NEW SERIES

SpringerBriefs in Complexity


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Typical texts for publication might include:
- A snapshot review of the current state of a hot or emerging field
- A concise introduction to core concepts that students must understand in order to make independent contributions
- An extended research report giving more details and discussion than is possible in a conventional journal article
- A manual describing underlying principles and best practices for an experimental or computational technique
- An essay exploring new ideas broader topics such as science and society

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Due September 2011

- € (D) 106,95 | € (A) 109,95 | sFr 133,50
- € 99,95 | £99.95
ISBN 978-3-642-23305-0

Due October 2011

2011. IX, 76 p. 4 illus. (SpringerBriefs in Complexity) Softcover
- € (D) 53,45 | € (A) 54,95 | sFr 66,50
- € 49,95 | £44.99
ISBN 978-3-642-23922-7
A. G. Bordeleau, Pointe-Claire University, QC, Canada

Flags of the Night Sky
Why Some National Symbols Carry Heavenly Signs

Many national flags display astronomical features – Sun, Moon, stars – but are they really based on existing astronomical objects? The United States flag sports 50 stars, one for each state, however none of them are linked to real stars. Further, the lunar crescent is often shaped like the Sun being eclipsed by the Moon. At times, stars are seen right next to the crescent, where the darkened disc of the moon should be! This book will present true astronomical objects and patterns highlighted on national flags and link informative capsules about these objects to the political reasons why they were chosen to adorn such an important symbol.

Contents

Fields of interest
Astronomy, Astrophysics and Cosmology; Popular Science in Astronomy; Human Geography

Target groups
Popular/general

Product Category
Popular science

Due February 2012
2012. 220 p. 50 illus., 30 in color. Softcover
≈ € (D) 28,84 | € (A) 29,65 | sFr 37,50
≈ £26.95 | £23.99
ISBN 978-1-4614-0928-1

Fundamental Aspects of Plasma Chemical Physics
Thermodynamics

Fundamental Aspects of Plasma Chemical Physics - Thermodynamics develops basic and advanced concepts of plasma thermodynamics from both classical and statistical points of view. After a refreshment of classical thermodynamics applied to the dissociation and ionization regimes, the book invites the reader to discover the role of electronic excitation in affecting the properties of plasmas, a topic often overlooked by the thermal plasma community. Particular attention is devoted to the problem of the divergence of the partition function of atomic species and the state-to-state approach for calculating the partition function of diatomic and polyatomic molecules.

Features
- Provides a clear assessment of fundamental concepts and theoretical formulations while also examining new insights into current scientific explorations
- Clarifies and emphasizes text by presenting worked examples throughout
- Achieves a unified approach to plasma thermodynamics by using classical and statistical concepts

Contents

Fields of interest
Plasma Physics; Physical Chemistry; Thermodynamics

Target groups
Research

Product Category
Monograph

Due October 2011
≈ € (D) 106,95 | € (A) 109,95 | sFr 143,50
≈ £99.95 | £90.00
ISBN 978-1-4419-5018-1

Physics

A. V. Boiko, A. V. Dovgal, G. R. Grek, V. V. Kozlov, Siberian Branch RAS, Novosibirsk, Russia

Physics of Transitional Shear Flows
Instability and Laminar–Turbulent Transition in Incompressible Near-Wall Shear Layers

Contents
Part I Fundamentals of the linear stability theory - 1 Concept of hydrodynamic stability. - 1.1 Hydrodynamic stability. - 1.2 Stability of fluid motion in time. - 1.2.1 Critical parameters for onset of instability. - 1.2.2 Conditional stability. - 1.2.3 Growth of disturbance energy. - References. - Further Reading. - 2 Theoretical aspects: 2.1 Formulation of linear hydrodynamic stability problems. - 2.1.1 Spectral formulation of stability. - 2.1.2 Inviscid instability mechanism. - 2.1.3 Viscous instability mechanism. - 2.2 Instability in space. - 2.3 Gaster’s transformation. - 2.4 Squire theorem. - 2.5 Adjoint problem and bi-orthogonality of normal modes. - 2.6 Completeness of solutions for the Orr–Sommerfeld and Squire equations. - References. - Further Reading. - Part II Generic problems: 3 Instability of plane parallel flows: 3.1 Plane Couette flow. - 3.2 Plane Poiseuille flow. - 3.2.1 Numerical results. - 3.2.2 Experimental linear stability investigations. - 3.3 Method of linear stability calculations. - Exercises. - References. - Further Reading. - 4 Instability of the flat-plate boundary layer: 4.1 Historical notes. - 4.2 Solution of the Orr–Sommerfeld equation for the boundary layers. - 4.3 Nonparallel flow effects. - 4.3.1 Outline of theoretical approaches to account for nonparallel effects. - 4.3.2 Modern view on the place and role of nonparallel effects in the Blasius boundary layer. - Exercises. - References. - Further Reading. [...]
Macromolecular Crystallography: Deciphering the Structure, Function, and Dynamics of Biological Molecules

Contents
Preface. List of contributors. - Spatial And Temporal Organization Of Multiscale Systems Of Cell Regulation And Signalling: What Can We Learn From Nhej System Of Double-Strand Break Repair?; Qian Wu. - Co-Translational Protein Processing, Folding, Targeting, And Membrane Insertion Of Newly Synthesized Proteins; D. Boehringer. N. Ban. - The Role Of Multiple Sequence Repeat Motifs In The Assembly Of Multi-Protein Complexes; D. Barford. - Cryoelectron Tomography Or Doing Structural Biology In Situ; W. Baumeister. - Ruvbl1 And Ruvbl2 And Their Complex Proteins Implicated In Many Cellular Pathways; S. Gorynia et al. [...] 

Fields of interests
Crystallography; Protein-Ligand Interactions; Protein Structure

Target groups
Graduate

Product Category
Proceedings

Due November 2011

Hardcover
2011. X, 224 p. 95 illus., 46 in color. (NATO Science for Peace and Security Series A: Chemistry and Biology) 
► *€ (D) 149,75 | € (A) 153,94 | sFr 186,50 
► € 139,95 | €126.00 
ISBN 978-94-007-2529-4

Softcover
2011. X, 224 p. 95 illus., 46 in color. (NATO Science for Peace and Security Series A: Chemistry and Biology) 
► *€ (D) 74,85 | € (A) 76,95 | sFr 93,50 
► € 69,95 | €62.99 
ISBN 978-94-007-2532-4

Next Generation of Photovoltaics: New Concepts

This book presents new concepts for a next generation of PV.

