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惑星科学関連書ご案内

外国出版社のカタログの中から惑星科学関係の新刊書・近刊書をご案内いたします。お見積り、見計らいのご希望など、お気軽にお申込みください。

1. 2001 Mars Odyssey

(Developments in Hydrobiology S)
Edited by C.T. Russell
April 2004, 159 pages, Hardcover (Springer)
ISBN 9781402016967 **¥27,220**

Mars, the most habitable of our sister planets, holds a special place in our imaginations and in our space exploration program. Fully half of NASA's planetary exploration effort is now devoted to Mars. Key questions include: Has Mars ever harbored life? Is there life on Mars now? Will humans be able to survive on the Martian surface? Answers to these questions lie in determining the present location of water on Mars and its likely inventory in the past, and in determining the present radiation environment of Mars. The 2001 Mars Odyssey Mission contributes greatly these answers by detecting near-surface water through measurements of neutron flux, from the detection of carbonates, and the quantification of its radiation environment. This book captures the objectives, the design of the mission and the details of the instruments carried to Mars. It should be of interest to every scientist interested in participating in the on-going exploration of Mars from graduate students to senior scientists as it provides the background information essential to interpret the many exciting results now appearing from the mission.

2. Advances in Planetary Information Systems

Edited by Stephan van Gasselt
Jan 2018, 390 pages, Hardcover (Springer)
ISBN 9783642234521 **ca. ¥29,490**

The volume on Advances in Planetary GIS is composed of innovative contributions from researchers (and users) in the field of planetary sciences and should also provide introductory material for (post)-graduates getting involved in this research field.
Topics are
[a] spatio-temporal GI aspects for planning and tracking of rovers and manned missions,
[b] geologic mapping conducted through NASA/ESA-financed programs,
[c] developments and application of DB models for specific requirements (also for collaboration)
[d] spatial remote-sensing data analysis (hyperspectral, terrain models, image data) for
landing-site assessments/selections as well as traverse planning,
[e] aspects of interoperability (accessing archive nodes via webGIS) using WF/WM/WC services,
[f] compliance to standards (XML Metadata, OGC, ...)
[f] processing and incorporation of data,
[g] cartographic aspects (map layout/production, visualisation),
[h] software developments for planetary research

3. Algae and Cyanobacteria in Extreme Environments

(Cellular Origin, Life in Extreme Habitats and Astrobiology, Vol 11)
Softcover reprint of the original 1st ed. 2007 Edition
Aug 2016, 813 pages, Softcover (Springer)
ISBN 9789402404746 **¥69,970**

ALGAE AND CYANOBACTRIA IN EXTREME ENVIRONMENTS is a unique collection of essays, contributed by leading scientists from around the world, devoted to algae – and some related microbes – observed in unexpected harsh habits, which it seems are an oasis or Garden of Eden for these organisms. This timely book on Extremophilic alga, including its especially impressive micrographs, may provide clues about the edges of life on Earth and possibly elsewhere in the universe.
Defining locations from the anthropomorphic point of view, the environments explored ranges from severe and distant to "normal" places. The algae discussed, microbial oxygenic phototrophs, are classified into various categories according to their habitats. They thrive in various temperature ranges, at the limits of pH values, in salt solutions, under UV radiation, dryness, heavy metals, anaerobic niches, under various levels of illuminations, and under hydrostatic pressure. Authors discuss bio-diversely algal territories ecologically – the hot springs with the thermophiles or acido-thermophiles; Antarctica, the Artic, and permafrost zones with their cold lovers (Psychrophiles); soda lakes with the alkaliphiles, saltine areas with halophiles. In addition to general essays, Algal species discussed in detail include diatoms, Cyanidium, Galdieria, Dunaliella, and Chroococcidiopsis.
This volume is a must for students of the field of biodiversity, as well as those in Phycology, ecology and general biological research.

4. The Apollo Lunar Samples

Collection Analysis and Results
(SpringerBriefs in Space Development)
by Anthony Young
March 2017, 114 pages, Paperback (Springer)
ISBN 9781461461845 **¥11,340**

In this book, detailed descriptions are given on the design of the lunar sampling tools, the Modular Experiment Transporter used on Apollo 14, and the specific areas of the Lunar Rover vehicle used for the Apollo 15, 16, and 17 missions, which carried the sampling tools, bags, and other related equipment used in sample collection. The Lunar Receiving Laboratory, which was designed and built at the Manned Spacecraft Center in Texas for analysis and storage of the lunar samples returned from the Apollo lunar landing missions is also described in detail.
There are also descriptions of astronaut mission training for sample collecting, with the focus on the specific portions of the mission EVAs devoted to this activity.

5. Asteroseismology and Exoplanets

Listening to the Stars and Searching for New Worlds: IVth Azores International Advanced School in Space Sciences
(Series: Astrophysics and Space Science

Proceedings, Vol 49)
Edited by Tiago L. Campante, Nuno C. Santos, & Mário J. P. F. G. Monteiro
Dec 2017, 282 pages, Hardcover (Springer)
ISBN 9783319593142 **¥38,560**
This book presents the proceedings of the IVth Azores International Advanced School in Space Sciences entitled "Asteroseismology and Exoplanets: Listening to the Stars and Searching for New Worlds". The school addressed the topics at the forefront of scientific research being conducted in the fields of asteroseismology and exoplanetary science, two fields of modern astrophysics that share many synergies and resources. These proceedings comprise the contributions from 18 invited lecturers, including both monographic presentations and a number of hands-on tutorials.

6. Astrobiology, History, and Society

Life Beyond Earth and the Impact of Discovery
(Advances in Astrobiology and Biogeophysics)
Reprint of 2013 Edition
Feb 2015, 375 pages, Paperback (Springer)
ISBN 9783642435409 **¥27,560**
This book addresses important current and historical topics in astrobiology and the search for life beyond Earth, including the search for extraterrestrial intelligence (SETI). The first section covers the plurality of worlds debate from antiquity through the nineteenth century, while section two covers the extraterrestrial life debate from the twentieth century to the present. The final section examines the societal impact of discovering life beyond Earth, including both cultural and religious dimensions. Throughout the book, authors draw links between their own chapters and those of other contributors, emphasizing the interconnections between the various strands of the history and societal impact of the search for extraterrestrial life.
The chapters are all written by internationally recognized experts and are carefully edited by Douglas Vakoch, professor of clinical psychology at the California Institute of Integral Studies and Director of Interstellar Message Composition at the SETI Institute.
This interdisciplinary book will benefit everybody trying to understand the meaning of astrobiology and SETI for our human society.

7. Astronomy Today Volume 1

The Solar System, 9th Edition
by Eric Chaisson & Steve McMillan
Feb 2017, 528 pages, Paperback (Pearson)
ISBN 9780134566221 **¥21,600**

8. The Atmosphere and Climate of Mars

(Series: Cambridge Planetary Science, Vol 18)
Edited by Dr Robert M. Haberle, Dr R. Todd Clancy, Dr François Forget, Dr Michael D. Smith & Dr Richard W. Zurek
Aug 2017, 588 pages, Hardcover (Cambridge U.P.)
ISBN 9781107016187 **¥35,080**
Humanity has long been fascinated by the planet Mars. Was its climate ever conducive to life? What is the atmosphere like today and why did it change so dramatically over time? Eleven spacecraft have successfully flown to Mars since the Viking mission of the 1970s and early 1980s. These orbiters, landers and rovers have generated vast amounts of data that now span a Martian decade (roughly eighteen years). This new volume brings together the many new ideas about the atmosphere and climate system that have emerged, including the complex interplay of the volatile and dust cycles, the atmosphere-surface interactions that connect them over time, and the diversity of the planet's environment and its complex history. Including tutorials and explanations of complicated ideas, students, researchers and non-specialists alike are able to use this resource to gain a thorough and up-to-date understanding of this most Earth-like of planetary neighbours.

