

T. Aranda, Chicago, IL, USA

## Annotated Catalogue of 3,000 Deep-Sky Objects

This title is a comprehensive set of visual descriptions of deep-sky objects visible from the northern hemisphere/ It is a record of the most extensive and systematic visual survey of the sky ever done in modern times. 3,000 deep-sky objects are listed with short descriptions of the visual appearance in the author's powerful binocular telescope. Objects in the book are organized by position for easy identification of unknown targets. Full indexes by catalog numbers and names allow searches for specific objects.

### Features

► Enables quick and easy location and identification of 3,000 deep-sky objects ► Descriptions make for easier practical object recognition than photographs because they are not as affected by aperture, or at all by imaging mode or post-processing ► Written as the result of a four-year observing project, this is the best source for realistic, accurate, no-nonsense descriptions of deep-sky objects

### Contents

Preface.- Part I: Introduction.- The Observing Project: An Overview.- Objects Chosen and Mode of Observing.- Verbal Descriptions vs. Illustrations.- Instrumentation.- The GC/NGC Descriptions and the Herschels.- Observational Parameters in the Descriptions of This Catalogue.- The Visual Appearance of Deep-Sky Objects.- Binocular Vision.- How to Use this Catalogue.- Part II: The Catalogue.- 0-6 hours: Fall.- 6-12 hours: Winter.- 12-18 hours: Spring.- 18-24 hours: Summer.- Appendix A: Making a Sky Atlas.- Appendix B: Notes on Object Descriptions.- Appendix C: The Visibility of Galactic Detail.- Appendix D: Building a Binocular Telescope.- Acknowledgements.- Index.

### Fields of interest

Astronomy, Observations and Techniques; Popular Science in Astronomy

### Target groups

Popular/general

### Discount group

P

*Due June 2011*

2011. X, 383 p. 27 illus. in color. (Patrick Moore's Practical Astronomy Series) Softcover

► **approx. \$39.95**  
ISBN 978-1-4419-9418-9

P. Barthol, Max Planck Institute for Solar System Research, Katlenburg-Lindau, Germany (Ed.)

## The Sunrise Balloon-Borne Stratospheric Solar Observatory

The central aim of the Sunrise project is to understand the structure and dynamics of the magnetic field in the solar atmosphere. The magnetic field is the source of solar activity, controls the space environment of the Earth and causes the variability of solar irradiance, which may be a significant driver of long-term changes of the terrestrial climate. Interacting with the convective plasma flow, the magnetic field in the solar photosphere develops intense field concentrations on scales below 100 km, which are crucial for the dynamics and energetics of the whole solar atmosphere. These spatial scales cannot be studied systematically from the ground because of image distortions due to atmospheric turbulence. The balloon-borne Sunrise telescope has, for the first time, provided measurements of the magnetic structure of the solar atmosphere on its intrinsic spatial and temporal scales. The book gives an overview about the instrumentation and the successful flight in 2009.

### Contents

The Sunrise Mission.- The Filter Imager SuFI and the Image Stabilization and Light Distribution System ISLiD of the Sunrise Balloon-Borne Observatory: Instrument Description.- The Imaging Magnetograph eXperiment (IMaX) for the Sunrise Balloon-Borne Solar Observatory.- The Wave-Front Correction System for the Sunrise Balloon-Borne Solar Observatory.

### Fields of interest

Extraterrestrial Physics, Space Sciences; Meteorology/Climatology; Aerospace Technology and Astronautics

### Target groups

Research

### Discount group

P

*Due May 2011*

Previously published in Solar Physics, Volume 268, Number 1, 2011

2011. 128 p. 65 illus., 44 in color. Hardcover

► **approx. \$129.00**  
ISBN 978-1-4419-9773-9

P. Blanchard, Universität Heidelberg, Germany;  
D. Volchenkov, University of Bielefeld, Germany

## Random Walks and Diffusions on Graphs and Databases

### An Introduction

Most networks and databases that humans have to deal with contain large, albeit finite number of units. Their structure, for maintaining functional consistency of the components, is essentially not random and calls for a precise quantitative description of relations between nodes (or data units) and all network components. This book is an introduction, for both graduate students and newcomers to the field, to the theory of graphs and random walks on such graphs. The methods based on random walks and diffusions for exploring the structure of finite connected graphs and databases are reviewed (Markov chain analysis). This provides the necessary basis for consistently discussing a number of applications such as electric resistance networks, estimation of land prices, urban planning, linguistic databases, music, and gene expression regulatory networks.

