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### Astrobiology

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#### Now available in softcover

#### **Lectures in Astrobiology**

Vol I : Part 1: The Early Earth and Other Cosmic Habitats for Life Study Edition

**B. Barbier**, Centre de Biophysique Moléculaire, Orléans, France; **H. Martin**, Université Blaise Pascal, Clermont-Ferrand, France; **J. Reisse**, Université Libre de Bruxelles, Belgium (Eds.) Editor-in-chief: **M. Gargaud** Foreword by: **C. de Duve** 

► The first comprehensive textbook at graduate level encompassing all aspects of the emerging field of astrobiology.

This is the first of a divided two-part softcover edition of the **Lectures in Astrobiology Volume I**  containing the sections "General Introduction", "The Early Earth and Other Cosmic Habitats for Life" and "Appendices" including an extensive glossary on Astrobiology.

Volume I of the **Lectures in Astrobiology** gathers a first set of extensive lectures that cover a broad range of topics, from the formation of solar systems to the quest for the most primitive life forms that emerged on the Early Earth.

2006. XXI, 530 p.181 illus. including photos and plates, 164 in color. (Advances in Astrobiology and Biogeophysics) Softcover ISBN 3-540-29005-2 ► € 59,95 | £46.00

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#### Lectures in Astrobiology

Vol I : Part 2: From Prebiotic Chemistry to the Origin of Life on Earth Study Edition

**B. Barbier**, Centre de Biophysique Moléculaire, Orleans, France; **H. Martin**, Université Blaise Pascal, Clermont-Ferrand, France; **J. Reisse**, Université Libre de Bruxelles, Belgium (Eds.) Editor-in-chief: **M. Gargaud**  This is the second of a divided two-part softcover edition of the **Lectures in Astrobiology Volume** I containing the sections "General Introduction", "From Prebiotic Chemistry to the Origin of Life on Earth" and "Appendices" including an extensive glossary on Astrobiology.

 2006. XXI, 384 p. (Advances in Astrobiology and Biogeophysics) Softcover
 ISBN 3-540-29004-4 ► € 59,95 | £46.00

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Forthcoming September 2006

### Lectures in Astrobiology

M. Gargaud, Observatoire de l'Université Bordeaux, Florirac, France; H. Martin, Université Blaise Pascal, Clermont-Ferrand, France; P. Claeys, Vrije Universiteit Brussels, Belgium (Eds.)

► Based on material delivered at several summer schools, this book is the first comprehensive textbook at the graduate level encompassing all aspects associated with the emerging field of astrobiology. Volume II gathers another set of extensive lectures covering topics so diverse as the formation and the distribution of elements in the universe, the concept of habitability from both the planetologists' and the biologists' point of view and artificial life. The contributions are held together by the common goal to understand better the origin of life, its evolution and possible existence outside the Earth's realm.

2006. 819 p. (Advances in Astrobiology and Biogeophysics) Hardcover
 ISBN 3-540-33692-3 ► € 149,95 | £115.50

#### **Micrometeorites and the Mysteries of Our Origins**

#### M. Maurette, Orsay-Campus, France

Micrometeorites played an essential role in the formation of the atmosphere of the Early Earth and also served as a significant source of activation for organic prebiotic chemistry on mineral surfaces. This book gives a coherent account of this scenario, embedding the more specific results within a broader framework that considers the creation and evolution of the Early Earth. It thus addresses students and nonspecialist researchers in the fields of planetary atmospheres, biogeophysics and astrobiology. The experienced researcher will find this volume to be a modern and compact reference, as well as a source of material for lectures in this field.

2006. XVI, 325 p. 52 illus. (Advances in Astrobiology and Biogeophysics) Hardcover ISBN 3-540-25816-7 ► € 49,95 | £38.50

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#### 2<sup>nd</sup> EDITION

#### Life in the Universe

**Expectations and Constraints** 

D. Schulze-Makuch, L. N. Irwin, University of Texas at El Paso, TX, USA

The highly praised primer of Astrobiology and the scientific quest for Life in the Universe, now in a softcover edition

 ▶ Well written reference for researchers in Astrobiology, as well as a highly recommended text for students ▶ Explores the operational definition of life, and the natural conditions that can give rise to it
 ▶ Accessible to a broad readership

"I would be happy to use this as a text when teaching undergraduate level astrobiology and would certainly recommend it as a good introduction for postgraduates." (Monica M. Grady Meteoritics and Planetary Science 2005, vol. 40, page 507-508)

"This book is [...] an in-depth, critical look at the chemical and physical requirements of known living; it also considers the possibilities of some highly speculative environments and living systems. The writing is excellent and, despite the technical nature of the subject, should be understandable for those with minimal exposure to math, physics, chemistry, and astronomy." (P. R. Douville, Choice May 2005, vol. 42, page 459) "This book provides an articulate overview of Astrobiology in the Springer Advances in Astrobiology and Biogeophysics series. It contains an introduction chapter that is essentially a summary of the book, a chapter outlining definitions used, then seven more *chapters describing the history of life, known energy* sources for life, types of building blocks, potential solvents, known and possible habitats, examples of exotic life forms, and signatures of life. This is an excellent Astrobiology primer and I highly recommend this as a good reference for all scientists in the field of Astrobiology." (Janice Bishop, Icarus 178 (2005), page 289-290)

1st ed 2004. 2nd printing 2006. XIV, 172 p. (Advances in Astrobiology and Biogeophysics) Softcover ISBN 3-540-30708-7 ► € 34,95 | £27.00

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Now in softcover

#### **Comets and the Origin and Evolution of Life**

P. Thomas, University of Wisconsin, Eau Claire, WI, USA; C. F. Chyba, Princeton University, Princeton, NJ, USA; C. P. McKay, NASA, Moffett Field, CA, USA; R. D. Hicks, University of Wisconsin, Eau Claire, WI, USA (Eds.)

Nine years after the publication of Comets and the Origin and Evolution of Life, one of the pioneering books in Astrobiology, this second edition revisits the role comets may have played in the origins and evolution of life. Recent analyses of Antarctic micrometeorites and ancient rocks in Australia and South Africa, the continuing progress in discovering complex organic macromolecules in comets, protostars and interstellar clouds, new insights into organic synthesis in comets, and numerical simulations of comet impacts on the Earth and other members of the solar system yield a spectacular wealth of new results. This second edition is thus actually a new book. As the first edition it is intended as a comprehensive review of current research, accessible to graduate students and others new to the field. Each chapter was prepared by experts to give an overview of an aspect of the field, and carefully revised by the editors for uniformity in style and presentation.

2nd ed. 2006. Approx. 365 p. 56 illus., some of them in color. (Advances in Astrobiology and Biogeophysics) Hardcover ISBN 3-540-33086-0 ► € 69,95 | £54.00 Originally published as a monograph

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forthcoming

#### Intelligent Life in the Universe

Principles and Requirements behind its Emergence

P. Ulmschneider, Heidelberg

► An intriguing and scientifically well based analysis of the conditions for the emergence of intelligent life on Earth and in the Universe. ► Second edition of a successful pioneering book in Astrobiology.

This book addresses all scientists and others interested in the origins, development and fate of intelligent species in the observable part of our universe. In particular, the author scrutinizes what kind of information about extraterrestrial intelligent life can be inferred from our own biological, cultural and scientific evolution and the likely future of mankind. The first part of the book provides the necessary background information from space and life sciences, thus making the book also accessible to students and the scientifically educated public. In this second edition of Peter Ulmschneider's successful and highly interesting book the author is putting even stronger emphasis on the geological conditions and consequences of life's conquest of land as the pre-condition for the emergence of life with our type of technical intelligence.

"[...] A more detailed and well-referenced approach is Intelligent Life in the Universe by Peter Ulmschneider. He concentrates on planet formation and the characteristics needed for the development of life, the timetable of evolution, and the effects on our planet and others of life becoming intelligent. A lecturer could build an intriguing general science module around this book." (New Scientist, March 22, 2003) "New in this book is the argument that, by thinking

"new in this book is the argument that, by thinking carefully about the future development of mankind, one can gain insight into the nature of extraterrestrial civilizations. [...] An interesting book for what concerns the scientific chapters, and also the speculative part will definitely interest a great number of readers." (Physicalia, 25/4, 2003)

2nd ed. 2006. Approx. 320 p. 156 illus., 37 in color (Advances in Astrobiology and Biogeophysics) Hardcover ISBN 3-540-32836-X ► € 69,95 | £54.00

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#### **The Electromagnetic Spectrum of Neutron Stars**

A. Baykal, S. K. Yerli, Middle East Technical University, Ankara, Turkey; S. C. Inam, Baskent University, Ankara, Turkey; S. Grebenev, Space Research Institute (IKI), Moscow, Russia (Eds.)

This book is devoted to selected lectures presented at he 6th NATO-ASI conference "The Electromagnetic Spectrum of Neutron Stars" in Marmaris, Turkey, held 7-18 June 2004. ► Serves as graduate level of text including the broad range of properties of neutron stars ► Presents spectral information for neutron stars in the broadest sense, including neutrino and gravitational radiation along with the electromagnetic spectrum.

2005. XVII, 386 p. (NATO Science Series II: Mathematics, Physics and Chemistry, Volume 210) Softcover ISBN 1-4020-3860-7 ► € 59,00 | £41.00

2005. XVII, 386 p. (NATO Science Series II: Mathematics, Physics and Chemistry, Volume 210) Hardcover ISBN 1-4020-3859-3 ► € 139,00 | £96.00

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#### **Solar Activity and Earth's Climate**

**R. E. Benestad**, The Norwegian Meteorological Institute, Oslo, Norway

The main purpose of this book is to introduce the reader to the subject of solar activity and the connection with Earth's climate. ► Covers a broad range of topics from the history of solar terrestrial studies to solar activity, the Earth's atmosphere and climatology

► Emphasizes the importance of using established scientific methods to test hypothesised relationships between solar activity and Earth's climate

2nd ed. 2006. XXVI, 316 p. (Springer Praxis Books / Environmental Sciences) Hardcover ISBN 3-540-30620-X ► € 99,95 | £77.00 Jointly published with Praxis Publishing, UK.

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#### An Interdisciplinary Approach

**P. T. Bobrowsky**, Geological Survey of Canada, Ottawa, ON, Canada; **H. Rickman**, Astronomical Observatory of Uppsala, Sweden (Eds.)

In 1908 an atmospheric explosion in northern Siberia released energy equivalent to 15 Mton of TNT. Can a comparable or larger NEO affect us again? When the next NEO strikes Earth will it be large enough to destroy a city? Will the climate change significantly? Can archaeology and anthropology provide insights into the expected cultural responses with NEO interactions? Does society have a true grasp of the actual risks involved? Is the Great Depression a good model for the economic collapse that could follow a NEO catastrophe? This volume provides a necessary link between various disciplines and comet/asteroid impacts.

2006. Approx. 250 p. Hardcover ISBN 3-540-32709-6 ► € 99,95 | £77.00

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forthcoming

#### A Comparison of the Dynamical Evolution of Planetary Systems

Proceedings of the 6th Alexander von Humboldt Colloquium on Celestial Mechanics Bad Hofgastein (Austria), 21-27 March 2004

**R. Dvorak,** Universität Wien, Austria; **S. Ferraz-Mello**, Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Universidade de São Paulo, Brazil (Eds.) Reprinted from **Celestial Mechanics and Dynamical Astronomy** journal, Vol. 92/1-3 2005. VIII, 300 p. Hardcover ISBN 1-4020-4218-3 ► € 99,95 | £77.00

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#### **Chaos and Stability in Planetary Systems**

**R. Dvorak,** F. Freistetter, University of Vienna, Austria; J. Kurths, University of Potsdam, Germany (Eds.)

This book is intended as an introduction to the field of planetary systems at the postgraduate level. It consists of four extensive lectures on Hamiltonian dynamics, celestial mechanics, the structure of extrasolar planetary systems and the formation of planets. As such, this volume is particularly suitable for those who need to understand the substantial connections between these different topics.

2005. XI, 279 p. (Lecture Notes in Physics, Volume 683) Hardcover ISBN 3-540-28208-4 ► € 69,95 | £54.00

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Detailed and comprehensive introduction

#### **Extrasolar Planets**

Saas Fee Advanced Course 31. Swiss Society for Astrophysics and Astronomy

T. Guillot, Observatoire de la Côte d'Azur, Grasse, France; P. Cassen, SETI Institute, Mountain View, CA, USA; A. Quirrenbach, Sterrewacht Leiden, The Netherlands S. Udry, M. Mayor, Observatoire de Genève, Schweiz; W. Benz, Universität Bern, Schweiz; D. Queloz, Observatoire de Genève, Schweiz (Eds.)

Research on extrasolar planets is one of the most exciting fields of activity in astrophysics. In a decade only, a huge step forward has been made from the early speculations on the existence of planets orbiting "other stars" to the first discoveries and to the characterization of extrasolar planets. This breakthrough is the result of a growing interest of a large community of researchers as well as the development of a wide range of new observational techniques and facilities.

Based on their lectures given at the 31st Saas-Fee Advanced Course, Andreas Quirrenbach, Tristan Guillot and Pat Cassen have written up up-to-date comprehensive lecture notes on the "Detection and Characterization of Extrasolar Planets", "Physics of Substellar Objects Interiors, Atmospheres, Evolution" and "Protostellar Disks and Planet Formation".

2006. XIV, 451 p, 140 illus. (Saas-Fee Advanced Courses, Number 31) Hardcover ISBN 3-540-29216-0 ► € 69,95 | £54.00

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#### The Square Kilometre Array: An Engineering Perspective

**P. J. Hall,** International SKA Project Office, Dwingeloo, The Netherlands (Ed.)

This volume is an up-to-date and comprehensive overview of the engineering of the Square Kilometre Array (SKA), a revolutionary instrument which will be the world's largest radio telescope. Expected to be completed by 2020, the SKA will be a pre-eminent tool in probing the Early Universe and in enhancing greatly the discovery potential of radio astronomy in many other fields.

This book, containing 36 refereed papers written by leaders in SKA engineering, has been compiled by

the International SKA Project Office and is the only contemporary compendium available. It features papers dealing with pivotal technologies such as antennas, RF systems and data transport. Also overviews of important SKA demonstrator instruments and key system design issues are included. Practising professionals, and students interested in next-generation telescopes, will find this book an invaluable reference.

Reprinted from **Experimental Astronomy** journal, Vol. 17/1-3 2004. V, 430 p. Hardcover ISBN 1-4020-3797-X ► **€ 129,00 | £99.00** 

Astronomy

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#### The Biographical Encyclopedia of Astronomers

Editor-in-chief: **Thomas Hockey**, University of Northern Iowa, Cedar Falls, IA, USA

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Editors: **Katherine Bracher**, Whitman College, Walla Walla, Washington, USA; **Richard A. Jarrell**, York University, Toronto, ON, Canada; **Jordan D. Marché**, II, University of Wisconsin, Madison, WI, USA; **F. Jamil Ragep**, University of Oklahoma, Norman, OK, USA;

Associate Editor: JoAnn Palmeri, University of Oklahoma, Norman, OK, USA

Assistant Editor: **Marvin Bolt**, Adler Planetarium, Chicago, IL, USA

This new resource for historians, astronomers, and the interested public provides biographical information even on the next generation of astronomers, going beyond existing references, and enhances the information on earlier periods by including many more astronomers and by utilizing contemporary historical scholarship. The two volumes are edited by an editorial board of 9 historians and astronomers. Additional details on the nature of an entry and some summary statistics on the content of entries are provided.