9. Atmospheric and Space Sciences

Ionospheres and Plasma Environments, Vol 2
(SpringerBriefs in Earth Sciences)
by Erdal Yiğit
July 2017, 143 pages, Paperback (Springer)
ISBN 9783319620053 **¥11,340**
The SpringerBriefs on Atmospheric and Space Sciences in two volumes presents a concise and interdisciplinary introduction to the basic theory, observation & modeling of atmospheric and ionospheric coupling processes on Earth. The goal is to contribute toward bridging the gap between meteorology, aeronomy, and planetary science. In addition recent progress in several related research topics, such atmospheric wave coupling and variability, is discussed. Volume 1 will focus on the atmosphere, while Volume 2 will present the ionospheres and the plasma environments. Volume 2 is aimed primarily at (research) students and young researchers that would like to gain quick insight into the basics of space sciences and current research. In combination with the first volume, it also is a useful tool for professors who would like to develop a course in atmospheric and space physics.

10. Biochirality

Origins, Evolution and Molecular Recognition
(Topics in Current Chemistry, Vol 333)
Reprint of 2013 Edition
Feb 2015, 316 pages, Paperback (Springer)
ISBN 9783642447372 **¥59,370**
CONTENTS: Early History of the Recognition of Molecular Biochiralit *(Joseph Gal, Pedro Cintas).* Synthesis and Chirality of Amino Acids Under Interstellar Conditions (*Chaitanya Giri, Fred Goesmann, Cornelia Meinert, Amanda C. Evans, Uwe J. Meierhenrich).* Chemical and Physical Models for the Emergence of Biological Homochirality *(son E. Hein, Dragos Gherase, Donna G. Blackmond)* Biomolecules at Interfaces: Chiral, Naturally *(Arántzazu González-Campo and David B. Amabilino).* Stochastic Mirror Symmetry Breaking: Theoretical Models and Simulation of Experiments *(Celia Blanco, David Hochberg)* Self-Assembly of Dendritic Dipeptides as a Model of Chiral Selection in Primitive Biological Systems *(Brad M. Rosen, Cécile Roche, Virgil Percec).* Chirality and Protein Biosynthesis *(Sindrila Dutta Banik, Nilashis Nandi)*

11. Biocommunication

Sign-Mediated Interactions between Cells and Organisms
(Astrobiology: Exploring Life on Earth and Beyond)
Edited by: Richard Gordon & Joseph Seckbach
Jan 2017, 700 pages, Hardcover (World Scientific)
ISBN 9781786340443 **¥45,800**
All coordination between cells, organs, and organisms depends on successful biocommunicative processes. There are abundant cases of communication in the biological world, both within (intraspecific) and between (interspecific) single-cell and multicellular microorganisms and higher animal forms.
Split into two parts, this book first looks at the history, development and progress within the field of

biocommunication. The second part presents real-life case studies and investigation into examples of biocommunication in the biological world. Among the organisms covered are bacteria, fungi, plants, terrestrial and marine animals, including bonobos, chimpanzees and dolphins, as well as a new theory of communication between parts in developing embryos (cybernetic embryos). Contributions from international experts in the field provide up-to-date research and results, while in depth analysis expands on these findings to pave the way for future discoveries. As the first comprehensive review of its kind, it is perfect for undergraduates, graduates, professionals and researchers in the field of life sciences.

12. Bode's Law and the Discovery of Juno

Historical Studies in Asteroid Research

By Clifford J. Cunningham,
June 2017, 304 pages, Hardcover (Springer)
ISBN 9783319328737 **¥23,340**

Johann Bode developed a so-called law of planetary distances best known as Bode's Law. The story of the discovery of Juno in 1804 by Karl Harding tells how Juno fit into that scheme and is examined as it relates to the philosopher Georg Hegel's 1801 thesis that there could be no planets between Mars and Jupiter. By 1804 that gap was not only filled but had three residents: Ceres, Pallas and Juno!

When Juno was discovered no one could have imagined its study would call into question Newton's law of gravity, or be the impetus for developing the mathematics of the fast Fourier transform by Carl Gauss. Clifford Cunningham, a dedicated scholar, opens to scrutiny this critical moment of astronomical discovery, continuing the story of asteroid begun in earlier volumes of this series.

The fascinating issues raised by the discovery of Juno take us on an extraordinary journey. The revelation of the existence of this new class of celestial bodies transformed our understanding of the Solar System, the implications of which are thoroughly discussed in terms of Romantic Era science, philosophy, poetry, mathematics and astronomy.

The account given here is based on both English and foreign correspondence and scientific papers, most of which are translated for the first time.

13. Celestial Shadows

Eclipses, Transits, and Occultations

Astrophysics and Space Science Library, Vol 410)
by John Westfall & William Sheehan
Nov 2014, 713 pages, Hardcover (Springer)
ISBN 9781493915347 **¥29,490**

"In Celestial Shadows, westfall … summarize all the ways in which observational astronomers and planetary scientists use eclipses, transits, and occultations to study distant objects. … This 22-chapter book collects in one place such a tremendous amount of information that it will be very useful, in particular, to those who wish to learn about how these events have previously allowed and continue to allow scientists to study solar system objects in unique ways. … Summing Up: Highly recommended. All levels/libraries." (C. Palma, Choice, Vol. 52 (10), June, 2015)

"The authors explain the astronomy, how to make observations, flag up future events, and link them to a rich history in which such observations contributed to significant developments in astronomy. … this work is as good a place as any for amateur astronomers to begin engagement with a history that takes them beyond the usual accounts of heroes and moments of discovery and makes a useful resource for historians and educators." (Rebekah Higgitt, Journal for the History of Astronomy, Vol. 47 (4), November, 2016)

14. The Chang'E-1 Topographic Atlas of the Moon

By C. Li, J. Liu, L. Mu, X. Ren, & W. Zuo
July 2017, 238 pages, Hardcover (Springer)
ISBN 9783662484371 **¥14,740**

This atlas is based on the lunar global Digital Elevation Models (DEM) of Chang'E-1 (CE-1), and presents CCD stereo image data with digital photogrammetry. The spatial resolution of the DEM in this atlas is 500m, with horizontal accuracy of 192m and vertical accuracy of 120m. Color-shaded relief maps with contour lines are used to show the lunar topographical characteristics. The topographical data gathered by CE-1 can provide fundamental information for the study of lunar topographical, morphological and geological structures, as well as for lunar evolution research.