Features
► Presents the horizons of photovoltaic solar energy systems 
► Important book for solar energy materials and solar cells 
► Essential reference guide for beginners and experts working with solar cell technology 
► Written by world-class experts in next generation photovoltaics 
► Useful reference to researchers and graduate students

Contents

Fields of interests
Optics, Optoelectronics, Plasmonics and Optical Devices; Renewable and Green Energy; Optical and Electronic Materials

Target groups
Research

Product Category
Monograph

Due October 2011

Hardcover
2011. 450 p. 150 illus. (Springer Series in Optical Sciences, Volume 165) Hardcover 
► *€ (D) 128,35 | € (A) 131,95 | sFr 160,00 
► € 119,95 | £108.00 
ISBN 978-3-642-23368-5

Softcover
2011. X, 150 pagg. 61 figg., 1 a colori. (l blu) Brossura 
► approx. *€ (D) 25,67 | € (A) 26,39 | sFr 34,50 
► approx. € 23,99 | £19.99 
ISBN 978-88-470-2046-1

Pubblicazione prevista per il mese di October 2011

L’enigma dei raggi cosmici: Le più grandi energie dell’universo

Grazie ad avventurosi studi fu possibile dimostrare un secolo fa che parte della radiazione naturale che si osserva sulla Terra è di natura extraterrestre: era la scoperta dei cosiddetti “raggi cosmici”, particelle che arrivano da misteriosi acceleratori nell’universo, probabilmente buchi neri supermassicci e resti di supernova, a energie anche centinaia di milioni di volte di quelle a cui riusciamo a produrre con i più potenti acceleratori della Terra. A cent'anni dalle prime scoperte questo libro propone, con l'aiuto di documenti scoperti recentemente, di raccontare la vera storia di questa appassionante avventura scientifica e le frontiere dell'esplorazione dei raggi cosmici.

Features
► Una storia “forte” con un’avventura umana 
► Nuovi fatti storici resi disponibili dalla fondazione Nobel accendono nuove luci su una scoperta importante. 
► Nuova cultura sui fenomeni di più alta energia dell’universo e sul futuro della fisica fondamentale. 
► Il 2011 (o 2012 secondo la maggiore degli astrofisici, ma non secondo me) è il centenario della scoperta dei raggi cosmici. 
► Nel 2011 ci saranno alcune celebrazioni dell’opera di Domenico Pacini, e questo è il libro “modern” in cui quest’opera viene discussa per la prima volta (con nuovo materiale, tra l’altro).

Codici discipline
Astrophysics and Astroparticles; Particle and Nuclear Physics; Energy, general

Target groups
Popular/general

Categoria del prodotto
Monografia
Advances in technology are demanding ever-increasing mastery over the materials being used: the challenge is to gain a better understanding of their behaviour, and more particularly of the relations between their microstructure and their macroscopic properties. This two-volume work, of which this is the first volume, aims to provide the means by which this challenge may be met. Starting from the mechanics of deformation, it develops the laws governing macroscopic behaviour - expressed as the constitutive equations - always taking account of the physical phenomena which underlie rheological behaviour. The most recent developments are presented, in particular those concerning heterogeneous materials such as metallic alloys, polymers and composites.

**Features**
- Second edition of standard work on this topic
- Updated and expanded for the next generation
- Numerous exercises and solutions make this suitable as a course text

**Contents**

**Fields of interests**
- Measurement Science and Instrumentation; Quality Control, Reliability, Safety and Risk; Probability Theory and Stochastic Processes

**Target groups**
- Research

**Product Category**
- Monograph

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**D. Gasparri**

**L’universo in 25 centimetri**

Da quando è iniziata la rivoluzione della fotografia digitale, con i sensori CCD che hanno soppiantato la pellicola, qualsiasi appassionato del cielo, dotandosi di una strumentazione non particolarmente costosa, può diventare esploratore attivo dell’immensità della volta celeste, potenzialmente un vero e proprio astronomo. In questo libro, l’autore mostra quanto è possibile ottenere (ed è tanto!) nello studio del cielo con un telescopio amatoriale di soli 25 cm di diametro, anche attraverso tecniche di ripresa innovative, come la fotografia dei pianeti fatta in pieno giorno, o la ripresa di dettagli della superficie di Venere, nonostante il fatto che il pianeta sia perennemente avvolto da una coltre impenetrabile di nubi.

**Features**
- Unica opera in lingua italiana che mostra punto per punto tutto il potenziale della strumentazione amatoriale nell’era dell’imaging digitale, a partire dai risultati ottenibili
- Oltre 200 immagini riprese direttamente dall’autore in ogni ambito dell’astronomia amatoriale, dallo studio del sistema solare all’imaging degli oggetti del profondo cielo fino alla ricerca scientifica di punta
- Nuove tecniche di ripresa trasformano ogni telescopio amatoriale in uno strumento dalle risorse illimitate, in grado di competere con i migliori telescopi del mondo
- Due sezioni dedicate all’imaging estetico ed una a tutti i progetti di ricerca che è possibile intraprendere vi daranno consapevolezza delle potenzialità dell’astronomia amatoriale del ventunesimo secolo

**Codici discipline**
- Astronomy, Observations and Techniques; Popular Science in Astronomy

**Target groups**
- Popular/general

**Categoria del prodotto**
- Libro di interesse generale
S. V. Gupta, Delhi, India

**Mass Metrology**

This book presents the practical aspects of mass measurements. Concepts of gravitational, inertial and conventional mass and details of the variation of acceleration of gravity are described. The Metric Convention and International Prototype Kilogram and BIPM standards are described. The effect of change of gravity on the indication of electronic balances is derived with respect of latitude, altitude and earth topography. The classification of weights by OIML is discussed. Maximum permissible errors in different categories of weights prescribed by national and international organizations are presented. Starting with the necessity of redefining the unit kilogram in terms of physical constants, various methods of defining the kilogram in terms of physical constants are described. The kilogram can be defined by Avogadro’s constant, ion collection of some heavy elements, levitation, voltage and Watt Balance.

**Features**
- Gives guidance to practicing metrologists
- Describes Metric Convention and International Prototype Kilogram and BIPM standards
- Gives orientation to maximum permissible errors in different categories of weights

**Contents**

**Fields of interests**
Measurement Science and Instrumentation; Characterization and Evaluation of Materials; Theoretical and Applied Mechanics

**Target groups**
Research

**Product Category**
Monograph

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K. Guseva, Carl von Ossietzky University Oldenburg, Germany

**Formation and Cooperative Behaviour of Protein Complexes on the Cell Membrane**

With the aim of providing a deeper insight into possible mechanisms of biological self-organization, this thesis presents new approaches to describe the process of self-assembly and the impact of spatial organization on the function of membrane proteins, from a statistical physics point of view. It focuses on three important scenarios: the assembly of membrane proteins, the collective response of mechanosensitive channels and the function of the twin arginine translocation (Tat) system. Using methods from equilibrium and non-equilibrium statistical mechanics, general conclusions were drawn that demonstrate the importance of the protein-protein interactions.