### Features

► Written by the experts who have contributed to the original development of the field ► Offers a lecture-based pedagogical approach for a broad audience ► Includes detailed benchmarking of theory with diverse real-world applications

### From the contents

Introduction to Permutations, Markov Chains, and Partitions.- Worth Another Binary Relation: Graphs.- Permutations Sieved Through Adjacency: Graph Automorphisms.- Exploring Undirected Graphs by Random Walks.- Embedding of Graphs in Probabilistic Euclidean Space.- Random Walks and Electric Resistance Networks.- Random Walks and Diffusions on Directed Graphs and Interacting Networks.- Structural Analysis of Networks and Databases.- When Feedbacks Matter: Epidemics, Synchronization, and Self-Regulation in Complex Networks.

### Fields of interest

Complex Networks; Manifolds and Cell Complexes (incl. Diff. Topology); Data Structures, Cryptology and Information Theory

### Target groups

Graduate

### Discount group

P

*Due June 2011*

2011. 340 p. 5 illus. in color. (Springer Series in Synergetics, Volume 10) Hardcover

► **approx. \$129.00**  
ISBN 978-3-642-19591-4

M. Chaichian, University of Helsinki, Finland;  
H. C. Perez Rojas, Institute of Cybernetics, Mathematics & Physics, La Habana, Cuba; A. Tureanu, University of Helsinki, Finland

## From the Cosmos to Quarks

### Basic Concepts in Physics

This book, using a novel combination of historical and conceptual approaches, gives an accessible and eminently readable introduction to the main ideas of modern physics. The first five chapters are devoted to classical physics, from planetary motion to special relativity, always keeping in mind its relevance to questions of contemporary interest. The next six chapters deal mainly with newer developments in physics, from quantum theory and general relativity to grand unified theories, and the book concludes by discussing the role of physics in living systems. A minimal mathematical background is required of the reader, but technicalities are avoided as far as possible; thus complex calculations are omitted so long as the essential ideas remain clear.

### Features

► A clear, concise and beautifully written presentation of modern physics ► Readers will not only learn physics, they will learn to enjoy it Self-contained and comprehensive ► History, concepts and formal treatment go hand-in-hand ► Suppresses mathematical technicalities in favor of a wide scope of topics ► Suited for class use, particularly revision, but also ideal for "lone explorers" and other newcomers to physics

### Contents

Gravitation and Newton Laws.- Entropy, Statistical Physics and Information.- Electromagnetism and Maxwell Equations.- Electromagnetic Waves.- The Special Theory of Relativity.- The Atom and Quantum Theory.- Quantum Electrodynamics.- Fermi-Dirac and Bose-Einstein Statistics.- The Four Fundamental Forces.- General Relativity and Cosmology.- Unification of the Forces of Nature.- Physics and Life.- Index.

### Fields of interest

Theoretical, Mathematical and Computational Physics; Cosmology; Classical Continuum Physics

### Target groups

Upper undergraduate

### Discount group

P

*Due May 2011*

2011. 290 p. 163 illus. (Undergraduate Lecture Notes in Physics) Hardcover

► **approx. \$59.95**  
ISBN 978-3-642-19597-6

G. P. Chernov, IZMIRAN, Troitsk, Moscow Region, Russia

## Fine Structure of Solar Radio Bursts

The study of the fine structure of solar radio emissions is key to understanding plasma processes in the solar corona. It remains a reliable means for both diagnosing the corona and verifying the results of laboratory plasma experiments on wave-wave and wave-particle interactions. This monograph provides a comprehensive review of the fine structure of solar radio bursts. Based on the diversity of experimental data resulting from the progress made in observational techniques, the validity of various theoretical models is reexamined. The book serves as an up-to-date reference work for all researchers in this field.

### Features

► Provides up-to-date review of the field of Fine Structure of Solar Radio Bursts ► Discusses latest theoretical models in view of a large diversity of experimental data ► Author has forty years of research experience in the field

### Contents

Preface.- Acknowledgments.- 1 Introduction.- 2 Pulsations.- 3 Spike bursts.- 4 Zebra pattern and fiber bursts.- 5 Recent results of zebra patterns in solar radio bursts.- References.- Subject Index.