15. Comets as Tracers of Solar System: Formation and Evolution

Edited by K. Mandt, O. Mousis, D. Bockelée-Morvan, & C. Russell
June 2017, 342 pages, Hardcover (Springer)
ISBN 9789402411027 **¥34,030**

This volume is a compilation of an International Workshop on Comets as Tracers of Solar System Formation and Evolution that was held in Toulouse, France, from April 1-3, 2014, meant to prepare the community for the task of placing Rosetta observations within the greater context of using comets as tracers of solar system formation and evolution. More than 100 scientists from 18 different countries participated in this three-day science program, which was comprised of themed sessions and featured a mixture of invited reviews, invited and contributed talks and posters. These invited speakers included many of the community leaders in cometary science, measurements and technology development. The workshop covered topics ranging from the dynamical and chemical evolution of the solar nebula during formation, to the techniques for measuring the composition of comets. Of particular focus was the role that measurements made by Rosetta could be expected to play in understanding the origin of solar system bodies. The purpose of this volume is to build upon the results of this workshop, providing a formal record of the state of knowledge leading into the Rosetta mission.

16. EChO – Exoplanet Characterisation Observatory

Edited by Giovanna Tinetti & Pierre Drossart
Dec 2016, 514 pages, Hardcover (Springer)
ISBN 9789402408362 **¥38,160**

This book comprises 26 articles on the EChO science cases, mission pre-assessment and assessment, phase-studies, the payload, the instrumentation and software. They are reprints of articles published in a special issue on EChO – Exoplanet Characterisation Observatory of the journal Experimental Astronomy.

Originally published in Experimental Astronomy, Volume 40, Nos. 2-3 (2015)

17. Dawn-Dusk Asymmetries in Planetary Plasma Environments

(Geophysical Monograph Series, Vol 230)
Edited by Stein Haaland, Andrei Runov & Colin Forsyth

Oct 2017, 376 pages, Hardcover (American Geophysical Union / Wiley) ISBN 9781119216322 **¥36,920**

Dawn-dusk asymmetries are ubiquitous features of the plasma environment of many of the planets in our solar system. They occur when a particular process or feature is more pronounced at one side of a planet than the other. For example, recent observations indicate that Earth's magnetopause is thicker at dawn than at dusk. Likewise, auroral breakups at Earth are more likely to occur in the pre-midnight than post-midnight sectors. Increasing availability of remotely sensed and in situ measurements of planetary ionospheres, magnetospheres and their interfaces to the solar wind have revealed significant and persistent dawn-dusk asymmetries. As yet there is no consensus regarding the source of many of these asymmetries, nor the physical mechanisms by which they are produced and maintained.

18. Dust Devils

(Space Sciences Series of ISSI, Vol 59)
Edited by D. Reiss, R. Lorenz, M. Balme, L Neakrase, A.P. Rossi, A. Spiga, & J. Zarnecki
June 2017, 426 pages, Hardcover (Springer)
ISBN 9789402411331 **¥34,030**

This volume reviews both historical and current studies of desert whirlwinds called dust devils on Earth and Mars. These include field measurements, orbital observations, modelling of dust devil formation and structure, studies of their population and statistics, and their atmospheric and climate impact.

Dust devils have captivated humankind since antiquity, and yet also assume importance in that most modern of activities, planetary exploration. The close investigation of the planet Mars by an armada of spacecraft in the last couple of decades has stimulated extensive research on these desert whirlwinds, supported by improvements in field instrumentation on Earth, laboratory experiments and powerful numerical simulations. This convergence of capability and interest stimulated the workshop 'Dust Devils on Mars and Earth', conceived by Dennis Reiss, Ralph Lorenz, Matt Balme, Lynn D. Neakrase, Angelo Pio Rossi, Aymeric Spiga and John Zarnecki, held under the auspices of the International Space Science Institute in Bern, Switzerland, during the week of February 16–20, 2015. The workshop drew not only planetary scientists, for whom terrestrial dust devils are a convenient proxy for their Martian cousins, but also scientists studying the impact of dust on the terrestrial climate.

19. The Early Evolution of the Atmospheres of Terrestrial Planets

(Astrophysics and Space Science Proceedings, 35)
Reprint of 2013 Edition
June 2015, 186 pages, Paperback (Springer)
ISBN 9781489996794 **¥38,160**

“The Early Evolution of the Atmospheres of Terrestrial Planets” presents the main processes participating in the atmospheric evolution of terrestrial planets. A group of experts in the different fields provide an update of our current knowledge on this topic.

Several papers in this book discuss the key role of nitrogen in the atmospheric evolution of terrestrial planets. The earliest setting and evolution of planetary atmospheres of terrestrial planets is directly associated with accretion, chemical differentiation, outgassing, stochastic impacts, and extremely high energy fluxes from their host stars. This book provides an overview of the present knowledge of the initial atmospheric composition of the terrestrial planets. Additionally it includes some papers about the current exoplanet discoveries and provides additional clues to our understanding of Earth’s transition from a hot accretionary phase into a habitable world. All papers included were reviewed by experts in their respective fields.

We are living in an epoch of important exoplanet discoveries, but current properties of these exoplanets do not match our scientific predictions using standard terrestrial planet models. This book deals with the main physio-chemical signatures and processes that could be useful to better understand the formation of rocky planets.

20. The Earth as a Distant Planet

A Rosetta Stone for the Search of Earth-Like Worlds

(Series: Astronomy and Astrophysics Library)
Softcover reprint of the original 1st ed. 2010 Edition
by M. Vázquez, E. Pallé, & P. Montañés Rodríguez
Aug 2016, 422 pages, Paperback (Springer)
ISBN 9781493950607 **¥34,030**

In The Earth as a Distant Planet, the authors become external observers of our solar system from a distance and try to determine how one can understand how Earth, the third in distance to the central star, is essentially unique and capable of sustaining life. The knowledge gained from this original perspective is then applied to the search for other planets outside the solar system, or exoplanets.

Since the discovery in 1992 of the first exoplanet, the number of planet detections has increased exponentially and ambitious missions are already being planned for the future. The exploration of Earth and the rest of the rocky planets are Rosetta stones in classifying and understanding the multiplicity of planetary systems that exist in our galaxy. In time, statistics on the formation and evolution of exoplanets will be available and will provide vital information for solving some of the unanswered questions about the formation, as well as evolution of our own world and solar system. Special attention is paid to the biosignatures (signs of life) detectable in the Earth's reflected spectra and the search for life in the universe.

The authors are experts on the subject of extrasolar planets. They provide an introductory but also very much up-to-date text, making this book suitable for researchers and for advanced students in astronomy and astrophysics.

21. The Earth's Lower Mantle

Composition and Structure

(Springer Geology)
by Felix V. Kaminsky
May 2017, 331 pages, Hardcover (Springer)
ISBN 9783319556833 **¥26,080**

This book presents the first overview of the composition and structure of the Earth’s lower mantle. The first part focuses on the study of lower-mantle minerals, identified as inclusions in diamonds from different regions of the world. Three associations are established among the lower-mantle minerals: ultramafic, mafic, and carbonatic. The carbonatic association is of particular interest because it characterizes the media of natural diamond formation. In turn, the second part analyzes the structure of the lower mantle, revealing its heterogeneous composition. It is based on the results of experiments demonstrating phase transitions in lower-mantle minerals, and on seismological data. Deep-seated earthquakes point to the presence within the lower mantle of numerous seismic boundaries caused by mineral structure transitions. In closing, the last part of the book compares observed data with experimental data, highlighting several discrepancies that indicate Earth may have a more complex planetary history than previously assumed, and examining its primarily non-chondritic composition.