**Features**
- Nominated as an outstanding contribution by the University of Aberdeen
- Contains essential new results on the statistical mechanics and dynamics of macromolecular assembly
- Yields important conclusions and predictions for biological membranes
- Work done in close cooperations with biologists studying membrane proteins

**Contents**
Introduction.- The Role of Fragmentation on the Formation of Homomeric Protein Complexes.- Fragmentation of Tat Pores.- Conclusion.

**Fields of interests**
Membranes; Membrane Biology; Statistical Physics, Dynamical Systems and Complexity

**Target groups**
Research

**Product Category**
Monograph

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K. Hashimoto, RIKEN, Nishina Center, Saitama, Japan

**D-Brane Superstrings and New Perspective of Our World**

Superstring theory is a promising theory which can unify all the forces and the matters in particle physics. A new multi-dimensional object which is called “D-brane” was found recently, which drastically changed our perspective on unified world. We may live on membrane-like hypersurface in higher dimensions (“braneworld scenario”), or we can create blackholes at particle accelerators, or the dynamics of quarks is shown to be equivalent to higher dimensional gravity theory. All of these are explained in this book with plain words but with little use of equations, and with many figures.

**Features**
- Covers the latest special developments in string theory
- Displays a new approach to hypothetically formulate a theory of the world, a braneworld scenario
- Provides specialists, students and scientists who are not in the field with interesting insights

**Contents**

**Fields of interests**
Theoretical, Mathematical and Computational Physics; Quantum Field Theories, String Theory; Elementary Particles, Quantum Field Theory

**Target groups**
Research

**Product Category**
Monograph
D. Helbing, ETH Zürich, Switzerland

Social Self-Organization
Agent-Based Simulations and Experiments to Study Emergent Social Behavior

What are the principles that keep our society together? This question is even more difficult to answer than the long-standing question, what are the forces that keep our world together. However, the social challenges of humanity in the 21st century ranging from the financial crises to the impacts of globalization, require us to make fast progress in our understanding of how society works, and how our future can be managed in a resilient and sustainable way.

Features
- Comprehensive research overview by the leading scientist
- Agent-based modelling for a broad range of applications
- From mobility in opinion space to mobility in geographical space
- New approaches to manage complexity in socio-economic systems

Contents

Fields of interests
Statistical Physics, Dynamical Systems and Complexity; Numerical and Computational Physics; Sociology

Target groups
Research

Product Category
Monograph

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C. S. Helrich, Goshen College, IN, USA

The Classical Theory of Fields
Electromagnetism

The study of classical electromagnetic fields is an adventure. The theory is complete mathematically and we are able to present it as an example of classical Newtonian experimental and mathematical philosophy. There is a set of foundational experiments on which most of the theory is constructed. And then there is the bold theoretical proposal of a field-field interaction from James Clerk Maxwell. This textbook presents the theory of classical fields as a mathematical structure based solidly on laboratory experiments. The student is introduced to the beauty of classical field theory as a gem of theoretical physics. To keep the discussion fluid, the history is placed in a beginning chapter and some of the mathematical proofs in the appendices.

Features
- Gives a thorough and logical exposition of the theory of electromagnetism, enriched with historical details
- High quality diagrams and end of chapter questions support fast learning progress
- Course tested and approved for many years
- Rich text book features include end-of-chapter questions, problems and solutions, separate complete solutions manual available

Contents

Fields of interests
Optics and Electrodynamics; Magnetism, Magnetic Materials; Classical and Quantum Gravitation, Relativity Theory

Target groups
Graduate

Product Category
Graduate/Advanced undergraduate textbook

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D. L. Hemmick, Berlin, MD, USA; A. M. Shakur, Salisbury University, MD, USA

Bell's Theorem and Quantum Realism
Reassessment in Light of the Schrödinger Paradox

Quantum theory presents a strange picture of the world, offering no real account of physical properties apart from observation. Neils Bohr felt that this reflected a core truth of nature: „There is no quantum world. There is only an abstract mathematical description.“ Among the most significant developments since Bohr’s day has been the theorem of John S. Bell. It is important to consider whether Bell’s analysis supports such a denial of microrealism. In this book, we evaluate the situation in terms of an early work of Erwin Schrödinger. Doing so, we see how Bell’s theorem is conceptually related to the Conway and Kochen Free Will theorem and also to all the major anti-realism efforts. It is easy to show that none of these analyses imply the impossibility of objective realism. We find that Schrödinger’s work leads to the derivation of a new series of theoretical proofs and potential experiments, each involving “entanglement,” the link between particles in some quantum systems.

Fields of interests
Quantum Physics; Atomic, Molecular, Optical and Plasma Physics; History and Philosophical Foundations of Physics

Target groups
Research

Product Category
Monograph
A Field Guide to Deep-Sky Objects

This star guide enables amateur astronomers to focus on a class of object, and using an observation list that begins with the easiest object, find and move progressively over a period of months to more difficult targets. Includes detailed descriptive summaries of each class of object. Amateur astronomers of all levels will find this book invaluable for its broad-ranging background material, its lists of fascinating objects, and for its power to improve practical observing skills while viewing many different types of deep-sky objects. This new edition of A Field Guide to Deep-sky Objects brings in a correction of out-of-date science along with two new chapters; Transient objects, and Naked-Eye Deep Sky Objects. This edition adds up-to-date information and on the objects mentioned above.

Features

► Displays a unique summary of the work of the Nobel laureate
► Rudolf Moessbauer Presents the basics, development and application of Moessbauer methods
► Provides lists, classified by object type, and readable, engaging descriptions of those objects
► Helps observers to locate objects at any time

Contents


Fields of interests

Astronomy, Observations and Techniques; Astrophysics and Astroparticles

Target groups

Popular/general

Product Category

Popular science
**Charm Production in Deep Inelastic Scattering**

Mellin Moments of Heavy Flavor Contributions to $F_2(x,Q^2)$ at NNLO

The production of heavy quarks in high-energy experiments offers a rich field to study, both experimentally and theoretically. Due to the additional quark mass, the description of these processes in the framework of perturbative QCD is much more demanding than it is for those involving only massless partons.