### Fields of interest

Extraterrestrial Physics, Space Sciences; Astronomy, Observations and Techniques; Astrophysics and Astroparticles

### Target groups

Research

### Discount group

P

*Due August 2011*

2011. 320 p. 90 illus., 10 in color. (Astrophysics and Space Science Library, Volume 375) Hardcover

► **approx. \$169.00**  
ISBN 978-3-642-20014-4

## Encyclopedia of Sustainability Science and Technology

Editor-in-chief: R. A. Meyers, RAMTECH Ltd., Larkspur, CA, USA

Sustainability in environmental usage refers to the potential longevity of vital human ecological support systems, such as the planet's climate system, systems of agriculture, industry, forestry, fisheries and the ocean, and fresh water, together with the impact of human communities, transportation systems, and the built environment in general on these natural services. Although definitions of "sustainable development" are often stated without reference to the number of people to be supported and at what standard of living, it is clear that we face something like a 50% increase in food demand as early as 2030, while global energy and materials use is expected to grow by 300% over this period. At the same time, the proportion of the population that lives in an urban environment will rise from about 47% to 60%.

### Fields of interest

Physics, general; Engineering, general; Chemistry/Food Science, general

### Target groups

Professional/practitioner

### Discount group

P

**SPRINGER  
REFERENCE**

*Due January 2012*

### Hardcover

2012. 10500 p. 2500 illus. in color. (In 12 volumes, not available separately)

► **\$8100.00**  
ISBN 978-0-387-89469-0

### eReference

2012.

► **\$8100.00**  
ISBN 978-1-4419-0851-3

### Print + eReference

2012. 10500 p. 2500 illus. in color. (In 12 volumes, not available separately)

► **\$10150.00**  
ISBN 978-1-4419-0852-0

G. Gouesbet, G. Gréhan, Université de Rouen,  
St.-Etienne du Rouvray CX, France

## Generalized Lorenz-Mie Theories

The Lorenz-Mie theory, describing the interaction between a homogeneous sphere and an electromagnetic plane wave, is likely to be one of the most famous theories in light scattering. But, with the advent of lasers and their increasing development in various fields, it has become too old-fashioned to meet most of the modern requisites. The book deals with generalized Lorenz-Mie theories when the illuminating beam is an electromagnetic arbitrary shaped beam, relying on the method of separation of variables. A particular emphasis is stressed on the case of the homogeneous sphere but other regular particles are considered too. An extensive discussion of the methods available to the evaluation of beam shape coefficients describing the illuminating beam is provided, and several methods are discussed.

### Features

► Extends the simple theory to the modern generalized Lorenz-Mie theory ► With many applications ► Essential reading scientists in experimental fluid dynamic scientists

### Contents

Background in Maxwell's Electromagnetism and Maxwell's Equations.- Resolution of Special Maxwell's Equations.- Generalized Lorenz-Mie Theories in the Strict Sense, and other GLMTs.- Gaussian Beams, and Other Beams.- Finite Series.- Special Cases of Axisymmetric and Gaussian Beams.- The Localized Approximation and Localized Beam Models.- Applications, and Miscellaneous Issues.- Conclusion.

### Fields of interest

Optics and Electrodynamics; Engineering Fluid Dynamics

### Target groups

Research

### Discount group

P

K. R. Hazzard, JILA University of Colorado, USA

## Quantum Phase Transitions in Cold Atoms and Low Temperature Solids

The primary focus of this thesis is to theoretically describe nanokelvin experiments in cold atomic gases, which offer the potential to revolutionize our understanding of strongly correlated many-body systems. The thesis attacks major challenges of the field: it proposes and analyzes experimental protocols to create new and interesting states of matter and introduces theoretical techniques to describe probes of these states. The phenomena considered include the fractional quantum Hall effect, spectroscopy of strongly correlated states, and quantum criticality, among others. The thesis also clarifies experiments on disordered quantum solids, which display a variety of exotic phenomena and are candidates to exhibit so-called "supersolidity." It collects experimental results and constrains their interpretation through theoretical considerations.

