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# Sci-Tech Book News Reviews

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# Sci-Tech Book News Reviews Susan Fingerman, Selector

The following section consists of 100 book reviews selected from *Sci-Tech Book News*, reprinted with the permission of Book News Inc. This review journal is published four times a year, each issue reviewing over 2,000 new titles in the physical and biological sciences, mathematics, engineering, computer science, technology, and agriculture. For a sample issue and subscription information, contact Book News Inc. at 5739 NE Sumner Street, Portland, OR 97218. Phone: (503)281-9230; Fax: (503)287-4485; E-mail: booknews@booknews.com.

## GEOGRAPHY, HYDROLOGY, ENVIRONMENT

G70 978-1-60511-046-2
**Materials and devices for laser remote sensing and optical communication; proceedings.**
Symposium on Materials...Laser Remote Sensing & Optical Communication (2008: San Francisco, CA) Ed. by Astrid Aksnes and F. Amzajerdian. (Materials Research Society Symposium proceedings; v.1076)
*Materials Research Society*, ©2008 201 p. $90.00
Science students and engineers in the field of material science and laser technology are the intended audience for this collection of research papers on laser remote sensing and optical communication devices. Documenting the proceedings of the Materials Research Society Symposium in March 2008, editors Aksnes (electronics and communications, Norwegian U. of Science and Technology) and Amzajerdian (NASA Langley Research Center) have included contributions on such topics as nanocrystal and photonic structure and devices, photodetection devices, fiber optic and semiconductor lasers and laser remote sensing instruments. Much of the conference stressed the fact that many of the technologies developed for this specific discipline have broader applications for other scientific fields.

G70 978-1-4129-1082-8
**The Sage handbook of spatial analysis.**
Title main entry. Ed. by A. Stewart Fotheringham and Peter A. Rogerson.
*Sage Publications*, ©2009 511 p. $140.00
Fotheringham (geocomputation, National U. of Maynooth, Ireland) and Rogerson (geography and biostatistics, U. at Buffalo, NY) have edited this textbook on spatial analysis to reflect the growing use of geographical information systems (GIS). Designed for graduate students and researchers in the field, this volume covers the specialized fields of mathematics and statistics that provide the foundation for GIS technologies before moving on to specific debates, problems and trends in spatial analysis techniques. Other topics include spatial sampling, geovisualization, geostatistics and spatial interpolation and geographically weighted regression.

## PRODUCTION, INDUSTRY, COMMERCE

HD30 2008-024194 978-1-60566-148-3
**Breakthrough perspectives in network and data communications security, design, and applications.**
Title main entry. Ed. by Indranil Bose. (Advanced topics in buisness data communications and networks; v.1)
*Information Science Reference*, ©2009 333 p. $265.00
Bose (University of Hong Kong) gathers contributors from12 countries to offer expert viewpoints on key issues in the field of network and data communications. Some areas discussed include empirical prediction of computer-network evolution, gigabit Ethernet implementation, and mobile information processing involving multiple non-collaborative sources. Other subjects are network planning algorithms for optimizing signal load in mobile networks, soft decision parallel interference cancellation for multi-carrier DS- CDMA, and distributed resources management in wireless LANs that support fault tolerance. The readership for the book includes the academic, managerial, and information technology communities.

KF8968 2008-029653 978-1-4200-5258-9
**The scientist or engineer as an expert witness.**
Speight, James G. (Chemical industries; v.122)
*CRC / Taylor & Francis*, ©2009 209 p. $89.95
Speight (chemical and fuels engineering, University of Utah) offers guidance for scientists and engineers who are called as expert witnesses in trials, or who are called before legislative committees at local, state, or national levels to



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present evidence that will lead to new regulations and laws. The book reviews the expert witness's responsibilities before, during, and after trial, and reviews major Supreme Court cases and rulings that determine the use of expert witnesses. The courtroom layout, the process of the trial, the use of visual aids, and the types of attempts to disqualify a witness are all discussed. Legal terminology is explained for the non-legal expert, and a glossary is included. While the book is written for scientists and engineers, it will also be useful to both plaintiff and defense lawyers and their paralegal assistants.

## SCIENCE (GENERAL)

Q172 2008-013818 978-1-60456-166-1
**Chaos and complexity research progress.**
Title main entry. Ed. by Franco F. Orsucci, Nicoletta Sala.
*Nova Science Publishers*, ©2008 231 p. $69.00
This collection of 13 papers reflects a wide diversity of applications and approaches based on interpretations of these famous but little-understood theories. Topics include transient synchronization in multivariate brain signals, bipolar disorder analysis using a van der Pol oscillator model, parallel implementation of the shortest paths problem on weighted intervals and circular arc graphs, low-dimensional chaos in small noisy sample sets, three-dimensional effects of effluents and wind in sensitivity studies of lakes, old and new riddles, mode decomposition and the wavelet approach in the analysis of time scale synchronization, fractal dimension estimation in bone studies, forecasting of hyperchaotic Rössler system state variables using one observable, fractal geometry in computer graphics, buyer decision-making in the housing industry, the climatic memory of deep lakes, the complexities associated with bioethics. Some papers may be available online.

Q175 2008-300128 978-981-277-994-6
**Physics of emergence and organization.**
Title main entry. Ed. by Ignazio Licata et al.
*World Scientific*, ©2008 421 p. $135.00
Twenty-five international academics and researchers contribute 18 articles to a state-of-the-art review on the physics of emergence, for students and experts in the field. The text contains significant and pioneering work based on rigorous physical and mathematical approaches dealing with the *bridge-laws* and their limitations between physics and biology, and discusses the involved epistemological features. A sampling of topics: emergence and computation at the edge of classical and quantum systems, gauge generalized principle for complex systems, a cross- disciplinary framework for the description of contextually mediated change, phase transitions in biological matter, the dissipative quantum model of brain and laboratory observations, primordial evolution in the finitary process soup, emergence of universe from a quantum network, order in the nothing—autopoiesis and the organizational characterization of the living, and anticipation in biological and cognitive systems—the need for a physical theory of biological organization.

Q335 2008-022541 978-1-60566-174-2

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**Artificial intelligence for maximizing content based image retrieval.**

Title main entry. Ed. by Zongmin Ma.

*Information Science Reference*, ©2009 430 p. $195.00

This reference for academics, researchers, and industry practitioners discusses major theoretical aspects and practical solutions related to content-based image retrieval using current technologies and applications within the field of artificial intelligence (AI). The book's 11 chapters are organized into four major sections on AI for feature extraction and representation, AI for distance measurement and image indexing, AI relevance feedback, and intelligent content-based image retrieval (CBIR) systems and applications. The readership for the book includes those working in artificial intelligence, data mining and databases, cognitive informatics, software systems and design, and human aspects of technology. Ma is affiliated with Northeastern University, China.

Q342 978-0-470-22975-0

**Computational intelligence and feature selection; rough and fuzzy approaches.**

Jensen, Richard and Qiang Shen. (IEEE Press series on computational intelligence)

*John Wiley & Sons*, ©2008 339 p. $110.00

Feature selection—the problem of selecting attributes that are most predictive of a given problem—is an issue encountered in many areas, such as machine learning, pattern recognition, systems control, and signal processing. Jensen and Shen, both affiliated with the computer science department at Aberystwyth University, UK, provide background and explain fundamental concepts behind feature selection and computational intelligence, concentrating on techniques based on rough and fuzzy sets and their hybridizations. Feature selection methods are reviewed within a consistent framework, with an emphasis on their current limitations. There is also coverage of computational intelligence based methods, such as fuzzy rule induction and swarm optimization, which either benefit from joint use with feature selection or help improve the selection mechanism. From this background, the book introduces an original approach to feature selection using conventional rough set theory, then proposes a fundamental approach based on fuzzy-rough sets. Real-world applications and worked examples illustrate the approach. Such applications include Web content classification, complex systems monitoring, and algae population estimation. The book concludes with investigation into associated areas such as rule induction and clustering.

## MATH, COMPUTERS

QA76 978-0-7695-3482-4

**High assurance systems engineering; proceedings.**

IEEE High Assurance Systems Engineering symposium (11th: 2008: Nanjing, China) Ed. by Bojan Cukic and Jing Dong.

*Computer Society Press*, ©2008 493 p. $212.00 (pa)

The 11th International Symposium on High Assurance Systems Engineering was held in Nanjing, China in December 2008, and the proceedings are presented in this volume sponsored by the IEEE Computer Society for engineers and researchers in the field of computer science. Li (computer science and technology, Nanjing U., China), Smidts (energy systems, Ohio State U.) and Xu (computing, U. of Leeds, UK) have edited these papers on the latest developments in system and network security, distributed and embedded systems, testing, formal verification and specification, ad hoc networks and service-oriented computers. A series of short papers on such subjects as multi-level security annotations and UML sequence diagrams are also included.

QA76.575 2008-012301 978-1-4200-6527-5

**Multimedia content encryption; techniques and applications.**

Lian, Shiguo.

*CRC / Taylor & Francis*, ©2009 217 p. $99.95

Encryption protects multimedia data from piracy or unauthorized use. This book presents the latest research in the field. It begins with a history of multimedia encryption and then examines general performance requirements of encryption and fundamental encrypting techniques. It discusses common techniques of complete, partial, and compression-combined encryption, as well as more specialized techniques, including perception, scalable, and commutative encryption. Later chapters deal with typical attacks on multimedia encryption, and outline principles for designing secure algorithms and various applications. Open questions and emerging areas are also explored. B&w photos and images are included. The audience for the book includes students, researchers, industrial practitioners in related areas, e-commerce professionals, and IT personnel of institutions and governments. Lian edits the *Journal of Universal Computer Science*.



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QA76.73 2008-009567 978-0-470-24211-7
**F# for scientists.**
Harrop, Jon D.
*John Wiley & Sons*, ©2008 334 p. $70.00
Consultant and teacher Harrop expects F# to become one of the world's most popular functional programming languages for scientists of all disciplines, and not only because it is free. Along with full illustrations and simple examples, Harrop provides well-written information on program structure, data structures, numerical analysis, input and output, simple examples, visualization, optimization, libraries, databases, programming guidance and interoperability. He also describes F# algorithms (up to an advanced level of complexity), arrays, lists, tables, maps and possible problems readers may encounter in the operating environment, along with possibilities for applications. For those requiring more information about specialized applications he includes a comprehensive bibliography.

QA76.76 2008276857 978-981-281-898-0
**Advances in intelligent information processing; tools and applications.**
Title main entry. Ed. by B. Chanda and C.A. Murthy.
(Statistical science and interdisciplinary research; v.2)
*World Scientific*, ©2008 295 p. $92.00
Researchers in computer science, informatics, and similar disciplines describe various methods for processing information generated by intelligent systems, some of them combining or even transcending the conventional broad approaches based either on models or on rules. Among the topics are pattern generation using level-set-based curve evolution, information theory approaches for next-best view planning in active computer vision, techniques for detecting unsupervised changes based on a self-organizing feature map neural network, and reusing knowledge when designing models of computational intelligence. Some of the papers are revised from presentations at a December 2006 conference at the Indian Statistical Institute.

QA76.76 2008-025939 978-1-60456-870-7
**Software components; guidelines and applications.**
Ramachandran, Muthu.
*Nova Science Publishers*, ©2008 410 p. $79.00
Aimed at professionals and advanced students, this book details best practices in component based software engineering (CBSE) and provides insight into software reuse, current issues in software engineering, and applications. Case studies and industrial examples are presented in areas such as distributed database systems and digital security. Guidelines are given on design for reuse, including large-scale reuse. Guidelines for design of large-scale software components in supercomputing and grid computing applications are also provided. Much of the information is presented in the form of checklists or informal outlines. Other learning features include a glossary and chapter objectives, key points, and exercises. The readership for the book includes professionals and advanced students in computer science, business computing, software development, information technology, and web and mobile applications engineering. An instructor's manual is available on a web site. Ramachandran is affiliated with Leeds Metropolitan University, UK.

