one or several of their infrastructural, technical/technological, operational, economic, environmental, social and policy performances as compared to their conventional counterparts. The advanced transport systems considered include: Bus Rapid Transit (BRT) and Personal Rapid[...]

### Features

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### Contents

1. Advanced Transport Systems – GENERAL.- 2. Advanced Transport Systems - OPERATIONS AND TECHNOLOGIES.- 3. Advanced Transport Systems - OPERATIONS AND ECONOMICS.- 4. Advanced Transport Systems - TECHNOLOGIES AND THE ENVIRONMENT.- 5. Advanced Transport Systems - INFRASTRUCTURE, TECHNOLOGIES, OPERATIONS, ECONOMICS, ENVIRONMENT, AND SOCIETY/POLICY.- 6. Advanced Transport Systems – FUTURE CONCEPTS.- 7. Advanced Transport Systems – CONTRIBUTION TO SUSTAINABILITY.

### Fields of interest

Automotive Engineering; Transportation; Civil Engineering; Landscape, Regional and Urban Planning

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-6286-5](http://www.springer.com/978-1-4471-6286-5)

### Hardcover

2014. XIII, 288 p. 101 illus., 16 illus. in color.  
ISBN 978-1-4471-6286-5

**Due: February 28, 2014**

J. Jia, Aker Solutions, Bergen, Norway

## Essentials of Applied Dynamic Analysis

This book presents up-to-date knowledge of dynamic analysis in engineering world. To facilitate the understanding of the topics by readers with various backgrounds, general principles are linked to their applications from different angles. Special interesting topics such as statistics of motions and loading, damping modeling and measurement, nonlinear dynamics, fatigue assessment, vibration and buckling under axial loading, structural health monitoring, human body vibrations, and vehicle-structure interactions etc., are also presented. The target readers include industry professionals in civil, marine and mechanical engineering, as well as researchers and students in this area.

### Features

This book presents up-to-date knowledge of dynamic analysis in engineering world. To facilitate the understanding of the topics by readers with various backgrounds, general principles are linked to their applications from different angles. Special interesting topics such as statistics of motions and loading, damping modeling and measurement, nonlinear dynamics, fatigue assessment, vibration and buckling [...]

### Contents

Introduction.- Governing Equation of Motions.- Free Vibrations for a Single-Degree-of-Freedom (SDOF) System-Translational Oscillations.- Practical Eigenanalysis and Structural Health Monitoring.- Solving Eigenproblem for Continuous Systems: Rayleigh Energy Method.- Vibration and Buckling Under Axial Loading.- Eigenfrequencies of Non-uniform Beams, Shallow and Deep Foundations.- Deterministic and Stochastic Motions.- Time Domain to Frequency Domain: Spectrum Analysis.- Statistics of Motions and Loads.- Forced Vibrations.- Calculation of Environmental Loading Based on Power Spectra.-[...]

### Fields of interest

Vibration, Dynamical Systems, Control; Quality Control, Reliability, Safety and Risk; Computational Mathematics and Numerical Analysis; Civil Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-37002-1](http://www.springer.com/978-3-642-37002-1)

### Hardcover

2014. XVIII, 423 p. 283 illus., 9 illus. in color. (Risk Engineering)  
ISBN 978-3-642-37002-1

**Due: January 31, 2014**

S.H.H. Kachapi, D.D. Ganji

## Nonlinear Equations

Analytical Methods and Applications

The present text reflects developments in the literature on nonlinear systems, while retaining a reader-friendly presentation. It has been developed from problems on nonlinear differential equations given over several years in the nonlinear dynamics team at the Mechanical Department of Babol Noshirvani University of Technology. A large variety of applied processes in both linear and nonlinear forms for important nonlinear differential equations are covered, enabling readers to solve problems without needing to refer to other sources. An introduction to systems in the context of nonlinear differential equations is provided and is suitable for courses of varying emphasis. The[...]

### Features

The present text reflects developments in the literature on nonlinear systems, while retaining a reader-friendly presentation. It has been developed from problems on nonlinear differential equations given over several years in the nonlinear dynamics team at the Mechanical Department of Babol Noshirvani University of Technology. A large variety of applied processes in both linear and nonlinear forms for [...]

### Contents

From the Contents: Exp -Function Method.- F-Expansion Method.- (G' G) -Expansion Method.- Sine-Cosine Function Method.- Tanh-Coth Method.- Homotopy Perturbation Method.- Variational Iteration Method.- Coupled Method of Homotopy Perturbation and Variational Method.- Homotopy Analysis Method.- Adomian's Decomposition Method.- Differential Transformation Method.- Energy Balance Method.- Applied Problems in Engineering and Applied sciences.

### Fields of interest

Complexity; Nonlinear Dynamics; Computational Mathematics and Numerical Analysis; Appl. Mathematics / Computational Methods of Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-907343-80-3](http://www.springer.com/978-1-907343-80-3)

### Hardcover

2014. Approx. 275 p.  
ISBN 978-1-907343-80-3

**Due: March 28, 2014**

N.K. Kasabov, Auckland University of Technology, Auckland, New Zealand (Ed.)

## Springer Handbook of Bio-/Neuro-Informatics

The Springer Handbook of Bio-/Neuro-Informatics is the first published book in one volume that explains together the basics and the state-of-the-art of two major science disciplines in their interaction and mutual relationship, namely: information sciences, bioinformatics and neuroinformatics. Bioinformatics is the area of science which is concerned with the information processes in biology and the development and applications of methods, tools and systems for storing and processing of biological information thus facilitating new knowledge discovery. Neuroinformatics is the area of science which is concerned with the information processes in biology and the development and[...]

### Features

The Springer Handbook of Bio-/Neuro-Informatics is the first published book in one volume that explains together the basics and the state-of-the-art of two major science disciplines in their interaction and mutual relationship, namely: information sciences, bioinformatics and neuroinformatics. Bioinformatics is the area of science which is concerned with the information processes in biology and [...]

### Contents

Part A (Ed. Heike Sichtig) Understanding Information Processes in Biological Systems.- Part B (Ed.: Chris Brown) Molecular Biology, Genome and Proteome Informatics.- Part C (Eds: Irwin King, Kaizhu Huang, Heike Sichtig) Machine Learning Methods.- Part D (Eds: Chris Brown, Heike .Sichtig, Irwin King, Kaizhu Huang, Francesco Masulli) Modeling Regulatory Networks: The Systems Biology Approach.- Part E (Ed.: Francesco Masulli) Bioinformatics Databases and Ontologies.- Part F (Eds: Francesco Masulli, Danilo Mandic) Bioinformatics in Medicine, Health and Ecology.- Part G (Ed.: Heike[...])

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics); Bioinformatics; Computational Biology / Bioinformatics; Neurosciences; Biomedical Engineering

### Target groups

Research

### Type of publication

Handbook

More on [www.springer.com/978-3-642-30573-3](http://www.springer.com/978-3-642-30573-3)

### Hardcover

2014. Approx. 1200 p. 500 illus. in color.  
ISBN 978-3-642-30573-3

**Due: January 29, 2014**

A. Kaveh, Iran University of Science, Teheran, Iran

## Computational Structural Analysis and Finite Element Methods

Graph theory gained initial prominence in science and engineering through its strong links with matrix algebra and computer science. Moreover, the structure of the mathematics is well suited to that of engineering problems in analysis and design. The methods of analysis in this book employ matrix algebra, graph theory and meta-heuristic algorithms, which are ideally suited for modern computational mechanics. Efficient methods are presented that lead to highly sparse and banded structural matrices. The main features of the book include: application of graph theory for efficient analysis; extension of the force method to finite element analysis; application of meta-heuristic algorithms[...]

### Features

Graph theory gained initial prominence in science and engineering through its strong links with matrix algebra and computer science. Moreover, the structure of the mathematics is well suited to that of engineering problems in analysis and design. The methods of analysis in this book employ matrix algebra, graph theory and meta-heuristic algorithms, which are ideally suited for modern computational [...]

### Contents

From the Contents: Basic concepts of structural analysis and graph theory.- Optimal force method of structural analysis.- Optimal displacement method of structural analysis.- Ordering for optimal patterns of structural matrices: graph theory methods.

### Fields of interest

Structural Mechanics; Graph Theory; Computational Science and Engineering; Computational Intelligence

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02963-4](http://www.springer.com/978-3-319-02963-4)

### Hardcover

2014. XVI, 418 p. 305 illus., 90 illus. in color.  
ISBN 978-3-319-02963-4

**Due: December 31, 2013**

M.A. Khan, Sharda University, Greater Noida, India; S. Saeed, Bahria University, Islamabad, Pakistan; A. Darwish, A. Abraham, Machine Intelligence Research Labs, Auburn, USA (Eds.)

## Embedded and Real Time System Development: A Software Engineering Perspective

### Concepts, Methods and Principles

Nowadays embedded and real-time systems contain complex software. The complexity of embedded systems is increasing, and the amount and variety of software in the embedded products are growing. This creates a big challenge for embedded and real-time software development processes and there is a need to develop separate metrics and benchmarks. "Embedded and Real Time System Development: A Software Engineering Perspective: Concepts, Methods and Principles" presents practical as well as conceptual knowledge of the latest tools, techniques and methodologies of embedded software engineering and real-time systems. Each chapter includes an in-depth investigation regarding the actual or[...]

### Features

Nowadays embedded and real-time systems contain complex software. The complexity of embedded systems is increasing, and the amount and variety of software in the embedded products are growing. This creates a big challenge for embedded and real-time software development processes and there is a need to develop separate metrics and benchmarks. "Embedded and Real Time System Development: A Software [...]

### Contents

PART I Embedded Software Development Process.- PART II Design Patterns and Development Methodology.- PART III Modeling framework.- PART IV Performance analysis, Power Management and Deployment.

### Fields of interest

Computational Intelligence; Software Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40887-8](http://www.springer.com/978-3-642-40887-8)

### Hardcover

2014. X, 330 p. 192 illus., 13 illus. in color. (Studies in Computational Intelligence, Vol. 520)  
ISBN 978-3-642-40887-8

**usually dispatched within 3 to 5 business days**

K. Khayat, Missouri University of Science and, Rolla, USA; G. De Schutter, Ghent University, Ghent, Belgium (Eds.)

## Mechanical Properties of Self-Compacting Concrete

State-of-the-Art Report of the RILEM Technical Committee 228-MPS on Mechanical Properties of Self-Compacting Concrete

The State-of-the-Art Report of RILEM Technical Committee 228-MPS on Mechanical properties of Self-Compacting Concrete (SCC) summarizes an extensive body of information related to mechanical properties and mechanical behaviour of SCC. Due attention is given to the fact that the composition of SCC varies significantly. A wide range of mechanical properties are considered, including compressive strength, stress-strain relationship, tensile and flexural strengths, modulus of elasticity, shear strength, effect of elevated temperature, such as fire spalling and residual properties after fire, in-situ properties, creep, shrinkage, bond properties and structural behaviour. A chapter on [...]

### Features

The State-of-the-Art Report of RILEM Technical Committee 228-MPS on Mechanical properties of Self-Compacting Concrete (SCC) summarizes an extensive body of information related to mechanical properties and mechanical behaviour of SCC. Due attention is given to the fact that the composition of SCC varies significantly. A wide range of mechanical properties are considered, including compressive strength, [...]

### Contents

Preface.- List of Authors.- 1. Introduction and Glossary, by G. De Schutter and K.H. Khayat.- 2. Mechanical Properties, by P. Desnerck, V. Boel, B. Craeye and P. Van Itterbeeck.- 3. Creep and Shrinkage, by A. Leemann and P. Lura.- 4. Bond Strength, by K.H. Khayat and P. Desnerck.- 5. Structural Behaviour, by M. Lachemi, A.A.A. Hassan, C. Mazzotti and M. Sonebi.- 6. Fiber Reinforced Self-Compacting Concrete (FR-SCC), by L. Ferrara.- 7. Specialty Self-Compacting Concrete, by M. Vieira, L. Ferrara, M. Sonebi and C. Shi.- 8. Summary and Conclusions, G. De Schutter and K.H. Khayat.

### Fields of interest

Building Materials; Structural Materials; Theoretical and Applied Mechanics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03244-3](http://www.springer.com/978-3-319-03244-3)

### Hardcover

2014. 240 p. (RILEM State-of-the-Art Reports, Vol. 14) ISBN 978-3-319-03244-3

Due: December 17, 2013

K.-H. Kim, Office of Naval Research, Arlington, USA; G. Chahine, J.-P. Franc, A. Karimi, Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland (Eds.)

## Advanced Experimental and Numerical Techniques for Cavitation Erosion Prediction

This book provides a comprehensive treatment of the cavitation erosion phenomenon and state-of-the-art research in the field. It is divided into two parts. Part 1 consists of seven chapters, offering a wide range of computational and experimental approaches to cavitation erosion. It includes a general introduction to cavitation and cavitation erosion a detailed description of facilities and measurement techniques commonly used in cavitation erosion studies, an extensive presentation of various stages of cavitation damage (including incubation and mass loss) and insights into the contribution of computational methods to the analysis of both fluid and material behavior. The proposed [...]

### Features

This book provides a comprehensive treatment of the cavitation erosion phenomenon and state-of-the-art research in the field. It is divided into two parts. Part 1 consists of seven chapters, offering a wide range of computational and experimental approaches to cavitation erosion. It includes a general introduction to cavitation and cavitation erosion, a detailed description of facilities and measurement [...]

### Contents

Foreword.- Preface.- Part I: Cavitation and Cavitation Erosion - Computational and Experimental Approaches.- 1 Cavitation and Cavitation Erosion.- 2 Laboratory Testing Methods of Cavitation Erosion.- 3 Pitting and Incubation Period.- 4 Cavitation Impulsive Pressures.- 5 Mass Loss and Advanced Periods of Erosion.- 6 Modeling of Cavitation Dynamics and Interaction with Material.- 7 Modeling of Material Response.- Part II: Selected Papers from the International Workshop on Advanced Experimental and Numerical Techniques for Cavitation Erosion Prediction (Grenoble, March 1-2, 2011).- 1 [...]

### Fields of interest

Engineering Fluid Dynamics; Fluid- and Aerodynamics; Tribology, Corrosion and Coatings

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-017-8538-9](http://www.springer.com/978-94-017-8538-9)

### Hardcover

2014. XVIII, 418 p. 290 illus., 220 illus. in color. (Fluid Mechanics and Its Applications, Vol. 106) ISBN 978-94-017-8538-9

Due: January 31, 2014

M.R. Knecht, T.R. Walsh, Deakin University, Geelong, Australia (Eds.)

## Bio-inspired Nanotechnology

From Surface Analysis to Applications

This book focuses on the use of bio-inspired and biomimetic methods for the fabrication and activation of nanomaterials. This includes studies concerning the binding of the biomolecules to the surface of inorganic structures, structure/function relationships of the final materials, and extensive discussions on the final applications of such biomimetic materials in unique applications including energy harvesting/storage, biomedical diagnostics, and materials assembly.

### Features

Bio-inspired Nanotechnology: From Surface Analysis to Applications focuses on the use of bio-inspired and biomimetic methods for the fabrication and activation of nanomaterials. This includes studies concerning the binding of the biomolecules to the surface of inorganic structures, structure/function relationships of the final materials, and extensive discussions on the final applications of such biomimetic [...]

### Contents

Biomimicry Big Picture/Vision Statement; Possibilities, Grand Challenges, Societal Benefits.- Basic Concepts of the bio/materials interface.- Qualitative Binding Characterization.- Quantitative Binding Characterization.- Structure-Function Relationships at the Bio-interface.- Interfacial Structure Determination.- Nucleation, Growth and Assembly.- Informatics approaches.- Molecular and Mesoscale Simulation.- Application 1 – catalysis.- Application 2 – energy.- Application 3 – biomedical.- Application 4 – optical/plasmonic.- Application 5 – green/recyclable/sustainable.- Outlook, Future [...]

### Fields of interest

Nanotechnology and Microengineering; Biomaterials; Catalysis; Nanoscale Science and Technology; Renewable and Green Energy

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9445-4](http://www.springer.com/978-1-4614-9445-4)

### Hardcover

2015. Approx. 250 p. 150 illus. ISBN 978-1-4614-9445-4

Due: March 31, 2015

J. Kober, Universität Bielefeld and Honda, Bielefeld, Germany; J. Peters

## Learning Motor Skills

From Algorithms to Robot Experiments

This book presents the state of the art in reinforcement learning applied to robotics both in terms of novel algorithms and applications. It discusses recent approaches that allow robots to learn motor skills and presents tasks that need to take into account the dynamic behavior of the robot and its environment, where a kinematic movement plan is not sufficient. The book illustrates a method that learns to generalize parameterized motor plans which is obtained by imitation or reinforcement learning, by adapting a small set of global parameters and appropriate kernel-based reinforcement learning algorithms. The presented applications explore highly dynamic tasks and exhibit a very[...]

### Features

This book presents the state of the art in reinforcement learning applied to robotics both in terms of novel algorithms and applications. It discusses recent approaches that allow robots to learn motor skills and presents tasks that need to take into account the dynamic behavior of the robot and its environment, where a kinematic movement plan is not sufficient. The book illustrates a method that [..]

### Contents

Reinforcement Learning in Robotics: A Survey.- Movement Templates for Learning of Hitting and Batting.- Policy Search for Motor Primitives in Robotics.- Reinforcement Learning to Adjust Parameterized Motor Primitives to New Situations.- Learning Prioritized Control of Motor Primitives.

### Fields of interest

Robotics and Automation; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03193-4](http://www.springer.com/978-3-319-03193-4)

### Hardcover

2014. XVI, 191 p. 56 illus., 54 illus. in color. (Springer Tracts in Advanced Robotics, Vol. 97)  
ISBN 978-3-319-03193-4

**usually dispatched within 3 to 5 business days**

O. Kramer, Carl von Ossietzky, Oldenburg, Germany

## A Brief Introduction to Continuous Evolutionary Optimization

Practical optimization problems are often hard to solve, in particular when they are black boxes and no further information about the problem is available except via function evaluations. This work introduces a collection of heuristics and algorithms for black box optimization with evolutionary algorithms in continuous solution spaces. The book gives an introduction to evolution strategies and parameter control. Heuristic extensions are presented that allow optimization in constrained, multimodal and multi-objective solution spaces. An adaptive penalty function is introduced for constrained optimization. Meta-models reduce the number of fitness and constraint function calls in[...]

### Features

Practical optimization problems are often hard to solve, in particular when they are black boxes and no further information about the problem is available except via function evaluations. This work introduces a collection of heuristics and algorithms for black box optimization with evolutionary algorithms in continuous solution spaces. The book gives an introduction to evolution strategies and parameter [..]

### Contents

Part I Foundations.- Part II Advanced Optimization.- Part III Learning.- Part IV Appendix.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03421-8](http://www.springer.com/978-3-319-03421-8)

### Softcover

2014. XI, 94 p. 29 illus., 24 illus. in color. (SpringerBriefs in Computational Intelligence)  
ISBN 978-3-319-03421-8

**usually dispatched within 3 to 5 business days  
December 31, 2013**

L.T. Kóczy, Széchenyi István University, Győr, Hungary; C.R. Pozna, Széchenyi István University, Győr, Hungary; J. Kacprzyk, Polish Academy of Sciences, Warsaw, Poland (Eds.)

## Issues and Challenges of Intelligent Systems and Computational Intelligence

This carefully edited book contains contributions of prominent and active researchers and scholars in the broadly perceived area of intelligent systems. The book is unique both with respect to the width of coverage of tools and techniques, and to the variety of problems that could be solved by the tools and techniques presented. The editors have been able to gather a very good collection of relevant and original papers by prominent representatives of many areas, relevant both to the theory and practice of intelligent systems, artificial intelligence, computational intelligence, soft computing, and the like. The contributions have been divided into 7 parts presenting first more[...]

### Features

This carefully edited book contains contributions of prominent and active researchers and scholars in the broadly perceived area of intelligent systems. The book is unique both with respect to the width of coverage of tools and techniques, and to the variety of problems that could be solved by the tools and techniques presented. The editors have been able to gather a very good collection of relevant and [..]

### Contents

Part I Fuzzy Systems: Theory.- Part II Fuzzy Systems: Application.- Part III Neural Network.- Part IV Clustering and Image Processing.- Part V Robotic Systems.- Part VI Data Manipulation.- Part VII Control.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03205-4](http://www.springer.com/978-3-319-03205-4)

### Hardcover

2014. XIII, 283 p. 131 illus., 55 illus. in color. (Studies in Computational Intelligence, Vol. 530)  
ISBN 978-3-319-03205-4

**Due: January 9, 2014**

A. Küchler, FH Würzburg - Schweinfurt, Schweinfurt, Germany

## High Voltage Engineering

Fundamentals - Technology - Applications

High voltage engineering is not only a key technology for a safe, economic and sustainable electric power supply. Furthermore, a broad spectrum of applications includes most of the innovative fields in engineering and science, such as medical engineering, laser technology, industrial production, automotive engineering, food technology, bioengineering, nanotechnology, environmental protection, recycling, electromagnetic compatibility, scientific research or superconductivity. "High Voltage Engineering: Fundamentals – Technologies – Applications" is based on the 3rd edition of the leading German standard work "Hochspannungstechnik", which is both a textbook for students and a [...]

### Features

High voltage engineering is not only a key technology for a safe, economic and sustainable electric power supply. Furthermore, a broad spectrum of applications includes most of the innovative fields in engineering and science, such as medical engineering, laser technology, industrial production, automotive engineering, food technology, bioengineering, nanotechnology, environmental protection, recycling, [...]

### Contents

Electric Fields in Dielectrics.- Dielectric Strength.- System Properties of Dielectrics.- Insulating Materials.- Testing, Measuring, Diagnosis.- Applications, Insulating Systems.

### Fields of interest

Power Electronics, Electrical Machines and Networks

### Target groups

Professional/practitioner

### Type of publication

Monograph

More on [www.springer.com/978-3-642-11992-7](http://www.springer.com/978-3-642-11992-7)

### Hardcover

Original german edition published with title: Hochspannungstechnik  
2014. 600p. 400 illus..  
ISBN 978-3-642-11992-7

**Due: March 28, 2014**

A. Laviere, Georgia Institute of Technology, Atlanta, USA; M. Egerstedt (Eds.)

## Controls and Art

Inquiries at the Intersection of the Subjective and the Objective

Dancing humanoids, robotic art installations, and music generated by mathematically precise methods are no longer science fiction; in fact they are the subject of this book. This first-of-its-kind anthology assembles technical research that makes such creations possible. In order to mechanize something as enigmatic and personal as dance, researchers must delve deeply into two distinct academic disciplines: control theory and art. Broadly, this research uses techniques from the world of art to inspire methods in control, enables artistic endeavours using advanced control theory and aids in the analysis of art using metrics devised by a systems theoretic approach. To ensure that artistic [...]

### Features

Dancing humanoids, robotic art installations, and music generated by mathematically precise methods are no longer science fiction; in fact they are the subject of this book. This first-of-its-kind anthology assembles technical research that makes such creations possible. In order to mechanize something as enigmatic and personal as dance, researchers must delve deeply into two distinct academic [...]

### Contents

Metric Preference Learning with Applications to Motion Imitation.- In the Dance Studio: An Art and Engineering Exploration of Human Flocking.- Dancing Robots: The Control Theory of Communication Through Movement.- So You Think You Can Dance?: Rhythmic Flight Performances with Quadcopters.- Robotic Puppets and the Engineering of Autonomous Theatre.- The Artistic Geometry of Consensus Protocols.- Generating Music from Flocking Dynamics.- "Are We There Yet?": Visual Tracking of Visitors Under Variable Lighting.- Style-based Robotic Motion in Contemporary Dance Performance.

### Fields of interest

Control; Arts; Popular Science in Mathematics / Natural Science / Technology; Robotics and Automation

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03903-9](http://www.springer.com/978-3-319-03903-9)

### Hardcover

2014. VI, 231 p. 107 illus., 71 illus. in color.  
ISBN 978-3-319-03903-9

**Due: February 28, 2014**

M. Lech, RMIT University, Melbourne, Australia; I. Song, James Cook University Australia, Singapore, Singapore; P. Yellowlees, University of California, Davis, Sacramento, USA; J. Diederich (Eds.)

## Mental Health Informatics

This book introduces approaches that have the potential to transform the daily practice of psychiatrists and psychologists. This includes the asynchronous communication between mental health care providers and clients as well as the automation of assessment and therapy. Speech and language are particularly interesting from the viewpoint of psychological assessment. For instance, depression may change the characteristics of voice in individuals and these changes can be detected by a special form of speech analysis. Computational screening methods that utilize speech and language can detect subtle changes and alert clinicians as well as individuals and caregivers. The use of online [...]

### Features

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### Contents

Mental Health Informatics: Current approaches.- The Rise of Person-Centered Healthcare and the Influence of Health Informatics and Social Network Applications on Mental Health Care.- The Changing Doctor-Patient Relationship – a Move to Anytime, Anywhere.- Novel Approaches to Clinical Care in Mental Health - from Asynchronous Telepsychiatry to Virtual Reality.- Speech Analysis for Mental Health Assessment using Support Vector Machines.- Social Networks and Automated Mental Health Screening.- Generating Explanations from Support Vector Machines for Psychological Classifications.- An [...]

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics); Biomedical Engineering; Health Informatics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-38549-0](http://www.springer.com/978-3-642-38549-0)

### Hardcover

2014. X, 253 p. 85 illus. (Studies in Computational Intelligence, Vol. 491)  
ISBN 978-3-642-38549-0

**usually dispatched within 3 to 5 business days**

C.M. Leech

## The Modelling and Analysis of the Mechanics of Ropes

This book considers the modelling and analysis of the many types of ropes, linear fibre assemblies. The construction of these structures is very diverse and in the work these are considered from the modelling point of view. As well as the conventional twisted structures, braid and plaited structures and parallel assemblies are modelled and analysed, first for their assembly and secondly for their mechanical behaviour. Also since the components are assemblies of components, fibres into yarns, into strands, and into ropes the hierarchical nature of the construction is considered. The focus of the modelling is essentially toward load extension behaviour but there is reference to bending[...]

### Features

This book considers the modelling and analysis of the many types of ropes, linear fibre assemblies. The construction of these structures is very diverse and in the work these are considered from the modelling point of view. As well as the conventional twisted structures, braid and plaited structures and parallel assemblies are modelled and analysed, first for their assembly and secondly for their mechanical [...]

### Contents

1 Introduction.- 2 Fibre Geometry and Fibre Mechanics.- 3 Component Path Geometries.- 4 Transversely Continuous Structures.- 5 Hierarchical Structures.- 6 Transversely Discrete Structures.- 7 Contact Force and Friction.- 8 Component Wear, Life and Heating.- Appendix - Tentative Scaling Relations.

### Fields of interest

Engineering (general)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-007-7840-5](http://www.springer.com/978-94-007-7840-5)

### Hardcover

2014. XI, 123 p. 79 illus., 38 illus. in color. (Solid Mechanics and Its Applications, Vol. 209)  
ISBN 978-94-007-7840-5

**usually dispatched within 3 to 5 business days**

F.L. Lewis, H. Zhang, K. Hengster-Movric, A. Das, Danfoss Power Solutions (US) Compan, Ames, USA

## Cooperative Control of Multi-Agent Systems

### Optimal and Adaptive Design Approaches

Cooperative Control of Multi-Agent Systems extends optimal control and adaptive control design methods to multi-agent systems on communication graphs. It develops Riccati design techniques for general linear dynamics for cooperative state feedback design, cooperative observer design, and cooperative dynamic output feedback design. Both continuous-time and discrete-time dynamical multi-agent systems are treated. Optimal cooperative control is introduced and neural adaptive design techniques for multi-agent nonlinear systems with unknown dynamics, which are rarely treated in literature are developed. Results spanning systems with first-, second- and on up to general high-order nonlinear[...]

### Features

Task complexity, communication constraints, flexibility and energy-saving concerns are all factors that may require a group of autonomous agents to work together in a cooperative manner. Applications involving such complications include mobile robots, wireless sensor networks, unmanned aerial vehicles (UAVs), spacecraft, and so on. In such networked multi-agent scenarios, the restrictions imposed by the [...]

### Contents

Introduction to Synchronization in Nature and Physics and Cooperative Control for Multi-agent Systems on Graphs.- Algebraic Graph Theory and Cooperative Control Consensus.- Part I Distributed Optimal Design for Cooperative Control in Multi-agent Systems on Graphs.- Local Optimal Design for Cooperative Control in Multi-agent Systems on Graphs.- Riccati Design for Synchronization of Discrete-Time Systems.- Cooperative Globally Optimal Control for Multi-agent Systems on Directed Graph Topologies.- Graphical Games: Distributed Multi-player Games on Graphs.- Part II Distributed Adaptive[...]

### Fields of interest

Control; Artificial Intelligence (incl. Robotics); Computational Intelligence; Aerospace Technology and Astronautics; Communications Engineering, Networks

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-5573-7](http://www.springer.com/978-1-4471-5573-7)

### Hardcover

2014. XX, 307 p. 80 illus., 59 illus. in color. (Communications and Control Engineering)  
ISBN 978-1-4471-5573-7

**Due: December 31, 2013**

S. Li, J.M.R.S. Tavares, Universidade do Porto, Porto, Portugal (Eds.)

## Shape Analysis in Medical Image Analysis

This book contains thirteen contributions from invited experts of international recognition addressing important issues in shape analysis in medical image analysis, including techniques for image segmentation, registration, modelling and classification and applications in biology, as well as in cardiac, brain, spine, chest, lung and clinical practice. This volume treats topics such as for example, anatomic and functional shape representation and matching; shape-based medical image segmentation; shape registration; statistical shape analysis; shape deformation; shape-based abnormality detection; shape tracking and longitudinal shape analysis; machine learning for shape modeling and[...]

### Features

This book contains thirteen contributions from invited experts of international recognition addressing important issues in shape analysis in medical image analysis, including techniques for image segmentation, registration, modelling and classification, and applications in biology, as well as in cardiac, brain, spine, chest, lung and clinical practice. This volume treats topics such as, anatomic [...]

### Contents

Preface.- Part I: Methods and Models.- 1. Shape Analysis for Brain Structures: A Review, by Bernard Ng, Matthew Toews, Stanley Durrleman, Yonggang Shi.- 2. Shape Analysis in Molecular Imaging, by Fei Gao, Pengcheng Shi.- 3. Variational Shape Representation for Modeling, Elastic Registration and Segmentation, by Amal A. Farag, Ahmed Shalaby, Aly A. Farag.- 4. Image Computing Based on Bayesian Models, by Zhong Xue, Stephen Wong.- 5. Shape-Constrained Deformable Models and Applications in Medical Imaging, by Jürgen Weese, Irina Waechter-Stehle, Lyubomir Zagorchev, Jochen Peters.- Part II: [...]

### Fields of interest

Biomedical Engineering; Image Processing and Computer Vision; Imaging / Radiology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03812-4](http://www.springer.com/978-3-319-03812-4)

### Hardcover

2014. VII, 438 p. 220 illus. (Lecture Notes in Computational Vision and Biomechanics, Vol. 14)  
ISBN 978-3-319-03812-4

**Due: January 31, 2014**

Y. Lim, Samsung Techwin RD Center, Seongnam-si, Korea, Republic of (South Korea); R. Venugopal, Intellicass Inc., Montreal, Canada; A.G. Ulsoy, University of Michigan, Ann Arbor, USA

## Process Control for Sheet-Metal Stamping

Process Modeling, Controller Design and Shop-Floor Implementation

Process Control for Sheet-Metal Stamping presents a comprehensive and structured approach to the design and implementation of controllers for the sheet metal stamping process. The use of process control for sheet-metal stamping greatly reduces defects in deep-drawn parts and can also yield large material savings from reduced scrap. Sheet-metal forming is a complex process and most often characterized by partial differential equations that are numerically solved using finite-element techniques. In this book, twenty years of academic research are reviewed and the resulting technology transitioned to the industrial environment. The sheet-metal stamping process is modeled in a manner[...]

### Features

Process Control for Sheet-Metal Stamping presents a comprehensive and structured approach to the design and implementation of controllers for the sheet metal stamping process. The use of process control for sheet-metal stamping greatly reduces defects in deep-drawn parts and can also yield large material savings from reduced scrap. Sheet-metal forming is a complex process and most often characterized [...]

### Contents

Equipment and Material Flow Control.- Recent Advances in Stamping Control.- Machine Control.- Laboratory Development of Process Control.- Process Control.- Auto-Tuning and Adaptive Control.- Direct and Indirect Adaptive Process Control.

### Fields of interest

Control; Operating Procedures, Materials Treatment; Automotive Engineering; Aerospace Technology and Astronautics

### Target groups

Professional/practitioner

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-6283-4](http://www.springer.com/978-1-4471-6283-4)

### Hardcover

2014. XI, 140 p. 79 illus., 67 illus. in color. (Advances in Industrial Control)

ISBN 978-1-4471-6283-4

**Due: January 31, 2014**

Y. Liu, Michigan State University, East Lansing, USA; E.C. Alcolija, Michigan State University, East Lansing, USA; S. Chakrabarty, Michigan State University, East Lansing, USA

## Forward Error-Correcting Biosensors

Principles, Modeling and Fabrication

This book explores a new area in the interface of biomedical devices and information engineering, describing an error-free biosensor technology, which employs error-correcting techniques to improve the reliability and accuracy of biosensors and biochips.

It is the first comprehensive book to introduce the application of error-correcting methods into bionanotechnology, in order to achieve error-free performance.

### Features

This book explores a new area in the interface of biomedical devices and information engineering, describing an error-free biosensor technology, which employs error-correcting techniques to improve the reliability and accuracy of biosensors and biochips.

It is the first comprehensive book to introduce the application of error-correcting methods into bionanotechnology, in order to achieve error-free performance.

### Contents

Fundamentals of Biosensors; Reliability of Biosensors.- Design of Forward Error-Correction Biosensors: Biosensor Encoder.- Design of Forward Error-Correction Biosensors: Biosensor Decoder.- Biosensor Instrumentation.- System Integration and BioMEMS.- Summary and Conclusions.

### Fields of interest

Circuits and Systems; Computer-Aided Engineering (CAD, CAE) and Design

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-3156-5](http://www.springer.com/978-1-4614-3156-5)

### Hardcover

2014. Approx. 200 p.

ISBN 978-1-4614-3156-5

**Due: February 28, 2014**

T. Lodygowski, Poznan University of Technology, Poznan, Poland; A. Rusinek, National Engineering School, Metz, France (Eds.)

## Constitutive Relations under Impact Loadings

Experiments, Theoretical and Numerical Aspects

The book describes behavior of materials (ductile, brittle and composites) under impact loadings and high strain rates. The three aspects: experimental, theoretical and numerical are in the focus of interest. Hopkinson bars are mainly used as experimental devices to describe dynamic behavior of materials. The precise description of experimental techniques and interpretation of wave interaction are carefully discussed. Theoretical background refers to rate dependent thermo viscoplastic formulation. This includes the discussion of well posedness of initial boundary value problems and the solution of the system of governing equations using numerical methods. Explicit time integration is[...]

### Features

The book describes behavior of materials (ductile, brittle and composites) under impact loadings and high strain rates. The three aspects: experimental, theoretical and numerical are in the focus of interest. Hopkinson bars are mainly used as experimental devices to describe dynamic behavior of materials. The precise description of experimental techniques and interpretation of wave interaction are carefully [...]