### Features

► Describes how to create and probe novel phases of matter and non-quasiparticle behavior in cold atomic gases ► Investigates the future of condensed matter systems by delving into outlooks for future studies ► Provides insight and theoretical solutions to current problems in low and ultralow temperature physics

### Fields of interest

Atomic, Molecular, Optical and Plasma Physics; Low Temperature Physics

### Target groups

Research

### Discount group

P

C. A. Knapek, Max Planck Institute for Extraterrestrial Physics, Garching, Germany

## Phase Transitions in Two-Dimensional Complex Plasmas

The two experimental studies reported in this thesis contribute important new knowledge about phase transitions in two-dimensional complex plasmas: in one case a determination of the coupling parameter (ratio of mean potential to mean kinetic energy of the particles in an ensemble), and in the other a detailed characterization of the non-equilibrium recrystallization of a two-dimensional system. The latter results are used to establish the connection between structural order parameters and the kinetic energy, which in turn gives novel insights into the underlying physical processes determining the two-dimensional phase transition.

### Features

► Reports two experiments, each of whose analysis makes an important contribution to understanding 2D complex plasmas ► Examiners unanimous in awarding highest mark of "summa cum laude" to this work ► Nominated as an outstanding contribution by Max-Planck-Institute for Extraterrestrial Physics, Garching

### Contents

Introduction.- Complex Plasmas.- Experiments.- Data Analysis Techniques.- Estimation of the Coupling Strength.- Theory of Phase Transitions in 2D Systems.- Recrystallization of a 2D Plasma Crystal.- Summary and Outlook.

### Fields of interest

Phase Transitions and Multiphase Systems; Plasma Physics; Surface and Interface Science, Thin Films

### Target groups

Research

### Discount group

P

### Available

2011. XXXVIII, 310 p. 25 illus., 19 in color. Hardcover

► \$179.00

ISBN 978-3-642-17193-2

### Due April 2011

2011. XXIV, 329 p. 32 illus., 8 in color. (Springer Theses) Hardcover

► \$179.00

ISBN 978-1-4419-8178-3

### Due June 2011

2011. 194 p. 71 illus., 46 in color. (Springer Theses) Hardcover

► approx. \$129.00

ISBN 978-3-642-19670-6

S. Li, University of California, Berkeley, CA, USA;  
B. Sun, Cape Peninsula University of Technology,  
Cape Town, South Africa (Eds.)

## Advances in Soft Matter Mechanics

"Advances in Soft Matter Mechanics" is a compilation and selection of recent works in soft matter mechanics by a group of active researchers in the field. The main objectives of this book are first to disseminate the latest developments in soft matter mechanics in the field of applied and computational mechanics, and second to introduce soft matter mechanics as a sub-discipline of soft matter physics. As an important branch of soft matter physics, soft matter mechanics has developed rapidly in recent years. A number of the novel approaches discussed in this book are unique, such as the coarse grained finite element method for modeling colloidal adhesion, entropic elasticity, meshfree simulations of liquid crystal elastomers, simulations of DNA, etc.

### Features

- Covers the latest developments in soft matter mechanics and physics from the perspective of applied and computational mechanics
- Adopts an interdisciplinary synergy, a multiscale paradigm, and computational approach
- Includes a selection of recent works in soft matter mechanics by a group of active researchers in the field
- Discusses the application of soft matter mechanics on engineering problems

### Contents

Molecular Modeling and Simulations of Proteins.- Modeling and Simulations of DNAs.- Computational Colloidal Continuum Mechanics.- Monte-Carlo Approach to Entropic Elasticity.- Soft Matter Biomaterials.- Soft Matter Modeling of Cells.- Long-rang Order Soft Biological Materials.- Monte Carlo Simulations of Polymers.- Mechanics of semiflexible networks.- Soft matter and fractional mathematics.

### Fields of interest

Soft and Granular Matter, Complex Fluids and Microfluidics; Biomaterials; Continuum Mechanics and Mechanics of Materials

### Target groups

Research

### Discount group

P

*Due August 2011*

Distribution rights in China: Higher Education Press.