QA76.88 2008-011010 978-0-470-10762-1
**High performance parallel database processing and grid databases.**
Taniar, David et al. (Wiley series on parallel and distributed computing)
*John Wiley & Sons*, ©2008 551 p. $125.00
Grid databases and parallel query processing are becoming important components in the development of database management systems, and this textbook covers the fundamentals of parallelism in data-intensive applications. Taniar (information technology, Monash U., Australia), Leung (computer science, Victoria U., Australia), Rahayu (database design, La Trobe U., Australia) and Goel (computer systems engineering, RMIT U., Australia) have created this book for researchers and practitioners working in parallel databases who need further training in grid concepts, algorithms, analytical models and transactions. Additional material is provided on parallel data mining, clustering, OLAP and replica management as well.

QA76.9 2008-040207 978-1-60566-172-8
**Advanced principles for improving database design, systems modeling and software development.**
Title main entry. Ed. by Keng Siau and John Erickson.
*Information Science Reference*, ©2009 431 p. $195.00
Siau and Erickson (U. of Nebraska-Lincoln) present this text for professionals and advanced students in library-centered computer science on the issues, methods, and theories involved in the provision of electronic resources in libraries. The 19 chapters are organized under the broad topics of ontologies and semantics, systems building, queries and data analysis, web and mobile commerce, and organizations and structures.


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Specific topics include: semantic integration and knowledge discovery for environmental research, IT value of software development, using decision trees to predict crime reporting, a model for estimating the savings from dimensional vs. keyword search, migrating legacy information systems to web services architecture, and design of a data model for social network applications.

QA76.9 2008-030667 978-0-945289-33-3
**Augmented cognition; a practitioner's guide.**
Title main entry. Ed. by Dylan D. Schmorrow and Kay M. Stanney.
*Human Factors & Ergonomics Soc*, ©2008
255 p. $115.00 (pa)
Psychologists and practitioners in various fields of engineering describe the steps needed to integrate human brains and computers into a "productive and thriving partnership" with superior sensory sensitivity, memory, and attention capacity. Due to its obvious appeal to the military, the birth of augmented cognition was funded by US taxpayers through the Decade of the Brain and the Defense Advanced Research Projects Agency (DARPA). While the field is still certainly of interest to the government, this book seeks to provide a reference to individuals, corporations and researchers who have now caught on to the potential of using computational technology to enhance worker performance and productivity by determining a person's cognitive state in real time and adapting information, technology and environment to their needs. Among the topics discussed are functional nearinfrared imaging sensors, sensor integration to characterize operator state, a mitigation framework for enhancing situation awareness, engineering control system theory in the behavioral sciences, and guidelines for developing augmented cognitition applications for operational tasks.

QA76.9 2008-040202 978-1-60566-306-7
**Collaborative and social information retrieval and access; techniques for improved user modeling.**
Title main entry. Ed. by Max Chevalier et al.
*Information Science Reference*, ©2009 371 p. $195.00
Chevalier, Julien and Soulé-Dupuy (computer science, U. of Toulouse, France) have edited these research papers on collaborative and social information retrieval and access (CSIRA), and how these techniques can detect the social parameters of users to provide a more efficient way to obtain search results. Written for students and practitioners of information science, cognitive science and computer science, these articles cover a wide range of CSIRA topics such as improved user modeling through applications such as DemonD and COBRAS, adaptations to users of mobile technologies, adaptive user profiles and computing recommendations with collaborative filtering. Semantic web-based approaches for information retrieval are also discussed.

QA76.9 2008-033937 978-1-60566-142-1
**Cross-disciplinary advances in human computer interaction; user modeling, social computing, and adaptive interfaces.**
Title main entry. Ed. by Panayiotis Zaphiris and Chee Siang Ang.
*Information Science Reference*, ©2009 449 p. $195.00
Researchers in the human-computer interaction community are developing new methods for describing user behavior, analyzing user needs and expectations, and designing and evaluating user-friendly computer systems. This book collects recent work in the field, 24 chapters in all, on major themes including computer mediated communication, online communities, computer-augmented environments, and computer-based learning. Other themes are information visualization, design of graphical user interfaces, support for creativity, and speech and natural language interfaces. Some specific topics explored include a process-oriented framework for cultural e-services, understanding the impact of culture on mobile phone usage in public places, global information ethics, anthropomorphic feedback in user interfaces, and software verification in a safety-critical information system. The editors are affiliated with the City University of London, UK.

QA76.9 978-1-4200-7404-8
**Grid resource management; toward virtual and services compliant grid computing.**
Magoulès, Frédéric et al. (Chapman & Hall/CRC numerical analysis and scientific computing)
*CRC / Taylor & Francis*, ©2009 300 p. $79.95
Grid technology holds the potential for providing secure access to remote services. Examining both data and execution management in grid computing, this book offers an overview of architectural issues of grid technology and related technologies, discussing aspects including security, data management, logging, and aggregation of services. After covering grid usages, grid systems, and the evolution of

grid computing, the book examines operational issues associated with web services and service-oriented architecture. It also explores technical and business topics relevant to data management, the development and characteristics of P2P systems, and a grid-enabled virtual file system that integrates underlying heterogeneous file systems into a unified location-transparent file system of the grid. Other areas discussed include scheduling, workflow management, semantic technologies, and deploying scientific application in a grid environment. The author is affiliated with the Applied Mathematics and Systems Laboratory, Ecole Centrale Paris.

QA76.9 2008-018995 978-0-470-19339-6
**Hardware-based computer security techniques to defeat hackers; from biometrics to quantum cryptography.**
Dube, Roger.
*John Wiley & Sons*, ©2008 227 p. $90.00
Dube, who runs a computer security company that uses products based on his patents, warns that the relationship between hackers and security evolves faster than that between bugs and pesticides, and that any security system that relies on software alone remains susceptible to attack. He begins his book with a review of basic computer security concepts and analysis then describes security technologies based on hardware and the approaches currently employed by hackers to defeat these devices. Among the technologies he describes are cryptography, key generation and distribution, secure bootstrap loading, secure memory management, hardware-based authentication, the trusted platform module, biometrics, tokens, and location. He concludes with a chapter detailing methods for deciding which applications might be most appropriate for different types of security environments.

QA76.9 2008-040941 978-1-4200-7399-7
**Knowledge discovery for counterterrorism and law enforcement.**
Skillicorn, David. (Data mining and knowledge discovery series)
*CRC / Taylor & Francis*, ©2009 330 p. $79.95
Skillicorn (computing, Queen's U.) provides an explanation of a new methodology in detection algorithms for use in counterterrorism, fraud detection, and other forensic uses. The book focuses on the four primary forms of knowledge discovery: prediction, clustering, relationship discovery, and textual analysis. It demonstrates how datasets can be used to provide concealment for criminals, discusses how how text and other forms of data can be analyzed to discover anomalies, and explores alternative ways to analyze graphical and relational data beyond visualization.

QA76.9 2008-04327 978-1-4200-8575-4
**The method framework for engineering system architectures.**
Firesmith, Donald G. et al.
*CRC / Taylor & Francis*, ©2009 483 p. $79.95
The Method Framework for Engineering System Architectures (MFESA) enables system architects and process engineers to create methods for engineering high-quality architectures for systems, subsystems, and software components. This book provides a ten-task process for developing MFESAs, which can be tailored to a project's particular situation. Introductory chapters review system architecture principles and challenges, and overview the concepts and terms of MFESA. Each task chapter contains material on the task's goal and objectives, preconditions, inputs, steps, postconditions, work products, guidelines and pitfalls, and a summary. Later chapters cover the role and requirements of architectural workers, the need for architectural validation of quality requirements, and future trends. Appendices offer a glossary and lists of MFESA components and guidelines. The book is intended for system architects and all other system architecture engineering stakeholders, including process engineers, requirements engineers, and technical and administrative managers.

QA76.9 2008-030773 978-1-60566-196-4
**Social implications of data mining and information privacy; interdisciplinary frameworks and solutions.**
Title main entry. Ed. by Ephrem Eyob.
*Information Science Reference*, ©2009 323 p. $195.00
Technical, legal, social, and philosophical approaches are brought to bear on the tension between the need to collect data and information for disparate operational objectives, and the need to preserve the integrity of the collected data to protect privacy. The topics include whether information ethics is culturally relative, protecting privacy on the Web, business collaboration by privacy-preserving clustering, agricultural data mining in the 21st century, and basic principles of data mining. They studies are intended to be of use to researchers in information science and technology and to decision makers.


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QA403 2008-19802 978-0-19-533592-7
**Handbook of fourier analysis & its applications.**
Marks, Robert J. II.
*Oxford U. Press*, ©2009 772 p. $150.00
This comprehensive text and reference is likely to become a standard in the classroom and on the professional bookshelf. Based upon practical applications but with full coverage of theory as well, this meets the needs of those working in physics, acoustics, optics, number theory, combinatorics, geometry, probability theory, statistics, signal processing, cryptography and even option pricing. Marks (engineering, Baylor U.) includes sample questions (and answers) for students and those needing a refresher, and applies Fourier analysis to a broad range of applications, including multidimensional transform theory, quantum physics, general computer science finance and Western music. For advance undergraduate and beginning graduate students the appendices provide solid background and supplemental knowledge. The result is likely to replace several other popular texts on multidimensional signals and systems, signal analysis, sampling and interpolation theory, random variables and stochastic processes, and signals and linear systems.

QA913 978-3-527-40739-2
**Particles in turbulent flows.**
Zaichik, Leonid et al.
*Wiley-VCH*, ©2008 297 p. $260.00
This book demonstrates the use of statistical models based on single- point and two-point probability density function (PDF) for solving physical problems that involve inertial particle motion. All of the models outlined in the book agree with the known results of DNS and LES of the continuous phase combined with Lagrangian trajectory simulation of the disperse phase. Chapters cover the motion of particles and heat exchange in homogeneous isotropic turbulence and gradient turbulent flows; collisions of particles in a turbulent flow; and dispersion, collision, and clustering of monodispersed and bidispersed particles in homogeneous turbulence. Techniques described are applicable to a range of industries, including the fuel industry, industrial chemistry, and food and water processing. Readers should be familiar with the fundamentals of hydrodynamics and statistical physics. Zaichik is head of the Laboratory of Theoretical Hydrodynamics at the Nuclear Safety Institute of the Russian Academy of Sciences.

## ASTRONOMY

QB62 978-0-521-88015-2
**Innovation in astronomy education.**
Pasachoff, Jay M. et al.
*Cambridge U. Press*, ©2008 334 p. $140.00
Pasachoff (astronomy, Williams College) et al. compile chapters that discuss effective strategies for teaching astronomy to students of all ages. The 45 papers and 28 short descriptions of posters are drawn from presentations given by an international group of astronomy educators at a Special Session, Innovation in Teaching/Learning Astronomy, of the International Astronomical Union General Assembly in Prague in 2006. Chapters address general strategies, connecting astronomy with the public, the use of instruction and information technology, and practical issues related to the implementation of the 2003 International Astronomical Union Resolution that recommended including astronomy in school curricula, assisting teachers in training and backup, and informing them about resources.