### Contents

Testing with bars from dynamic to quasi-static.- Dynamic testing of materials.- Material behavior under dynamics loading, modeling and experiments.- Analysis of some high-speed impact problems in the aircraft industry.- Computer estimation of plastic strain localization and failure for large strain rates using viscoplasticity.- Inelastic flow and failure of metallic solids accounting for asymmetry of elastic range and micro-shear banding.

### Fields of interest

Continuum Mechanics and Mechanics of Materials; Characterization and Evaluation of Materials; Structural Mechanics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-7091-1767-5](http://www.springer.com/978-3-7091-1767-5)

### Hardcover

2014. VIII, 286 p. 172 illus. (CISM International Centre for Mechanical Sciences, Vol. 552)

ISBN 978-3-7091-1767-5

**Due: January 28, 2014**

Y. Ma, Honeywell, Golden Valley, USA; G. Guo, West Virginia University, Morgantown, USA (Eds.)

## Support Vector Machines Applications

Support vector machines (SVM) have both a solid mathematical background and practical applications. This book focuses on the recent advances and applications of the SVM, such as image processing, medical practice, computer vision, and pattern recognition, machine learning, applied statistics, and artificial intelligence. The aim of this book is to create a comprehensive source on support vector machine applications.

### Features

Support vector machines (SVM) have both a solid mathematical background and good performance in practical applications. This book focuses on the recent advances and applications of the SVM in different areas, such as image processing, medical practice, computer vision, pattern recognition, machine learning, applied statistics, business intelligence, and artificial intelligence. The aim of this book is to [...]

### Contents

Augmented-SVM for gradient observations with application to learning multiple-attractor dynamics.- Multi-class Support Vector Machine.- Novel Inductive and Transductive Transfer Learning Approaches Based on Support Vector Learning.- Security Evaluation of Support Vector Machines in Adversarial Environments.- Application of SVMs to the Bag-of-features Model— A Kernel Perspective.- Support Vector Machines for Neuroimage Analysis: Interpretation from Discrimination.- Kernel Machines for Imbalanced Data Problem and the Use in Biomedical Applications.- Soft Biometrics from Face Images using[...]

### Fields of interest

Signal, Image and Speech Processing; Computer Communication Networks; Complexity; Computational Intelligence; Computer Systems Organization and Communication Networks; Communications Engineering, Networks

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02299-4](http://www.springer.com/978-3-319-02299-4)

### Hardcover

2014. VI, 297 p. 85 illus., 61 illus. in color. ISBN 978-3-319-02299-4

**Due: February 28, 2014**

M. Macdonald (Ed.)

## Advances in Solar Sailing

This book presents the best contributions of the the Third International Symposium on Solar Sailing Glasgow, 11 – 13 June 2013. It is a rapid snap-shot of the state-of-the art of solar sail technology in 2013 across the globe, capturing flight programs, technology development programs and new technology and application concepts. The book contains contributions from all of the leading figures in the field, including NASA, JAXA, ESA & DLR as well as university and industry experts. It therefore provides a unique reference point for the solar sail technology. The book also includes key contributions from the prospective users of solar sail technology, which will allow the technology to [...]

### Features

This book presents the best contributions of the the Third International Symposium on Solar Sailing Glasgow, 11 – 13 June 2013. It is a rapid snap-shot of the state-of-the art of solar sail technology in 2013 across the globe, capturing flight programs, technology development programs and new technology and application concepts. The book contains contributions from all of the leading figures in the field, [...]

### Fields of interest

Aerospace Technology and Astronautics; Extraterrestrial Physics, Space Sciences; Optical and Electronic Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-34906-5](http://www.springer.com/978-3-642-34906-5)

### Hardcover

2014. VI, 963 p. 607 illus., 477 illus. in color. (Astronautical Engineering) ISBN 978-3-642-34906-5

**Due: January 31, 2014**

C. Machado, University of Minho, Braga, Portugal; J.P. Davim, University of Aveiro, Aveiro, Portugal (Eds.)

## Human Resource Management and Technological Challenges

This book focuses on the challenges and changes that new technologies bring to human resources (HR) of modern organizations. It examines the technological implications of the last changes taking place and how they affect the management and motivation of human resources belonging to these organizations. It looks for ways to understand and perceive how organizational HR, individually and as a team, conceptualize, invent, adapt, define and use organizational technology, as well as how they are constrained by features of it. The book provides discussion and the exchange of information on principles, strategies, models, techniques, methodologies and applications of human resources[...]

### Features

This book focuses on the challenges and changes that new technologies bring to human resources (HR) of modern organizations. It examines the technological implications of the last changes taking place and how they affect the management and motivation of human resources belonging to these organizations. It looks for ways to understand and perceive how organizational HR, individually and as a team, [...]

### Contents

HRM politics and practices.- Technological impact and consequences in HRM.- Communication, participation and involvement.- Equal opportunities.- Health and safety.- How work is changing.- Matching human and technological needs.- Motivating people in a technological environment.- Knowledge management in the new technologies era.- Developing leadership skills.- Global management.- Matching human and technological needs.- Strategic management.- Innovation and change.- Entrepreneurship.- Employee motivation.- Learning skills and styles in technology innovation.- Training effectiveness.

### Fields of interest

Engineering Economics, Organization, Logistics, Marketing; Technology Management; Personnel Management

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02617-6](http://www.springer.com/978-3-319-02617-6)

### Hardcover

2014. VII, 170 p. 16 illus. (Management and Industrial Engineering) ISBN 978-3-319-02617-6

**usually dispatched within 3 to 5 business days  
December 31, 2013**

S. Mao, Auburn University, Auburn, USA

## Video over Cognitive Radio Networks

When Quality of Service Meets Spectrum

This book focuses on the problem of video streaming over emerging cognitive radio (CR) networks. The book discusses the problems and techniques for scalable video streaming over cellular cognitive radio networks, ad hoc CR networks, cooperative CR networks, and femtocell CR networks. The authors formulate these problems and propose optimal algorithms to solve these problems. Also the book analyzes the proposed algorithms and validates the algorithms with simulations.

### Features

This book focuses on the problem of video streaming over emerging cognitive radio (CR) networks. The book discusses the problems and techniques for scalable video streaming over cellular cognitive radio networks, ad hoc CR networks, cooperative CR networks, and femtocell CR networks. The author formulates these problems and proposes optimal algorithms to solve these problems. Also, the book analyzes the [...]

### Contents

Introduction.- Video over Cellular CR networks.- Video over Cooperative CR Networks.- Video over Femto CR Networks.- Video over Multi-hop CR Networks.- Conclusion and Open Problems.

### Fields of interest

Communications Engineering, Networks; Computer Systems Organization and Communication Networks; Signal, Image and Speech Processing

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-4956-0](http://www.springer.com/978-1-4614-4956-0)

### Hardcover

2014. XIII, 129 p. 37 illus., 36 illus. in color. ISBN 978-1-4614-4956-0

**Due: January 31, 2014**

R. Martinez-Guerra, CINVESTAV-IPN, Mexico, D.F., Mexico; J.L. Mata-Machuca, Instituto Politecnico Nacional, Mexico, D.F., Mexico

## Fault Detection and Diagnosis in Nonlinear Systems

A Differential and Algebraic Viewpoint

The high reliability required in industrial processes has created the necessity of detecting abnormal conditions, called faults, while processes are operating. The term fault generically refers to any type of process degradation, or degradation in equipment performance because of changes in the process's physical characteristics, process inputs or environmental conditions. This book is about the fundamentals of fault detection and diagnosis in a variety of nonlinear systems which are represented by ordinary differential equations. The fault detection problem is approached from a differential algebraic viewpoint, using residual generators based upon high-gain nonlinear auxiliary[...]

### Features

The high reliability required in industrial processes has created the necessity of detecting abnormal conditions, called faults, while processes are operating. The term fault generically refers to any type of process degradation, or degradation in equipment performance because of changes in the process's physical characteristics, process inputs or environmental conditions. This book is about the [...]

### Contents

From the Contents: The Fault Detection Problem in Nonlinear Systems using Residual Generators.- Fault Detection in CSTR Using Nonlinear Observers.- Diagnosis of Nonlinear Systems Using the Concept of Differential Transcendence Degree.- On Nonlinear System Diagnosis Via High-Gain Observers: a Case Study.

### Fields of interest

Vibration, Dynamical Systems, Control; Nonlinear Dynamics; Industrial and Production Engineering; Mathematical Applications in the Physical Sciences

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03046-3](http://www.springer.com/978-3-319-03046-3)

### Hardcover

2014. XVII, 128 p. 31 illus., 11 illus. in color. (Understanding Complex Systems) ISBN 978-3-319-03046-3

**usually dispatched within 3 to 5 business days**

A. Medeisis, Vilnius Gediminas Technical University, Vilnius, Lithuania; O. Holland, King's College London, London, United Kingdom (Eds.)

## Cognitive Radio Policy and Regulation

Techno-Economic Studies to Facilitate Dynamic Spectrum Access

This book offers a timely reflection on how the proliferation of advanced wireless communications technologies, particularly cognitive radio (CR) can be enabled by thoroughly-considered policy and appropriate regulation. It looks at the prospects of CR from the divergent standpoints of technological development and economic market reality. The book provides a broad survey of various techno-economic and policy aspects of CR development and provides the reader with an understanding of the complexities involved as well as a toolbox of possible solutions to enable the evolutionary leap towards successful implementation of disruptive CR technology or indeed any other novel wireless[...]

### Features

This book offers a timely reflection on how the proliferation of advanced wireless communications technologies, particularly cognitive radio (CR) can be enabled by thoroughly-considered policy and appropriate regulation. It looks at the prospects of CR from the divergent standpoints of technological development and economic market reality. The book provides a broad survey of various techno-economic and [...]

### Contents

From the Contents: Part I State-of-the-Art in Policy and Regulation of the Radio Spectrum: Introduction.- Part II Deployment Scenarios for Cognitive Radio: Introduction.- Part III Technical Approaches for Improved Spectrum Sharing.- Part IV Economic Aspects of CR Policy and Regulation.- Part V Impact Assessment of CR/SDR Regulation.- Part VI Novel Approaches to Spectrum Policy and Regulation for the Age of CR.- Part VII Summary and Recommendations.

### Fields of interest

Communications Engineering, Networks; Technology Management; Information Systems and Communication Service

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-04021-9](http://www.springer.com/978-3-319-04021-9)

### Hardcover

2014. XII, 425 p. 161 illus., 61 illus. in color. With online files/update. (Signals and Communication Technology) ISBN 978-3-319-04021-9

**Due: April 8, 2014**

U. Meyer-Baese, Florida State University, Tallahassee, USA

## Digital Signal Processing with Field Programmable Gate Arrays

Field-Programmable Gate Arrays (FPGAs) are revolutionizing digital signal processing. The efficient implementation of front-end digital signal processing algorithms is the main goal of this book. It starts with an overview of today's FPGA technology, devices and tools for designing state-of-the-art DSP systems. A case study in the first chapter is the basis for more than 40 design examples throughout. The following chapters deal with computer arithmetic concepts, theory and the implementation of FIR and IIR filters, multirate digital signal processing systems, DFT and FFT algorithms, advanced algorithms with high future potential, and adaptive filters. Each chapter contains exercises.[...]

### Features

Field-Programmable Gate Arrays (FPGAs) are revolutionizing digital signal processing. The efficient implementation of front-end digital signal processing algorithms is the main goal of this book. It starts with an overview of today's FPGA technology, devices, and tools for designing state-of-the-art DSP systems. A case study in the first chapter is the basis for more than 40 design examples throughout. The [...]

### Contents

Computer Arithmetic.- Finite Impulse Response (FIR) Digital Filters.- Infinite Impulse Response (IIR) Digital Filters.- Multirate Signal Processing.- Fourier Transforms.- Advanced Topics.- Adaptive Filters.- Microprocessor Design.

### Fields of interest

Signal, Image and Speech Processing; Control Structures and Microprogramming; Circuits and Systems

### Target groups

Graduate

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-3-642-45308-3](http://www.springer.com/978-3-642-45308-3)

### Hardcover

2014. 750 p. With DVD. (Signals and Communication Technology)

ISBN 978-3-642-45308-3

**Due: April 27, 2014**

G.H. Miley, University of Illinois, Urbana, USA; S.K. Murali

## Inertial Electrostatic Confinement (IEC) Fusion

### Fundamentals and Applications

This book provides readers with an introductory understanding of Inertial Electrostatic Confinement (IEC), a type of fusion meant to retain plasma using an electrostatic field. IEC provides a unique approach for plasma confinement, as it offers a number of spin-off applications, such as a small neutron source for Neutron Activity Analysis (NAA), that all work towards creating fusion power. The IEC has been identified in recent times as an ideal fusion power unit because of its ability to burn aneutronic fuels like p-B11 as a result of its non-Maxwellian plasma dominated by beam-like ions. This type of fusion also takes place in a simple mechanical structure small in size, which also [...]

### Features

This book provides readers with an introductory understanding of Inertial Electrostatic Confinement (IEC), a type of fusion meant to retain plasma using an electrostatic field. IEC provides a unique approach for plasma confinement, as it offers a number of spin-off applications, such as a small neutron source for Neutron Activity Analysis (NAA), that all work towards creating fusion power. The IEC [...]

### Contents

Background, Basics, and Experimental IECs.- Theory of Potential Well Traps in the IEC.- Gas Discharges in Gridded IECs.- High-Voltage Stalk Design for IECs.- IEC Grid Materials and Construction.- Effect of Grid Geometry on IEC Device Performance.- Space Charge Limited Flow.- Ion and Electron Current Scaling Issues.- Cylindrical and Other IEC Geometries.- Various Other IEC Concepts and Experiments.- IEC Diagnostics.- Potential Applications.- Reactor Confinement Theory and IEC Reactor Visions.

### Fields of interest

Nuclear Engineering; Nuclear Fusion; Engineering Thermodynamics, Heat and Mass Transfer; Atoms and Molecules in Strong Fields, Laser Matter Interaction

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9337-2](http://www.springer.com/978-1-4614-9337-2)

### Hardcover

2014. XVIII, 400 p. 292 illus., 200 illus. in color.

ISBN 978-1-4614-9337-2

**Due: December 31, 2013**

K. Moiseev, Intel, Haifa, Israel; A. Kolodny, Technion, Haifa, Israel; S. Wimer, Technion, Haifa, Israel

## Multi-Net Optimization of VLSI Interconnect

This book covers layout design and layout migration methodologies for optimizing multi-net wire structures in advanced VLSI interconnects. Scaling-dependent models for interconnect power, interconnect delay and crosstalk noise are covered in depth, and several design optimization problems are addressed, such as minimization of interconnect power under delay constraints, or design for minimal delay in wire bundles within a given routing area. A handy reference or a guide for design methodologies and layout automation techniques, this book provides a foundation for physical design challenges of interconnect in advanced integrated circuits.

### Features

This book covers layout design and layout migration methodologies for optimizing multi-net wire structures in advanced VLSI interconnects. Scaling-dependent models for interconnect power, interconnect delay and crosstalk noise are covered in depth, and several design optimization problems are addressed, such as minimization of interconnect power under delay constraints, or design for minimal delay in wire [...]

### Contents

The driving forces behind the interconnect scaling problem: economy and technology.- Interconnect aspects in design methodology and CAD tools.- Scaling dependent electrical modeling of interconnects.- Scaling dependent design metrics and performance goals.- Classification of interconnect sizing problems.- Single-net optimizations.- Multi-net sizing in wire bundles.- Multi-net sizing in general layouts.

### Fields of interest

Circuits and Systems; Electronics and Microelectronics, Instrumentation; Processor Architectures

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-0820-8](http://www.springer.com/978-1-4614-0820-8)

### Hardcover

2014. 300p. 100 illus..

ISBN 978-1-4614-0820-8

**Due: December 2013**

O. Moreira, H. Corporaal, Eindhoven University of Technology, Eindhoven, Netherlands

## Scheduling Real-Time Streaming Applications onto an Embedded Multiprocessor

This book provides a comprehensive overview of the state-of-the-art, data flow-based techniques for the analysis, modeling and mapping technologies of concurrent applications on multi-processors. The authors present a flow for designing embedded hard/firm real-time multiprocessor streaming applications, based on data flow formalisms, with a particular focus on wireless modem applications. Architectures are described for the design tools and run-time scheduling and resource management of such a platform.

### Features

This book provides a comprehensive overview of the state-of-the-art, data flow-based techniques for the analysis, modeling and mapping technologies of concurrent applications on multi-processors. The authors present a flow for designing embedded hard/firm real-time multiprocessor streaming applications, based on data flow formalisms, with a particular focus on wireless modem applications. Architectures are [...]

### Contents

Setting the Stage.- Software Framework.- Data Flow Computation Models.- Temporal Analysis.- Resource Modeling and Compile Time Scheduling.- Mode-Controlled Data Flow.- Resource Manager.- Demonstrator.- Conclusions and Further Work.

### Fields of interest

Circuits and Systems; Processor Architectures; Signal, Image and Speech Processing

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-01245-2](http://www.springer.com/978-3-319-01245-2)

### Hardcover

2014. X, 193 p. (Embedded Systems, Vol. 24)  
ISBN 978-3-319-01245-2

**usually dispatched within 3 to 5 business days**

H.A. Moser, LuxSpace Särl, Betzdorf, Luxembourg

## Systems Engineering, Systems Thinking, and Learning

A Case Study in Space Industry

This book focuses on systems engineering, systems thinking, and how that thinking can be learned in practice. It describes a novel analytical framework based on activity theory for understanding how systems thinking evolves and how it can be improved to support multidisciplinary teamwork in the context of system development and systems engineering. This method, developed using data collected over four years from three different small space systems engineering organizations, can be applied in a wide variety of work activities in the context of engineering design and beyond in order to monitor and analyze multidisciplinary interactions in working teams over time. In addition, the book[...]

### Features

This book focuses on systems engineering, systems thinking, and how that thinking can be learned in practice. It describes a novel analytical framework based on activity theory for understanding how systems thinking evolves and how it can be improved to support multidisciplinary teamwork in the context of system development and systems engineering. This method, developed using data collected over four years [...]

### Contents

Part I Introduction of the research project.- Part II Analysis and findings of the empirical studies.- Part III Results, intervention, and contributions.

### Fields of interest

Complexity; Industrial and organisational psychology; Aerospace Technology and Astronautics; Organization / Planning; Engineering Design

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03894-0](http://www.springer.com/978-3-319-03894-0)

### Hardcover

2014. XX, 328 p. 94 illus., 8 illus. in color. (Understanding Complex Systems)  
ISBN 978-3-319-03894-0

**usually dispatched within 3 to 5 business days**

**December 31, 2013**

G. Mzyk, Wrocław University of Technology, Wrocław, Poland

## Combined Parametric-Nonparametric Identification of Block-Oriented Systems

This book considers a problem of block-oriented nonlinear dynamic system identification in the presence of random disturbances. This class of systems includes various interconnections of linear dynamic blocks and static nonlinear elements, e.g., Hammerstein system, Wiener system, Wiener-Hammerstein ("sandwich") system and additive NARMAX systems with feedback. Interconnecting signals are not accessible for measurement. The combined parametric-nonparametric algorithms, proposed in the book, can be selected dependently on the prior knowledge of the system and signals. Most of them are based on the decomposition of the complex system identification task into simpler local sub-problems by[...]

### Features

This book considers a problem of block-oriented nonlinear dynamic system identification in the presence of random disturbances. This class of systems includes various interconnections of linear dynamic blocks and static nonlinear elements, e.g., Hammerstein system, Wiener system, Wiener-Hammerstein ("sandwich") system and additive NARMAX systems with feedback. Interconnecting signals are not accessible for [...]

### Contents

Hammerstein system.- Wiener system.- Wiener-Hammerstein (sandwich) system.- Large-scale interconnected systems.- Structure detection and model order selection.- Time-varying systems.- Simulation studies.- Summary.

### Fields of interest

Control; Systems Theory, Control; Nonlinear Dynamics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03595-6](http://www.springer.com/978-3-319-03595-6)

### Softcover

2014. XVI, 238 p. 68 illus. (Lecture Notes in Control and Information Sciences, Vol. 454)  
ISBN 978-3-319-03595-6

**usually dispatched within 3 to 5 business days**

W.H. Müller, TU Berlin, Berlin, Germany

## An Expedition to Continuum Theory

This book introduces field theory as required in solid and fluid mechanics as well as in electromagnetism. It includes the necessary applied mathematical framework of tensor algebra and tensor calculus, using an inductive approach particularly suited to beginners. It is geared toward undergraduate classes in continuum theory for engineers in general, and more specifically to courses in continuum mechanics. Students will gain a sound basic understanding of the subject as well as the ability to solve engineering problems by applying the general laws of nature in terms of the balances for mass, momentum, and energy in combination with material-specific relations in terms of constitutive[...]

### Features

This book introduces field theory as required in solid and fluid mechanics as well as in electromagnetism. It also presents the necessary mathematical framework, namely tensor algebra and tensor calculus, by using an inductive approach, which makes it particularly suitable for beginners. In general, the book can be used in undergraduate classes on continuum theory and, more specifically, in courses on [..]

### Contents

1 Prologue.- 2 Coordinate transformations.- 3 Balances (in particular in Cartesian systems).- 4 Spatial derivatives of fields.- 5 Balance equations in skew curvilinear coordinate systems.- 6 Constitutive equations in arbitrary coordinate systems.- 7 A first glance on field equations.- 8 Observers and frames of reference in classical continuum theory.- 9 Problems of linear elasticity.- 10 Selected problems for Newtonian and Maxwellian fluids.- 11 Introduction to time-independent plasticity theory.- 12 Entropy.- 13 Fundamentals of electromagnetic field theory.- Picture sources.- Subject index.

### Fields of interest

Theoretical and Applied Mechanics; Classical Continuum Physics; Materials Science (general)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-007-7798-9](http://www.springer.com/978-94-007-7798-9)

### Hardcover

2014. XIII, 399 p. 161 illus., 32 illus. in color. (Solid Mechanics and Its Applications, Vol. 210)  
ISBN 978-94-007-7798-9

**Due: January 31, 2014**

N. Nedjah, University of Rio de Janeiro, Rio de Janeiro, Brazil; L. de M. Mourelle, State University of Rio de Janeiro, Rio de Janeiro, Brazil

## Hardware for Soft Computing and Soft Computing for Hardware

Single and Multi-Objective Evolutionary Computation (MOEA), Genetic Algorithms (GAs), Artificial Neural Networks (ANNs), Fuzzy Controllers (FCs), Particle Swarm Optimization (PSO) and Ant colony Optimization (ACO) are becoming omnipresent in almost every intelligent system design. Unfortunately, the application of the majority of these techniques is complex and so requires a huge computational effort to yield useful and practical results. Therefore, dedicated hardware for evolutionary, neural and fuzzy computation is a key issue for designers. With the spread of reconfigurable hardware such as FPGAs, digital as well as analog hardware implementations of such computation become[...]

### Features

Single and Multi-Objective Evolutionary Computation (MOEA), Genetic Algorithms (GAs), Artificial Neural Networks (ANNs), Fuzzy Controllers (FCs), Particle Swarm Optimization (PSO) and Ant colony Optimization (ACO) are becoming omnipresent in almost every intelligent system design. Unfortunately, the application of the majority of these techniques is complex and so requires a huge computational effort to [..]

### Contents

Part I Hardware for Soft Computing.- Part II Soft Computing for Hardware.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics); Computer Graphics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03109-5](http://www.springer.com/978-3-319-03109-5)

### Hardcover

2014. XII, 198 p. 124 illus. (Studies in Computational Intelligence, Vol. 529)  
ISBN 978-3-319-03109-5

**usually dispatched within 3 to 5 business days**

H.-N. Nguyen, Ecole Centrale Paris, Paris, France

## Constrained Control of Uncertain, Time-Varying, Discrete-Time Systems

### An Interpolation-Based Approach

A comprehensive development of interpolating control, this monograph demonstrates the reduced computational complexity of a ground-breaking technique compared with the established model predictive control. The text deals with the regulation problem for linear, time-invariant, discrete-time uncertain dynamical systems having polyhedral state and control constraints, with and without disturbances, and under state or output feedback. For output feedback a non-minimal state-space representation is used with old inputs and outputs as state variables. Constrained Control of Uncertain, Time-Varying, Discrete-time Systems details interpolating control in both its implicit and explicit forms.[...]

### Features

A comprehensive development of interpolating control, this monograph demonstrates the reduced computational complexity of a ground-breaking technique compared with the established model predictive control. The text deals with the regulation problem for linear, time-invariant, discrete-time uncertain dynamical systems having polyhedral state and control constraints, with and without disturbances, and under [..]

### Contents

Introduction.- Part I Background.- Set-Theoretic Methods in Control.- Optimal and Constrained Control: An Overview.- Part II Interpolating Control.- Interpolating Control: Nominal State Feedback Case.- Interpolating Control: Robust State Feedback Case.- Interpolating Control: Output Feedback Case.- Part III Applications.- High-order Examples.- A Benchmark Problem: The Non-Isothermal Continuous Stirred Tank Reactor.

### Fields of interest

Control; Systems Theory, Control; Calculus of Variations and Optimal Control; Optimization

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02826-2](http://www.springer.com/978-3-319-02826-2)

### Softcover

2014. XIV, 196 p. 97 illus. (Lecture Notes in Control and Information Sciences, Vol. 451)  
ISBN 978-3-319-02826-2

**Due: January 31, 2014**

A. Nijholt, University of Twente, Enschede, Netherlands (Ed.)

## Playful User Interfaces

Interfaces that Invite Social and Physical Interaction

The book is about user interfaces to applications that have been designed for social and physical interaction. The interfaces are 'playful', that is, users feel challenged to engage in social and physical interaction because that will be fun. The topics that will be present in this book are interactive playgrounds, urban games using mobiles, sensor-equipped environments for playing, child-computer interaction, tangible game interfaces, interactive tabletop technology and applications, full-body interaction, exertion games, persuasion, engagement, evaluation and user experience. Readers of the book will not only get a survey of state-of-the-art research in these areas, but the chapters[...]

### Features

The book is about user interfaces to applications that have been designed for social and physical interaction. The interfaces are 'playful', that is, users feel challenged to engage in social and physical interaction because that will be fun. The topics that will be present in this book are interactive playgrounds, urban games using mobiles, sensor-equipped environments for playing, child-computer interaction, [...]

### Contents

Introduction.- Public Interfaces Requiring Full-Body Interaction.- Multiplayer Mobile Games.- Smart Ball Applications.- New Exertion Games.- Tabletop Interfaces for Children with Autism.- Tabletop Interfaces for Children's Museum Visits.- Tangible Game Interfaces.- Child-Computer Interaction.- Interactive Playgrounds for Children.- Engagement in Playful Collective Interaction.- Head Up Games.

### Fields of interest

Computational Intelligence; User Interfaces and Human Computer Interaction; Mathematical Applications in Computer Science

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-981-4560-95-5](http://www.springer.com/978-981-4560-95-5)

### Hardcover

2014. Approx. 350 p. 100 illus. (Gaming Media and Social Effects)  
ISBN 978-981-4560-95-5

**Due: April 18, 2014**

B. Noia, K. Chakrabarty, Duke University, Durham, USA

## Design-for-Test and Test Optimization Techniques for TSV-based 3D Stacked ICs

This book describes innovative techniques to address the testing needs of 3D stacked integrated circuits (ICs) that utilize through-silicon-vias (TSVs) as vertical interconnects. The authors identify the key challenges facing 3D IC testing and present results that have emerged from cutting-edge research in this domain. Coverage includes topics ranging from die-level wrappers, self-test circuits, and TSV probing to test-architecture design, test scheduling, and optimization. Readers will benefit from an in-depth look at test-technology solutions that are needed to make 3D ICs a reality and commercially viable.

### Features

This book describes innovative techniques to address the testing needs of 3D stacked integrated circuits (ICs) that utilize through-silicon-vias (TSVs) as vertical interconnects. The authors identify the key challenges facing 3D IC testing and present results that have emerged from cutting-edge research in this domain. Coverage includes topics ranging from die-level wrappers, self-test circuits, and TSV [...]

### Contents

Introduction.- Wafer Stacking and 3D Memory Test.- Built-in Self-Test for TSVs.- Pre-Bond TSV Test Through TSV Probing.- Pre-Bond TSV Test Through TSV Probing.- Overcoming the Timing Overhead of Test Architectures on Inter-Die Critical Paths.- Post-Bond Test Wrappers and Emerging Test Standards.- Test-Architecture Optimization and Test Scheduling.- Conclusions.

### Fields of interest

Circuits and Systems; Processor Architectures; Semiconductors

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-3-319-02377-9](http://www.springer.com/978-3-319-02377-9)

### Hardcover

2014. XVIII, 245 p. 133 illus., 115 illus. in color.  
ISBN 978-3-319-02377-9

**usually dispatched within 3 to 5 business days**

P.A.J. Nuyts, Tri ICT, Kessel-Lo, Belgium; P. Reynaert, KU Leuven, ESAT-MICAS, Heverlee, Belgium; W. Dehaene, K.U. Leuven, Heverlee, Belgium

## Continuous-Time Digital Front-Ends for Multistandard Wireless Transmission

This book describes the design of fully digital multistandard transmitter front-ends which can directly drive one or more switching power amplifiers, thus eliminating all other analog components. After reviewing different architectures, the authors focus on polar architectures using pulse width modulation (PWM), which are entirely based on unlocked delay lines and other continuous-time digital hardware. As a result, readers are enabled to shift accuracy concerns from the voltage domain to the time domain, to coincide with submicron CMOS technology scaling. The authors present different architectural options and compare them, based on their effect on the signal and spectrum quality.[...]

### Features

This book describes the design of fully digital multistandard transmitter front-ends which can directly drive one or more switching power amplifiers, thus eliminating all other analog components. After reviewing different architectures, the authors focus on polar architectures using pulse width modulation (PWM), which are entirely based on unlocked delay lines and other continuous-time digital hardware. [...]

### Contents

Introduction.- Digital Transmitter Architectures: Overview.- High-Level Analysis of Fully Digital PWM Transmitters.- Continuous-time Digital Design Techniques.- A 65-nm CMOS Fully Digital Reconfigurable Transmitter Front-End for Class-E PA based on Baseband PWM.- A 40-nm CMOS Fully Digital Reconfigurable Transmitter with Class-D Pas using Baseband and RF PWM.- Conclusions and Future Work.

### Fields of interest

Circuits and Systems; Electronics and Microelectronics, Instrumentation; Signal, Image and Speech Processing

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03924-4](http://www.springer.com/978-3-319-03924-4)

### Hardcover

2014. XXIII, 328 p. 164 illus., 3 illus. in color. (Analog Circuits and Signal Processing)  
ISBN 978-3-319-03924-4

**Due: January 31, 2014**

Y. Okuyama

## Discrete Control Systems

Discrete Control Systems establishes a basis for the analysis and design of discretized/quantized control systems for continuous physical systems. Beginning with the necessary mathematical foundations and system-model descriptions, the text moves on to derive a robust stability condition. To keep a practical perspective on the uncertain physical systems considered, most of the methods treated are carried out in the frequency domain. As part of the design procedure, modified Nyquist–Hall and Nichols diagrams are presented and discretized proportional–integral–derivative control schemes are reconsidered. Schemes for model-reference feedback and discrete-type observers are proposed.[...]

### Features

Discrete Control Systems establishes a basis for the analysis and design of discretized/quantized control systems for continuous physical systems. Beginning with the necessary mathematical foundations and system-model descriptions, the text moves on to derive a robust stability condition. To keep a practical perspective on the uncertain physical systems considered, most of the methods treated are carried [...]

### Contents

Mathematical Descriptions and Models.- Discretized Feedback Systems.- Robust Stability Analysis.- Model-Reference Feedback and PID Control.- Multiloop Feedback Systems.- Interval Polynomials and Robust Performance.- Relation to Discrete-Event Systems.

### Fields of interest

Control; Systems Theory, Control

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-5666-6](http://www.springer.com/978-1-4471-5666-6)

### Hardcover

2014. XII, 243 p. 164 illus., 99 illus. in color. ISBN 978-1-4471-5666-6

**Due: January 31, 2014**

T. Orłowska-Kowalska, F. Blaabjerg, J. Rodriguez, University of Federico Santa Maria, Valpariso, Chile (Eds.)

## Advanced and Intelligent Control in Power Electronics and Drives

Power electronics and variable frequency drives are continuously developing multidisciplinary fields in electrical engineering and it is practically not possible to write a book covering the entire area by one individual specialist. Especially by taking account the recent fast development in the neighboring fields like control theory, computational intelligence and signal processing, which all strongly influence new solutions in control of power electronics and drives. Therefore, this book is written by individual key specialist working on the area of modern advanced control methods which penetrates current implementation of power converters and drives. Although some of the presented[...]

### Features

Power electronics and variable frequency drives are continuously developing multidisciplinary fields in electrical engineering, and it is practically not possible to write a book covering the entire area by one individual specialist. Especially by taking account the recent fast development in the neighboring fields like control theory, computational intelligence and signal processing, which all strongly [...]

### Contents

Part I: Advanced Power Electronic Control in Renewable Energy Sources.-Part II: Predictive Control of Power Converters and Drives.-Part III: Neuro and Nonlinear Control of Power Converters and Drives.

### Fields of interest

Computational Intelligence; Control; Artificial Intelligence (incl. Robotics); Power Electronics, Electrical Machines and Networks

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03400-3](http://www.springer.com/978-3-319-03400-3)

### Hardcover

2014. XII, 434 p. 284 illus., 161 illus. in color. (Studies in Computational Intelligence, Vol. 531) ISBN 978-3-319-03400-3

**Due: January 31, 2014**

J.L. Otegui

## Failure Analysis

Fundamentals and Applications in Mechanical Components

This book addresses the failures of structural elements, i.e. those components whose primary mission is to withstand mechanical loads. The book is intended as a self-contained source for those with different technical grades, engineers and scientists but also technicians in the field can benefit from its reading.

### Features

This book addresses the failures of structural elements, i.e. those components whose primary mission is to withstand mechanical loads. The book is intended as a self-contained source for those with different technical grades, engineers and scientists but also technicians in the field can benefit from its reading.

### Contents

Introduction.- Tools for Preliminary Analysis of a Mechanical Failure.- Tools for the Microscopic Analysis of a Mechanical Failure.- Damage and Failure Mechanisms.- Characterization and Testing of Materials.- Mechanical Modelling Tools applied to Failure Analysis.- Root Cause Analysis.- Damage and Failure Mechanisms in Machinery.- Mitigation and Life Prediction.- Consequences of a Failure Analysis.

### Fields of interest

Mechanical Engineering; Continuum Mechanics and Mechanics of Materials; Characterization and Evaluation of Materials; Building Repair and Maintenance

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-3-319-03909-1](http://www.springer.com/978-3-319-03909-1)

### Hardcover

2014. XXI, 313 p. 236 illus. ISBN 978-3-319-03909-1

**Due: January 31, 2014**

V. Panasyuk, V. Marukha, V. Sylovanyuk

## Injection Technologies for the Repair of Damaged Concrete Structures

This book analyzes the most important achievements in science and engineering practice concerning operational factors that cause damage to concrete and reinforced concrete structures. It includes methods for assessing their strength and service life, especially those that are based on modern concepts of the fracture mechanics of materials. It also includes basic approaches to the prediction of the remaining service life for long-term operational structures. Much attention is paid to injection technologies for restoring the serviceability of damaged concrete and reinforced concrete structures. In particular, technologies for remedying holes, cracks, corrosion damages etc. The books[...]