An Appendix of Countries enables researchers to locate astronomers by country, and a comprehensive subject index helps researchers to identify the authors of important scientific topics and treatises.
The collective work of about 400 authors drawn from 40 different countries and numerous institutions around the world, such as the Smithsonian and the Indian Institute of Astrophysics, as well as an editorial board of nine historians and astronomers

► More than 1550 biographical sketches on astronomers broken down into four periods: Ancient-Medieval, Non-Western, Early Modern, and Modern

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pprox. 2000 p. 300 illus., 50 in color. Hardcover ISBN 0-387-31022-3 ► € 399,00 | £307.00 ISBN 0-387-31022-3 ► Prepublication price, valid until February 28, 2007: € 329,00 | £253.00

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Proceedings of an ESO Workshop Held at Garching, Germany, 18-21 November 2003

H. U. Käufl, R. Siebenmorgen, A. F. Moorwood, European Southern Observatory, Garching, Germany (Eds.)

2005. XX, 559 p. (ESO Astrophysics Symposia) Hardcover ISBN 3-540-25256-8 ► € 59,95 | £46.00

#### **High Energy Density Laboratory Astrophysics**

**G. A. Kyrala**, Los Alamos National Laboratory, Los Alamos, NM, USA (Ed.)

Proceedings of a conference, with topics covering: - Hydrodynamic instabilities in astrophysics,-Supernovae and supernova remnant evolution,-Astrophysical shocks, blast waves, and jets,- Stellar opacities,- Radiation and thermal transport,- Dense plasma atomic physics and EOS,- X-ray photoionized plasmas,- Ultrastrong magnetic field generation.

2005. VIII, 401 p. Hardcover ISBN 1-4020-3483-0 ► € 139,00 | £107.00 Reprinted from Astrophysics and Space Science journal, Vol. 298:1-2, 2005.

# ASTRONOWY AND ASTROPHYSICS

forthcoming

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Chronology and Glossary with Data Tables K. R. Lang, Tufts University, Medford, MA, USA

Astronomy and Astrophysics is a comprehensive, fundamental, up-to-date reference book. It is filled with vital information and basic facts for amateur astronomers and professional astrophysicists, and for anyone interested in the Universe, from the Earth and other planets to the stars, galaxies and beyond. Although serious and thorough, the language, and ideas will attract the general reader, as well as students and professionals.

Astronomy and Astrophysics consists of two main parts, a Timeline and a Dictionary. The Timeline is a concise history, arranged chronologically, which provides the complete story of cosmic discovery from early Chinese and Greek astronomy to the latest findings of modern astrophysics and robotic spacecraft. It provides a sense of destination and flow in our growing awareness of the Universe. Each entry in the unfolding narrative is written in a concise, light and friendly style that will be appreciated by all, without being weighted down with incomprehensible specialized terms. The story of science is one of individuals, as well as discoveries and ideas. So our Timeline includes the people who have made major scientific contributions that are related to astronomy, and astrophysics. The Dictionary defines all terms and acronyms that deal with our celestial science, from important concepts to individual objects and space missions. It is arranged alphabetically and complemented by numerous tables of fundamental data for bright cosmic objects, including the celestial coordinates required to observe them. Line drawings are also used to forcefully compact a scientific insight, with clear labels and captions.

An exceptionally thorough Index cross-references concepts, discoveries and individuals in both the Timeline and Dictionary. The combined result is a unique, comprehensive, stand-alone reference volume in which the reader can quickly locate information, while also discovering new and unexpected knowledge.

► Kenneth R. Lang is known for his widely used reference books **Astrophysical Formulae** I, II. See chapter **Astrophysics** on that title from Springer.

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#### **Parting the Cosmic Veil**

K. R. Lang, Tufts University, Medford, MA, USA

► Presents the cosmological voyage of discovery within universal human themes. ► Written in a concise, light and friendly style that will be appreciated by all.

**Parting the Cosmic Veil** describes our gradual awareness of a vast, previously concealed Universe. It is a story of expanding horizons and the discovery of invisible worlds, made possible with new technology and novel telescopes that have broadened our range of perception and sharpened our vision. The Cosmos is evolving, participating in ongoing processes of creation, destruction, and re-birth. But even though we are pushing the boundaries of

knowledge closer to an understanding of the origins

and destinies, of either the Universe or Life, the ultimate answers to these grand questions still lie hidden behind the Cosmic Veil.

Table of contents: -Preface.- Discovering the Unknown.- Brave New Worlds.- Motion, Content and Form.- The Violent Universe.- Illusory Emptiness.- Unanswered Questions.- Timeline of Astronomy, Astrophysics and Cosmology.- Glossary.- Index

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#### Sun, Earth and Sky

K. R. Lang, Tufts University, Medford, MA, USA

This Second Edition of Sun, Earth and Sky updates the popular text by providing comprehensive accounts of the most recent discoveries made by five modern solar spacecraft during the past decade. Their instruments have used sound waves to peer deep into the Sun's inner regions and measure the temperature of its central nuclear reactor, and extended our gaze far from the visible Sun to record energetic outbursts that threaten Earth. Breakthrough observations with the underground Sudbury Neutrino Observatory are also included, which explain the new physics of ghostly neutrinos and solve the problematic mismatch between the predicted and observed amounts of solar neutrinos. This new edition of Sun, Earth and Sky also describes our recent understanding of how the Sun's outer atmosphere is heated to a million degrees,

and just where the Sun's continuous winds come from. As humans we are more intimately linked with our life-sustaining Sun than with any other astronomical object, and the new edition therefore provides modern interpretations of ozone depletion and global warming that are related to both the Sun and to human activities. introduces the Sun and its physics, and describes all aspects of the Sun's interaction with us on Earth.

► Written in a light and friendly style, the text incorporates numerous images from spacecraft and even a few works of modern art ► The new edition surveys our revolutionized understanding of the Sun, and presents a number of images never before seen in print

2nd ed. 2006. XV, 300 p. 133 illus., 61 in color. Hardcover ISBN 0-387-30456-8 ► € 46,95 | £36.00

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#### **Space Weather, Environment and Societies**

J. Lilensten, J. Bornarel, Grenoble University (Université Joseph Fourier), France

Space Weather is the developing field within astronomy that aims at predicting the sun's violent activity and minimizing the impacts on our daily lives. **Space Weather, Environment, and Societies** explains why our technological societies are so dependent on solar activity and how the Sun disturbs the transmission of information and energy. Footnotes expand specific points and the appendices facilitate a more thorough command of the physics involved.

► Written in such a way that people without a physics background can understand it.

2006. XIII, 242p. Hardcover ISBN 1-4020-4331-7 ► € 99,00 | £76.00

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#### The Hands-On Guide for Science Communicators

A Step-by-Step Approach to Public Outreach

L. Lindberg Christensen, ESA/Hubble Space Telescope, Munich, Germany

This **Guide** touches upon all aspects of science communication, revealing a tightly interwoven fabric of issues: product types, target groups, written communication, visual communication, validation processes, practices of efficient workflow, distribution, promotion, advertising and much more. New science communicators will find this **Guide** both helpful and inspirational.

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#### From X-ray Binaries to Quasars: Black Holes on All Mass Scales

T. J. Maccarone, University of Southampton, UK; R. P. Fender, University of Amsterdam, The Netherlands; L. C. Ho, Carnegie Observatories, Pasadena, CA, USA (Eds.)

Brings together contributions from many of the world's leading authorities on black hole accretion.
 The papers represent part of a new movement to make use of the relative advantages of studying stellar mass and supermassive black holes and to

bring together the knowledge gained from the two approaches. ► The topics covered are: variability, spectroscopy, disk-jet connections, and multi-wavelength campaigns on black holes.

Reprinted from **Astrophysics and Space Science** journal, Vol. 300/1-3 2005. VI, 288 p. Hardcover ISBN 1-4020-4084-9 ► € **99,95 | £77.00** 

![](_page_11_Picture_16.jpeg)

![](_page_11_Picture_17.jpeg)

#### **Satellite Orbits**

#### Models, Methods and Applications

**O. Montenbruck, E. Gill,** Deutsches Zentrum für Luft-und Raumfahrt (DLR) e.V., Weßling, Germany

Third corrected printing of the modern textbook that guides the reader through the theory and practice of satellite orbit prediction and determination. Starting from the basic principles of orbital mechanics, it covers elaborate force models as well as precise methods of satellite tracking. Emphasis is on numerical treatment and a multitude of algorithms adopted in modern satellite trajectory computation are described in detail. The accompanying CD-ROM includes all source codes written in C++ and relevant data files for applications. The result is a powerful and unique spaceflight dynamics library which allows easy software extensions by the user. An extensive collection of Internet resources is provided through links to detailed and frequently updated online information on spaceflight dynamics. Both authors are working for the German Space Flight Center near Munich and the book reflects their own long experience in this field.

From the reviews of the first edition: "Not many books on the topic of satellite orbits over the past decades have been informative, comprehensive and practical. I am happy to say that this publication does fall into that category. [...] This book should certainly be in the library of students and scientists working in the fields of navigation, geodesy, and spaceflight technology, as well as satellite engineers and operators focusing on spaceflight dynamics." (The Observatory, 2001)

Ist ed. 2000. Corr. 3rd printing 2005. XI, 369 p.
 illus., 10 in color. With CD-ROM. Hardcover
 ISBN 3-540-67280-X ► € 64,95 | £50.00

#### **Natural Fullerenes and Related Structures of Elemental Carbon**

### **F. J. Rietmeijer,** University of New Mexico, Albuquerque, NM, USA (Ed.)

This book provides an up-to-date summary of the state of knowledge on natural fullerene occurrences and the laboratory techniques used to determine their presence at low concentration in rock samples. The book demonstrates that natural fullerenes exist and should be searched for in places not yet considered such as carbon-containing deep-seated crustal rocks. ► For professional astronomers, meteoriticists, earth and planetary scientists, biologists and chemists interested in carbon and hydrocarbon vapor condensation.

2006. Approx. 320 p. (Developments in Fullerene Science, Volume 6) Hardcover ISBN 1-4020-4134-9 ► € 129,95 | £100.00

![](_page_12_Picture_7.jpeg)

#### Deep Impact Mission: Looking Beneath the Surface of a Cometary Nucleus

C. Russell, University of California, Los Angeles, USA (Ed.)

Deep Impact, or at least part of the flight system, is designed to crash into comet 9P/Tempel 1. This bold mission design enables cometary researchers to peer into the cometary nucleus, analyzing the excavated material with its imagers and spectrometers. The book describes the mission, its objectives, expected results, payload, and data products in articles written by those most closely involved. This mission has the potential of revolutionizing our understanding of the cometary nucleus.

2005. VII, 396 p. Hardcover ISBN 1-4020-3599-3 ► € 148,95 | £114.50 Reprinted from **Space Science Reviews**, Vol. 117:1-2, 2005

![](_page_12_Picture_13.jpeg)

### Dictionary of Minor Planet Names Addendum to Fifth Edition: 2003 - 2005

Prepared on Behalf of Commission 20 Under the Auspices of the International Astronomical Union

L. Schmadel, Universität Heidelberg; L. D. Schmadel, Astronomisches Rechen-Institut, Heidelberg, Germany

This **Addendum to the Dictionary of Minor Planet Names, fifth edition**, which is the official reference for the field of the IAU, contains all newly published names from the period 2003-2005 as well as corrections and amendments to earlier editions. In total the **Dictionary of Minor Planet Names** now covers some 12000 named minor planets. It provides authoritative information about the basis for the rich and colorful variety of ingenious names, from heavenly goddesses to more prosaic constructions.

2006. Approx. 400 p. Hardcover ISBN 3-540-34360-1 ► € 99,95 | £77.00

![](_page_12_Picture_20.jpeg)

Adds more than 2000 names to the Dictionary of Minor Planet Names

#### **Dictionary of Minor Planet Names**

Prepared on Behalf of Commission 20 Under the Auspices of the International Astronomical Union

L. Schmadel, Universität Heidelberg; L.D. Schmadel, Astronomisches Rechen-Institut, Heidelberg, German

Dictionary of Minor Planet Names, fifth edition, is the official reference for the field of the IAU, which serves as the internationally recognised authority for assigning designations to celestial bodies and any surface features on them. The accelerating rate of the discovery of minor planets has not only made a new edition of this established compendium necessary but has also significantly altered its scope: this thoroughly revised edition concentrates on the approximately 10,000 minor planets that carry a name. It provides authoritative information about the basis for all names of minor planets. In addition to being of practical value for identification purposes, this collection provides a most interesting historical insight into the work of those astronomers who over two centuries vested their affinities in a rich and colorful variety of ingenious names, from heavenly goddesses to more prosaic constructions. The fifth edition serves as the primary reference, with plans for supplementary booklets with newly named bodies to be issued every three years.

2003. XVI, 992 p.Hardcover ISBN 3-540-00238-3 ► € 149,95 | £115.50

![](_page_12_Picture_28.jpeg)

![](_page_13_Picture_2.jpeg)

![](_page_13_Picture_3.jpeg)

#### **Extragalactic Astronomy and Cosmology**

#### **An Introduction**

P. Schneider, Universität Bonn, Germany

Starting with the description of our home galaxy the Milky Way, this cogently written textbook introduces the reader to the astronomy of galaxies, their structure, active galactic nuclei, evolution and large scale distribution. Then, from the extensive and thorough introduction to modern observational and theoretical cosmology, the text turns to the formation of structures and astronomical objects in the early universe.

In particular, Peter Schneider's **Extragalactic Astronomy and Cosmology** has the goal of imparting the fundamental knowledge of this fascinating subfield of astronomy, while leading readers to the forefront of astronomical research. But it seeks to accomplish this not only with extensive textual information and insights. In addition, the author's evident admiration for the workings of the universe that shines through the lines and the many supporting color illustrations will deeply inspire the reader.

While this book has grown out of introductory university courses on astronomy and astrophysics, it will not only be appreciated by undergraduate students and lecturers. Through the comprehensive coverage of the field, even graduate students and researchers specializing in related fields will appreciate it as reliable reference.

► Written by Peter Schneider, a specialist in extragalactic astronomy and proven textbook author.

2006. Approx. XV, 500 p. 331 illus., some of them in color. Hardcover
 ISBN 3-540-33174-3 ► € 59,95 | £46.00

Gravitational Lensing: Gravitational Lensing: Strong, Weak and Micro

![](_page_13_Picture_14.jpeg)

#### Gravitational Lensing: Strong, Weak and Micro

Saas-Fee Advanced Course 33. Swiss Society for Astrophysics and Astronomy

P. Schneider, C. Kochanek, J. Wambsganss, G. Meylan, P. Jetzer, P. North (Eds.)

The theory, observations, and applications of gravitational lensing constitute one of the most rapidly growing branches of astrophysics. The gravitational deflection of light generated by mass concentrations along a light path produces magnification, multiplicity, and distortion of images and delays photon propagation from one line of sight relative to another. The huge amount of scientific work produced over the last decade on gravitational lensing has clearly revealed its already substantial and wide impact and its potential for future astrophysical applications.

The up-to-date contributions in this book are based on the lecture notes of the 33rd Saas–Fee Advanced Course of the Swiss Society of Astronomy and Astrophysics, entitled Gravitational Lensing: Strong, Weak, and Micro. The book comprises four complementary parts, written by leading experts in the field, constituting a genuine textbook about gravitational lensing.

2006. XVI, 552 p., 196 illus., 36 in color (Saas-Fee Advanced Courses, Number 33) Hardcover ISBN 3-540-30309-X ► € **79,95 | £61.50** 

#### **Neutrinos and Explosive Events in the Universe**

Proceedings of the NATO Advanced Study Institute, held in Erice, Italy, 2-13 July 2004

M. M. Shapiro, University of Maryland, College Park, MD, USA; T. Stanev, University of Delaware, Newark, DE, USA; J. P. Wefel, Louisiana State University, Baton Rouge, LA, USA (Eds.) 2005. XII, 424p. (NATO Science Series II: Mathematics, Physics and Chemistry, Volume 209) Hardcover ISBN 1-4020-3746-5 ► € 149,00 | £103.00 | \$199.00

2005. XII, 424 p. (NATO Science Series II: Mathematics, Physics and Chemistry, Volume 209) Softcover ISBN 1-4020-3747-3 ► € 69,00 | £48.00

#### The Universe of Fluctuations

#### The Architecture of Spacetime and the Universe

**B. Sidharth**, B.M. Birla Science Centre, Adarsh Nagar, Hyderabad, India

This is a path-breaking work which proposes solutions to the impasse and crisis facing fundamental physics and cosmology. It gives a unique overview

### of the role of overdensities and fluctuations in cosmology.

2005. X, 184 p. (Fundamental Theories of Physics, Volume 147) Hardcover ISBN 1-4020-3785-6 ► **€ 89,00 | £62.00** 

#### A Century of Ideas

Personal Perspectives from a Selection of the Greatest Minds of the Twentieth Century

**B. Sidharth**, B.M. Birla Science Centre, Adarsh Nagar, Hyderabad, India (Ed.)

A valuable collection of lectures by Nobel Laureates and scientists of equal caliber on frontier topics in Physics and Astronomy. The transcript of each lecture is preceded by a short introduction to, and biography of, the Nobel Laureate/Scientist in question. The lectures are aimed at, and accessible to, a wide non-specialist but higher educated audience.