**Features**
- Presents a new and more accurate description of quark production in particle experiments
- Selected by the German Physical Society for a Dissertation Award 2011
- Develops new mathematical tools

**Contents**
Deeply Inelastic Scattering - Heavy Quark Production in DIS - Renormalization of Composite Operator Matrix Elements - Representation in Different Renormalization Schemes - Calculation of the Massive Operator Matrix Elements up to O(αs2 ë) - Calculation of Moments at O(α33) - Heavy Flavor Corrections to Polarized Deep-Inelastic Scattering - Heavy Flavor Contributions to Transversity - First Steps Towards a Calculation of $A_{ij}(3)$ for all Moments - Conclusions - Conventions - Feynman Rules - Special Functions - Finite and Infinite Sums - Moments of the Fermionic Contributions to the 3-Loop Anomalous Dimensions - The O(ë 0) Contributions to $A_{ij}(3)$ - 3-Loop Moments for Transversity

**Fields of interests**
Elementary Particles, Quantum Field Theory; Particle and Nuclear Physics; Mathematical Methods in Physics

**Target groups**
Research

**Product Category**
Monograph

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**Theory of Nuclear Fission**

A Textbook

This book ties together various aspects of the nuclear fission phenomenon discovered by Hahn, Strassmann and Meitner almost 70 years ago. Beginning with an historical introduction the authors present various models to describe the fission process of hot nuclei as well as the spontaneous fission of cold nuclei and their isomers. The role of transport coefficients, like inertia and friction in fission dynamics is discussed. The effect of the nuclear shell structure on the fission probability and the mass and kinetic energy distributions of the fission fragments is presented. The fusion-fission process leading to the synthesis of new isotopes including super-heavy elements is described. The book will thus be useful for theoretical and experimental physicists, as well as for graduate and PhD students.

**Features**
- Only contemporary textbook on nuclear fission on the market
- Summarizes the basic knowledge and the current state-of-the-art of the theory nuclear fission research
- Didactical presentation of the theory nuclear fission

**Contents**
From the contents: Introduction - Potential Energy Surfaces - Statistical Decay Model - Scission Point Models - Fission Dynamics

**Fields of interests**
Nuclear Physics, Heavy Ions, Hadrons; Nuclear Engineering

**Target groups**
Research

**Product Category**
Monograph

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**Hyperbolic Chaos**

A Physicist’s View

“Hyperbolic Chaos: A Physicist’s View” presents recent progress on uniformly hyperbolic attractors in dynamical systems from a physical rather than mathematical perspective (e.g. the Plykin attractor, the Smale – Williams solenoid).

**Features**
- Written by an experienced teacher of nonlinear dynamics and chaos theory
- Accessible to readers with different levels of knowledge
- Stresses applications of the mathematical theory

**Contents**
Part I Basic Notions and Review: Dynamical Systems and Hyperbolicity - Dynamical Systems and Hyperbolicity

**Fields of interests**
Nonlinear Dynamics; Systems Theory, Control; Vibration, Dynamical Systems, Control

**Target groups**
Research

**Product Category**
Monograph
The volume 'Medical Radiological Physics' is intended to provide the scientific basis of diagnostics and therapy in medical radiology. The present Subvolume A reviews radiation (both ionising and non-ionising) and its biological effects, dosimetry in diagnostic radiology and radiotherapy, as well as in nuclear medical diagnostics and therapy, and, finally, medical radiological protection relevant for patients, personnel and the general public. Not only fundamentals but also basic data pertinent to the topics dealt with have been collected by numerous experts of great international renown.

Fields of interest
Physics, general

Target groups
Research

Product Category
Reference work

H. Schopper, CERN, Geneva, Switzerland (Ed.)

Z = 1-29. Excited Nuclear States

Volume I/25A is the first one in a series of volumes on the properties of the excited states of all nuclei. The data presented are collected from all kinds of nuclear reactions, including measurements of reactions with neutrons and γ-rays not yet fully considered in previous compilations. The nuclei considered also comprise nuclei far from the stability line. The properties of excited nuclear states are of importance for scientific and practical applications. No systematic compilation of such data has been performed so far. The present compilation has been prepared by eminent experts in the field. One of the characteristics of Landolt-Börnstein is that data are evaluated before they are accepted for compilation. The idea is to present 'best values' which can be used with confidence by non-experts. The present Volume I/25A is providing new data (energy levels, branching ratios, cross-sections, spectroscopic factors, etc.) for nuclei with atomic numbers Z ranging from 1 (H) to 29 (Cu) published in 2005-2010, thus supplementing previous compilations. Additionally, sections of the Introduction are devoted to isomers and nuclear collective excitations, recent trends in the theory of nuclear structure and nucleon interactions (tensor force effects, nonstatistical effects), and γ-ray cascade measurements after neutron capture. In view of the large amount of data available some of the information is given online only at www.springermaterials.com.

Fields of interests
Physics, general; Astronomy, Astrophysics and Cosmology; Particle and Nuclear Physics

Target groups
Research

Product Category
Reference work

Z. N. Soroko, S. I. Sukhoruchkin, St. Petersburg Nuclear Physics Inst., Russia; U. Kneissl, Universität Stuttgart, Germany; P. Descouvemont, Université Libre de Bruxelles, Belgium

H. Schopper, CERN, Geneva, Switzerland (Ed.)

Z = 30-47. Excited Nuclear States

Volume I/25B is the second one in a series of volumes on the properties of the excited states of all nuclei. The data presented are collected from all kinds of nuclear reactions, including measurements of reactions with neutrons and γ-rays not yet fully considered in previous compilations. The nuclei considered also comprise nuclei far from the stability line. The properties of excited nuclear states are of importance for scientific and practical applications. No systematic compilation of such data has been performed so far. The present compilation has been prepared by eminent experts in the field. One of the characteristics of Landolt-Börnstein is that data are evaluated before they are accepted for compilation. The idea is to present 'best values' which can be used with confidence by non-experts. The present Volume I/25B is providing new data (energy levels, branching ratios, cross-sections, spectroscopic factors, etc.) for nuclei with atomic numbers Z ranging from 30 (Zn) to 47 (Ag) published in 2005-2010, thus supplementing previous compilations. Additionally, sections of the Introduction are devoted to nuclear resonance fluorescence and cluster models in nuclear astrophysics. In view of the large amount of data available some of the information is given online only at www.springermaterials.com.

Fields of interests
Physics, general; Astronomy, Astrophysics and Cosmology; Medical and Radiation Physics

Target groups
Research

Product Category
Reference work

Due January 2012


ISBN 978-3-642-22929-9
Index Compounds reg. in Volumes A-I; Comprehensive CAS-Index for all Subvolumes A-L

This index is a guide to organic compounds which have material constants of general interest described in the Landolt-Börnstein / New Series. In total in the subvolumes J, K, L and M, 23865 compounds with 83941 references to numerical data are recorded. Compiled are volumes containing nuclear magnetic resonance (NMR) and nuclear quadrupole resonance (NQR) data, acoustical and optical properties, structure and molecular constants, mechanical and thermodynamic constants as well as physical properties of liquid crystals. All new compounds are given with the drawing of the chemical structure, the molecular formula, chemical names, the Chemical Abstracts registration numbers (CAS-RN) where known and references to Landolt-Börnstein citations.