### Features

This book analyzes the most important achievements in science and engineering practice concerning operational factors that cause damage to concrete and reinforced concrete structures. It includes methods for assessing their strength and service life, especially those that are based on modern concepts of the fracture mechanics of materials. It also includes basic approaches to the prediction of the remaining [...]

### Contents

1 Introduction.- 2 General characteristics of concretes and reinforced concretes.- 3 Predominant damages and injuries in reinforced concrete structures arising during use.- 4 Implementation of injection technologies for the renewal and restoration of serviceability of concrete or reinforced concrete structures.- 5 Injection materials: Technological, mechanical, and service characteristics.- 6 Serviceability estimations for elements of building structures.- 7 Methods and devices for technical diagnostic of long-term concrete structures.- 8 Implementation of injection technologies in the[...]

### Fields of interest

Continuum Mechanics and Mechanics of Materials; Structural Materials; Civil Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-007-7907-5](http://www.springer.com/978-94-007-7907-5)

### Hardcover

2014. XI, 230 p. 50 illus.  
ISBN 978-94-007-7907-5

**Due: December 31, 2013**

E.I. Papageorgiou, Technological Educational, Lamia, Greece (Ed.)

## Fuzzy Cognitive Maps for Applied Sciences and Engineering

From Fundamentals to Extensions and Learning Algorithms

Fuzzy Cognitive Maps (FCM) constitute cognitive models in the form of fuzzy directed graphs consisting of two basic elements: the nodes, which basically correspond to "concepts" bearing different states of activation depending on the knowledge they represent, and the "edges" denoting the causal effects that each source node exercises on the receiving concept expressed through weights. Weights take values in the interval  $[-1,1]$ , which denotes the positive, negative or neutral causal relationship between two concepts. An FCM can be typically obtained through linguistic terms, inherent to fuzzy systems, but with a structure similar to the neural networks, which facilitates data[...]

### Features

Fuzzy Cognitive Maps (FCM) constitute cognitive models in the form of fuzzy directed graphs consisting of two basic elements: the nodes, which basically correspond to "concepts" bearing different states of activation depending on the knowledge they represent, and the "edges" denoting the causal effects that each source node exercises on the receiving concept expressed through weights. Weights [...]

### Contents

Methods and Algorithms for Fuzzy Cognitive Map-based Modeling.- Fuzzy Cognitive Maps as representations of mental models and group beliefs.- FCM Relationship Modeling for Engineering Systems.- Using RuleML for Representing and Prolog for Simulating Fuzzy Cognitive Maps.- Fuzzy Web Knowledge Aggregation, Representation, and Reasoning for Online Privacy and Reputation Management.- Decision Making by Rule-Based Fuzzy Cognitive Maps: An Approach to Implement Student-Centered Education.- Extended Evolutionary Learning of Fuzzy Cognitive Maps for the Prediction of Multivariate Time-Series.- [...]

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-39738-7](http://www.springer.com/978-3-642-39738-7)

### Hardcover

2014. XXVII, 395 p. 147 illus., 2 illus. in color. With online files/update. (Intelligent Systems Reference Library, Vol. 54)

ISBN 978-3-642-39738-7

**usually dispatched within 3 to 5 business days January 3, 2014**

K.P. Parker

## The Boundary-Scan Handbook

Aimed at electronics industry professionals, this 4th edition of the Boundary Scan Handbook describes recent changes to the IEEE1149.1 Standard Test Access Port and Boundary-Scan Architecture. This updated edition features new chapters on the possible effects of the changes on the work of the practicing test engineers and the new 1149.8.1 standard. Anyone needing to understand the basics of boundary scan and its practical industrial implementation will need this book.

### Features

Aimed at electronics industry professionals, this 4th edition of the Boundary Scan Handbook describes recent changes to the IEEE1149.1 Standard Test Access Port and Boundary-Scan Architecture. This updated edition features new chapters on the possible effects of the changes on the work of the practicing test engineers and the new 1149.8.1 standard. Anyone needing to understand the basics of boundary scan and [...]

### Contents

Boundary-Scan Basics and Vocabulary.- Boundary-Scan Description Language (BSDL).- Boundary-Scan Testing.- Advanced Boundary-Scan Topics.- Design for Boundary-Scan Test.- Analog Measurement Basics.- IEEE 1149.4: Analog Boundary-Scan.- IEEE 1149.6: Testing Advanced I/O.- IEEE 1532: In-System Configuration.- IEEE 1149.8.- Affects of changes for 1149.1.

### Fields of interest

Circuits and Systems; Processor Architectures; Semiconductors

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-3-319-01173-8](http://www.springer.com/978-3-319-01173-8)

### Hardcover

2014. 500 p. 200 illus.  
ISBN 978-3-319-01173-8

**Due: March 28, 2014**

C. Pautasso, University of Lugano, Lugano, Switzerland; E. Wilde, UC Berkeley, Berkeley, USA; R. Alarcón, Pontificia Universidad Católica de Chile, Santiago, Chile (Eds.)

## REST: Advanced Research Topics and Practical Applications

This book serves as a starting point for people looking for a deeper principled understanding of REST, its applications, its limitations, and current research work in the area and as an architectural style. The authors focus on applying REST beyond Web applications (i.e., in enterprise environments), and in reusing established and well-understood design patterns. The book examines how RESTful systems can be designed and deployed, and what the results are in terms of benefits and challenges encountered in the process. This book is intended for information and service architects and designers who are interested in learning about REST, how it is applied, and how it is being advanced.

### Features

This book serves as a starting point for people looking for a deeper principled understanding of REST, its applications, its limitations, and current research work in the area and as an architectural style. The authors focus on applying REST beyond Web applications (i.e., in enterprise environments), and in reusing established and well-understood design patterns. The book examines how RESTful systems can be [...]

### Contents

Introduction.- Communication and Capability URLs in COAST-based Decentralized Services.- Interoperability of two RESTful protocols: HTTP and CoAP.- Enabling Real-Time Resource Oriented Architectures with REST Observers.- Survey of Semantic Description of REST APIs.- APIs to A ordances: A New Paradigm for Services on the Web.- Leveraging Linked Data to Build Hypermedia-Driven Web APIs.- RestML: Modeling RESTful Web Services.- A Lightweight Coordination Approach For Resource-Centric Collaborations.- Connecting the Dots: Using REST and Hypermedia to publish Digital Content.- In-Process[...]

### Fields of interest

Communications Engineering, Networks; Information Systems and Communication Service; Signal, Image and Speech Processing

### Target groups

Research

### Type of publication

Professional book

More on [www.springer.com/978-1-4614-9298-6](http://www.springer.com/978-1-4614-9298-6)

### Hardcover

2014. IX, 222 p. 58 illus., 25 illus. in color.  
ISBN 978-1-4614-9298-6

**Due: December 31, 2013**

W. Pedrycz, University of Alberta, Edmonton, Canada; S.-M. Chen (Eds.)

## Social Networks: A Framework of Computational Intelligence

This volume provides the audience with an updated, in-depth and highly coherent material on the conceptually appealing and practically sound information technology of Computational Intelligence applied to the analysis, synthesis and evaluation of social networks. The volume involves studies devoted to key issues of social networks including community structure detection in networks, online social networks, knowledge growth and evaluation, and diversity of collaboration mechanisms. The book engages a wealth of methods of Computational Intelligence along with well-known techniques of linear programming, Formal Concept Analysis, machine learning, and agent modeling. Human-centricity is[...]

### Features

This volume provides the audience with an updated, in-depth and highly coherent material on the conceptually appealing and practically sound information technology of Computational Intelligence applied to the analysis, synthesis and evaluation of social networks. The volume involves studies devoted to key issues of social networks including community structure detection in networks, online social networks, [...]

### Contents

From the Contents: Detecting Community Structures in Networks Using A Linear-Programming Based Approach.- Personalization of Social Networks: Adaptive Semantic Layer Approach.- Social Network and Formal Concept Analysis.- Explaining Variation in State Involvement in Cyber Attacks: A Social Network Approach.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02992-4](http://www.springer.com/978-3-319-02992-4)

### Hardcover

2014. XI, 440 p. 168 illus. (Studies in Computational Intelligence, Vol. 526)  
ISBN 978-3-319-02992-4

**Due: December 20, 2013**

H. Ponce Espinosa, Instituto Tecnológico de Estudios, Col. Ejidos de Huipulco Tlalpan, Mexico; P. Ponce-Cruz, A. Molina, Instituto Tecnológico de Estudios Superiores, Tlalpan, Mexico

## Artificial Organic Networks

### Artificial Intelligence Based on Carbon Networks

This monograph describes the synthesis and use of biologically-inspired artificial hydrocarbon networks (AHNs) for approximation models associated with machine learning and a novel computational algorithm with which to exploit them. The reader is first introduced to various kinds of algorithms designed to deal with approximation problems and then, via some conventional ideas of organic chemistry, to the creation and characterization of artificial organic networks and AHNs in particular. The advantages of using organic networks are discussed with the rules to be followed to adapt the network to its objectives. Graph theory is used as the basis of the necessary formalism. Simulated and[...]

### Features

This monograph describes the synthesis and use of biologically-inspired artificial hydrocarbon networks (AHNs) for approximation models associated with machine learning and a novel computational algorithm with which to exploit them. The reader is first introduced to various kinds of algorithms designed to deal with approximation problems and then, via some conventional ideas of organic chemistry, to the [...]

### Contents

Introduction to Modeling Problems.- Chemical Organic Compounds.- Artificial Organic Networks.- Artificial Hydrocarbon Networks.- Enhancements of Artificial Hydrocarbon Networks.- Notes on Modeling Problems Using Artificial Hydrocarbon Networks.- Applications of Artificial Hydrocarbon Networks.- Appendices.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics); Biochemical Engineering; Simulation and Modeling

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02471-4](http://www.springer.com/978-3-319-02471-4)

### Hardcover

2014. XII, 228 p. 192 illus., 56 illus. in color. With online files/update. (Studies in Computational Intelligence, Vol. 521)  
ISBN 978-3-319-02471-4

**usually dispatched within 3 to 5 business days**

C.A. Rabbath, N. Léchevin

## Discrete-Time Control System Design with Applications

This unique book provides a bridge between digital control theory and vehicle guidance and control practice. It presents practical techniques of digital redesign and direct discrete-time design suitable for a real-time implementation of controllers and guidance laws at multiple rates and with and computational techniques. The theory of digital control is given as theorems, lemmas, and propositions. The design of the digital guidance and control systems is illustrated by means of step-by-step procedures, algorithms, and case studies. The systems proposed are applied to realistic models of unmanned systems and missiles, and digital implementation.

### Features

This book presents practical techniques of discrete-time control system design. In general, the design techniques lead to low-order dynamic compensators that ensure satisfactory closed-loop performance for a wide range of sampling rates. The theory is given in the form of theorems, lemmas, and propositions. The design of the control systems is presented as step-by-step procedures and algorithms. The [...]

### Contents

Control Systems.- Review of Signals and Systems.- Discretization.- Models.- Global Digital Redesign.- Flatness-Based Control.- Digital Redesign of Autopilots.

### Fields of interest

Aerospace Technology and Astronautics; Control; Robotics and Automation

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9289-4](http://www.springer.com/978-1-4614-9289-4)

### Hardcover

2014. XVII, 171 p. 105 illus., 20 illus. in color. ISBN 978-1-4614-9289-4

**usually dispatched within 3 to 5 business days  
December 31, 2013**

B. Ramkumar, IIT Mandi, Mandi, India; T. Bose, University of Arizona, Tucson, USA; A. Babaei, Virginia Tech, Blacksburg, USA; W.H. Tranter, Virginia Tech, Blacksburg, USA

## Blind Signal Classification Algorithms for Cognitive Radios

This book provides a comprehensive tutorial to signal classification, an important signal processing technique that enables cognitive radios to identify the kind of users present in a frequency band, helping a radio to characterize the environment in which it is operating. Engineers involved in the design and implementation of cognitive radio receivers will benefit from this book's coverage of a newly developed, multiuser signal classification algorithm, as well as techniques for design of other components to work in conjunction with the signal classifier, such as blind equalizers, blind channel estimators, and cognitive engines.

### Features

This book provides a comprehensive tutorial to signal classification, an important signal processing technique that enables cognitive radios to identify the kind of users present in a frequency band, helping a radio to characterize the environment in which it is operating. Engineers involved in the design and implementation of cognitive radio receivers will benefit from this book's coverage of a newly [...]

### Contents

Single User Signal Classifier.- Multiuser Signal Classifier.- Combined SISO Blind Equalizer and Signal Classifier.- Combined MIMO Blind Equalizer and Multiuser Classifier.- Distributed Signal Classification.

### Fields of interest

Circuits and Systems; Electronics and Microelectronics, Instrumentation; Signal, Image and Speech Processing

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-1-4614-3881-6](http://www.springer.com/978-1-4614-3881-6)

### Hardcover

2014. Approx. 250 p. 125 illus. (Analog Circuits and Signal Processing)

ISBN 978-1-4614-3881-6

**Due: January 31, 2014**

F. Rastello, École Normale Supérieure de Lyon, Lyon CX 07, France (Ed.)

## SSA-based Compiler Design

The manner in which programs are represented in compilers has a large influence on the efficiency and effectiveness of the compiler. The Static Single Assignment (SSA) form is widely used in modern compilers, even at the code generation level, as it allows for simple yet efficient optimizations and analyses. This book offers the first comprehensive reference on SSA-based compilers. Special emphasis is put on the comparison of SSA-based techniques to their non-SSA counterparts.

### Features

The manner in which programs are represented in compilers has a large influence on the efficiency and effectiveness of the compiler. The Static Single Assignment (SSA) form is widely used in modern compilers, even at the code generation level, as it allows for simple yet efficient optimizations and analyses. This book offers the first comprehensive reference on SSA-based compilers. Special emphasis is put [...]

### Contents

Properties and Flavors.- Classical construction/update/destruction algorithms.- Alternative SSA construction/destruction algorithms.- Repair SSA after optimization.- Semantics.- Array SSA.- Hashed SSA form: HSSA.- Extended SSA Numbering.- Memory SSA in GCC.- Concurrent SSA.- Static Single Information Form.- SSRO.- Psi-SSA Form.- Gated SSA.- Predicated SSA.- Value State Dependence Graph.- Propagating information using SSA.- Dead-code elimination in SSA.- Liveliness.- Additional Gain from PSI SSA.- Alias Analysis.- Bitwidth analysis value range analysis.- Loop tree.- PRE.- Types-tate[...]

### Fields of interest

Circuits and Systems; Computer-Aided Engineering (CAD, CAE) and Design

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4419-6201-0](http://www.springer.com/978-1-4419-6201-0)

### Hardcover

2014. Approx. 290 p. ISBN 978-1-4419-6201-0

**Due: February 28, 2014**

S. Ray, University of Texas at Austin, Austin, USA; J. Bhadra, Freescale Semiconductor, Inc., Austin, USA

## Semiconductor Memories

Design, Modeling, Abstraction, and Verification

This book provides a comprehensive overview of techniques for modeling, abstracting, and formalizing custom memories. It should benefit researchers and practitioners involved either in the design or in the validation of memory circuits. It explains different state-of-the-art transistor technologies used in memory design, and how the design technology affects verification.

### Features

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### Contents

Transistor Networks.- CMOS Memory Design.- Non-volatile Memories.- Switch-level Models.- Regular Expressions.- Behavioral Abstraction.- Verification Overview.- Switch-level Verification.- Reductions.- Trace Containment.

### Fields of interest

Circuits and Systems; Processor Architectures

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-3060-5](http://www.springer.com/978-1-4614-3060-5)

### Hardcover

2014. 200p. 75 illus.  
ISBN 978-1-4614-3060-5

**Due: December 2013**

R. Reis, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil; Y. Cao, Arizona State University, Tempe, USA; G. Wirth (Eds.)

## Circuit Design for Reliability

This book presents physical understanding, modeling and simulation, on-chip characterization, layout solutions, and design techniques that are effective to enhance the reliability of various circuit units.

### Features

This book presents physical understanding, modeling and simulation, on-chip characterization, layout solutions, and design techniques that are effective to enhance the reliability of various circuit units.

### Fields of interest

Circuits and Systems; Quality Control, Reliability, Safety and Risk; Computer-Aided Engineering (CAD, CAE) and Design

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-4077-2](http://www.springer.com/978-1-4614-4077-2)

### Hardcover

2014. XI, 127 p. 72 illus., 54 illus. in color.  
ISBN 978-1-4614-4077-2

**Due: February 28, 2014**

H. Richter, HTWK Leipzig University of Applied, Leipzig, Germany; A. Engelbrecht, University of Pretoria, Pretoria, South Africa (Eds.)

## Recent Advances in the Theory and Application of Fitness Landscapes

This book is concerned with recent advances in fitness landscapes. The concept of fitness landscapes originates from theoretical biology and refers to a framework for analysing and visualizing the relationships between genotypes, phenotypes and fitness. These relationships lay at the centre of attempts to mathematically describe evolutionary processes and evolutionary dynamics. The book addresses recent advances in the understanding of fitness landscapes in evolutionary biology and evolutionary computation. In the volume, experts in the field of fitness landscapes present these findings in an integrated way to make it accessible to a number of audiences: senior undergraduate and [...]

### Features

This book is concerned with recent advances in fitness landscapes. The concept of fitness landscapes originates from theoretical biology and refers to a framework for analysing and visualizing the relationships between genotypes, phenotypes and fitness. These relationships lay at the centre of attempts to mathematically describe evolutionary processes and evolutionary dynamics. The [...]

### Contents

Part I Principles and Perspectives.- Part II Topology, Measures and Problem Hardness.- Part III Coevolution and Dynamics.- Part IV Visualization and Characterization.- Part V Outlook and Afterthoughts.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics); Mathematical and Computational Biology; Systems Biology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-41887-7](http://www.springer.com/978-3-642-41887-7)

### Hardcover

2014. XXXVIII, 553 p. 201 illus., 75 illus. in color. (Emergence, Complexity and Computation, Vol. 6)  
ISBN 978-3-642-41887-7

**usually dispatched within 3 to 5 business days**

M. Robinson, University of Pennsylvania, Philadelphia, USA

## Topological Signal Processing

Signal processing is the discipline of extracting information from collections of measurements. To be effective, the measurements must be organized and then filtered, detected, or transformed to expose the desired information. Distortions caused by uncertainty, noise, and clutter degrade the performance of practical signal processing systems. In aggressively uncertain situations, the full truth about an underlying signal cannot be known. This book develops the theory and practice of signal processing systems for these situations that extract useful, qualitative information using the mathematics of topology -- the study of spaces under continuous transformations. Since the collection of [...]

### Features

Signal processing is the discipline of extracting information from collections of measurements. To be effective, the measurements must be organized and then filtered, detected, or transformed to expose the desired information. Distortions caused by uncertainty, noise, and clutter degrade the performance of practical signal processing systems. In aggressively uncertain situations, the full truth about [...]

### Contents

Introduction and informal discussion.- Parametrization.- Signals.- Detection.- Transforms.- Noise.

### Fields of interest

Signal, Image and Speech Processing; Topology; Communications Engineering, Networks; Computational Science and Engineering; Information and Communication, Circuits

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-36103-6](http://www.springer.com/978-3-642-36103-6)

### Hardcover

2014. XIII, 212 p. 134 illus. (Mathematical Engineering) ISBN 978-3-642-36103-6

**Due: January 31, 2014**

Y.K. Rybin, National Research Tomsk, Tomsk, Russian Federation

## Measuring Signal Generators

### Theory & Design

The book brings together the following issues: Theory of deterministic, random and discrete signals reproducible in oscillatory systems of generators; Generation of periodic signals with a specified spectrum, harmonic distortion factor and random signals with specified probability density function and spectral density; Synthesis of oscillatory system structures; Analysis of oscillatory systems with non-linear elements and oscillation amplitude stabilization systems; It considers the conditions and criteria of steady-state modes in signal generators on active four-pole elements with unidirectional and bidirectional transmission of signals and on two-pole elements; analogues of Barkhausen [...]

### Features

The book brings together the following issues: Theory of deterministic, random and discrete signals reproducible in oscillatory systems of generators; Generation of periodic signals with a specified spectrum, harmonic distortion factor and random signals with specified probability density function and spectral density; Synthesis of oscillatory system structures; Analysis [...]

### Contents

Theory and Praxis of Measuring Signal Sources: Present and Future.- Synthesis of Mathematical Models for Measuring Signals.- Synthesis of Models for Self-Oscillating Systems of Generators.- Selected Issues of the Theory of Sinusoidal Generators.- Synthesis of Block Diagrams of Measuring Signal Generators.- Optimization of Oscillatory Systems of Generators.- Analog Signal Generators.- Digital Signal Generators.- Practical Design of Measuring Signal Generators.

### Fields of interest

Signal, Image and Speech Processing; Measurement Science, Instrumentation; Circuits and Systems

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02832-3](http://www.springer.com/978-3-319-02832-3)

### Hardcover

2014. XIX, 488 p. 332 illus., 30 illus. in color. (Signals and Communication Technology) ISBN 978-3-319-02832-3

**usually dispatched within 3 to 5 business days**

**December 31, 2013**

B. Sadhu, R. Harjani, University of Minnesota, Minneapolis, USA

## Cognitive Radio Receiver Front-Ends

### RF/Analog Circuit Techniques

This book focuses on the architecture and circuit design for cognitive radio receiver front-ends. The authors first provide a holistic explanation of RF circuits for cognitive radio systems. This is followed by an in-depth exploration of existing techniques that can be utilized by circuit designers. Coverage also includes novel circuit techniques and architectures that can be invaluable for designers for cognitive radio systems.

### Features

This book focuses on the architecture and circuit design for cognitive radio receiver front-ends. The authors first provide a holistic explanation of RF circuits for cognitive radio systems. This is followed by an in-depth exploration of existing techniques that can be utilized by circuit designers. Coverage also includes novel circuit techniques and architectures that can be invaluable for designers for [...]

### Contents

Introduction.- Cognitive Radio Architectures.- Wideband Voltage Controlled Oscillator.- RF Sampling and Signal Processing.- CRAFT: Charge Re-use Analog Fourier Transform.- Conclusions.

### Fields of interest

Circuits and Systems; Electronics and Microelectronics, Instrumentation; Communications Engineering, Networks

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9295-5](http://www.springer.com/978-1-4614-9295-5)

### Hardcover

2014. VI, 79 p. 57 illus., 47 illus. in color. (Analog Circuits and Signal Processing, Vol. 115) ISBN 978-1-4614-9295-5

**Due: December 31, 2013**

B. Shafai, Northeastern University, Boston, USA

## System Identification and Adaptive Control

This book offers comprehensive coverage of identification and adaptive control while familiarizing graduate students and practicing engineers with computational software tools such as MATLAB and SIMULINK and describing the underlying theoretical concepts. Identification is the process of mathematically modeling a system based on measurement data that may be limited or uncertain. Adaptive control is the means whereby a system that is poorly modeled is controlled adequately. Therefore the topical coverage is divided into two parts: Part I describes fundamental topics of system identification independent of adaptive control and discusses non-parametric and parameteric estimation methods[...]

### Features

This book offers comprehensive coverage of identification and adaptive control while familiarizing graduate students and practicing engineers with computational software tools such as MATLAB and SIMULINK and describing the underlying theoretical concepts. Identification is the process of mathematically modeling a system based on measurement data that may be limited or uncertain. Adaptive control is the [...]

### Contents

Part I: Systems Identification.- Introduction.- Signal and System Models.- Nonparametric Identification Methods.- Least Squares Theory.- Input Signals, Persistent Excitation, and Model Parametrizations.- System Identification by Least Squares and Generalized Least Squares.- Recursive Estimation.- Instrumental Variable Method.- Prediction Error Method.- Model Validation.- Part II: Adaptive Control.- System Identification and Adaptive Control.- Model Reference Adaptive Control.- Self Tuning Regulator.- Adaptive Pole Placement.- Adaptive Observer.- Robust Adaptive Control.

### Fields of interest

Vibration, Dynamical Systems, Control; Systems Theory, Control; Control, Robotics, Mechatronics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-3202-9](http://www.springer.com/978-1-4614-3202-9)

### Hardcover

2017. 500p. 80 illus.  
ISBN 978-1-4614-3202-9

**Due: December 31, 2016**

N. Siddique

## Intelligent Control

A Hybrid Approach Based on Fuzzy Logic, Neural Networks and Genetic Algorithms

Intelligent Control considers non-traditional modelling and control approaches to nonlinear systems. Fuzzy logic, neural networks and evolutionary computing techniques are the main tools used. The book presents a modular switching fuzzy logic controller where a PD-type fuzzy controller is executed first followed by a PI-type fuzzy controller thus improving the performance of the controller compared with a PID-type fuzzy controller. The advantage of the switching-type fuzzy controller is that it uses one rule-base thus minimises the rule-base during execution. A single rule-base is developed by merging the membership functions for change of error of the PD-type controller and sum of [...]

### Features

Intelligent Control considers non-traditional modelling and control approaches to nonlinear systems. Fuzzy logic, neural networks and evolutionary computing techniques are the main tools used. The book presents a modular switching fuzzy logic controller where a PD-type fuzzy controller is executed first followed by a PI-type fuzzy controller thus improving the performance of the controller compared [...]

### Contents

Introduction.- Dynamical Systems.- Control Systems.- Mathematics of Fuzzy Control.- Fuzzy Control.- GA-Fuzzy Control.- Neuro-Fuzzy Control.- GA-Neuro-Fuzzy Control.- Stability Analysis.- Epilogue and Future Work.

### Fields of interest

Control; Systems Theory, Control; Simulation and Modeling

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02134-8](http://www.springer.com/978-3-319-02134-8)

### Hardcover

2014. XVII, 282 p. 158 illus., 55 illus. in color. (Studies in Computational Intelligence, Vol. 517)  
ISBN 978-3-319-02134-8

**usually dispatched within 3 to 5 business days  
December 31, 2013**

V. Snášel, VŠB-TUO, Ostrava-Poruba, Czech Republic; P. Krömer, VŠB-TUO, Ostrava-Poruba, Czech Republic; M. Köppen, Kyushu Institute of Technology, Fukuoka, Japan; G. Schaefer, Loughborough University, Loughborough, United Kingdom (Eds.)

## Soft Computing in Industrial Applications

Proceedings of the 17th Online World Conference on Soft Computing in Industrial Applications

This volume of Advances in Intelligent Systems and Computing contains accepted papers presented at WSC17, the 17th Online World Conference on Soft Computing in Industrial Applications, held from December 2012 to January 2013 on the Internet. WSC17 continues a successful series of scientific events started over a decade ago by the World Federation of Soft Computing. It brought together researchers from over the world interested in the ever advancing state of the art in the field. Continuous technological improvements make this online forum a viable gathering format for a world class conference. The aim of WSC17 was to disseminate excellent research results and contribute to building a [...]

### Features

This volume of Advances in Intelligent Systems and Computing contains accepted papers presented at WSC17, the 17th Online World Conference on Soft Computing in Industrial Applications, held from December 2012 to January 2013 on the Internet. WSC17 continues a successful series of scientific events started over a decade ago by the World Federation of Soft Computing. It brought together researchers from over [...]

### Contents

From the Contents: Advanced methods for 3D magnetic localization in industrial process distributed data logging with a sparse distance matrix.- Neural Network Ensemble based on Feature Selection for Non-Invasive Recognition of Liver Fibrosis Stage.- Cooperative and Non-Cooperative Equilibrium Problems with Equilibrium Constraints: Applications in Economics and Transportation.- Statistical Genetic Programming: The Role of Diversity.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-00929-2](http://www.springer.com/978-3-319-00929-2)

### Softcover

2014. XIV, 391 p. 130 illus. (Advances in Intelligent Systems and Computing, Vol. 223)  
ISBN 978-3-319-00929-2

**usually dispatched within 3 to 5 business days**

R. Sobot

## Wireless Communication Electronics by Example

This book is intended for senior undergraduate and graduate students as well as practicing engineers who are involved in design and analysis of radio frequency (RF) circuits. Fully-solved, tutorial-like examples are used to put into practice all major topics required to understand the principles underlying the main sub-circuits required to design an RF transceiver and the whole communication system. Starting with review of principles in electromagnetic (EM) transmission and signal propagation, through detailed practical analysis of RF amplifier, mixer, modulator, demodulator, and oscillator circuit topologies, all the way to the system communication theory behind the RF transceiver[...]

### Features

This book is intended for senior undergraduate and graduate students as well as practicing engineers who are involved in design and analysis of radio frequency (RF) circuits. Fully-solved, tutorial-like examples are used to put into practice all major topics required to understand the principles underlying the main sub-circuits required to design an RF transceiver and the whole communication system. [...]

### Contents

Introduction.- Problems.- Basic Terminology.- Electrical Noise.- Electronic Devices.- Electrical Resonance.- Matching Networks.- RF and IF Amplifiers.- Sinusoidal Oscillators.- Frequency Shifting.- Modulation.- Signal Demodulation.- RF Receivers.

### Fields of interest

Circuits and Systems; Communications Engineering, Networks; Processor Architectures

### Target groups

Upper undergraduate

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-3-319-02870-5](http://www.springer.com/978-3-319-02870-5)

### Hardcover

2014. XIV, 292 p. 158 illus., 89 illus. in color.  
ISBN 978-3-319-02870-5

**usually dispatched within 3 to 5 business days**

V.M. Srivastava, G. Singh

## MOSFET Technologies for Double-Pole Four-Throw Radio-Frequency Switch

This book provides analysis and discusses the design of various MOSFET technologies which are used for the design of Double-Pole Four-Throw (DP4T) RF switches for next generation communication systems. The authors discuss the design of the (DP4T) RF switch by using the Double-Gate (DG) MOSFET, as well as the Cylindrical Surrounding double-gate (CSDG) MOSFET. The effect of HFO2 (high dielectric material) in the design of DG MOSFET and CSDG MOSFET is also explored. Coverage includes comparison of Single-gate MOSFET and Double-gate MOSFET switching parameters, as well as testing of MOSFETs parameters using image acquisition.

### Features

This book provides analysis and discusses the design of various MOSFET technologies which are used for the design of Double-Pole Four-Throw (DP4T) RF switches for next generation communication systems. The authors discuss the design of the (DP4T) RF switch by using the Double-Gate (DG) MOSFET, as well as the Cylindrical Surrounding double-gate (CSDG) MOSFET. The effect of HFO2 (high dielectric [...])

### Contents

Introduction.- Design of Double-Pole Four-Throw RF Switch.- Design of Double-Gate MOSFET.- Double-Pole Four-Throw RF Switch Based on Double-Gate MOSFET.- Cylindrical Surrounding Double-Gate RF MOSFET.- Hafnium Dioxide Based Double-Pole Four-Throw Double-Gate RF CMOS Switch.- Testing of MOSFET Surfaces Using Image Acquisition.- Conclusions and Future Scope.

### Fields of interest

Circuits and Systems; Communications Engineering, Networks; Semiconductors

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-3-319-01164-6](http://www.springer.com/978-3-319-01164-6)

### Hardcover

2014. XV, 199 p. 55 illus., 45 illus. in color. (Analog Circuits and Signal Processing, Vol. 122)  
ISBN 978-3-319-01164-6

**usually dispatched within 3 to 5 business days**

A. Subic, RMIT University, Bundoora, Australia; W.-P. Schmidt, L. Koopmans, RMIT University, Victoria, Australia; M. Leary, RMIT University, Melbourne, Australia

## Management and Design of Sustainable Automotive Technologies

Management and Design of Sustainable Automotive Technologies aims to provide a comprehensive treatment of relevant management and design strategies and approaches required for the development of sustainable vehicle technologies. The book features current and emerging technologies and solutions supported by original case studies stemming from contemporary research and industry practice. These include vehicle life-cycle management and design methods and tools, sustainability assessment criteria and tools, development strategies and examples of new and emerging green car technologies such as alternative power-trains and fuels, lightweight structures and materials, end-of-life vehicle[...]

### Features

Management and Design of Sustainable Automotive Technologies aims to provide a comprehensive treatment of relevant management and design strategies and approaches required for the development of sustainable vehicle technologies. The book features current and emerging technologies and solutions supported by original case studies stemming from contemporary research and industry practice. These include vehicle [...]

### Contents

Sustainable Mobility.- Sustainable Vehicle Design.- Vehicle Life Cycle Management.- Alternative Powertrain Technologies.- Lightweight Structures and Materials.- End-of-Life Vehicle Management.

### Fields of interest

Automotive Engineering; Engineering Design; Technology Management; Transportation

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-3-642-25196-2](http://www.springer.com/978-3-642-25196-2)

### Hardcover

2014. 350p. 140 illus., 20 illus. in color.  
ISBN 978-3-642-25196-2

**Due: March 28, 2014**

H. Sucuoglu, Middle East Technical University, Ankara, Turkey; S. Akkar, Middle East Technical University, Ankara, Turkey

## Basic Earthquake Engineering

From Seismology to Analysis and Design

This book provides senior undergraduate students and structural engineers lacking a background in the field with core knowledge of structural earthquake engineering that will be invaluable in their professional lives. The basics of seismotectonics, including the causes, magnitude, and intensity of earthquakes, are first explained. Subsequent chapters cover key aspects of the analysis of responses of simple systems and building structures to earthquake ground motions, the adoption of seismic analysis procedures in seismic design codes, and the seismic design of reinforced concrete structures. Helpful worked examples on earthquake-resistant design of frame and frame-shear wall systems[...]

### Features

This book provides senior undergraduate students and structural engineers lacking a background in the field with core knowledge of structural earthquake engineering that will be invaluable in their professional lives. The basics of seismotectonics, including the causes, magnitude, and intensity of earthquakes, are first explained. Subsequent chapters cover key aspects of the analysis of responses of simple [...]

### Contents

Nature of Earthquakes.- Response of Simple Structures to Earthquake Ground Motions.- Response of Building Structures to Earthquake Ground Motions.- Seismic Analysis Procedures in Earthquake Codes.- Seismic Design Principles for RC Structures.- Seismic Hazard Analysis.

### Fields of interest

Geoengineering, Foundations, Hydraulics; Structural Mechanics; Geotechnical Engineering & Applied Earth Sciences; Engineering Design; Vibration, Dynamical Systems, Control

### Target groups

Upper undergraduate

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-3-319-01025-0](http://www.springer.com/978-3-319-01025-0)

### Softcover

2014. 300 p. 100 illus.  
ISBN 978-3-319-01025-0

**Due: April 3, 2014**

S. Supek, University of Zagreb, Zagreb, Croatia; C.J. Aine, University of New Mexico, Albuquerque, USA (Eds.)

## Magnetoencephalography

From Signals to Dynamic Cortical Networks

Magnetoencephalography (MEG) is an invaluable functional brain imaging technique that provides direct, real-time monitoring of neuronal activity necessary for gaining insight into dynamic cortical networks. Our intentions with this book are to cover the richness and transdisciplinary nature of the MEG field, make it more accessible to newcomers and experienced researchers and to stimulate growth in the MEG area. The book presents a comprehensive overview of MEG basics and the latest developments in methodological, empirical and clinical research, directed toward master and doctoral students, as well as researchers. There are three levels of contributions: 1) tutorials on[...]

