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With best regards,
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Dr. Ramon Khanna

Executive Editor

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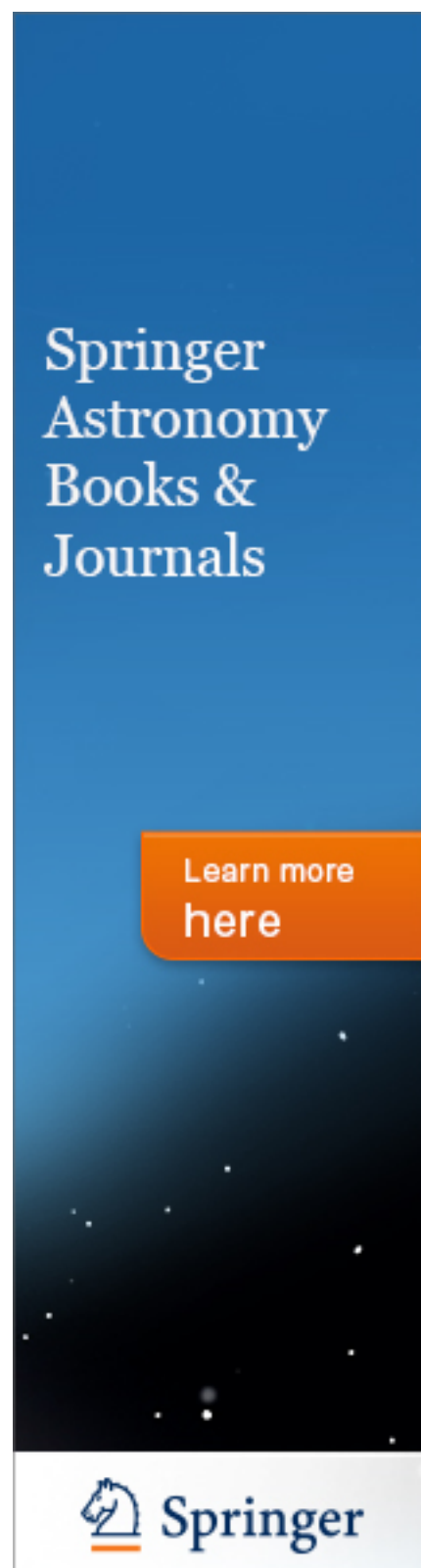
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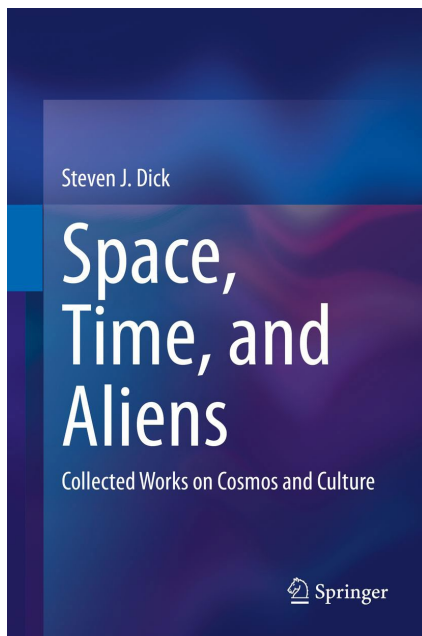
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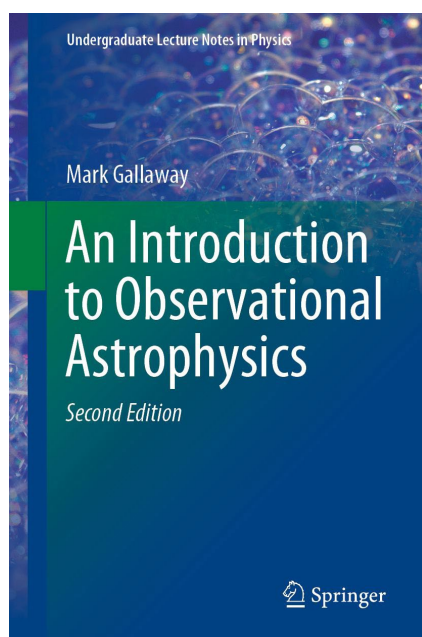
In this comprehensive and interdisciplinary volume, former NASA Chief Historian Steven Dick reflects on the exploration of space, astrobiology and its implications, cosmic evolution, astronomical institutions, discovering and classifying the cosmos, and the philosophy of astronomy. The unifying theme of the book is the connection between cosmos and culture, or what Carl Sagan many years ago called the “cosmic connection.” As both an astronomer and historian of science, Dr. Dick has been both a witness to and a participant in many of the astronomical events of the last half century. This collection of papers presents his reflections over the last forty years in a way accessible to historians, philosophers, and scientists alike. From the search for alien life to ongoing space exploration efforts, readers will find this volume full of engaging topics relevant to science, society, and our collective future on planet Earth and beyond.

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M. Galloway

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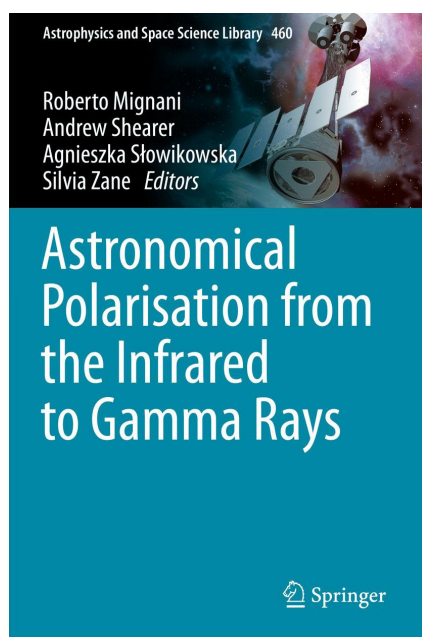
The observational component of astronomy is an exciting and vital part of any astrophysics degree. With the advent of low-cost astronomical cameras and remote and robotic operation, more students than ever have the opportunity to observe and perform observatory research. This updated and fully corrected textbook provides a comprehensive overview of practical observing techniques for undergraduate astrophysics courses. The chapters introduce students to the basics of the field before delving into telescope types, the nature and operation of the astronomical camera, imaging techniques and reduction, photometry and spectrography, and solar and radio observations. The second edition covers the latest research on calibrating the telescope-camera-observatory system. It contains revised information on all available astronomy equipment, including filters, webcams, sensors, and telescope designs. Also included is an entirely new chapter on exoplanet transit measurements. The textbook's practical approach will guide readers from basic first-year techniques to those required for a final-year project.

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R. Mignani, A. Shearer, A. Słowikowska, S. Zane

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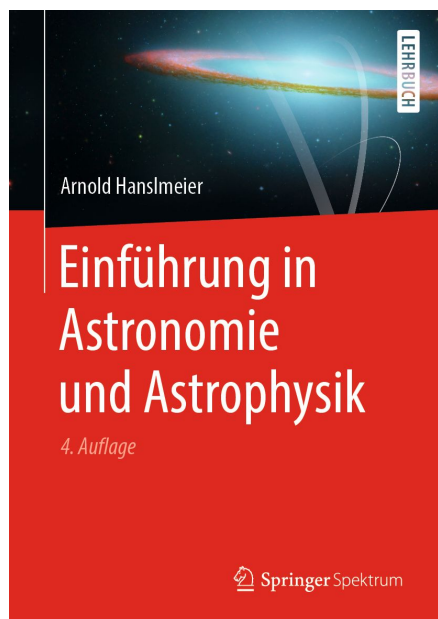
This book serves as both a primer to astronomical polarimetry and an authoritative overview of its application to various types of astronomical objects from AGN, compact stars, binary systems, stars across the HR diagram, transients, the interstellar medium and solar system bodies. It starts with an historical perspective, a discussion of polarimetric theory, instrumentation and techniques in wave bands from the near infrared to gamma rays. The book presents the state of the art in astronomical polarimetry. It is motivated by the new X-ray polarimeters due to be launched in the next four years and improved optical polarimeters on large telescopes requiring a new analysis of polarimetric theory, methodology and results. This book will be suitable as advanced undergraduate companion text, a primer for graduate students and all researchers with an interest in astronomical polarimetry.