2006. Approx. 245 p. (Fundamental Theories of Physics, Volume 149) Hardcover ISBN 1-4020-4359-7 ► **€ 99,00 | £76.00**  forthcoming

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a powerful central access point for researchers and scientists

#### **Dynamics of Extended Celestial Bodies And Rings**

J. Souchay, Observatoire de Paris, France (Ed.)

Taking both a theoretical and observational perspective, this book is an introduction to recent developments in the field of celestial mechanics. It emphasizes the application to extended celestial bodies and devotes much attention to rotational aspects. In particular, it explains the state of art for accurate modelling of the rotation of celestial bodies such as the Earth, the Moon, and Mercury, which involves principles related to hydrodynamics and geodesy. Comparisons between the light curves of the asteroids and their rotational state are made and spatial techniques leading to the determination of the Earth's gravitational field are explained. Also, the book provides a general overview of the collisional processes in the solar system and of the dynamics of the rings.

2006. XII, 207 p. (Lecture Notes in Physics, Volume 682) Hardcover ISBN 3-540-28024-3 ► € 59,95 | £46.00

![](_page_14_Picture_22.jpeg)

#### **Planetary Nebulae Beyond the Milky Way**

Proceedings of the ESO Workshop held at Garching, Germany, 19-21 May, 2004

The first book specifically devoted to planetary nebulae beyond the milky way.

L. Stanghellini, NOAO, Tucson, AZ, USA; J. Walsh, European Southern Observatory, Garching, Germany; N. Douglas, University of Groningen, The Netherlands (Eds.)

2006. XV, 370 p. (ESO Astrophysics Symposia) Harcover ISBN 3-540-31011-8 ► € **79,95 | £61.50** 

![](_page_15_Picture_2.jpeg)

Astronomical Image and Data Analysis

![](_page_15_Picture_4.jpeg)

#### Astronomical Image and Data Analysis

J. Starck, Centre d'Etudes de Saclay, Gif-sur-Yvette, France; F. Murtagh, Queen's University Belfast, UK

With information and scale as central themes, this comprehensive survey explains how to handle real problems in astronomical data analysis using a modern arsenal of powerful techniques. It treats those innovative methods of image, signal, and data processing that are proving to be both effective and widely relevant. The authors are leaders in this rapidly developing field and draw upon decades of experience. They have been playing leading roles in international projects such as the Virtual Observatory and the Grid.

The book addresses not only students and professional astronomers and astrophysicists, but also serious amateur astronomers and specialists in earth observation, medical imaging, and data mining. The coverage includes chapters or appendices on: detection and filtering; image compression; multichannel, multiscale, and catalog data analytical methods; wavelets transforms, Picard iteration, and software tools.

This second edition of Starck and Murtagh's highly appreciated reference again deals with topics that are at or beyond the state of the art. It presents material which is more algorithmically oriented than most alternatives and broaches new areas like ridgelet and curvelet transforms. Throughout the book various additions and updates have been made.

► Unique especially in its treatment of wavelet analysis ► Can also be used for classroom work

"This book is an authoritative and thorough account of numerous mathematical techniques used by research astronomers and I can strongly recommend it for those purposes." (C.R. Kitchin, Astronomy Now, Oct. 2003)

2nd ed. 2006. 360 p. 139 illus., 27 in color. (Astronomy and Astrophysics Library) Hardcover ISBN 3-540-33024-0 ► € 89,95 | £69.00

![](_page_15_Picture_14.jpeg)

#### Chaotic Worlds: from Order to Disorder in Gravitational N-Body Dynamical Systems

Proceedings of the NATO Advanced Study Institute on Chaotic Worlds: from Order to Disorder in Gravitational N-Body Dynamical Systems, held in Cortina, Italy, 8-20 September 2003

B. Steves, Glasgow Caledonian University, UK; A. Maciejewski, University of Zielona Gora, Poland; M. Hendry, University of Glasgow, UK (Eds.) 2006. Approx. 345 p. (NATO Science Series II: Mathematics, Physics and Chemistry, Volume 227) Hardcover ISBN 1-4020-4704-5 ► € 129,95 | £100.00

2006. Approx. 360 p. (NATO Science Series II: Mathematics, Physics and Chemistry, Volume 227) Softcover ISBN 1-4020-4705-3 ► € 59,95 | £46.00

#### **Planetary Nebulae as Astronomical Tools**

International Conference on Planetary Nebulae as Astronomical Tools Gdansk, Poland, 28 June-2 July 2005

**R. Szczerba**, N. Copernicus Astronomical Center, Torun, Poland; **G. Stasinska**, Observatoire de Meudon, Meudon, France; **S. K. Górny,** N. Copernicus Astronomical Center, Torun, Poland (Eds.)

2005. 382 p. (AIP Conference Proceedings / Astronomy and Astrophysics, Volume 804) Softcover ISBN 0-7354-0294-9 ► € 198,00 | £152.50

#### **IFAE 2005**

XVII Incontri di Fisica delle Alte Energie - 17th Italian Meeting on High Energy Physics

Catania, Italy, 30 March-2 April 2005 A. Tricomi, S. Albergo, M. Chiorboli, University of Catania, Italy (Eds.)

Distinguished scientists discuss relevant topics of particle physics, cosmic ray and neutrino physics, as well as detector and accelerator technologies.

Topics included are: the standard model, SUSY and beyond the standard model, heavy flavor physics, neutrinos and cosmic rays, as well as detectors and new technologies.

2005. XVIII, 324 p. (AIP Conference Proceedings, Volume 794) Softcover ISBN 0-7354-0285-X ► € 191,00 | £147.00

#### **Tools of Radio Astronomy**

#### **Problems and Solutions**

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the language of science

T. L. Wilson, ESO, Garching, Germany; S. Hüttemeister, Zeiss Planetarium Bochum, and Ruhr-Universität Bochum, Germany

Covering topics of radio astronomy, this book contains graduate-level problems with carefully presented solutions. The problems are arranged following the content of the book **Tools of Radio Astronomy** by K. Rohlfs and T.L.Wilson (also available in this series) on a chapter-by-chapter basis. Some of these problems have been formulated to provide an extension to the material presented in

#### Tools of Radio Astronomy.

From the reviews : "In your library you should have already another book, **Tools of Radio Astronomy** by Rohlfs and Wilson (A&A Library). The present text is its companion. Here we are given graduate level problems, chapter by chapte, with answers for that book. Now this sounds an excellent thing for students, does it not? The reviewer wishes he had had such help and guidance." The Irish Astronomical Journal, 2001

 1st ed. 2000. Corr. 2nd printing 2005. X, 162 p. 36 illus.

 (Astronomy and Astrophysics Library) Softcover

 ISBN 3-540-66802-0 ► € 34,95 | £27.00

![](_page_16_Picture_9.jpeg)

**Corrected second printing** 

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### **Astrophysics**

![](_page_17_Picture_3.jpeg)

Reprinted now as paperback

#### **Cosmology and Particle Astrophysics**

L. Bergström, A. Goobar, Stockholm University, Sweden

► Highly readable, yet comprehensive introduction to particle astrophysics ► Recommended by lecturers

Beginning with some basic facts about the observable universe the authors consider in successive chapters the complete range of topics that make up a degree course in cosmology and particle astrophysics. The outstanding feature of this book is that it is self-contained, in that no specialised knowledge is required on the part of the reader, apart from basic undergraduate mathematics and physics. This paperback edition will again target students of physics, astrophysics and cosmology at the advanced undergraduate level or early graduate level. One of the book's biggest strong points is that the authors rapidly involve students in the most exciting of today's developments in the field in a simple and self-contained manner, relegating the more technical aspects to appendices. The worked examples throughout the book, and summaries at the end of each chapter, which were expanded in the second edition, have been very well received by students.

2nd ed. 2004. 2nd printing 2006. XVI, 270 p. (Springer Praxis Books / Astronomy and Planetary Sciences) Softcover ISBN 3-540-32924-2 ► € 49,95 | £38.50 Joint published with Praxis Publishing, UK

#### New Vistas in Dusty Plasmas

Fourth International Conference on the Physics of Dusty Plasmas

Orleans, France, 13-17 June 2005

L. Boufendi, M. Mikikian, Université d'Orléans, France; P. K. Shukla, Ruhr-Universität Bochum, Germany (Eds.)

2005. XV, 594 p. (AIP Conference Proceedings / Plasma Physics, Volume 799) Hardcover ISBN 0-7354-0287-6 ► € 222,00 | £171.00 | \$178.00

#### Topical Workshop on Low Radioactivity Techniques LRT 2004

Sudbury, Ontario, Canada, 12-14 December 2004

B. Cleveland, R. Ford, SNOLAB, Lively, ON, Canada; M. Chen, Queen's University, Kingston, ON, CANADA (Eds.)

2005. X, 285 p. (AIP Conference Proceedings, Volume 785) Hardcover

ISBN 0-7354-0274-4 ► € 183,00 | £141.00

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#### Astrophysical Sources of High Energy Particles and Radiation

Torun, Poland, 20-24 June 2005

N. T. Bulik, N. B. Rudak, Nicolaus Copernicus Astronomical Center, Warsaw, Poland; G. Madejski, Stanford Linear Accelerator Center, Menlo Park, CA, USA (Eds.)

The main purpose of this conference was to present an overview of the current state of research in the area of high energy astrophysics. In particular, the mechanisms of particle acceleration, generation of high energy radiation, and polarization properties of such emission were discussed. A broad range of compact and diffuse sources, ranging from stellar to extragalactic objects are covered.

2005. XIII, 418 p. (AIP Conference Proceedings / Astronomy and Astrophysics, Volume 801) Hardcover ISBN 0-7354-0290-6 ► € **192,00** | **±147.50** 

![](_page_18_Picture_2.jpeg)

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#### **Interacting Binaries**

Accretion, Evolution, Outcomes Cefalu, Sicily, 4-10 July 2004.

L. Burderi, L. A. Antonelli, F. D'Antona, Astronomical Observatory of Rome, Monte Porzio Catone, Italy; T. Di Salvo, University of Palermo, Italy; L. Piersanti, A. Tornambè, O. Straniero, Astronomical Observatory of Teramo, Italy (Eds.)

This conference examines the progress in the field of interacting binaries discussing a number of relevant astrophysical problems regarding the interaction between stars in binary systems, such as the physics of neutron stars and black holes that accrete matter from their companion stars and the study of the end points of stellar evolution, like supernovae and gamma-ray bursts. This proceedings provides an updated overview of both observations and theory.

2005. XX, 670 p. (AIP Conference Proceedings, Volume 797) Hardcover ISBN 0-7354-0286-8 ► € 231,00 | £177.50

#### **Compact Objects in Astrophysics**

#### White Dwarfs, Neutron Stars and Black Holes

M. Camenzind, Landessternwarte, Heidelberg, Germany

This book gives a comprehensive introduction and up-to-date overview about the physical processes at work in White Dwarfs, Neutron Stars and Black Holes. After a presentation of the taxonomy of compact objects, the basic principles of General Relativity are given. The author then discusses in detail the physics and observations of White Dwarfs and Neutron Stars (including the most recent equations of state for neutron star matter), the Gravitational Field of Rapidly Rotating Compact Objects, Rotating Black Holes (including ray tracing and black hole magnetospheres), gravitational waves and our new understanding of accretion processes by means of the magnetorotational instability of accretion disks.

► A book for graduate students and advanced researchers containing exercises and solutions

2006. Approx. 600 p. (Astronomy and Astrophysics Library) Hardcover ISBN 3-540-25770-5 ► € **74,95** | **±57.50** 

![](_page_18_Picture_26.jpeg)

![](_page_19_Picture_2.jpeg)

#### **The Initial Mass Function 50 Years Later**

E. Corbelli, F. Palla, INAF Osservatorio Astrofisico di Arcetri, Firenze, Italy; H. Zinnecker, Astrophysikalisches Institut Potsdam, Germany (Eds.)

► Covers all aspects of the current research in this field, as testified by the large number of contributing scientists

This book presents the proceedings of a conference held in celebration of the 50th anniversary of the introduction of the Initial Mass Function (IMF) concept by Ed Salpeter along with Ed Salpeter's 80th birthday. It provides a vast amount of information, and updates the Herstmonceux book on the IMF. This volume goes far beyond a regular proceedings in that it presents a large collection of long reviews on IMF determinations in the Galaxy, in galaxies, and in the Early Universe. In addition, the book includes reviews on the deep implications of the IMF on star formation theories, and on the physical conditions of the gas before and after star formation. As a consequence, the reader will find a lot of basic information needed for graduate courses on Stellar Evolution, Star Formation, Interstellar Medium, Galactic Dynamics, Formation and Evolution of Galaxies. The book covers all aspects of the current research in this field, as testified by the large number of contributing scientists.

2005. XX, 543 p. (Astrophysics and Space Science Library, Volume 327) Hardcover ISBN 1-4020-3406-7 ► € 159,00 | £110.00

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![](_page_19_Picture_10.jpeg)

#### The Many Scales in the Universe JENAM 2004 Astrophysics Reviews

J. Del Toro Iniesta, E. Alfaro, Instituto de Astrofisica de Andalucía,, CSIC, Granada, Spain; J. Gorgas, Universidad Complutense de Madrid, Spain; E. Salvador-Solé, Universitat de Barcelona, Spain; H. Butcher, ASTRON, Dwingelo, The Netherlands (Eds.)

The book gathers the invited talks to the XIII JENAM conference, organized this time by the

European Astronomical Society (EAS) and the Spanish Astronomical Society (SEA), and hosted by the Instituto de Astrofísica de Andalucía (CSIC). All branches of astrophysics are encompassed from the largest scales and cosmology to the solar system and the Sun, through the galaxies and the stars, including a section on astronomical instrumentation.

2006. XVII, 295 p. With CD-ROM. Hardcover ISBN 1-4020-4351-1 ► € 134,95 | £104.00

![](_page_19_Picture_16.jpeg)

#### **High-Energy-Density Physics**

Fundamentals, Inertial Fusion, and Experimental Astrophysics

R. P. Drake, University of Michigan, MI, USA

The raw numbers of high-energy-density physics are amazing: shock waves at hundreds of km/s (approaching a million km per hour), temperatures of millions of degrees, and pressures that exceed 100 million atmospheres. This book introduces the reader to the fundamental tools and discoveries of high-energy-density physics. It surveys the production of high-energy-density conditions, the fundamental plasma and hydrodynamic models that can describe them and the problem of scaling from the laboratory to the cosmos. Connections to astrophysics are discussed throughout. The book is intended to support coursework in high-energydensity physics, to meet the needs of new researchers in this field, and also to serve as a useful reference on the fundamentals.