### Features

Magnetoencephalography (MEG) is an invaluable functional brain imaging technique that provides direct, real-time monitoring of neuronal activity necessary for gaining insight into dynamic cortical networks. Our intentions with this book are to cover the richness and transdisciplinary nature of the MEG field, make it more accessible to newcomers and experienced researchers and to stimulate growth in the MEG [...]

### Contents

Part 1: Measurements, experimental paradigms and analysis approaches.- Part 2: Neuromagnetic studies of brain and multi-modal SQUID-based functional brain imaging.- Part 3: Hot, open and challenging issues.

### Fields of interest

Biomedical Engineering; Neuroradiology; Medical and Radiation Physics; Neurosciences; Image Processing and Computer Vision

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-33044-5](http://www.springer.com/978-3-642-33044-5)

### Hardcover

2014. 250 p. 10 illus.  
ISBN 978-3-642-33044-5

**Due: March 28, 2014**

M.-C. Tsai, National Cheng Kung University, Tainan, Taiwan; D.-W. Gu, University of Leicester, Leicester, United Kingdom

## Robust and Optimal Control

A Two-port Framework Approach

A Two-port Framework for Robust and Optimal Control introduces an alternative approach to robust and optimal controller synthesis procedures for linear, time-invariant systems, based on the two-port system widespread in electrical engineering. The novel use of the two-port system in this context allows straightforward engineering-oriented solution-finding procedures to be developed, requiring no mathematics beyond linear algebra. A chain-scattering description provides a unified framework for constructing the stabilizing controller set and for synthesizing H<sub>2</sub> optimal and H<sub>∞</sub> sub-optimal controllers. Simple yet illustrative examples explain each step. A Two-port Framework for Robust and [...]

### Features

A Two-port Framework for Robust and Optimal Control introduces an alternative approach to robust and optimal controller synthesis procedures for linear, time-invariant systems, based on the two-port system widespread in electrical engineering. The novel use of the two-port system in this context allows straightforward engineering-oriented solution-finding procedures to be developed, requiring no [...]

### Contents

Two-port Networks.- Linear Fractional Transformations.- Chain Scattering Descriptions.- Co prime Factorizations.- Algebraic Riccati Equations and Spectral Factorizations.- CSD Approach to Stabilization Control and H<sub>2</sub> Optimal Control.- A CSD Approach to H-infinity Controller Synthesis.- Design Examples.

### Fields of interest

Control; Circuits and Systems

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-6256-8](http://www.springer.com/978-1-4471-6256-8)

### Hardcover

2014. XII, 280 p. 222 illus., 130 illus. in color. With online files/update. (Advances in Industrial Control)  
ISBN 978-1-4471-6256-8

**Due: January 31, 2014**

V. Vashchenko, Maxim Integrated Corp., Palo Alto, USA; M. Scholz, IMEC, Heverlee, Belgium

## System Level On-Chip ESD Protection

This book addresses key aspects of analog integrated circuits and systems design related to system level electrostatic discharge (ESD) protection. It is an invaluable reference for anyone developing systems-on-chip (SoC) and systems-on-package (SoP), integrated with system-level ESD protection. Coverage focuses on both the design of semiconductor integrated circuit (IC) components with embedded, on-chip system level protection and chip-system co-design. Readers will be enabled to bring the system level ESD protection solutions to the level of integrated circuits, thereby reducing or completely eliminating the need for additional, discrete components on the printed circuit board (PCB)[...]

### Features

This book addresses key aspects of analog integrated circuits and systems design related to system level electrostatic discharge (ESD) protection. It is an invaluable reference for anyone developing systems-on-chip (SoC) and systems-on-package (SoP), integrated with system-level ESD protection. Coverage focuses on both the design of semiconductor integrated circuit (IC) components with embedded, on-chip [...]

### Contents

Introduction.- System Level IC Design.- ESD Test Methods for IC level verification of System Pins.- ESD Devices and Clamps for System Level ESD protection.- Latchup in Case of System Level IC Design.- Analog IC Case Studies for System Level Conditions.- IC and System ESD Co-Design Methodologies.- Conclusion.

### Fields of interest

Circuits and Systems; Electronic Circuits and Devices; Electronics and Microelectronics, Instrumentation

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-3-319-03220-7](http://www.springer.com/978-3-319-03220-7)

### Hardcover

2014. 500 p. 200 illus.  
ISBN 978-3-319-03220-7

**Due: April 28, 2014**

J.-E. Vinnem

## Offshore Risk Assessment

Principles, Modelling and Applications of QRA Studies

Offshore Risk Assessment was the first book to deal with quantified risk assessment (QRA) as applied specifically to offshore installations and operations. Risk assessment techniques have been used for more than three decades in the offshore oil and gas industry, and their use is set to expand increasingly as the industry moves into new areas and faces new challenges in older regions. This updated and expanded third edition has been informed by a major R&D program on offshore risk assessment in Norway and summarizes research from 2006 to the present day. Rooted with a thorough discussion of risk metrics and risk analysis methodology, subsequent chapters are devoted to analytical[...]

### Features

Offshore Risk Assessment was the first book to deal with quantified risk assessment (QRA) as applied specifically to offshore installations and operations. Risk assessment techniques have been used for more than three decades in the offshore oil and gas industry, and their use is set to expand increasingly as the industry moves into new areas and faces new challenges in older regions. This updated and [...]

### Fields of interest

Quality Control, Reliability, Safety and Risk; Environmental Management; Offshore Engineering; Mathematical Modeling and Industrial Mathematics

### Target groups

Professional/practitioner

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-1-4471-5265-1](http://www.springer.com/978-1-4471-5265-1)

### Hardcover

2014. XL, 896 p. 100 illus., 4 illus. in color. 2 volume-set. (Springer Series in Reliability Engineering)  
ISBN 978-1-4471-5265-1

**Online orders shipping within 2-3 days.**

B. Vogel, Lab 6-11, Stuttgart, Germany

## How to Gain Gain

A Reference Book on Triodes in Audio Pre-Amplifiers

The 34 chapters of the 2nd edition of How to Gain Gain give a detailed insight into a collection (54) of the most common gain producing, constant current generating possibilities, and electronic noise creation of triodes for audio pre-amplifier purposes. These chapters also offer complete sets of formulae to calculate gain, frequency and phase responses, and signal-to-noise ratios of certain building blocks built-up with this type of vacuum valve (tube). In all cases detailed derivations of the gain formulae are also presented. All what is needed are the data sheet valve characteristic figures of the triode's mutual conductance, the gain factor and the internal plate (anode) [...]

### Features

The 34 chapters of the 2nd edition of How to Gain Gain give a detailed insight into a collection (54) of the most common gain producing, constant current generating possibilities, and electronic noise creation of triodes for audio pre-amplifier purposes. These chapters also offer complete sets of formulae to calculate gain, frequency and phase responses, and signal-to-noise ratios of certain building blocks [...]

### Contents

From the Contents: Basics - Noise in Triodes - Noise in Components and Other General Noise Effects - The Common Cathode Gain Stage (CCS) - CCS Mathcad Worksheets - The Common Anode gain Stage (Cathode Follower CF) - CF Mathcad Worksheets - The Common Grid gain Stage (CGS) - CGS Mathcad Worksheets - The Concertina (Cathodyne) Phase Splitter (CPS) - CPS Mathcad Worksheets - Constant Current Generators (CCG) - CCG Mathcad Worksheets - The Cascode Amplifier (CAS) - CAS Mathcad Worksheets - The Shunt Regulated Push-Pull Gain Stage (SRPP) - SRPP Mathcad Worksheets - The  $\mu$ -Follower ( $\mu F$ ) -  $\mu F$ [...]

### Fields of interest

Electronics and Microelectronics, Instrumentation; Acoustics; Engineering Acoustics

### Target groups

Popular/general

### Type of publication

Professional book

More on [www.springer.com/978-3-642-33032-2](http://www.springer.com/978-3-642-33032-2)

### Hardcover

2013. XIV, 862 p. 536 illus.  
ISBN 978-3-642-33032-2

**usually dispatched within 3 to 5 business days**

C. Walloth, University of Duisburg Essen, Essen, Germany; J.M. Gurr, University of Duisburg-Essen, Essen, Germany; J.A. Schmidt, University of Duisburg-Essen, Essen, Germany (Eds.)

## Understanding Complex Urban Systems: Multidisciplinary Approaches to Modeling

Understanding Complex Urban Systems takes as its point of departure the insight that the challenges of global urbanization and the complexity of urban systems cannot be understood – let alone ‘managed’ – by sectoral and disciplinary approaches alone. But while there has recently been significant progress in broadening and refining the methodologies for the quantitative modeling of complex urban systems, in deepening the theoretical understanding of cities as complex systems, or in illuminating the implications for urban planning, there is still a lack of well-founded conceptual thinking on the methodological foundations and the strategies of modeling urban complexity across the[...]

### Features

Understanding Complex Urban Systems takes as its point of departure the insight that the challenges of global urbanization and the complexity of urban systems cannot be understood – let alone ‘managed’ – by sectoral and disciplinary approaches alone. But while there has recently been significant progress in broadening and refining the methodologies for the quantitative modeling of complex urban [..]

### Contents

From the Contents: Introduction: Towards a Transdisciplinary Understanding of Complex Urban Systems.- Multi-method Modeling and Simulation Supporting Urban Planning.- Understanding Effects of Complexity in Cities During Disasters.- Towards Evolutionary Economic Analysis of Sustainable Urban Real Estate.- Organized and Disorganized Complexities and Socio-Economic Implications in the Northern Ruhr Area.

### Fields of interest

Complexity; Socio- and Econophysics, Population and Evolutionary Models; Nonlinear Dynamics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02995-3](http://www.springer.com/978-3-319-02995-3)

### Hardcover

2014. XI, 163 p. 36 illus. (Understanding Complex Systems)  
ISBN 978-3-319-02995-5

**Due: December 31, 2013**

G.-C. Wang, T.-M. Lu, Rensselaer Polytechnic Institute, Troy, USA

## RHEED Transmission Mode and Pole Figures

Thin Film and Nanostructure Texture Analysis

This unique book covers the fundamental principle of electron diffraction, basic instrumentation of RHEED, definitions of textures in thin films and nanostructures, mechanisms and control of texture formation, and examples of RHEED transmission mode measurements of texture and texture evolution of thin films and nanostructures. Also presented is a new application of RHEED in the transmission mode called RHEED pole figure technique that can be used to monitor the texture evolution in thin film growth and nanostructures and is not limited to single crystal epitaxial film growth. Details of the construction of RHEED pole figures and the interpretation of observed pole figures are[...]

### Features

This unique book covers the fundamental principle of electron diffraction, basic instrumentation of RHEED, definitions of textures in thin films and nanostructures, mechanisms and control of texture formation, and examples of RHEED transmission mode measurements of texture and texture evolution of thin films and nanostructures. Also presented is a new application of RHEED in the transmission mode called [..]

### Contents

Introduction.- Crystal Lattices and Reciprocal Lattices.- Kinematic Scattering of Waves and Diffraction Conditions.- RHEED Reflection Mode.- X-Ray Diffraction.- RHEED Transmission Mode and RHEED Pole Figure.- Instrumentation for RHEED Pole Figure.- Origins of Texture Formation.- Techniques to Control Thin Film Textures.- Applications and Future Direction.- Appendix A: Operational Procedures for RHEED Pole Figure.- Appendix B: RHEED Pattern Simulations.

### Fields of interest

Nanotechnology and Microengineering; Surfaces and Interfaces, Thin Films; Characterization and Evaluation of Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9286-3](http://www.springer.com/978-1-4614-9286-3)

### Hardcover

2014. XIII, 233 p. 126 illus., 67 illus. in color.  
ISBN 978-1-4614-9286-3

**Due: December 31, 2013**

W. Wang, University of Albany, Albany, USA; M. Liu, Chinese Academy of Sciences, Beijing, China, People's Republic; G.S. Rose, Polytechnic Institute of New York, Brooklyn, USA

## Hybrid CMOS/Memristor Nanoelectronics

This book will focus on the new physics of memristors and the integration of CMOS and memristor devices to establish efficient memory, FPGA, DSP, analog, biomedical, and neuromorphic systems. It will be the first such introduction for the electronics community to the promise of CMOS-nano hybrid structures. By including a number of new experimental and theoretical results of memristor and CMOS-nano hybrid structures, this book will present a wide range of device, circuit, and system emerging technologies in a timely manner to promote the ever increasing interest in the memristor/CMOS hybrid technology and its many potential uses. This book provides a single-source reference to the[...]

### Features

This book will focus on the new physics of memristors and the integration of CMOS and memristor devices to establish efficient memory, FPGA, DSP, analog, biomedical, and neuromorphic systems. It will be the first such introduction for the electronics community to the promise of CMOS-nano hybrid structures. By including a number of new experimental and theoretical results of memristor and CMOS-nano [..]

### Contents

CMOS Transistor and Memristor Device; CMOS/memristor Integration.- Combinational Circuit Designs based on CMOS and Memristors.- Sequential Circuit Designs based on CMOS and Memristors.- Design and Simulation Techniques for Hybrid Nanoelectronics.- CMOS/memristor Memory, FPGA, and DSP.- CMOS/memristor Analog and Neuromorphic Circuits.- CMOS/memristor Hybrid 3D IC.- Natural Computing Paradigm Based on CMOS/Memristor.

### Fields of interest

Circuits and Systems; Computer-Aided Engineering (CAD, CAE) and Design

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-1161-1](http://www.springer.com/978-1-4614-1161-1)

### Hardcover

2014. 200p. 100 illus..  
ISBN 978-1-4614-1161-1

**Due: December 31, 2013**

Z. Wang, H. Jiang, Tsinghua University, Beijing, China (P.R.); H. Chen

## CMOS IC Design for Wireless Medical and Health Care

This book provides readers with detailed explanation of the design principles of CMOS integrated circuits for wireless medical and health care, from the perspective of two successfully-commercialized applications. Design techniques for both the circuit block level and the system level are discussed, based on real design examples. CMOS IC design techniques for the entire signal chain of wireless medical and health care systems are covered, including biomedical signal acquisition, wireless transceivers, power management and SoC integration, with emphasis on ultra-low-power IC design techniques.

### Features

This book provides readers with detailed explanation of the design principles of CMOS integrated circuits for wireless medical and health care, from the perspective of two successfully-commercialized applications. Design techniques for both the circuit block level and the system level are discussed, based on real design examples. CMOS IC design techniques for the entire signal chain of wireless medical and [...]

### Contents

Introduction.- System Architecture and Design Considerations.- Biomedical Signal Acquisition Circuits.- WBAN Transceiver Design.- Other Important Circuits.- SoC Design and Application Systems.- Summary.

### Fields of interest

Circuits and Systems; Biomedical Engineering; Electronics and Microelectronics, Instrumentation

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-1-4614-9502-4](http://www.springer.com/978-1-4614-9502-4)

### Hardcover

2014. X, 186 p. 171 illus., 95 illus. in color. ISBN 978-1-4614-9502-4

**usually dispatched within 3 to 5 business days**

I. Wechsung

## An Evaluation Framework for Multimodal Interaction

Determining Quality Aspects and Modality Choice

This book presents (1) an exhaustive and empirically validated taxonomy of quality aspects of multimodal interaction as well as respective measurement methods, (2) a validated questionnaire specifically tailored to the evaluation of multimodal systems and covering most of the taxonomy's quality aspects, (3) insights on how the quality perceptions of multimodal systems relate to the quality perceptions of its individual components, (4) a set of empirically tested factors which influence modality choice, and (5) models regarding the relationship of the perceived quality of a modality and the actual usage of a modality.

### Features

This book presents (1) an exhaustive and empirically validated taxonomy of quality aspects of multimodal interaction as well as respective measurement methods, (2) a validated questionnaire specifically tailored to the evaluation of multimodal systems and covering most of the taxonomy's quality aspects, (3) insights on how the quality perceptions of multimodal systems relate to the quality perceptions of its [...]

### Contents

From the Contents: What Are Multimodal Systems? Why Do They Need Evaluation? - Theoretical Background.- What to Evaluate? - A Taxonomy of Quality Aspects of Multimodal Interfaces.

### Fields of interest

Communications Engineering, Networks; User Interfaces and Human Computer Interaction; Psychometrics; Quality Control, Reliability, Safety and Risk

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03809-4](http://www.springer.com/978-3-319-03809-4)

### Hardcover

2014. XIII, 191 p. 33 illus., 19 illus. in color. (T-Labs Series in Telecommunication Services) ISBN 978-3-319-03809-4

**Due: December 31, 2013**

R. Wille, University of Bremen, Bremen, Germany; M. Soeken, University of Bremen, Bremen, Germany; R. Drechsler, University of Bremen, Bremen, Germany

## Introduction to Reversible and Quantum Circuits

From Basics to Hardware Design

This book provides a comprehensive and self-contained introduction to reversible and quantum circuits, with which power emissions can be reduced or eliminated and processing can be performed exponentially faster compared to conventional methods.

No previous knowledge of quantum mechanics is assumed, so the presentation will be accessible to students in electrical engineering, computer science, and mathematics as well as professionals new to this field. After a step-by-step introduction, the necessary background on both reversible and quantum computation is presented, core applications and physical realizations are discussed and automatic design methods for the respective circuits are [...]

### Features

This book provides a comprehensive and self-contained introduction to reversible and quantum circuits, with which power emissions can be reduced or eliminated and processing can be performed exponentially faster compared to conventional methods.

No previous knowledge of quantum mechanics is assumed, so the presentation will be accessible to students in electrical engineering, computer science, and mathematics [...]

### Contents

Boolean Logic.- Reversible Logic.- Quantum Logic.- Quantum Algorithms.- Low Power Computing.- Synthesis.- Optimization.- Verification and Test.

### Fields of interest

Circuits and Systems; Electronics and Microelectronics, Instrumentation; Logic Design

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-0793-5](http://www.springer.com/978-1-4614-0793-5)

### Hardcover

2014. 200p. 75 illus.. ISBN 978-1-4614-0793-5

**Due: February 28, 2014**

M. Winterholer, Cadence Design Systems Inc., Stuttgart, Germany; D. Lettnin, Federal University of Santa Catarina, Florianópolis, Brazil (Eds.)

## Embedded Software Verification and Debugging

This book provides comprehensive coverage of verification and debugging techniques for embedded software, which is frequently used in safety critical applications (e.g., automotive), where failures are unacceptable. Since the verification of complex systems needs to encompass the verification of both hardware and embedded software modules, this book focuses on verification and debugging approaches for embedded software with hardware dependencies. Coverage includes the entire flow of design, verification and debugging of embedded software and all key approaches to debugging, dynamic, static, and hybrid verification. This book discusses the current, industrial embedded software[...]

### Features

This book provides comprehensive coverage of verification and debugging techniques for embedded software, which is frequently used in safety critical applications (e.g., automotive), where failures are unacceptable. Since the verification of complex systems needs to encompass the verification of both hardware and embedded software modules, this book focuses on verification and debugging approaches for [...]

### Contents

Overview of Verification and Debugging Techniques.- Hardware and Software Design Process.- Verification and Debugging Flow.- Test Planning and Management.- Debugging Embedded Software.- Testing.- Model-based Testing.- Metric-driven Software Verification.- Hardware/Software Co-verification.- Static Analysis.- Model Checking.- Semiformal Verification.- Combining Symbolic Model Checking and Theorem Proving.

### Fields of interest

Circuits and Systems; Processor Architectures; Electronics and Microelectronics, Instrumentation

### Target groups

Professional/practitioner

### Type of publication

Professional book

More on [www.springer.com/978-1-4614-2265-5](http://www.springer.com/978-1-4614-2265-5)

### Hardcover

2014. 400p. 150 illus.. (Embedded Systems)  
ISBN 978-1-4614-2265-5

**Due: February 2014**

M. Witczak

## Fault Diagnosis and Fault-Tolerant Control Strategies for Non-Linear Systems

### Analytical and Soft Computing Approaches

This book presents selected fault diagnosis and fault-tolerant control strategies for non-linear systems in a unified framework. In particular, starting from advanced state estimation strategies up to modern soft computing, the discrete-time description of the system is employed Part I of the book presents original research results regarding state estimation and neural networks for robust fault diagnosis. Part II is devoted to the presentation of integrated fault diagnosis and fault-tolerant systems. It starts with a general fault-tolerant control framework, which is then extended by introducing robustness with respect to various uncertainties. Finally, it is shown how to implement[...]

### Features

This book presents selected fault diagnosis and fault-tolerant control strategies for non-linear systems in a unified framework. In particular, starting from advanced state estimation strategies up to modern soft computing, the discrete-time description of the system is employed Part I of the book presents original research results regarding state estimation and neural networks for robust fault [...]

### Contents

Part I Robust fault diagnosis.- Part II Integrated fault diagnosis and control.

### Fields of interest

Control; Computational Intelligence; Artificial Intelligence (incl. Robotics); Complexity

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03013-5](http://www.springer.com/978-3-319-03013-5)

### Hardcover

2014. XVI, 229 p. 117 illus. (Lecture Notes in Electrical Engineering, Vol. 266)  
ISBN 978-3-319-03013-5

**Due: December 31, 2013**

X. Xin, Okayama Prefectural University, Okayama, Japan; Y. Liu, Okayama University, Okayama, Japan

## Control Design and Analysis for Underactuated Robotic Systems

The last two decades have witnessed considerable progress in the study of underactuated robotic systems (URSs). Control Design and Analysis for Underactuated Robotic Systems presents a unified treatment of control design and analysis for a class of URSs, which include systems with multiple-degree-of-freedom and/or with underactuation degree two. It presents novel notions, features, design techniques and strictly global motion analysis results for these systems. These new materials are shown to be vital in studying the control design and stability analysis of URSs. Control Design and Analysis for Underactuated Robotic Systems includes the modelling, control design and analysis presented[...]

### Features

The last two decades have witnessed considerable progress in the study of underactuated robotic systems (URSs). Control Design and Analysis for Underactuated Robotic Systems presents a unified treatment of control design and analysis for a class of URSs, which include systems with multiple-degree-of-freedom and/or with [...]

### Contents

Fundamental Background.- Directly Driven Acrobat.- Remotely Driven Acrobat.- Pendubot.- Rotational Pendulum.- Counter-Weighted Acrobat.- Variable Length Pendulum.- 2-Link Underactuated Robot with Flexible Elbow Joint.- 3-Link Planar Robot with Passive First Joint.- n-Link Planar Robot with Single Passive Joint.- Two Parallel Pendulums on a Cart.- Double Pendulum on a Cart.- 3-Link Planar Robot with Two Passive Joints.- 2-Link Flying Robot.

### Fields of interest

Control; Robotics and Automation; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-6250-6](http://www.springer.com/978-1-4471-6250-6)

### Hardcover

2014. XVII, 319 p. 111 illus., 94 illus. in color. With online files/update.

ISBN 978-1-4471-6250-6

**Due: January 31, 2014**

B. Xing, W.-J. Gao

## Innovative Computational Intelligence: A Rough Guide to 134 Clever Algorithms

The first notable feature of this book is its innovation: Computational intelligence (CI), a fast evolving area, is currently attracting lots of researchers' attention in dealing with many complex problems. At present, there are quite a lot competing books existing in the market. Nevertheless, the present book is markedly different from the existing books in that it presents new paradigms of CI that have rarely mentioned before, as opposed to the traditional CI techniques or methodologies employed in other books. During the past decade, a number of new CI algorithms are proposed. Unfortunately, they spread in a number of unrelated publishing directions which may hamper the use of such[...]

### Features

The present book *Innovative Computational Intelligence: A Rough Guide to 134 Clever Algorithms* is compilation of recent trends in computational intelligence (CI) research using inspiration from various sources such as biology, physics, chemistry, and mathematics. Innovative CI, unlike its counterparts, i.e., highly developed and refined traditional CI, is a new CI category introduced in the present book. [...]

### Contents

Part I.- Part II Biology-based CI Algorithms.- Part III Physics-based CI Algorithms.- Part V Mathematics-based CI Algorithms.

### Fields of interest

Computational Intelligence; Image Processing and Computer Vision

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03403-4](http://www.springer.com/978-3-319-03403-4)

### Hardcover

2014. XXXIX, 453 p. (Intelligent Systems Reference Library, Vol. 62)  
ISBN 978-3-319-03403-4

**Due: December 31, 2013**

J. Xu, Sichuan University, Chengdu, China (P.R.); Z. Zeng

## Fuzzy-Like Multiple Objective Multistage Decision Making

Decision has inspired reflection of many thinkers since the ancient times. With the rapid development of science and society, appropriate dynamic decision making has been playing an increasingly important role in many areas of human activity including engineering, management, economy and others. In most real-world problems, decision makers usually have to make decisions sequentially at different points in time and space, at different levels for a component or a system, while facing multiple and conflicting objectives and a hybrid uncertain environment where fuzziness and randomness co-exist in a decision making process. This leads to the development of fuzzy-like multiple objective[...]

### Features

Decision has inspired reflection of many thinkers since the ancient times. With the rapid development of science and society, appropriate dynamic decision making has been playing an increasingly important role in many areas of human activity including engineering, management, economy and others. In most real-world problems, decision makers usually have to make decisions sequentially at different points in time [...]

### Contents

Multiple Objective Multistage Decision Making.- Elements of Fuzzy-Like MOMSDM.- Fuzzy MOMSDM for Dynamic Machine Allocation.- Fuzzy MOMSDM for Closed Multiclass Queuing Networks.- Fuzzy Random MOMSDM for Inventory Management.- Fuzzy Random MOMSDM for Facilities Planning.- Fuzzy Random MOMSDM for Transportation Assignment.

### Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03397-6](http://www.springer.com/978-3-319-03397-6)

### Hardcover

2014. XII, 349 p. (Studies in Computational Intelligence, Vol. 533)  
ISBN 978-3-319-03397-6

**Due: December 15, 2013**

E. Yahya, TIMA, Grenoble Institute of Technology, GRENoble Cedex, France; M. Renaudin, Tiempo, Montbonnot Saint Martin, France; L. Fesquet, TIMA, Grenoble Institute of Technology, GRENoble Cedex, France

## Performance Modeling, Analysis and Optimization for Asynchronous Circuits: Static and Statistical Analysis Approaches

Asynchronous circuits provide efficient solutions for many of the recent nanometric technologies, although the lack of analysis and optimization tools has limited the commercial spread of this technology. This book helps readers to understand the difficulties of modeling and analyzing asynchronous circuits. A new modeling methodology is introduced; it is used to build Asynchronous Static Timing Analysis (ASTA) and Asynchronous Statistical Static Timing Analysis (ASSTA). These fast and accurate methods are used to optimize the circuit speed against its hardware size. In addition, the book investigates the handshaking protocol effect on different asynchronous circuit performance metrics[...]

### Features

Asynchronous circuits provide efficient solutions for many of the recent nanometric technologies, although the lack of analysis and optimization tools has limited the commercial spread of this technology. This book helps readers to understand the difficulties of modeling and analyzing asynchronous circuits. A new modeling methodology is introduced; it is used to build Asynchronous Static Timing Analysis (ASTA) [...]

### Contents

Asynchronous Circuits Performance Modeling and Analysis: Static Analysis Approach.- Asynchronous Circuits Performance Modeling and Analysis: Statistical Static Analysis Approach.- Asynchronous Circuit Optimization.- Handshaking Protocol Effect.- AHMOSE (Asynchronous High-speed Modeling and Optimization Tool-set).

### Fields of interest

Circuits and Systems; Computer-Aided Engineering (CAD, CAE) and Design

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-0544-3](http://www.springer.com/978-1-4614-0544-3)

### Hardcover

2014. 200p.  
ISBN 978-1-4614-0544-3

**Due: December 2013**

L. Yan, Northeastern University, Shenyang, China (P.R.); Z. Ma, Northeastern University, Shenyang, China (P.R.); F. Zhang, Northeastern University, Shenyang, China (P.R.)

## Fuzzy XML Data Management

This book presents an exhaustive and timely review of key research work on fuzzy XML data management, and provides readers with a comprehensive resource on the state-of-the-art tools and theories in this fast growing area. Topics covered in the book include: representation of fuzzy XML, query of fuzzy XML, fuzzy database models, extraction of fuzzy XML from fuzzy database models, reengineering of fuzzy XML into fuzzy database models, and reasoning of fuzzy XML. The book is intended as a reference guide for researchers, practitioners and graduate students working and/or studying in the field of Web Intelligence, as well as for data and knowledge engineering professionals seeking new[...]

### Features

This book presents an exhaustive and timely review of key research work on fuzzy XML data management, and provides readers with a comprehensive resource on the state-of-the-art tools and theories in this fast growing area. Topics covered in the book include: representation of fuzzy XML, query of fuzzy XML, fuzzy database models, extraction of fuzzy XML from fuzzy database models, reengineering of fuzzy XML [...]

### Contents

Databases and XML for Data Management.- Fuzzy Sets and Fuzzy Database Models.- Fuzzy XML Data Models.- Fuzzy XML Queries and Index.- Fuzzy XML Extraction from Fuzzy Database Models.- Reengineering Fuzzy XML into Fuzzy Database Models.

### Fields of interest

Computational Intelligence; Database Management; Data Mining and Knowledge Discovery

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-44898-0](http://www.springer.com/978-3-642-44898-0)

### Hardcover

2014. XI, 210 p. 55 illus. (Studies in Fuzziness and Soft Computing, Vol. 311)  
ISBN 978-3-642-44898-0

**usually dispatched within 3 to 5 business days**

K. Yoshida, Tohoku University, Sendai, Japan; S. Tadokoro, Tohoku University, Sendai, Japan (Eds.)

## Field and Service Robotics

Results of the 8th International Conference

FSR, the International Conference on Field and Service Robotics, is the leading single track conference of robotics for field and service applications. This book presents the results of FSR2012, the eighth conference of Field and Service Robotics, which was originally planned for 2011 with the venue of Matsushima in Tohoku region of Japan. However, on March 11, 2011, a magnitude M9.0 earthquake occurred off the Pacific coast of Tohoku, and a large-scale disaster was caused by the Tsunami which resulted, therefore the conference was postponed by one year to July, 2012. In fact, this earthquake raised issues concerning the contribution of field and service robotics technology to[...]

### Features

FSR, the International Conference on Field and Service Robotics, is the leading single track conference of robotics for field and service applications. This book presents the results of FSR2012, the eighth conference of Field and Service Robotics, which was originally planned for 2011 with the venue of Matsushima in Tohoku region of Japan. However, on March 11, 2011, a magnitude M9.0 earthquake occurred off [...]

### Contents

Disaster Response.- Service/Entertainment Robots.- Inspection/Maintenance Robots.- Mobile Robot Navigation.- Agricultural Robots.- Robots for Excavation, Planetary Exploration.- Large Area Mapping.- SLAM for Outdoor Robots.- and Elemental Technology for Mobile Robots.

### Fields of interest

Robotics and Automation; Artificial Intelligence (incl. Robotics)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40685-0](http://www.springer.com/978-3-642-40685-0)

### Hardcover

2014. XIII, 658 p. 426 illus., 367 illus. in color. (Springer Tracts in Advanced Robotics, Vol. 92)  
ISBN 978-3-642-40685-0

**Due: December 31, 2013**

M.Z. Zgurovsky, V.A. Sadovnichiy, Lomonosov Moscow State University, Moscow, Russian Federation (Eds.)

## Continuous and Distributed Systems

Theory and Applications

In this volume, the authors close the gap between abstract mathematical approaches, such as abstract algebra, number theory, nonlinear functional analysis, partial differential equations, methods of nonlinear and multi-valued analysis, on the one hand, and practical applications in nonlinear mechanics, decision making theory and control theory on the other. Readers will also benefit from the presentation of modern mathematical modeling methods for the numerical solution of complicated engineering problems in hydromechanics, geophysics and mechanics of continua. This compilation will be of interest to mathematicians and engineers working at the interface of these field. It presents[...]

### Features

In this volume, the authors close the gap between abstract mathematical approaches, such as abstract algebra, number theory, nonlinear functional analysis, partial differential equations, methods of nonlinear and multi-valued analysis, on the one hand, and practical applications in nonlinear mechanics, decision making theory and control theory on the other. Readers will also benefit from the [...]

### Contents

From the Contents: Part I Abstract Algebra and Applications.- Part II Mechanics and Numerical Methods.- Part III Long-time Forecasting in Multidisciplinary Investigations.- Part IV Control Theory and Decision Making.- Part V Short Communications.

### Fields of interest

Theoretical and Applied Mechanics; Systems Theory, Control; Physical Chemistry

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03145-3](http://www.springer.com/978-3-319-03145-3)

### Hardcover

2014. XIX, 333 p. 33 illus., 14 illus. in color. (Solid Mechanics and Its Applications, Vol. 211)  
ISBN 978-3-319-03145-3

**usually dispatched within 3 to 5 business days**

Y.-T. Zhang, The Chinese University of Hong Kong, Hong Kong, China (P.R.) (Ed.)

## Wearable Medical Sensors and Systems

This contributed volume covers a broad spectrum of wearable sensing techniques and their applications in m-Health. The book includes design methodologies of wearable sensors and systems that are end-to-end integrated and connected into worn items such as intelligent textile cloth. Moreover, the book provides review materials on sensing technologies, signal processing, power harvest and signal transmission. Applications in m-health are discussed, as well as the connection to fields such as sports, entertainment and military applications. The target audience primarily comprises of researchers and practitioners, but the book may also be beneficial to graduate students.

### Features

This contributed volume covers a broad spectrum of wearable sensing techniques and their applications in m-Health. The book includes design methodologies of wearable sensors and systems that are end-to-end integrated and connected into worn items such as intelligent textile cloth. Moreover, the book provides review materials on sensing technologies, signal processing, power harvest and signal transmission. [...]

### Fields of interest

Biomedical Engineering; Computer Imaging, Vision, Pattern Recognition and Graphics; Biomedicine (general); Life Sciences (general); Electrical Engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-01004-5](http://www.springer.com/978-3-319-01004-5)

### Hardcover

2014. 350 p. 50 illus., 10 illus. in color. (Biomedical and Health Informatics)  
ISBN 978-3-319-01004-5

**Due: March 28, 2014**

A. Çela, Université Paris-Est, ESIEE Paris, Noisy-le-Grand, France;  
M. Ben Gaid, X.-G. Li, Northeastern University, Shenyang, China (P.R.); S.-I. Niculescu

## Optimal Design of Distributed Control and Embedded Systems

Optimal Design of Distributed Control and Embedded Systems focuses on the design of special control and scheduling algorithms based on system structural properties as well as on analysis of the influence of induced time-delay on systems performances. It treats the optimal design of distributed and embedded control systems (DCESs) with respect to communication and calculation-resource constraints, quantization aspects, and potential time-delays induced by the associated communication and calculation model. Particular emphasis is put on optimal control signal scheduling based on the system state. In order to render this complex optimization problem feasible in real time, a time[...]

### Features

Optimal Design of Distributed Control and Embedded Systems focuses on the design of special control and scheduling algorithms based on system structural properties as well as on analysis of the influence of induced time-delay on systems performances. It treats the optimal design of distributed and embedded control systems (DCESs) with respect to communication and calculation-resource constraints, [...]

### Contents

From the Contents: Part I Abstract Model of Distributed Control and Embedded Systems:- Introduction to Distributed Control and Embedded Systems.- Part II Optimal Co-design of Distributed Control and Embedded Systems.- Optimal Integrated Control and Scheduling of Resource-constrained Systems.- Part III Insights in DECS and Delayed Systems.- Stability Analysis of Distributed Control and Embedded Systems Subject to State and Control Delays.