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Arnold Hanslmeier

Einführung in Astronomie und Astrophysik

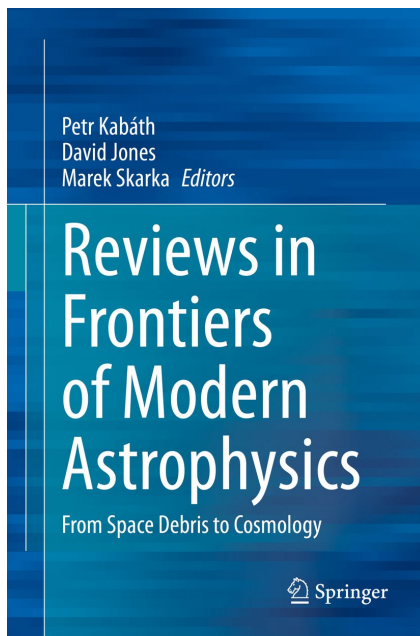
- Deckt ein breites Spektrum an astronomischen Themen ab - von Beobachtungsmethoden bis hin zur Astrobiologie
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- Ideal geeignet für Einführungsvorlesungen im Bachelor

Dieses Lehrbuch vermittelt das theoretische und praktische Grundwissen der Astronomie und Astrophysik. Es bietet eine Übersicht von der klassischen Astronomie und Beobachtungsmethoden bis hin zur Sonnenphysik und Astrophysik der Sterne und Galaxien. Den Abschluss bilden Kapitel zur Kosmologie, Astrobiologie sowie mathematische und numerische Methoden. Zahlreiche farbige Abbildungen, Rechenbeispiele sowie Aufgaben mit Lösungen machen das Werk zu einem nützlichen Begleiter der Astronomie-Vorlesungen im Studium. Das Buch eignet sich für Studierende der Physik und Astronomie auf Lehramt oder im Bachelor – aber auch an Naturwissenschaften interessierte Personen mit entsprechendem mathematisch-physikalischem Basiswissen finden hier einen ansprechenden Einstieg in das Thema. Die vorliegende vierte Auflage wurde hinsichtlich der neuesten Entwicklungen in der Astronomie aktualisiert und überarbeitet. Das Kapitel über mathematische Methoden wurde neu gestaltet und als Software wird nun ausschließlich Python verwendet. Aus dem Inhalt: Sphärische Astronomie - Geschichte der Astronomie - Himmelsmechanik - Astronomische Instrumente - Physik der Körper des Sonnensystems - Die Sonne - Zustandsgrößen der Sterne - Sternatmosphären - Sternaufbau - Sternentwicklung - Interstellare Materie - Die Galaxis - Extragalaktische Systeme - Kosmologie - Astrobiologie - Mathematische Methoden

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P. Kabáth, D. Jones, M. Skarka

Reviews in Frontiers of Modern Astrophysics

From Space Debris to Cosmology

- Offers a collection of 13 review articles on a wide spectrum of modern astronomical topics
- Serves as inspiration for advanced graduate students in astronomy
- Written by expert members of an EU-funded ERASMUS+ program of strategic partnership between several European institutes

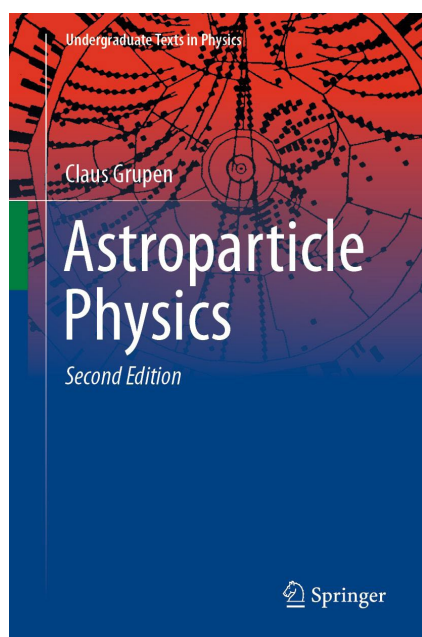
This book presents a collection of focused review papers on the advances in topics in modern astronomy, astrophysics, cosmology and planetary science. The chapters are written by expert members of an EU-funded ERASMUS+ program of strategic partnership between several European institutes. The 13 reviews comprise the topics: Space debris, optical measurements Meteors, light from comets and asteroids Extrasolar enigmas: from disintegrating exoplanets to exo-asteroids Physical conditions and chemical abundances in photoionized nebulae from optical spectra Observational Constraints on the Common Envelope Phase A modern guide to quantitative spectroscopy of massive OB stars Explosion mechanisms of core-collapse supernovae and their observational signatures Low-mass and substellar eclipsing binaries in stellar clusters Globular cluster systems and Galaxy Formation Hot atmospheres of galaxies, groups, and clusters of galaxies The establishment of the Standard Cosmological Model through observations Exploiting solar visible-range observations by inversion techniques: from flows in the solar subsurface to a flaring atmosphere Starburst galaxies The book is intended for the general astronomical community as well as for advanced students who could use it as a guideline, inspiration and overview for their future careers in astronomy.

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C. Grupen

Astroparticle Physics

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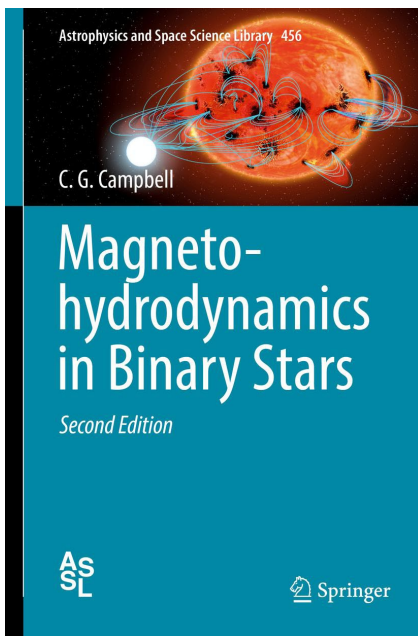
This second, revised and thoroughly updated edition of the successful textbook by Claus Grupen describes the branch of astrophysics known as astroparticle physics. Using experimental methods known from cosmic ray and particle physics, astroparticle physics investigates processes of highest energies taking place in the universe. The new edition reports on progress made by recent discoveries in gravitational wave astronomy and neutrino astronomy (including all details needed to understand recent discoveries in multi-messenger experiments) and also astrobiology. After a historical introduction to the basics of elementary particles the author describes their interactions and the relevant detection techniques. The main body of the book concerns cosmic rays as well as particle processes in astrophysics and cosmology including the physics of the early universe. The book provides an orientation in the field of astroparticle physics that many beginners might be looking for. It also presents new sections exploring the interface between particle physics and cosmic radiation and illustrates the impact of particle physics discoveries to astroparticle physics. The physics is presented using little mathematics, and the results are illustrated by many diagrams and illustrative scientific cartoons which ease the reading of the book. Closing the gap between expert and popular level, the book is highly recommended for undergraduate students in physics or astronomy. It also includes an extensive glossary and a detailed index.

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C. G. Campbell

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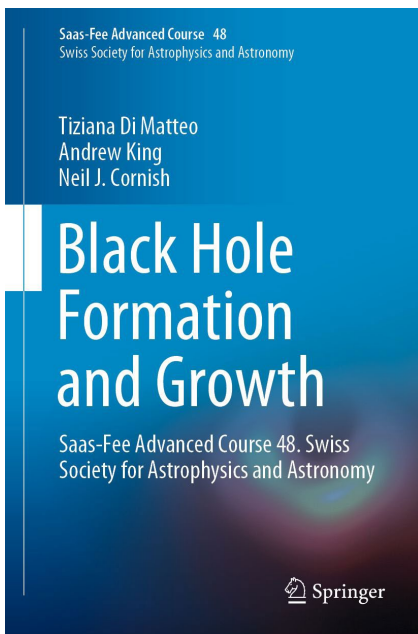
Magnetism in binary stars is an area of central importance in stellar astrophysics. The second edition of "Magnetohydrodynamics in Binary Stars" is a major revision of the first edition. The material has been updated and extended, including additional chapters on the origins of the stellar magnetic fields and accretion disc magnetic winds. A comprehensive account is given of the subject, from the early work up to the latest results. The unifying theme remains the redistribution of angular momentum by magnetic stresses. This occurs in a wide variety of ways, including magnetic stellar and orbital coupling, magnetic channelling of accretion streams, magnetic stellar coupling to accretion discs, dynamo field coupling in discs, and magnetic stellar and disc winds. The associated stellar spin and orbital evolution problems, including stability, are also considered. Although the main focus is on binary stars, much of the work on accretion discs and wind flows has more general astrophysical relevance. Convenient formulae are included that can be compared to observations, making the book useful to observers as well as theorists, and there are extensive reference lists. The material is mainly aimed at research workers, but parts of the text could be useful for postgraduate courses in magnetic stellar astrophysics topics.