2011. Approx. 475 p. 100 illus., 40 in color. Hardcover

► **approx. \$169.00**

ISBN 978-3-642-19372-9

I. Lindgren, University of Gothenburg, Sweden

## Relativistic Many-Body Theory

### A New Field-Theoretical Approach

This book gives a comprehensive account of relativistic many-body perturbation theory, based upon field theory. After some introductory chapters about time-independent and time dependent many-body perturbation theory (MBPT), the standard techniques of S-matrix and Green's functions are reviewed. Next, the newly introduced covariant-evolution-operator method is described, which can be used, like the S-matrix method, for calculations in quantum electrodynamics (QED). Unlike the S-matrix method, this has a structure that is similar to that of MBPT and therefore can serve as basis for a unified theory. Such an approach is developed in the final chapters, and its equivalence to the Bethe-Salpeter equation is demonstrated. Possible applications are discussed and numerical illustrations given.

### Features

- Describes for the first time relativistic many-body perturbation theory, rigorously based upon field theory
- Provides a unified account of quantum electrodynamics and many-body perturbation theory
- Synthesizes the techniques of many-body perturbation theory and quantum field theory

### From the contents

Introduction.- Time-independent formalism.- Time-dependent formalism.- S-matrix.- Green's functions.- Covariant evolution operator and Green's operator.- Numerical illustrations to Part II.- Covariant evolution combined with electron correlation.- The Bethe-Salpeter equation.- Implementation of the MBPT-QED procedure with numerical results.- Analytical treatment of the Bethe-Salpeter equation.- Regularization and renormalization.- Summary and Conclusions.- Notations and definitions.- Second quantization.- Representations of states and operators.- Dirac equation and the momentum representation.

### Fields of interest

Quantum Physics; Quantum Optics

### Target groups

Research

### Discount group

P

*Due May 2011*

2011. X, 377 p. 84 illus., 2 in color. (Springer Series on Atomic, Optical, and Plasma Physics, Volume 63) Hardcover

► **\$169.00**

ISBN 978-1-4419-8308-4

J. Rozelot, Observatoire de la Côte d'Azur, Grasse, France; C. Neiner, Observatoire de Meudon, Meudon, France (Eds.)

## Pulsation of the Sun and Stars

This volume of lecture notes brings together the knowledge on pulsations of the Sun and the stars, with a particular emphasis on recent observations and modelling, and on the influence of pulsations of other physical processes. The book begins with an extensive introduction to helioseismology. The solar cycle and gravity modes are discussed before the focus is widened from helioseismology to asteroseismology which is detailed in a series of specific chapters. Based on courses given at a graduate school, these tutorial lecture notes will be of interest and useful to a rather broad audience of scientists and students.

### Features

- Presents an excellent introduction to the field of helioseismology and asteroseismology
- Carefully edited school-tested lecture notes

With contributions by international experts

### Contents

Preface.- General Overview.- Advances in Global and Local Helioseismology: an Introductory Review.- Section 1: The Sun as a Star.- The Quiet Solar Photosphere: Dynamics and Magnetism.- Modeling and Prediction of Solar Cycles Using Data Assimilation Methods.- Amplitudes of Solar Gravity Modes.- Unveiling Stellar Cores and Multipole Moments via Their Flattening.- From Helioseismology to Asteroseismology: Some Recent Developments.- Section 2: Stellar Pulsations.- Issues Relating to Observables of Rapidly Rotating Stars.- Seismic Diagnostics for Rotating Massive Main Sequence Stars.- Asymptotic Theory of Stellar Oscillations Based on Ray Dynamics.- Angular Momentum Transport by Regular Gravitational Inertial Waves in Stellar Radiation Zones.- Stochastic Excitation of Acoustic Modes in Stars.

### Fields of interest

Astronomy, Astrophysics and Cosmology; Astronomy, Observations and Techniques

### Target groups

Research

### Discount group

P

*Due June 2011*

2011. 350 p. 110 illus., 10 in color. (Lecture Notes in Physics, Volume 832) Softcover

► **approx. \$99.00**

ISBN 978-3-642-19927-1

L. Schachter, Technion - Israel Institute of Technology, Haifa, Israel

## Beam-Wave Interaction in Periodic and Quasi-Periodic Structures

The main theme of this book is the interaction of electrons with electromagnetic waves in the presence of periodic and quasi-periodic structures in vacuum, in view of applications in the design and operation of particle accelerators. The first part of the book is concerned with the textbook-like presentation of the basic material, in particular reviewing elementary electromagnetic phenomena and electron dynamics. The second part of the book describes the current models for beam-wave interactions with periodic and quasi-periodic structures. This is the basis for introducing, in the last part of the book, a number of particle and radiation sources that rest on these principles, in particular the free-electron laser, wake-field acceleration schemes and a number of other advanced particle accelerator concepts.