### Fields of interest

Control; Control Structures and Microprogramming; Circuits and Systems; Communications Engineering, Networks

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02728-9](http://www.springer.com/978-3-319-02728-9)

### Hardcover

2014. XXIV, 288 p. 94 illus., 60 illus. in color. (Communications and Control Engineering)  
ISBN 978-3-319-02728-9

**usually dispatched within 3 to 5 business days**  
**December 31, 2013**

## Materials Science

D. Brigante, Olympus FRP, Napoli, Italy

## New Composite Materials

### Selection, Design, and Application

This timely volume presents a range of critical topics on the use of composite materials in civil engineering; industrial, commercial, and residential structures; and historic buildings. Structural strengthening techniques based on composite materials, including, but not limited to, fiber-reinforced polymers, fiber-reinforced glasses, steel-reinforced polymers, and steel-reinforced glasses represent a practice employed internationally and have become an important component in the restoration of buildings impacted by natural hazards and other destructive forces. *New Composite Materials: Selection, Design, and Application* stands as a highly relevant and diverse effort, distinct from[...]

### Features

This timely volume presents a range of critical topics on the use of composite materials in civil engineering; industrial, commercial, and residential structures; and historic buildings. Structural strengthening techniques based on composite materials, including, but not limited to, fiber-reinforced polymers, fiber-reinforced glasses, steel-reinforced polymers, and steel-reinforced glasses represent a [...]

### Contents

Composite Materials.- Manufacturing Processes.- Choice of the Composite System.- Strengthening of Existing Structures.- Technical Standards.- Strengthening of Reinforced and Pre-Stressed Reinforced Concrete Structures.- Strengthening of Masonry Structures.- Strengthening of Steel Structures.- Characterization and Monitoring.- Application Techniques.- Examples of Application.

### Fields of interest

Ceramics, Glass, Composites, Natural Materials; Building Materials; Structural Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-01636-8](http://www.springer.com/978-3-319-01636-8)

### Hardcover

2014. XVI, 179 p. 88 illus., 77 illus. in color.  
ISBN 978-3-319-01636-8

**usually dispatched within 3 to 5 business days**

N. Chawla, Arizona State University, Tempe, USA; K.K. Chawla, University of Alabama at Birmingham, Birmingham, USA

## Metal Matrix Composites

This work focuses on the fundamentals of MMCs for engineers and designers. The new edition addresses new issues and developments in the areas of automotive, aerospace, electronics and consumer applications. These include continuous fiber reinforced MMCs for cables in power transmission, high temperature superconducting wires, particulate MMCs in civilian aircraft and automotive applications, and high volume fraction, high thermal conductivity substrates for electronic packaging. The coverage is thorough and cohesive, and emphasizes the synergistic relationships among processing, structure and properties of metal matrix composites.

### Features

Metal Matrix Composites (MMCs) have progressed from "niche" materials to high performance applications in aerospace, electronic packaging, automotive, and recreational products. This book focuses on the synergistic relationships among processing, microstructure, and properties of metal matrix composites. The authors include chapters on reinforcements, common matrix materials, processing of MMCs, interface [...]

### Contents

Preface.- Introduction.- Reinforcements.- Matrix Materials.- Processing.- Interface.- Micromechanics.- Monotonic Behavior.- Cyclic Fatigue.- Creep.- Wear and Corrosion.- Applications.- Author Index.- Subject Index.

### Fields of interest

Metallic Materials; Ceramics, Glass, Composites, Natural Materials; Theoretical and Applied Mechanics; Engineering Design

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9547-5](http://www.springer.com/978-1-4614-9547-5)

### Hardcover

2013. XVI, 370 p. 277 illus., 55 illus. in color. ISBN 978-1-4614-9547-5

usually dispatched within 3 to 5 business days  
December 31, 2013

H. Cheng, Beijing Institute of Technology, Beijing, China (P.R.)

## Independent Variables for Optical Surfacing Systems

### Synthesis, Characterization and Application

Independent Variables for Optical Surfacing Systems discusses the characterization and application of independent variables of optical surfacing systems and introduces the basic principles of surfacing technologies and common surfacing systems. All the pivotal variables influencing surface quality are analyzed; evaluation methods for surface quality, the removal capability of tool influence functions, and a series of novel optical surfacing systems are introduced. The book also particularly focuses on the multi-path mode and dwell time used for deterministic surfacing. Researchers and graduate students working in optical engineering will benefit from this book; optical engineers in[...]

### Features

Independent Variables for Optical Surfacing Systems discusses the characterization and application of independent variables of optical surfacing systems, and introduces the basic principles of surfacing technologies and common surfacing systems. All the pivotal variables influencing surface quality are analyzed; evaluation methods for surface quality, the removal capability of tool influence [...]

### Contents

Basic theory of optical surfacing systems.- Tool influence functions.- Finishing paths.- Dwell time map.

### Fields of interest

Optical and Electronic Materials; Microwaves, RF and Optical Engineering; Applied Optics, Optoelectronics, Optical Devices; Surface and Interface Science, Thin Films; Surfaces and Interfaces, Thin Films

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-45354-0](http://www.springer.com/978-3-642-45354-0)

### Hardcover

2014. Approx. 175 p. 100 illus., 50 illus. in color. ISBN 978-3-642-45354-0

Due: January 31, 2014

T. Correia, Q. Zhang, Cranfield University, Cranfield, United Kingdom (Eds.)

## Electrocaloric Materials

### New Generation of Coolers

Since the 1997 Kyoto protocol of reduction of greenhouse gas emissions, the development of novel refrigerators has been a priority within the scientific community. Although magnetocaloric materials are promising candidates, they still need a large magnetic field to induce a giant  $\Delta T$  as well as powerful and costly magnets. However, in electrocaloric materials (ECMs) a temperature change may be achieved by applying or removing an electric field. Since a giant electrocaloric effect on ferroelectric thin films was reported in Science in 2006, researchers have been inspired to explore such effect in different ferroelectric thin films. This book reviews electrocaloric effects observed in[...]

### Features

Since the 1997 Kyoto protocol of reduction of greenhouse gas emissions, the development of novel refrigerators has been a priority within the scientific community. Although magnetocaloric materials are promising candidates, they still need a large magnetic field to induce a giant  $\Delta T$  as well as powerful and costly magnets. However, in electrocaloric materials (ECMs) a temperature change may be achieved by [...]

### Contents

Electrocaloric effect: An Introduction.- Constitutive Modeling of Electrothermal Properties in Polar Dielectric Materials and Thin Films.- Electrocaloric Effect in Relaxor Ferroelectric-based Materials.- Electrocaloric Effect in Multilayer Structures.- Electrocaloric Polymers.- Lead-free and exotic Electrocaloric Materials.- Indirect and Direct Measurements of the Electrocaloric Effect.- New Approaches to Electrocaloric-Based Multilayer Cooling.- Energy Harvesting from Temperature: use of Pyroelectric and Electrocaloric Properties.

### Fields of interest

Surfaces and Interfaces, Thin Films; Characterization and Evaluation of Materials; Circuits and Systems

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40263-0](http://www.springer.com/978-3-642-40263-0)

### Hardcover

2014. VIII, 253 p. 141 illus., 36 illus. in color. (Engineering Materials, Vol. 34) ISBN 978-3-642-40263-0

usually dispatched within 3 to 5 business days  
December 31, 2013

P.L. Fauchais, Professor Emeritus, Limoges CX, France; J.V.R. Heberlein, Professor Emeritus, Minneapolis, USA; M.I. Boulos, President and CEO, Sherbrooke, Canada

## Thermal Spray Fundamentals

### From Powder to Part

This book provides readers with the fundamentals necessary for understanding thermal spray technology. Coverage includes in-depth discussions of various thermal spray processes, feedstock materials, particle-jet interactions, and associated yet very critical topics: diagnostics, current and emerging applications, surface science, and pre and post-treatment. This book will serve as an invaluable resource as a textbook for graduate courses in the field and as an exhaustive reference for professionals involved in thermal spray technology.

### Features

This book provides readers with the fundamentals necessary for understanding thermal spray technology. Coverage includes in-depth discussions of various thermal spray processes, feedstock materials, particle-jet interactions, and associated yet very critical topics: diagnostics, current and emerging applications, surface science, and pre and post-treatment. This book will serve as an invaluable resource as [...]

### Contents

Overview of thermal spray.- Basic concepts of combustion and thermal plasma.- Flame or plasma - particle interactions.- Combustion spraying systems.- Cold spray.- D.C. plasma spraying.- R.F. induction plasma spraying.- Wire arc spraying.- Plasma transferred arc deposition (PTA).- Nano- or finely-structured coatings.- Conventional deposit formation.- Surface preparation.- Process diagnostics and on-line control.- Coating characterizations.- Powder, wire and rods production and characteristics.- Process integration.- Industrial applications of thermal spraying technology.

### Fields of interest

Tribology, Corrosion and Coatings; Engineering Fluid Dynamics; Operating Procedures, Materials Treatment

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-0-387-28319-7](http://www.springer.com/978-0-387-28319-7)

### Hardcover

2013. XXVIII, 1570 p. 953 illus., 235 illus. in color. ISBN 978-0-387-28319-7

**Due: December 31, 2013**

P. Ferraro, S. Grilli, CNR, Pozzuoli, Italy; P. De Natale (Eds.)

## Ferroelectric Crystals for Photonic Applications

### Including Nanoscale Fabrication and Characterization Techniques

This book deals with the latest achievements in the field of ferroelectric domain engineering and characterization at micro- and nano-scale dimensions and periods. The book collects the results obtained in the last years by world scientific leaders in the field, thus providing a valid and unique overview of the state-of-the-art and also a view to future applications of those engineered and used materials in the field of photonics. The second edition covers the major aspects of ferroelectric domain engineering and combines basic research and latest updated applications such as challenging results by introducing either new as well as extended chapters on Photonics Crystals based on [...]

### Features

This book deals with the latest achievements in the field of ferroelectric domain engineering and characterization at micro- and nano-scale dimensions and periods. The book collects the results obtained in the last years by world scientific leaders in the field, thus providing a valid and unique overview of the state-of-the-art and also a view to future applications of those engineered and used materials in [...]

### Contents

From the Contents: Part I Fabrication.- Micro-structuring and ferroelectric domain engineering of single crystal lithium Niobate.- Fabrication and characterization of self-assembled ferroelectric linear and nonlinear photonic crystals: GaN and LiNbO<sub>3</sub>.- Part II Characterization.- Light aided domain patterning and rare earth emission based imaging of ferroelectric domains.- Part III Applications.- Nonlinear Interactions in Periodic and Quasi-Periodic Nonlinear Photonic Crystals.- Domain-engineered ferroelectric crystals for nonlinear and quantum optics.

### Fields of interest

Optical and Electronic Materials; Laser Technology and Physics, Photonics; Microwaves, RF and Optical Engineering; Nanoscale Science and Technology; Magnetism, Magnetic Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-41085-7](http://www.springer.com/978-3-642-41085-7)

### Hardcover

2014. XXII, 493 p. 309 illus., 43 illus. in color. (Springer Series in Materials Science, Vol. 91) ISBN 978-3-642-41085-7

**usually dispatched within 3 to 5 business days**

H.W. Kim, Brown University, Barrington, USA; A.G. Greenburg, Brown University, Barrington, USA (Eds.)

## Hemoglobin-Based Oxygen Carriers as Red Cell Substitutes

Currently, hemoglobin (Hb)-based oxygen carriers (HBOCs) are leading candidates as red blood cell substitutes. In addition, HBOCs are also potential oxygen therapeutics for treatment of patients with critical ischemic conditions due to atherosclerosis, diabetes and other conditions. This book will provide readers a comprehensive review of topics involved in the HBOC development. It focusses on current products and clinical applications as well as on emerging technologies and future prospects.

### Features

Currently, hemoglobin (Hb)-based oxygen carriers (HBOCs) are leading candidates as red blood cell substitutes. In addition, HBOCs are also potential oxygen therapeutics for treatment of patients with critical ischemic conditions due to atherosclerosis, diabetes and other conditions. This book will provide readers a comprehensive review of topics involved in the HBOC development. It focusses on current products [...]

### Contents

Brief historical account of HBOC development.- Physiology of respiration.- Oxygen transport to tissues.- Pathophysiology of acute anemia.- Global blood safety and need for safe blood supply.- Blood transfusion and its limitations.- Scientific basis and design of HBOCs.- HBOCs: a regulatory perspective.- Current HBOC products in development.- Clinical indications and clinical trials of HBOCs.- HBOCs and adverse events observed in clinical trials.- HBOC-mediated vasoactivity and hypertension.- HBOC and oxygen and nitrogen radical mediated toxicity.- HBOCs and clinical laboratory [...]

### Fields of interest

Biomaterials; Molecular Medicine; Medicinal Chemistry; Hematology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40716-1](http://www.springer.com/978-3-642-40716-1)

### Hardcover

2013. XXIII, 746 p. 130 illus., 77 illus. in color. ISBN 978-3-642-40716-1

**Due: December 31, 2013**

D.J. Larson, T.J. Prosa, CAMECA Instruments, Inc., Madison, USA; R.M. Uffig, CAMECA Instruments, Inc., Madison, USA; B.P. Geiser, CAMECA Instruments, Inc., Madison, USA; Th.F. Kelly, CAMECA Instruments, Inc., Madison, USA

## Local Electrode Atom Probe Tomography

### A User's Guide

This book is the first, single-source guide to successful experiments using the local electrode atom probe (LEAP<sup>®</sup>) microscope. Coverage is both comprehensive and user friendly, including the fundamentals of preparing specimens for the microscope from a variety of materials, the details of the instrumentation used in data collection, the parameters under which optimal data are collected, the current methods of data reconstruction, and selected methods of data analysis. Tricks of the trade are described that are often learned only through trial and error, allowing users to succeed much more quickly in the challenging areas of specimen preparation and data collection. A closing chapter[...]

### Features

This book is the first, single-source guide to successful experiments using the local electrode atom probe (LEAP<sup>®</sup>) microscope. Coverage is both comprehensive and user friendly, including the fundamentals of preparing specimens for the microscope from a variety of materials, the details of the instrumentation used in data collection, the parameters under which optimal data are collected, the [...]

### Contents

Preface.- Acknowledgements.- Foreword.- Abbreviations.- Chapter 1. History of APT and LEAP.- Chapter 2. Specimen Preparation.- Chapter 3. Design & Instrumentation.- Chapter 4. Data Collection.- Chapter 5. Data Processing and Reconstruction.- Chapter 6. Selected Analysis Topics.- Chapter 7. Applications of the Local Electrode Atom Probe.- Appendix A. Data File Formats.- Appendix B. Field Evaporation.- Appendix C. Reconstruction Geometry.- Appendix D. Mass Spectral Performance.- Appendix E. Additional Considerations for LEAP Operation.- Glossary.- Index.

### Fields of interest

Characterization and Evaluation of Materials; Nanoscale Science and Technology; Nanochemistry; Spectroscopy and Microscopy; Nanotechnology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-8720-3](http://www.springer.com/978-1-4614-8720-3)

### Hardcover

2013. XVII, 318 p. 164 illus., 54 illus. in color. ISBN 978-1-4614-8720-3

Due: December 31, 2013

S. Li, University of Electronic Science and, Chengdu, China (P.R.); J. Wu, University of Electronic Science and, Chengdu, China (P.R.); Z.M. Wang, University of Electronic Science and, Chengdu, China (P.R.); Y. Jiang, University of Electronic Science and, Chengdu, China (P.R.) (Eds.)

## Nanoscale Sensors

This book is a comprehensive introduction to nanoscale materials for sensor applications, with a focus on connecting the fundamental laws of physics and the chemistry of materials with device design. Nanoscale sensors can be used for a wide variety of applications, including the detection of gases, optical signals, and mechanical strain, and can meet the need to detect and quantify the presence of gaseous pollutants or other dangerous substances in the environment. Gas sensors have found various applications in our daily lives and in industry. Semiconductive oxides, including SnO<sub>2</sub>, ZnO, Fe<sub>2</sub>O<sub>3</sub>, and In<sub>2</sub>O<sub>3</sub>, are promising candidates for gas sensor applications. Carbon nanomaterials are[...]

### Features

This book is a comprehensive introduction to nanoscale materials for sensor applications, with a focus on connecting the fundamental laws of physics and the chemistry of materials with device design. Nanoscale sensors can be used for a wide variety of applications, including the detection of gases, optical signals, and mechanical strain, and can meet the need to detect and quantify the presence of gaseous [...]

### Contents

Preface.- Chapter 1: Recent progress in the development of novel nanostructured biosensors for detection of water borne contaminants.- Chapter 2: Nanosensors for intracellular Raman studies.- Chapter 3: BioFET-SIM: a Tool for the Analysis and Prediction of Signal Changes in Nanowire Based Field Effect Transistor Biosensors.- Chapter 4: Semiconductor-Based Nanostructures for Photoelectrochemical Sensors and Biosensors.- Chapter 5: ZnO hydrogen nanoscale sensors.- Chapter 6: Recent advances in the design of photodetectors based on thin film and nanostructured ZnO.- Chapter 7: Thin Film[...]

### Fields of interest

Nanotechnology; Nanotechnology and Microengineering; Applied Optics, Optoelectronics, Optical Devices; Nanochemistry; Nanoscale Science and Technology; Optical and Electronic Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02771-5](http://www.springer.com/978-3-319-02771-5)

### Hardcover

2013. VIII, 312 p. 168 illus., 105 illus. in color. (Lecture Notes in Nanoscale Science and Technology, Vol. 19) ISBN 978-3-319-02771-5

Due: December 31, 2013

T. Mang (Ed.)

## Encyclopedia of Lubricants and Lubrication

The importance of lubricants in virtually all fields of the engineering industry is reflected by an increasing scientific research of the basic principles. Energy efficiency and material saving are just two core objectives of the employment of high-tech lubricants. The encyclopedia presents a comprehensive overview of the current state of knowledge in the realm of lubrication. All the aspects of fundamental data, underlying concepts and use cases, as well as theoretical research and last but not least terminology are covered in hundreds of essays and definitions, authored by experts in their respective fields, from industry and academic institutes.

### Features

The importance of lubricants in virtually all fields of the engineering industry is reflected by an increasing scientific research of the basic principles. Energy efficiency and material saving are just two core objectives of the employment of high-tech lubricants. The encyclopedia presents a comprehensive overview of the current state of knowledge in the realm of lubrication. All the aspects of fundamental [...]

### Contents

From the Contents: Aluminium Hot and Cold Rolling.- Circulating Lubrication with progressive Feeders.- ACEA European Oil Sequences.- Acidity.- Actuating pressure.- Additives.- Barium-soap greases.- Bearing Inch.- Bearing rigidity.- Bentonite.- Bio-Based and Biodegradable Base Oils.- Calcium-soap greases.- Capillary Viscometers.- Cartridge pump.- CEC-L 54-96 Fuel Economy Effects of Engine Lubricants.- CEC-L-093 Oil Dispersion Test.- Delivery resistance.- Density.- Detergents.- Diesel Fuel Lubricity Agents.- DIN.- Elastic Interaction.- Elastomers and their Properties.- Electrochemical[...]

### Fields of interest

Materials Science (general); Industrial Chemistry / Chemical Engineering; Tribology, Corrosion and Coatings

### Target groups

Research

### Type of publication

Encyclop(a)edia

More on [www.springer.com/978-3-642-22646-5](http://www.springer.com/978-3-642-22646-5)

### Hardcover

2014. 2000 p. In 4 volumes, not available separately. ISBN 978-3-642-22646-5

Due: February 3, 2014

T. Mang (Ed.)

## Encyclopedia of Lubricants and Lubrication

Prof. Dr.-Ing. Theo Mang received his diploma in mining engineering in 1963 and his PhD in chemical engineering in 1967 (University of Clausthal, Germany). He has been Professor at the Faculty of Mechanical Engineering of the RWTH Aachen, Germany, since 1998. He started working in the field of lubricants at Fuchs in Mannheim in 1967 and became head of the technical department in 1980. He has been a member of the Executive Board of the global Fuchs Group from 1983 until 2001, responsible initially for technology and later for group purchasing and human resources. Professor Mang is a recipient of the Georg-Vogelpohl-Award of the German Society of Tribology and has published about 80[...]

### Features

Prof. Dr.-Ing. Theo Mang received his diploma in mining engineering in 1963 and his PhD in chemical engineering in 1967 (University of Clausthal, Germany). He has been Professor at the Faculty of Mechanical Engineering of the RWTH Aachen, Germany, since 1998. He started working in the field of lubricants at Fuchs in Mannheim in 1967 and became head of the technical department in 1980. He has been a [...]

### Fields of interest

Materials Science (general); Industrial Chemistry / Chemical Engineering; Tribology, Corrosion and Coatings

### Target groups

Research

### Type of publication

Encyclop(a)edia

More on [www.springer.com/978-3-642-37439-5](http://www.springer.com/978-3-642-37439-5)

### Hardcover

2014. 2000 p. Print + eReference  
ISBN 978-3-642-37439-5

**Due: February 15, 2014**

F.J. Manjon, I. Tiginyanu, V. Ursaki (Eds.)

## Pressure-Induced Phase Transitions in AB<sub>2</sub>X<sub>4</sub> Chalcogenide Compounds

This book on pressure-induced phase transitions in AB<sub>2</sub>X<sub>4</sub> chalcogenide compounds deals with one important AmBnXp material. The interest in these materials is caused by their properties. The results are discussed for three main groups of structural families: cubic-spinel structures, defective tetragonal structures, and other structures like layered and wurtzite-type modifications. A systematic analysis of the behavior of cubic (spinel), tetragonal (defect chalcopyrites and stannites) and other crystal modifications of AB<sub>2</sub>X<sub>4</sub> compounds under hydrostatic pressure is performed. The behavior of AlAl<sub>2</sub>S<sub>4</sub>, AlGa<sub>2</sub>S<sub>4</sub>, AlAl<sub>2</sub>Se<sub>4</sub> and AlGa<sub>2</sub>Se<sub>4</sub> compounds with defective tetragonal structures.[...]

### Features

This book on pressure-induced phase transitions in AB<sub>2</sub>X<sub>4</sub> chalcogenide compounds deals with one important AmBnXp material. The interest in these materials is caused by their properties. The results are discussed for three main groups of structural families: cubic-spinel structures, defective tetragonal structures, and other structures like layered and wurtzite-type modifications. A systematic analysis of the [...]

### Contents

Introduction.- Part I Spinel-Structured AB Chalcogenide Compounds.- Part II Ordered-Vacancy AB Chalcogenide Compounds.- Part III Chalcogenide Compounds with other Types of Structures.

### Fields of interest

Optical and Electronic Materials; Semiconductors; Microwaves, RF and Optical Engineering; Applied and Technical Physics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40366-8](http://www.springer.com/978-3-642-40366-8)

### Hardcover

2014. XI, 243 p. 121 illus., 32 illus. in color. (Springer Series in Materials Science, Vol. 189)  
ISBN 978-3-642-40366-8

**Due: December 31, 2013**

P.L. Menezes, S.P. Ingole, M. Nosonovsky, S.V. Kailas, M.R. Lovell (Eds.)

## Tribology for Scientists and Engineers

### From Basics to Advanced Concepts

This book describes available tribology technologies and introduces a comprehensive overview of tribology. General, up-to-date knowledge on how tribology is approached in various related areas of research, both experimental and computational is provided.

### Features

This book details a comprehensive overview of tribology. General information on how tribology is approached in various related areas of research, both experimental and computational is provided. The book contains up-to-date data and describes current technologies.

### Contents

Fundamentals of Engineering Surfaces.- Friction and Wear.- Contact Mechanics.- Experimental Methods in Tribology.- Interface Temperature of Sliding Surfaces.- Tribology of Metals and Alloys.- Tribology of Ceramics and Ceramic Matrix Composites.- Tribology of Metal Matrix Composites.- Coatings Tribology.- Fundamentals of Lubrication.- Self-Lubricating Behaviour of Graphite Reinforced Composites.- Particle Tribology.- Tribology of Solid Lubricants.- Tribology of Green Lubricants.- Nano Tribology.- Surface Probe Techniques.- Biotribology and Human Tribology.- Green and Biomimetic[...]

### Fields of interest

Tribology, Corrosion and Coatings; Machinery and Machine Elements; Surface and Interface Science, Thin Films; Surfaces and Interfaces, Thin Films

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-1944-0](http://www.springer.com/978-1-4614-1944-0)

### Hardcover

2013. XI, 948 p. 526 illus., 223 illus. in color.  
ISBN 978-1-4614-1944-0

**Due: December 31, 2013**

C. Ngo, M. van de Voorde, University of Technology Delft, Bergen, Netherlands

## Nanotechnology in a Nutshell

### From Simple to Complex Systems

This book shows where nanotechnology is now—a fascinating time when the science is transitioning into complex systems with impact on new products. Present and future developments are addressed, as well as a larger number of new industrial and research opportunities deriving from this domain. The authors provide an overview for professionals, researchers and policy-makers of this very rapidly expanding field—including many applications such as information and communication technologies, environmental sciences and engineering, societal life and medicine, with provision of customized treatments. Brief chapters and colour figures with a contained overall length make the book attractive—

### Features

This book shows where nanotechnology is now—a fascinating time when the science is transitioning into complex systems with impact on new products. Present and future developments are addressed, as well as a larger number of new industrial and research opportunities deriving from this domain. The authors provide an overview for professionals, researchers and policy-makers of this very

### Contents

Exploring and Working in the Nano world.- Seeing and Moving Atoms.- Making Nano-Objects.- Quantum and Mesoscopic Physics.- Nanomaterials: Doing More with Less.- New Forms of Carbon and New Opportunities.- Nanoengineering for Material Technology.- From Microelectronics to Nano electronics.- Major Trends in Nano electronics.- Emerging Quantum Devices.- Molecular Electronics.- Diagnostics.- Therapeutics and Regenerative Medicine.- Nanotechnologies in Agriculture and Food.- Sensors for Measuring and Monitoring.- Nanotechnology Applications for Air, Water and Soil.- Water Demands for[...]

### Fields of interest

Nanotechnology; Science (general); Science Education; Engineering Design; Nanochemistry

### Target groups

Popular/general

### Type of publication

Professional book

More on [www.springer.com/978-94-6239-011-9](http://www.springer.com/978-94-6239-011-9)

### Hardcover

2014. XLV, 502 p. 402 illus., 204 illus. in color. ISBN 978-94-6239-011-9

**Due: December 31, 2013**

J. Njuguna, Robert Gordon University, Aberdeen, United Kingdom (Ed.)

## Structural Nanocomposites

### Perspectives for Future Applications

Advancements in the nanotechnology industry promise to offer improvements in capabilities across a spectrum of applications. This is of immense strategic importance to the high performance sector which has historically leveraged technological advances. The use of polymer nanocomposites in structures have several predictable impacts on structural design and applications, primarily by providing a safer, faster, and eventually cheaper transportation in the future. This book comprises reviews on the state-of-the-art, new research results, perspectives of future developments, and innovative applications relevant to structural materials, engineering structures, nanocomposites, modelling [...]

### Features

Advancements in the nanotechnology industry promise to offer improvements in capabilities across a spectrum of applications. This is of immense strategic importance to the high performance sector which has historically leveraged technological advances. The use of polymer nanocomposites in structures have several predictable impacts on structural design and applications, primarily by providing a safer, faster, [...]

### Contents

From the Contents: Dispersion methods of carbon nanotubes for the development of polymeric nanocomposites: characterization and application.- Thermoplastic nanocomposites with carbon nanotubes.- Graphite Based Nanocomposites to Enhance Mechanical Properties.

### Fields of interest

Structural Materials; Nanotechnology; Continuum Mechanics and Mechanics of Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40321-7](http://www.springer.com/978-3-642-40321-7)

### Hardcover

2013. VIII, 269 p. 143 illus., 11 illus. in color. (Engineering Materials) ISBN 978-3-642-40321-7

**usually dispatched within 3 to 5 business days**

**December 31, 2013**

W.J. Ooij, University of Cincinnati, Cincinnati, USA

## Silanes for Corrosion Control of Metals

Silanes for corrosion of metals covers the emerging applications of silanes for use in the corrosion protection of metals. The role of silane coupling agents is less than ten years old and is attracting attention from researchers in industry and academia alike. There is no comprehensive book on this topic on the market. Silanes for corrosion of metals covers the chemistry of silanes – in solution and at metal surfaces – as well as mechanisms of corrosion protection and paint adhesion by silanes. Modification of silane films for improved protection capabilities, e.g., by the addition of corrosion inhibitors, nanoparticles, or organic resins, is also covered. Special attention is paid[...]

### Features

Silanes for corrosion of metals covers the emerging applications of silanes for use in the corrosion protection of metals. The role of silane coupling agents is less than ten years old and is attracting attention from researchers in industry and academia alike. There is no comprehensive book on this topic on the market. Silanes for corrosion of metals covers the

### Contents

Definitions – Scope of Book.- Synthesis of Silanes.- Classification of Silane Types.- Behavior of Silanes in Solution.- Rate of Hydrolysis and Condensation.- Interaction of Silanes with Metals (and Ceramics).- Which Corrosion Forms can be controlled by Silane Films? How?- Paint Adhesion by Silanes.- Mechanisms (of Corrosion Protection; Paint Adhesion; Rubber Bonding).- Additions to Silane Solutions (for Performance Improvement).- Silane Additions to Primers (Superprimer Technology).- Electrodeposition of Silanes and Superprimers.

### Fields of interest

Tribology, Corrosion and Coatings; Metallic Materials; Industrial Chemistry / Chemical Engineering; Organic Chemistry; Materials Science (general)

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4020-9770-6](http://www.springer.com/978-1-4020-9770-6)

### Hardcover

2014. Approx. 400 p. (Advances in Silicon Science, Vol. 5)

ISBN 978-1-4020-9770-6

**Due: April 28, 2014**

A.D. Pomogailo, Russian Academy of Sciences, Chernogolovka, Moscow region, Russian Federation; A.S. Rozenberg, Russian Academy of Sciences, Chernogolovka, Moscow region, Russian Federation; G.I. Dzhardimalieva, Russian Academy of Sciences, Chernogolovka, Moscow region, Russian Federation

## Nanostructured Materials Preparation via Condensation Methods

The book is devoted to novel nanostructured materials and nanotechnology. A comprehensive analysis of the condensing methods of preparation of novel nanostructured materials is given. The methodology of power-consuming preparation of nanostructured materials is discussed, including thermolysis, photo- and radiolytic, electrochemical and mechanochemical methods. The peculiarities of chemical transformations in organic and inorganic matrices are compared. Special attention is given to kinetics and mechanism of the formation of nanocomposites. The structure and properties of such nanostructured materials are analysed.

### Features

The book is devoted to novel nanostructured materials and nanotechnology. A comprehensive analysis of the condensing methods of preparation of novel nanostructured materials is given. The methodology of power-consuming preparation of nanostructured materials is discussed, including thermolysis, photo- and radiolytic, electrochemical and mechanochemical methods. The peculiarities of chemical transformations [...]

### Contents

Part 1 Methodology of power-consuming preparation of nanostructured materials.- Methodology of thermal transformations.- Photo- and radiolytic methods.- Electrochemical methods.- Mechanochemical methods of nanomaterials preparation.- Part 2 The chemical transformations in inorganic matrices.- The peculiarities of structure of inorganic matrices.- Chemical transformations of guest in inorganic matrix.- Systems with crystal matrices.- Reactions in inorganic carrier of high dispersity.- The peculiarities of chemical transformations in sol-gel synthesis.- Part 3 The chemical [...]

### Fields of interest

Nanotechnology; Nanochemistry; Organic Chemistry

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-90-481-2564-7](http://www.springer.com/978-90-481-2564-7)

### Hardcover

2014. Approx. 400 p. 100 illus.  
ISBN 978-90-481-2564-7

**Due: July 28, 2014**

M.C. Roco, W. Bainbridge, B. Tonn, University of Tennessee, Knoxville, USA; G. Whitesides, Harvard University, Cambridge, USA (Eds.)

## Convergence of Knowledge, Technology and Society

Beyond Convergence of Nano-Bio-Info-Cognitive Technologies

This volume aims to document the most important worldwide accomplishments in converging knowledge and technology, including converging platforms, methods of convergence, societal implications, and governance in the last ten years. Convergence in knowledge, technology, and society is the accelerating, transformative interaction among seemingly distinct scientific disciplines, technologies, and communities to achieve mutual compatibility, synergism, and integration, and through this process to create added value for societal benefit. It is a movement that is recognized by scientists and thought leaders around the world as having the potential to provide far-reaching solutions to many of [...]

### Features

Convergence of knowledge and technology for the benefit of society (CKTS) is the core opportunity for progress in the 21st century, based on five principles: (1) the interdependence of all components of nature and society, (2) enhancement of creativity and innovation through evolutionary processes of convergence that combine existing principles, and divergence that generates new ones, (3) decision analysis [...]

### Contents

Acknowledgements.- Study Team and Report Authors.- External Reviewers.- Preface (Executive Summary).- Overview and Recommendations.- 1 Convergence Platforms: Foundational Science and Technology Tools.- 2 Convergence Platforms: Human-Scale Convergence and the Quality of Life.- 3 Convergence Platforms: Earth-Scale Systems.- 4 Methods to Improve and Expedite Convergence.- 5 Implications: Human Health and Physical Potential.- 6 Implications: Human Cognition and Communication and the Emergence of Cognitive Society.- 7 Implications: Societal Collective Outcomes, including Manufacturing.- [...]

### Fields of interest

Nanotechnology; R & D / Technology Policy; Information Systems and Communication Service; Neurosciences; Biotechnology; Philosophy of Technology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02203-1](http://www.springer.com/978-3-319-02203-1)

### Hardcover

2013. LVI, 542 p. 102 illus., 100 illus. in color. (Science Policy Reports)  
ISBN 978-3-319-02203-1

**Due: December 31, 2013**

A. Saboktakin, École de Technologie Supérieure, Montreal, Canada (Ed.)

## Problems and Solutions in the Mechanics of Composites

This book starts with a review of composite mechanics and basic behaviour of composite materials. The fundamentals of finite element analysis for composite modeling are presented in the following chapter. The applications of NDT techniques in composite inspection, in particular wave propagation, are scientifically discussed. Then, composites mechanics and NDT inspection are introduced in a question-answer format. In the last chapters, the editors introduce MATLAB codes and simulation results related to wave propagation in composite materials and vibrothermography technique, very useful for aerospace applications.

### Features

This book starts with a review of composite mechanics and basic behaviour of composite materials. The fundamentals of finite element analysis for composite modeling are presented in the following chapter. The applications of NDT techniques in composite inspection, in particular wave propagation, are scientifically discussed. Then, composites mechanics and NDT inspection are introduced in a question-answer [...]

### Contents

Mechanics of composite materials.- Finite element analysis of composite.- Non-destructive inspection of composite materials.- Problems and solutions.- Sample modeling (including wave propagation and composite testing).

### Fields of interest

Ceramics, Glass, Composites, Natural Materials; Structural Materials; Continuum Mechanics and Mechanics of Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-41325-4](http://www.springer.com/978-3-642-41325-4)

### Hardcover

2014. 300 p. (Engineering Materials)  
ISBN 978-3-642-41325-4

**Due: January 29, 2014**

I.L. Shabalin, The University of Salford, Salford, Greater Manchester, United Kingdom

## Ultra-High Temperature Materials I

Carbon (Graphene/Graphite) & Refractory Metals

This exhaustive work in three volumes with featuring cross-reference system provides a thorough overview of ultra-high temperature materials – from elements and chemical compounds to alloys and composites. Topics included are physical (crystallographic, thermodynamic, thermo-physical, electrical, optical, physico-mechanical, nuclear) and chemical (solid-state diffusion, interaction with chemical elements and compounds, interaction with gases, vapours and aqueous solutions) properties of the individual physico-chemical phases and multi-phase materials with melting (or sublimation) points over or about 2500 °C. The first volume focuses on carbon (graphite/graphene) and refractory metals[...]