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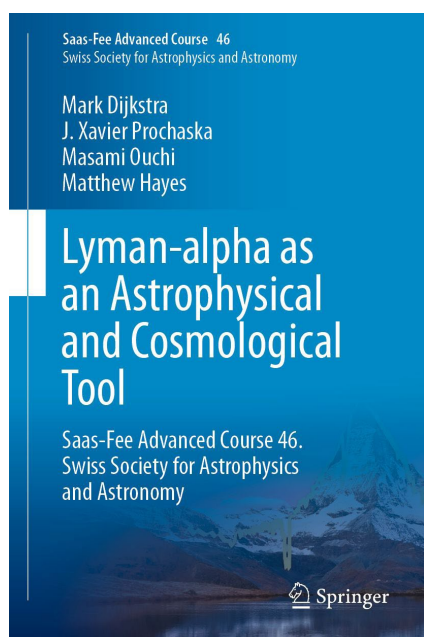
The ultimate proofs that black holes exist have been obtained very recently thanks to the detection of gravitational waves from their coalescence and due to material orbiting at a distance of some gravitational radii imaged by optical interferometry or X-ray reverberation mapping. This book provides three comprehensive and up-to-date reviews covering the gravitational wave breakthrough, our understanding of accretion and feedback in supermassive black holes and the relevance of black holes for the Universe since the Big Bang. Neil J. Cornish presents gravitational wave emission from black hole mergers and the physics of detection. Andrew King reviews the physics of accretion on to supermassive black holes and their feedback on host galaxies. Tiziana Di Matteo addresses our understanding of black hole formation at cosmic dawn, the emergence of the first quasars, black hole merging and structure formation. The topics covered by the 48th Saas-Fee Course provide a broad overview of the importance of black holes in modern astrophysics.

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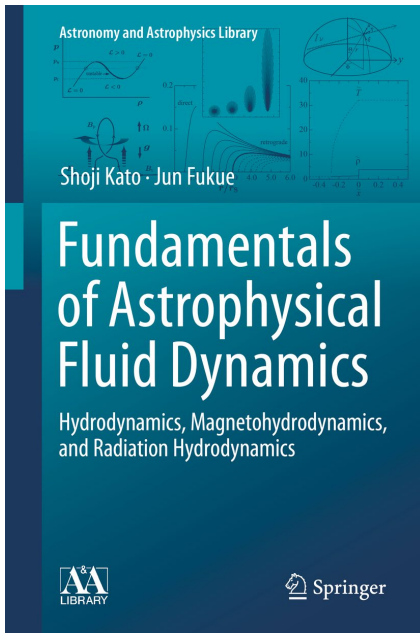
The hydrogen Lyman-alpha line is of utmost importance to many fields of astrophysics. This UV line being conveniently redshifted with distance to the visible and even near infrared wavelength ranges, it is observable from the ground, and provides the main observational window on the formation and evolution of high redshift galaxies. Absorbing systems that would otherwise go unnoticed are revealed through the Lyman-alpha forest, Lyman-limit, and damped Lyman-alpha systems, tracing the distribution of baryonic matter on large scales, and its chemical enrichment. We are living an exciting epoch with the advent of new instruments and facilities, on board of satellites and on the ground. Wide field and very sensitive integral field spectrographs are becoming available on the ground, such as MUSE at the ESO VLT. The giant E-ELT and TMT telescopes will foster a quantum leap in sensitivity and both spatial and spectroscopic resolution, to the point of being able, perhaps, to measure directly the acceleration of the Hubble flow. In space, the JWST will open new possibilities to study the Lyman-alpha emission of primordial galaxies in the near infrared. As long as the Hubble Space Telescope will remain available, the UV-restframe properties of nearby galaxies will be accessible to our knowledge. Therefore, this Saas-Fee course [...]

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S. Kato, J. Fukue

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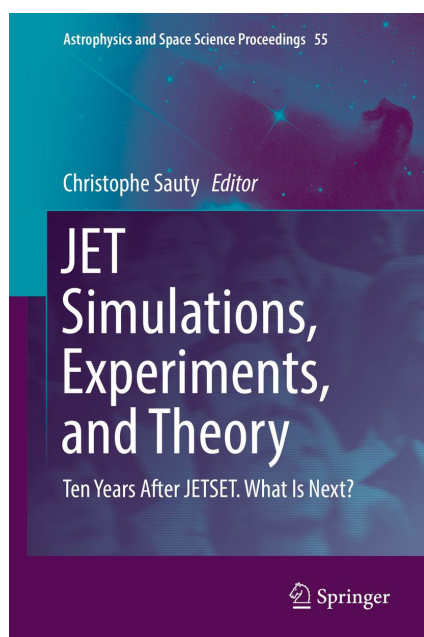
This book offers an overview of the fundamental dynamical processes, which are necessary to understand astrophysical phenomena, from the viewpoint of hydrodynamics, magnetohydrodynamics, and radiation hydrodynamics. The book consists of three parts: The first discusses the fundamentals of hydrodynamics necessary to understand the dynamics of astrophysical objects such as stars, interstellar gases and accretion disks. The second part reviews the interactions between gases and magnetic fields on fluid motions – the magnetohydrodynamics – highlighting the important role of magnetic fields in dynamical phenomena under astrophysical environments. The third part focuses on radiation hydrodynamics, introducing the hydrodynamic phenomena characterized by the coupling of radiation and gas motions and further on relativistic radiation hydrodynamics. Intended as a pedagogical introduction for advanced undergraduate and graduate students, it also provides comprehensive coverage of the fundamentals of astrophysical fluid dynamics, making it an effective resource not only for graduate courses, but also for [...]

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C. Sauty

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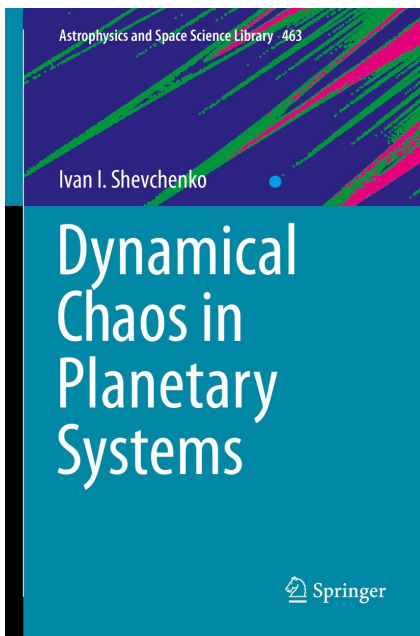
In 2008, the European FP6 JETSET project ended. JETSET, for Jet, Simulations, Experiments, and Theory, was a joint research network of European expert teams on protostellar jets. The present proceedings are a collection of contributions presenting new results obtained by those groups since the end of the JETSET program. This is also the occasion to celebrate Kanaris Tsinganos' important contributions to this network and for his enlightening insight in the subject that inspired us all. Some of the former JETSET students are now in the academic world and the subject has never been so alive. So we present here a collection of results of what has been done in the field of protostellar jets in the past ten years from the theoretical, numerical, observational and experimental point of view. We also present new challenges in the field of protostellar jets and what we should expect from the development of new instruments and new numerical codes in the near future. We also gather results on the impact of the study of protostellar jets on other jet studies in particular on relativistic jets. As a matter of fact, it is time for a new network.