2006. XV, 534 p. 171 illus. (Shock Wave and High Pressure Phenomena) Hardcover
 ISBN 3-540-29314-0 ► € 79,95 | £61.50

#### Astrophysics

#### springer.com

#### Comets

#### Nature, Dynamics, Origin, and their Cosmogonical Relevance

J. A. Fernández, University of Montevideo, Uruguay

The book covers the most recent ideas about the nature and dynamics of comets, including a thorough discussion on Oort cloud dynamics which has not received due attention in other books on the subject. It also discusses the most relevant aspects of the physics and chemistry of comet nuclei, highlighting their importance as relics of the protoplanetary disk and, perhaps, as carriers of water and organics that permitted the development of life on Earth. The book contains several tables with useful data, and an ample bibliography covering the most recent work as well as some historical key contributions to the subject. It may be suitable as a textbook for graduate students with some basic knowledge of celestial mechanics and astrophysics, as well as a consult book for comet researchers, or researchers from other related fields willing to start working on comets, or get an updated view of the subject.

2005. X, 383 p. (Astrophysics and Space Science Library, Volume 328) Hardcover ISBN 1-4020-3490-3 ► € 119,00 | £91.50

![](_page_20_Picture_8.jpeg)

#### **Astrophysical Disks**

#### **Collective and Stochastic Phenomena**

A. M. Fridman, Institute of Astronomy, Moscow, Russia; M. Y. Marov, Keldysh Institute of Applied Mathematics, Moscow, Russia; I. G. Kovalenko, Volgograd State University, Russia (Eds.)

► Good summary of collective/stochastic processes in the astrophysical disks formation/structure/evolution and in-depth study of different approaches in their modelling with the use of computational tools. The book deals with collective and stochastic processes in astrophysical disks involving theory, observations, and the results of modelling. Among others, it examines the spiral-vortex structure in galactic and accretion disks, stochastic and ordered structures in the developed turbulence. It also describes sources of turbulence in the accretion disks, internal structure of disk in the vicinity of a black hole, numerical modelling of Be envelopes in binaries, gaseous disks in spiral galaxies with shock waves formation, observation of accretion disks in a binary system and mass distribution of luminous matter in disk galaxies.

The editors adeptly brought together collective and stochastic phenomena in the modern field of astrophysical disks, their formation, structure, and evolution involving the methodology to deal with, the results of observation and modelling, thereby advancing the study in this important branch of astrophysics and benefiting professional researchers, lecturers, and graduate students.

2006. Approx. 360 p. (Astrophysics and Space Science Library, Volume 337) Hardcover ISBN 1-4020-4347-3 ► € 119,95 | £92.50

![](_page_20_Picture_16.jpeg)

### Solar Journey: The Significance of our Galactic Environment for the Heliosphere and Earth

P. Frisch, University of Chicago, IL, USA (Ed.)

This book lays the foundation for an interdisciplinary study of the influence of interstellar material on the solar system and Earth as we travel through the Milky Way Galaxy. The solar wind bubble responds dynamically to interstellar material flowing past the Sun, regulating interstellar gas, dust, and cosmic particle fluxes in the interplanetary medium and the Earth. Cones of interstellar gas and dust focused by solar gravity, the magnetospheres of the outer planets, and cosmic rays at Earth all might yield the first hints of changes in our galactic environment. Twelve articles from leading experts in diverse fields discuss the physical changes expected as the heliosphere adjusts to its galactic environment. Topics include the interaction between the solar wind and interstellar dust and gas, cosmic ray modulation, magnetospheres, temporal variations in the solar environment, and the cosmic ray isotope record preserved in paleoclimate data.

2006. Approx. 420 p. (Astrophysics and Space Science Library, Volume 338) Hardcover ISBN 1-4020-4397-X ► € 129,95 | £100.00

![](_page_20_Picture_22.jpeg)

![](_page_20_Picture_23.jpeg)

#### **Nuclear Physics in Astrophysics II**

Refereed and Selected Contributions, ATOMKI,Debrecen, Hungary, 16-20 May 2005

Z. Fülöp, G. Gyürky, E. Somorjai (Eds.)

2006. Approx. 250 p. Hardcover ISBN 3-540-32842-4 7 € 169,95 | £130.50

![](_page_21_Picture_6.jpeg)

### The first comprehensive monograph on this topic

#### Solar-Type Activity in Main-Sequence Stars

**R. Gershberg,** Crimean Astrophysical Observatory, Crimea, Ukraine Transl. from Russian: **S. Knyazeva** 

Solar-type activity over the whole range of the electromagnetic spectrum is a phenomenon inherent in the majority of low- and moderate-mass main sequence stars. In this monograph observational results are summarized in a systematic and comprehensive fashion. The analysis of the various manifestations of such stellar activity leads to the identification of these phenomena with macroscopic non-linear processes in a magnetized plasma. Comparative study of flare stars and the Sun has become increasingly fruitful and is presently an active field of research involving stellar and solar physicists, experts in plasma physics and high-energy astrophysicists. This book provides them with both an introduction and overview of observational results from the first optical photometry and spectroscopy, from the satellite telescopes International Ultraviolet Explorer to Hubble Space Telescope, XMM-Newton and Chandra, as well as with the present physical interpretation of solar-type activity in main sequence stars. Gershberg's 40-year career studying UV Cet type stars and related objects enables him to provide readers with expert insight into the characteristics of such stars in both the quiescent state and during flares and the reliability of the data over the electromagnetic spectrum and wide temporal scales.

2005. XII, 494 p. 69 illus. (Astronomy and Astrophysics Library) Hardcover ISBN 3-540-21244-2 ► € 99,95 | £77.00

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forthcoming

#### Fundamental Questions in Astrophysics: Guidelines for Future UV

#### **Observatories**

**A. I. Gómez de Castro,** Instituto de Astronomía y Geodesia, Madrid, Spain; **W. Wamsteker,** ESA-VILSPA, Madrid, Spain (Eds.)

Modern astrophysics is a mature science that has evolved from its early phase of discovery and classification to a physics-oriented discipline focused on finding answers to fundamental problems ranging from cosmology to the origin and diversity of lifesustainable systems in the Universe. For this very reason, progress of modern astrophysics requires access to the electromagnetic spectrum in the broadest energy range. The Ultraviolet is a fundamental energy domain since it is one of the most powerful tools to study plasmas at temperatures in the 3,000-300,000 K range as well as electronic transitions of the most abundant molecules in the Universe. Moreover, the UV radiation field is a powerful astrochemical and photoionizing agent. This book describes the fundamental problems in modern astrophysics that cannot progress without easy and wide-spread access to modern UV instrumentation.

2006. Approx. 300 p. Hardcover ISBN 1-4020-4838-6 ► € 109,95 | £84.50 Reprinted from Astrophysics and Space Science journal 303:1-4

#### Magnetic Fields in the Universe

From Laboratory and Stars to Primordial Structures Angra dos Reis, Brazil, 28 November - 3 December 2004

E. M. de Gouveia Dal Pino, Universidade de São Paulo, Brazil; G. Lugones, Università di Pisa, Italy; A. Lazarian,

#### University of Wisconsin, Madison, WI, USA (Eds.)

2005. XXII, 460 p. With CD-ROM. (AIP Conference Proceedings / Astronomy and Astrophysics, Volume 784) Hardcover ISBN 0-7354-0273-6 ► € 231,00 | £177.50

#### **Neutron Stars 1**

#### Equation of State and Structure

**P. Haensel**, Copernicus Astronomical Center, Warszawa, Poland; **A. Potekhin, D. Yakovlev**, loffe Physical Technical Institute, St. Petersburg, Russia

The book gives an extended review of theoretical and observational aspects of neutron star physics. With masses comparable to that of the Sun and radii of about ten kilometres, neutron stars are the densest stars in the Universe. This book describes all layers of neutron stars, from the surface to the core, with the emphasis on their structure and equation of state. Theories of dense matter are reviewed, and used to construct neutron star models. Hypothetical strange quark stars and possible exotic phases in neutron star cores are also discussed. Also covered are the effects of strong magnetic fields in neutron star envelopes and a comparison on neutron star models with observations.

2007. Approx. 600 p. (Astrophysics and Space Science Library, Volume 326) Hardcover ISBN 0-387-33543-9 ► € 114,95 | £88,50

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#### **Astrophysical Concepts**

M. Harwit, Cornell University, Ithaca, NY, USA

This classic text - aimed at senior undergraduates and beginning graduate students in physics and astronomy - presents a wide range of concepts in sufficient depth to give the reader a quantitative understanding of the subject. Emphasising physical concepts, it provides the student with a series of astrophysical sketches, concluding with a synthesis of all the subjects discussed in the book, sketching the history of the universe from its beginning to the formation of the Sun and the planets. For this fourth edition, nearly every part of the text has been rewritten; new sections have been added to cover recent advances in our understanding of black holes, the formation of galaxies and clusters, and the evolution of the Universe. From reviews of the previous editon: "a clear, solid introduction to astrophysics ... that shows how physics can be applied to astronomical objects ... One of the strong points is the problems (that) give students a real feel for the sort of calculations astronomers must do ... were I teaching a junior/senior astrophysics course, this is the book I would use." American Journal of Physics "This is a popular book among professional astrophysicists, produced with that meticulous detail and completeness of the house of Springer ... This is indeed a theoretician's book [and] Harwit has made a prodigious effort in organizing all this information in a logical sequence ... A masterly mathematical exposition of a galaxy of astrophysical processes." Astronomy

4th ed. 2006. Approx. 700 p. 168 illus. (Astronomy and Astrophysics Library) Hardcover ISBN 0-387-32943-9 ► € 69,95 | £54.00

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![](_page_22_Picture_21.jpeg)

![](_page_23_Picture_2.jpeg)

### A must read to understand the astronomy community

#### **Organizations and Strategies in Astronomy 6**

**A. Heck**, Strasbourg Astronomical Observatory, France (Ed.)

This book is the sixth volume under the title **Organizations and Strategies in Astronomy** (OSA). The OSA series is intended to cover a large range of fields and themes. In practice, one could say that all aspects of astronomy-related life and environment are considered in the spirit of sharing specific expertise and lessons learned.

The chapters of this book are dealing with sociodynamical aspects of the astronomy (and related space sciences) community: characteristics of organizations, strategies for development, legal issues, operational techniques, observing practicalities, educational policies, journal and magazine profiles, public outreach, publication studies, relationships with the media, research communication, evaluation and selection procedures, research indicators, national specificities, contemporary history, and so on.

The experts contributing to this volume have done

their best to write in a way understandable to readers not necessarily hyperspecialized in astronomy while providing specific detailed information and sometimes enlightening 'lessons learned' sections. The book concludes with an updated bibliography of publications related to socio-astronomy and to the interactions of the astronomy community with the society at large.

► This volume will be most usefully read by researchers, teachers, editors, publishers, librarians, sociologists of science, research planners and strategists, project managers, public-relations officers, plus those in charge of astronomy-related organizations, as well as by students aiming at a career in astronomy or related space science.

► Contributors are scientists, policy makers, librarians, publishers, journalists etc.

2006. VIII, 344 p. (Astrophysics and Space Science Library, Volume 335) Hardcover ISBN 1-4020-4055-5 ► € 155,00 | £107.00

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#### **Dark Matter in Astro- and Particle Physics**

Proceedings of the International Conference DARK 2004, College Station, USA, 3-9 October, 2004

H. Klapdor-Kleingrothaus, MPI für Kernphysik, Heidelberg, Germany; R. Arnowitt, Texas A & M University, College Station, TX, USA (Eds.)

The search for dark matter in the universe has established itself as one of the most exciting and

central fields of astrophysics, particle physics and cosmology. The lectures and talks in this book emphasize the experimental and theoretical status and future perspectives, stressing in particular the interplay between astro- and particle physics.

2006. XX, 665 p. Hardcover ISBN 3-540-26372-1 ► € 249,00 | £191.50

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#### **Astrophysical Formulae**

Volume I & Volume II: Radiation, Gas Processes and High Energy Astrophysics / Space, Time, Matter and Cosmology

K. R. Lang, Tufts University, Medford, MA, USA

Kenneth Lang's classic work **Astrophysical Formulae** (Vol. I and II) is now available as soft cover edition in a set.

Astrophysical Formulae is a reference source of fundamental formulae in physics and astrophysics. In contrast to most of the usual compendia it carefully explains the physical assumptions entering the formulae. All the important results of physical theories are covered: electrodynamics, hydrodynamics, general relativity, atomic and nuclear physics, and so on. Over 2100 formulae are included, and the original papers for the formulae are cited together with papers on modern applications in a bibliography of over 1900 entries. For the third edition (first published in 1999), a chapter on space, time, matter and cosmology had been included and the other chapters carefully revised.

3rd ed. 1999. 2nd printing 2006. Vol. I: XX p., 616 p, 36 illus.; Vol. II: XX p., 438 p. 41 illus. (in 2 volumes, not available separately). (Astronomy and Astrophysics Library) Softcover ISBN 3-540-29692-1 ► € 99,95 | £77.00

#### **Spinning Flight**

### Dynamics of Frisbees, Boomerangs, Samaras, and Skipping Stones

R. D. Lorenz, University of Arizona, Tucson, AZ, USA

More frisbees are sold each year than baseballs, basketballs and footballs combined. Yet these familiar flying objects have subtle and clever aerodynamic and gyrodynamic properties which are only recently being documented by wind tunnel and other studies. In common with other rotating bodies discussed in this readily accessible book, they are typically not treated in textbooks of aeronautics and the literature is scattered in a variety of places. This book develops the theme of disc-wings and spinning aerospace vehicles in parallel. Since many of the examples are recreational, anyone who enjoys these activities will likely find it profitable and enjoyable. In addition to spinning objects of various shapes, several exotic manned aircraft with disc planforms have been proposed and a prototypes built - these include a Nazi 'secret weapon' and the De Havilland

Avrocar, also discussed in the book. Boomerangs represent another category of spinning aerodynamic body whose behavior can only be understood by coupling aerodynamics with gyrodynamics. The narrative, supported by equations and graphs, explains how the shape and throw of a boomerang relates to its trajectory. The natural world presents still other examples, namely the samaras or 'seed-wings' of many tree species, which autorotate during their descent, like a helicopter whose engine has failed. The flight performance of these spinning wings directly affects the dispersal and thus the evolutionary competitiveness of the trees concerned. Samara-type configurations are also considered for instrumentation and other payload dispersal applications. In short, the book discusses a range of familiar, connected, but largely undeveloped, topics in an accessible, but complete, manner.

2006. Approx. 300 p. 118 illus., 99 in color. Hardcover ISBN 0-387-30779-6 ► € 34,95 | £24.00

### forthcoming

#### **The Evolution of Starbursts**

The 331st Wilhelm and Else Heraeus Seminar Bad Honnef, Germany, 16-20 August 2004

S. Hüttemeister, E. Manthey, D. Bomans, K. Weis, University of Bochum, Germany (Eds.)

This volume brings together all aspects of starburst

evolution, focusing on the much debated question of what triggers starbursts.

2005. XIV, 429 p. (AIP Conference Proceedings / Astronomy and Astrophysics, Volume 783) Hardcover ISBN 0-7354-0270-1 ► € 194,00 | £149.00

#### **Magneto-Fluid Dynamics**

**Fundamentals and Case Studies** 

P. Lorrain, McGill University, Montreal, QC, Canada; F. Lorrain, College Jean-de-Brebeuf, QC, Canada; S. Houle

► This book provides an understanding of the physics at work in sunspots and solar coronal loops
 ► Contrary to the usual custom of discussing imaginary magnetic field lines, the book focuses on the electric currents that are induced in conductors that move in magnetic fields. This leads to new results, and disproves a number of misconceptions ► The authors take into account the electric field of charges that appear inside those conductors. Although this field is all important, it is invariably disregarded, which leads to absurd situations ► Contains many simple examples, and many detailed case studies, with numerical calculations

The part "Fundamentals" is novel, first in that it

stresses the use of electric currents in Magneto-Fluid-Dynamics. As a rule, authors discuss magnetic field lines without ever referring to the required electric currents. Second, the book stresses the importance of electric space charges inside conductors that move in magnetic fields. It is the custom to disregard both the required electric currents and the field of the space charges; this leads to many absurd results.

The "Case Studies" concern solar phenomena and the Earth's magnetic field, stressing electric currents and electric space charges. Each case study is based on a published, or soon to be published, paper.

