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Outskirts of Galaxy Clusters (IAU C195) - International Astronomical Union. Colloquium 2004-12-16
This book contains the proceedings of the International Astronomical Union Colloquium no. 195, held in Torino, Italy in 2004. The meeting investigated the formation of galaxies within a full cosmological context, focusing on the outer

regions of galaxy clusters. The observed correlation of optical and radio properties of galaxies with their environment indicates that the formation and evolution of galaxies is intimately linked to the formation of large scale structure. With chapters written by leading authorities in the field, this timely volume investigates the role of the environment in determining the properties of galaxies. It describes the distribution of matter and galaxies on the largest scales in the Universe, the processes of cluster and galaxy formation, their role and interplay. This is a valuable collection of review articles for professional astronomers.

Biodefense in the Age of Synthetic Biology - National Academies of Sciences, Engineering, and Medicine 2019-01-05

Scientific advances over the past several decades have accelerated the ability to engineer existing organisms and to potentially create novel ones not found in nature. Synthetic biology, which collectively refers to concepts, approaches, and tools that enable the modification or creation of biological organisms, is being pursued overwhelmingly for beneficial purposes ranging from reducing the burden of disease to improving agricultural yields to remediating pollution. Although the contributions synthetic biology can make in these and other areas hold great promise, it is also possible to imagine malicious uses that could threaten U.S. citizens and military personnel. Making informed decisions about how to address such concerns requires a realistic assessment of the capabilities that could be misused. Biodefense in the Age of Synthetic Biology explores and envisions potential misuses of synthetic biology. This report develops a framework to guide an assessment of the security concerns related to advances in synthetic biology, assesses the levels of concern warranted for such advances, and identifies options that could help mitigate those concerns.

JET Simulations, Experiments, and Theory -

Christophe Sauty 2019-08-02

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.

Plasma Physics for Astrophysics - Russell M. Kulsrud 2020-05-26

In this book, a distinguished expert introduces plasma physics from the ground up, presenting it as a comprehensible field that can be grasped largely on the basis of physical intuition and qualitative reasoning, similar to other fields of physics. Plasmas are ionized gases that can be found in a hydrogen bomb explosion, the confinement chamber of an experimental fusion reactor, the solar corona, the aurora borealis, the interstellar medium, and the immediate vicinity of a gravitational black hole. Not surprisingly, plasma physics appears to consist of numerous topics arising independently from astrophysics, fusion physics, and other practical applications, and hence it remains a field poorly

understood even by many astrophysicists. But, in fact, most of these topics can be approached from the same perspective, with a simple, physical intuition. Selecting simple examples and presenting them in a simultaneously intuitive and rigorous manner, Russell Kulsrud guides readers through a careful derivation of the results and allows them to think through the physics for themselves. Thus, they are better prepared for complex cases and more general results. The first eleven chapters present topics by their importance to plasma physics while the last three chapters emphasize the field's astrophysical applications, applying the results accrued earlier. Throughout, many problems illustrate the field's applications. Based on a course the author taught for many years, Plasma Physics for Astrophysics is intended for graduate students as well as for working astrophysicists.

Debates - Mysore (India : State). Legislature. Legislative Assembly 1969

The First Galaxies in the Universe - Abraham Loeb 2013-01-15

This book provides a comprehensive, self-contained introduction to one of the most exciting frontiers in astrophysics today: the quest to understand how the oldest and most distant galaxies in our universe first formed. Until now, most research on this question has been theoretical, but the next few years will bring about a new generation of large telescopes that promise to supply a flood of data about the infant universe during its first billion years after the big bang. This book bridges the gap between theory and observation. It is an invaluable reference for students and researchers on early galaxies. The First Galaxies in the Universe starts from basic physical principles before moving on to more advanced material. Topics include the gravitational growth of structure, the intergalactic medium, the formation and evolution of the first stars and black holes, feedback and galaxy evolution, reionization, 21-

cm cosmology, and more. Provides a comprehensive introduction to this exciting frontier in astrophysics Begins from first principles Covers advanced topics such as the first stars and 21-cm cosmology Prepares students for research using the next generation of large telescopes Discusses many open questions to be explored in the coming decade

Topics in Magnetohydrodynamic Topology, Reconnection and Stability Theory - David MacTaggart 2019-07-19

The book presents an advanced but accessible overview of some of the most important sub-branches of magnetohydrodynamics (MHD): stability theory, magnetic topology, relaxation theory and magnetic reconnection. Although each of these subjects is often treated separately, in practical MHD applications they are normally inseparable. MHD is a highly active field of research.The book is written for advanced undergraduates, postgraduates and researchers working on MHD-related research in plasma physics and fluid dynamics.