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I. I. Shevchenko

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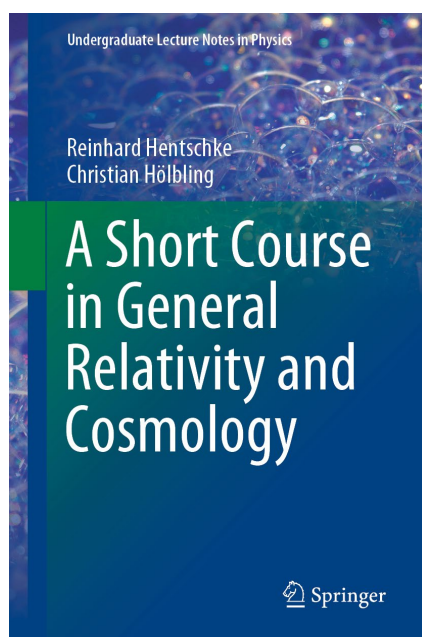
This is the first monograph dedicated entirely to problems of stability and chaotic behaviour in planetary systems and its subsystems. The author explores the three rapidly developing interplaying fields of resonant and chaotic dynamics of Hamiltonian systems, the dynamics of Solar system bodies, and the dynamics of exoplanetary systems. The necessary concepts, methods and tools used to study dynamical chaos (such as symplectic maps, Lyapunov exponents and timescales, chaotic diffusion rates, stability diagrams and charts) are described and then used to show in detail how the observed dynamical architectures arise in the Solar system (and its subsystems) and in exoplanetary systems. The book concentrates, in particular, on chaotic diffusion and clearing effects. The potential readership of this book includes scientists and students working in astrophysics, planetary science, celestial mechanics, and nonlinear dynamics.

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R. Hentschke, C. Hölbling

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Matthias Bartelmann

Das kosmologische Standardmodell

Grundlagen, Beobachtungen und Grenzen

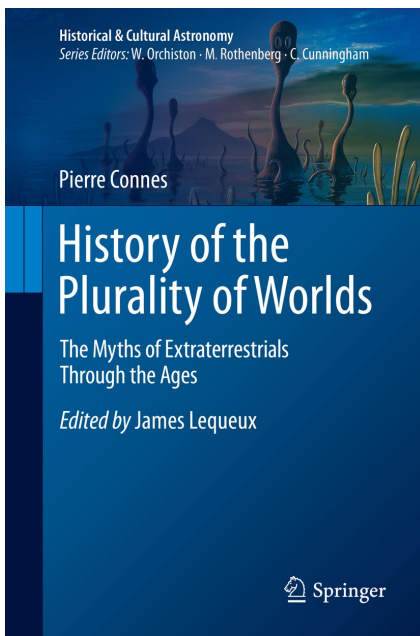
- Erklärt das kosmologische Standardmodell und seine Empirischen Evidenzen
- Präsentiert Grundlagen, theoretische Beschreibung und Beobachtungen modern, eingängig und verständlich
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Das vorliegende Buch bietet einen umfassenden Überblick über das kosmologische Standardmodell und seine empirische Evidenz: Von welchen Annahmen über den Kosmos und seine Entwicklung gehen wir aus? Wie erklärt die Inflation die Entstehung von Strukturen? Wie verhalten sich Dichtestörungen im Laufe der Zeit? Welche Erkenntnisse können wir aus Beobachtungen des kosmischen Mikrowellenhintergrunds und des Gravitationslinseneffekts ziehen? Neben den Grundlagen, der theoretischen Beschreibung und den Beobachtungen beleuchtet der Autor den aktuellen Stand der Forschung und bespricht offene Fragen der modernen Kosmologie. Damit erreicht das Buch dreierlei: Es schafft Verständnis für die Grundlagen des Modells, beschreibt die empirische Evidenz, die ihm seine Überzeugungskraft verleiht, und regt zum Weiterfragen an. Das Buch bietet sich für Bachelor- oder Masterstudierende der Physik als modernes und verständlich geschriebenes Lehrbuch an. Die Kapitel beginnen mit grundlegenden Fragen zum jeweiligen Thema, wichtige Formeln und Aussagen sind als solche hervorgehoben, kleine Zwischenfragen regen zum aktiven Mitdenken an und Hinweise warnen den Leser vor häufigen Fehlkonzepten oder Verständnisproblemen. Vertiefungsboxen ermöglichen einen Blick über den kanonischen Vorlesungsstoff hinaus und in zahlreichen Beispielen werden physikalische Größen berechnet oder abgeschätzt. Die Lektüre hilft Leserinnen und Lesern dabei, eigene Fragen über unser physikalisches Verständnis des Kosmos zu stellen und Antworten zu finden. Aus dem Inhalt: Homogene, isotrope Weltmodelle, Alter und Ausdehnung der Welt, Thermische Entwicklung, Inflation und Dunkle Energie, Strukturen im Universum, Der kosmische Mikrowellenhintergrund, Halos und ihre Massenfunktion, Gravitationslinsen, Galaxienhaufen, Galaxien und Gas. Der Autor Matthias Bartelmann ist seit 2003 Professor für theoretische Astrophysik an der Universität Heidelberg.

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P. Connes, J. Lequeux

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- Chronicles famous supporters and opponents of the theory, along with its most controversial and significant events

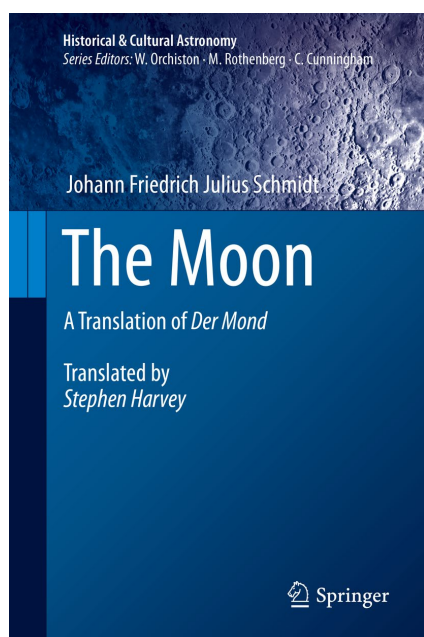
Modern research has demonstrated that many stars are surrounded by planets—some of which might contain the right conditions to harbor life. This has only reinforced a question that has been tormenting scientists, philosophers and priests since Antiquity: Are there other inhabited worlds beyond our own? This book analyzes the many ways that humans have argued for and depicted extraterrestrial life over the centuries. The first known texts about the subject date from as early as the 6th century BC. Since that time, countless well-known historical characters like Lucretius, Aristotle, Thomas Aquinas, Cusanus, Bruno, Kepler, Descartes, and Huygens contributed to the debate; here, their lesser known opinions on the subject are studied in detail. It is often difficult for the modern mind to follow the thinking of our ancestors, which can only be understood when placed in the relevant context. The book thus extends its scope to the evolution of ideas about cosmology in general, as well as the culture in which these great thinkers wrote. The research is presented with the author's insight and humor, making this an easy and enjoyable read.

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J. F. J. Schmidt

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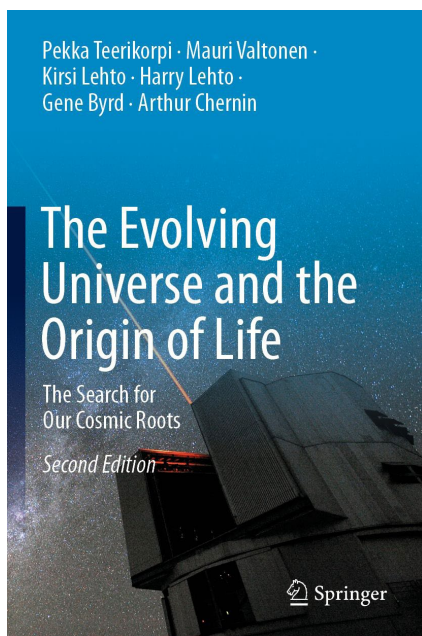
Julius Schmidt was one of the finest astronomical observers of his time, and his detailed map of the Moon surpassed anything that had come before. Today, the German astronomer and geophysicist has remained a largely neglected figure, despite being one of the most important players in the history of lunar studies. This book at last makes accessible Schmidt's highly regarded German work, *Der Mond*. Considered an astronomical classic of the nineteenth century, *Der Mond* remained without a proper English counterpart for the last century and a half, until now. The author's faithful English translation provides readers with much-needed access into Schmidt's original publication, with the aim of showing the community just how vital his work and legacy have been in the international field of selenography.