## PHYSICS

QC20 2008-025636 978-1-58488-459-0
**Difference methods for singular perturbation problems.**
Shishkin, Grigory I and Lidia P. Shishkina. (Chapman & Hall/CRC monographs and surveys in pure and applied mathematics; 140)
*Chapman & Hall/CRC*, ©2009 393 p. $119.95
This book explores the development of robust difference schemes for wide classes of boundary value problems, and surveys the latest approaches for further progress in numerical methods. The first part of the book examines boundary value problems for elliptic and parabolic reaction-diffusion and convection-diffusion equations in *n*- dimensional domains with smooth and piecewise-smooth boundaries. Containing material published mainly in the last four years, the second section of the book focuses on problems with boundary layers and additional singularities generated by nonsmooth data, unboundedness of the domain, and the perturbation vector parameter. The authors are affiliated with the Institute of Mathematics and Mechanics at the Ural Branch of the Russian Academy of Sciences.

QC21 978-981-270-944-8
**Condensed matter physics in the prime of the 21st century; phenomena, materials, ideas, methods; proceedings.**
Karpacz Winter School of Theoretical Physics (43rd: 2007:

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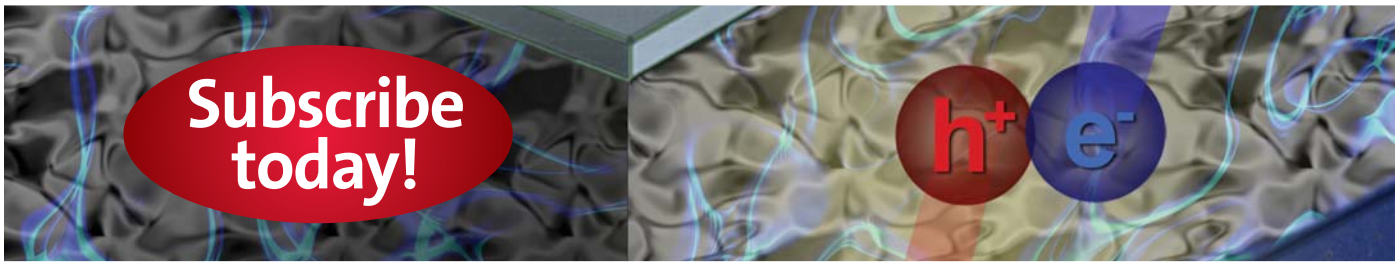


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Ladek Zdroj, Poland). Ed. by Janusz Jedrzejewski.
*World Scientific*, ©2008 358 p. $98.00
Specialists address primarily new scientists in 11 lectures on theoretical and experimental aspects of condensed matter physics, as well as methods of calculation used in the field. Among the topics are coherent control and de-coherence of charge states in quantum dots, the physics of carbon nanostructures, a full-potential local-orbital approach to the electronic structure of solids and molecules, and the theory of dynamical thermal transport coefficients in correlated condensed matter.

QC176 2008-001362 978-0-470-07794-8
**Defects in solids.**
Tilley, Richard J. D.
*John Wiley & Sons*, ©2008 529 p. $100.00
This reference guide authored by Tilley (engineering, U. of Cardiff, Wales) describes defects, how they form, and how they influence physical properties. It is intended to help scientists manipulate solids in the creation of new or improved materials. The guide also covers basic concepts in the chemistry and physics of defects, links principles to real-world applications, covers cutting-edge applications, and includes chapters on point defect chemistry, linear and planar defects, diffusion in solids, magnetic and optical defects, and more. Chapters begin with three introductory questions and conclude with answers to those questions and a series of self- test questions. The reference includes numerous illustrations and is clearly written.

QC176 978-3-527-32203-9
**Dictionary of nanotechnology, colloid and interface science.**
Schramm, Laurier L.
*Wiley-VCH*, ©2008 290 p. $145.00
This manageable dictionary covers theory, experiment, industrial practice, and applications for nanotechnology, colloid, and interface science, as well as much of what is now termed materials science. The information is presented in several formats: a dictionary of terms, classification tables on colloid and nanomaterial types, and subterm glossaries for specific phenomena, properties, and methods. The dictionary defines both newly-coined terms and older terms whose meanings have changed, and also includes acronyms, synonyms, famous names, selected abbreviations, and cross-references. There is also a historical overview, a guide to units and symbols, and a separate literature section for further reading. Schramm is president of a Canadian applied research provider.

QC176 2008-016990 978-1-60456-704-5
**Nanoparticles; new research.**
Title main entry. Ed. by Simone Luca Lombardia.
*Nova Science Publishers*, ©2008 412 p. $129.00
This book provides leading edge research from around the world in the field of nanoparticles and their potential biomedical, optical, and electronics applications. The process of nanoparticle formation under laser ablation of solids in liquids is described, and the use of carbon and/or metal-carbon composite nanoparticles for the construction of patterned surfaces and the directed growth of cells is discussed. Other topics examined include the novel synthesis of inorganic nanoparticles stabilized by an organic shell layer, the use of nanoparticles and quantum dots as tags for electrochemical bioassays, a hybrid nanoparticle based on silica, and heat transfer of nanoparticle suspensions. Some specific applications described are the use of nanoparticles in food and drug packaging, and the use of polymeric nanoparticles for oral delivery of protein drugs. The book is illustrated with numerous color and b&w images. Information on the editor is not given.

QC446 978-3-527-31999-2
**Periodic materials and interface lithography; for photonics, phononics and mechanics.**
Maldovan, Martin and Edwin L. Thomas.
*Wiley-VCH*, ©2009 313 p. $175.00
This book delves into the theoretical design, fabrication, and practical applications of nano and micro scale periodic materials. A theoretical section studies the correlation between the mathematical description of periodic materials by Fourier series methods and the experimental realization of these materials by a fast, low-cost experimental technique known as interference lithography. The experimental section of the book provides guidelines for the fabrication of nano and micro periodic materials by interference lithography. Theory and numerical data are used to demonstrate how periodic structures control the photonic, acoustic, and mechanical properties of materials. Examples of applications from these three fields are given in the third section of the book. Appendices provide MATLAB programs for calculating reflectance from one-dimensional photonic and phononic crystals. B&w and a few color figures are included. The authors are affiliated with the Department of Materials Science and Engineering at the Massachusetts Institute of Technology.

QC454 978-3-527-31997-8
**Lasers in chemistry; 2v.**
Title main entry. Ed. by Maximilian Lackner.
*Wiley-VCH*, ©2008 1466 p. $505.00
The 50 chapters of this 2-volume reference describe current research and methods in the field of lasers in chemistry. V.1, subtitled 'probing matter', begins with three chapters that describe the history and principles of lasers, laser safety, and an overview of the use of lasers as probes in chemistry (by Lackner). Subsequent chapters in V.1 include chemical sensing using quantum cascade lasers, laser diagnostics of combustion process, and tunable diode laser absorption spectroscopy. V.2, subtitled 'influencing matter', begins with an overview by Lackner on the use of lasers to start and influence chemical reactions. The chapters that follow describe such techniques as laser-based formation of nanoparticles and laser enrichment of isotopes, before turning to a series of chapters on applications, including lasers in biology, medicine, material processing, and dentistry. The chapters are detailed in their descriptions of the processes involved, mentioning the origins of the process and the basic principles and methods employed, and illustrated with b&w and color images. V.2 concludes with a view to the future (by Lackner), a glossary, and an index. Each chapter concludes with a full list of references. An impressive group of 50 specialists at research institutions worldwide are the contributors; Lackner is at the Vienna U. of Technology in Austria.

QC459 2008-018045 978-0-8194-6964-9
**EUV lithography.**
Title main entry. Ed. by Vivek Bakshi. (Press monograph; 136)
*SPIE*, ©2009 673 p. $105.00
Extreme ultraviolet lithography (EUVL) is one of the leading patterning technologies for the production of computer chips. This reference contains 12 chapters by leading researchers and suppliers in the EUVL field. It also contains a detailed appendix with EUVL reference data. Chapter topics are intended to meet the needs of practitioners of the technology as well as readers who want an introduction to EUVL. Early chapters present a history of EUVL development and overview EUVL source technology. Later chapters cover EUV optics, EUV wavefront measurement techniques, contamination in EUVL scanners, mask technology, resist technology, design considerations, MET optics, and lithography cost trends. The appendix contains reference data for the EUV spectral region. The editor works in the private sector. The book is co-published with Wiley-Interscience.

QC476 978-0-87849-358-6
**Advances in light emitting materials.**
Title main entry. Ed. by Bo Monemar et al.
*Trans Tech Publications*, ©2008 278 p. $230.00 (pa)
Designed for engineers and researchers in the field of silicon and III-nitride semiconductors, this collection of research papers covers the rapid advances made over the last few years in the development and performance of silicon-based light- emitters. Editors Monemar (materials science, Linköping U., Sweden), Kittler (defect engineering, Joint Lab BTU-IHP, Germany) and Grimmeiss (solid state physics, U. of Lund, Sweden) have assembled this research to show how silicon research has expanded from microelectronics to photonics in recent years. These papers describe such developments as the potential value of D-band luminescence through silicon dislocations, silicon-germanium LEDs and MOS light-emitting devices based upon rare-earth ion implantation.

QC777 2008-013350 978-1-4200-6164-2
**Introduction to nuclear science.**
Bryan, Jeff C.
*CRC / Taylor & Francis*, ©2009 244 p. $89.95
Bryan (nuclear chemistry, University of Wisconsin-La Crosse) offers an accessible introduction to the fundamental concepts, relevant mathematics, current applications, and health issues associated with nuclear chemistry and physics. The book addresses important contemporary topics such as nuclear power, weapons, and food and mail irradiation. Extensive chapters on fission nuclear reactors will be useful to those who will soon be entering the nuclear workforce. The text can be used by nuclear medicine majors; it also includes material relevant to other medical professionals using ionizing radiation for diagnosis and treatment of diseases, and to scientists from other areas. Beyond some knowledge of algebra and general chemistry, very little science and math background is assumed. Chapter questions and reference appendixes are included.

## CHEMISTRY

QD75 2008-411801 978-1-904275-33-6
**State estimation in chemometrics; the Kalman filter and beyond.**
Thijssen, P.C.
*Horwood Publishing*, ©2008 122 p. $78.00 (pa)


Published by Jefferson Digital Commons, 2009

With the intention of improving advanced data processing techniques, practitioner Thijssen not only applies system theory to develop a modular framework for simple intelligent analyzers but also provides background in both state estimation and chemometrics for those requiring an introduction or reminder. Thijssen also provides short reviews of the development of this unique process along with extensive examples of applications and descriptions of estimation (classical, state and nonlinear), multi-component calibration and titration systems, the Kalman filter, and relevant statistics. Thijssen builds concepts logically, so professionals and graduate students in chemistry and engineering can follow the text easily. He also includes an appendix on matrix fundamentals. The result serves as both a reference and a course text. Distributed by ISBS.

QD75 2008-029542 978-1-4200-6796-5
**Environmental chemometrics; principles and modern applications.**
Hanrahan, Grady. (Analytical chemistry; 4)
*CRC / Taylor & Francis*, ©2009 292 p. $89.95 (pa)
Written for students and researchers in the field of analytical and environmental chemistry, this textbook explains modern chemometric methods used to discover relationships between multiple samples and variables. Hanrahan (analytical chemistry, California Lutheran U.) explains the mathematical, statistical and logical components of chemometrics, and how advanced computing capabilities and analytical instrumentation contributed to the development of these methods. The author then reviews the statistical and analytical figures most important to the study of these chemical system interactions while explaining quality assurance standards, experimental design and optimization techniques, time series analysis and multivariate data analysis.