2006. Approx. 375 p. 70 illus. (Astronomy and Astrophysics Library) Hardcover ISBN 0-387-33542-0 ► € **79,95 | £61.50** 

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A new approach

![](_page_24_Picture_25.jpeg)

![](_page_25_Picture_2.jpeg)

#### **Astrophysics Update 2**

J. W. Mason, West Sussex, UK (Ed.)

This book is intended to serve the information needs of professional astronomers and postgraduate students about areas of astronomy, astrophysics and cosmology that are rich and active research spheres. Observational methods and the latest results of astronomical research are presented as well as their theoretical foundations and interrelations. The contributed commissioned articles are written by leading exponents in a format that will appeal to professional astronomers and astrophysicists who are interested in topics outside their own specific areas of research. This collection of timely reviews may also attract the interest of advanced amateur astronomers seeking scientifically rigorous coverage.

2006. XIII, 398 p. (Springer Praxis Books / Astronomy and Planetary Sciences) Hardcover ISBN 3-540-30312-X ► € 109,95 | £84.50 Jointly published with Praxis Publishing, UK

### The Hamilton-Type Principle in Fluid Dynamics

Fundamentals and Applications to Magnetohydrodynamics, Thermodynamics, and Astrophysics

A. Fierros Palacios, Instituto de Investigaciones Eléctricas, Cuernavaca, MOR, México

2006. XXV, 404 p. Softcover ISBN 3-211-24964-8 ► € 80,00 | £61.50

#### Advanced Summer School in Physics 2005

Frontiers in Contemporary Physics; EAV'05

Cinvestav, Mexico City, Mexico, 11-22 July 2005 **O. Rosas-Ortiz, M. Carbajal, O. Miranda,** Cinvestav-IPN, México, D.F., México (Eds.)

2006. 370 p. (AIP Conference Proceedings / High Energy Physics, Volume 809) Hardcover ISBN 0-7354-0300-7 ► € **182,00 | £140.00** 

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#### **Outer Magnetospheric Boundaries: Cluster Results**

G. Paschmann, ISSI, Bern, Schweiz; S. Schwartz, Imperial College, London, UK; C. Escoubet, ESTEC, Noordwijk, The Netherlands; S. Haaland, MPE, Garching, Germany (Eds.)

The boundaries of the magnetosphere have been the target of direct in-situ measurements since the beginning of the space age. But because they are constantly moving, changing their orientation, and undergoing evolution, the interpretation of single-spacecraft measurements has been plagued by the fundamental inability of a single observer to unambiguously distinguish spatial from temporal changes. The boundaries are thus a prime target for the study by a closely spaced fleet of spacecraft. Thus the Cluster mission, with its four spacecraft in a three-dimensional configuration at variable separation distances, represents a giant step forward. This 20th volume of the ISSI Space Science Series represents the first synthesis of the exciting new results obtained in the first few years of the Cluster mission.

Reprinted from **Space Science Reviews** journal Vol. 118:1-4, 2005. IX, 431 p. (Space Sciences Series of ISSI, Volume 20) Hardcover ISBN 1-4020-3488-1 ► € **109,00 | £84.00** 

#### **XXV** Physics in Collision

Prague, Czech Republic, 6-9 July 2005

Proceedings of the XXV International Conference on Physics in Collision

and Nuclear Physics, Prague 8, Czech Republic (Eds.)

2006. 330 p. (AIP Conference Proceedings / High Energy Physics, Volume 815) Hardcover V. Simák, Czech Technical University, Prague 2, Czech ISBN 0-7354-0308-2 ► € 177,00 | £136.00 Republic; R. Leitner, A. Valkárová, Institute of Particle

#### **Ultraviolet Radiation in the Solar System**

M. Vázquez, Instituto de Astrofísica de Canarias, La Laguna, Spain; A. Hanslmeier, Institut für Physik, Graz, Austria

An updated multidisciplinary summary of the sources and effects of ultraviolet radiation in the Solar System

▶ Aims to brief the professionals or students in other branches of the Natural Sciences on the importance

of our cosmic environment ► The first general overview of the important effects of radiation in a region of the electromagnetic spectrum that has hitherto been underrepresented at the semipopular level.

2006. XII, 380 p. (Astrophysics and Space Science Library, Volume 331) Hardcover ISBN 1-4020-3726-0 ► € 139,00 | £107.00

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#### **Cosmic Magnetic Fields**

R. Wielebinski, R. Beck, Max-Planck-Institut für Radioastronomie, Bonn, Germany (Eds.)

While magnetic fields permeate the universe on all scales, the present book is dedicated to their investigation on the largest scales and affords a balanced account of both theoretical and observational aspects. Written as a set of advanced lectures and tutorial reviews that lead up to the forefront of

research, this book offers both a modern source of reference for the experienced researchers as well as a high-level introductory text for postgraduate students and nonspecialist researchers working in related areas.

2005. XIV, 279 p. (Lecture Notes in Physics, Volume 664) Hardcover

ISBN 3-540-24175-2 ► € 59,95 | £46.00

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#### The Physics of Collisionless Shocks

4th Annual IGPP International Astrophysics Conference Palm Springs, California, 26 February - 3 March 2005

G. Li, G. P. Zank, C. T. Russell, University of California at Riverside, CA, USA (Eds.)

2005. IX, 349 p. (AIP Conference Proceedings / Astronomy and Astrophysics, Volume 781) Hardcover ISBN 0-7354-0268-X ► € 181,00 | £139.00

### Extraterrestrial Physics and Space Science

#### **Space Technology and Applications International Forum - 2006**

10th Conference on Thermophysics Applications in Microgravity;

23rd Symposium on Space Nuclear Power and Propulsion; 4th Conference on Human/Robotic Technology and the National Vision for Space Exploration; 4th Symposium on Space Colonization Albuquerque, NM, 12-16 February 2006

2006. Approx. 1452 p. (AIP Conference Proceedings, Volume 813) Hardcover ISBN 0-7354-0305-8 ► € 400,00 | £307.50

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Softcover study edition

#### **Physics of the Solar Corona**

An Introduction with Problems and Solutions

M. J. Aschwanden

This softcover study edition of Markus Aschwanden's highly acclaimed **Physics of the Solar Corona** includes 50 pages of problems and solutions which will much enhance the value of the book to students. ▶ Draws on the most recent observations of solar phenomena obtained by the current generation of space missions, and includes the very latest imaging material most consistent with current observations ▶ Incorporates all the new results and discoveries made and presents them in a systematic form, suitable for students and researchers ► Includes high quality data and previously unseen images obtained as a result of the author's access to the data archives of all current solar space missions

1st ed. 2004. 2nd printing 2006. XVIII, 908 p. (Springer Praxis Books / Astronomy and Planetary Sciences) Softcover ISBN 3-540-30765-6 ► € 69,95 | £54.00 Jointly published with Praxis Publishing, UK

![](_page_27_Picture_17.jpeg)

#### Solar System Update

Topical and Timely Reviews in Solar System Sciences

**P. Blondel**, University of Bath, UK; J. Mason, Barnham, UK (Eds.)

This book, the first in a series of forthcoming volumes, consists of topical and timely reviews of a number of carefully selected topics in solar system science. Contributions, in form of up-to-date reviews, are mainly aimed at professional astronomers and planetary scientists wishing to inform themselves about progress in fields closely related to their own field of expertise.

2006. I, 299 p. (Springer Praxis Books / Geophysical Sciences) Hardcover ISBN 3-540-26056-0 ► € 129,95 | £100.00 Joint published with Praxis Publishing, UK

#### **Space Weather**

#### **Physics and Effects**

V. Bothmer, University of Göttingen, Germany; I. A. Daglis, National Observatory of Athens, Greece

Provides the first comprehensive, scientific background of space storms caused by the sun and its impact on geospace and subsequent technological and biological impacts

► Focuses on weather issues which have become vital for the development of nationwide technological infrastructures ► Comprehensive coverage of the various aspects of space weather physics and of space weather impacts on technological assets
▶ Explains magnetic storms on earth, including the effects of EUV radiation on the atmosphere ▶ Will help establish realtime space weather forecasts
▶ Details the threat solar effects represent to modern telecommunication systems, including national power grid systems, aircraft and manned spaceflight

2006. I, 351 p. (Springer Praxis Books / Environmental Sciences) Hardcover ISBN 3-540-23907-3 ► € 119,95 | £92.50

#### **Observation of the Earth System from Space**

J. Flury, R. Rummel, TU München, Germany; C. Reigber, M. Rothacher, GeoForschungszentrum Potsdam, Germany; G. Boedecker, Bayerische Akademie der Wissenschaften, München, Germany; U. Schreiber, Fundamentalstation Wettzell, Kötzting, Germany (Eds.)

Within the national German geoscientific research and development programme "GEOTECHNOLO-GIEN", funded by the Federal Ministry of Education and Research (BMBF) and the German Research Foundation (DFG), the research theme "Observation of the System Earth from Space" was selected as one of 13 key areas in this programme. During the first research phase for this theme from 2002 to 2004 six projects were accomplished covering Earth gravity field and Earth rotation research. These six projects are related to the data exploitation and preparation of analysis techniques for the gravity field satellite missions CHAMP, GRACE and GOCE, to the integration of geodetic observation techniques for a user centre within the International Earth Rotation Service and to improvements in observation and analysis techniques for airborne gravimetry and ring lasers. This book provides a detailed summary of the obtained results, which are relevant for a broad scientific community working in gravity field and Earth rotation research.

2006. X, 494 p. 249 illus. Hardcover ISBN 3-540-29520-8 ► € 139,95 | £107.50

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Inspiration for future research work

#### The Magnetospheric Cusps: Structure and Dynamics

T. A. Fritz, S. F. Fung (Eds.)

This collection of papers addresses the question "What is the Magnetospheric Cusp?" and what is its role in the coupling of the solar wind to the magnetosphere as well as its role in the processes of particle transport and energization within the magnetosphere. The cusps have traditionally been described as narrow funnel-shaped regions that provide a focus of the Chapman-Ferraro currents that flow on the magnetopause, a boundary between the cavity dominated by the geomagnetic field (i.e., the magnetosphere) and the external region of the interplanetary medium. Measurements from a number of recent satellite programs have shown that the cusp is not confined to a narrow region near local noon but appears to encompass a large portion of the dayside high-latitude magnetosphere. It appears that the cusp is a major source region for the production of energetic charged particles for the magnetosphere. This book will be of great interest to scientists in Space Physics as well as to those working in research organizations in governments and industries, university departments of physics, astronomy, space physics, and geophysics.

2005. VI, 414 p. Hardcover ISBN 1-4020-3438-5 ► € 149,95 | £115.50 Reprinted from Surveys in Geophysics journal Vol 26 (1-3), 2005

![](_page_28_Picture_14.jpeg)

#### **Interplanetary Mission Analysis and Design**

S. Kemble, Astrium Ltd., Herts, UK

The book describes current mission analysis and design techniques that may be applied to a very wide range of interplanetary missions from those targeting the inner planets to those destined for the outer planets and Solar System escape trajectories. The early chapters comprise an introduction and a description of the fundamentals of interplanetary missions, aspects of leaving Earth and planet orbit selection and insertion. A discussion of various propulsion systems for interplanetary transfer is followed by a detailed overview of transfer techniques, including the principles of gravity assist and a range of applications of this technique, low-thrust transfers in combination with gravity assist and for planetary escape and capture and the utilisation of multi-body gravity perturbations. The final chapter deals with various optimisation methods for interplanetary missions.

The dynamics of the problems are analysed and algorithms that may be used to solve the problems are presented. Practical difficulties that may be encountered are also discussed. The mission design options are considered in the context of spacecraft types, ranging from high thrust, nuclear thermal rockets to low thrust ion propulsion systems. A series of specific examples are described in detail in the appendices, covering 'end-to-end' mission design for some topical space mission scenarios. Finally, a CD is included providing helpful examples of interplanetary transfers in an STK compatible format and an animated trajectory visualisation tool.

2006. XXXVI, 484 p. With CD-ROM. (Springer Praxis Books / Astronautical Engineering) Hardcover
 ISBN 3-540-29913-0 ► € 139,95 | £107.50
 Jointly published with Praxis Publishing, UK

![](_page_28_Picture_21.jpeg)

![](_page_29_Picture_3.jpeg)

#### Space Debris

#### Models and Risk Analysis

H. Klinkrad, European Space Agency, Darmstadt, Germany

The authors provide the reader with a detailed analysis of the sources of the current on-orbit space debris environment

► Details the mathematical description of risk analysis and debris environment modelling techniques, for all currently known debris sources ► Gives examples of the analysis of on-orbit collision avoidance, with historic examples ► Analyses reentries of hazardous objects with historic examples
▶ Demonstrates the effects of debris mitigation measures on the long-term risk evaluation and environment stability

2006. X, 430 p. (Springer Praxis Books / Astronautical Engineering) Hardcover ISBN 3-540-25448-X ► € 129,95 | £100.00 Jointly published with Praxis Publishing, UK

![](_page_29_Picture_11.jpeg)

#### **Giant Planets of Our Solar System**

An Introduction

P. G. Irwin, Clarendon Laboratory, Oxford, UK

All the latest data and background information on the giant gaseous planets: Jupiter, Saturn, Uranus, and Neptune for the first time in one handy volume. ► Clearly explains all specialist terms used when they are first introduced, especially helpful for undergraduate students. ► Details the current state of knowledge of the atmospheres, composition and structure of giant planets. ► Highlights most recent observations obtained by ground-based telescopes and space missions, both ongoing and planned. ► Discusses the pros and cons of ground- versus space-based observations.

"Irwin [...] has done an outstanding job of presenting material geared to upper-division undergraduates and beginning graduate students." (J.R. Kraus (University of Denver), Choice Feb. 2004)

1st ed. 2003. 2nd printing 2006. XXVI, 326 p. (Springer Praxis Books / Astronomy and Planetary Sciences) Softcover ISBN 3-540-31317-6 ► € 49,95 | £38.50 Jointly published with Praxis Publishing, UK.

#### **Geospace Electromagnetic Waves and Radiation**

J. W. LaBelle, Dartmouth College, Hanover, NH, USA; R. A. Treumann, Universität München, Germany (Eds.)

The contributions gathered in this volume provide introductions to current problems in geospace electromagnetic radiation, guides to the associated literature and tutorial reviews of the relevant space physics.

Students and scientists working on various aspects

of the terrestrial aurora or magnetospheric and near-Earth heliospheric high-frequency waves will find this volume an indispensable companion for their studies.

2006. XV, 345 p. (Lecture Notes in Physics, Volume 687) Hardcover ISBN 3-540-30050-3 ► € 69,95 | £54.00

![](_page_29_Picture_25.jpeg)

#### **3D Radiative Transfer in Cloudy Atmospheres**

A. Marshak, NASA-Goddard Space Flight Center, Greenbelt, Maryland, USA; A. Davis, Los Alamos National Laboratory, Los Alamos, NM, USA (Eds.)

Developments in three-dimensional cloud radiation over the past few decades are assessed and distilled into this contributed volume. Chapters are authored by subject-matter experts who address a broad audience of graduate students, researchers, and anyone interested in cloud-radiation processes in the solar and infrared spectral regions. After two introductory chapters and a section on the fundamental physics and computational techniques, the volume extensively treats two main application areas: the impact of clouds on the Earth's radiation budget, which is an essential aspect of climate modeling; and remote observation of clouds, especially with the advanced sensors on current and future satellite missions.

2005. XII, 686 p. 227 illus. (Physics of Earth and Space Environments) Hardcover ISBN 3-540-23958-8 ► € **79,95 | £61.50** 

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#### Solar and Heliospheric Origins of Space Weather Phenomena

J. Rozelot, OCA-GEMINI, Grasse, France (Ed.)

This book comprises an excursion through space weather, a scientific topic in rapid growth and with growing impact and complications for technological societies.

The emphasis of the present volume is on the origins of space weather: the Sun and the solar mind. Very much as the Sun's electromagnetic radiation drives the Earth climate, our space weather is driven by the solar wind.