22. Earth's Magnetic Field

Understanding Geomagnetic Sources from the Earth's Interior and its Environment

(Space Sciences Series of ISSI, Vol 60)
Edited by Claudia Stolle, Nils Olsen, Arthur D. Richmond, & Hermann J. Opgenoorth
Dec 2017, 620 pages, Hardcover (Springer)
ISBN 9789400703223 **¥24,950**

This volume provides a comprehensive view on the different sources of the geomagnetic field both in the Earth's interior and from the field's interaction with the terrestrial atmosphere and the solar wind. It combines expertise from various relevant areas of geomagnetic and near Earth space research with the aim to better characterise the state and dynamics of Earth's magnetic field. Advances in the exploitation of geomagnetic observations hold a huge potential not only for an improved quantitative description of the field source but also for a better understanding of the underlying processes and physics. Key is the separation of the field sources in the observations, especially, but not solely, during times of quiet geomagnetic conditions, when the most subtle geomagnetic effects can be identified and become significant. The collected articles are based on the current constellation of ground and space observations, and on state-of-the-art empirical models and physics-based simulations. Thus, it provides an in-depth overview over recent achievements, current limitations and challenges, and future opportunities in the field of geomagnetism and space sciences.
Originally published in Space Science Reviews, Volume 206, Issue 1-4, March 2017

23. Encyclopedia of Astrobiology 2nd Edition

Edited by M. Gargaud, W.M. Irvine, R. Amils, H.J. Cleaves, D. Pinti, J. Cernicharo Quintanilla, D. Rouan, T. Spohn, S. Tirard, & M. Viso
Sept 2015, 2737 pages, Hardcover (Springer)
ISBN 9783-662-44184-8 **¥254,450**

The interdisciplinary field of Astrobiology constitutes a joint arena where provocative discoveries are coalescing concerning, e.g. the prevalence of exoplanets, the diversity and hardiness of life, and its increasingly likely chances for its emergence. Biologists, astrophysicists, biochemists, geoscientists and space scientists share this exciting mission of revealing the origin and commonality of life in the Universe. The members of the different disciplines are used to their own terminology and technical language. In the interdisciplinary environment many terms either have redundant meanings or are completely unfamiliar to members of other disciplines.
The Encyclopedia of Astrobiology serves as the key to a common understanding. Each new or experienced researcher and graduate student in adjacent fields of astrobiology will appreciate this reference work in the quest to understand the big picture. The carefully selected group of active researchers contributing to this work and the expert field editors intend for their contributions, from an internationally comprehensive perspective, to accelerate the interdisciplinary advance of astrobiology.
This new edition offers ~300 new entries. Many entries were expanded or supplemented by figures supporting the understanding of the text. Especially in the field of astrochemistry there is a huge body of new results that have been taken into account in this new edition. The synonyms and keywords have been carefully revisited. Many were added, redundant ones deleted.

24. Encyclopedia of Geochemistry

A comprehensive reference source on the chemistry of the Earth

(Encyclopedia of Earth Sciences Series)
Edited by William M. White
July 2018, 1680 pages, Hardcover (Springer)
ISBN 9783319393117 **ca. ¥90,520**

The Encyclopedia is a complete and authoritative reference work for this rapidly evolving field. Over 200 international scientists, each experts in their specialties, have written over 340 separate topics on different aspects of geochemistry including geochemical thermodynamics and kinetics, isotope and organic geochemistry, meteorites and cosmochemistry, the carbon cycle and climate, trace elements, geochemistry of high and low temperature processes, and ore deposition, to name just a few. The geochemical behavior of the elements is described as is the state of the art in analytical geochemistry. Each topic incorporates cross-referencing to related articles, and also has its own reference list to lead the reader to the essential articles within the published literature. The entries are arranged alphabetically, for easy access, and the subject and citation indices are comprehensive and extensive.

25 Experimental and Computational Solutions of Hydraulic Problems

32nd International School of Hydraulics

(GeoPlanet: Earth and Planetary Sciences, Vol 9)
Softcover reprint of the original 1st ed. 2013 Edition
Edited by Pawel Rowiński
Aug 2016, 425 pages, Paperback (Springer)
ISBN 9783662522134 **¥41,970**

What is the progress in hydraulic research? What are the new methods used in modeling of transport of momentum, matter and heat in both open and conduit channels? What new experimental methods, instruments, measurement techniques, and data analysis routines are used in top class laboratory and field hydro-environment studies? How to link novel findings in fundamental hydraulics with the investigations of environmental issues? The consecutive 32nd International School of Hydraulics that took place in Łochów, Poland brought together eminent modelers, theoreticians and experimentalists as well as beginners in the field of hydraulics to consider these and other questions about the recent advances in hydraulic research all over the world. This volume reports key findings of the scientists that took part in the meeting. Both state of the art papers as well as detailed reports from various recent investigations are included in the book

26. Extrasolar Planets and Their Host Stars

(Series: SpringerBriefs in Astronomy)
by Kaspar von Braun & Tabetha Boyajian
Aug 2017, 78 pages, Paperback (Springer)
ISBN 9783319611969 **¥11,340**

This book explores the relations between physical parameters of extrasolar planets and their respective parent stars. Planetary parameters are often directly dependent upon their stellar counterparts. In addition, the star is almost always the only visible component of the system and contains most of the system mass. Consequently, the parent star heavily influences every aspect of planetary physics and astrophysics. Drs. Kaspar von Braun and Tabetha Boyajian use direct methods to characterize exoplanet host starts that minimize the number of assumptions needed to be made in the process.
The book provides a background on interferometric techniques

for stellar diameter measurements, illustrates the authors' approach on using additional data to fully characterize the stars, provides a comprehensive update on the current state of the field, and examines in detail a number of historically significant and well-studied exoplanetary systems.

27. Flood Risk in the Upper Vistula Basin

(Series: GeoPlanet: Earth and Planetary Sciences)
Edited by Zbigniew W. Kundzewicz, Markus Stoffel, Tadeusz Niedźwiedź, & Bartlomiej Wyżga
Series: GeoPlanet: Earth and Planetary Sciences
Aug 2016, 418 pages, Hardcover (Springer)
ISBN 9783319419220 **¥34,030**

This pioneering book addresses the entirety of river flooding issues in the Upper Vistula Basin, where considerable flood generation potential exists. It analyses the factors influencing flood risk, investigates variations in observation records and discusses projections for the future and adaptation to changing risk. It serves the general interest in understanding the floods that cause massive destruction in Europe, with dozens of fatalities and tremendous material damages. This interdisciplinary book, which covers aspects of climatology, geomorphology, hydrology, and water and flood risk management, unveils the complexity of the current situation. Access to reliable and accurate information can help solve important practical problems related to flood risk reduction strategies, and is at the core of the EU Floods Directive. As such, the book offers a valuable resource for scientists, educators and practitioners involved in water management, natural disaster reduction and adaptation to climate change.