QD79 978-3-527-31830-8
**Advances in flow analysis.**
Title main entry. Ed. by Marek Trojanowicz.
*Wiley-VCH*, ©2008 672 p. $275.00
This resource for chemists offers an overview of methods and instrumentation for flow analysis, advances in detection methods in flow analysis, and applications. Coverage includes the current status of the development of theoretical description of flow analysis, various methods of injection techniques, and use of moveable beads. Application areas discussed include flow methods in pharmaceutical analysis, and industrial and environmental applications of continuous flow analysis. Sample processing methods in flow analysis and the most commonly employed detection methods are discussed, such as molecular and atomic spectroscopic, electrochemical, biochemical, and mass spectrometry. Numerous applications are reviewed for environmental, pharmaceutical, and industrial analysis. Internet resources for flow analysis, including databases, vendors of instrumentation, journals, books, and standards methods, are given. Trojanowicz teaches chemistry at the University of Warsaw.

QD96 2008-041505 978-0-471-71395-1
**Mass spectrometry; instrumentation, interpretation, and applications.**
Title main entry. Ed. by Rolf Ekman et al. (Wiley-Interscience series in mass spectrometry)
*John Wiley & Sons*, ©2009 371 p. $110.00
Graduate and even undergraduate students of analytic chemistry are increasingly taking courses in mass spectrometry, and researchers from around the world provide a textbook for such a course. Students are expected to move into such fields as chemistry, biochemistry, molecular and systems biology, and polymer chemistry, where the technique will be just one of several they use. The goal here is to introduce principles and general procedures as a foundation from which advanced students and professionals can seek and understand more technical and specific description when they need it.

QD96 2008-010999 978-0-470-03197-1
**A practical approach to quantitative metal analysis of organic matrices.**
Brennan, Martin.
*John Wiley & Sons*, ©2008 258 p. $150.00
Brennan is an analytical scientist from Ireland with some 30 years of experience in atomic spectroscopy; he is currently with a firm in Ireland specializing in the manufacture of adhesives and other organic compounds. In this text, Brennan examines the practical approach of quantitative metal analysis using inductively coupled plasma optical emission spectrometry (ICP-OES), a powerful state-of-the-art technique used for metal analysis of all kinds of samples but requiring highly skilled operators. Following a general overview, coverage includes instrumentation associated with atomic spectroscopy; quantitative metal analysis of organic matrices; analysis of plastics, fibers, and textiles for metals content; metal analysis of virgin and crude petroleum products; metal analysis of structural adhesives; and

hyphenated and miscellaneous techniques used with ICP-OES. For academic, industrial, and research departments, as well as graduates and researchers seeking new ideas for further research.

QD172 2008-016254 978-1-60456-702-1
**Transition metal chemistry; new research.**
Title main entry. Ed. by Bence Varga and Levente Kis.
*Nova Science Publishers*, ©2008 216 p. $129.00
Work by researchers from around the world discusses the preparation of a diverse range of transition metal-based compounds, and addresses their structural and physical properties, their use in chemical synthesis, and their role in naturally occurring systems. Some areas investigated include homochiral porous metal-organic frameworks, transition metal complexes in delignification catalysis, metallosupramolecular complexes derived from functionalized pyridyl ligands, and coordination diversity of N-phosphorylated amides and ureas towards VIIIB group cations. Other subjects studied are transition metal chemistry and carbon nanotubes, and problems of modern nomenclature of coordination compounds of transition metals. B&w and a few color diagrams are included. Information on the editors is not given.

QD181 2007-050781 978-1-60456-342-9
**Silicon-based inorganic polymers.**
Title main entry. Ed. by Roger De Jaeger and Mario Gleria.
*Nova Science Publishers*, ©2008 506 p. $69.00
This book collects contributions from Europe, the US, and Japan on silicon-based inorganic polymers. Following a general review on polysiloxane synthesis, chapters cover silicones in industrial applications, polysiloxanes as templates and building blocks in nanostructured materials, photochemistry of polysiloxanes, polysilanes, polycarbosilanes, polysilzanes, and polyferrocenylsilane-based polymer systems. Color and b&w images are included. Information on the editors is not given.

QD262 2008-027929 978-0-470-03586-3
**Flash chemistry; fast organic synthesis in microsystems.**
Yoshida, Jun-ichi.
*John Wiley & Sons*, ©2008 234 p. $150.00
Yoshida (synthetic chemistry and biological chemistry, Kyoto U., Japan) has provided this textbook of the emerging field of flash chemistry, an exciting sub- discipline that examines fast organic synthesis and chemical transformation. The author describes reaction dynamics of chemical interactions, noting the rate and selectivity of each combination. Flash chemistry applications are also suggested for organic synthesis, rapid construction of chemical libraries, industrial processes and polymer synthesis protocols. Written for researchers and students in the field of organic chemistry, process chemistry and chemical engineering, this book provides one of the first and most thorough explorations of this discipline in print.

QD400 978-3-527-31927-5
**Iron catalysis in organic chemistry; reactions and applications.**
Title main entry. Ed. by Bernd Plietker.
*Wiley-VCH*, ©2008 279 p. $190.00
Plietker (organic chemistry, U. of Stuttgart, Germany) has edited a collection of 9 high-level articles that demonstrate the usefulness of iron catalysis in organic reaction, with emphasis on the appeal of iron catalysts as a sustainable, inexpensive, non-toxic tool for organic synthesis. Among the chapter topics are iron catalysis in biological and biomimetic reactions, iron-catalyzed cross-coupling reactions, iron-catalyzed aromatic substitutions, and addition and conjugate addition reactions to carbonyl compounds. Written by chemists at German university and private research labs, the articles offer detailed and practical discussion of methods and outcomes for a wide range of reactions, with copious use of diagrams. Each chapter concludes with a list of references.

QD505 2008-007592 978-0-470-26202-3
**Mechanical catalysis; methods of enzymatic, homogeneous, and heterogeneous catalysis.**
Swiegers, Gerhard F.
*John Wiley & Sons*, ©2008 351 p. $100.00
This book examines the principles of mechanics as they apply to chemistry, and, more particularly, catalysis, unifying about 30 general theories of enzymatic catalysis into a conceptually coherent whole. The book focuses on unconventional time-dependent (mechanical) catalysis, rather than the more familiar energy-dependent (thermodynamic) catalysis. It describes the physical manifestations of both types of catalysis in heterogeneous and homogeneous systems, then details the fundamental processes of enzymatic catalysis, explains how it has evolved, and shows how it relates to catalysis in man-made systems. The book goes on to explain how to mimic the underlying principles of enzymatic catalysis in man-made systems, discussing the


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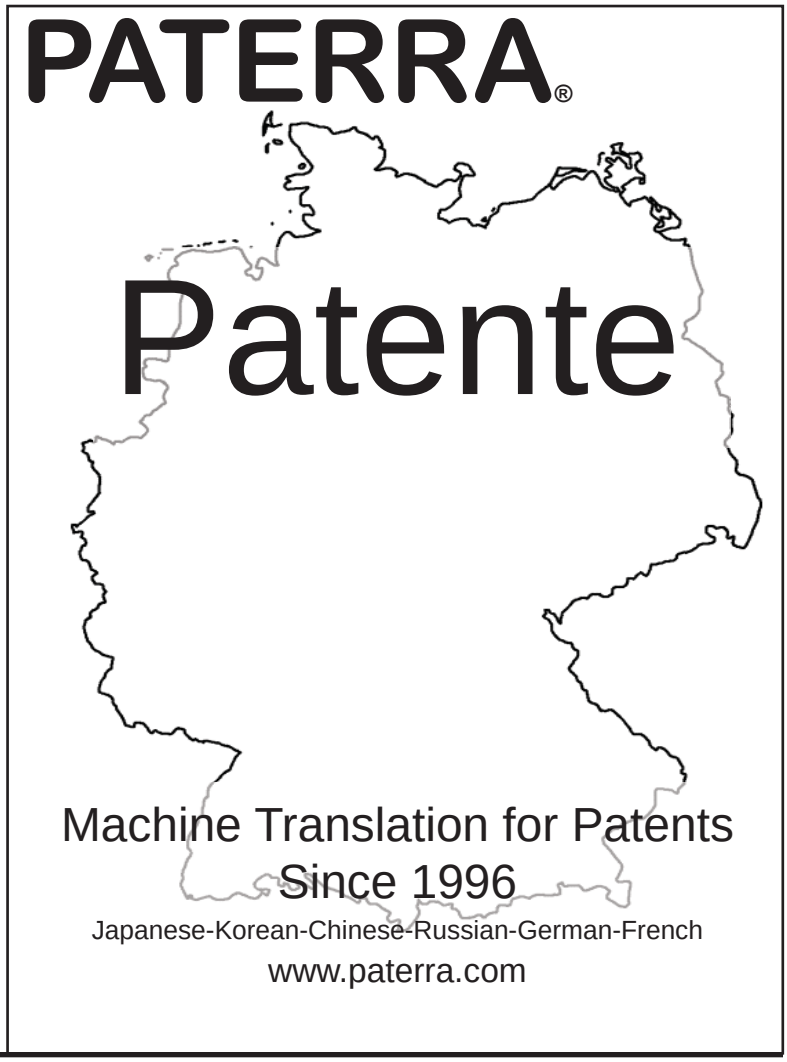
design requirements for such catalysts, the difficulties in duplicating the natural process, and approaches that may be used to overcome these challenges. A glossary is included. For chemists, biochemists, and chemical engineers, as well as students of complex systems science, and researchers in a variety of fields including evolution, economics, weather forecasting, and networking. Swiegers is a researcher and inventor.

QD506 978-3-527-32037-0
**Highlights in colloid science.**
Title main entry. Ed. by Dimo Platikanov and Dotchi Exerowa.
*Wiley-VCH*, ©2009 306 p. $190.00
This book is a compilation of 16 invited review articles by some of the best-known international scientists in the field of colloidal and interface science. Topics reported include orthokinetic heteroflocculation in papermaking, uptake and release of active species into and from microgel particles, manipulation of DNA by surfactants, particle characterization using electro-acoustic spectroscopy, conditions for the existence of a stable colloidal liquid, and wetting films stabilized by polymeric surfactants. The audience for the book is made up of chemists and material scientists, as well as those working in industries impacted by colloidal science. Platikanov teaches in the Department of Physical Chemistry at the University of Sofia, Bulgaria. Exerowa is professor in the Department of Colloids and Surfaces at the Institute of Physical Chemistry of the Bulgarian Academy of Sciences.

## MEDICINE (GENERAL & PUBLIC ASPECTS)

R856 978-1-59693-158-9
**Nanoreactor engineering for life sciences and medicine.**
Title main entry. Ed. by Agnes Ostafin and Katharina Landfester. (Engineering in medicine & biology)
*Artech House*, ©2009 283 p. $129.00
The nanosized containers for chemical reactions are so small that the space itself becomes a factor in the reaction. Artificial ones are recent, but natural ones include nuclei, mitochondria, mitotic bundles, the pores of channel protein, and other structures inside living cells. Researchers from physical, biological, and materials sciences and engineering describe some of the types being used and what they are used for. Among them are mini-emulsion droplets for radical or oxidative polymerization, ordered mesoporous materials for drug delivery and tissue engineering, surface nanoreactors for the efficient catalysis of hydrolytic reactions, and stem cells as nanoreactors.

R857 2008-005517 978-1-60456-435-8
**Advanced nanomedicine and nanobiotechnology.**
Viroj Wiwanitkit.
*Nova Science Publishers*, ©2008 232 p. $89.00
In this volume, Wiwanitkit presents introductory discussions of aspects related to advanced nanomedicine and nanobiotechnology, defining key terms and discussing applications. He begins with the basic principles of nanoscience and discussion of commonly used nanomaterials and nanomodification techniques, followed by chapters on nanopolymers, the development and new types of nanochips, and medical tool development and technology. He also explains



uses of nanotechnology in therapy, diagnosis, pharmacology, hematology, bioinformatics, computing, quantity measurement in medicine, and imaging, as well as nanoproducts in society, ending with chapters on quantum medicine and the smaller-scale picomedicine.