Features
- Standard reference book with selected and easily retrievable data from the fields of physics and chemistry collected by acknowledged international scientists
- Also available online on www.springerLink.com

Fields of interests
Physics, general; Organic Chemistry

Target groups
Research

Product Category
Reference work

G. Peters, LCI Publisher GmbH, Hamburg, Germany
V. Vill, Universität Hamburg, Germany (Ed.)

H2O (HOH), Part alpha
Subvolume C: Nonlinear Triatomic Molecules

With the development of modern instruments and theories, a considerable amount of spectroscopic information is being permanently collected on molecules. The infrared, in particular, is seeing extraordinary activities. Using Fourier transform interferometers and infrared lasers, accurate data are measured often with extreme sensitivity. These data are also analyzed and precise molecular parameters determined. Volume II/20, “Molecular Constants Mostly from Infrared Spectroscopy”, is a recent Landolt-Börnstein publication series bringing together these results. It is made up of several volumes (A, B, C, D) with comprehensive compilation of critically evaluated molecular constants of diatomic (A), linear triatomic (B), nonlinear triatomic (C), and other polyatomic (D) molecules. Subvolume II/20C1 is devoted to H2O.

Features
- Standard reference book with selected and easily retrievable data from the fields of physics and chemistry collected by acknowledged international scientists
- Also available online on www.springerLink.com

Fields of interests
Physics, general; Atomic/Molecular Structure and Spectra

Target groups
Research

Product Category
Reference work

N. Picqué, Orsay, France
G. Guelachvili, Orsay, France (Ed.)

H2O (HOH), Part beta
Subvolume C: Nonlinear Triatomic Molecules

With the development of modern instruments and theories, a considerable amount of spectroscopic information is being permanently collected on molecules. The infrared, in particular, is seeing extraordinary activities. Using Fourier transform interferometers and infrared lasers, accurate data are measured often with extreme sensitivity. These data are also analyzed and precise molecular parameters determined. Volume II/20, “Molecular Constants Mostly from Infrared Spectroscopy”, is a recent Landolt-Börnstein publication series bringing together these results. It is made up of several volumes (A, B, C, D) with comprehensive compilation of critically evaluated molecular constants of diatomic (A), linear triatomic (B), nonlinear triatomic (C), and other polyatomic (D) molecules. Subvolume II/20C1 is devoted to H2O.

Features
- Standard reference book with selected and easily retrievable data from the fields of physics and chemistry collected by acknowledged international scientists
- Also available online on www.springerLink.com

Fields of interests
Physics, general; Chemistry/Food Science, general

Target groups
Research

Product Category
Reference work

N. Picqué, Université Paris-Sud, Paris, France
G. Guelachvili, Université de Paris, France (Ed.)
Magnetic Properties of Paramagnetic Compounds

During the past three decades since the publication of the last volume on the magnetic susceptibilities of co-ordination and organometallic transition metal compounds thousands of new paramagnetic compounds of striking diversity and novelty have appeared. The present volume on the magnetic properties of paramagnetic compounds covers 1663 references published between 1985 and 1991. After an introduction into the theoretical aspects of the paramagnetic susceptibility, the data tables are providing experimental values for susceptibility, effective paramagnetic moment, and paramagnetic Curie constant. Where available the temperature dependence of the magnetic susceptibility is given in figures. The compounds are listed under their central metal ion (transition metal, lanthanide or actinide) of definite, or mixed, oxidation state. The substances include simple compounds, co-ordination compounds (N-, ligands, O-ligands, S-ligands, etc.), organometallic compounds, homo- and hetero-multimetallic derivatives, clusters, polymers. Finally, data for simple compounds, co-ordination compounds (N-, mixed, oxidation state. The substances include

due January 2012

- approx. *€ (D) 5339,30 | € (A) 5489,00 | sFr 7154,00
- approx. € 4990,00 | £4491.00
ISBN 978-3-642-23674-7

Due October 2011

2011. 110 p. 37 illus., 9 in color. (Springer Theses) Hardcover
- *€ (D) 106,95 | € (A) 109,95 | sFr 133,50
- € 99,95 | £90.00
ISBN 978-3-642-24120-8

Studying Atomic Dynamics with Coherent X-rays

Diffusion in solids at moderate temperatures is a well-known phenomenon. However, direct experimental evidence about the responsible atomic-scale mechanisms has been scarce, due to difficulties in probing the relevant length- and time-scales. The present thesis deals with the application of X-ray Photon Correlation Spectroscopy (XPCS) for answering such questions. This is an established method for the study of slow dynamics on length-scales of a few nanometres. The scattered intensity in the diffuse regime, i.e. corresponding to atomic distances, is very low, however, and so it has so far been considered impossible to use XPCS for this problem. Threefold progress is reported in this work: It proposes a number of systems selected for high diffuse intensity, it optimizes the photon detection and data evaluation procedures, and it establishes theoretical models for interpreting the results.

Features
- Selected as an outstanding contribution by the University of Vienna
- Proposes and optimizes a novel method for studying diffusion in solids
- Develops theoretical model for data interpretation

Contents
- Introduction.
- Theory.
- Linking Theory to Experiments.
- Characteristics of Diffusion in Selected Systems.
- Data Evaluation.
- Considerations Concerning the Experiment.
- Experimental Results.
- Outlook.

Fields of interest
- Physics, general
- Research

Product Category
- Reference work

Due November 2011

- *€ (D) 128,35 | € (A) 131,95 | sFr 160,00
- € 119,95 | £108.00
ISBN 978-3-642-23748-5

Photons in Natural and Life Sciences
An Interdisciplinary Approach

The book describes first the principle photon generation processes from nuclear reactions, electron motion and from discrete quantum transitions. It then focuses on the use of photons in various selected fields of modern natural and life sciences. It bridges disciplines such as physics, chemistry, earth- and materials science, proteomics, information technology, photoelectrochemistry, biosynthesis and spintronics. Advanced light sources and their use in natural and life sciences are emphasized and the effects related to the quantum nature of photons (quantum computing, teleportation) are described.

Features
- Represents the only book on this topic available on the market
- Provides unprecedented interdisciplinarity in covering the scientific fields/areas
- The tutorial style allows for easy understanding of readers from various disciplines

Contents
- On the Origin of Light.
- Sources of Spectral Photon Radiation.
- Photon Generation in Electronic Transition High-Energy Lasers.
- Applications in Chemistry, Physics, Materials Science and Biology.
- Exploiting the Quantum Nature of Photons.
- Spintronics.

Fields of interest
- Optics, Optoelectronics, Plasmonics and Optical Devices; Nanotechnology; Biophysics and Biological Physics
- Research

Product Category
- Monograph
Nonlinear Waves and Solitons on Contours and Closed Surfaces

This volume is an introduction to nonlinear waves and soliton theory in the special environment of compact spaces such as closed curves and surfaces and other domain contours.