28.Formation, Evolution, and Dynamics of Young Solar Systems

(Astrophysics and Space Science Library, Vol 445)
Edited by Martin Pessah & Oliver Gressel
Nov 2017, 374 pages, Hardcover (Springer)
ISBN 9783319606088 **¥34,030**

This book's interdisciplinary scope aims at bridging various communities: 1) cosmochemists, who study meteoritic samples from our own solar system, 2) (sub-) millimetre astronomers, who measure the distribution of dust and gas of star-forming regions and planet-forming discs, 3) disc modellers, who describe the complex photo-chemical structure of parametric discs to fit these to observation, 4) computational astrophysicists, who attempt to decipher the dynamical structure of magnetised gaseous discs, and the effects the resulting internal structure has on the aerodynamic re-distribution of embedded solids, 5) theoreticians in planet formation theory, who aim to piece it all together eventually arriving at a coherent holistic picture of the architectures of planetary systems discovered by 6) the exoplanet observers, who provide us with unprecedented samples of exoplanet worlds. Combining these diverse fields the book sheds light onto the riddles that research on planet formation is currently confronted with, and paves the way for a comprehensive understanding of the formation, evolution, and dynamics of young solar systems.
The chapters ‘Chondrules – ubiquitous chondritic solids tracking the evolution of the solar protoplanetary disk’, ‘Dust coagulation with porosity evolution’ and ‘The emerging paradigm of pebble accretion’ are published open access under a CC BY 4.0 license.

29. Genesis - In The Beginning: Precursors of Life, Chemical Models and Early Biological Evolution

(Cellular Origin, Life in Extreme Habitats and Astrobiology, Vol 22)
Softcover reprint of the original 1st ed. 2012 Edition
Aug 2016, 934 pages, Paperback (Springer)
ISBN 9789401779395 **¥46,640**

Genesis – In The Beginning deals with the origin and diversity of Life and early biological evolution and discusses the question of where (hot or cold sources) and when the beginning of Life took place. Among the sections are chapters dealing with prebiotic chemical processes and considering self-replication of polymers in mineral habitats. One chapter is dedicated to the photobiological regime on early Earth and the emergence of Life. This volume covers the role of symmetry, information and order (homochrial biomolecules) in the beginning of Life. The models of protocells and the genetic code with gene transfer are important topics in this volume. Three chapters discuss the Panspermia hypothesis (to answer “Are we from outer Space?”). Other chapters cover the Astrobiological aspects of Life in the Universe in extraterrestrial Planets of the Solar System and deal with cometary hydrosphere (and its connection to Earth). We conclude with the history and frontiers of Astrobiogy.

30. Handbook of Exoplanets

Edited by Hans J. Deeg, & Juan Antonio Belmonte
June 2018, (Springer) ISBN 9783319553320
¥281,330

This state-of-the-art reference work includes over 15 sections dealing with all aspects of exoplanets and exobiology research, including historic aspects, the Solar System as a template, objects at the planet-to-star transition, exoplanet detection and characterization with related instrumentation, technology and software tools, planet and planet-system statistics with recent and planned surveys, their atmosphere and formation and evolution processes, habitability and exobiology implications, and outlooks for future exploration and science development, including visionary contributions. Each section has 10-20 contributions written by the top experts in their subject, including both senior researchers as well as young, smart researchers who represent the future of the discipline.
All in all, this handbook comprehensively tackles one of the most challenging and dynamic fields of modern astronomy and astrophysics.

31. Infrared Spectroscopy of Diatomics for Space Observation

By PIERRE RICHARD DAHOO & AZZEDINE LAKHLIFI
Jan 2018, 234 pages, Hardback (Wiley)
ISBN 9781786301161 **¥23,080**

This book presents theoretical models for the calculation of the absorption spectrum in the infrared region of a diatomic molecule in the gas phase and isolated in the condensed phase in a nano-cage. The spectrum is the result of transitions between energy levels of vibration-rotation of the molecule. The energy levels of vibration-rotation in the gas phase were determined using the Van-Vleck contact method and condensed phase using the extended inclusion model Lakhlifi-Dahoo. The widths and rays displacements are calculated by applying the model of Anderson-Tsao-Curnutte from the classical perturbation theory and model of Robert and Bonamy using the Liouville formalism and density matrix and a series expansion cumulants. These theories are applied to the homo-nuclear molecules N2 and O2 and hetero-nuclear HCl and CO2.

32. Introduction to Astrochemistry

Chemical Evolution from Interstellar Clouds to Star and Planet Formation

(Astronomy and Astrophysics Library, Vol 7)
By Satoshi Yamamoto
Feb 2017, 286 pages, Hardcover (Springer)
ISBN 9784431541707 **¥24,950**

This important book describes the basic principles of astrochemistry—an interdisciplinary field combining astronomy, physics, and chemistry—with particular emphasis on its physical and chemical background. Chemical processes in diffuse clouds, dense quiescent molecular clouds, star-forming regions, and protoplanetary disks are discussed. A brief introduction to molecular spectroscopy and observational techniques is also presented. These contents provide astronomers with a comprehensive understanding of how interstellar matter is evolved and brought into stars and planets, which is ultimately related to the origin of the solar system. The subject matter will also be understandable and useful for physical chemists who are interested in exotic chemical processes occurring in extreme physical conditions. The book is a valuable resource for all researchers beginning at the graduate level.

33. Investigating the Origin of the Asteroids and Early Findings on Vesta

Historical Studies in Asteroid Research

Sept 2017, 399 pages, Hardcover (Springer)
ISBN 9783319581170 **¥34,030**

This book assesses the origin of asteroids by analyzing the discovery of Vesta in 1807. Wilhelm Olbers, who discovered Vesta, suggested that the asteroids were the result of a primordial planet's explosion. Cunningham studies that idea in detail through the writings of Sir David Brewster in Scotland, the era's most prolific writer about the asteroids. He also examines the link between meteorites and asteroids, revealing a synergy between Ernst Chladni, Romantic symbolism, and the music of the spheres.

Vesta was a lightning rod for controversy throughout the nineteenth century with observers arguing over its size and color, and the astounding notion that it was self-luminous. It was also a major force for change, as new methods in the field of celestial mechanics were developed to study the orbital perturbations it is subject to. A large selection of private correspondence and scientific papers complete the first comprehensive historical study of Vesta ever published.

With a synoptic look at the four asteroids, Ceres, Pallas, Juno and Vesta, Cunningham provides a valuable resource on asteroid origins and explains how they were integrated into the newly revealed solar system of the early nineteenth century.

34. Isotope Geochemistry

The Origin and Formation of Manganese Rocks and Ores

Edited by Vladimir Kuleshov & J. Barry Maynard
Oct 2016, 440 pages, Paperback (Elsevier)
ISBN 9780128031650 **¥22,160**

Isotope Geochemistry: The Origin and Formation of Manganese Rocks and Ores is a comprehensive reference on global manganese deposits, including their origins and formations. Manganese is both a significant industrial chemical, critical for steel-making, and a strategic mineral, occurring in abundance only in certain countries. Furthermore, it is used effectively in CO2 sequestration, helping to mitigate greenhouse gas emission challenges around the world. For these reasons, exploration for manganese is very active, yet access to the primary academic literature can be a challenge, especially in field operations.

Isotope Geochemistry brings this material together in a single source, making it the ideal all-in-one reference that presents the supporting data, analytics, and interpretation from known manganese deposits. This book is an essential resource for researchers and scientists in multiple fields, including exploration and economic geologists, mineralogists, geochemists, and environmental scientists alike.