## AGRICULTURE, PLANT CULTURE, FORESTRY

S612 2008-014042 978-1-60456-579-9
**Agricultural irrigation research progress.**
Title main entry. Ed. by Daniel Alonso and Hugo J. Iglesias.
*Nova Science Publishers*, ©2008 194 p. $129.00
This collection of research articles on agricultural irrigation reflects the need for global conservation efforts in light of the fact that irrigated cropland has increased while water application rates have decreased over the last few decades. Editors Alonso and Iglesias (no affiliations listed) have enlisted the help of global contributors to address such topics as deficit irrigation practices, fertility status and dynamics of Himalayan soils, evapotranspiration estimates and water stress indicators, the application of stable isotopes to watershed diagnosis and the cost of irrigation resources. Agricultural engineers and researchers should be particularly interested in the content of this book since the data reveals that the cost of supplying water for irrigation does not reflect the water's true value and potential.

## TECHNOLOGY (GENERAL)

T10 2008-013541 978-0-89503-375-8
**Connecting people with technology; issues in professional communication.**
Title main entry. Ed. by George F. Hayhoe and Helen M. Grady. (Baywood's technical communications series)
*Baywood Publishing Co.*, ©2009 269 p. $56.95
Hayhoe and Grady, professors of technical communication at Mercer University, collect selected papers from the 2005 IEEE International Professional Communication Conference, exploring five areas where technology affects society: usability, globalization, health and safety, biotechnology, and corporate communication. Some specific topics examined include navigation design for a medical web site, the hidden costs of cross-cultural documentation, using role sets to engage visitors to safe sex web sites, connecting popular culture and science, and knowledge management in the aerospace industry. The book will be of interest to practitioners in technical and professional communication and to students and academics seeking information on current industry practices in technical communication. The book can also be used with undergraduate and graduate students.

T57 978-1-59693-246-3
**Integrated interconnect technologies for 3D nanoelectronic systems.**
Title main entry. Ed. by Muhannad S. Bakir and James D. Meindl. (Integrated microsystems series)
*Artech House*, ©2009 528 p. $149.00
Bakir and Meindl (microelectronics, Georgia Institute of Technology) have edited this textbook on 3D nanoelectronic systems, helping students and engineers to understand the latest developments in power delivery design, analysis and modeling. This book explains the latest concepts in I/O interconnects and packaging, chip- package mechanical interaction modeling and compliant I/O fabrication and assembly, with additional chapters on CMOS integrated optical devices and wafer stacking technologies. New advances in heat removal techniques are also discussed, including chip-scale microchannel cooling and integrated micropumps.

T57 978-1-4200-9186-1
**Operations research applications.**
Title main entry. Ed. by Ravi Ravindran. (Operations research)
*CRC / Taylor & Francis*, ©2009 -- p. $89.95
Ravindran (industrial and manufacturing engineering, Pennsylvania State U.) has edited this guide of operations research applications for students and practitioners who may not be experts in software development or information technology. Each of the 12 chapters are designed with a particular type of industry in mind (airlines, e-commerce, military and supply chain management), so that resources can be obtained as particular issues and problems in the field emerge. Each section is written by an expert in that particular field so that software techniques and functional issues can be explained properly to qualified personnel.

T58 2008-022538 978-1-60566-128-5
**Best practices and conceptual innovations in information resources management; utilizing technologies to enable global progressions.**
Title main entry. Ed. by Mehdi Khosrow-Pour. (Advances in information resources management book series)
*Information Science Reference*, ©2009 401 p.


Published by Jefferson Digital Commons, 2009

$265.00
Khosrow-Pour (information systems, Pennsylvania State U. Harrisburg) presents 21 chapters on current research and trends in information resource management for managers of electronic resources and network professionals. Chapter topics discuss information research management with regards to IT-reliant systems, a management control system, critical realism regarding the implementation of automated performance management systems, cost estimation of lead system integrator engineering activities, the mixing of soft systems methodology and Unified Modeling Language in business process modeling, the examination of online purchase intentions in B2C e-commerce, and a research agenda for investigating open source software user communities, among others.

T58 2007-039589 978-1-59904-939-7
**Global information technologies; concepts, methodologies, tools and applications; 6v.**
Title main entry. Ed. by Felix Tan.
*Information Science Reference*, ©2008 3820 p. $1,750.00
This six-volume reference edited by Tan (Auckland U. of Technology, New Zealand) brings together a large body of research in the rapidly expanding field of global information technologies. The volumes' 269 chapters cover conceptual, methodological, technical, and managerial issues. They begin with a section on fundamental concepts and theories, containing chapters on such topics as e-commerce security and critical issues for developing countries, digital government and the digital divide, distance learning in Hong Kong, gender and information and communication technologies in Zambia, global perspectives on the information society, the role of modularity in free/open source software development, and web-based distance learning and the second digital divide. Next comes a section on development and design methodologies, which contains chapters on the role of social capital in outsourcing information technology, analysis of software requirements engineering exercises in a global virtual team setup, clustering dynamics of the information and communication technology sector in South Africa, and systems and processes framework in global business transition. Tool and technologies topics discussed include global information systems applications to city planning engineering, impact of mobile and wireless technologies on developing countries, and voice over Internet protocol for rural telecommunication provision. Utilization and application is the topic of the next section, with chapters on an adoption study of online-payment in Chinese companies, integration of global supply chain management with small and medium suppliers, cross-cultural user attitudes towards e-commerce, and the use of information technology in teaching accounting in Egypt. The next section discusses organizational and social implications and includes examination of university programs, community-based initiatives, and governmental programs, followed by a section on managerial impact issues, including e-commerce challenges, corporate offshoring opportunities, supply chain globalization, and related topics. Finally, critical issues, especially inequalities in technology access, and emerging trends are examined.

T58 2008-017753 978-1-60566-040-0
**Information systems research methods, epistemology, and applications.**
Title main entry. Ed. by Aileen Cater-Steel and Latif Al-Hakim.
*IGI Publishing*, ©2009 395 p. $195.00
In the information systems field, a strong tradition of using empirical research has developed to evaluate the methods, systems, and processes used in organizations. Editors Steel (information systems, U. of Southern Queensland) and Al-Hakim (management, U. of Southern Queensland) and more than 30 contributors offer a selection of recent empirical studies relating to evaluation, and examples of effective approaches to the analysis, summary, and presentation of empirical data and conclusions. Topics cover computer industry information systems, epistemology, information systems in financial organizations, government and defense information systems, manufacturing industry information systems, educational information systems, and more.

T59 2008-030668 978-0-945289-34-0
**Best of Human factors; thirty classic contributions to human factors/ ergonomics science and engineering.**
Title main entry. Ed. by Nancy J. Cooke and Eduardo Salas.
*Human Factors & Ergonomics Soc*, ©2008 572 p. $125.00 (pa)
The Society was founded in 1957, and it began publishing its journal *Human Factors* the following year. Here the current and immediately past editors select articles on application, methodology, and theory in the discipline that has since come to be called ergonomics. Their selection was based on the number of

votes an article got in a survey, the number of citations listed on the Web of Science, and whether or not it was named article of the year when it was published. The top article is "Toward a Theory of Situational Awareness in Dynamic Systems," from 1995; the second is from 1963, "A Model for Visual Memory Tasks."

T174 2008-012400 978-1-58488-637-2
**Analytical methods for risk management; a systems engineering perspective.**
Garvey, Paul R. (Statistics; textbooks and monographs)
*Chapman & Hall/CRC*, ©2008 264 p. $99.95
Garvey (risk management, MITRE Corp.) has written a textbook on managing risk in both traditional and advanced engineering systems. Topics cover identifying, analyzing, measuring, and managing risk. It also includes essays on analytical topics such as writing, prioritizing, and representing risks, and monitoring progress during mitigation of a risk's possible adverse effects. Chapters include exercises and references. The book is intended for upper division undergraduate or graduate students in systems engineering, program management, or engineering management.

## ENGINEERING (GENERAL, CIVIL)

TA165 2008-030149 978-1-891121-74-6
**Sensors for ranging and imaging.**
Brooker, Graham.
*SciTech Publishing*, ©2009 717 p. $99.00
This textbook/reference on active sensing technologies provides students and engineers with the latest information on time-of-flight sensors, radar range equations, detection of echo signals and radar, sonar and lidar imaging. Brooker (radar research and development, U. of Sydney) explains the fundamentals of signal processing and modulation before moving on to IR radiometers and image intensifiers, millimeter wave radiometers, active ranging sensors, active imaging sensors, signal propagation, Doppler measurement and radio frequency ID tags and transponders. A section is also provided on tomography and 3D imaging technologies such as MRIs and ultrasound.

TA168 2008-034941 978-0-13-221307-3
**Policy technologies for self-managing systems.**
Agrawal, Dakshi et al.
*IBM Press*, ©2009 208 p. $59.99
This book describes current innovations in information technology policies and autonomic computing and how they can be used to guide and automate decisions required to manage computer and network infrastructure. The benefits: cost reductions, improved quality of service, and enhanced business agility. The book covers numerous relevant topics, including understanding the life cycle and components of policy-based self-managing systems, making policies automatically enforceable by computer, and using policies to simplify configuration management for SANs and other information technology systems. The authors, Agrawal, Lee, Calo, Lobo, and Verma are employed at IBM's T.J. Watson Research Center.

TA350 2008-033432 978-1-4200-6271-7
**Introduction to engineering mechanics; a continuum approach.**
Rossman, Jenn Stroud and Clive L. Dym.
*CRC / Taylor & Francis*, ©2009 472 p. $89.95
This textbook on solid and fluid mechanics focuses on the mathematical concepts behind stress and strain, and uses case studies to describe both real-world applications and catastrophic failures. Rossman (mechanical engineering, Lafayette College) and Dym (engineering design, Harvey Mudd College) show the connection between solid and fluid mechanics by taking a continuum approach to show the transitions between multiple dimensions of strain and stress. Written for advanced engineering students, this book expands upon basic Newtonian laws to describe how biomaterials (which combine both fluid and solid characteristics) fit within the spectrum of material behavior.

TA357 2008-019608 978-1-60456-111-1
**Electrorheological material and device design and preparation.**
Zhao, Xiaopeng et al.
*Nova Science Publishers*, ©2008 106 p. $39.00 (pa)
Electro-rheological (ER) fluid is a suspension whose structure and rheological properties can be tuned quickly by an external electric field. Three authors introduce new methods in design and preparing the materials through two approaches: molecular and crystal structure design, and nano-composite and hybrid design. They describe some advanced preparation techniques such as self-assembly, nano-composition, and hybridization that can be used to obtain physical and chemical properties of high-performance materials. Example applications include self-coupled dampers based on ER fluid and piezoelectric ceramic for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vibration control, and a flexible sandwiched ER composite for sound transmission control.

TA409 978-0-87849-377-7
**Progress in fracture and damage mechanics.**
Title main entry. Ed. by B.G. Falzon and M.H. Aliabadi.
(Key engineering materials; v.383)
*Trans Tech Publications*, ©2008 121 p.
$135.00 (pa)
These research papers for materials science and aeronautics engineers discuss new and advanced composite materials for civil aircraft that are less prone to the types of fractures and damage that may result in catastrophic failures. Falzon (aeronautics, Imperial College London) and Aliabadi (aerostructures, Imperial College London) edit these articles that cover such topics as BEM analysis of semipermeable piezoelectric cracks, boundary element analysis of cracked sheets repaired with bonded anisotropic patches and static and fatigue performance of composite adhesives. Many of these studies discuss methods of crack repair, and how adhesive bonding may offer higher rates of failure than mechanical fasteners.