### Features

This exhaustive work in three volumes with featuring cross-reference system provides a thorough overview of ultra-high temperature materials – from elements and chemical compounds to alloys and composites. Topics included are physical (crystallographic, thermodynamic, thermo-physical, electrical, optical, physico-mechanical, nuclear) and chemical (solid-state diffusion, interaction with chemical elements [...])

### Contents

Preface.- Introduction.- 1. Carbon (Graphene/Graphite) .- Structures.- Thermal Properties.- Electro-Magnetic & Optical Properties.- Physico-Mechanical Properties.- Nuclear Physical Properties.- Chemical Properties.- References.- 2. Tungsten.- Structures.- Thermal Properties.- Electro-Magnetic & Optical Properties.- Physico-Mechanical Properties.- Nuclear Physical Properties.- Chemical Properties.- References.- 3 Rhenium.- Structures.- Thermal Properties.- Electro-Magnetic & Optical Properties.- Physico-Mechanical Properties.- Nuclear Physical Properties.- Chemical Properties.- [...]

### Fields of interest

Characterization and Evaluation of Materials; Organic Chemistry; Engineering Thermodynamics, Heat and Mass Transfer

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-007-7586-2](http://www.springer.com/978-94-007-7586-2)

### Hardcover

2014. XVII, 808 p. 30 illus., 1 illus. in color. ISBN 978-94-007-7586-2

**Due: January 15, 2014**

W. Skorupa, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; H. Schmidt, Technische Universität Chemnitz, Chemnitz, Germany (Eds.)

## Subsecond Annealing of Advanced Materials

Annealing by Lasers, Flash Lamps and Swift Heavy Ions

The thermal processing of materials ranges from few fem to seconds by Swift Heavy Ion Implantation to about one second using advanced Rapid Thermal Annealing. This book offers after an historical excursus selected contributions on fundamental and applied aspects of thermal processing of classical elemental semiconductors and other advanced materials including nanostructures with novel optoelectronic, magnetic, and superconducting properties. Special emphasis is given on the diffusion and segregation of impurity atoms during thermal treatment. A broad range of examples describes the solid phase and/or liquid phase processing of elemental and compound semiconductors, dielectric [...]

### Features

The thermal processing of materials ranges from few femtoseconds by Swift Heavy Ion Implantation to about one second using advanced Rapid Thermal Annealing. This book offers after an historical excursus selected contributions on fundamental and applied aspects of thermal processing of classical elemental semiconductors and other advanced materials including nanostructures with novel optoelectronic, magnetic, [...]

### Contents

From the Contents: The very early time.- Nanonet formation by constitutional supercooling of pulsed laser annealed, Mn-implanted germanium.- Metastable activation of dopants by solid phase epitaxial recrystallization.- Superconducting Ga-implanted Germanium.- Structural changes in SiGe/Si layers induced by fast crystallization.

### Fields of interest

Optical and Electronic Materials; Laser Technology and Physics, Photonics; Semiconductors; Microwaves, RF and Optical Engineering; Surface and Interface Science, Thin Films

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03130-9](http://www.springer.com/978-3-319-03130-9)

### Hardcover

2014. XXII, 252 p. 217 illus., 61 illus. in color. (Springer Series in Materials Science, Vol. 192) ISBN 978-3-319-03130-9

**Due: January 31, 2014**

J. Thomas, Leibniz Institute for Solid State and Ma, Dresden, Germany; Th. Gemming, Leibniz Institute for Solid State and Ma, Dresden, Germany

## Analytical Transmission Electron Microscopy

An Introduction for Operators

This work is based on experiences acquired by the authors regarding often asked questions and problems during manifold education of beginners in analytical transmission electron microscopy. These experiences are summarised illustratively in this textbook. Explanations based on simple models and hints for the practical work are the focal points. This practically- oriented textbook represents a clear and comprehensible introduction for all persons who want to use a transmission electron microscope in practice but who are not specially qualified electron microscopists up to now.

### Features

This work is based on experiences acquired by the authors regarding often asked questions and problems during manifold education of beginners in analytical transmission electron microscopy. These experiences are summarised illustratively in this textbook. Explanations based on simple models and hints for the practical work are the focal points. This practically- oriented textbook represents a clear [...]

### Contents

From the Contents: Why this effort?.- What should we know about electron optics and the construction of an electron microscope.- We prepare electron-transparent samples.- Let us start with the work.- Let us switch to electron diffraction.- Why do we see any contrasts in the images?.- We increase the magnification.- Let us switch to scanning transmission electron microscopy.- Let us use the analytical possibilities.- Basics explained in more detail (a little bit more mathematics).

### Fields of interest

Characterization and Evaluation of Materials; Spectroscopy and Microscopy; Spectroscopy / Spectrometry; Nanotechnology and Microengineering

### Target groups

Graduate

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-94-017-8600-3](http://www.springer.com/978-94-017-8600-3)

### Hardcover

2014. 382 p. 193 illus., 33 illus. in color. ISBN 978-94-017-8600-3

**Due: April 27, 2014**

R. Vajtai (Ed.)

## Springer Handbook of Nanomaterials

The Springer Handbook of Nanomaterials covers the description of materials which have dimension on the "nanoscale". The description of the nanomaterials in this Handbook follows the thorough but concise explanation of the synergy of structure, properties, processing and applications of the given material. The Handbook mainly describes materials in their solid phase; exceptions might be e.g. small sized liquid aerosols or gas bubbles in liquids. The materials are organized by their dimensionality. Zero dimensional structures collect clusters, nanoparticles and quantum dots, one dimensional are nanowires and nanotubes, while two dimensional are represented by thin films and surfaces.[...]

### Features

Forewords by Claes-Göran Granqvist, Uppsala University, Sweden, and Neal F. Lane, Rice University, Texas. Nanomaterials inevitably have bright prospects, but even now they play an important role in many areas of industry. Some of these new materials are commercially available and are used in off the shelf products, others are important model systems for [...]

### Contents

Forewords by Claes-Göran Granqvist, Uppsala University, Sweden, and Neal F. Lane, Rice University, Texas.- Part A NanoCarbons.- Part B NanoMetals.- Part C NanoCeramics.- Part D NanoSemiconductors.- Part E Nanocomposites and Solutions.- Part F Nanoporous Materials.- Part G Organic and Bio Nanomaterials.- Part H Applications and Impact Acknowledgements. Part A NanoCarbons.- Part B NanoMetals.- Part C NanoCeramics.- Part D NanoSemiconductors.- Part E Nanocomposites and Solutions.- Part F Nanoporous Materials.- Part G Organic and Bio Nanomaterials.- Part H Applications and Impact Acknowledgements.

### Fields of interest

Nanotechnology; Structural Materials; Optical and Electronic Materials; Ceramics, Glass, Composites, Natural Materials; Biomaterials

### Target groups

Professional/practitioner

### Type of publication

Handbook

More on [www.springer.com/978-3-642-20594-1](http://www.springer.com/978-3-642-20594-1)

### Hardcover

2013. XXXVI, 1221 p. 685 illus. in color. ISBN 978-3-642-20594-1

**Online orders shipping within 2-3 days.**

X. Wang, Chinese Academy of Sciences, Beijing, China (P.R.); Z.M. Wang, Chinese Academy of Sciences, Beijing, China (P.R.) (Eds.)

## Nanoscale Thermoelectrics

For the efficient utilization of energy resources and the minimization of environmental damage, thermoelectric materials can play an important role by converting waste heat into electricity directly. Nanostructured thermoelectric materials have received much attention recently due to the potential for enhanced properties associated with size effects and quantum confinement. Nanoscale Thermoelectrics describes the theory underlying these phenomena, as well as various thermoelectric materials and nanostructures such as carbon nanotubes, SiGe nanowires, and graphene nanoribbons. Chapters written by leading scientists throughout the world are intended to create a fundamental bridge[...]

### Features

For the efficient utilization of energy resources and the minimization of environmental damage, thermoelectric materials can play an important role by converting waste heat into electricity directly. Nanostructured thermoelectric materials have received much attention recently due to the potential for enhanced properties associated with size effects and quantum confinement. Nanoscale [...]

### Contents

Preface.- Chapter 1: Thermoelectric effects: semiclassical and quantum approaches from the Boltzmann transport equation.- Chapter 2: Electron transport engineering by nanostructures for efficient thermoelectrics.- Chapter 3: Thermal Conductivity of Particulate Nanocomposites.- Chapter 4: Nano Bulk Thermoelectrics: Concepts, Techniques, and Modeling.- Chapter 5: Control Thermal Conductivity of Semiconductor Nanowires: Phononics Engineering.- Chapter 6: Thermoelectric efficiency of nanowires with long range surface disorder.- Chapter 7: One-dimensional Bi-based Nanostructures for [...]

### Fields of interest

Nanotechnology; Energy Harvesting; Engineering Thermodynamics, Heat and Mass Transfer; Nanoscale Science and Technology; Optical and Electronic Materials; Nanotechnology and Micro-engineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02011-2](http://www.springer.com/978-3-319-02011-2)

### Hardcover

2014. XI, 519 p. 279 illus., 223 illus. in color. (Lecture Notes in Nanoscale Science and Technology, Vol. 16) ISBN 978-3-319-02011-2

**usually dispatched within 3 to 5 business days**

Z.M. Wang, University of Electronic Science and, Chengdu, China (P.R.) (Ed.)

## Nanodroplets

Nanodroplets, the basis of complex and advanced nanostructures such as quantum rings, quantum dots and quantum dot clusters for future electronic and optoelectronic materials and devices, have attracted the interdisciplinary interest of chemists, physicists and engineers. This book combines experimental and theoretical analyses of nanosized droplets which reveal many attractive properties. Coverage includes nanodroplet synthesis, structure, unique behaviors and their nanofabrication, including chapters on focused ion beam, atomic force microscopy, molecular beam epitaxy and the "vapor-liquid-solid" route. Particular emphasis is given to the behavior of metallic nanodroplets, water[...]

### Features

Nanodroplets, the basis of complex and advanced nanostructures such as quantum rings, quantum dots, and quantum dot clusters for future electronic and optoelectronic materials and devices, have attracted the interdisciplinary interest of chemists, physicists, and engineers. This book combines experimental and theoretical analyses of nanosized droplets which reveal many attractive properties. Coverage [...]

### Contents

Preface.- Chapter 1: Generation of nanodroplets and Its applications.- Chapter 2: Nanodroplet formations in electrospun fibers of immiscible polymer blends and their effects on crystallization.- Chapter 3: Dynamic Study of Nanodroplet Nucleation and Growth using Transmitted Electrons in ESEM.- Chapter 4: Self-assembly of nanodroplets in nanocomposite materials in Nanodroplets Science and Technology.- Chapter 5: Ordering of Ga Nanodroplets by Low Energy Ion Sputtering.- Chapter 6: Atomistic mechanisms underlying the freezing behavior of metal nanodroplets.- Chapter 7: Dynamics of [...]

### Fields of interest

Nanotechnology; Nanoscale Science and Technology; Nanochemistry; Nanotechnology and Micro-engineering; Optical and Electronic Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9471-3](http://www.springer.com/978-1-4614-9471-3)

### Hardcover

2013. XII, 428 p. 197 illus., 124 illus. in color. (Lecture Notes in Nanoscale Science and Technology, Vol. 18) ISBN 978-1-4614-9471-3

**Due: December 31, 2013**

Z.M. Wang, University of Electronic Science and, Chengdu, China  
(P.R.) (Ed.)

## FIB Nanostructures

FIB Nanostructures reviews a range of methods, including milling, etching, deposition, and implantation, applied to manipulate structures at the nanoscale. Focused Ion Beam (FIB) is an important tool for manipulating the structure of materials at the nanoscale, and substantially extends the range of possible applications of nanofabrication. FIB techniques are widely used in the semiconductor industry and in materials research for deposition and ablation, including the fabrication of nanostructures such as nanowires, nanotubes, nanoneedles, graphene sheets, quantum dots, etc. The main objective of this book is to create a platform for knowledge sharing and dissemination of the latest[...]

### Features

FIB Nanostructures reviews a range of methods, including milling, etching, deposition, and implantation, applied to manipulate structures at the nanoscale. Focused Ion Beam (FIB) is an important tool for manipulating the structure of materials at the nanoscale, and substantially extends the range of possible applications of nanofabrication. FIB techniques are widely used in the semiconductor [...]

### Contents

Preface.- Chapter 1: Focused Ion Beam (FIB) technology for micro and nanoscale fabrications.- Chapter 2: Epitaxial ferroelectric nanostructures fabricated by FIB milling.- Chapter 3: Low current focused-ion-beam milling for freestanding nanomaterial characterization.- Chapter 4: Focused ion beam milling of carbon nanotube yarns and Bucky-papers: Correlating their internal structure with their macro-properties.- Chapter 5: Nanoscale electrical contacts grown by Focused-Ion-Beam (FIB) Induced Deposition.- Chapter 6: Metal induced crystallization of focused ion beam induced deposition for[...]

### Fields of interest

Nanotechnology; Semiconductors; Nanotechnology and Microengineering; Nanochemistry; Nanoscale Science and Technology; Optical and Electronic Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02873-6](http://www.springer.com/978-3-319-02873-6)

### Hardcover

2013. X, 590 p. 372 illus., 204 illus. in color. (Lecture Notes in Nanoscale Science and Technology, Vol. 20)  
ISBN 978-3-319-02873-6

**Due: December 31, 2013**

Z.M. Wang, University of Electronic Science, Chengdu, China  
(P.R.) (Ed.)

## MoS2

### Materials, Physics, and Devices

This book reviews the structure and electronic, magnetic, and other properties of various MoS<sub>2</sub> (Molybdenum disulfide) nanostructures, with coverage of synthesis, Valley polarization, spin physics, and other topics. MoS<sub>2</sub> is an important, graphene-like layered nano-material that substantially extends the range of possible nanostructures and devices for nanofabrication. These materials have been widely researched in recent years, and have become an attractive topic for applications such as catalytic materials and devices based on field-effect transistors (FETs) and semiconductors. Chapters from leading scientists worldwide create a bridge between MoS<sub>2</sub> nanomaterials and fundamental physics[...]

### Features

This book reviews the structure and electronic, magnetic, and other properties of various MoS<sub>2</sub> (Molybdenum disulfide) nanostructures, with coverage of synthesis, Valley polarization, spin physics, and other topics. MoS<sub>2</sub> is an important, graphene-like layered nano-material that substantially extends the range of possible nanostructures and devices for nanofabrication. These materials have been widely [...]

### Contents

Preface.- Chapter 1: Progress on the Theoretical Study of Two-Dimensional MoS<sub>2</sub> Monolayer and Nanoribbon.- Chapter 2: Electronic Structure of Exfoliated MoS<sub>2</sub>.- Chapter 3: Tunable Electronic and Dielectric Properties of Molybdenum Disulfide.- Chapter 4: Ab initio study on MoS<sub>2</sub> and its family: Chemical trend, band alignment, alloying and gap modulation.- Chapter 5: MoS<sub>2</sub>: A first principles perspective.- Chapter 6: Mechanical properties and electric field screening of atomically thin MoS<sub>2</sub> crystals.- Chapter 7: Insights into vibrational and electronic properties of MoS<sub>2</sub> using Raman.[...]

### Fields of interest

Optical and Electronic Materials; Nanoscale Science and Technology; Nanotechnology and Microengineering; Nanochemistry; Nanotechnology; Renewable and Green Energy

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02849-1](http://www.springer.com/978-3-319-02849-1)

### Hardcover

2014. XI, 291 p. 171 illus., 152 illus. in color. (Lecture Notes in Nanoscale Science and Technology, Vol. 21)  
ISBN 978-3-319-02849-1

**usually dispatched within 3 to 5 business days**

## Physics

H. Aoki, University of Tokyo, Tokyo, Japan; M. S. Dresselhaus, Massachusetts Institute of Technology, Cambridge, USA (Eds.)

## Physics of Graphene

This book provides a state of the art report of the knowledge accumulated in graphene research. The fascination with graphene has been growing very rapidly in recent years and the physics of graphene is now becoming one of the most interesting as well as the most fast-moving topics in condensed-matter physics. The Nobel prize in physics awarded in 2010 has given a tremendous impetus to this topic. The horizon of the physics of graphene is ever becoming wider, where physical concepts go hand in hand with advances in experimental techniques. Thus this book is expanding the interests to not only transport but optical and other properties for systems that include multilayer as well as[...]

### Features

This book provides a state of the art report of the knowledge accumulated in graphene research. The fascination with graphene has been growing very rapidly in recent years and the physics of graphene is now becoming one of the most interesting as well as the most fast-moving topics in condensed-matter physics. The Nobel prize in physics awarded in 2010 has given a tremendous impetus to this topic. The horizon [...]

### Contents

From the Contents: Experimental Manifestation of Berry Phase.- Probing Dirac Fermions in Graphene by Scanning Tunneling Microscopy and Spectroscopy.- Electron and Phonon Transport in Graphene in and out of the Bulk.- Optical Magneto-Spectroscopy of Graphene-Based Systems.- Graphene Constrictions.

### Fields of interest

Nanoscale Science and Technology; Nanotechnology; Nanotechnology and Microengineering; Semiconductors; Surfaces and Interfaces, Thin Films

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02632-9](http://www.springer.com/978-3-319-02632-9)

### Hardcover

2014. XII, 350 p. 146 illus., 64 illus. in color. (Nano-Science and Technology)  
ISBN 978-3-319-02632-9

**Due: January 31, 2014**

A. Ashtekar, Pennsylvania State University, University Park, USA; V. Petkov, Concordia University, Montreal, Canada (Eds.)

## Springer Handbook of Spacetime

The Springer Handbook of Space time brings together the theories of space time and their implications for our understanding of the universe and the quantum world. Unlike any existing book, the handbook will contain in a single volume detailed chapters, which address the physics, the mathematics, the experimental evidence, and the cosmological implications of the profound idea that gravity is not a force but is caused by the curvature of space time, as well as chapters on the efforts to create a theory of quantum gravity. Authored by the world's leading experts, this volume will be a valuable resource to students, teachers, and researchers alike.

### Features

The Springer Handbook of Spacetime brings together the theories of spacetime and their implications for our understanding of the universe and the quantum world. Unlike any existing book, the handbook will contain in a single volume detailed chapters, which address the physics, the mathematics, the experimental evidence, and the cosmological implications of the profound idea that gravity is not a force but is [..]

### Contents

Introduction to Spacetime Structure.- Foundational Issues.- Spacetime Structure and Mathematics.- Confronting Relativity Theories with Observations.- General Relativity and the Universe.- Spacetime Beyond Einstein.

### Fields of interest

Classical and Quantum Gravitation, Relativity Theory; Astronomy, Astrophysics and Cosmology; Mathematical Applications in the Physical Sciences; History and Philosophical Foundations of Physics

### Target groups

Professional/practitioner

### Type of publication

Handbook

More on [www.springer.com/978-3-642-41991-1](http://www.springer.com/978-3-642-41991-1)

### Hardcover

2014. C, 1100 p. 130 illus.  
ISBN 978-3-642-41991-1

**Due: April 13, 2014**

P.B. Baranov, Ioffe Physical -Technical Institute, St. Petersburg, Russia

## Magnetic Resonance of Semiconductors and Semiconductor Nanostructures

Different magnetic resonance (MR) methods and their applications in solids (e.g. semiconductors and nanostructures) are the focus of this work. Techniques and combinations thereof are explained and used to analyze defects in semiconductors and nanostructures. Presented for the first time are novelties such as single defects MR as well as state-of-art high-frequency pulse methods: EPR, ODMR, ENDOR. An overview of MR methods currently used to study defects, such as electron paramagnetic resonance (EPR), optically detected magnetic resonance (ODMR), electron-nuclear double resonance (ENDOR) etc. is provided. Problems existing in semiconductor and nanotechnology sciences which are[...]

### Features

Different magnetic resonance (MR) methods and their applications in solids (e.g. semiconductors and nanostructures) are the focus of this work. Techniques and combinations thereof are explained and used to analyze defects in semiconductors and nanostructures. Presented for the first time are novelties such as single defects MR as well as state-of-art high-frequency pulse methods: EPR, ODMR, ENDOR. An overview [..]

### Contents

1. Introduction.- 2. Fundamentals of electron paramagnetic resonance and related methods.- 2.1. Electron paramagnetic resonance (epr) .- 2.2. Electron spin echo (ese).- 2.3. Electron-nuclear double resonance (endor).- 2.4. Optically detected magnetic resonance (odmr).- 2.5. Optically detected cyclotron resonance (odcr).- 3. Retrospectives: milestones of magnetic resonance in semiconductors.- 3.1. Donors, acceptors, transition metals in si.- 3.2. Defects in diamond.- 3.3. Ii-vi, iii-v.- 3.4 silver halides.- 3.5. Wide-band-gap semiconductors.- 3.6. Beginning of nanotechnology era.- 4.[...]

### Fields of interest

Semiconductors; Nanotechnology; Physical Chemistry

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-7091-1156-7](http://www.springer.com/978-3-7091-1156-7)

### Hardcover

2014. 400 p. 150 illus., 8 illus. in color.  
ISBN 978-3-7091-1156-7

**Due: December 28, 2013**

J. Bland-Hawthorn, University of Sydney, Sydney, Australia; K. Freeman, Australian National University, Australian Capital Territory, Australia; F. Matteucci, Trieste University, Trieste, Italy; B. Moore, University of Zurich, Zurich, Switzerland (Ed.)

## The Origin of the Galaxy and Local Group

Saas-Fee Advanced Course 37. Swiss Society for Astrophysics and Astronomy

This volume contains the updated and expanded lecture notes of the 37th Saas-Fee Advanced Course organised by the Swiss Society for Astrophysics and Astronomy. It offers the most comprehensive and up to date review of one of the hottest research topics in astrophysics - how our Milky Way galaxy formed. Joss Bland-Hawthorn & Ken Freeman lectured on Near Field Cosmology - The Origin of the Galaxy and the Local Group. Francesca Matteucci's chapter is on Chemical evolution of the Milky Way and its Satellites. As designed by the SSAA, books in this series - and this one too - are targeted at graduate and PhD students and young researchers in astronomy, astrophysics and cosmology. Lecturers[...]

### Features

This volume contains the updated and expanded lecture notes of the 37th Saas-Fee Advanced Course organised by the Swiss Society for Astrophysics and Astronomy. It offers the most comprehensive and up to date review of one of the hottest research topics in astrophysics - how our Milky Way galaxy formed. Joss Bland-Hawthorn & Ken Freeman lectured on Near Field Cosmology - The Origin of the Galaxy and the [..]

### Contents

Near Field Cosmology - The Origin of the Galaxy and the Local Group.- Chemical evolution of the Milky Way and its Satellites.

### Fields of interest

Astronomy, Astrophysics and Cosmology

### Target groups

Graduate

### Type of publication

Monograph

More on [www.springer.com/978-3-642-41719-1](http://www.springer.com/978-3-642-41719-1)

### Hardcover

2014. 250 p. 115 illus., 60 illus. in color. (Saas-Fee Advanced Course, Vol. 37)  
ISBN 978-3-642-41719-1

**Due: February 2014**

F. Bourgeois, Université Paris-Sud, Orsay, France; C. Vincent, University of Nantes, Nantes, France; A. Stipsicz, Hungarian Academy of Sciences, Budapest, Hungary (Eds.)

## Contact and Symplectic Topology

Symplectic and contact geometry naturally emerged from the mathematical description of classical physics. The discovery of new rigidity phenomena and properties satisfied by these geometric structures launched a new research field worldwide. The intense activity of many European research groups in this field is reflected by the ESF Research Networking Programme "Contact And Symplectic Topology" (CAST). The lectures of the Summer School in Nantes (June 2011) and of the CAST Summer School in Budapest (July 2012) provide a nice panorama of many aspects of the present status of contact and symplectic topology. The notes of the minicourses offer a gentle introduction to topics which have [...]

### Features

Symplectic and contact geometry naturally emerged from the mathematical description of classical physics. The discovery of new rigidity phenomena and properties satisfied by these geometric structures launched a new research field worldwide. The intense activity of many European research groups in this field is reflected by the ESF Research Networking Programme "Contact And Symplectic [...]

### Contents

Mathematical contributions from V.I. Arnold.- Topological methods in 3-dimensional contact geometry.- A short introduction to Fukaya categories.- Open books and Lefschetz pencils in contact geometry.- Introduction to contact topology in higher dimensions.- Bordered Heegaard Floer homology.- Stein structures: existence and flexibility.- Embedded contact homology, cobordism maps, and applications.- Knot contact homology and applications.

### Fields of interest

Mathematical Methods in Physics; Geometry; Mathematical Applications in the Physical Sciences; Mathematical Physics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02035-8](http://www.springer.com/978-3-319-02035-8)

### Hardcover

2014. VIII, 460 p. 143 illus., 79 illus. in color. (Bolyai Society Mathematical Studies, Vol. 26)  
ISBN 978-3-319-02035-8

**Due: January 31, 2014**

S. Brandt

## Data Analysis

Statistical and Computational Methods for Scientists and Engineers

The fourth edition of this successful textbook presents a comprehensive introduction to statistical and numerical methods for the evaluation of empirical and experimental data. Equal weight is given to statistical theory and practical problems. The concise mathematical treatment of the subject matter is illustrated by many examples and for the present edition a library of Java programs has been developed. It comprises methods of numerical data analysis and graphical representation as well as many example programs and solutions to programming problems. The programs (source code, Java classes and documentation) and extensive appendices to the main text are available for free download [...]

### Features

The fourth edition of this successful textbook presents a comprehensive introduction to statistical and numerical methods for the evaluation of empirical and experimental data. Equal weight is given to statistical theory and practical problems. The concise mathematical treatment of the subject matter is illustrated by many examples, and for the present edition a library of Java programs has been developed. [...]

### Contents

Introduction.- Probabilities.- Random Variables: Distributions.- Computer-Generated Random Numbers: The Monte Carlo Method.- Some Important Distributions and Theorems.- Samples.- The Method of Maximum Likelihood.- Testing Statistical Hypotheses.- The Method of Least Squares.- Function Minimization.- Analysis of Variance.- Linear and Polynomial Regression.- Time-Series Analysis.- A) Matrix Calculations.- B) Combinatorics.- C) Formulas and Methods for the Computation of Statistical Functions.- D) The Gamma Function and Related Functions: Methods and Programs for their Computation.- E) [...]

### Fields of interest

Mathematical Methods in Physics; Appl. Mathematics / Computational Methods of Engineering; Statistics for Engineering, Physics, Computer Science, Chemistry and Earth Sciences; Math. Applications in Chemistry; Numerical and Computational Physics

### Target groups

Graduate

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-3-319-03761-5](http://www.springer.com/978-3-319-03761-5)

### Hardcover

2014. X, 352 p. 97 illus.  
ISBN 978-3-319-03761-5

**Due: February 28, 2014**

Z. Cao, Shanghai Jiao Tong University, Shanghai, China (P.R.); C. Yin, Hohai University, Changzhou, China (P.R.)

## Advances in One-Dimensional Wave Mechanics

Towards A Unified Classical View

Advances in One-Dimensional Wave Mechanics provides a comprehensive description of the motion of microscopic particles in one-dimensional, arbitrary-shaped potentials based on the analogy between Quantum Mechanics and Electromagnetism. Utilizing a deeper understanding of the wave nature of matter, this book introduces the concept of the scattered sub-waves and a series of new analytical results using the Analytical Transfer Matrix (ATM) method. This work will be useful for graduate students majoring in physics, mainly in basic quantum theory, as well as for academic researchers exploring electromagnetism, particle physics, and wave mechanics and for experts in the field of optics [...]

### Features

Advances in One-Dimensional Wave Mechanics provides a comprehensive description of the motion of microscopic particles in one-dimensional, arbitrary-shaped potentials based on the analogy between Quantum Mechanics and Electromagnetism. Utilizing a deeper understanding of the wave nature of matter, this book introduces the concept of the scattered sub-waves and a series of new analytical results using [...]

### Contents

Analogy between Quantum Mechanics and Optics.- Analytical Transfer Matrix method.- Semiclassical Approximation.- Exact Quantization Condition via Analytical Transfer Matrix method.- Barrier Tunneling.- The Scattered Subwaves.

### Fields of interest

Quantum Physics; Mathematical Methods in Physics; Quantum Optics, Quantum Electronics, Nonlinear Optics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40890-8](http://www.springer.com/978-3-642-40890-8)

### Hardcover

Jointly published with Shanghai Jiao Tong University Press, Shanghai, China  
2014. X, 158 p. 83 illus., 3 illus. in color.  
ISBN 978-3-642-40890-8

**Due: February 28, 2014**

M. Castillejo, Instituto de Química Física Rocasolano, Madrid, Spain; P.M. Ossi, Politecnico di Milano, Milan, Italy; L. Zhigilei, University of Virginia, Charlottesville, USA (Eds.)

## Lasers in Materials Science

This book covers various aspects of lasers in materials science, including a comprehensive overview on basic principles of laser-materials interactions and applications enabled by pulsed laser systems. The material is organized in a coherent way, providing the reader with a harmonic architecture. While systematically covering the major current and emerging areas of lasers processing applications, the Volume provides examples of targeted modification of material properties achieved through careful control of the processing conditions and laser irradiation parameters. Special emphasis is placed on specific strategies aimed at nanoscale control of material structure and properties to[...]

### Features

This book covers various aspects of lasers in materials science, including a comprehensive overview on basic principles of laser-materials interactions and applications enabled by pulsed laser systems. The material is organized in a coherent way, providing the reader with a harmonic architecture. While systematically covering the major current and emerging areas of lasers processing applications, the [...]

### Contents

From the Contents: Laser Physics for Materials Scientists: A Primer.- Material Response to Laser Energy Deposition (Thermal and Hyper thermal Processes).- Non-Thermal Material Response to Laser Energy Deposition.- Atomic Movies of Laser-Induced Structural and Phase Transformations from Molecular Dynamics Simulations.

### Fields of interest

Laser Technology and Physics, Photonics; Optical and Electronic Materials; Surface and Interface Science, Thin Films; Nanotechnology and Micro-engineering; Surfaces and Interfaces, Thin Films

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02897-2](http://www.springer.com/978-3-319-02897-2)

### Hardcover

2014. XIV, 387 p. 203 illus., 74 illus. in color. (Springer Series in Materials Science, Vol. 191)  
ISBN 978-3-319-02897-2

**Due: December 14, 2013**

G. Galati, Tor Vergata University - Roma, Roma, Italy

## 100 Years of Radar

This book, written by an expert in the field with a worldwide reputation, outlines the developments in radar and its applications during the past 100 years. Special attention is paid to the Italian and German contributions, which tend to be neglected in the scarce international literature. The entire historical period up to the present day is considered, with documentation of all significant events since the issue of the first patent to Christian Hülsmeyer in 1904. Information is also provided on the exceptional people who have made possible the development of this technology. The book is divided into ten chapters and is organized in such a way as to be easily read by both[...]

### Features

This book, written by an expert in the field with a worldwide reputation, outlines the developments in radar and its applications during the past 100 years. Special attention is paid to the Italian and German contributions, which tend to be neglected in the scarce international literature. The entire historical period up to the present day is considered, with documentation of all significant events since the [...]

### Contents

The unfortunate inventor and the lucky one - the Ur-radar, primordial apparatus.- The owls and the Owl - birth of the Italian radar.- A simultaneous invention - the first developments.- The air defense and the alleged father of radar.- The Second World War and its legacies.- The radar flies: birth and development of airborne radar systems.- The Italian situation in post-war period: SMA, Microlambda, Sindel, Selenia, Contraves, GEM, IDS.- From terrestrial to space-based radar: the adventure of Synthetic Aperture Radar (SAR).- Scops owls and bats - some considerations on the development[...]

### Fields of interest

Electronic Circuits and Devices; Aerospace Technology and Astronautics; History and Philosophical Foundations of Physics; History of Science

### Target groups

Upper undergraduate

### Type of publication

Monograph

More on [www.springer.com/978-3-319-00583-6](http://www.springer.com/978-3-319-00583-6)

### Hardcover

2014. Approx. 500 p. 200 illus.  
ISBN 978-3-319-00583-6

**Due: March 28, 2014**

V. Girka, I. Girka, M. Thumm, Karlsruhe Institute of Technology, Karlsruhe, Germany

## Surface Flute Waves in Plasmas

### Theory and Applications

The book presents results of a comprehensive study of various features of eigen electromagnetic waves propagating across the axis of plasma filled metal waveguides with cylindrical geometry. The authors collected in one book material on various features of surface flute waves, i.e. impact of waveguide design on wave dispersion, wave damping influenced by various reasons, impact of plasma density and external magnetic field inhomogeneity on the wave, and impact of waveguide corrugation and electric current on the wave. A variety of present surface waves applications and possible future applications is also included. Using the method of successive approximations it is shown how one can[...]

### Features

The book presents results of a comprehensive study of various features of eigen electromagnetic waves propagating across the axis of plasma filled metal waveguides with cylindrical geometry. The authors collected in one book material on various features of surface flute waves, i. e. impact of waveguide design on wave dispersion, wave damping influenced by various reasons, impact of plasma density and external [...]

### Contents

Surface Flute Waves Propagating in Uniform Magneto-Active Plasma Filled Waveguides.- Coupled Surface Flute Waves Propagating in Current-Carrying Plasma Waveguides.- Surface Flute Waves Propagating in Non-Isotropic Plasma Filled Waveguides.- Surface Flute Waves Propagating in Waveguides with Non-Circular Cross-Section.- Applications of Surface Wave Propagation.

### Fields of interest

Plasma Physics; Classical Electrodynamics, Wave Phenomena; Applied and Technical Physics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02026-6](http://www.springer.com/978-3-319-02026-6)

### Hardcover

2014. VIII, 163 p. 50 illus., 3 illus. in color. (Springer Series on Atomic, Optical, and Plasma Physics, Vol. 79)  
ISBN 978-3-319-02026-6

**usually dispatched within 3 to 5 business days**

W. Han, Chinese Academy of Sciences, Beijing, China (P.R.); Z.M. Wang (Eds.)

## Toward Quantum FinFET

### Features

This book reviews a range of quantum phenomena in novel nanoscale transistors called FinFETs, including quantized conductance of 1D transport, single electron effect, tunneling transport, etc. The goal is to create a fundamental bridge between quantum FinFET and nanotechnology to stimulate readers' interest in developing new types of semiconductor technology. Although the rapid development of micro-nano [...]