35. Magnetic Fields in the Solar System

Planets, Moons and Solar Wind Interactions

(Astrophysics and Space Science Library, Vol 448)
Edited by Hermann Lühr, Johannes Wicht & Stuart Gilder
Dec 2017, 398 pages, Hardcover (Springer)
ISBN 9783319642918 **¥34,030**

This book addresses and reviews many of the still little understood questions related to the processes underlying planetary magnetic fields and their interaction with the solar wind. With focus on research carried out within the German Priority Program "PlanetMag", it also provides an overview of the most recent research in the field.

Magnetic fields play an important role in making a planet habitable by protecting the environment from the solar wind. Without the geomagnetic field, for example, life on Earth as we know it would not be possible. And results from recent space missions to Mars and Venus strongly indicate that planetary magnetic fields play a vital role in preventing atmospheric erosion by the solar wind. However, very little is known about the underlying interaction between the solar wind and a planet's magnetic field.

The book takes a synergistic interdisciplinary approach that combines newly developed tools for data acquisition and analysis, computer simulations of planetary interiors and dynamos, models of solar wind interaction, measurement of ancient terrestrial rocks and meteorites, and laboratory investigations.

36. Mars Science Laboratory

Softcover reprint of the original 1st ed. 2013 Edition
Edited by John Grotzinger, Ashwin Vasavada & Christopher Russell
Aug 2016, 860 pages, Paperback (Springer)
ISBN 9781493955244 **¥65,570**

The Mars Science Laboratory is the latest and most advanced NASA roving vehicle to explore the surface of Mars. The Curiosity rover has landed in Gale crater and will explore this region assessing conditions on the surface that might be hospitable to life and paving the way for later even more sophisticated exploration of the surface. This book describes the mission, its exploration and scientific objectives, studies leading to the design of the mission and the instruments that accomplish the objectives of the mission. This book is aimed at all those engaged in Martian studies as well as those interested in the origin of life in other environments. It will be a valuable reference for anyone who uses data from the Mars Science Laboratory. Previously published in Space Science Reviews journal, Vol. 170/1-4, 2012.

37. Microstructural Geochronology

Planetary Records Down to Atom Scale

(Geophysical Monograph Series, Vol 232)
Edited by Desmond Moser, Fernando Corfu, James Darling, Steven Reddy, & Kimberly Tait
Dec 2017, 402 pages, Hardcover (American

Geophysical Union / Wiley) ISBN 9781119227243
¥36,920
Geochronology techniques enable the study of geological evolution and environmental change over time. This volume integrates two aspects of geochronology: one based on classical methods of orientation and spatial patterns, and the other on ratios of radioactive isotopes and their decay products.
The chapters illustrate how material science techniques are taking this field to the atomic scale, enabling us to image the chemical and structural record of mineral lattice growth and deformation, and sometimes the patterns of radioactive parent and daughter atoms themselves, to generate a microstructural geochronology from some of the most resilient materials in the solar system.
First compilation of research focusing on the crystal structure, material properties, and chemical zoning of the geochronology mineral archive down to nanoscale
Novel comparisons of mineral time archives from different rocky planets and asteroids and their shock metamorphic histories
Fundamentals on how to reconstruct and date radiogenic isotope distributions using atom probe tomography
Microstructural Geochronology will be a valuable resource for graduate students, academics, and researchers in the fields of petrology, geochronology, mineralogy, geochemistry, planetary geology, astrobiology, chemistry, and material science. It will also appeal to philosophers and historians of science from other disciplines.

38. Nuclear Planetary Science
Planetary Science Based on Gamma-Ray, Neutron and X-Ray Spectroscopy
(Advances in Planetary Science, Vol 1)
by Nobuyuki Hasebe, Kyeong Ja Kim, & Eido Shibamura
Nov 2017, 176 pages, Hardcover (World Scientific)
ISBN 9789813209701 **¥18,460**
Nuclear planetary science has come to play an important role in our understanding of the origin and evolution of the planetary bodies in our solar system. A newly established branch of planetary science, its study aids in humankind's exploration of the present states of the structures of various planetary bodies (including the Earth), their atmospheres and their satellites, as well as small celestial bodies (e.g. asteroids), through direct observation. Knowing the elemental composition of the planetary bodies is essential in order to understand the formation and evolution of planetary bodies — just as important as it is to know the mass, radius, density and orbit of the celestial body.
Suitable for students and specialists interested in the much wider field of Earth and Planetary Science, topics related to the planets and asteroids in the solar system are dealt with in this book. Techniques related to nuclear planetary science's nuclear cosmochemical and geological methods are also covered in this book.

39. Planetary Cartography and GIS
(Lecture Notes in Geoinformation and Cartography)
Edited by Henrik Hargitai
May 2018, Hardcover (Springer)
ISBN 9783319628486 **¥26,080**
This book approaches geological, geomorphological and topographical mapping from the point in the workflow at which science-ready datasets are available. Though there have been many individual projects on dynamic maps and online GISs, in which coding and data processing are given precedence over cartographic principles, cartography is more than “just” processing and displaying spatial data. However, there are currently no textbooks on this rapidly changing field, and methods tend to be shared informally.

40. Planetary Exploration and Science
Recent Results and Advances
(Series: Springer Geophysics)
Edited by Shuanggen Jin, Nader Haghighipour, & Wing-Huen Ip
Nov 2014, 340 pages, Hardcover (Springer)
ISBN 9783662450512 **¥29,490**
This contributed monograph is the first work to present the latest results and findings on the new topic and hot field of planetary exploration and sciences, e.g., lunar surface iron content and mare orientale basalts, Earth’s gravity field, Martian radar exploration, crater recognition, ionosphere and astrobiology, Comet ionosphere, exoplanetary atmospheres and planet formation in binaries. By providing detailed theory and examples, this book helps readers to quickly familiarize themselves with the field. In addition, it offers a special section on next-generation planetary exploration, which opens a new landscape for future exploration plans and missions.
Prof. Shuanggen Jin works at the Shanghai Astronomical Observatory, Chinese Academy of Sciences, China. Dr. Nader Haghighipour works at the University of Hawaii-Manoa, USA. Prof. Wing-Huen Ip works at the National Central University, Taiwan.

41. Planetary Habitability
(Series: Cambridge Astrobiology)
by Pamela Gales Conrad
June 2016, 530 pages, Hardcover (Cambridge U.P.)
ISBN 9780521516716 **ca. ¥24,000**
This book presents a new perspective on the search for life on other planets and approaches habitability holistically, utilizing a complete range of environmental data including physical features as well as chemical signals. Based upon the fundamental premise that every observation may be the clue that later confirms or evidence of a habitable environment, it presents practical advice on organizing a field site, the range of tools available and how they can be used, and how the data can be organized as an assessment tool with applicability to multiple planetary environments. The role of analogue activities, in addition to analogue environments, in advancing the state-of-the-art in astrobiology is emphasised. Planetary Habitability is a manual for research astrobiologists in the field and an important reference for engineers planning and constructing missions to other planets. It can also be used in student seminars on this central theme in space exploration.