Features
- Fully revised and updated 2nd edition
- Provides the necessary mathematical framework for treating the manifolds considered with relevant notions from topology and differential geometry
- Applies the theory to many concrete examples appearing in the physical and related sciences

Contents

Fields of interest
Nonlinear Dynamics; Differential Geometry; Mathematical Methods in Physics

Target groups
Research

Product Category
Monograph

The Universe as Automaton From Simplicity and Symmetry to Complexity

This Brief is an essay at the interface of philosophy and complexity research, trying to inspire the reader with new ideas and new conceptual developments of cellular automata. Going beyond the numerical experiments of Steven Wolfram, it is argued that cellular automata must be considered complex dynamical systems in their own right, requiring appropriate analytical models in order to find precise answers and predictions in the universe of cellular automata. Indeed, eventually we have to ask whether cellular automata can be considered models of the real world and, conversely, whether there are limits to our modern approach of attributing the world, and the universe for that matter, essentially a digital reality.

Features
- Authored and edited by leading researchers in the field
- Tutorial approach, suitable for both taught courses and self-study
- Comprehensive treatment, suitable as source of reference

Contents

Fields of interest
Statistical Physics, Dynamical Systems and Complexity; Artificial Intelligence (incl. Robotics); Complexity

Target groups
Research

Product Category
Monograph

Fundamentals of Time-Dependent Density Functional Theory

There have been many significant advances in time-dependent density functional theory over recent years, both in enlightening the fundamental theoretical basis of the theory, as well as in computational algorithms and applications. This book, as successor to the highly successful volume Time-Dependent Density Functional Theory (Lect. Notes Phys. 706, 2006) brings together for the first time all recent developments in a systematic and coherent way.

Features
- Tutorial approach, suitable for both taught courses and self-study
- Comprehensive treatment, suitable as source of reference

Contents

Fields of interest
Numerical and Computational Physics; Theoretical and Computational Chemistry; Condensed Matter Physics

Target groups
Graduate

Product Category
Monograph

Due November 2011


- € (D) 106,95 | € (A) 109,95 | sFr 133,50
- € 99,95 | £90.00

ISBN 978-3-642-22894-0

Due October 2011

2011. VIII, 104 p. 43 illus., 39 in color. (SpringerBriefs in Complexity) 1 Softcover

- € (D) 53,45 | € (A) 54,95 | sFr 66,50
- € 49,95 | £44.99

ISBN 978-3-642-23476-7

Due October 2011

2011. XXVIII, 540 p. 72 illus. (Lecture Notes in Physics, Volume 837) Softcover

- € (D) 96,25 | € (A) 98,95 | sFr 120,00
- € 89,95 | £81.00

ISBN 978-3-642-23517-7
**F. Matteucci**, University of Trieste, Italy

**Chemical Evolution of Galaxies**

The term “chemical evolution of galaxies” refers to the evolution of abundances of chemical species in galaxies, which is due to nuclear processes occurring in stars and to gas flows into and out of galaxies. This book deals with the chemical evolution of galaxies of all morphological types (ellipticals, spirals and irregulars) and stresses the importance of the star formation histories in determining the properties of stellar populations in different galaxies. The topic is approached in a didactical and logical manner via galaxy evolution models which are compared with observational results obtained in the last two decades. The reader is given an introduction to the concept of chemical abundances and learns about the main stellar populations in our Galaxy as well as about the classification of galaxy types and their main observables.

**Features**
- Educates graduate students and young researchers to start their own research in the field
- Outlines theoretical models of chemical evolution of galaxies and compares them with observational results
- Treats all main aspects of chemical evolution of galaxies in a didactical and logical order
- Author with great expertise and strong reputation

**Contents**

**Fields of interest**
Astronomy, Astrophysics and Cosmology

**Target groups**
Research

**Product Category**
Monograph

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**L. Mersini-Houghton**, University of North Carolina, Chapel Hill, NC, USA; **R. Vaas**, Justus Liebig University Giessen, Germany (Eds)

**The Arrows of Time**

A Debate in Cosmology

The concept of time has fascinated humanity throughout recorded history, and it remains one of the biggest mysteries in science and philosophy. Time is clearly one of the fundamental building blocks of the universe and thus a deeper understanding of nature at a fundamental level also demands a comprehension of time.

**Features**
- Contributions by leading experts on the physics of time
- Addresses the most fundamental questions about time: what it is and how it arises
- Each chapter offers a different perspective on the role of time in the cosmos
- Provides a comparison between philosophical and physical questions relating to time

**Contents**

**Fields of interests**
Classical and Quantum Gravitation, Relativity Theory; Philosophy of Science; Quantum Field Theories, String Theory

**Target groups**
Research

**Product Category**
Monograph

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**D. D. O’Regan**, University of Cambridge, UK

**Optimised Projections for the Ab Initio Simulation of Large and Strongly Correlated Systems**

**Features**
- Reports an important advance in describing strongly correlated electronic systems
- Can serve as a standard reference for the electronic structure community
- Nominated as an outstanding contribution by the University of Cambridge

**Contents**

**Fields of interests**
Strongly Correlated Systems, Superconductivity; Theoretical, Mathematical and Computational Physics; Solid State Physics

**Target groups**
Research

**Product Category**
Monograph
Femtosecond Laser Micromachining
Photonic and Microfluidic Devices in Transparent Materials

Contents

Fields of interests
LASER TECHNOLOGY, PHOTONICS: MICROWAVES, RF AND OPTICAL ENGINEERING; OPTICAL AND ELECTRONIC MATERIALS

Target groups
Graduate

Product Category
Monograph

Econodynamics
The Theory of Social Production

In this book the theory of social production is systematically formulated in terms and concepts of classical political economy and neo-classical economics. In this way the subject becomes accessible not only to professional researchers in areas of the theory of production and economic growth, but also to the educated reader who is curious about the principles behind the functioning of a national economy. The book can be considered as an introduction for students with a background in physics, chemistry and engineering, who wish to specialize in economics.

Features
► Revisits the theory of production of commodities from a physicist’s standpoint ► Provides the tools for both consistent interpretation of empirical data and for drawing development scenarios ► A very useful basis for lectures on the theory of production

Contents

Fields of interests
SOCIO- AND ECONOPHYSICS, POPULATION AND EVOLUTIONARY MODELS; ECONOMIC THEORY; THERMODYNAMICS

Target groups
Research

Product Category
Monograph

Principles of Physics
For Scientists and Engineers

This textbook presents a basic course in physics to teach mechanics, mechanical properties of matter, thermal properties of matter, elementary thermodynamics, electrodynamics, electricity, magnetism, light and optics and sound. It includes simple mathematical approaches to each physical principle, and all examples and exercises are selected carefully to reinforce each chapter.