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P. Teerikorpi, M. Valtonen, K. Lehto, H. Lehto, G. Byrd, A. Chernin

The Evolving Universe and the Origin of Life

The Search for Our Cosmic Roots

- A simple, nontechnical introduction to our current understanding of the physical world
- Structures scientific concepts chronologically, emphasizing historical context and development
- Divided into four thematic sections that weave together our multidisciplinary knowledge of the universe

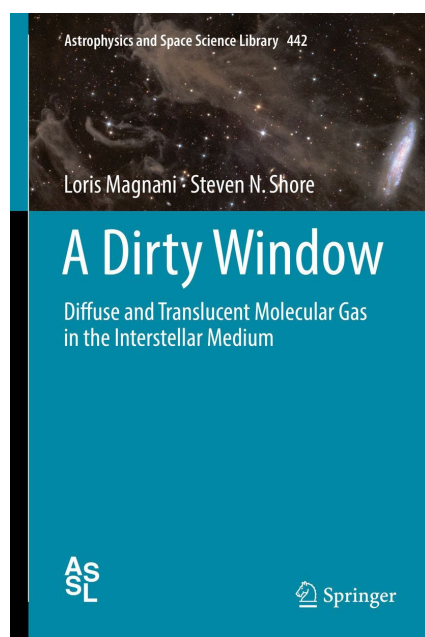
Regarding his discoveries, Sir Isaac Newton famously said, "If I have seen further it is by standing upon the shoulders of giants." The Evolving Universe and the Origin of Life describes, complete with fascinating biographical details of the thinkers involved, a history of the universe as interpreted by the expanding body of knowledge of humankind. From subatomic particles to the protein chains that form life, and expanding in scale to the entire universe, this book covers the science that explains how we came to be. This book contains a great breadth of knowledge, from astronomy and physics to chemistry and biology. The second edition brings this story up to date, chronicling scientific achievements in recent years in such fields of research as cosmology, the large-scale architecture of the universe, black holes, exoplanets, and the search for extraterrestrial life. With over 250 figures, this is a non-technical, easy-to-read textbook at an introductory college level that is ideal for anyone interested in science as well as its history.

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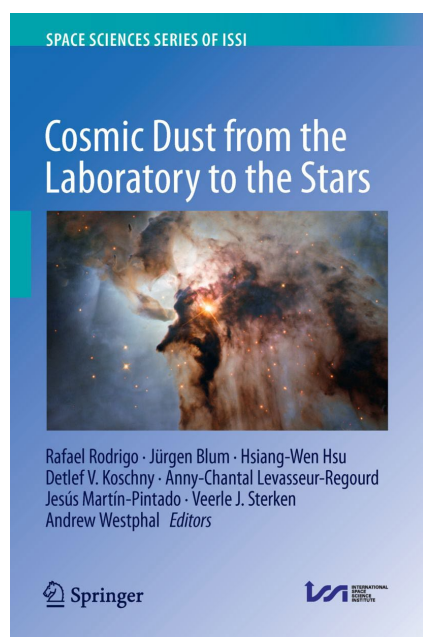
This book provides an introduction to the physics of interstellar gas in the Galaxy. It deals with the diffuse interstellar medium which supplies a complex environment for exploring the neutral gas content of a galaxy like the Milky Way and the techniques necessary for studying this non-stellar component. After an initial exposition of the phases of the interstellar medium and the role of gas in a spiral galaxy, the authors discuss the transition from atomic to molecular gas. They then consider basic radiative transfer and molecular spectroscopy with particular emphasis on the molecules useful for studying low-density molecular gas. Observational techniques for investigating the gas and the dust component of the diffuse interstellar medium throughout the electromagnetic spectrum are explored emphasizing results from the recent Herschel and Planck missions. A brief exposition on dust in the diffuse interstellar medium is followed by a discussion of molecular clouds in general and high-latitude molecular clouds in particular. Ways of calibrating CO observations with the molecular hydrogen content of a cloud are examined along with the dark molecular gas controversy. High-latitude molecular clouds are considered in detail as vehicles for applying the techniques developed in the book. Given the transient nature of diffuse and translucent molecular clouds, the role of turbulence in the origin and dynamics of these objects is examined in some detail. The book is targeted at graduate students or postdocs who are entering the field of interstellar medium studies.

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R. Rodrigo, J. Blum, H. Hsu, D. V. Koschny, A. Levasseur-Regourd, J. Martín-Pintado, V. J. Sterken, A. Westphal

Cosmic Dust from the Laboratory to the Stars

- The first authoritative overview of cosmic dust science in over a decade
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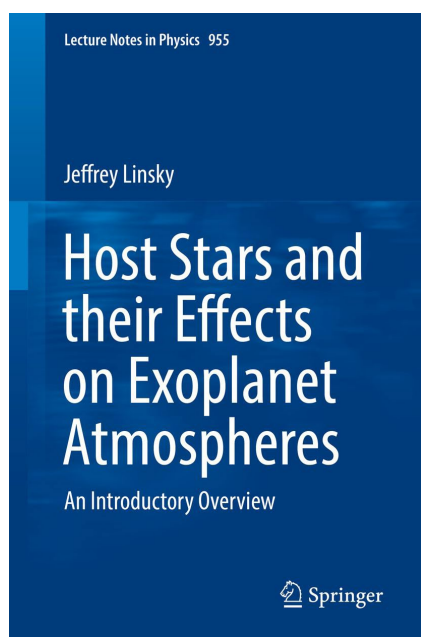
From the Earth's atmosphere to the edges of our Universe, the presence of dust is ubiquitous. One of the main challenges in studying dust in these various environments is thus to harmonize the diverse research techniques and results, including in-situ measurement, remote observation, laboratory experiments and modelling, and analysis of returned samples. For the first time in over a decade, this volume accomplishes exactly that, providing an overarching picture of the current state of dust science and research. Where possible, the papers in this volume emphasize the interconnections, similarities, and differences in the field, synthesizing results from several techniques into one cohesive view. Importantly, astrobiological connections have now been considered. The dust hazard, future technology and research, and space mission requirements and scenarios are also addressed. The outcome of this endeavor is an interdisciplinary compendium with a unified perspective on cosmic dust science. Originally published in Space Science Reviews in the Topical Collection "Cosmic Dust from the Laboratory to the Stars"

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J. Linsky

Host Stars and their Effects on Exoplanet Atmospheres

An Introductory Overview

- First topical primer for non-specialists in the field
- Written by a leading expert in the field
- Includes many figures and tables

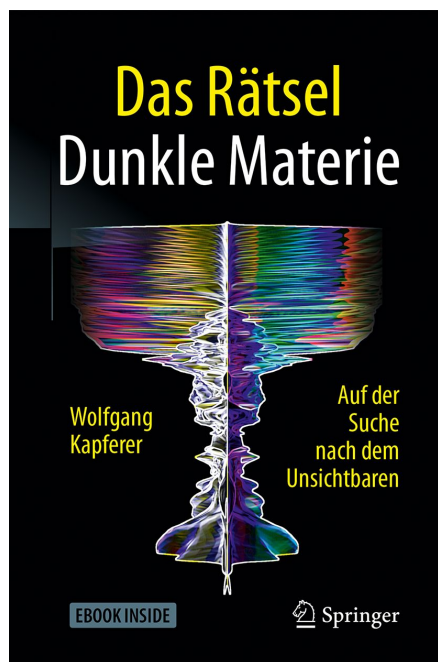
Like planets in our solar system, exoplanets form, evolve, and interact with their host stars in many ways. As exoplanets acquire material and grow to the final size, their atmospheres are subjected to intense UV and X-radiation and high-energy particle bombardment from the young host star. Whether a planet can retain its atmosphere and the conditions for significant mass loss both depend upon the strength of the host star's high-energy radiation and wind, the distance of the exoplanet from its host star, the gravitational potential of the exoplanet, and the initial chemical composition of the exoplanet atmosphere. This introductory overview describes the physical processes responsible for the emission of radiation and acceleration of winds of host stars that together control the environment of an exoplanet, focusing on topics that are critically important for understanding exoplanetary atmospheres but are usually not posed from the perspective of host stars. Accordingly, both host stars and exoplanets are not studied in isolation but are treated as integrated systems. Stellar magnetic fields, which are the energy source for activity phenomena including high-energy radiation and winds, play a critical role in determining whether exoplanets are habitable. This text is primarily for researchers and graduate students who are studying exoplanet atmospheres and habitability, but who may not have a background in the physics and phenomenology of host stars that provide the environment in which exoplanets evolve. It provides a comprehensive overview of this broad topic rather than going deeply [...]