TA410 2008-276645 978-0-87849-386-9
**Structural integrity and failure.**
Title main entry. Ed. by Xiaozhi Hu et al. (Advanced materials research; v.41-42)
*Trans Tech Publications*, ©2008 516 p.
$276.00 (pa)
This collection of 71 peer-reviewed papers was accepted for presentations at the SIF 2008 conference held in July, 2008 in Perth, Australia. Edited by Hu, Fillery, and Qasim (U. of Western Australia), and Duan (Central Queensland U.), the papers are grouped into five categories: bio-materials and nano-materials; fracture and fatigue, ceramics, concrete, and rock; composites; and structural integrity. They reflect state-of-the-art knowledge and research on these topics.

TA418 978-0-87849-384-5
**Advances in nanostructured materials processed by severe plastic deformation.**
Title main entry. Ed. by Xiaozhou Liao and Yonghao Zhao.
(Materials science forum; v.579)
*Trans Tech Publications*, ©2008 154 p.
$138.00 (pa)
Editors Liao (aerospace, mechanical, and mechatronic (engineering, U. of Sydney) and Zhao (chemical engineering materials science, U. of California) provide 10 papers that explore a variety of aspects of interest to severe plastic deformation (SPD) researchers. SPD techniques are the most popular and most rapidly developing methods for producing nanostructured materials. The collection's 28 contributors discuss several related subjects, including recent developments of SPD techniques for processing bulk nanostructured materials, plastic behavior of metals in reverse straining after large pre-strains, and surface nonocrystallization by surface mechanical attrition treatment. Chapters begin with abstracts and introductions and include illustrations.

TA418 978-1-4200-8776-5
**Ageing of composites.**
Title main entry. Ed. by Rod Martin.
*CRC Press*, ©2008 517 p. $289.95
While there has been large growth in the demand for and use of composite products, their long-term properties when exposed to a combination of in-service loads and environments are not well characterized according to Martin (a chartered engineer and scientist based in the UK), who here gathers together papers exploring aspects of the aging of composites from a fundamental level for different materials systems, including polymeric composites, glass-ceramic matrix composites, glass fiber reinforced concrete, glass reinforced polymer composites, silicon carbide composites. They also discuss composite aging from an industrial perspective for a variety of sectors, including rail, rotorcraft, marine vessels, medical devices, oil and gas, construction, insulators, chemical processing, and underwater applications. Co-published by Woodhead Publishing.

TA418 2008-459096 978-3-527-31938-1
**Cellular and porous materials; thermal properties simulation and prediction.**
Title main entry. Ed. by Andreas Ochsner et al.
*Wiley-VCH*, ©2008 422 p. $215.00
Combining physical properties such as high mechanical damping with heat insulation, cellular or foam-like materials have a wide range of applications in the automotive and aerospace industries. These 12 articles provide designers, chemists, materials scientists, engineers and advanced students with a solid understanding of the fundamentals as well as awareness of recent advances. Along with thorough coverage of the effective thermal properties of hollow sphere structures in a finite element approach, contributors analyze the thermal properties of composite materials and porous media using a lattice-paced Monte Carlo approach (and a boundary element approach)

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and provide other analytical methods for heat conduction from composites and porous media. They model composite heat transfers in open cellular porous materials at high temperatures, and describe thermal conduction systems, heat sinks, direct simulation, oscillating flow, and the application of optimization technologies to heat transfer and cellular materials.

TA418 2008-428766 978-3-527-31361-7
**Ceramic matrix composites; fiber reinforced ceramics and their applications.**
Title main entry. Ed. by Walter Krenkel.
*Wiley-VCH*, ©2008 418 p. $200.00
Brittle refractory materials are often useful in severe environments combining high temperatures with high stress levels. Here editor Krenkel (ceramic materials, U. of Bayreuth) and his contributors offer 16 articles on materials, including ceramic matrix composites (CMCs) and reinforced ceramics, and their applications. Compared to other materials ceramics are mostly at the development stage, so the collection includes leading-edge information on such topics as fibers for ceramic matrix composites, textual reinforcement structures, interfaces and interphases, carbon applications, melt-infiltration processes, chemical vapor infiltration processes for CMCs, oxide composites with fiber coatings, CMCs with porous matrices, micro- structural modeling and thermal mechanical properties, nondestructive testing techniques, machining, integration technologies, and applications in aerospace, aeronautics and nuclear power. Although the result covers a lot of ground, it is remarkably comprehensive and eminently useful.

TA418 2008-298396 978-0-87849-390-6
**Corrosion in the military II; proceedings.**
World Congress on Corrosion in the Military (2d: 2007: Naples, Italy) Ed. by Vinod Agarwala et al. (Advanced materials research; v.38)
*Trans Tech Publications*, ©2008 338 p. $246.00 (pa)
These peer-reviewed papers from the Second World Congress on Corrosion in the Military identify the effects corrosion has on world economies in terms of replacement costs and environmental concerns, and offer the latest research on inhibitors, controls, diagnostic protocols and data management practices. Editors Aharwala (materials science and engineering, U.S. Office of Naval Research Global), Bellucci (materials and production engineering, U. of Naples "Federico II"), Montuori (materials and production engineering, U. of Naples "Federico II") and Ippolito (aerospace engineering, U. of Naples "Federico II") have collected these papers for military engineers and researchers who need to exchange the latest information on smart technologies for early detection and prevention of corrosion, innovations in non-metallic structures and state-of-the-art control technologies. Sessions on stress-induced crack repairs and metal joining concepts are also reviewed.

TA418 978-1-59693-283-8
**Nano-optics and near-field optical microscopy.**
Title main entry. Ed. by Anatoly Zayats and David Richards. (Nanoscale science and engineering)
*Artech House*, ©2009 361 p. $149.00
If we are to better understand the function of biological cells, molecules and nanostructure materials, we need optical imaging tools. Here editors Zayats (physics, Queen's U., Belfast) and Richards (physics, King's College, London) and their contributors explain this relatively new field from its historical background to new research and applications, addressing near-field photonic forces such as nano- optics with single quantum systems, near-field second harmonic generation, and the microscopy and lithography of light emitting polymers; nano-photonics, such as near-field characterization of photonic crystal wave guide structures and near-field microscopy tracking of light pulses; plasmonic materials, including near-field optical characterization, high enhancement in near-field localization of light on semi-continuous films, and nano-optics with hybrid plasmonics nanoparticles; and near-field optical microscopy, including electric light scattering from a tip, single molecule contrast, tip enhanced fluorescence microscopy and optical microscopy, near field optical molecular structuring and manipulation, and recent developments in near-field optics.

TA418 978-0-87849-393-7
**Stress evaluation in materials using neutrons and synchrotron radiation; selected papers.**
Title main entry. Ed. by (Materials science forum; vs.571-2)
*Trans Tech Publications*, ©2008 432 p. $276.00 (pa)
This volume is a collection of selected peer-reviewed papers from the MECASENS IV conference on stress evaluation on materials by neutron and synchrotron radiation held in Vienna, Austria, on September 24- 26, 2007. The papers, prepared by scientists in both

academia and industry, cover a variety of related topics, including processing, plasticity, methods, ceramics, welds, composites, and thin films. Papers also include discussions of advances in instrumentation, experimental techniques, data evaluation, modeling, and simulation. The collection was edited by Degischer (materials science and technology, Vienna U. of Technology) and Pyzalla and Borbély (material diagnostics and steel technology, Max Planck Institut für Eisenforschung GmBH).

TA418 978-0-87849-397-5
**Surface engineering; selected papers.**
International Conference on Surface Engineering (5th: 2007: Dalian, China) Ed. by M.K. Lei et al. (Key engineering materials; vs.373-374)
*Trans Tech Publications*, ©2008 849 p. $381.00
A July 2007 conference gathered the surface engineering community and provided a forum for specialists, scholars, and engineers in research, teaching, and industry. This collection of 201 peer-reviewed international papers from the conference is grouped into seven sections on thermal spray technology, vapor deposition technologies, electrodeposition and electroless deposition, energetic beams and plasma surface treatments, wear and corrosion behavior of engineering surfaces, functional films and coatings, and surface machining and mechanical processing technologies. Some areas described are remanufacturing and automatic surface engineering technology, plasma transferred arc powder surfacing technology of thrust face, cerium- phytic acid passivation treatment on galvanized steel, supersaturated surface engineering S-phase materials, and preparation of epoxy modified organosilicone high-temperature resistance coatings. Other subjects are surface grafting modification of silk fibroin by atom transfer radical polymerization, superficial optimization of microcapsule, and figuration control of deposits in friction surfacing.

TA462 978-0-8493-3374-3
**Corrosion science and technology.**
Title main entry. Ed. by U. Kamachi Mudali and Baldev Raj.
*Narosa Pub./Alpha Science*, ©2008 586 p. $129.95
The field of corrosion science has seen many innovations and advances in the last few years, and this volume for students, researchers and industrial plant personnel describes new materials, surface modifications, coatings and other types of protective technologies. Editors Mudali (corrosion science and technology, Indira Gandhi Centre for Atomic Research) and Raj (Director, Indira Gandhi Centre for Atomic Research) have collected specialist articles on corrosion research, grouping them under separate sections for processes, protection, materials and evaluation and monitoring. Many of these articles stress the new avenues of research and development that have opened up due to rapid progress in the field. Distributed by CRC Press.

TA480 2008-934668 978-0-87170-715-4
**Parametric analyses of high-temperature data for aluminum alloys.**
Kaufman, J. Gilbert.
*ASM International*, ©2008 165 p. $134.00
The problem addressed here is that aluminum alloys change their properties under a combination of high temperature and time, but they cannot realistically be tested for an expected lifetime extending to decades at high temperature. A consultant with over half a century experience in the aluminum and materials information industries, Kaufman explains how time-temperature parametric equations can permit the folding of data obtained over a variety of temperatures and exposure times into a single relationship. Once that relationship is determined with adequate consistency and reliability, he says, it is possible to extrapolate the available data to anticipate service lives that substantially exceed the range of test data. He sets out three popular parameters, and discusses their theory and application. Then he presents data sets for various wrought and cast aluminum alloys.

TA1165 2008-018404 978-1-58948-164-0
**Designing geodatabases for transportation.**
Butler, J. Allison.
*ESRI Press*, ©2008 461 p. $64.95 (pa)
Designed for GIS professionals and those who manage transportation, this guide to scalable geodatabase design provides detailed instructions on how apply existing data to spatial data themes, use data modeling to adapt to changing requirements, and to keep historical data to analyze and compare data sets. Butler is a licensed contractor, certified planner and GIS professional, and he offers step-by-step instructions on how to design a geospatial information system that will effectively manage and process information on a wide variety of complex transportation systems through the use of data modeling and geometric networks. Different models of the UNETRANS network are also explained.


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TA1660 2008-023096 978-1-60456-838-7
**Guided wave optics and photonics; micro-ring resonator design for telephone network security.**
Yupapin, Preecha & N.Pornsuwancharoen.
*Nova Science Publishers*, ©2008 197 p. $98.00
Yupapin and Pornsuwancharoen (photonics, King Mongkut's Institute of Technology Ladkraband, Thailand) detail an approach to security in wireless communication that they have developed. It involves a small device called a micro ring resonator planted within the mobile phone handset, and can be made smaller and smaller as the size of telephones decrease. They describe the linear performance of the resonator, its nonlinear aspects, and the emerging technologies.