42. The Plasma Environment of Venus, Mars and Titan
(Seires: Space Sciences Series of ISSI, Vol 37)
Softcover reprint of the original 1st ed. 2012 Edition
Edited by Karoly Szego
Aug 2016, 334 pages, Paperback (Springer)
ISBN 9781493944415 **¥49,680**
This volume summarizes the recent results of the exploration of Venus, Mars and Titan in the field of space plasma physics. These are the only non-magnetic solar system bodies having dense atmospheres. A number of space missions investigated these objects; the past and the current missions are put in context with modern theoretical descriptions. The strength of the book is the comparison of the similarities and differences in the plasma interaction of Venus, Mars and Titan; such comparisons have not yet been published. This volume is aimed at graduate students and researchers working in planetary science and space physics. Previously published in Space Science Reviews journal, Vol. 162/1-4, 2011.

43. Pythonic Geodynamics

Implementations for Fast Computing

(Lecture Notes in Earth System Sciences)
by Gabriele Morra
Aug 2017, 227 pages, Hardcover (Springer)
ISBN 9783319556802 **¥26,080**

This book addresses students and young researchers who want to learn to use numerical modeling to solve problems in geodynamics. Intended as an easy-to-use and self-learning guide, readers only need a basic background in calculus to approach most of the material. The book difficulty increases very gradually, through four distinct parts. The first is an introduction to the Python techniques necessary to visualize and run vectorial calculations. The second is an overview with several examples on classical Mechanics with examples taken from standard introductory physics books. The third part is a detailed description of how to write Lagrangian, Eulerian and Particles in Cell codes for solving linear and non-linear continuum mechanics problems. Finally the last one address advanced techniques like tree-codes, Boundary Elements, and illustrates several applications to Geodynamics. The entire book is organized around numerous examples in Python, aiming at encouraging the reader to learn by experimenting and experiencing, not by theory.

44. Reactive Transport Modeling

by Yitian Xiao, Fiona Whitaker, Tianfu Xu & Carl Steefel
May 2018, 352 pages, Hardcover (Wiley)
ISBN 9781119060000 **¥33,240**

This book lays out the basic principles and approaches of Reactive Transport Modeling (RTM) for surface and subsurface environments, presenting specific workflows and applications. The techniques discussed are being increasingly commonly used in a wide range of research fields, and the information provided covers fundamental theory, practical issues in running reactive transport models, and how to apply techniques in specific areas. The need for RTM in engineered facilities, such as nuclear waste repositories or CO2 storage sites, is ever increasing, because the prediction of the future evolution of these systems has become a legal obligation. With increasing recognition of the power of these approaches, and their widening adoption, comes responsibility to ensure appropriate application of available tools. This book aims to provide the requisite understanding of key aspects of RTM, and in doing so help identify and thus avoid potential pitfalls.

45. Rivers – Physical, Fluvial and Environmental Processes

(GeoPlanet: Earth and Planetary Sciences)
Edited by Pawel Rowiński & Artur Radecki-Pawlik
Series: GeoPlanet: Earth and Planetary Sciences
July 2015, 613 pages, Hardcover (Springer)
ISBN 9783319177182 **¥29,490**

This book describes the domain of research and investigation of physical, chemical and biological attributes of flowing water, and it deals with a cross-disciplinary field of study combining physical, geophysical, hydraulic, technological, environmental interests. It aims to equip engineers, geophysicists, managers working in water-related arenas as well as advanced students and researchers with the most up to date information available on the state of knowledge about rivers, particularly their physical, fluvial and environmental processes. Information from various but also interrelated areas available in one volume is the main benefit for potential readers. All chapters are prepared by leading experts from the leading research laboratories from all over the world.

46. The Role of Halogens in Terrestrial and Extraterrestrial Geochemical Processes

Surface, Crust, and Mantle

(Series: Springer Geochemistry)
Edited by Daniel E. Harlov, & Leonid Aranovich
Dec 2017, 1029 pages, Hardcover (Springer)
ISBN 9783319616650 **¥80,310**

The book summarizes the knowledge and experiences concerning the role of halogens during various geochemical processes, such as diagenesis, ore-formation, magma evolution, metasomatism, mineralization, and metamorphism in the crust and mantle of the Earth. It comprises the role of halogens in other terrestrial worlds like volatile-rich asteroids, Mars, and the ice moons of Jupiter and Saturn. Review chapters outline and expand upon the basis of our current understanding regarding how halogens contribute to the geochemical/geophysical evolution and stability of terrestrial worlds overall.

47. Shapes and Dynamics of Granular Minor Planets

The Dynamics of Deformable Bodies Applied to Granular Objects in the Solar System

(Advances in Geophysical and Environmental Mechanics and Mathematics)
by Ishan Sharma
Dec 2016, 354 pages, Hardcover (Springer)
ISBN 9783319404899 **¥34,030**

This book develops a general approach that can be systematically refined to investigate the statics and dynamics of deformable solid bodies. These methods are then employed to small bodies in the Solar System. With several space missions underway and more being planned, interest in our immediate neighbourhood is growing. In this spirit, this book investigates various phenomena encountered in planetary science, including disruptions during planetary fly-bys, equilibrium shapes and stability of small rubble bodies, and spin-driven shape changes.

The flexible procedure proposed here will help readers gain valuable insights into the mechanics of solar system bodies, while at the same time complementing numerical investigations. The technique itself is built upon the virial method successfully employed by Chandrasekhar (1969) to study the equilibrium shapes of spinning fluid objects. However, here Chandrasekhar's approach is modified in order to study more complex dynamical situations and include objects of different rheologies, e.g., granular aggregates, or "rubble piles". The book is largely self-contained, though some basic familiarity with continuum mechanics will be beneficial.

48. Solar Planetary Systems

Stardust to Terrestrial and Extraterrestrial Planetary Sciences

By Asit B. Bhattacharya, & Jeffrey M. Lichtman
Dec 2016, 540 pages, Hardback (CRC Press)
ISBN 9781498762069 **¥31,540**

The authors have put forth great efforts in gathering present day knowledge about different objects within our solar system and universe. This book features the most current information on the subject with information acquired from noted scientists in this area. The main objective is to convey the importance of the subject and provide detailed information on the physical makeup of our planetary system and technologies used for research. Information on educational projects has also been

included in the Radio Astronomy chapters.This information is a real plus for students and educators considering a career in Planetary Science or for increasing their knowledge about our planetary system.

49. Solar System Astrophysics

Background Science and the Inner Solar System, 2nd Edition.

(Astronomy and Astrophysics Library)
by Eugene F. Milone
Jan 2014, Hardcover (Springer)
ISBN 9781461488477 **¥17,010**

The second edition of Solar System Astrophysics: Planetary Atmospheres and the Outer Solar System provides a timely update of our knowledge of planetary atmospheres and of the bodies of the outer solar system and their analogs in other planetary systems. This volume begins with an expanded treatment of the physics, chemistry, and meteorology of the atmospheres of the Earth, Venus, and Mars, moving on to their magnetospheres and then to a full discussion of the gas and ice giants and their properties. From here, attention switches to the small bodies of the solar system, beginning with the natural satellites. The comets, meteors, meteorites, and asteroids are discussed in order, and the volume concludes with the origin and evolution of our solar system. Finally, a fully revised section on extrasolar planetary systems puts the development of our system in a wider and increasingly well understood galactic context.