### Features

► Provides the reader with a self-contained and detailed introduction to the field ► Contains many end-of-chapter exercises ► Refers the reader to the relevant literature whenever new concepts are already supported by experiment.

### Contents

Introduction.- Elementary Electromagnetic Phenomena.- Elementary Electron Dynamics.- Models of Beam-Wave Interaction in Slow-Wave Structure.- Periodic Structures.- Quasi-Periodic Structures.- Free-Electron Laser.- Basic Acceleration Concepts.- References.- Subject Index.

### Fields of interest

Particle Acceleration and Detection, Beam Physics; Optics and Electrodynamics; Microwaves, RF and Optical Engineering

### Target groups

Research

### Discount group

P

Due July 2011

2nd ed. 2011. 400 p. (Particle Acceleration and Detection) Hardcover

► approx. \$199.00  
ISBN 978-3-642-19847-2

K. Schmid, Max-Planck-Institute of Quantum Optics, Garching, Germany

## Laser Wakefield Electron Acceleration

### A Novel Approach Employing Supersonic Microjets and Few-Cycle Laser Pulses

This thesis covers the few-cycle laser-driven acceleration of electrons in a laser-generated plasma. This so-called laser wakefield acceleration (LWFA) relies on strongly driven plasma waves for the generation of accelerating gradients in the range of several 100 GV/m, a value four orders of magnitude larger than that attainable by conventional accelerators. This thesis demonstrates that laser pulses with an ultrashort duration of 8 fs and a peak power of 6 TW allow the production of electron energies up to 50 MeV via LWFA. The special properties of laser accelerated electron pulses, namely the ultrashort pulse duration, the high brilliance, and the high charge density, open up new possibilities in many applications of these electron beams.

### Features

► Nominated as an outstanding contribution by the Max Planck Institute for Quantum Optics ► Reports on research that can revolutionize the design and applications of particle accelerators ► Results of this work will be invaluable in future research on electron beam acceleration

### Contents

Supersonic Micro-Jets.- Theory of Compressible Fluid Flow.- Numeric Flow Simulation.- Experimental Characterization of Gas Jets.- Few Cycle Laser-Driven Electron Acceleration.- Electron Acceleration by Few-Cycle Laser Pulses: Theory and Simulation.- Experimental Setup.- Experimental Results on Electron Acceleration.- Next Steps for Optimizing the Accelerator.- A. Numeric Setup of the Fluid Flow Simulations.- B. Nozzle Designs.

### Fields of interest

Plasma Physics; Particle Acceleration and Detection, Beam Physics; Optics, Optoelectronics, Plasmonics and Optical Devices

### Target groups

Research

### Discount group

P

Due June 2011

2011. 185 p. 69 illus., 24 in color. (Springer Theses) Hardcover

► approx. \$129.00  
ISBN 978-3-642-19949-3

P. Seitz, CSEM SA, Landquart, Switzerland;  
A. J. Theuvsen, Delft University of Technology, Delft, The Netherlands (Eds.)

## Single Photon Imaging

The acquisition and interpretation of images is a central capability in almost all scientific and technological domains. In particular, the acquisition of electromagnetic radiation, in the form of visible light, UV, infrared, X-ray, etc. is of enormous practical importance. The ultimate sensitivity in electronic imaging is the detection of individual photons. With this book, the first comprehensive review of all aspects of single-photon electronic imaging has been created. Topics include theoretical basics, semiconductor fabrication, single-photon detection principles, imager design and applications of different spectral domains. Today, the solid-state fabrication capabilities for several types of image sensors has advanced to a point, where uncooled single-photon electronic imaging will soon become a consumer product.