## ENVIRONMENTAL TECHNOLOGY

TD193 2008-013349 978-0-8493-5007-8
**Methods in environmental forensics.**
Title main entry. Ed. by Stephen M. Mudge.
*CRC / Taylor & Francis*, ©2009 386 p. $129.95
The name of the discipline is much younger than its practice, which has been conducted for decades in such forms as investigating the source of contaminants in the environment and occasionally using the findings as evidence for reducing pollution or prosecuting offenders. Practitioners outline methods that have worked well, after an introductory chapter traces the course of a typical environmental case from inception to court testimony. Other topics include the chemical fingerprinting of petroleum hydrocarbons, biological communities as a forensic tool in marine environments, and multivariate and geostatistical methods.

## BUILDING CONSTRUCTION

TH6057 2007-046415 978-1-933742-27-4
**Best practices for datacom facility energy efficiency.**
Title main entry. (ASHRAI datacom series)
*ASHRAE Publications*, ©2008 230 p. $59.00 (pa)
Published by the American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE), this reference work provides detailed information on the design of datacom facilities with the goal of reducing life cycle costs to clients and maximizing energy efficiency—in accordance with ASHRAE's intent to provide sustainable building design and operation. Topics include environmental criteria, mechanical and equipment systems, airflow distribution, HVAC controls and energy management, liquid cooling, total ownership costs, and emerging technologies.

## MECHANICAL ENGINEERING & MACHINERY

TJ808 2007-050173 978-0-470-01749-4
**Renewable energy in power systems.**
Freris, Leon and David Infield.
*John Wiley & Sons*, ©2008 284 p. $90.00
Based on a masters course the authors have taught for 10 years at the Centre for Renewable Energy Systems Technology at Loughborough U., the UK, this volume teaches the basics of renewable energy technology and how it is integrated into electrical networks. Assuming a basic knowledge of math and physics, the text requires no previous knowledge of power systems engineering, and provides background chapters on energy and the essential features of conventional and renewable generation of electricity, with attention to the variable nature of renewable sources and solutions required to maintain power balance and frequency stability in the network. Chapters are included on the economics and trading of green electricity and on future trends in the technology. The volume is clearly written and organized, with worked examples and their solutions, equations, and frequent drawings and diagrams. An appendix describes basic electric power engineering concepts.

## ELECTRICAL ENGINEERING, ELECTRONICS, NUCLEAR ENGINEERING

TK153 2008-000269 978-1-4200-4776-9
**Practical MATLAB applications for engineers.**
Kalechman, Misza. (Handbook of practical MATLAB for engineers)
*CRC / Taylor & Francis*, ©2009 686 p. $69.95 (pa)
Kalechman (electrical and telecommunication engineering, City U. of New York) offers this guide for engineers who need to use MATLAB software to perform calculations to solve circuit, signal and system problems. The author shows the relationship between theories and real-world applications in each chapter while discussing topics such as continuous and discrete signals, sampling, communication signals, direct current analysis and frequency response. A chapter is devoted to Fourier and Laplace theorems, which form the foundation of the MATLAB problem-solving capabilities.

TK2896 2007-049255 978-1-60456-263-7
**Energy conversion; new research.**
Title main entry. Ed. by Wenzhong Lín.
*Nova Science Publishers*, ©2008 324 p. $129.00
Mechanical, chemical, energy, and other engineers explore a disparate collection of topics related to how energy mostly from sources besides fossil fuels can be converted for use in specific situations. Some report their research while others review the literature. The topics include electrochemical energy conversion technologies and their environmental impact, conceptual integration strategies for the hybrid systems of solid oxide fuel cell, characterizing laminar flames of natural gas and liquefied petroleum gas in air, and an experiment with methane hydration process with samples comparison.

TK5102 2008-035242 978-0-470-03009-7
**FPGA-based implementation of complex signal processing systems.**
Wood, Roger et al.
*John Wiley & Sons*, ©2008 364 p. $130.00
This book explains the methods and tools needed for the design, optimization, and implementation of digital signal processing (DSP) systems in field programmable gate array (FPGA) hardware. Written from a system level design perspective and with a DSP focus, the book reviews the leading-edge techniques in the field, looking at advanced DSP-based design flows for both signal flow graph-based and dataflow- based implementation, system in chip (SoC) aspects, and future trends and challenges for FPGAs. Applications of DSP implementation involving matrix operations, high-speed and adaptive filtering, and transforms are presented. The book is useful as a reference for engineers and researchers working on the design and development of DSP systems for radio, telecommunication, information, audio-visual, and security applications. Advanced students in electrical and computer engineering will also find the book useful. Woods is affiliated with Queen's University, Belfast.

TK5102 2008-025446 978-1-4200-5308-1
**Handbook of multisensor data fusion; theory and practice, 2d ed.**
Title main entry. Ed. by Martin E. Liggins et al. (Electrical engineering and applied signal processing series; no.22)
*CRC / Taylor & Francis*, ©2009 849 p. $159.95
This book captures the latest data fusion concepts and techniques drawn from disciplines including statistical estimation, signal and image processing, artificial intelligence, and biological, social, and information sciences. Material is presented in sections on fundamentals of multisensor data fusion, advanced tracking and association methods, automated reasoning and visualization for situation and threat refinement, and sample applications. This second edition represents the most current concepts and theory as data fusion expands into the realm of network-centric architectures and into applications such chemical and biological sensing, crisis management, combat identification, and intelligent buildings. There is new material on extensions into service-oriented networks and data mining, automated detection fusion, particle filtering, and random set theory. A new chapter covers commercial off-the-shelf (COTS) software tools. The editor is affiliated with the Office of Naval Research.

TK5103 2008-016294 978-1-60566-108-7
**Handbook of research on heterogeneous next generation networking; innovations and platforms.**
Title main entry. Ed. by Stavros Kotsopoulos and Konstantinos Ioannou.
*Information Science Reference*, ©2009 584 p. $265.00
This handbook gathers international research on issues that networks face as they enter the next generation, and highlights promising new technologies for networks. The first section focuses on the shared core network and multiple access networks, examining modeling, security, performance, and delivery methods. The next section more deeply examines the service layer, emphasizing service control and quality of service as key components necessary for the integration of data, video, and voice. The third section examines the terminal/antenna systems that will be necessary and describes their channel characteristics. The final section of the book considers the societal impact of next-generation networks, looking at topics such as the expansion of the e-marketplace to the m-marketplace, integrating mobility and auctions in a location-sensitive environment, innovation and e-government, and factors influencing the success of new services.

TK5103 978-0-470-22762-6
**Wireless broadband; conflict and convergence.**
Fotheringham, Vern and Chetan Sharma.
*Wiley-IEEE Press*, ©2008 253 p. $85.00
Fotheringham is recognized internationally as an industry leader and successful entrepreneur

in the wireless and broadband communications industry; Sharma is an international consultant and a leading strategist in the mobile industry. They examine the contesting factors that have influenced and will continue to influence the deployment and adoption of the broadband Internet Protocol wireless infrastructure, its devices and its services, which will mark the next major steps in the evolution of wireless worldwide. The authors consider the impact of new entrants and operators, versus new innovators and the current market leaders in each sector of the industry; examine how future technology road maps of the 3GPP and WiMAX standards promoters will conflict, compete, and eventually converge; and sort through the noise and hype—both positive and negative—currently clouding the perceptions of both industry insiders and the general public who will be impacted by the broadband revolution.

TK5103 2008-043630 978-0-8493-8582-7
**Wireless multimedia communications; convergence, DSP, QoS, and security.**
Rao, K.R. et al.
*CRC Press*, ©2009 296 p. $99.95
For engineers, graduate students, and other professionals, this volume brings together information on wireless multimedia communications and aspects of convergence, quality of service, security, and standardization activities. The authors describe the primary methods of design, analysis, and implementation of wireless communications systems, and the underlying theory, concepts, and principles. Chapters address convergence technologies for third generation (3G) networks, wireless video, IP multimedia services, wireless networking standards, cross-layer wireless multimedia design, mobile internet, and the future of 4G networks.

TK5104 2008-013166 978-0-470-72527-6
**Satellite communications systems engineering; atmospheric effects, satellite link design, and system performance.**
Ippolito, Louis J. Jr. (Wiley series on wireless communications and mobile computing)
*John Wiley & Sons*, ©2008 376 p. $130.00
For communications engineers, wireless network and system engineers, system designers, and graduate students in satellite communications and related fields, this work provides detailed coverage of satellite free-space links, describing and analyzing atmospheric effects on satellite systems and discussing design and evaluation. The emphasis is practical, and theoretical background is minimal. To keep the book relevant for the entire global wireless community, focus is on basic principles rather than regional technologies and hardware dependent developments. Ippolito (ITT Advanced Engineering & Sciences, and The George Washington U.) begins with an introduction to satellite communications and continues with material on satellite orbits, subsystems, the RF link, transmission impairments, propagation effects (modeling and prediction), rain fade mitigation, the composite link, satellite multiple access, the mobile satellite channel, and signal processing elements. Many tools and calculations are provided in handbook form, with step-by-step procedures and all necessary algorithms in one place to allow direct calculations without the need to consult other material. Chapter problems are included, making the book useful as a graduate text.

TK5105 2008-927955 978-1-84720-453-0
**Cooperative networks; control and optimization.**
Pardalos, Panos et al. (New dimensions in networks)
*Edward Elgar Publishing*, ©2008 358 p. $180.00
Among such networks might be robots operating within a manufacturing cell, unmanned aircraft in search and rescue or surveillance and attack missions, arrays of tiny satellites that form distributed large-aperture radar, employees behaving within an organization, and software agents. Scientists and engineers, most from US military and corporate laboratories, examine such aspects of them as centralized cooperative optimization for systems coupled through the constraints, towards an irreducible theory of complex systems, and market-based adaptive task allocations for autonomous agents. Some of the studies are from a February 2006 conference in Gainesville, Florida.

TK5105 2008-037395 978-1-60566-418-7
**Integrated approaches in information technology and web engineering; advancing organizational knowledge sharing.**
Title main entry. Ed. by Ghazi Alkhatib and David Rine
*Information Science Reference*, ©2009 369 p. $195.00
From the first two volumes of The International Journal of Technology and Web Engineering, 21 articles have been selected to create a volume broadly addressing issues that arise in web engineering. They are arranged in sections on platforms and architecture including wireless and mobile computing and networks, software

development and product lines, and open source development projects and environments. Among specific topics are applying social network analysis techniques to community-driven libre software projects, hierarchical scheduling in heterogeneous grid systems, and the agile development of secure web-based applications.

TK5105 2008-032888 978-1-4200-6459-9
**IP multimedia subsystem (IMS) handbook.**
Title main entry. Ed. by Syed A. Ahson and Mohammad Ilyas.
*CRC / Taylor & Francis*, ©2009 543 p. $139.95
The IP multimedia subsystem (IMS) is a standardized, next-generation, service-oriented networking architecture that provides Internet services to both fixed and mobile end users over a multi-access, all-IP platform. With 22 chapters in all, this handbook provides technical information about aspects of the IMS. The areas covered range from basic concepts to research-grade material. Concepts covered in the first section include peer-to-peer features in the IMS, and support of media functions within the IMS. Technology described in the second section includes the FOKUS Open IMS Core, policy-based QoS control for a convergence network, and internetworking of 3GPP and WLAN and Wimax networks. Services described in the last section of the book include IMS-based IPTV, instant messaging and presence service, and multiparty services. The audience for the book consists of designers and planners of IMS systems, researchers, and graduate students. Ahson is a software engineer. Ilyas is affiliated with the College of Engineering and Computer Science at Florida Atlantic University.