50. Solar System Astrophysics

Planetary Atmospheres and the Outer Solar System, 2nd Edition.

(Astronomy and Astrophysics Library)
by Eugene F. Milone
Han 2014, Hardcover (Springer)
ISBN 9781461490890 **¥17,010**

The second edition of Solar System Astrophysics: Planetary Atmospheres and the Outer Solar System provides a timely update of our knowledge of planetary atmospheres and of the bodies of the outer solar system and their analogs in other planetary systems. This volume begins with an expanded treatment of the physics, chemistry, and meteorology of the atmospheres of the Earth, Venus, and Mars, moving on to their magnetospheres and then to a full discussion of the gas and ice giants and their properties. From here, attention switches to the small bodies of the solar system, beginning with the natural satellites. The comets, meteors, meteorites, and asteroids are discussed in order, and the volume concludes with the origin and evolution of our solar system. Finally, a fully revised section on extrasolar planetary systems puts the development of our system in a wider and increasingly well understood galactic context.

51. Stardust Final Conference

Advances in Asteroids and Space Debris Engineering and Science

(Astrophysics and Space Science Proceedings, Vol 52)
Jan 2018, 137 pages, Hardcover (Springer)
ISBN 9783319699554 **¥51,950**

Space debris and asteroid impacts pose a very real, very near-term threat to Earth. In order to help study and mitigate these risks, the Stardust program was formed in 2013. This training and research network was devoted to developing and mastering techniques such as removal, deflection, exploitation, and tracking. This book is a collection of many of the topics addressed at the Final Stardust Conference, describing the latest in asteroid monitoring and how engineering efforts can help us reduce space debris. It is a selection of studies bringing together specialists from universities, research institutions, and industry, tasked with the mission of pushing the boundaries of space research with innovative ideas and visionary concepts.

52. Stars and Planets

The Most Complete Guide to the Stars, Planets, Galaxies, and Solar System
Updated and Expanded Edition

by Ian Ridpath & Wil Tirion
Dec 2017, 400 pages, Paperback (Princeton U.P.)
ISBN 9780691177885 **¥4,230**

In this newly updated and expanded edition of their classic work, Ian Ridpath and Wil Tirion illuminate the night sky as never before, providing novice stargazers and professional astronomers alike with the most informative, user-friendly, comprehensive, and authoritative celestial field guide available. The product of a thirty-year collaboration between one of the world's leading astronomy writers and the world's foremost celestial mapmaker, Stars and Planets features superb color sky charts, diagrams, or photographs on almost every page; clear and engaging writing; a spacious and attractive design; and a compact size. This updated edition features the latest information on stars, a revised section on planets that incorporates recent research on exoplanets, and some revised charts and new photographs. Simply put, Stars and Planets is indispensable. Don't leave home—at night—without it.

53. Subseafloor Biosphere Linked to Hydrothermal Systems

TAIGA Concept

Edited by Jun-Ichiro Ishibashi, Kyoko Okino & Sunamura, Michinari
Jan 2015, Hardcover (Springer)
ISBN 9784431548645 **¥11,340**

This book is the comprehensive volume of the TAIGA ("a great river " in Japanese) project. Supported by the Japanese government, the project examined the hypothesis that the subseafloor fluid advection system (subseafloor TAIGA) can be categorized into four types, TAIGAs of sulfur, hydrogen, carbon (methane), and iron, according to the most dominant reducing substance, and the chemolithoautotrophic bacteria/archaea that are inextricably associated with respective types of TAIGAs which are strongly affected by their geological background such as surrounding host rocks and tectonic settings. Sub-seafloor ecosystems are sustained by hydrothermal circulation or TAIGA that carry chemical energy to the chemosynthetic microbes living in an extreme environment. The results of the project have been summarized comprehensively in 50 chapters, and this book provides an overall introduction and relevant topics on the mid-ocean ridge system of the Indian Ocean and on the arc-backarc systems of the Southern Mariana Trough and Okinawa Trough.

54. Trace Metal Biogeochemistry and Ecology of Deep-Sea Hydrothermal Vent Systems

(The Handbook of Environmental Chemistry, Vol 50)
Edited by Liudmila L. Demina & Sergey V. Galkin
July 2016, 210 pages, hardcover (Springer)
ISBN 9783319413389 **¥49,680**

This volume synthesizes the relevant data that is fundamental to our understanding of trace metal biogeochemistry and the ecology of biological communities of deep-sea vent systems. It presents the combined results of biological and geochemical research and analyzes the microdistribution of animals and the spatial structure of vent communities. Careful consideration is given to the export of iron and other trace metals from hydrothermal vents. The environmental conditions to be found in deep-sea hydrothermal community habitats, along with the trace metal behavior in biotope water are characterized and the sources and forms of trace metals taken up by dominant hydrothermal vent animals are discussed. Special attention is paid to the poorly investigated deep biosphere of the sub-seafloor igneous crust. The book is illustrated with a wealth of exceptional deep-sea photos taken by the manned submersible “Mir”, and a dedicated chapter focuses on the role of deep manned submersibles in ocean research. The book will be of interest to researchers and students in the fields of oceanography, geochemistry, biology, the environmental sciences and marine ecology.

55. The Vatican Observatory, Castel Gandolfo

80th Anniversary Celebration

(Series: Astrophysics and Space Science Proceedings, Vol 51)

Edited by Gabriele Gionti S. J. & Jean-Baptiste Kikwaya Eluo S.J.

Jan 2018, 279 pages, Hardcover (Springer)

ISBN 9783319672045 **¥38,560**

This book presents contributions from an internal symposium organized to celebrate the 80th anniversary of the Specola Vaticana, or Vatican Observatory, in the Papal Palace of Castel Gandolfo. The aim is to provide an overview of the scientific and cultural work being undertaken at the Observatory today and to describe the outcomes of important recent investigations. The contents cover interesting topics in a variety of areas, including planetary science and instrumentation, stellar evolution and stars, galaxies, cosmology, quantum gravity, the history of astronomy, and interactions between science, philosophy, and theology.

On September 29, 1935, Pope Pius XI officially inaugurated the new headquarters of the Specola Vaticana at Castel Gandolfo. With new telescopes, a new astrophysical laboratory for spectrochemical analysis, and a young staff comprising Jesuit scientists, this inauguration marked the beginning of an intense period of scientific achievements at the Observatory. This anniversary book, featuring contributions from members of the current Observatory staff and adjunct scholars, will appeal to all with an interest in the history of the Specola Vaticana and its significance for astronomy.

56. Water on Mars

By Michael H. Carr

April 1996, 248 pages, Hardback (Oxford U.P.)

ISBN 9780195099386 **¥17,880**

Mars has always held a special interest because of the possibility that life may have existed there. In this book Dr Carr summarizes the history of water on Mars. He highlights problems confronted, addressing them from the records of morphology of the surface and the chemistry and mineralogy of some near-surface rocks, and revealed in meteorites originating on Mars. The book is well illustrated with imagery from the Viking missions.

Interweaves theories of planet formation, climate change, and geologic evolution to provide an integrated picture of the history of water on Mars.

Describes the hydraulics and erosive capabilities of floods 100 times the discharge of the Mississippi.

Integrates data from spacecraft and Martian meteorites.

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