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Auf der Suche nach dem Unsichtbaren

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- Spannt den Bogen zwischen frühen Hinweisen und aktuellen Beobachtungen
- Veranschaulicht die spannende Suche nach dem unsichtbaren Stoff, der einen Großteil des Universums ausmacht

Mit diesem Buch begeben Sie sich auf die spannende Suche nach der Dunklen Materie, die nach dem aktuellen Stand der Forschung den Großteil der Masse unseres Universums ausmacht. Der Autor erklärt anschaulich, welche Schlüsselbeobachtungen dazu geführt haben, eine unsichtbare Massenkomponente in das Weltbild unseres Universums aufzunehmen. Dabei liegt der Schwerpunkt auf den „Beobachtungen“ des Unsichtbaren: angefangen von den frühen Hinweisen des sonderbaren Zusammenhalts von Galaxienhaufen hin zu den aktuellen Beobachtungen wie beispielsweise der kosmischen Hintergrundstrahlung. Darüber hinaus erfahren Sie, mit welchen direkten und indirekten Messmethoden Forscher derzeit versuchen, der Dunklen Materie auf die Spur zu kommen und was sich hinter dem Phänomen verbergen könnte. „Das Rätsel Dunkle Materie“ ist ein Buch für alle, die wissen wollen, was es mit der unsichtbaren Masse, die unser Universum erfüllt, auf sich hat und wie man versucht, dem Mysterium auf die Spur zu kommen.

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Dirk Schulze-Makuch, William Bains

Das lebendige Universum

Komplexes Leben auf vielen Planeten?

- Bietet einen unterhaltsamen und verständlichen Einstieg in die aktuellsten Ideen zur Entstehung von komplexen Leben auf anderen Planeten
- Widmet sich von wissenschaftlicher Perspektive der Frage, ob wir allein im Universum sind
- Erläutert von führenden und in Wissenschaftsvermittlung erfahrenen Forschern
- Erklärt komplexe Konzepte anhand einfacher Grafiken und Zeichnungen

Sind wir allein im Universum? Dieses Buch bietet eine einzigartige Perspektive auf die Frage, die die Menschheit von Anbeginn beschäftigt. In klarem und allgemein verständlichem Stil untersuchen zwei führende Forscher aus der Astrobiologie die verschiedenen Wege, die zu einer vielfältigen Biosphäre führen. Ist der Mensch eine galaktische Besonderheit oder entwickelt sich immer komplexes Leben auf Planeten, die lange genug bewohnbar sind? Leben wir in einem „einsamen Universum“ oder gibt es eine Vielzahl von Planeten mit komplexem und mikrobiellem Leben – ein „lebendiges Universum“? Schulze-Makuch und Bains führen den Leser durch die Geschichte des Lebens auf der Erde – von den ersten replizierenden Molekülen über die Photosynthese, die Erfindung von Sex zu intelligentem Leben. Indem sie sich auf die Funktionalitäten des Lebens, statt auf eine bestimmte Biochemie oder Anatomie konzentrieren, legen sie dar, warum wir denken sollten, dass fortgeschrittenes, komplexes Leben auf anderen Planeten als der Erde existiert.

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Karl Urban (Hrsg.)

Der Mond

Von lunaren Dörfern, Schrammen und Lichtblitzen

- Präsentiert eine Zusammenstellung von über 20 Artikel unter anderem aus *Sterne und Weltraum*, *Neue Zürcher Zeitung* und *Wissenschaft im Brennpunkt*
- Bringt Lesern die lunare Geologie, Beobachtung und Raumfahrt näher
- Beantwortet die wichtigsten Fragen rund um den Mond

Kommen Sie mit diesem Buch dem Erdtrabanten näher: Wie sehen wir den Mond heute? Was wissen wir über Entstehung und Aufbau? Hat der Mond einen flüssigen Kern? Was bleibt vom Apollo-Programm und warum läuft aktuell ein neues Rennen zum Mond? In diesem Buch haben wir eine Reihe von allgemeinverständlichen Artikeln zusammengestellt, die unter anderem in *Sterne und Weltraum*, *Wissenschaft im Brennpunkt* (DLF) und der *Neuen Zürcher Zeitung* veröffentlicht wurden und sich mit unserem kosmischen Begleiter auf vielfältige Weise beschäftigen: Was ist das Supermond-Phänomen? Was verraten uns Mondsteine? Wer baut das erste Dorf auf dem Mond? Was haben der Erdmond und der Asteroid Vesta gemeinsam? Was ist die Zukunft der astronautischen Raumfahrt?

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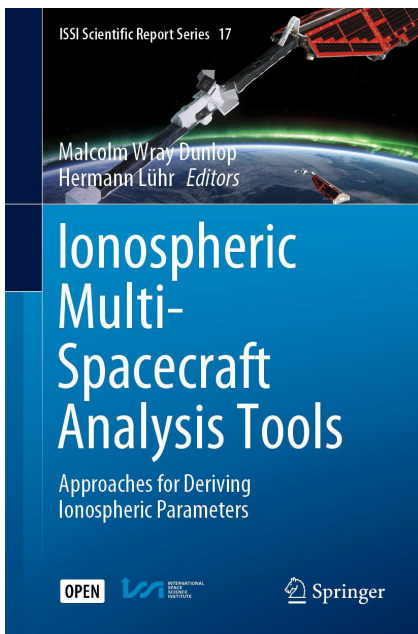
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M. W. Dunlop, H. Lühr

Ionospheric Multi-Spacecraft Analysis Tools

Approaches for Deriving Ionospheric Parameters

- This book is open access, which means that you have free and unlimited access
- Provides a comprehensive toolbox of analysis techniques for upcoming and future ionospheric missions
- Written by an international group of experts

This open access book provides a comprehensive toolbox of analysis techniques for ionospheric multi-satellite missions. The immediate need for this volume was motivated by the ongoing ESA Swarm satellite mission, but the tools that are described are general and can be used for any future ionospheric multi-satellite mission with comparable instrumentation. In addition to researching the immediate plasma environment and its coupling to other regions, such a mission aims to study the Earth's main magnetic field and its anomalies caused by core, mantle, or crustal sources. The parameters for carrying out this kind of work are examined in these chapters. Besides currents, electric fields, and plasma convection, these parameters include ionospheric conductance, Joule heating, neutral gas densities, and neutral winds.

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B. Ganse, U. Ganse

The Spacefarer's Handbook

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- Serves as a practical guide to spaceflight
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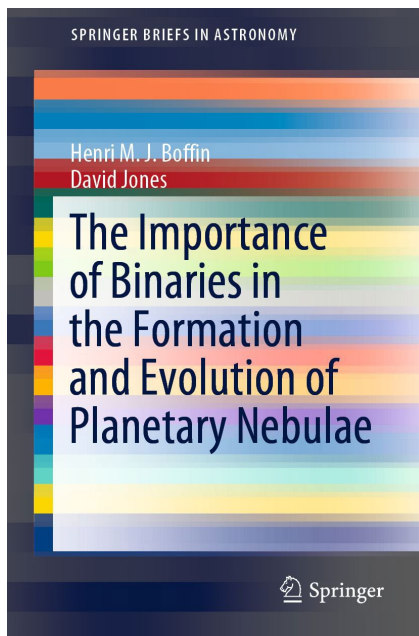
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H. M. J. Boffin, D. Jones

The Importance of Binaries in the Formation and Evolution of Planetary Nebulae

- **First expanded presentation of all theoretical and observational support for the importance of binarity in the formation and evolution of planetary nebulae**