### Features

► Uniquely covering all aspects of single-photon electronic imaging ► Theoretical basics, semiconductor fabrication, imager design, applications included ► Features beginning single-photon imaging revolution ► Acquisition and interpretation of electromagnetic radiation (visible light, UV, infrared, X-ray) images in technological domains presented

### From the contents

Fundamentals of noise in optoelectronics.- Semiconductor technology for single-photon image sensing.- Hybrid Avalanche Photodiode Array (APD) Imaging.- Electron Bombarded Semiconductor Image Sensors.- Silicon Photomultipliers, SiPM.- Electron-Multiplying CCDs, EMCCD.- Monolithic Single-Photon Avalanche Photodiodes, SPAD.- Single-photon CMOS imaging through bandwidth optimization.- Architectures for low-noise CMOS electronic imaging.- Low-noise electronic imaging with double-gate FETs and charge-modulation devices.

### Fields of interest

Optics, Optoelectronics, Plasmonics and Optical Devices; Microwaves, RF and Optical Engineering; Atomic, Molecular, Optical and Plasma Physics

### Target groups

Graduate

### Discount group

P

Due May 2011

2011. 310 p. 220 illus. (Springer Series in Optical Sciences, Volume 160) Hardcover

► \$169.00  
ISBN 978-3-642-18442-0

**D. B. Sirdeshmukh**, Kakatiya University, Warangal, India; **L. Sirdeshmukh**, Kakatiya University, Hyderabad, Andhra Pradesh, India; **K. Subhadra**, Kakatiya University, Secunderabad, Andhra Pradesh, India

## Atomistic Properties of Solids

The book deals with atomistic properties of solids which are determined by the crystal structure, interatomic forces and atomic displacements influenced by the effects of temperature, stress and electric fields. The book gives equal importance to experimental details and theory. There are full chapters dedicated to the tensor nature of physical properties, mechanical properties, lattice vibrations, crystal structure determination and ferroelectricity. The other crystalline states like nano-, poly-, liquid- and quasi crystals are discussed. Several new topics like nonlinear optics and the Rietveld method are presented in the book. The book lays emphasis on the role of symmetry in crystal properties. Comprehensiveness is the strength of the book; this allows users at different levels a choice of chapters according to their requirements.

### Features

- Describes the properties of solids in a comprehensive way
- Provides information on crystallographic specificity of various kinds of material
- Covers both the experimental and the theoretical approach
- The large number of tables and figures helps in understanding

### Contents

Introduction.- Crystal growth.- Crystallography.- Diffraction of radiation by crystals.- Crystal structure determination.- Cohesion.- Tensor nature of crystal properties.- Mechanical properties.- Thermal properties.- Lattice vibrations.- Dielectric properties.- Pyro-, Piezo- and ferroelectricity.- Optical properties of insulators.- Defects in crystals: I Point defects.- Defects in crystals: II Dislocations.- The other crystalline states (quasi crystals, nano crystals, polycrystals, thin films, liquid crystals).

### Fields of interest

Solid State Physics; Characterization and Evaluation of Materials; Physical Chemistry

### Target groups

Research

### Discount group

P

*Due June 2011*

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2011. 600 p. 400 illus. (Springer Series in Materials Science, Volume 147) Hardcover

► **\$199.00**

ISBN 978-3-642-19970-7

Deep-sky objects are celestial objects that exist outside our solar system. Three major types of deep-sky objects are nebulae, star clusters, and galaxies. The word nebula is Latin and means "cloud." A nebula (plural = nebulae), therefore, is a cloud of gas and dust in space. The first catalog of dark nebulae was prepared by American astronomer Edward Emerson Barnard (1857-1923). Use the following list to locate and observe the best of Barnard's objects. Great objects from Barnard's catalog. Catalog name. Common name. R.A. 3,000 Deep-Sky Objects book. Read reviews from world's largest community for readers. This title is a comprehensive set of visual descriptions of deep-sk... Goodreads helps you keep track of books you want to read. Start by marking "3,000 Deep-Sky Objects: An Annotated Catalogue" as Want to Read: Want to Read saving... Want to Read. Information is actual for version 0.14.1. Extended objects are those which are external to the solar system, and are not point-sources like stars. Extended objects include galaxies, planetary nebulae and star clusters. These objects may or may not have images associated with them. Stellarium also comes with a catalogue with over 14,000 extended objects containing the combined data from many catalogues, with 190 images.