Features
► Very didactical textbook ► Presents the mathematical basics for each topic ► Contains many exercises and solutions for teaching and learning

Contents

Fields of interests
CLASSICAL CONTINUUM PHYSICS; MECHANICS; OPTICS AND ELECTRODYNAMICS

Target groups
Lower undergraduate

Product Category
Monograph
Rivas, University of Madrid, Spain; S. F. Huelga, University of Ulm, Germany

**Open Quantum Systems**

**An Introduction**

In this volume the fundamental theory of open quantum systems is revised in the light of modern developments in the field. A unified approach to the quantum evolution of open systems is presented by merging concepts and methods traditionally employed by different communities, such as quantum optics, condensed matter, chemical physics and mathematical physics. The mathematical structure and the general properties of the dynamical maps underlying open system dynamics are explained in detail. The microscopic derivation of dynamical equations, including both Markovian and non-Markovian evolutions, is also discussed. Because of the step-by-step explanations, this work is a useful reference to novices in this field. However, experienced researchers can also benefit from the presentation of recent results.

**Features**

- Represents a self-contained introduction to the theory of open quantum systems
- Gives guidance to novices in the field by tutorial-like presentation of mathematical results
- Gives a unique detailed microscopic derivation of Markovian and non-Markovian models

**Contents**


**Fields of interests**

Quantum Physics; Numerical and Computational Physics; Mathematical Methods in Physics

**Target groups**

Research

**Product Category**

Monograph

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S. G. Rodrigo, CSIC-Universidad de Zaragoza, Spain

**Optical Properties of Nanostructured Metallic Systems**

**Studied with the Finite-Difference Time-Domain Method**

The common belief is that light is completely reflected by metals. In reality they also exhibit an amazing property that is not so widely known: under some conditions light flows along a metallic surface as if it were glued to it. Physical phenomena related to these light waves, which are called Surface Plasmon Polaritons (SPP), have given rise to the research field of plasmonics. This thesis explores four interesting topics within plasmonics: extraordinary optical transmission, negative refractive index metamaterials, plasmonic devices for controlling SPPs, and field enhancement phenomena near metal nanoparticles.

**Features**

- Addresses fascinating and novel aspects of the phenomenon of surface plasmon polaritons
- Includes much information of interest in the exciting field of metamaterials
- Reports both experimental data and simulations, with necessary theory explained
- Nominated as an outstanding contribution by the University of Zaragoza

**Contents**


**Fields of interests**

Optics, Optoelectronics, Plasmonics and Optical Devices; Optical and Electronic Materials; Surface and Interface Science, Thin Films

**Target groups**

Research

**Product Category**

Monograph
K. Sakmann, Heidelberg University, Germany

Many-Body Schrödinger Dynamics of Bose-Einstein Condensates

At extremely low temperatures, clouds of bosonic atoms form what is known as a Bose-Einstein condensate. Recently, it has become clear that many different types of condensates – so called fragmented condensates – exist. In order to tell whether fragmentation occurs or not, it is necessary to solve the full many-body Schrödinger equation, a task that remained elusive for experimentally relevant conditions for many years.

Features

► A new theoretical approach to understanding the dynamics of Bose-Einstein condensates ► Develops optimized models that are shown to perform better than conventional models ► Nominated as an outstanding contribution by the University of Heidelberg

Contents


Fields of interest

Quantum Gases and Condensates; Theoretical, Mathematical and Computational Physics; Strongly Correlated Systems, Superconductivity

Target groups

Research

Product Category

Monograph

H. Satz, Universität Bielefeld, Germany (Ed.)

Extreme States of Matter in Strong Interaction Physics

An Introduction

The thermodynamics of strongly interacting matter remains a profound and challenging area of modern physics, both in theory and in experiment. Statistical quantum chromodynamics, through analytical as well as numerical studies, provides the main theoretical tool, while in experiment, high-energy nuclear collisions are the key for extensive laboratory investigations. The field therefore straddles statistical, particle and nuclear physics, both conceptually and in the methods of investigation used. This course-tested primer addresses above all the many young scientists starting their scientific research in this field, providing them with a general, self-contained introduction that emphasizes in particular the basic concepts and ideas, with the aim of explaining why we do what we do.

Features

► Conceived as self-contained primer for newcomers to this field of research ► Authored by a leading scientist ► Pedagogical approach, based on numerous courses and lectures given over two decades

Contents


Fields of interest

Nuclear Physics, Heavy Ions, Hadrons; Elementary Particles, Quantum Field Theory; Statistical Physics, Dynamical Systems and Complexity

Target groups

Research

Product Category

Monograph

N. S. Schulz, Massachusetts Institute of Technology, Cambridge, MA, USA

The Formation and Early Evolution of Stars

From Dust to Stars and Planets

Starburst regions in nearby and distant galaxies have a profound impact on our understanding of the early universe.

Features

► 2nd edition of successful book ► Outlines recent advances and contemporary research on the theory of star formation ► Includes new chapters on massive star formation, proto-planetary disks and observations of young exoplanets ► Describes new observations, specifically from the current array of space observatories ► Provides updates in star formation theory, cloud fragmentation, dust, and circumstellar disks ► This 2nd edition now hosts some sets of problems and their solutions suitable for graduate course work

Contents


Fields of interest

Astrophysics and Astroparticles

Target groups

Research

Product Category

Monograph
**UV Astronomy 2011**

This book is a reprint of the the Special Issue of Astrophysics and Space Science “UV Astronomy 2011”. It covers four main topics: stellar physics and evolution, planets, Milky Way and other galaxies and finally, UV Instrumentation with an update on the current status of the main missions and technologies. This builds on the remarkable progress made in the field since the earlier Special issue: "Space Astronomy: the UV window to the Universe" which appeared in 2008.

**Features**
- Latest research in UV Astronomy
- Carefully peer-reviewed papers

**Contents**
- Editorial
- Chapter 1 Planets
- Chapter 2 Stellar Physics and Evolution
- Chapter 3 Milky Way and Galaxies
- Chapter 4 UV Instrumentation

**Fields of interests**
- Astronomy, Observations and Techniques
- Astrophysics and Astrophotons
- Extraterrestrial Physics, Space Sciences

**Target groups**
- Research

**Product Category**
- Monograph

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**Adiabatic Logic**

**Future Trend and System Level Perspective**

Adiabatic Logic is a potential successor for static CMOS circuit design when it comes to ultra-low-power energy consumption. Future development like the evolutionary shrinking of the minimum feature size as well as revolutionary novel transistor concepts will change the gate level savings gained by Adiabatic Logic. In addition, the impact of worsening degradation effects has to be considered in the design of adiabatic circuits. The impact of the technology trends on the figures of merit of Adiabatic Logic, energy saving potential and optimum operating frequency, are investigated, as well as degradation related issues.