This book addresses students and scientists working, or interested in, the field and provides a thorough introduction to the topic for those who wish to become acquainted with the basic solar physics at the origin of space weather.

2006. Approx. 170 p. (Lecture Notes in Physics, Volume 699) Hardcover ISBN 3-540-33758-X ► € 59,95 | £46.00

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011710x

#### **Elementary Physics of Complex Plasmas**

V. Tsytovich, Russian Academy of Sciences, Moscow, Russia; G. E. Morfill, H. Thomas, MPI für Extraterrestrische Physik, Garching, Germany

Complex plasmas are dusty plasmas where the density and electric charges of the dust grains are sufficiently high to induce long-range grain-grain interactions as well as strong absorption of charged plasma components. Together with the sources replenishing the plasma such systems form a highly dissipative thermodynamically open system that exhibits many features of collective behaviour generally found in complex systems. Most notably among them are self-organized patterns such as plasma crystals, plasma clusters, dust stars and further spectacular new structures. Beyond their intrinsic scientific interest, the study of complex plasmas becomes of growing importance in a great variety of fields, such as plasma processing, thin film deposition combustion and even the production of computer chips by plasma etching where strongly interacting clouds of complex plasmas can cause major contamination of the final product.

2006. Approx. 320 p. Hardcover ISBN 3-540-29000-1 ► € 99,95 | £77.00

### forthcoming

### **General Relativity and Cosmology**

![](_page_31_Picture_4.jpeg)

![](_page_31_Picture_5.jpeg)

#### **Mathematica for Theoretical Physics**

Electrodynamics, Quantum Mechanics, General Relativity, and Fractals

G. Baumann, University of Ulm, Germany

This second edition shows readers how to solve physical problems and deal with their underlying theoretical concepts while using Mathematica<sup>\*</sup> to derive numeric and symbolic solutions. Each example and calculation can be evaluated by the reader, and the reader can change the example calculations and adopt the given code to related or similar problems.

This edition has been completely revised and expanded into two volumes: The first volume covers classical mechanics and nonlinear dynamics. Both topics are the basis of a regular mechanics course. The second volume covers electrodynamics, quantum mechanics, relativity, and fractals and fractional calculus.

New examples have been added and the representa-

tion has been reworked to provide a more interactive problem-solving presentation. This book can be used as a textbook or as a reference work, by students and researchers alike. A brief glossary of terms and functions is contained in the appendices. The CD-ROM accompanying each of the two volumes contains Mathematica<sup>®</sup> notebooks as well as Mathematica<sup>®</sup> programs. The notebooks contain the entire text of the corresponding volume and can interface with Mathematica<sup>®</sup>.

Volume 2, 2nd ed Electrodynamics, Quantum Mechanics, Relativity, and Fractals. 2005. XVI, 410 p. With CD-ROM. Hardcover

ISBN 0-387-21933-1 ► € 46,95 | £36.00

Originally published in one volume with: Volume 1, 2nd ed Classical Mechanics and Nonlinear Dynamics. 2005. 544 p. 100 illus.. With CD-ROM. Hardcover

ISBN 0-387-01674-0 ► € 46,95 | £36.00

#### **Supersymmetric Mechanics**

Vol 1: Supersymmetry, Noncommutativity and Matrix Models

S. Bellucci, INFN-Laboratori Naz. di Frascati, Italy (Ed.)

![](_page_31_Picture_20.jpeg)

This is the first volume in a series of books on the general theme of Supersymmetric Mechanics; the series is based on lectures and discussions held in 2005 and 2006 at the INFN-Laboratori Nazionali di Frascati. The selected topics include supersymmetry and supergravity, the attractor mechanism, black holes, fluxes, noncommutative mechanics, super-Hamiltonian formalism and matrix models. All lectures are intended for beginners at the

graduate level and nonspecialists from related fields of research and a substantial effort was made to incorporate in the extensive write-ups the results of the animated discussion sessions which followed the individual lectures. A second volume appears as Lecture Notes in Physics, Vol. 701 **Supersymmetric Mechanics - Vol. 2 : The Attractor Mechanism** (2006), ISBN: 3-540-34156-0.

2006. Approx. 230 p. (Lecture Notes in Physics, Volume 698) Hardcover ISBN 3-540-33313-4 ► € **59,95 | £46.00** 

![](_page_31_Picture_24.jpeg)

#### **Elements of Numerical Relativity**

### From Einstein's Equations to Black Hole Simulations

**C. Bona**, Universitat de les Illes Balears, Palma de Mallorca, Spain; **C. Palenzuela-Luque**, Louisiana State Universtity, Baton Rouge, LA, USA

This book can be considered a primer for both graduate students and non-specialist researchers wishing to enter the field.

▶ Begins from the most basic insights and aspects of

numerical relativity ► Develops coherent guidelines for the reliable and convenient selection of key aspects: evolution formalism, gauge, initial and boundary conditions ► Offers numerous tests and applications that can be performed on a standard PC

2005. XII, 151 p. (Lecture Notes in Physics, Volume 673) Hardcover ISBN 3-540-25779-9 ► € **49,95 | £38.50** 

#### Fluctuations, Information, Gravity and the Quantum Potential

R. Carroll, University of Illinois, Urbana, IL, USA

A main theme of the book outlines the role of the quantum potential in quantum mechanics and general relativity and one of its origins via fluctuations formulated in terms of Fisher information. Another theme is the description of various approaches to Bohmian mechanics and their role in quantum mechanics and general relativity. Along the way various approaches to, for instance, the Dirac equation, the Einstein equations, the Klein-Gordon equation, the Maxwell equations and the Schrödinger equations are described. Statistics and geometry are intertwined in various ways and, among other matters, the aether, cosmology, entropy, fractals, quantum Kaehler geometry, the vacuum and the zero point field are discussed. There is also some speculative material and some original work along with material extracted from over 1000 references and the work is current up to April 2005.

2006. XII, 444 p. (Fundamental Theories of Physics, Volume 148) Hardcover ISBN 1-4020-4003-2 ► € 132,00 | £92.00

![](_page_32_Picture_7.jpeg)

#### Particles, Strings and Cosmology

The 11th International Symposium on Particles, Strings and Cosmology; PASCOS 2005

Gyeongju, Korea, 30 May-4 June 2005

K. Choi, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea; J. E. Kim, Seoul National University, Seoul, Korea; D. Son, Kyeongpook National University, Daegu, Korea (Eds.)

2005. 502 p. (AIP Conference Proceedings / High Energy Physics, Volume 805) Hardcover ISBN 0-7354-0295-7 ► € 221,00 | £170.00

#### Meet us at the upcoming conferences: COSPAR, IAU and IAC

#### Lasers, Clocks and Drag-Free Key Technologies

#### **Future High Precision Tests of General Relativity**

Hansjörg Dittus, Universität Bremen, Germany; Claus Lämmerzahl, Universität Bremen, Germany; Slava Turyshev, NASA JPL (Eds.)

Over the next decade the gravitational physics community will benefit from dramatic improvements in many technologies critical to the tests of gravity. The highly accurate deep space navigation, interplanetary laser communication, interferometry and metrology, high precision frequency standards, precise pointing and attitude control, together with the drag-free technologies will revolutionize the field of the experimental gravitational physics. The Centennial of general theory of relativity in 2015 will motivate significant number of experiments designed to test this theory to unprecedented accuracy.

The purpose of the contributions in this book is to explore possibilities for the next 20 years for conducting gravitational experiments in space that would utilize the new and also much improved existing capabilities.

2006. Approx. 500 p. Hardcover ISBN 3-540-34376-8 ► € 139,95 | £107,50

![](_page_32_Picture_22.jpeg)

![](_page_33_Picture_3.jpeg)

#### **Relativistic Astrophysics and Cosmology**

#### **A Primer**

P. Hoyng, SRON, Utrecht, The Netherlands

**Relativistic Astrophysics and Cosmology** offers a succinct and self-contained treatment of general relativity and its application to compact objects, gravitational waves and cosmology. The required mathematical concepts are introduced informally, following geometrical intuition as much as possible. The approach is theoretical, but there is ample discussion of observational aspects and of instrumental issues where appropriate. The book includes such topical issues as the

Gravity Probe B mission, interferometer detectors

of gravitational waves, and the physics behind the angular power spectrum of the cosmic microwave background (CMB). Written for advanced undergraduates and beginning graduate students in (astro)physics, it is ideally suited for a lecture course and contains 140 exercises with extensive hints. The reader is assumed to be familiar with linear algebra and analysis, ordinary differential equations, special relativity, and basic thermal physics.

2006. XII, 293 p. 111 illus. (Astronomy and Astrophysics Library) Hardcover ISBN 1-4020-4521-2 ► € 59,95 | £46.00

#### **Ernst Equation and Riemann Surfaces**

Analytical and Numerical Methods

**C. Klein,** Max-Planck-Institut für Mathematik in den Naturwissenschaften, Leipzig, Germany; **O. Richter** 

► This is the only broad survey in this topic related to general relativity and solutions to Einstein equations of astrophysical relevance

Exact solutions to Einstein's equations have been useful for the understanding of general relativity in many respects. They have led to physical concepts as black holes and event horizons and helped to visualize interesting features of the theory. In addition they have been used to test the quality of various approximation methods and numerical codes. The most powerful solution generation methods are due to the theory of Integrable Systems. In the case of axisymmetric stationary spacetimes the Einstein equations are equivalent to the completely integrable Ernst equation. In this volume the solutions to the Ernst equation associated to Riemann surfaces are studied in detail and physical and mathematical aspects of this class are discussed both analytically and numerically.

2005. X, 249 p. (Lecture Notes in Physics, Volume 685) Hardcover ISBN 3-540-28589-X ► € 59,95 | £46.00

#### 1st Crisis in Cosmology Conference: CCC-1

#### Moncao, Portugal, 23-25 June 2005

**E. J. Lerner**, Lawrenceville Plasma Physics, West Orange, NJ, USA; **A. José B.**, Universidade do Minho, Braga, Portugal (Eds.)

2006. Approx. 330 p. (AIP Conference Proceedings / Astronomy and Astrophysics, Volume 822) Softcover ISBN 0-7354-0296-5 ► € **112,00** | **£86.00** 

#### **Cosmology and Gravitation**

### XIth Brazilian School of Cosmology and Gravitation

**Rio de Janeiro, Brazil, 26 July-4 August 2004 M. Novello, S. E. Perez Bergliaffa**, Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro, Brazil (Eds.)

The conference presented an overview of several important topics in cosmology, astrophysics, and

gravitation, with emphasis on the interplay between theory and observation. Topics such as gravitational waves, dark energy, quantum gravity, and gammaray bursts were discussed.

2005. IX, 323 p. (AIP Conference Proceedings / Astronomy and Astrophysics, Volume 782) Hardcover ISBN 0-7354-0269-8 ► € 190,00 | £146.00

### Popular Astronomy and Space Exploration

#### **Distant Worlds**

#### **Milestones in Planetary Exploration**

**P. Bond,** Royal Astronomical Society and ESA, Nuneaton, UK

Every planet and other significant body in our solar system (including some asteroids, but not Pluto) has been or soon will be landed on, crashed into, flown by, or otherwise prodded and peered at for whatever information it will yield. The lion's share of all of this exploration has been done and will continue to be done in unmanned missions. Because these missions lack the obvious human drama and personal danger present in manned missions, they tend to receive less public attention and, in Peter Bond's view, are probably somewhat undervalued in the popular imagination. But if we draw back and look at the whole history of the last 40 years of space exploration, a very different and extremely exciting story emerges. Peter Bond provides an overview of key, unmanned missions, chapter by chapter, to planets in the twentieth century. He tells the story of the mission planners and engineers who, working mostly in the background, made these unprecedented achievements in scientific exploration possible. Bond's perspective provides a much-needded overview, but it also details the very human feelings that animated the intense rivalries between the Soviet Union and the United States, and most recently the difficulties that arose in collaborations between NASA and ESA on the Rosetta and Halley's Comet missions.

2006. Approx. 280 p. Hardcover ISBN 0-387-40212-8 ► € 24,95 | £16.95

![](_page_34_Picture_9.jpeg)

#### **Celestial Mechanics**

#### The Waltz of the Planets

A. Celletti, E. Perozzi, University of Rome, Rome, Italy

The authors cover topics which are on the front line of scientific research and technology in spaceflight for the exploration of our Solar System. The book reinforces public awareness as a key issue for appreciating and exploiting the wealth of astronomical data and images gathered during the space age

► Explains Celestial Mechanics without the use of mathematics ► Provides an interdisciplinary cross section of all Celestial Mechanics

2006. Approx. 204 p. 20 illus. (Springer Praxis Books / Popular Astronomy) Softcover ISBN 0-387-30777-X ► € 24,95 | £19.00

### forthcoming

#### **Space Shuttle Columbia**

#### Her Missions and Crews

#### B. Evans, Warwickshire, UK

On February 1<sup>st</sup> 2003, one of the worst and most public disasters ever witnessed in the human space programme unfolded with horrifying suddenness in the skies above north central Texas. The Space Shuttle Columbia – the world's first truly reusable manned spacecraft – was lost during her return to Earth, along with a crew of seven. It was an event that, after the loss of Space Shuttle Challenger during a launch 17 years before, the world had hoped it would never see again. This book details each of Columbia's 28 missions in turn, as told by scientists and researchers who developed and supported her many payloads, by the engineers who worked on her and by the astronauts who flew her. In doing so, it is intended to provide a fitting tribute to this most remarkable flying machine and those who perished on her last mission.

► Direct experience of interviewing Rick Husband, the Commander of Columbia's final flight, over the telephone in April 2001

2005. IX, 486 p. (Springer Praxis Books / Space Exploration) Softcover ISBN 0-387-21517-4 ► € 32,95 | £19.50 Jointly published with Praxis Publishing, UK

![](_page_34_Picture_25.jpeg)

More than a decade of interviewing astronauts

![](_page_35_Picture_3.jpeg)

#### In Search of Dark Matter

**K. Freeman,** The Australian National University, ACT, Australia; **G. McNamara,** Evatt, ACT, Australia

The dark matter problem is one of the most fundamental and profoundly difficult to solve problems in the history of science. Not knowing what makes up most of the known universe goes to the heart of our understanding of the Universe and our place in it. **In Search of Dark Matter** is the story of the emergence of the dark matter problem, from the initial erroneous 'discovery' of dark matter by Jan Oort to contemporary explanations for the nature of dark matter and its role in the origin and evolution of the Universe. Written for the educated non-scientist and scientist alike, it spans a variety of scientific disciplines, from observational astronomy to particle physics. Concepts that the reader will encounter along the way are at the cutting edge of scientific research. The themes are explained in such a way that no prior understanding of science beyond a high school education is necessary.

2006. XVI, 158 p. (Springer Praxis Books / Space Exploration) Softcover ISBN 0-387-27616-5 ► € 29,95 | £19.50 Jointly published with Praxis Publishing, UK

#### Space Exploration 2007

Space Launches, Missions and Events

B. Harvey, Dublin, Ireland

The aim of the **Space Exploration - 2007** is to provide an annual update on recent space launches, missions and results, to be published every year in September. The annual will cover space exploration from a variety of angles: looking back at past missions, reviewing those currently under way and looking to those planned for the future. The ten invited contributions each year will cover a variety of topics within these areas, to appeal to a wide readership.

The regular set features, which will appear every year, will include records noting satellite and rocket

launches in the previous year and satellite recoveries; analysis of developments and emerging trends in space exploration; notes on records and main feats during the year; basic data on all launchers currently in operation; schedules of upcoming missions; anniversaries and landmarks.