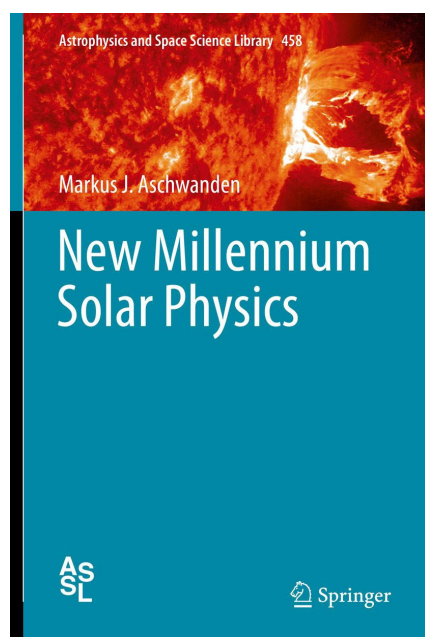
It is now clear that a binary evolutionary pathway is responsible for a significant fraction of all planetary nebulae, with some authors even going so far as to claim that binarity may be a near requirement for the formation of an observable nebula. This has led to the requirement that textbooks most likely need to be rewritten. Building upon the review of Jones and Boffin in *Nature Astronomy* (2017), this Springer Brief takes a first step in this direction. It offers the first expanded presentation of all the theoretical and observational support for the importance of binarity in the formation of planetary nebulae, initially focusing on common envelope evolution but also covering wider binaries. This book emphasises the wider impact of the field, highlighting the critical role binary central stars of planetary nebulae have in understanding a plethora of astrophysical phenomena, including type Ia supernovae, chemically peculiar stars and circumbinary exoplanets.

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M. J. Aschwanden

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- Describes new research results in solar physics in a systematic way, organized by 16 chapters of solar phenomena from the solar interior out to the heliosphere, each one subdivided into 10 topics of recent research interest
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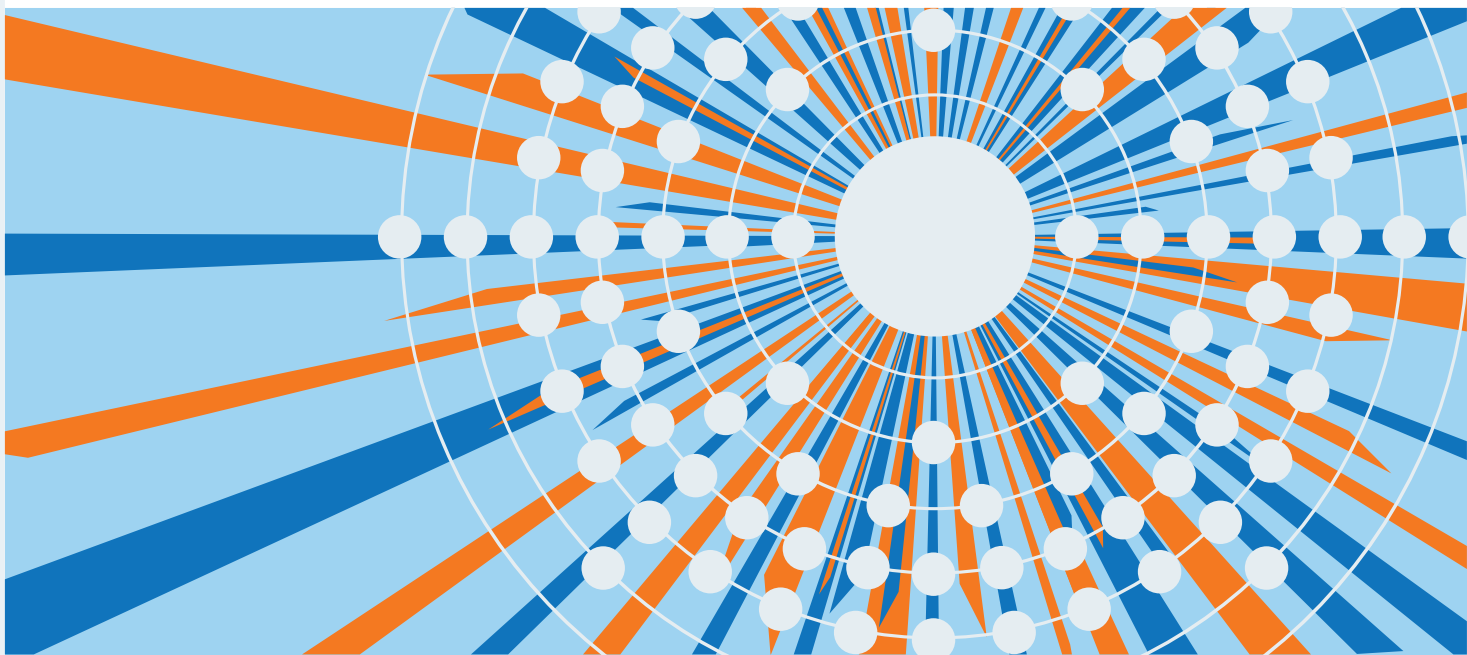
This is a follow-on book to the introductory textbook “Physics of the Solar Corona” previously published in 2004 by the same author, which provided a systematic introduction and covered mostly scientific results from the pre-2000 era. Using a similar structure as the previous book the second volume provides a seamless continuation of numerous novel research results in solar physics that emerged in the new millennium (after 2000) from the new solar missions of RHESSI, STEREO, Hinode, CORONAS, and the Solar Dynamics Observatory (SDO) during the era of 2000-2018. The new solar space missions are characterized by unprecedented high-resolution imaging, time resolution, spectral capabilities, stereoscopy and tomography, which reveal the intricate dynamics of magneto-hydrodynamic processes in the solar corona down to scales of 100 km. The enormous amount of data streaming down from SDO in Terabytes per day requires advanced automated data processing methods. The book focuses exclusively on new research results after 2000, which are reviewed in a comprehensive manner, documented by over 3600 literature references, covering theory, observations, and numerical modeling of basic physical processes that are observed in high-temperature plasmas of the Sun and other astrophysical [...]

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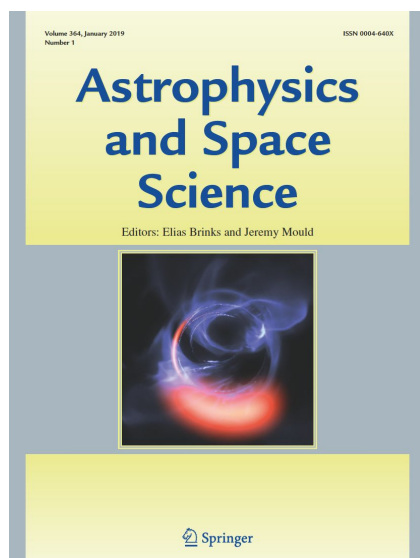
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Astrophysics and Space Science

An International Journal of Astronomy, Astrophysics and Space Science

Editors-in-Chief: E. Brinks; J. Mould

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- 99% of authors who answered a survey reported that they would definitely publish or probably publish in the journal again

Astrophysics and Space Science publishes original contributions and invited reviews covering the entire range of astronomy, astrophysics, astrophysical cosmology, planetary and space science and the astrophysical aspects of astrobiology. This includes both observational and theoretical research, the techniques of astronomical instrumentation and data analysis and astronomical space instrumentation. We particularly welcome papers in the general fields of high-energy astrophysics, astrophysical and astrochemical studies of the interstellar medium including star formation, planetary astrophysics, the formation and evolution of galaxies and the evolution of large scale structure in the Universe. Papers in mathematical physics or in general relativity which do not establish clear astrophysical applications will no longer be considered.