**Features**
- This is the first comprehensive book on Adiabatic Logic systems
- It presents how Adiabatic Logic will perform with future scaling, future devices and degrading effects
- It presents measurement results of a manufactured adiabatic system and compares it to static CMOS
- Design methodology is presented to generate more energy efficient and less area consuming adiabatic digital signal processing units

**Contents**
- 1 Introduction
- 2 Fundamentals of Adiabatic Logic
- 3 Future trend in Adiabatic Logic
- 4 Generation of the power-clock
- 5 Power-Clock Gating
- 6 Arithmetic structures in Adiabatic Logic
- 7 Measurement results of an adiabatic FIR filter
- 8 Conclusions

**Fields of interests**
- Electronic Circuits and Devices
- Circuits and Systems
- Logic Design

**Target groups**
- Research

**Product Category**
- Monograph
**News 9/2011**

**K. S. Thomas**, Hamilton Sundstrand, Windsor Locks, CT, USA; H. J. McMann, Temple, TX, USA

**U. S. Spacetimes**

Spacesuits are far more than garments. They are a personalized spacecraft that allows direct contact and interaction with everything beyond our world, and a last refuge for survival in a disaster.

**Features**
- Remains the most comprehensive text on U.S. spacesuits and their development available.
- Contains many new insights and photographs on space suits used for different manned missions that were not in the first edition.
- Explains the function, historical development, and use of spacesuits from a worldwide perspective.
- Provides details on NASA’s new Constellation Spacesuit System.

**Contents**
- List of figures.
- List of tables.
- List of contributors.
- Preface.
- Foreword.
- Acknowledgments.
- Editorial notes.
- Acronyms and abbreviations.

**Chapter 1: Introduction**
- History of space exploration and extravehicular activity.
- Overview of the space suits used.

**Chapter 2: Reaching upward and outward**
- The basics of spacesuits.
- Development of the early spacesuit systems.

**Chapter 3: The basics of spacesuits**
- Design, function, and interaction with everything beyond our world.
- Personalized spacecraft that allows direct contact and interaction.

**Chapter 4: Launch/entry spacesuits: Past, present, and future**
- Early spacesuit systems.
- Modern spacesuit systems.

**Chapter 5: Gemini: The first manned mission**
- Gemini’s role in the space suit development.

**Chapter 6: Apollo: Mankind starts the exploration outward**
- Development of Apollo space suits.

**Chapter 7: Advanced development and possibly future**
- Advanced space suit technology.

**Chapter 8: U.S. spacesuits and their development available**
- Advanced space suit technology.

**Chapter 9: Skylab and the use of spacesuits from a worldwide perspective**
- Skylab’s role in space suit development.

**Chapter 10: The Space Shuttle program: Apollo-Soyuz Test Project suit systems (1969-1975)**
- Development of Space Shuttle suit systems.

**Chapter 11: The quest for canceled Apollo missions**
- Canceled Apollo missions.

**Chapter 12: Epilogue**
- Future prospects for extravehicular activity.

**Appendix A**
- Exploring and working in space.
- Appendix B: U.S. space suit systems overview.

**Appendix C**
- U.S. EVAs information.

**Appendix D**
- B: U.S. EV A information.

**Appendix E**
- Bibliography.

**Field of interests**
- Extraterrestrial Physics, Space Sciences; Popular Science in Astronomy; Aerospace Technology and Astronautics.

**Target groups**
- Graduate.

**Product Category**
- Monograph.
New Eyes on the Sun
A Guide to Satellite Images and Amateur Observation

Information collected by satellites recently sent by the USA, the European Space Agency, Japan, Germany, the United Kingdom, and Russia to monitor the Sun has changed our knowledge and understanding of the Sun, particularly its effect on Earth. This book presents these findings in a way that will be welcomed by amateur astronomers, students, educators and anyone interested in the Sun. Enhanced by many colour photographs, the book combines newly acquired scientific understanding with detailed descriptions of features visible on the Sun's surface and in its atmosphere.

Field of interests
Extraterrestrial Physics, Space Sciences; Popular Science in Astronomy; Planetology

Target groups
Popular/general

Product Category
Popular science

Nonlinear Optics and Solid-State Lasers
Advanced Concepts, Tuning-Fundamentals and Applications

This book covers the complete spectrum of nonlinear optics and all solid state lasers. The book integrates theory, calculations and practical design, technology, experimental schemes and applications. With the expansion and further development of Laser technology, the wavelength spectrum of Lasers had to be enlarged, even to be tunable which requires the use of nonlinear optical and Laser tunable technology.

Features
► Helps readers interpret and understand solar images taken by space probes, and to compare them with their own observations  ► Focuses on the most recent discoveries about the Sun including its effect on the Earth  ► Includes an important aspect of how amateurs can observe the Sun safely using the latest solar telescopes  ► All technical terms are explained in a glossary at the end of the book  ► Presents some of the fascinating solar phenomena in their full splendor to readers through a variety of illustrations, colour photographs and easy to understand text

Contents
1 Warming to the Sun.- 2 Probing the Sun.- 3 Activity in the photosphere and corona.- 4 Activity in the chromosphere and corona.- 5 Eclipses and Transits.- 6 Observing the Sun.- 7 Satellite images of the Sun.- 8 Space weather.- 9 The Sun and Earth's climate.- 10. The Sun and stars.- About the author.- Glossary.- Index.

Fields of interest
Microwaves, RF and Optical Engineering; Laser Technology, Photonics; Quantum Optics; Classical Continuum Physics; Industrial Chemistry/Chemical Engineering; Mechanical Engineering; Propulsion and Power, Hazard Prevention as well as military engineering;

Target groups
Research

Product Category
Monograph

Shock Waves Science and Technology Library, Vol. 6
Detonation Dynamics

This book, as a volume of the Shock Wave Science and Technology Reference Library, is primarily concerned with the fundamental theory of detonation physics in gaseous and condensed phase reactive media. The detonation process involves complex chemical reaction and fluid dynamics, accompanied by intricate effects of heat, light, electricity and magnetism - a contemporary research field that has found wide applications in propulsion and power, hazard prevention as well as military engineering.

Features
► The "Shock Wave Science and Technology Reference Library" is a numbered and bounded collection of specifically commissioned volumes on basic fundamental and applied aspects of shock wave science and technology  ► A unique collection, the library as a whole sets out to comprehensively and authoritatively cover and review at research level the subject matter with all its ramifications  ► Every volume is edited and authored by leading researchers in the field

Contents

Fields of interest
Classical Continuum Physics; Industrial Chemistry/Chemical Engineering; Mechanical Engineering

Target groups
Research

Product Category
Monograph