► Written at an accessible level for both young and older space enthusiasts ► Will have a strong appeal to younger enthusiasts and be a perfect Christmas gift

2006. Approx. 355 p. 35 illus., 20 in color. (Springer Praxis Books / Space Exploration) Softcover ISBN 0-387-33330-4 ► € 19,95 | £15.50

![](_page_35_Picture_17.jpeg)

### forthcoming

forthcoming

The first regular space

exploration annual

Hard science softly presented

#### **Calibrating the Cosmos**

How Cosmology Explains Our Big Bang Universe F. Levin, Portsmouth, RI, USA

**Calibrating the Cosmos** explains in clear, nonmathematical language the measurements and the interpretation of the resulting data that have led to the current understanding of the origin, evolution and properties of our expanding Big Bang universe. Many people have a sketchy idea of the work of cosmologists, but Professor Levin's experience in teaching both scientific and liberal arts students has enabled him to impart much of our current thinking without resorting to difficult mathematics, or physical concepts that the reader may be unfamiliar with. Theoretical concepts are emphasized, in particular the symmetries of homogeneity and isotropy enjoyed by our universe on the largest scales, how these symmetries lead to only one quantity being needed to describe the growth of the universe from its infancy to the present time, and how the so-called parameters of the universe are the ingredients used to construct the model universes to which ours – the real thing – is compared.

Levin includes the 2003 results from the Wilkinson Microwave Anisotropy Probe (WMAP) and the 2003 and 2004 results of the Sloan Digital Sky Survey to ensure that the book is completely up to date. Background material is provided in the first four chapters; the current picture and how it was attained are discussed in the next four chapters; and some unsolved problems and conjectured solutions are explored in the final chapter.

2006. Approx. 230 p. 30 illus., 4 in color. (Astronomers' Universe Series) Hardcover ISBN 0-387-30778-8 ► € **29,95 | £19.50** 

#### Hubble

#### **15 Years of Discovery**

L. Lindberg Christensen, ESA/Hubble Space Telescope, Munich, Germany; R. A. Fosbury, ESA Hubble Space Telescope, Munich, Germany

Hubble: 15 Years of Discovery forms a key element of the European Space Agency's 15th anniversary celebration activities for the 1990 launch of the NASA/ESA Hubble Space Telescope. Hubble continues to have an enormous impact by exploiting a unique scientific niche where no other instruments can compete. It consistently delivers super-sharp images and clean, uncontaminated spectra over the entire near-infrared and ultraviolet regions of the electromagnetic spectrum. This has opened up new scientific territory and resulted in many paradigm-breaking discoveries.

 The only Hubble Heritage picture book endorsed by the two leading space agencies, NASA and ESA
 Close-up photos within book are unmatched in competing texts, because the images have been prepared straight from the data by scientists to reach the highest possible quality

2006. Approx. 120 p. 40 illus. in color. Hardcover ISBN 0-387-28599-7 ► € 29,95 | £23.00

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#### Great gifts for enthusiasts!

#### The Seven Secrets of How to Think Like a Rocket Scientist

J. Longuski, Purdue University, Purdue, IN, USA

Explains the methods that rocket scientists use expressed in a way that could be applied in everyday life. The book illustrates the methods (the 7 secrets) with anecdotes, quotations and biographical sketches of famous scientists, ideas from sci-fi, personal stories and insights, and occasionally a bit of space history. The author, a rocket scientist himself, reveals that rocket science is just common sense applied to the extraordinarily uncommon environment of outer space and that rocket scientists are people, too. ▶ Conversational and humorous in its style ▶ Well organized: ▶ parts reveal the ▶ secrets; 50 chapters give specific, useful advice beginning with their titles

" "People of Earth . . . Attention!" Jim Longuski's book takes you on a journey of exploration to that nearly infinite space between the ears and behind the brows of that most mysterious of all creatures - the rocket scientist! Going well beyond the oft-used aphorisms, where no writer has gone before, he shows you how these gifted individuals think, feel, work, play, fantasize, rationalize, laugh and cry. From the glories of their epoch-making achievements to the tragedies of their magnificent failures, it is all here, told with insight, humor, objectivity and personal perspective. Without being preachy, lessons are offered that apply to anyone seeking to make professional or personal life just a little bit more successful and fun. I just couldn't set this book down!" Robert Cesarone, Rocket Scientist

2006. Approx. 170 p. Hardcover ISBN 0-387-30876-8 ► € 19,95 | £15.50 Copernicus

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#### The Future of the Universe

A. Meadows, Loughborough University, UK

There are many books that describe what we know of the past of the Universe, beginning with the Big Bang. But what of its future?

It is only in recent years that astronomers and cosmologists have come to any kind of consensus about the probable history of the universe, so have been relatively few books speculating about its future evolution. What will happen to the Earth and solar system? What about our galaxy? Indeed, how long will the universe as we recognize it survive? **The Future of the Universe** takes the reader on a journey through space and time, beginning with a long look at the Earth and solar system, voyaging to the outermost galaxies, and finishing with speculations about the life and fate of the entire universe. ► Takes an in-depth look at the future of the Earth and solar system ► Pitched at amateur astronomer level, but assumes no scientific/mathematical background

2006. Approx. 260 p. 29 illus., 9 in color. (Astronomers' Universe Series) Hardcover ISBN 1-85233-946-2 ► € 29,95 | £19.50

### forthcoming

forthcoming

#### **Contact with Alien Civilizations**

#### Our Hopes and Fears about Encountering Extraterrestrials

M. A. Michaud, International Institute of Space Law, Dulles, VA, USA

This book describes a wide variety of speculations by many authors about the consequences for humanity of coming into contact with extraterrestrial intelligence. The assumptions underlying those speculations are examined, and some conclusions are drawn. As necessary background, the book also includes brief summaries of the history of thinking about extraterrestrial intelligence, searches for life and for signals, contrasting paradigms of how contact might take place, and the paradox that those paradigms allegedly create.

2006. Approx. 400 p. Hardcover ISBN 0-387-28598-9 ► € 22,95 | £17.50

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# State Ser and Title at

#### Apollo

The Definitive Sourcebook R. W. Orloff, Oakhurst, NJ, USA; D. M. Harland, Glasgow, UK

On 25 May 1961, John F Kennedy announced the goal of landing an American man on the Moon by the end of the decade. This challenge forced NASA to review the planned lunar landing of a three-man spaceship named Apollo in the mid-1970s. In 1962, it was decided that a specialized vehicle would accompany the main spacecraft, to make the lunar landing while the mothership remained in lunar orbit. To send these vehicles to the Moon would require the development of an enormous rocket. Development was protracted, but in December 1968 Apollo 8 was launched on a pioneering mission to perform an initial reconnaissance in lunar orbit. When Apollo 17 lifted off from the Moon in December 1972, the program was concluded. Now, at long last, there is a real prospect of a resumption of human exploration of the Moon.

This book provides an overview of the origins of the Apollo program and descriptions of the ground facilities, launch vehicles and spacecraft that will serve as an invaluable single-volume sourcebook for space enthusiasts, space historians, journalists, and programme-makers on radio and TV. It supplements the other books that have focused on the politics and management of the Apollo program, the astronauts, and their training and exploits.

2006. XXXII, 633 p. (Springer Praxis Books / Space Exploration) Softcover ISBN 0-387-30043-0 ► € 39,95 | £30.50 Jointly published with Praxis Publishing, UK

#### **NASA's Scientist-Astronauts**

#### D. J. Shayler, C. Burgess

This book provides readers with a unique opportunity to read the story of how scientists were accepted into the American Space Programme and how their fortunes and careers were shaped by budgets, politics and flight opportunities

► For the first time inside views are provided of the workings of the Astronaut Office and American Space Programme ► Reveals how, after four difficult decades, the role of the heroic test pilot astronaut has been replaced by men and women who are science orientated space explorers ► Tells how the first scientists and physicians became assigned to command positions on the ISS

2006. I, 399 p. (Springer Praxis Books / Space Exploration) Softcover ISBN 0-387-21897-1 ► € 32,95 | £22.50 Jointly published with Praxis Publishing, UK

forthcoming

#### **US Spacesuits**

#### K. S. Thomas, H. J. McMann

The most accurate and comprehensive work on U.S. spacesuits ever published:

► A unique insight into the development of US spacesuits through to the present day ► Presents in context the authors' unique collection of 172 black and white photographs ► Explains why spacesuits

are a last refuge for astronauts for survival ► Details many technically and historically interesting developments, but which never achieved fruition

2006. XXX, 397 p. (Springer Praxis Books / Space Exploration) Softcover ISBN 0-387-27919-9 ► € 32,95 | £22.00 Jointly published with Praxis Publishing, UK

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![](_page_38_Picture_9.jpeg)

#### The Invisible Universe

The Story of Radio Astronomy

G. Verschuur, University of Memphis, Memphis, TN

Hidden from human view, accessible only to sensitive receivers attached to huge radio telescopes, giant versions of backyard satellite dishes, the invisible universe beyond our senses continues to fascinate and intrigue our imaginations.

This is the story of radio astronomy, of how radio waves are generated by stars, supernova, quasars, colliding galaxies, and by the very beginnings of the universe itself. In **The Invisible Universe**, you learn what astronomers are doing with those huge dishes in the New Mexico desert, in a remote valley in Puerto Rico, in the green Pocahontas Valley in West Virginia, as well as dozens of other remote sites around the world. With each of these observatories, the scientists collect and analyze their data, "listening" to the radio signals from space, in order to learn what is out there, and perhaps even if someone else may be listening as well.

► A completely updated revision of the successful Springer book **The Invisible Universe Revealed** from 1987

2nd. ed. 2006. Approx. 280 p. Hardcover ISBN 0-387-30816-4 ► € 24,95 | £19.00

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<u>Invisible</u>

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#### Einstein's Enigma or Black Holes in my Bubble Bath

C.V. Vishveshwara

A humourous and informal rendition of the story of gravitation theory from the early historic origins to the latest developments in astrophysics, focusing on Albert Einstein's theory of general relativity and black hole physics. Through engaging conversations and napkin-scribbled diagrams come tumbling the rudiments of relativity, spacetime and much of modern physics, narrated with high didactic and literary talent, and each embedded in casual lessons given by a worldly astrophysicist to his friend. Join the intellectual fun and exalt in the frothy ideas while vicariously taking relaxing baths in this magical bathtub.

2006. Approx. 280 p. Dustjacket ISBN 3-540-33199-9 ► € 19,95 | £15.50

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### **Practical and Amateur Astronomy**

![](_page_39_Picture_4.jpeg)

#### **Astronomers' Observing Guides**

The series **Astronomers' Observing Guides** is designed especially for practical amateur astronomers who not only want to observe, but want to know the details of exactly what they are looking at. The concept of the series is to present an up-to-date detailed description of the objects, their physics and their evolution (part one); and then (part two) to consider how to observe and record them successfully.

![](_page_39_Picture_8.jpeg)

#### **Star Clusters and How to Observe Them**

M. Allison, Cheshire, UK

Astronomy enthusiasts will all appreciate the detailed yet easily-assimilated description of star clusters, how they were formed as our Milky Way galaxy, how they evolved, and how they are classified. The latest research has revealed a vast amount of fascinating information about the clusters, along with some spectacular photographs. Modern commercially-made telescopes enable amateur astronomers to see a surprising amount of detail, and to record – using CCD cameras, video, webcams or even film – some remarkably beautiful and detailed images. Contained here also is detailed information on using refractors, reflectors, and, of course, Meade and Celestron's ubiquitous range of computer-controlled SCT telescopes.

2006. XII, 212 p. 110 illus. (Astronomers' Observing Guides) Softcover ISBN 1-84628-190-3 ► € 29,95 | £22.00

![](_page_39_Picture_14.jpeg)

#### Saturn and How to Observe It

J. Benton, ALPO Saturn Section, Savannah, GA, USA

Saturn is the second largest planet in the solar system, and the only one with a spectacular ring system that is easily visible from Earth. Saturn is a gas-giant, a huge world dominated by its rings and a retinue of moons. It is probably the most commonly observed and imaged planet for amateur astronomers, because it is always changing - the moons move visibly in the course of an hour, the weather systems on the planet change, and the orientation of the ring alters this way and that. The concept of the book series is to present an up-todate detailed description and then to consider how best to observe and record the planet, its moons and its ring system successfully.

**Saturn and How to Observe It** is a mine of information for all levels of amateur observers, from the beginner to the experienced.

2005. VII, 182 p. 96 illus., in Full Color. (Astronomers' Observing Guides) Softcover ISBN 1-85233-887-3 ► € 24,95 | £19.50

#### **Galaxies and How to Observe Them**

W. Steinicke, Umkirch, Germany; R. Jakiel, USA

forthcoming

Galaxies are perhaps the most popular of all visual targets that are sought after by visual observers. At present the only way to get up-to-date information, is to query various (often highly technical) specialty books or digging deeply into the Internet. This can be a time consuming and often frustrating task, as the data aren't often compatible. This book satisfies the need for a modern, comprehensive review in combining the three major aspects: the physical background on the nature and data of galaxies, the relevant instrumentation and viewing techniques, and finally the targets and their individual appearance in telescopes of various apertures. To illustrate the latter, a comprehensive sample of galaxies, including quasars, groups and clusters of galaxies is presented. This combination of theoretical knowledge and practical information guarantees successful observing sessions. The book could become a standard source on galaxy observing for all kinds of amateur observers, from the beginner to the experienced.

2006. Approx. 180 p. (Astronomers' Observing Guides) Softcover ISBN 1-85233-752-4 ► € 24,95 | £19.50

#### **Human Vision and The Night Sky**

#### How to Improve Your Observation Skills

#### M. Borgia

This book is intended for amateur astronomers who are readers of **Sky & Telescope** magazine or similar astronomy periodicals – or are at least at the same level of knowledge and enthusiasm. In particular, those of us who have reached a point where enjoyment is fading because the challenges have run out will appreciate it, because it takes such people to the "next level" in observational astronomy. It begins with teaching astronomers to use their most important astronomy tool, their eyes. Then it discusses how to select the right telescope – taking into account that everyone is unique – and shows readers how to set up and care for their instruments. Subsequent chapters take the readers on a tour of the solar system as they have never viewed it before... through their own eyes. We start close to home with the hidden treasures of the Moon, on to investigate the power of the Sun, incredibly hot Mercury, the subtleties of Venus, the changing surface of Mars, the outer solar system and then on into deep space. Each chapter includes a series of observing challenges that will entertain and push the reader to continually higher levels of achievement.

Amateur astronomers will learn, through this book, many of the same lessons that professionals learned as they conducted similar observations.

2006. Approx. 240 p. 50 illus. (Patrick Moore's Practical Astronomy Series) Softcover ISBN 0-387-30776-1 ► € 24,95 | £19.00

![](_page_40_Picture_9.jpeg)

![](_page_40_Picture_10.jpeg)

#### How to Photograph the Moon and Planets with Your Digital Camera

T. Buick, Orpington, Kent, UK

Since the advent of astronomical CCD imaging it has been possible for amateurs to produce images of a quality that was attainable only by universities and professional observatories just a decade ago. However, astronomical CCD cameras are still very expensive, and technology has now progressed so that digital cameras – the kind you use on holiday – are more than capable of photographing the brighter astronomical objects, notably the Moon and major planets.

Tony Buick has worked for two years on the techniques involved, and has written this illustrated step-by-step manual for anyone who has a telescope (of any size) and a digital camera. The color images he has produced – there are over 300 of them in the book – are of breathtaking quality. His book is more than a manual of techniques (including details of how to make a low-cost DIY camera mount) and examples; it also provides a concise photographic atlas of the whole of the nearside of the Moon – with every image made using a standard digital camera – and describes the various lunar features, including the sites of manned and robotic landings.

2006. XIV, 282 p. 330 illus., most in color. (Patrick Moore's Practical Astronomy Series) Softcover ISBN 1-85233-990-X ► € 24,95 | £19.00

![](_page_40_Picture_17.jpeg)

#### Lunar Orbiter Photographic Atlas of the Near Side of the Moon

#### C. J. Byrne, Middletown, NJ, USA

In 1967, Lunar Orbiter Mission 4 sent back to Earth a superb series of photographs of the surface of the Moon, despite severe degradation caused by scanning artifacts and the reconstruction processes involved in transmission from lunar orbit. Using 21st century techniques, Charles Byrne – previously System Engineer of the Apollo Program for Lunar Orbiter Photography – has removed the artifacts and imperfections to produce the most comprehensive and beautifully detailed set of images of the lunar surface.