### Fields of interest

Nanoscale Science and Technology; Nanotechnology and Microengineering; Optical and Electronic Materials; Semiconductors; Nanotechnology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-02020-4](http://www.springer.com/978-3-319-02020-4)

### Hardcover

2013. XI, 363 p. 235 illus., 168 illus. in color. (Lecture Notes in Nanoscale Science and Technology, Vol. 17) ISBN 978-3-319-02020-4

**usually dispatched within 3 to 5 business days**

G. Iadonisi, Università di Napoli "Federico II", Napoli, Italy; G. Cantale, Università di Napoli "Federico II", Napoli, Italy; M.L. Chiofalo, University of Pisa, Pisa, Italy

## Introduction to Solid State Physics and Crystalline Nanostructures

This textbook provides conceptual, procedural, and factual knowledge on solid state and nanostructure physics. It is designed to acquaint readers with key concepts and their connections, to stimulate intuition and curiosity, and to enable the acquisition of competences in general strategies and specific procedures for problem solving and their use in specific applications. To these ends, a multidisciplinary approach is adopted, integrating physics, chemistry, and engineering and reflecting how these disciplines are converging towards common tools and languages in the field. Each chapter discusses essential ideas before the introduction of formalisms and the step-wise addition of [...]

### Features

This textbook provides conceptual, procedural, and factual knowledge on solid state and nanostructure physics. It is designed to acquaint readers with key concepts and their connections, to stimulate intuition and curiosity, and to enable the acquisition of competences in general strategies and specific procedures for problem solving and their use in specific applications. To these ends, a multidisciplinary [...]

### Contents

Crystals and Nanosystems Structure.- Electronic structure of nanosystems and crystals.- Elements of continuum mechanics and lattice vibrations.- Transport and Equilibrium Properties.- Optical Properties.- Correlations and Density Functional Theory.

### Fields of interest

Physics (general); Materials Science (general); Chemistry (general); Engineering Design

### Target groups

Upper undergraduate

### Type of publication

Graduate/advanced undergraduate textbook

More on [www.springer.com/978-88-470-2804-3](http://www.springer.com/978-88-470-2804-3)

### Softcover

2014. XXIV, 688 p. 50 illus. in color. (Collana di Fisica e Astronomia)

ISBN 978-88-470-2804-3

**Due: March 28, 2014**

C.-D. Jan, National Cheng Kung University, Tainan, Taiwan

## Gradually-varied Flow Profiles in Open Channels

Analytical Solutions by Using Gaussian Hypergeometric Function

Gradually-varied flow (GVF) is a steady non-uniform flow in an open channel with gradual changes in its water surface elevation. The evaluation of GVF profiles under a specific flow discharge is very important in hydraulic engineering. This book proposes a novel approach to analytically solve the GVF profiles by using the direct integration and Gaussian hypergeometric function. Both normal-depth- and critical-depth-based dimensionless GVF profiles are presented. The novel approach has laid the foundation to compute at one sweep the GVF profiles in a series of sustaining and adverse channels, which may have horizontal slopes sandwiched in between them.

### Features

Gradually-varied flow (GVF) is a steady non-uniform flow in an open channel with gradual changes in its water surface elevation. The evaluation of GVF profiles under a specific flow discharge is very important in hydraulic engineering. This book proposes a novel approach to analytically solve the GVF profiles by using the direct integration and Gaussian hypergeometric function. Both normal-depth- and [...]

### Fields of interest

Classical Continuum Physics; Mechanics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-35241-6](http://www.springer.com/978-3-642-35241-6)

### Hardcover

2014. XV, 203 p. 34 illus., 7 illus. in color. (Advances in Geophysical and Environmental Mechanics and Mathematics)

ISBN 978-3-642-35241-6

**Due: February 28, 2014**

K.K. Kar, Indian Institute of Technology Kanpur, Kanpur, India; S.K. Rana, Nanyang Technological University, Singapore, Singapore; J.K. Pandey, The University of Tokushima, Tokushima, Japan (Eds.)

## Handbook of Polymer Nanocomposites. Processing, Performance and Application

### Volume B: Carbon Nanotube Based Polymer Composites

Volume B forms one volume of a Handbook about Polymer Nanocomposites. Volume B deals with Carbon nanotube based polymer composites. The preparation, architecture, characterisation, properties and application of polymer nanocomposites are discussed within some 25 chapters. Each chapter has been authored by experts in the respective field.

#### Features

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#### Contents

Polystyrene Carbon Nanotube Nanocomposites.- Crystallization Behaviors and Mechanical Strength of Poly(butylene succinate)s/carbon Nanotubes Composites.- Functionalization of Carbon Nanotubes and their Polyurethane Nanocomposites.- Polyaniline/carbonnanocomposite Films for Gas Sensing.- Preparation and Properties of Nanocomposites Based on Poly(Ethylene-Co-Methyl Acrylate) and Multi-walled Carbon Nanotubes.- Synthesis and Characterization of Poly(phenylene sulphide) (PPS)-grafted Carbon Nanotube Nanocomposites.- CNT-Based Inherent Sensing and Interfacial Properties of Glass Fiber[...]

#### Fields of interest

Physics (general); Polymer Sciences

#### Target groups

Research

#### Type of publication

Handbook

More on [www.springer.com/978-3-642-45228-4](http://www.springer.com/978-3-642-45228-4)

#### Hardcover

2014. Approx. 200 p.  
ISBN 978-3-642-45228-4

**Due: March 3, 2014**

H.G. Merkus, Retired Associate Professor, Pijnacker, Netherlands; G.M.H. Meesters, DSM Food Specialities & Delft Univ. of T, Delft, Netherlands (Eds.)

## Particulate Products

### Tailoring Properties for Optimal Performance

Particulate products make up around 80% of chemical products, from all industry sectors. Examples given in this book include the construction materials, fine ceramics and concrete; the delicacies, chocolate and ice cream; pharmaceutical, powders, medical inhalers and sun screen; liquid and powder paints. Size distribution and the shape of the particles provide for different functionalities in these products. Some functions are general, others specific. General functions are powder flow and require – at the typical particulate concentrations of these products – that the particles cause adequate rheological behavior during processing and/or for product performance. Therefore, this book[...]

#### Features

Particulate products make up around eighty percent of chemical products, from all industry sectors. Examples given in this book include construction materials, fine ceramics and concrete, chocolate and ice cream, pharmaceutical, powders, medical inhalers and sun screen, liquid and powder paints. Size distribution and the shape of the particles provide for different functionalities in these products, [...]

#### Contents

Preface.- 1 Introduction by Henk G. Merkus and Gabriel M.H. Meesters.- 2 Basic Information for Design of Particulate Products by G. Henk Merkus.- 3 Measurement of Particle Size, Shape, Porosity and Zeta-potential by Henk G. Merkus.- 4 Assessment and Control of Fire and Explosion Hazards and Risks of Particulates by Saul M. Lemkowitz and Hans J. Pasman.- 5 Particle and Fiber Toxicology by Georgia K. Hinkley and Stephen M. Roberts.- 6 Ceramics - Effect of Powder and Slurry Properties on Quality by Makio Naito.- 7 Chocolate.- 8 Propellants.- 9 Dry powder inhalers.- 10 Powder coatings.- 11[...]

#### Fields of interest

Soft and Granular Matter, Complex Fluids and Microfluidics; Characterization and Evaluation of Materials; Nanoscale Science and Technology; Quality Control, Reliability, Safety and Risk

#### Target groups

Research

#### Type of publication

Monograph

More on [www.springer.com/978-3-319-00713-7](http://www.springer.com/978-3-319-00713-7)

#### Hardcover

2014. XVIII, 469 p. 151 illus., 72 illus. in color. (Particle Technology Series, Vol. 19)  
ISBN 978-3-319-00713-7

**usually dispatched within 3 to 5 business days**

E.L. Michelsen

## Quirky Quantum Concepts

Physical, Conceptual, Geometric, and Pictorial Physics that Didn't Fit in Your Textbook

Quirky Quantum Concepts explains the more important and more difficult concepts in theoretical quantum mechanics, especially those which are consistently neglected or confusing in many common expositions. The emphasis is on physical understanding, which is necessary for the development of new, cutting edge science. In particular, this book explains the basis for many standard quantum methods, which are too often presented without sufficient motivation or interpretation. The book is not a simplification or popularization: it is real science for real scientists. Physics includes math, and this book does not shy away from it, but neither does it hide behind it. Without conceptual[...]

#### Features

Quirky Quantum Concepts explains the more important and more difficult concepts in theoretical quantum mechanics, especially those which are consistently neglected or confusing in many common expositions. The emphasis is on physical understanding, which is necessary for the development of new, cutting edge science. In particular, this book explains the basis for many standard quantum methods, [...]

#### Contents

Introduction To Quirky Quantum Concepts.- Basic Wave Mechanics Concepts.- Riding the Wave: More on Wave Mechanics.- Introduction to Scattering.- Matrix Mechanics.- Angular Momentum.- Multi-Particle Quantum Mechanics.- Quantum Electromagnetic Radiation.- Desultory Topics in Quantum Mechanics.- Appendices.

#### Fields of interest

Quantum Physics; Mathematical Physics; Mathematical Methods in Physics; Mechanical Engineering

#### Target groups

Upper undergraduate

#### Type of publication

Undergraduate textbook

More on [www.springer.com/978-1-4614-9304-4](http://www.springer.com/978-1-4614-9304-4)

#### Softcover

2014. XIX, 361 p. 71 illus., 10 illus. in color. (Undergraduate Lecture Notes in Physics)  
ISBN 978-1-4614-9304-4

**Due: December 31, 2013**

S. Musazzi, Ricerca sul Sistema Energetico - RSE SpA, Milano, Italy; U. Perini, Ricerca sul Sistema Energetico - RSE SpA, Milano, Italy (Eds.)

## Laser-Induced Breakdown Spectroscopy

### Theory and Applications

This book deals with the Laser-Induced Breakdown Spectroscopy (LIBS) a widely used atomic emission spectroscopy technique for elemental analysis of materials. It is based on the use of a high-power, short pulse laser excitation. The book is divided into two main sections: the first one concerning the theoretical aspects of the technique, the second one describing the state of the art in applications of the technique in different scientific/technological areas. Numerous examples of state of the art applications provide the readers an almost complete scenario of the LIBS technique. The LIBS theoretical aspects are reviewed. The book helps the readers who are less familiar with the technique[...]

### Features

This book deals with the Laser-Induced Breakdown Spectroscopy (LIBS), a widely used atomic emission spectroscopy technique for elemental analysis of materials. It is based on the use of a high-power, short pulse laser excitation. The book is divided into two main sections: the first one concerning theoretical aspects of the technique, the second one describing the state of the art in applications of the [...]

### Contents

Part I Fundamentals of LIBS.- Physical processes in optical emission spectroscopy.- A review of LIBS instrumental techniques.- Effect of atmospheric conditions on LIBS spectra.- Temporal evolution of the LIBS signals.- The LIBS double pulse technique.- Part II Applications of LIBS.- Analysis of solid materials by means of LIBS.- Analysis of liquids/aerosol by means of LIBS.- Detection of contaminants in soil by means of LIBS.- Forensic applications by means of LIBS.- Biological applications of LIBS.- LIBS analysis of coal.- Detection of explosives in traces.- Cultural heritage[...]

### Fields of interest

Laser Technology and Physics, Photonics; Spectroscopy and Microscopy; Characterization and Evaluation of Materials; Physical Chemistry; Classical Electrodynamics, Wave Phenomena

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-45084-6](http://www.springer.com/978-3-642-45084-6)

### Hardcover

2014. 350 p. 190 illus., 10 illus. in color. (Springer Series in Optical Sciences, Vol. 182)  
ISBN 978-3-642-45084-6

Due: February 2014

V. Méndez, Universitat Autònoma de Barcelona, Cerdanyola del Vallés (Bellaterra), Spain; D. Campos, Universitat Autònoma de Barcelona, Cerdanyola del Vallés (Bellaterra), Spain; F. Bartumeus, Centre d'Estudis Avançats de Blanes, Blanes (Girona), Spain

## Stochastic Foundations in Movement Ecology

### Anomalous Diffusion, Front Propagation and Random Searches

This book presents the fundamental theory for non-standard diffusion problems in movement ecology. Lévy processes and anomalous diffusion have shown to be both powerful and useful tools for qualitatively and quantitatively describing a wide variety of spatial population ecological phenomena and dynamics, such as invasion fronts and search strategies. Adopting a self-contained, textbook-style approach, the authors provide the elements of statistical physics and stochastic processes on which the modeling of movement ecology is based and systematically introduce the physical characterization of ecological processes at the microscopic, mesoscopic and macroscopic levels. The explicit[...]

### Features

This book presents the fundamental theory for non-standard diffusion problems in movement ecology. Lévy processes and anomalous diffusion have shown to be both powerful and useful tools for qualitatively and quantitatively describing a wide variety of spatial population ecological phenomena and dynamics, such as invasion fronts and search strategies. Adopting a self-contained, textbook-style [...]

### Contents

Elements of Probability Theory.- Introduction to Stochastic Processes.- Microscopic, Mesoscopic and Macroscopic Descriptions of Dispersal- Continuous-Time Random Walks and Anomalous Diffusion.- Reaction-Dispersal Models and Front Propagation.- Stochastic Optimal Foraging Theory.- Cell Motion and Chemotaxis.- Host-Pathogen Interactions.- Biological Invasions.- Random Search in Model Organisms.

### Fields of interest

Socio- and Econophysics, Population and Evolutionary Models; Theoretical Ecology / Statistics; Genetics and Population Dynamics; Complexity; Complex Systems

### Target groups

Graduate

### Type of publication

Monograph

More on [www.springer.com/978-3-642-39009-8](http://www.springer.com/978-3-642-39009-8)

### Hardcover

2014. XVII, 310 p. 84 illus., 16 illus. in color. (Springer Series in Synergetics)  
ISBN 978-3-642-39009-8

usually dispatched within 3 to 5 business days

M. Naruse (Ed.)

## Nanophotonic Information Physics

### Nanointelligence and Nanophotonic Computing

This book provides a new direction in the field of nano-optics and nanophotonics from information and computing-related sciences and technology. Entitled by "Information Physics and Computing in Nanoscale Photonics and Materials", IPCN in short, the book aims to bring together recent progresses in the intersection of nano-scale photonics, information, and enabling technologies. The topic will include (1) an overview of information physics in nanophotonics, (2) DNA self-assembled nanophotonic systems, (3) Functional molecular sensing, (4) Smart fold computing, an architecture for nanophotonics, (5) semiconductor nanowire and its photonic applications, (6) single photoelectron[...]

### Features

This book provides a new direction in the field of nano-optics and nanophotonics from information and computing-related sciences and technology. Entitled by "Information Physics and Computing in Nanoscale Photonics and Materials", IPCN in short, the book aims to bring together recent progresses in the intersection of nano-scale photonics, information, and enabling technologies. The topic will include (1) an [...]

### Contents

Information Physics in Nanophotonics.- DNA Self-assembled Nanostructures for Resonance Energy Transfer Circuits.- Functional Molecular Sensing Using Photonic DNA Nanoprocessor.- Smart Fold Computing - A Distributed Approach to Overcome Diffraction Limit of Light.- Nonlinear Behaviors in III-V Semiconductor Nanowires and Their Application to Information Detection and Processing.- Single Photoelectron Manipulation and Detection with Sub-nanosecond Resolution in CMOS Imagers.- Engineering of Nanometric Optical System Based on Optical Near-field Interactions for Macroscale Applications.- [...]

### Fields of interest

Classical Electrodynamics, Wave Phenomena; Nanotechnology and Microengineering; Information Systems Applications (incl.Internet); Nanotechnology; Nanoscale Science and Technology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40223-4](http://www.springer.com/978-3-642-40223-4)

### Hardcover

2014. XV, 250 p. 151 illus., 57 illus. in color. (Nano-Optics and Nanophotonics)  
ISBN 978-3-642-40223-4

Due: December 31, 2013

T. Padmanabhan, Inter University Centre, Pune, India (Ed.)

## Astronomy in India: A Historical Perspective

### Fields of interest

Astronomy, Astrophysics and Cosmology; History and Philosophical Foundations of Physics; History of Science; Popular Science in Astronomy; Regional and Cultural Studies

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-81-8489-997-9](http://www.springer.com/978-81-8489-997-9)

### Hardcover

2014. Approx. 250 p.  
ISBN 978-81-8489-997-9

**Due: March 28, 2014**

J.K. Pandey, The University of Tokushima, Tokushima, Japan; H. Takagi, The University of Tokushima, Tokushima, Japan; A.N. Nakagaito, The University of Tokushima, Tokushima, Japan; H.-J. Kim, Seoul National University, Seoul, Korea, Republic of (South Korea) (Eds.)

## Handbook of Polymernanocomposites. Processing, Performance and Application

### Volume C: Polymernanocomposites of Cellulose Nanoparticles

Volume C forms one volume of a Handbook about Polymer Nanocomposites. Volume C deals with Polymer nano-composites of cellulose nano-particles. The preparation, architecture, characterisation, properties and application of polymer nanocomposites are discussed within some 27 chapters. Each chapter has been authored by experts in the respective field.

### Features

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### Contents

Preparation of Nanocellulose from Kenaf (Hibiscus cannabinus L.) via Chemical and Chemo-Mechanical Processes.- Bagasse and Rice Straw Nanocellulosic Materials and their Applications.- Extraction and Characterization of Cellulose Nanofibres from Banana Plant.- Isolation and Characterization of Cellulose Nanofibers from the Aquatic Weed Water Hyacinth - Eichhornia crassipes.- Dispersion of Cellulose Nano Fibers.- Extraction and Production of Cellulose Nanofibers.- Enzymatically Produced Nano-ordered Elements Containing Cellulose Crystalline Domains of Cladophora cellulose.- [...]

### Fields of interest

Physics (general); Polymer Sciences

### Target groups

Research

### Type of publication

Handbook

More on [www.springer.com/978-3-642-45231-4](http://www.springer.com/978-3-642-45231-4)

### Hardcover

2014. 200 p.  
ISBN 978-3-642-45231-4

**Due: January 13, 2014**

A.L. Peratt

## Physics of the Plasma Universe

Today many scientists recognize plasma as the key element to understanding the generation of magnetic fields in planets, stars, and galaxies; the behavior of stellar atmospheres and the interstellar medium; the acceleration and transport of cosmic rays, their effect on earth-bound artifacts; and many other phenomena occurring in radio galaxies, galactic nuclei, and quasars. These phenomena increasingly are recognized as a unified discipline. The material in Physics of the Plasma Universe addresses topics in contemporary astrophysics such as magnetism in plasma; the generation of electric fields in space plasmas; double-layers; synchrotron radiation, cosmic radiation, energy transport[...]

### Features

Today many scientists recognize plasma as the key element to understanding the generation of magnetic fields in planets, stars, and galaxies; the behavior of stellar atmospheres and the interstellar medium; the acceleration and transport of cosmic rays, their effect on earth-bound artifacts; and many other phenomena occurring in radio galaxies, galactic nuclei, and quasars. These phenomena [...]

### Contents

Cosmic Plasma Fundamentals.- Birkeland Currents in Cosmic Plasma.- Biot-Savart Law in Cosmic Plasma.- Electric Fields in Cosmic Plasma.- Double Layers in Astrophysics.- Synchrotron Radiation.- Transport of Cosmic Radiation.- Particle in Cell Simulation of Cosmic Plasma.

### Fields of interest

Plasma Physics; Astronomy, Astrophysics and Cosmology; Cosmology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-7818-8](http://www.springer.com/978-1-4614-7818-8)

### Hardcover

2014. X, 400 p. 220 illus.  
ISBN 978-1-4614-7818-8

**Due: June 2, 2014**

W. Quint, Gesellschaft f. Schwerionenforschung, Darmstadt, Germany; M. Vogel (Eds.)

## Fundamental Physics in Particle Traps

This volume provides detailed insight into the field of precision spectroscopy and fundamental physics with particles confined in traps. It comprises experiments with electrons and positrons, protons and antiprotons, antimatter and highly charged ions together with corresponding theoretical background. Such investigations represent stringent tests of quantum electrodynamics and the Standard model, antiparticle and antimatter research, test of fundamental symmetries, constants and their possible variations with time and space. They are key to various aspects within metrology such as mass measurements and time standards, as well as promising to further developments in quantum [...]

### Features

This volume provides detailed insight into the field of precision spectroscopy and fundamental physics with particles confined in traps. It comprises experiments with electrons and positrons, protons and antiprotons, antimatter and highly charged ions, together with corresponding theoretical background. Such investigations represent stringent tests of quantum electrodynamics and the Standard model, [...]

### Contents

Precise Matter and Antimatter Tests of the Standard Model with  $e^-$ ,  $e^+$ ,  $p$ ,  $\bar{p}$  and  $H$  (G. Gabrielse, S. Fogwell Hoogerheide, J. Dorr and E. Novitski).- Theory of Anomalous Magnetic Dipole Moments of the Electron (M. Hayakawa).- Magnetic Moment of the Bound Electron (M. Vogel and W. Quint).- QED Theory of the Bound-Electron Magnetic Moment (D.A. Glazov, A.V. Volotka, V.M. Shabaev, and G. Plunien).- The Magnetic Moments of the Proton and the Antiproton (S. Ulmer and C. Smorra).- Fundamental Physics with Antihydrogen (J.S. Hangst).- High-precision Mass Measurements of Radionuclides with [...]

### Fields of interest

Spectroscopy and Microscopy; Quantum Physics; Atomic/Molecular Structure and Spectra; Measurement Science, Instrumentation

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-45200-0](http://www.springer.com/978-3-642-45200-0)

### Hardcover

2014. XIX, 411 p. 166 illus. (Springer Tracts in Modern Physics, Vol. 256)  
ISBN 978-3-642-45200-0

**Due: January 31, 2014**

D. Rickles

## A Brief History of String Theory

From Dual Models to M-Theory

During its forty year lifespan, string theory has always had the power to divide, being called both a 'theory of everything' and a 'theory of nothing'. Critics have even questioned whether it qualifies as a scientific theory at all. This book adopts an objective stance, standing back from the question of the truth or falsity of string theory and instead focusing on how it came to be and how it came to occupy its present position in physics. An unexpectedly rich history is revealed, with deep connections to our most well-established physical theories. Fully self-contained and written in a lively fashion, the book will appeal to a wide variety of readers from novice to specialist.

### Features

During its forty year lifespan, string theory has always had the power to divide, being called both a 'theory of everything' and a 'theory of nothing'. Critics have even questioned whether it qualifies as a scientific theory at all. This book adopts an objective stance, standing back from the question of the truth or falsity of string theory and instead focusing on how it came to be and how it [...]

### Contents

History and Mythology.- Part I: The (Very) Early Years: 1959-1973.- Particle Physics in the Sixties.- The Veneziano Model.- The Hadronic String.- Supersymmetric Strings and Field Theoretic Limits.- Part II: A Decade of Darkness: 1974-1984.- An Early Demise? Theoretical Exaptation in String Theory.- Turning Point(s).- Part III: String Theory Becomes Super: 1985-1995.- Superstring Theory and the Real World.- A 'Second Superstring Revolution' and the Future of String Theory.

### Fields of interest

Quantum Field Theories, String Theory; Philosophy of Science; History and Philosophical Foundations of Physics; Elementary Particles, Quantum Field Theory; Classical and Quantum Gravitation, Relativity Theory

### Target groups

Upper undergraduate

### Type of publication

Monograph

More on [www.springer.com/978-3-642-45127-0](http://www.springer.com/978-3-642-45127-0)

### Hardcover

2014. XIX, 250 p. 39 illus. (The Frontiers Collection)  
ISBN 978-3-642-45127-0

**Due: January 15, 2014**

J.G. Roederer, University of Alaska-Fairbanks, Fairbanks, USA; H. Zhang, University of Alaska-Fairbanks, Fairbanks, USA

## Dynamics of Magnetically Trapped Particles

Foundations of the Physics of Radiation Belts and Space Plasmas

This book is a new edition of Roederer's classic Dynamics of Geomagnetically Trapped Radiation, updated and considerably expanded. The main objective is to describe the dynamic properties of magnetically trapped particles in planetary radiation belts and plasmas and explain the physical processes involved from the theoretical point of view. The approach is to examine in detail the orbital and adiabatic motion of individual particles in typical configurations of magnetic and electric fields in the magnetosphere and, from there, derive basic features of the particles' collective "macroscopic" behavior in general planetary environments. Emphasis is not on the "what" but on the "why" of [...]

### Features

This book is a new edition of Roederer's classic Dynamics of Geomagnetically Trapped Radiation, updated and considerably expanded. The main objective is to describe the dynamic properties of magnetically trapped particles in planetary radiation belts and plasmas and explain the physical processes involved from the theoretical point of view. The approach is to examine in detail the orbital and [...]

### Contents

Particle Drifts and the First Adiabatic Invariant.- Particle Trapping, Drift Shells and the Second Adiabatic Invariant.- Periodic Drift Motion and the Third Adiabatic Invariant.- Trapped Particle Distributions and Flux Mapping.- Violation of the Adiabatic Invariants and Trapped Particle Diffusion.- Introduction to Plasma Physics.

### Fields of interest

Extraterrestrial Physics, Space Sciences; Plasma Physics; Geophysics / Geodesy; Applied and Technical Physics; Magnetism, Magnetic Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-41529-6](http://www.springer.com/978-3-642-41529-6)

### Hardcover

2014. XVIII, 192 p. 100 illus., 1 illus. in color. (Astrophysics and Space Science Library, Vol. 403)  
ISBN 978-3-642-41529-6

**Due: December 31, 2013**

A. Rubin, Lomonosov Moscow State University, Moscow, Russian Federation; G. Rizinchenko, Lomonosov Moscow State University, Moscow, Russian Federation

## Mathematical Biophysics

This book presents concise descriptions and analysis of the classical and modern models used in mathematical biophysics. The authors ask the question "what new information can be provided by the models that cannot be obtained directly from experimental data?" Actively developing fields such as regulatory mechanisms in cells and subcellular systems and electron transport and energy transport in membranes are addressed together with more classical topics such as metabolic processes, nerve conduction and heart activity, chemical kinetics, population dynamics, and photosynthesis. The main approach is to describe biological processes using different mathematical approaches necessary to [...]

### Features

This book presents concise descriptions and analysis of the classical and modern models used in mathematical biophysics. The authors ask the question "what new information can be provided by the models that cannot be obtained directly from experimental data?" Actively developing fields such as regulatory mechanisms in cells and subcellular systems and electron transport and energy transport in membranes are [...]

### Contents

Preface.- Part I Basic models in mathematical biophysics.- Chapter 1 Growth and catalysis models.- Chapter 2 Oscillations, rhythms and chaos in biological systems.- Chapter 3 Spatiotemporal self-organization of biological systems.- Chapter 4 Model of the impact of a weak electric field on the nonlinear system of trans-membrane ion transport.- Part II Models of complex systems.- Chapter 5 Oscillations and periodic space structures of pH and electric potential along the cell membrane of algae *Chara corallina*.- Chapter 6 Models of Morphogenesis.- Chapter 7 Autowave processes, nerve pulse [...]

### Fields of interest

Biophysics and Biological Physics; Computer Applications in Life Sciences; Math. Applications in Chemistry

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-8701-2](http://www.springer.com/978-1-4614-8701-2)

### Hardcover

2014. XV, 273 p. 150 illus., 43 illus. in color. (Biological and Medical Physics, Biomedical Engineering)  
ISBN 978-1-4614-8701-2

**usually dispatched within 3 to 5 business days**

H. Satz

## Ultimate Horizons

Probing the Limits of the Universe

In the last hundred years, modern physics and cosmology have shown that there exist regions of the universe forever beyond our reach, hidden by truly ultimate horizons. Such regions exist in those remote parts of the universe where, from our point of view, space expands faster than the speed of light. They are found in black holes, where the gravity is strong enough to retain even light within its field of attraction. And in the realm of the very small, quarks must remain forever confined to their world of extreme density and can never be removed from it. The aim of this book is to describe these ultimate horizons, how they were discovered, how they shape our view of the world, and [...]

### Features

In the last hundred years, modern physics and cosmology have shown that there exist regions of the universe forever beyond our reach, hidden by truly ultimate horizons. Such regions exist in those remote parts of the universe where, from our point of view, space expands faster than the speed of light. They are found in black holes, where the gravity is strong enough to retain even light within its field of [...]

### Contents

Horizons.- The Vanishing Stars.- The Secret Glow of Black Holes.- The Visions of the Accelerating Observer.- The Smallest Possible Thing.- Primordial Matter.-The Last Veil.

### Fields of interest

Astronomy, Astrophysics and Cosmology; Elementary Particles, Quantum Field Theory; Epistemology; Philosophy of Science

### Target groups

Upper undergraduate

### Type of publication

Monograph

More on [www.springer.com/978-3-642-41656-9](http://www.springer.com/978-3-642-41656-9)

### Hardcover

2013. XII, 172 p. 68 illus., 53 illus. in color. (The Frontiers Collection)  
ISBN 978-3-642-41656-9

**Due: December 31, 2013**

G. Schaller, Technische Universität Berlin, Berlin, Germany

## Open Quantum Systems Far from Equilibrium

This monograph provides graduate students and also professional researchers aiming to understand the dynamics of open quantum systems with a valuable and self-contained toolbox. Special focus is laid on the link between microscopic models and the resulting open-system dynamics. This includes how to derive the celebrated Lindblad master equation without applying the rotating wave approximation. As typical representatives for non-equilibrium configurations it treats systems coupled to multiple reservoirs (including the description of quantum transport), driven systems and feedback-controlled quantum systems. Each method is illustrated with easy-to-follow examples from recent research. [...]

### Features

This monograph provides graduate students and also professional researchers aiming to understand the dynamics of open quantum systems with a valuable and self-contained toolbox. Special focus is laid on the link between microscopic models and the resulting open-system dynamics. This includes how to derive the celebrated Lindblad master equation without applying the rotating wave approximation. As typical [...]

### Contents

An Introduction to Master Equations.- Obtaining a Master Equation.- Solving Master Equations.- Multi-Terminal Coupling: Non-Equilibrium Case I.- Direct Bath Coupling: Non-Equilibrium Case II.- Open-Loop Control: Non-Equilibrium Case III.- Closed-Loop Control: Non-Equilibrium Case IV.

### Fields of interest

Quantum Physics; Mathematical Methods in Physics; Mathematical Applications in the Physical Sciences; Mathematical Physics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-03876-6](http://www.springer.com/978-3-319-03876-6)

### Softcover

2014. X, 242 p. 44 illus., 10 illus. in color. (Lecture Notes in Physics, Vol. 881)  
ISBN 978-3-319-03876-6

**Due: February 28, 2014**

C. Scheidenberger, Gesellschaft für, Darmstadt, Germany; M. Pfitzner, University of Warsaw, Warsaw, Poland (Eds.)

## The Euroschool on Exotic Beams, Vol. IV

This is the fourth volume in a series of Lecture Notes based on the highly successful Euro Summer School on Exotic Beams. The aim of these notes is to provide a thorough introduction to radioactive ion-beam physics at the level of graduate students and young postdocs starting out in the field. Each volume covers a range of topics from nuclear theory to experiment and applications. Vol I has been published as LNP 651, Vol II has been published as LNP 700, and Vol. III has been published as LNP 764.

### Features

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### Contents

Clustering in Light Nuclei: From the Stable to the Exotic.- A Pedestrian Approach to the Theory of Transfer Reactions: Applications to Weekly-bound and Unbound Exotic Nuclei.- Effective Field Theories of Loosely Bound Nuclei.- Direct Reactions at Relativistic Energies: A New Insight Into the Single-particle Structure of Exotic Nuclei.- Nuclear Charge Radii of Light Elements and Recent Developments in Collinear Laser Spectroscopy.- The Nuclear Energy Density Functional Formalism.

### Fields of interest

Nuclear Physics, Heavy Ions, Hadrons; Particle Acceleration and Detection, Beam Physics; Measurement Science, Instrumentation; Astrophysics and Astroparticles

### Target groups

Graduate

### Type of publication

Monograph

More on [www.springer.com/978-3-642-45140-9](http://www.springer.com/978-3-642-45140-9)

### Softcover

2014. XIII, 350 p. 133 illus., 83 illus. in color. (Lecture Notes in Physics, Vol. 879)  
ISBN 978-3-642-45140-9

**Due: January 31, 2014**

V. Schmidt, Joanneum Research Forschungsges. mbH, Weiz, Austria; M.R. Beleggratis, Joanneum Research Forschungsges. mbH, Weiz, Austria (Eds.)

## Laser Technology in Biomimetics

### Basics and Applications

Lasers are progressively more used as versatile tools for fabrication purposes. The wide range of available powers, wavelengths, operation modes, repetition rates etc. facilitate the processing of a large spectrum of materials at exceptional precision and quality. Hence, manifold methods were established in the past and novel methods are continuously under development. Biomimetics, the translation from nature-inspired principles to technical applications, is strongly multidisciplinary. This field offers intrinsically a wide scope of applications for laser based methods regarding structuring and modification of materials. This book is dedicated to laser fabrication methods in [...]

### Features

Lasers are progressively more used as versatile tools for fabrication purposes. The wide range of available powers, wavelengths, operation modes, repetition rates etc. facilitate the processing of a large spectrum of materials at exceptional precision and quality. Hence, manifold methods were established in the past and novel methods are continuously under development. Biomimetics, the translation from nature-inspired principles to technical applications, is strongly multidisciplinary. This field offers intrinsically a wide scope of applications for laser based methods regarding structuring and modification of materials. This book is dedicated to laser fabrication methods in [...]

### Contents

Laser fabrication in biomimetics.- Laser technology in biomimetics applications.- Future perspectives.

### Fields of interest

Biophysics and Biological Physics; Laser Technology and Physics, Photonics; Biomedical Engineering; Classical Electrodynamics, Wave Phenomena

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-41340-7](http://www.springer.com/978-3-642-41340-7)

### Hardcover

2014. XXIII, 268 p. 82 illus., 50 illus. in color. (Biological and Medical Physics, Biomedical Engineering)  
ISBN 978-3-642-41340-7

**Due: January 31, 2014**

P. Schmüser, M. Dohlus, J. Rossbach, C. Behrens, DESY, Hamburg, Germany

## Free-Electron Lasers in the Ultraviolet and X-Ray Regime

### Physical Principles, Experimental Results, Technical Realization

The main goal of the book is to provide a systematic and didactic approach to the physics and technology of free-electron lasers. Numerous figures are used for illustrating the underlying ideas and concepts and links to other fields of physics are provided. After an introduction to undulator radiation and the low-gain FEL, the one-dimensional theory of the high-gain FEL is developed in a systematic way. Particular emphasis is put on explaining and justifying the various assumptions and approximations that are needed to obtain the differential and integral equations governing the FEL dynamics. Analytical and numerical solutions are presented and important FEL parameters are defined, [...]

### Features

The main goal of the book is to provide a systematic and didactic approach to the physics and technology of free-electron lasers. Numerous figures are used for illustrating the underlying ideas and concepts, and links to other fields of physics are provided. After an introduction to undulator radiation and the low-gain FEL, the one-dimensional theory of the high-gain FEL is developed in a systematic way. [...]

### Contents

Introduction.- Undulator Radiation.- Low-Gain FEL Theory.- One-Dimensional Theory of the High-Gain FEL.- Applications of the High-Gain FEL Equations.- Energy Spread, Space Charge and 3D Effects.- Self-Amplified Spontaneous Emission and FEL Seeding.- The EUV and Soft X-Ray FEL in Hamburg.- X-Ray Free-Electron Lasers: Technical Realization and Experimental Results.- Appendices.- A. Hamiltonian Formalism.- B. Supplements to Chapter 4.- C. Gaussian Modes of Laser Beams.- D. Eigenmode Approach.- E. Statistical Methods and Tools.- F. Conventions and Frequently used Symbols.- Index.