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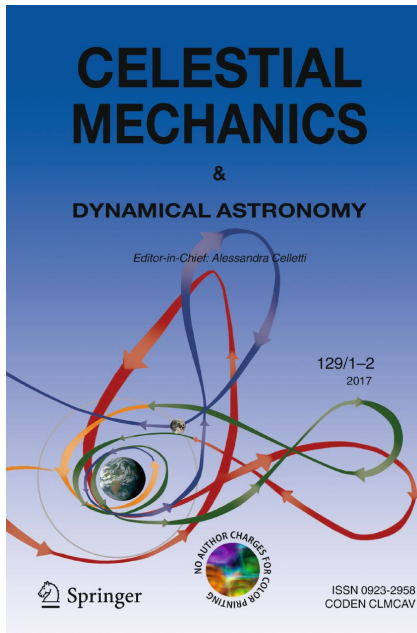
Commonly used title abbreviations: *Astrophys Space Sci*, *Ap&SS*

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Celestial Mechanics and Dynamical Astronomy

An International Journal of Space Dynamics

Editor-in-Chief: A. Celletti

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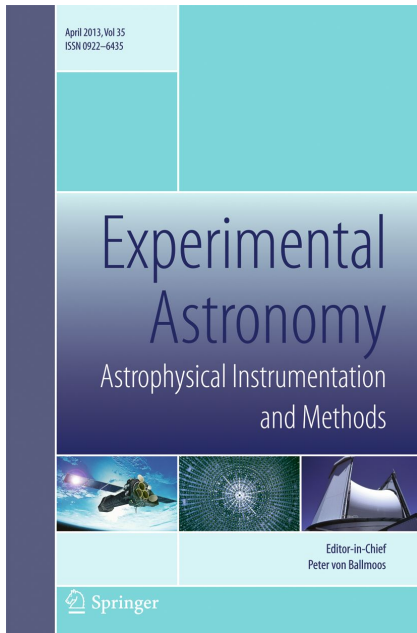
The international journal *Celestial Mechanics and Dynamical Astronomy* is concerned with the broad topic of celestial mechanics and its applications, as well as with peripheral fields. The papers published in *Celestial Mechanics and Dynamical Astronomy* include treatments of the mathematical, physical and computational aspects of planetary theory, lunar theory, general and special perturbation theory, ephemerides, resonance theory, geodesy of the Earth and the planets, dynamics, the 3-body problem, the n-body problem, space mechanics, ring systems, galactic dynamics, reference frames, time, relativity, nongravitational forces, computer methods, computer languages for analytical developments, and database management. *Celestial Mechanics and Dynamical Astronomy* is the journal of record in its field and is an indispensable component of reference libraries on Dynamical Astronomy, Astrodynamics and Dynamical Systems.

Impact Factor: 1.837 (2018), Journal Citation Reports®

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Astrophysical Instrumentation and Methods

Editor-in-Chief: P. von Ballmoos

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- Covers detection techniques, instruments, and data analysis and image processing techniques
- Presents full-length articles, research letters and reviews and occasional special in-depth issues on specific projects and techniques
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Many new instruments for observing astronomical objects at a variety of wavelengths have been and are continually being developed. Consequently, a vast amount of effort is being put into new data analysis techniques to cope with rivers of data collected by these instruments.

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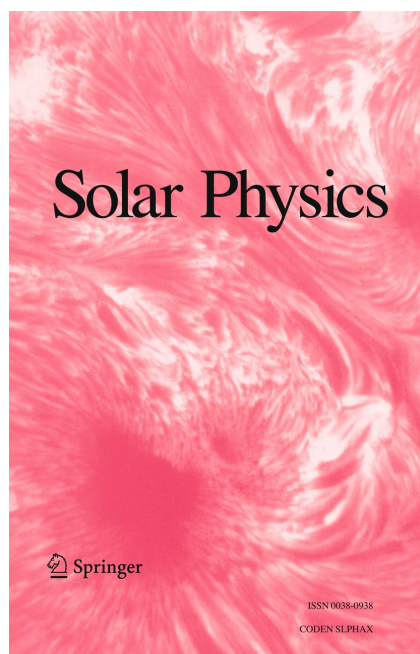
Commonly used title abbreviations: Exp. Astron., Exp Astron, ExA

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A Journal for Solar and Solar-Stellar Research and the Study of Solar-Terrestrial Physics

Editors-in-Chief: J. Leibacher; L. van Driel-Gesztelyi; C.H. Mandrini; M.S. Wheatland

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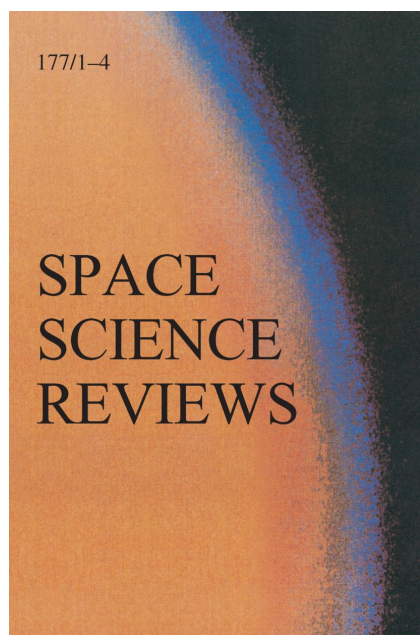
Commonly used title abbreviations: SoPh, Solar Phys., Sol. Phys.

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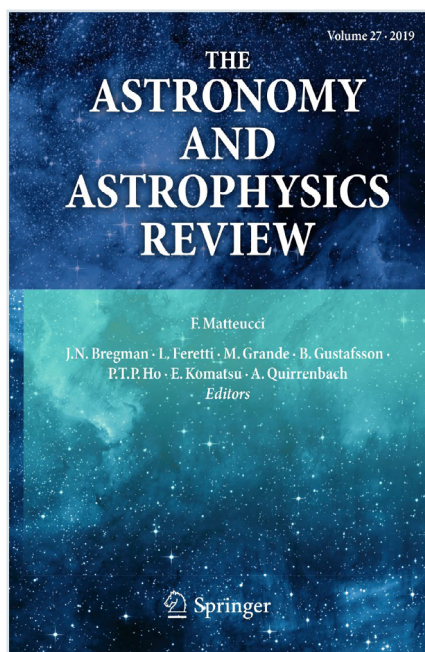
Commonly used title abbreviations: SSRv, Space Sci. Rev.

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- Publishes invited reviews by leading experts from around the world
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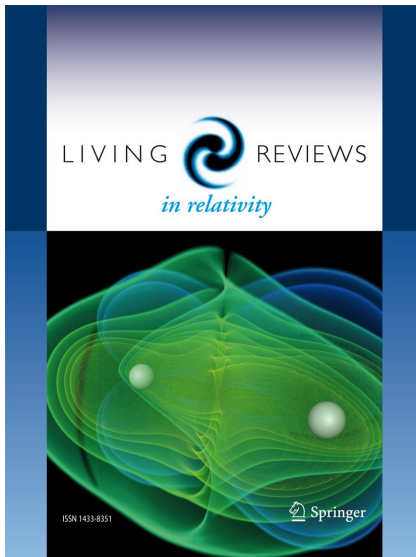
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Cover figure: Numerical simulation of two inspiralling black holes that merge to form a new black hole. The image shows the apparent horizons and the gravitational waves produced. Shown are either the real and/or imaginary part of the curvature scalar Ψ_{i4} .

Credits: Numerical simulation: C. Reisswig, L. Rezzolla (Albert Einstein Institute). Scientific visualization: M. Koppitz (Albert Einstein Institute & Zuse Institute Berlin)

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Editor-in-Chief: S.K. Solanki

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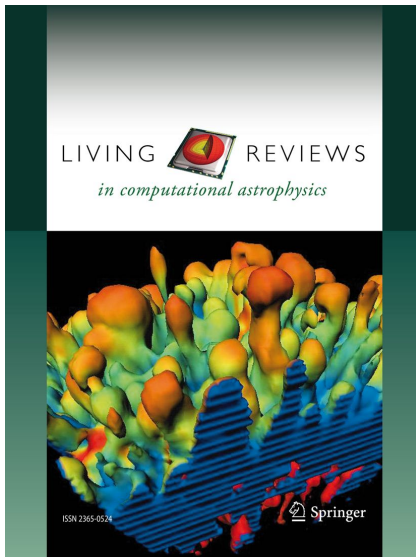
Cover figure: Extreme ultra-violet image of the Sun at 171 Å taken by the Atmospheric Imaging Assembly (AIA) on the Solar Dynamics Observatory (SDO); *credit:* NASA

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Cover Figure: 3D simulations in a 60x60 degree wedge of Rayleigh-Taylor instabilities in a proto-neutronstar; *credit:* Ewald Müller

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