 Includes reference map so astronomers can compare the images with what they can see 
 Indentification of features with their IAU names

 Free CD-Rom includes all the enhanced and

cleaned photographs for screen viewing, lectures, etc.

Choice Outstanding Title! (January 2006)

2005. X, 329 p. 619 illus. With CD-ROM. Hardcover ISBN 1-85233-886-5 ► € 59,95 | £45.00

![](_page_40_Picture_26.jpeg)

Spectacular close-up images of the Moon

![](_page_41_Picture_3.jpeg)

#### Pattern Asterisms

#### A New Way to Chart the Stars

J. Chiravalle, Safford, AZ, USA

Since the very beginning of astronomy, people have looked up sky and constructed patterns – the constellations – out of the almost random scattering of stars in the night sky. The fact that the constellations are still used to day reflects not their historical origins, but their usefulness in identifying bright stars in the rotating dome of the sky. Most people (and all astronomers) are familiar with, for example, the constellation of Orion and can thus easily point to Betelguese and Bellatrix as being Orion's "shoulders". It is the pattern made by the constellation that makes them easy to identify.

Suitable for observers using binoculars and medium

size telescopes, this catalog includes star pictures, dot-to-dot outlines of the objects ( on a negative photograph for clarity ), and an artistic image next to the star patterns. Size, stellar magnitudes, and coordinates are provided, along with north direction, star-hopping instructions and Sky Atlas 2000 references.

The imaginative observer will surely begin to develop a new insight into star patterns, and will start seeing patterns of his own, under this catalog's influence!

2006. X, 182 p. 120 illus., 40 in color. (Patrick Moore's Practical Astronomy Series) Softcover ISBN 1-84628-327-2 ► € 34,95 | £19.50

![](_page_41_Picture_12.jpeg)

#### **The Hatfield SCT Lunar Atlas**

Photographic Atlas for Meade, Celestron and other SCT Telescopes

J. Cook

SCT and Maksutov telescopes - which of course includes the best-selling models from Meade, Celestron, and other important manufacturers - reverse the visual image left for right, giving a "mirror image". This makes it extremely difficult to identify lunar features at the eyepiece of one of these instruments using conventional atlases, which show the Moon "upside-down" with south at the top. This new SCT version of Hatfield's famous lunar atlas solves the problem. Photographs and key maps in the Hatfield SCT Lunar Atlas are exactly as the Moon appears through the eyepiece of an SCT or Maksutov telescope. Smaller IAU-standard reference photographs are included on each page, to make it simple to compare the mirrored SCT photographs and maps with those that appear in other atlases. This edition uses the superb original photographs taken by Commander Henry Hatfield using his purpose-built 12-inch reflector. The key maps, on which lunar features can be readily identified, retain the style and clarity that made the original justly famous.

The first photographic lunar atlas to show the Moon as it appears through SCTs - the world's most popular telescopes!

► Features the superb photographs from the original Hatfield Lunar Atlas ► Detailed key maps for every photograph identify lunar features ► Inset IAUstandard photographs, to help users learn to identify features on conventional Moon maps

2005. VI, 122 p. 216 illus. Hardcover ISBN 1-85233-749-4 ► € 39,95 | £24.95

![](_page_41_Picture_21.jpeg)

#### Visual Astronomy Under Dark Skies

A New Approach to Observing Deep Space

A. Cooke

Modern astronomical telescopes, along with other advances in technology, have brought the deep sky – star clusters, nebulae and the galaxies – within reach of amateur astronomers. And it isn't even necessary to image many of these deep-sky objects in order to see them; they are within reach of visual observers using modern techniques and enhancement technology.

The first requirement is truly dark skies; if you are observing from a light-polluted environment you

need Tony Cooke's book, **Visual Astronomy in the Suburbs**. Given a site with clear, dark night skies everything else follows... this book will provide the reader with everything he needs to know about what to observe, and using some of today's state-of-theart technique and commercial equipment, how to get superb views of faint and distant astronomical objects.

2005. X, 180 p. 117 illus. (Patrick Moore's Practical Astronomy Series) Softcover ISBN 1-85233-901-2 ► € **39,95 | £24.95** 

#### **Patrick Moore's Practical Astronomy Series**

This series is written for serious newcomers to amateur astronomy, for undergraduate students who are studying astronomy - but not as a first subject - and for interested general readers who want to study astronomy in more depth than is provided by the general run of "popular" astronomy book that is found in the general trade bookshops. All the books in the series are as far as possible non- mathematical. They require only a modest background knowledge of science on the part of the reader, but provide material that goes into the various topics in considerable depth and detail. The series thus bridges the gap between the many introductory books and specialised technical publications. For a complete list of available titles, visit springer.com

![](_page_42_Picture_5.jpeg)

#### Lunar and Planetary Webcam User's Guide

M. Mobberley, Suffolk, England

In the last few years, cheap webcams have revolutionized amateur astronomy by providing a very inexpensive alternative to purpose-made astronomical CCD cameras, which use refrigerated imaging chips and are thus extremely expensive. Webcams are capable of more advanced work than "normal" digital cameras because their simple construction makes it easy to remove the webcam's lens, allowing it to be interfaced directly to a telescope. Using a webcam is not difficult but most amateur astronomers who have tried to do this do not achieve the finest results, despite the webcam's potential. There are numerous imaging and image processing tricks and techniques, and all of them are needed to get the best results.

Along with webcam technology has come simple-touse image processing and enhancement using a PC: the most powerful technique is, ,stacking' in which the best images (out of hundreds) are selected and summed automatically to provide startlingly good results.

Lunar and Planetary Webcam User's Guide

de-mystifies the jargon of webcams and computer processing, and provides detailed hints and tips for imaging the Sun, Moon and planets with a webcam. He looks at each observing target separately, describing and explaining all specialised techniques in context.

Glance through the images in this book to see just how much you can – easily – achieve by using a webcam with your telescope!

2006. Approx. 220 p. 80 illus. (Patrick Moore's Practical Astronomy Series) Softcover ISBN 1-84628-197-0 ► € 29,95 | £19.50

![](_page_42_Picture_15.jpeg)

#### The Urban Astronomer's Guide

R. Mollise, Mobile, AL, USA

Most amateur astronomers yearn to observe more frequently. Many of them, however, live in urban and highly developed suburban areas that are heavily light polluted. Due to this light pollution, they are under the impression that deep sky objects - nebulae, galaxies, star clusters- are either invisible or not worth viewing from home. This book describes the many objects that can be seen in a bright urban sky, and shows the city or suburban astronomer how to observe object after object, season after season. This book covers the "why," "how," and "what" of astronomy under light-polluted skies. The prospective city-based observer is told why to observe from home (there are hundreds of spectacular objects to be seen from the average urban site), how to observe the city sky (telescopes, accessories, and moderns techniques), and what to observe. About 50% of the book is devoted to describing "tours" of the sky, with physical and observational descriptions, at-theeyepiece drawings, and photographs.

2006. Approx. 210 p. 100 illus., 50 in color. (Patrick Moore's Practical Astronomy Series) Softcover ISBN 1-84628-216-0 ► € 29,95 | £19.50

![](_page_42_Picture_21.jpeg)

![](_page_43_Picture_2.jpeg)

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### forthcoming

The most up-to-date book about Mercury for amateur astronomers

#### **Moore on Mercury**

The Planet and the Missions P Moore

Mercury is one of the more difficult objects for amateur astronomers to observe because of its close proximity to the Sun. For the same reason, it is also one of the most fascinating and strange planets. Mercury is not much larger that our Moon, but orbits the Sun at an average distance of only 58 million km, compared to the Earth's 150 million km. On its sunlit side, Mercury's surface temperature can exceed 450C while the night side freezes at –180C. Amateur astronomers can see Mercury and its ever-changing phases all year, and sometimes watch it transit the Sun – the next transit is in November 2006, followed by one in May 2016. In his inimitable, easy-going style, Patrick Moore describes Mercury, the professional astronomers who have observed it over the centuries, amateur observations, and the past, present and future space missions to this extraordinary world.

VISIT

TODAY

2006. Approx. 160 p. Softcover ISBN 1-84628-257-8 ► € 29,95 | £19.00

![](_page_43_Picture_19.jpeg)

#### **Digital Astrophotography: The State of the Art**

D. Ratledge, Lancashire, UK (Ed.)

The CCD (Charge-Coupled Device) has revolutionised optical astronomy during the past 20 years, and specialised astronomical CCD cameras are now even more affordable, colour is standard, and they provide spectacular results.

Digital Astrophotography: The State of the Art, provides some examples of the best images, and gives readers hints and tips about how to get the best out of this extraordinary technology.

Experts in CCD astronomy from North America and

Europe have contributed to this book, illustrating their help and advice with many beautiful colour images – the book is in full colour throughout. Techniques range from using simple webcams to highly technical aspects such as supernovae patrolling. Computer processing, stacking and image-enhancement are detailed, along with many hints and tips from the experts.

2005. VIII, 177 p. 125 illus. (Patrick Moore's Practical Astronomy Series) Softcover ISBN 1-85233-734-6 ► € 24,95 | £22.00

#### **Practical and Amateur Astronomy**

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#### **CCD** Astrophotography

#### High-Quality Imaging from the Suburbs

**A. Stuart**, Physician Offices of South Florida, Florida City, FL, USA

Not all amateur astronomers who live in a suburban location realize just how very effective a 'chilledchip' astronomical CCD-camera and software can be at cutting through seemingly impenetrable light-pollution. CCD Astrophotography from the Suburbs details one man's approach to the problem of getting high-quality astronomical images under light-polluted conditions. Adam Stuart has written this reference book for all amateur astronomers who are interested in CCD imaging, especially those who have to work under suburban conditions. The book outlines the materials and (commercially-available) equipment used for high-quality imaging. The many wonderful images Dr. Stuart has produced allow the reader to see the product of – initially – a fellow beginner's efforts. The glorious images found in numerous books, and especially those seen in Sky and Telescope magazine – might seem out of reach. But this is not really the case. Respectable images are attainable with modest equipment. This book outlines a complete and thoroughly tested working program for every beginner to achieve high-quality digital imaging.

2006. Approx. 210 p. 40 illus., 20 in color. (Patrick Moore's Practical Astronomy Series) Softcover ISBN 0-387-26241-5 ► € 29,95 | £19.50

![](_page_44_Picture_8.jpeg)

#### **Binocular Astronomy**

S. Tonkin, Kent, UK

The advantages of using both eyes for astronomical observing are many and considerable, largely because of the way the human brain processes visual information.

Binoculars – the usual kinds – are incredibly useful for wide-field observing, but "binocular astronomy" is much more than that, including binocular eyepieces that can be fitted to normal astronomical

telescopes, and even giant binocular telescopes that are effectively two astronomical telescopes working

in tandem.

Here is everything an astronomer needs to know about binocular observing. The book takes an in-depth look at the instruments themselves, and has sections on evaluating and buying binoculars and binocular telescopes, their care, mounting, and accessories. In addition there is a selection of fine objects to be seen with 50mm and 100mm binoculars.

2006. X, 270 p. 120 illus. (Patrick Moore's Practical Astronomy Series) Softcover ISBN 1-84628-308-6 ► € 24,95 | £19.50

![](_page_44_Picture_17.jpeg)

#### A Practical Guide to Lightcurve Photometry and Analysis

**B. D. Warner,** Minor Planet Observer, Colorado Springs, CO, USA Foreword by: **A. W. Harris** 

This book provides those with access to even a modest telescope and a CCD camera the background and detailed steps to take part in important astronomical research. Readers learn about the joint projects in which they can take part, as well as the techniques of gathering, analyzing, and then publishing their data. The primary market for this book is amateur astronomers, but undergraduate students will also find its easy going friendly style ideal for help with their studies in this subject. There is of course more to lightcurve photometry than simply taking pictures. For the results to be of value, the data must be gathered and processed in certain ways so that it is both meaningful and can be used by others for analysis. The book contains enough background material (theory) for the reader to understand – and avoid – the pitfalls in the process. More important, there are detailed examples provided for how to obtain data and, for many, the more exciting and rewarding effort of analyzing the data to determine various properties of the object being studied. Under "choosing the right software," the author looks critically at the commercially-available packages, providing screen shots and useful advice. Amateur astronomers who want to go beyond mere imaging with a CCD camera will find everything that they need in the book to take a step into 'real' science.

2006. XIII, 297 p. Softcover ISBN 0-387-29365-5 ► € **34,95 | £27.00** 

![](_page_44_Picture_23.jpeg)

The next step after CCD imaging for amateur astronomers

### Space Exploration at an Academic Level

![](_page_45_Picture_4.jpeg)

#### **Fundamentals of Space Biology**

Research on Cells, Animals, and Plants in Space G. Clément, Faculte de Medecine Rangueil, Toulouse, France; K. Slenzka, OHB-System AG, Bremen, Germany (Eds.)

This book is intended as an overview at an undergraduate or early university level and describes the effects of spaceflight at cellular and organism levels. Past, current, and future research on the effects of gravity--or its absence--and ionizing radiation on the evolution, development, and function of living organisms is presented in layman's terms by researchers who have been active in this field. The purpose is to enlighten science and non-science readers to the benefits of space biology research for conducting basic and applied research to support human exploration of space and to take advantage of the space environment as a laboratory for scientific, technological, and commercial research. The first chapters present an overview of the major focuses of space research in biology, as well as

the history and the list of animals and plants that have flown in space to date. The following chapters describe the main results of space studies in gravitational biology, developmental biology, radiation biology, and biotechnology. A background is given in each chapter, so that a minimum of prior coursework in biology is necessary for full comprehension. Each chapter also includes perspectives for future research and a list of references.

► Gives a unique account of what we know about the effects of zero gravity on life ► Features an introduction and review of past, current and future research in space biology in layman's terms ► For specialists and non-specialists alike ► Each chapter includes perspectives for future research and a list of references

2006. Approx. 325 p. (Space Technology Library, Volume 18) Hardcover ISBN 0-387-33113-1 ► € 114,95 | £88.50

![](_page_45_Picture_11.jpeg)

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#### **Future Spacecraft Propulsion Systems**

#### Enabling Technologies for Space Exploration

P. A. Czysz, University of St.Louis, MO, USA; C. Bruno, Università Degli Studi di Roma La Sapziena, Rome, Italy

This is a timely and comprehensive book, putting spacecraft propulsion systems in perspective.
▶ Demonstrates how the development of space propulsion systems has been held back by reliance on expendable rockets and chemical propulsion
▶ Puts forward a step-by-step approach to the design of new space propulsion systems for future

operations ► Reviews the concepts for nuclear and high-energy space propulsion, essential for fast Solar System exploration ► Looks ahead to possible future developments of propulsion systems for journeys to the stars

2006. XXVI, 464 p. (Springer Praxis Books / Astronautical Engineering) Hardcover ISBN 3-540-23161-7 ► € 139,95 | £107.50 Jointly published with Praxis Publishing, UK

![](_page_45_Picture_18.jpeg)

#### Utilization of Space

#### **Today and Tomorrow**

**B. Feuerbacher**, DLR, Köln, Germany; **H. Stoewer**, SAC Space Associates, St. Augustin, Germany (Eds.)

This book gives an overview of the current status of peaceful space utilization and applications, as well as an outlook on future developments. It is complementary to the large number of books available on space technology and to specialised volumes in specific application fields. It covers scientific space utilization, commercial, and technological applications in chapters written by leading specialists in the respective fields. The book is written on a level comprehensible to an educated but not specialized reader, with color illustrations throughout and only occasional use of mathematical formulae. It is intended to transmit to the reader, in addition to the factual information, some of the fascination attached to space activities.

2006. XX, 410 p. 315 illus. Hardcover ISBN 3-540-25200-2 ► € **59,95 | £46.00** 

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