### Fields of interest

Laser Technology and Physics, Photonics; Particle Acceleration and Detection, Beam Physics; Measurement Science, Instrumentation

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-319-04080-6](http://www.springer.com/978-3-319-04080-6)

### Hardcover

2014. XIII, 242 p. 114 illus., 111 illus. in color. (Springer Tracts in Modern Physics, Vol. 258)  
ISBN 978-3-319-04080-6

**Due: February 28, 2014**

K.-I. Shudo, I. Katayama, S.-Y. Ohno (Eds.)

## Frontiers in Optical Methods

### Nano-Characterization and Coherent Control

This collection of reviews by leading Japanese researchers covers topics like ultrafast optical responses, terahertz and phonon studies, super-sensitive surface and high-pressure spectroscopy, combination of visible and x-ray photonics. Several related areas at the cutting edge of measurement technology and materials science are included. This book is partly based on well-cited review articles in the Japanese language in special volumes of the Journal of the Vacuum Society of Japan.

#### Features

This collection of reviews by leading Japanese researchers covers topics like ultrafast optical responses, terahertz and phonon studies, super-sensitive surface and high-pressure spectroscopy, combination of visible and x-ray photonics. Several related areas at the cutting edge of measurement technology and materials science are included. This book is partly based on well-cited review articles in the Japanese [...]

#### Contents

State-of-Art of Terahertz Science and Technology.- Broadband Terahertz Spectroscopy and its Application to the Characterization of Thin Films.- Single Photon Counting and Passive Microscopy of Terahertz Radiation.- Coherent Phonons in Carbon Nanotubes.- Time-resolved X-ray Diffraction Studies of Coherent Lattice Dynamics Using Synchrotron Radiation.- Imaging GHz-THz Acoustic Wave Propagation in Thin Films and Microstructures.- Material Evaluation with Various Optical Measurement Systems: Focusing on Terahertz Spectroscopy.- Ultrafast Excitation and Dynamics Measurements with Intense[...]

#### Fields of interest

Laser Technology and Physics, Photonics; Atomic, Molecular, Optical and Plasma Physics; Applied Optics, Optoelectronics, Optical Devices; Spectroscopy and Microscopy; Microwaves, RF and Optical Engineering; Nanotechnology

#### Target groups

Research

#### Type of publication

Monograph

More on [www.springer.com/978-3-642-40593-8](http://www.springer.com/978-3-642-40593-8)

#### Hardcover

2014. XII, 228 p. 139 illus., 70 illus. in color. (Springer Series in Optical Sciences, Vol. 180)

ISBN 978-3-642-40593-8

usually dispatched within 3 to 5 business days  
December 31, 2013

A. Solov'yov, Goethe Universität Frankfurt, Frankfurt, Germany; A. Korol, Goethe Universität Frankfurt, Frankfurt, Germany

## Polarization Bremsstrahlung

This book introduces and reviews both theory and applications of polarizational bremsstrahlung, i.e. the electromagnetic radiation emitted during collisions of charged particles with structured, thus polarizable targets, such as atoms, molecules and clusters. The subject, following the first experimental evidence a few decades ago, has gained importance through a number of modern applications. Thus, the study of several radiative mechanisms is expected to lead to the design of novel light sources, operating in various parts of the electromagnetic spectrum. Conversely, the analysis of the spectral and angular distribution of the photon emission constitutes a new tool for extracting[...]

#### Features

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#### Contents

Introduction.- Bremsstrahlung in Collisions of Structureless Charged Particles with Atoms and Ions.- Polarizational Bremsstrahlung in Collisions With Hydrogen Atom.- Cross Section of PBrS From Many-Electron Atoms and Ions.- PBrS in Non-Relativistic Collisions of Structural Particles with Atoms and Ions.- Relativistic Effects in the Polarizational BrS Process.- PBrS From Atomic Clusters and Fullerenes.- Conclusion.- References.

#### Fields of interest

Atoms and Molecules in Strong Fields, Laser Matter Interaction; Physical Chemistry

#### Target groups

Research

#### Type of publication

Monograph

More on [www.springer.com/978-3-642-45223-9](http://www.springer.com/978-3-642-45223-9)

#### Hardcover

2014. Approx. 280 p. (Springer Series on Atomic, Optical, and Plasma Physics, Vol. 80)

ISBN 978-3-642-45223-9

Due: March 28, 2014

G. Srinivasan

## What are the Stars?

The outstanding question in astronomy at the turn of the twentieth century was: What are the stars and why are they as they are? In this volume, the story of how the answer to this fundamental question was unravelled is narrated in an informal style, with emphasis on the underlying physics. Although the foundations of astrophysics were laid down by 1870, and the edifice was sufficiently built up by 1920, the definitive proof of many of the prescient conjectures made in the 1920s and 1930s came to be established less than ten years ago. This book discusses these recent developments in the context of discussing the nature of the stars, their stability and the source of the energy they[...]

#### Features

The outstanding question in astronomy at the turn of the twentieth century was: What are the stars and why are they as they are? In this volume, the story of how the answer to this fundamental question was unravelled is narrated in an informal style, with emphasis on the underlying physics. Although the foundations of astrophysics were laid down by 1870, and the edifice was sufficiently built up by 1920, [...]

#### Contents

The Present Revolution in Astronomy: An Overview.- What Are the Stars?.- Stars as Globes of Gas.- Eddington's Theory of the Stars.- Why Are the Stars as They Are?.- Energy Generation in the Stars.- Sounds of the Sun.- The Smoking Gun is Finally Found.

#### Fields of interest

Astrophysics and Astroparticles; Astronomy, Observations and Techniques

#### Target groups

Lower undergraduate

#### Type of publication

Undergraduate textbook

More on [www.springer.com/978-3-642-45301-4](http://www.springer.com/978-3-642-45301-4)

No distribution rights for India, Pakistan, Bhutan, Bangladesh, Sri Lanka, Nepal, The Maldives, Middle East, Malaysia, Indonesia and Singapore

#### Hardcover

Originally published by Universities Press (India) Private Ltd., Himayatnagar, 2011

2014. XLIX, 213 p. 105 illus. (Undergraduate Lecture Notes in Physics)

ISBN 978-3-642-45301-4

Due: February 28, 2014

G. Srinivasan

## Life and Death of the Stars

This volume is devoted to one of the fascinating things about stars: they evolve as they age. This evolution is different for stars of different mass. How stars end their lives when their supply of energy is exhausted also depends on their mass. Historically speaking, astronomers first worried about the ultimate fate of the stars, even before the details of their evolution became clear. The book is divided into two parts. Part I is an account of the remarkable predictions made during the 1920s and 1930s concerning the ultimate fate of the stars. Since much of this development hinged on the emerging quantum physics, a detailed introduction to the relevant physics is included. Part II [...]

### Features

This volume is devoted to one of the fascinating things about stars: they evolve as they age. This evolution is different for stars of different mass. How stars end their lives when their supply of energy is exhausted also depends on their mass. Historically speaking, astronomers first worried about the ultimate fate of the stars, even before the details of their evolution became clear. The book is [...]

### Contents

Part I: A Historical Perspective.- What Are the Stars?.- Stars in Their Youth.- White Dwarf Stars.- The Principles of Statistical Mechanics.- Fermi-Dirac Distribution.- Quantum Stars.- The Chandrasekhar Limit.- The Absurd Behaviour of Stars: Not All Stars Will Have Energy to Cool.- Guest Stars.- Supernovae, Neutron Stars and Black Holes.- A Profile of Chandra.- Part II: The Life History of Stars—A Modern Perspective.- To Burn or Not To Burn.- What Does the Future Hold for the Sun?.- Life History of Intermediate Mass Stars.- Diamonds in the Sky.- Exploding Stars.

### Fields of interest

Astrophysics and Astroparticles; Astronomy, Observations and Techniques

### Target groups

Lower undergraduate

### Type of publication

Undergraduate textbook

More on [www.springer.com/978-3-642-45383-0](http://www.springer.com/978-3-642-45383-0)

No distribution rights for India, Pakistan, Bhutan, Bangladesh, Sri Lanka, Nepal, The Maldives, Middle East, Malaysia, Indonesia and Singapore

### Hardcover

Originally published by Universities Press (India) Private Ltd., Himayatnagar, 2011

2014. 268 p. 70 illus. (Undergraduate Lecture Notes in Physics)

ISBN 978-3-642-45383-0

**Due: February 28, 2014**

M. Stafe, A. Marcu, National Institute for Laser Plasma, Bucharest-Magurele, Romania; N. Puscas

## Pulsed Laser Ablation of Solids

### Basics, Theory and Applications

The book introduces 'the state of the art' of pulsed laser ablation and its applications. It is based on recent theoretical and experimental studies. The book reaches from the basics to advanced topics of pulsed laser ablation. Theoretical and experimental fundamental phenomena involved in pulsed laser ablation are discussed with respect to material properties, laser wavelength, fluence and intensity regime of the light absorbed linearly or non-linearly in the target material. The energy absorbed by the electrons leads to atom/molecule excitation, ionization and/or direct chemical bond breaking and is also transferred to the lattice leading to material heating and phase transitions.[...]

### Features

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### Contents

Lasers for Pulsed Laser Ablation.- Laser-Matter Interaction Below the Plasma Ignition Threshold Intensity.- Laser-Matter Interaction Above the Plasma Ignition Threshold Intensity.- Material Removal and Deposition by Pulsed Laser Ablation and Associated Phenomena.- Experimental Techniques for Analyzing the Material Removal and Deposition Rates in Real Time.

### Fields of interest

Surface and Interface Science, Thin Films; Classical Electrodynamics, Wave Phenomena; Surfaces and Interfaces, Thin Films; Applied and Technical Physics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-40977-6](http://www.springer.com/978-3-642-40977-6)

### Hardcover

2014. XII, 233 p. 140 illus., 11 illus. in color. (Springer Series in Surface Sciences, Vol. 53)

ISBN 978-3-642-40977-6

**usually dispatched within 3 to 5 business days**

C. Sun, Nanyang Technological University, Singapore, Singapore

## Relaxation of the Chemical Bond

### Skin Chemisorption Size Matter ZTP Mechanics H2O Myths

The aim of this book is to explore the detectable properties of a material to the parameters of bond and non-bond involved and to clarify the interdependence of various properties. This book is composed of four parts; Part I deals with the formation and relaxation dynamics of bond and non-bond during chemisorptions with uncovering of the correlation among the chemical bond, energy band and surface potential barrier (3B) during reactions; Part II is focused on the relaxation of bonds between atoms with fewer neighbors than the ideal in bulk with unraveling of the bond order-length-strength (BOLS) correlation mechanism, which clarifies the nature difference between nanostructures and [...]

### Features

The aim of this book is to explore the detectable properties of a material to the parameters of bond and non-bond involved and to clarify the interdependence of various properties. This book is composed of four parts; Part I deals with the formation and relaxation dynamics of bond and non-bond during chemisorptions with uncovering of the correlation among the chemical bond, energy band, and surface potential [...]

### Contents

From the Contents: Part I Molecular Chemisorption.- Introduction.- Foundations.- STM and LEED: Atomic Valences and Bond Geometry.- Part II Atomic Undercoordination.- Introduction.- Principles: BOLS and NEP.- Surface Relaxation and Nanosolid Densification.- Part III Mechano and Thermo Activation.- Introduction.- Principles.- Liquid and Solid Surfaces.- Part IV Water and Ice.- Introduction.- Principles: Hypotheses and Expectations.

### Fields of interest

Surface and Interface Science, Thin Films; Physical Chemistry; Nanotechnology; Surfaces and Interfaces, Thin Films; Nanotechnology and Microengineering

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-981-4585-20-0](http://www.springer.com/978-981-4585-20-0)

### Hardcover

2014. 500 p. 250 illus., 20 illus. in color. (Springer Series in Chemical Physics, Vol. 108)

ISBN 978-981-4585-20-0

**Due: February 21, 2014**

K. Sundermeyer

## Symmetries in Fundamental Physics

Over the course of the last century it has become clear that both elementary particle physics and relativity theories are based on the notion of symmetries. These symmetries become manifest in that the "laws of nature" are invariant under spacetime transformations and/or gauge transformations. The consequences of these symmetries were analyzed as early as in 1918 by Emmy Noether on the level of action functionals. Her work did not receive due recognition for nearly half a century, but can today be understood as a recurring theme in classical mechanics, electrodynamics and special relativity, Yang-Mills type quantum field theories, and in general relativity. As a matter of fact, as[...]

### Features

Over the course of the last century it has become clear that both elementary particle physics and relativity theories are based on the notion of symmetries. These symmetries become manifest in that the "laws of nature" are invariant under spacetime transformations and/or gauge transformations. The consequences of these symmetries were analyzed as early as in 1918 by Emmy Noether on the level of action [...]

### Contents

Preface.- Notation.- Introduction.- Symmetry: Argument, Principle, and Leitmotif.- Operations and Invariants.- "Symmetries" in "Fundamental Physics".- The Scope of Symmetries.- Bibliographical Notes.- Classical Mechanics.- Newtonian and Analytical Mechanics.- Symmetries and Conservation Laws.- Galilei Group.- Electrodynamics and Special Relativity.- Electrodynamics à la Maxwell.- Special Relativity.- Noether Theorems.- Poincaré Transformations.- Generalizations of Poincaré Symmetry.- On the Validity of Special Relativity.- Quantum Mechanics.- Principles of Quantum Mechanics.- Symmetry[...]

### Fields of interest

Theoretical, Mathematical and Computational Physics; Elementary Particles, Quantum Field Theory; Phase Transitions and Multiphase Systems; Classical and Quantum Gravitation, Relativity Theory; Mathematical Physics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-007-7641-8](http://www.springer.com/978-94-007-7641-8)

### Hardcover

2014. XXVIII, 757 p. 25 illus. (Fundamental Theories of Physics, Vol. 176)  
ISBN 978-94-007-7641-8

Due: January 14, 2014

M. Thiriet

## Anatomy and Physiology of the Circulatory and Ventilatory Systems

Together, the volumes in this series present all of the data needed at various length scales for a multidisciplinary approach to modeling and simulation of flows in the cardiovascular and ventilatory systems, especially multiscale modeling and coupled simulations. The cardiovascular and respiratory systems are tightly coupled, as their primary function is to supply oxygen to, and remove carbon dioxide from, the body's cells. Because physiological conduits have deformable and reactive walls, macroscopic flow behavior and prediction must be coupled to nano- and microscopic events in a corrector scheme of regulated mechanism. Therefore, investigation of flows of blood and air in[...]

### Features

Together, the volumes in this series present all of the data needed at various length scales for a multidisciplinary approach to modeling and simulation of flows in the cardiovascular and ventilatory systems, especially multiscale modeling and coupled simulations. The cardiovascular and respiratory systems are tightly coupled, as their primary function is to supply oxygen to, and remove carbon dioxide from, [...]

### Contents

Preface.- Chapter 1: Anatomy of the Cardiovascular Apparatus.- Chapter 2: Anatomy of the Ventilatory Apparatus.- Chapter 3: Cardiovascular Physiology.- Chapter 4: Physiology of Ventilation.- Chapter 5: Medical Images and Physiological Signals.- Conclusions.- References.- List of Currently Used Prefixes and Suffixes.- List of Aliases and Primary Symbols.- Complementary Lists of Notations.- Index.

### Fields of interest

Biophysics and Biological Physics; Biomedical Engineering; Mathematical and Computational Biology; Systems Biology; Engineering Fluid Dynamics; Cardiology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9468-3](http://www.springer.com/978-1-4614-9468-3)

### Hardcover

2014. XV, 585 p. 75 illus., 25 illus. in color. (Biomechanical and Biomechanical Modeling of the Circulatory and Ventilatory Systems, Vol. 6)  
ISBN 978-1-4614-9468-3

usually dispatched within 3 to 5 business days

W. Waldenfels

## A Measure Theoretical Approach to Quantum Stochastic Processes

This monograph takes as starting point that abstract quantum stochastic processes can be understood as a quantum field theory in one space and in one time coordinate. As a result it is appropriate to represent operators as power series of creation and annihilation operators in normal-ordered form, which can be achieved using classical measure theory. Considering in detail four basic examples (e.g. a two-level atom coupled to a heat bath of oscillators), in each case the Hamiltonian of the associated one-parameter strongly continuous group is determined and the spectral decomposition is explicitly calculated in the form of generalized eigen-vectors. Advanced topics include the theory of[...]

### Features

This monograph takes as starting point that abstract quantum stochastic processes can be understood as a quantum field theory in one space and in one time coordinate. As a result it is appropriate to represent operators as power series of creation and annihilation operators in normal-ordered form, which can be achieved using classical measure theory. Considering in detail four basic examples (e.g. a [...])

### Contents

Weyl Algebras.- Continuous Sets of Creation and Annihilation Operators.- One-Parameter Groups.- Four Explicitly Calculable One-Excitation Processes.- White Noise Calculus.- Circled Integrals.- White Noise Integration.- The Hudson-Parthasarathy Differential Equation.- The Amplifies Oscillator.- Approximation by Coloured Noise.- Index.

### Fields of interest

Quantum Physics; Mathematical Physics; Mathematical Methods in Physics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-45081-5](http://www.springer.com/978-3-642-45081-5)

### Softcover

2014. XVII, 228 p. (Lecture Notes in Physics, Vol. 878)  
ISBN 978-3-642-45081-5

usually dispatched within 3 to 5 business days  
December 31, 2013

A. Zjajo

## Stochastic Process Variation in Deep-Submicron CMOS

Circuits and Algorithms

One of the most notable features of nanometer scale CMOS technology is the increasing magnitude of variability of the key device parameters affecting performance of integrated circuits. The growth of variability can be attributed to multiple factors, including the difficulty of manufacturing control, the emergence of new systematic variation-generating mechanisms, and most importantly, the increase in atomic-scale randomness, where device operation must be described as a stochastic process. In addition to wide-sense stationary stochastic device variability and temperature variation, existence of non-stationary stochastic electrical noise associated with fundamental processes in[...]

### Features

One of the most notable features of nanometer scale CMOS technology is the increasing magnitude of variability of the key device parameters affecting performance of integrated circuits. The growth of variability can be attributed to multiple factors, including the difficulty of manufacturing control, the emergence of new systematic variation-generating mechanisms, and most importantly, the increase in [...]

### Contents

1 Introduction.- 2 Random Process Variation in Deep-Submicron CMOS.- 3 Electronic Noise in Deep-Submicron CMOS.- 4 Thermal Effects in Deep-Submicron CMOS.- 5 Circuit Solutions.- 6 Conclusions and Recommendations.- Appendix. References.- Acknowledgement.- About the Author.

### Fields of interest

Electronic Circuits and Devices; Circuits and Systems; Statistical Physics, Dynamical Systems and Complexity; Appl. Mathematics / Computational Methods of Engineering; Physiological, Cellular and Medical Topics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-007-7780-4](http://www.springer.com/978-94-007-7780-4)

### Hardcover

2014. XIX, 192 p. 46 illus. (Springer Series in Advanced Microelectronics, Vol. 48)  
ISBN 978-94-007-7780-4

usually dispatched within 3 to 5 business days

J. Åystö, University of Jyväskylä, Jyväskylä, Finland; T. Eronen, University of Jyväskylä, Jyväskylä, Finland; A. Jokinen, University of Jyväskylä, Jyväskylä, Finland; A. Kankainen, University of Jyväskylä, Jyväskylä, Finland; I. Moore, University of Jyväskylä, Jyväskylä, Finland; H. Penttilä, University of Jyväskylä, Jyväskylä, Finland (Eds.)

## IGISOL

Three decades of research using IGISOL technique at the University of Jyväskylä

The IGISOL group at the University of Jyväskylä studies the properties of nuclei far off the line of beta stability. These studies are performed locally at the Jyväskylä Ion Guide Isotope Separator On-Line (IGISOL) facility, as well as at a number of other laboratories such as the ISOLDE facility in CERN, at GANIL and in Helmholtzzentrum GSI, the location of the future radioactive beam facility FAIR. The group is also actively involved in work to support the development of international future facilities EURISOL and aforementioned FAIR. This book presents carefully selected papers to portrait the work at IGISOL. Previously published in the journals *Hyperfine Interactions* and *European*[...]

### Features

The IGISOL group at the University of Jyväskylä studies the properties of nuclei far off the line of beta stability. These studies are performed locally at the Jyväskylä Ion Guide Isotope Separator On-Line (IGISOL) facility, as well as at a number of other laboratories such as the ISOLDE facility in CERN, at GANIL and in Helmholtzzentrum GSI, the location of the future radioactive beam facility FAIR. The group [...]

### Contents

Introduction.- Experimental facilities and methods.- Decay Spectroscopy.- Ground state properties of nuclei. Charge radii and moments.- Ground State Properties. Atomic Masses.- Applied and miscellaneous.- Future developments.

### Fields of interest

Nuclear Physics, Heavy Ions, Hadrons; Particle Acceleration and Detection, Beam Physics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-94-007-5554-3](http://www.springer.com/978-94-007-5554-3)

### Hardcover

2014. 200 p. 120 illus.  
ISBN 978-94-007-5554-3

Due: February 2014

## Psychology

S. Chakrabartty, Michigan State University, East Lansing, USA

## CMOS Integrated Circuits for Self-powered and Energy-scavenging Systems

This book describes the fundamental principles of designing integrated circuits used for sensors that operate by scavenging energy from the environment. Although energy scavenging and self-powering is an area which spans several engineering and scientific disciplines, this book focuses on fundamental principles of energy scavenging circuits and therefore should be accessible to any researcher working in the area of integrated circuits. This book will be a valuable reference for anyone interested in designing sensors and systems that can operate without batteries by scavenging ambient energy. It will also be beneficial to designers working on ultra-low power analog and digital signal[...]

### Features

This book describes the fundamental principles of designing integrated circuits used for sensors that operate by scavenging energy from the environment. Although energy scavenging and self-powering is an area which spans several engineering and scientific disciplines, this book focuses on fundamental principles of energy scavenging circuits and therefore should be accessible to any researcher working in the [...]

### Contents

Overview of energy scavenging and self-powering sensors.- CMOS devices for energy scavenging.- Energy scavenging sensors and transducers.- Piezoelectric energy scavengers.- Principles of optimal energy scavenging.- Micro-energy storage techniques.- Micro-energy Conditioning Circuits.- Micro-energy Conversion Circuits.- DSP Techniques for Energy Scavenging.- ASP Techniques for Energy Scavenging.- Sensor Telemetry and Interrogation.- Case study: Self-powered Fatigue Monitoring Sensors.- Conclusions and Discussions.

### Fields of interest

Energy Systems; Circuits and Systems; Electronics and Microelectronics, Instrumentation

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4419-9576-6](http://www.springer.com/978-1-4419-9576-6)

### Hardcover

2014. 200p. 75 illus..  
ISBN 978-1-4419-9576-6

Due: February 28, 2014

D. Das, Bhabha Atomic Research Centre, Trombay, Mumbai, India; S.R. Bharadwaj (Eds.)

## Thoria-based Nuclear Fuels

Thermophysical and Thermodynamic Properties, Fabrication, Reprocessing, and Waste Management

This book presents the state of the art on thermo-physical and thermochemical properties, fabrication methodologies, irradiation behaviours, fuel reprocessing procedures, and aspects of waste management for oxide fuels in general and for thoria-based fuels in particular. The book covers all the essential features involved in the development of and working with nuclear technology. With the help of key databases, many of which were created by the authors, information is presented in the form of tables, figures, schematic diagrams and flow sheets, and photographs. This information will be useful for scientists and engineers working in the nuclear field, particularly for design and [...]

### Features

This book presents the state of the art on thermo-physical and thermochemical properties, fabrication methodologies, irradiation behaviours, fuel reprocessing procedures, and aspects of waste management for oxide fuels in general and for thoria-based fuels in particular. The book covers all the essential features involved in the development of and working with nuclear technology. With the help of key [...]

### Contents

Ch 1 Introduction.- Ch 2 Thermophysical properties -thermal expansion and thermal diffusivity.- Ch 3 Phase stability, thermodynamic properties and oxygen potential of thoria based oxide fuels with relevance to the fuel behaviour in handling & during irradiation.- Ch 4 Thermochemistry of fuel and fission products interactions with burnup.- Ch 5 Transport and release characteristics of gaseous and volatile fission products.- Ch 6 Fuel fabrication and characterizations.- Ch 7 Fuel reprocessing.- Ch 8 Waste management in the oxide fuels.

### Fields of interest

Nuclear Energy; Nuclear Engineering; Thermodynamics; Nuclear Physics, Heavy Ions, Hadrons

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-5588-1](http://www.springer.com/978-1-4471-5588-1)

### Hardcover

2013. XII, 418 p. 173 illus. (Green Energy and Technology)

ISBN 978-1-4471-5588-1

**Due: December 31, 2013**

N. Imanishi, Mie University, Tsu, Japan; A.C. Luntz, SUNCAT Center for Interface Science and, Menlo Park, USA; P. Bruce, University of St Andrews, St. Andrews, United Kingdom (Eds.)

## The Li-Air Battery

Fundamentals

Lithium-air rechargeable batteries are the best candidate for a power source for electric vehicles, because of their high specific energy density. In this book, the history, scientific background, status and prospects of the lithium/air system are introduced by specialists in the field. This book will contain the basics, current statuses, and prospects for new technologies. This book is ideal for those interested in electro-chemistry, energy storage, and materials science.

### Features

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### Contents

Introduction.- Non-aqueous Electrolytes.- Cathode Electrochemistry in Non-aqueous Li-air Batteries.- The Kinetics and Product Characteristics of Oxygen Reduction and Evolution in Li-O<sub>2</sub> Batteries.- Atomistic and First Principles -Computational Studies of Li-O<sub>2</sub> Batteries.- Lithium-air Batteries Based on Protected Lithium Electrodes.- Air Electrodes for Aqueous Li-air Batteries.- Solid Electrolytes for Aqueous Lithium-air Batteries.- A Solid State, Rechargeable Lithium-Oxygen Battery.- Primary Lithium-Air Batteries.- Overview of Li-O<sub>2</sub> Battery Systems, with a Focus on Oxygen Handling [...]

### Fields of interest

Energy Storage; Electrochemistry; Automotive Engineering; Characterization and Evaluation of Materials

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4899-8061-8](http://www.springer.com/978-1-4899-8061-8)

### Hardcover

2014. X, 342 p. 164 illus., 100 illus. in color.

ISBN 978-1-4899-8061-8

**Due: December 31, 2013**

T.R. Jow, U.S. Army Research Laboratory, Adelphi, USA; K. Xu, Driving Biological Discovery using Prote, Adelphi, USA; O. Borodin, U.S. Army Research Laboratory, Adelphi, USA; M. Ue, Mitsubishi Chemical Corporation, Yokohama, Japan (Eds.)

## Electrolytes for Lithium and Lithium-ion Batteries

Electrolytes for Lithium and Lithium-ion Batteries provides a comprehensive overview of the scientific understanding and technological development of electrolyte materials in the last 10 years. This book covers not only the key electrolytes such as LiPF<sub>6</sub> salt in mixed-carbonate solvents with additives for the state-of-the-art Li-ion batteries but also the new electrolyte materials developed recently that potentially lay the foundation for future advances. Characterization of electrolyte materials for their transport properties, structures, phase relationships, stabilities, and impurities is reviewed. Advances in the understanding of the electrode-electrolyte interactions and [...]

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### Fields of interest

Energy Storage; Electrochemistry; Industrial Chemistry / Chemical Engineering; Surfaces and Interfaces, Thin Films; Energy Technology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4939-0301-6](http://www.springer.com/978-1-4939-0301-6)

### Hardcover

2014. X, 10 p. 100 illus. (Modern Aspects of Electrochemistry)

ISBN 978-1-4939-0301-6

**Due: March 31, 2014**

J. Kurnitski (Ed.)

## Cost Optimal and Nearly Zero-Energy Buildings (nZEB)

Definitions, Calculation Principles and Case Studies

Cost optimal and nearly zero energy performance levels are principles initiated by the European Union's (EU) Energy Performance of Buildings Directive which was recast in 2010. These will be major drivers in the construction sector in the next few years, because all new buildings in the EU from 2021 onwards are expected to be nearly zero energy buildings (nZEB). This book introduces the technical definitions, system boundaries, energy calculation methodology and input data needed to set primary energy based minimum/cost optimal and nZEB requirements in national energy frames. Worked examples are provided to illustrate the calculation of delivered, exported and primary energy, and[...]

### Features

Cost optimal and nearly zero energy performance levels are principles initiated by the European Union's (EU) Energy Performance of Buildings Directive which was recast in 2010. These will be major drivers in the construction sector in the next few years, because all new buildings in the EU from 2021 onwards are expected to be nearly zero energy buildings (nZEB). This book introduces the technical [...]

### Contents

Nearly zero energy buildings nZEB definitions and calculation frameworks.- Present energy performance requirements and future targets in some selected countries.- Cost optimal energy performance.- Indoor climate and standard building use input data for energy calculations.- Energy calculation methods with relevant accuracy for nZEB buildings.- Case studies of office and public nZEB buildings.- How to include nZEB and low carbon targets in architectural competitions.- Lessons learnt and future prospective.

### Fields of interest

Energy Efficiency (incl. Buildings); Building Construction, HVAC, Refrigeration; Renewable and Green Energy; Environmental Engineering / Biotechnology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-5609-3](http://www.springer.com/978-1-4471-5609-3)

### Hardcover

2013. IX, 176 p. 84 illus. (Green Energy and Technology)  
ISBN 978-1-4471-5609-3

usually dispatched within 3 to 5 business days

H. Liu, Chinese Academy of Sciences, Shaanxi, China (P.R.); X. Liu, Chinese Academy of Sciences, Shaanxi, China (P.R.); L. Xiong, Chinese Academy of Sciences, Shaanxi, China (P.R.); W. Zhao, Chinese Academy of Sciences, Shaanxi, China (P.R.)

## Packaging of High Power Semiconductor Lasers

This book introduces high power semiconductor laser packaging design. The challenges of the design and various packaging and testing techniques are detailed by the authors. New technologies and current applications are described in detail.

### Features

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### Contents

From the Contents: Introduction of High Power Semiconductor Lasers.- Package Types of High Power Semiconductor Lasers.- Thermal Design and Management in High Power Semiconductor Laser Packaging.- Thermal Stress Failures: Prediction and Prevention.- Optical Design and Beam Shaping in High Power Semiconductor Lasers.

### Fields of interest

Energy Systems

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4614-9262-7](http://www.springer.com/978-1-4614-9262-7)

### Hardcover

2014. 400 p. 300 illus., 100 illus. in color. (Micro- and Opto-Electronic Materials, Structures, and Systems)  
ISBN 978-1-4614-9262-7

Due: December 24, 2013

X. Liu, Y. Jiang, Tsinghua University, Beijing, China (P.R.); T. Zhang, Tsinghua University, Beijing, China (P.R.)

## Temperature and Humidity Independent Control (THIC) of Air-conditioning System

Temperature and Humidity Independent Control (THIC) of Air-conditioning System focuses on temperature and humidity independent control (THIC) systems, which represents a new concept and new approach for indoor environmental control. This book presents the main components of the THIC systems, including dehumidification devices, high-temperature cooling devices and indoor terminal devices. Other relevant issues, such as operation and control strategy and case studies, are also included. This book is intended for air-conditioning system designers and engineers as well as researchers working with indoor environments. Xiaohua Liu is an associate professor at the Building Energy Research [...]

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### Contents

Characteristics of conventional air-conditioning systems.- The basic idea of the THIC air-conditioning system.- Key components of the THIC system- Indoor terminals.- Key components of the THIC system- Outdoor air handling methods.- Key components of the THIC system- Outdoor air processor using liquid desiccant.- Key components of the THIC system- High temperature cooling sources.- Design and operation of THIC systems.- Application cases of THIC systems.- Development tendencies and perspectives of the THIC systems.

### Fields of interest

Energy Efficiency (incl. Buildings); Building Physics, HVAC; Thermodynamics; Engineering Thermodynamics, Heat and Mass Transfer; Energy Technology

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-3-642-42221-8](http://www.springer.com/978-3-642-42221-8)

### Hardcover

2014. XIII, 356 p. 240 illus., 211 illus. in color.  
ISBN 978-3-642-42221-8

Due: January 31, 2014

E. Michalena, Paris Sorbonne and Paris 8 Universities, Paris, France; J.M. Hills (Eds.)

## Renewable Energy Governance

### Complexities and Challenges

This book focuses on Renewable Energy (RE) governance - the institutions, plans, policies and stakeholders that are involved in RE implementation - and the complexities and challenges associated with this much discussed energy area. Whilst RE technologies have advanced and become cheaper, governance schemes rarely support those technologies in an efficient and cost-effective way. To illustrate the problem, global case-studies delicately demonstrate successes and failures of renewable energy governance. RE here is considered from a number of perspectives: as a regional geopolitical agent, as a tool to meet national RE targets and as a promoter of local development. The book considers[...]

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### Contents

Introduction - Renewable Energy Governance – Is it Blocking the Technically Feasible?.- Renewable and Conventional Electricity Generation Systems: Technologies and Diversity of Energy Systems.- Institutional Factors that Determine Energy Transitions: A Comparative Case Study Approach.- Renewable Energy: Urban Centres Lead the Dance in Australia?.- Endogenous Tourism Development Through Renewable Energy Governance: A Questionable Challenge.- Outliers or Frontrunners? Exploring the (Self-) Governance of Community-owned Sustainable Energy in Scotland and the Netherlands.- Renewable Energy[...]

### Fields of interest

Energy Policy, Economics and Management; Energy Economics

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-1-4471-5594-2](http://www.springer.com/978-1-4471-5594-2)

### Hardcover

2013. IX, 397 p. 40 illus. (Lecture Notes in Energy, Vol. 57)

ISBN 978-1-4471-5594-2

**usually dispatched within 3 to 5 business days  
December 31, 2013**

H. Yoshikawa, Z. Zhang (Eds.)

## Progress of Nuclear Safety for Symbiosis and Sustainability

### Advanced Digital Instrumentation, Control and Information Systems for Nuclear Power Plants

This book introduces advanced methods of computational and information systems allowing readers to better understand the state-of-the-art design and implementation technology needed to maintain and enhance the safe operation of nuclear power plants. The subjects dealt with in the book are (i) Full digital instrumentation and control systems and human-machine interface technologies (ii) Risk monitoring methods for large and complex plants (iii) Condition monitors for plant components (iv) Virtual and augmented reality for nuclear power plants and (v) Software reliability verification and validation for nuclear power plants. The target readers of this book are Ph.D. students,[...]

### Features

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### Contents

Mitsubishi's computerized HSI and digital I&C system for PWR plants.- Design of an integrated operator support system for advanced NPP MCRs: Issues and perspectives.- Concept of advanced back-up control panel design of digital main control room.- U.S. Department of Energy instrumentation and controls technology research for advanced small modular reactors.- Application of FPGA to nuclear power plant I&C systems.- Prejob briefing using process data and tagout / line-up data on 2D drawings.- Study on modeling of an integrated control and condition monitoring system for nuclear power[...]

### Fields of interest

Nuclear Energy; Nuclear Engineering; Control; Quality Control, Reliability, Safety and Risk; Sustainable Development

### Target groups

Research

### Type of publication

Monograph

More on [www.springer.com/978-4-431-54609-2](http://www.springer.com/978-4-431-54609-2)

### Hardcover

2014. XV, 304 p. 229 illus., 155 illus. in color.

ISBN 978-4-431-54609-2

**Due: February 28, 2014**