TK5105 2008-014461 978-1-60566-112-4
**Semantic web engineering in the knowledge society.**
Title main entry. Ed. by Jorge Cardoso and Miltiadis Lytras.
*IGI Publishing*, ©2009 410 p. $195.00
Semantic web engineering addresses the language barriers between human and computers and provides a bridge between conflicting information systems, and this collection of research articles delves into this emerging area of ontology. Cardoso (computer science, SAP Research, Germany) and Lytras (computer engineering and informatics, Athens U. of Economics and Business, Greece) have edited these papers for students and practitioners who need to move beyond the syntactic nature of the World Wide Web and develop data that is understood by transportable machines. Topics include Social Software and Web 2.0, search engine-based web information extraction, the RapidOWL engineering methodology and semantic annotation and ontology population.

TK5105 2008-040488 978-0-13-613516-6
**SOA design patterns.**
Erl, Thomas.
*Prentice Hall*, ©2009 814 p. $59.99
Erl is an author, editor and consultant on service-oriented architectures, and he has designed this comprehensive reference volume on SOA design patterns for organizations that need to build and deliver high-quality software applications. The author describes the correct steps in planning the design, implementation and governance of service inventories and portfolios, using specific applications for reliability, scalability, contract design and security areas. Several case studies are included that outline the history, technical infrastructure and business goals for a properly-designed SOA.

TK7870 2008-027978 978-0-470-27802-4
**Prognostics and health management of electronics.**
Pecht, Michael.
*John Wiley & Sons*, ©2008 315 p. $130.00
In an effort to forecast failures and reduce life cycle costs, professional engineer Pecht (electronics products and systems, U. of Maryland) provides a road map for research and development. He takes a diagnostic approach, advocating isolating faults and systems failures to provide advance warning, preventative and predictive maintenance, attention to key factors such as load history for future design qualifications and root cause analysis, and systematic review of system availabilities. He also provides methods of reduction of inspection which results in improved performance at reduced cost and describes sensor systems for data-driven approaches, the physics of failure approach, commercially available failure tracking systems. He includes superior coverage of statistical methods and cost analysis. The result is a very good professional reference that can double as a classroom text.

TK7871 2008-018722 978-1-4200-4376-1
**Defects in microelectronic materials and devices.**
Fleetwood, Daniel M. et al.
*CRC / Taylor & Francis*, ©2009 753 p. $149.95
Editors Fleetwood (electrical engineering and computer science, Vanderbilt U.), Pantelides


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(physics, Vanderbilt U.) and Schrimpf (electrical engineering, Vanderbilt U.) have assembled this textbook on defects and damage detection in MOSFET technologies for students and electrical engineers who work with microelectronic features and devices. This volume covers all of the defects that can affect yield and performance in devices based on silicon, linear bipolar, silicon-carbide and gallium arsenide technologies. Long-term reliability standards are also covered for negative bias temperature instabilities, defects in ultra-thin oxides and hydrogen impurities and vacancies.

TK7874 2008-014182 978-0-8493-7242-1
**Handbook of algorithms for physical automation.**
Title main entry. Ed. by Charles J. Alpert et al.
*CRC Press*, ©2009 1024 p. $149.95
The purpose of VLSI physical design is to embed an abstract circuit description, such as a netlist, into silicon, creating a detailed geometric layout on a die. This handbook provides a detailed overview of VLSI physical design automation, emphasizing techniques, trends, and improvements that have emerged during the past decade. After a brief introduction to the modern physical design problem, basic data structures and algorithmic techniques, and partitioning and clustering, material is presented in sections on floorplanning, placement, net layout and optimization, routing multiple signal nets, manufacturability and detailed routing, physical synthesis, design of large global nets, and physical design for specialized technologies. The book is suitable for researchers and students in physical design automation, for practitioners in industry, and for designers who use design automation software. Alpert is affiliated with IBM's Austin Research Laboratory.

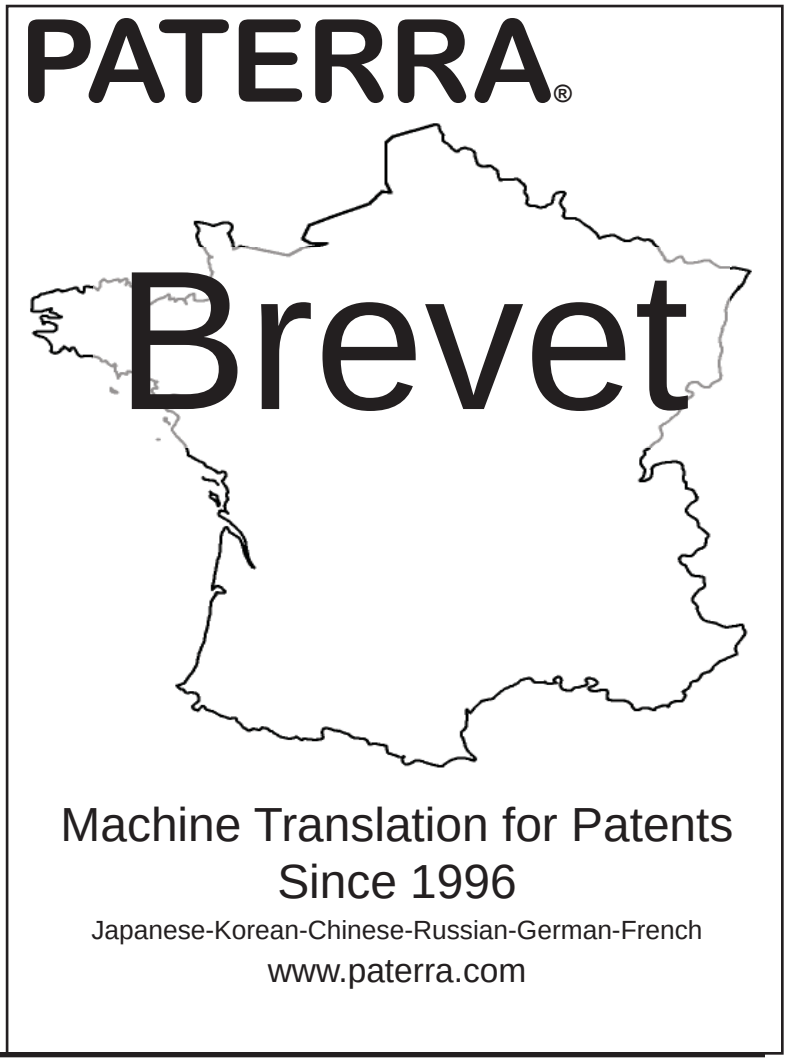
TK7882 2008-040444 978-1-60566-200-8
**Advanced pattern recognition technologies with applications to biometrics.**
Title main entry. Ed. by David Zhang et al.
*Medical Information Science Ref.*, ©2009 368 p. $225.00
Zhang (computer science, Hong Kong Polytechnic U.), Song (applied mathematics, New Star Research Institute of Applied Technology), Xu (pattern recognition and intelligence systems, Harbin Institute of Technology) and Liang (automation, Shanghai Jiao Tong U.) have written this textbook on the use of biometric technologies for security, identification and forensics, noting how these techniques are highly reliable and becoming more widely used. Written for advanced students and researchers in the fields of computer science and information technology, this volume covers both biometric data discrimination and multi- biometrics. Tensor-based biometric data discrimination technologies are also discussed in depth. Medical Information Science Reference is an imprint of IGI Global.

## CHEMICAL TECHNOLOGY

TP159 2007-041577 978-0-471-73167-2
**Advanced membrane technology and applications.**
Title main entry. Ed. by Norman N. Li et al.
*John Wiley & Sons*, ©2008 994 p. $150.00
This reference for practicing professionals covers fundamental principles and theories of membrane separation and purification, membrane processes and systems, and major industrial applications. Coverage encompasses all of the major types of membranes: ultrafiltration, microfiltration, nanofiltration, reverse osmosis, membranes for gas separations, and membranes for fuel cell uses. Applications discussed include water and wastewater, biotechnology and chemical/ biomedical application, gas separations, membrane contractors and reactors, environmental and energy applications, and membrane materials and characterization. The readership for the book includes graduate students and professionals in industrial manufacturing, separations research and development, membrane manufacture and applications, water treatment, and the pharmaceutical, food, and fuel cell processing industries. Li is a member of the National Academy of Engineering. Co-editor Anthony Fane is director of the Singapore Membrane Technology Center at Nanyang Technological University. Co-editor Winston Ho won the 2007 Clarence G. Gerhold Award from the American Institute of Chemical Engineers. Co-editor Takeshi Matsuura is professor of chemical engineering at the University of Ottawa, Canada.

TP245 2008-007354 978-0-471-77985-8
**Introduction to hydrogen technology.**
Press, Roman J. et al.
*John Wiley & Sons*, ©2009 307 p. $90.00
The timely arrival of this text will be appreciated by scientists, researchers, and students in engineering, science, environmental science, and applied science and technology, as well as concerned general readers, as nations throughout the world search for sustainable alternative energy sources worthy of consideration and further development. Press, Santhanam, Miri, Bailey, Takacs (all Rochester Institute of Technology

Renewable Energy Enterprise, New York) provide readers with a solid overview of the fundamental aspects of hydrogen technology. Coverage includes the need for renewable sources of energy and the greenhouse effect, the basic chemistry knowledge needed to understand hydrogen technology, hydrogen sources and storage, the principles of different fuel cell operations, and hydrogen infrastructure and applications.

TP248 2008-012855 978-0-8493-7528-6
**Bionanotechnology; global prospects.**
Title main entry. Ed. by David E. Reisner.
*CRC / Taylor & Francis*, ©2009 349 p. $89.95
Preferring "bionanotechnology" over the term "nanobiotechnology" because of its connotations of a rapidly evolving sector of the nanotechnology field dealing with biological processes and structures, Reisner (chief executive officer of the nanotech companies Inframat and US Nanocorp) presents 27 papers chosen to provide the reader with "representative reporting on a wide variety of activities from all corners of the planet" that is relevant to readers interested in looming product opportunities or interested in developing products for the future. Topics include nanotechnology in stem cell biology and technology, lipid membranes in biomimetic systems, mesenchymal stem cells and controlled nanotopography, biological applications of optical tags based on surface- enhanced Raman scattering, nanostructured titanium alloys for implant applications, opportunities for bionanotechnology in food and the food industry, engineering nanostructured thermal spray coatings for biomedical applications, proteoliposome as a nanoparticle for vaccine adjuvants, nanocrystalline silicon for biomedical intelligent sensor systems, nanophotonics for biomedical superresolved imaging, DNA as a scaffold for nanostructure assembly, directed evolution of proteins for device applications, semiconductor quantum dots for molecular and cellular imaging, and patenting inventions in bionanotechnology.

UG1242 2008-032459 978-0-89871-664-1
**UAV cooperative decision and control; challenges and practical approaches.**
Title main entry. Ed. by Tal Shima and Steven Rasmussen. (Advances in design and control; no.18)
*SIAM*, ©2009 164 p. $85.00
Future unmanned aerial vehicle (UAV) systems will have the capability of working cooperatively in groups. This book provides a reference on US Air Force-relevant UAV cooperative decision and control problems and the solution algorithms that have recently been developed to solve them. Problems are presented in a manner that abstracts the challenges, making it possible to leverage the solution methods over a broader range of applications. To investigate the performance of the proposed algorithms and explore new cooperative decision and control strategies, a multiple UAV simulation test bed, MultiUAV2, accompanies the text. The research that forms the foundation for this book was accomplished at the Air Force Research Laboratory's Control Science Center of Excellence. The book is aimed at practitioners, academics, and students. Shima is a lecturer with the Department of Aerospace Engineering at the Technion-Israel Institute of Technology. Rasmussen is a consultant to the Control Science Center of Excellence.