Historical and Biographical Annals of Berks County, Pennsylvania - Morton L (Morton Luther) B Montgomery 2018-10-14

This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. To ensure a quality reading experience, this work has been proofread and republished using a format that seamlessly blends the original graphical elements with text in an easy-to-read typeface. We appreciate your support of the preservation process, and thank you for being an important part of keeping this

knowledge alive and relevant.

High-Energy-Density Physics - R Paul Drake 2018-01-02

The raw numbers of high-energy-density physics are amazing: shock waves at hundreds of km/s (approaching a million km per hour), temperatures of millions of degrees, and pressures that exceed 100 million atmospheres. This title surveys the production of high-energy-density conditions, the fundamental plasma and hydrodynamic models that can describe them and the problem of scaling from the laboratory to the cosmos. Connections to astrophysics are discussed throughout. The book is intended to support coursework in high-energy-density physics, to meet the needs of new researchers in this field, and also to serve as a useful reference on the fundamentals. Specifically the book has been designed to enable academics in physics, astrophysics, applied physics and engineering departments to provide in a single-course, an introduction to fluid mechanics and radiative transfer, with dramatic applications in the field of high-energy-density systems. This second edition includes pedagogic improvements to the presentation throughout and additional material on equations of state, heat waves, and ionization fronts, as well as problem sets accompanied by solutions.

Neutrino Mass - Guido Altarelli 2003-09-08

Reviews the current state of knowledge of neutrino masses and the related question of neutrino oscillations. After an overview of the theory of neutrino masses and mixings, detailed accounts are given of the laboratory limits on neutrino masses, astrophysical and cosmological constraints on those masses, experimental results on neutrino oscillations, the theoretical interpretation of those results, and theoretical models of neutrino masses and mixings. The book concludes with an examination of the potential of long-baseline experiments. This is an essential reference text for workers in elementary-particle physics, nuclear physics,

and astrophysics.

The First Stars - Volker Bromm 2016-09-07

The formation of the first stars (Pop III stars) and galaxies is one of the great outstanding challenges in modern astrophysics and cosmology. The first stars are likely key drivers for early cosmic evolution and will be at the center of attention over the next decade. The best available space and ground-based telescopes like the Hubble Space Telescope probe the Universe to high redshifts and provide us with tantalizing hints; but they cannot yet directly detect the first generation of stars and the formation of the first galaxies. This is left as key science for future telecopes like the James Webb Space Telescope. This book is based in part on classroom tested lectures related to Pop III stars, but also draws from the author's review articles of the main physical principles involved. The book will thus combine pedagogical introductory chapters with more advanced ones to survey the cutting-edge advances from the frontier of research. It covers the theory of first star formation, the relation between first stars and dark matter, their impact on cosmology, their observational signatures, the transition to normal star formation as well as the assembly of the first galaxies. It will prepare students for interpreting observational findings and their cosmological implications.

Turbulence in Magnetohydrodynamics - Andrey Beresnyak 2019-07-08

Magnetohydrodynamics describes dynamics in electrically conductive fluids. These occur in our environment as well as in our atmosphere and magnetosphere, and play a role in the sun's interaction with our planet. In most cases these phenomena involve turbulences, and thus are very challenging to understand and calculate. A sound knowledge is needed to tackle these problems. This work gives the basic information on turbulence in nature, comtaining the needed equations, notions and numerical simulations. The current state of our knowledge and future

implications of MHD turbulence are outlined systematically. It is indispensable for all scientists engaged in research of our atmosphere and in space science.
Key Stage 3 Mathematics - Stafford Burndred 1996-02-01

Enhancing Teaching and Learning through Assessment - Steve Frankland 2007-10-17
Assessment is the daily life of a teacher; designing plans, setting questions, giving feedback and grading are all activities that teachers undertake on a regular basis. This book provides a practical guide on the effective use of assessment. It includes the use of assessment tools and pedagogical design that help students deepen their learning. Major issues on assessment and some excellent examples are presented as a useful resource to university teachers in enhancing teaching and students' learning.

Facts Controllers in Power Transmission and Distribution - K. R. Padiyar 2009-01-01
The emerging technology of Flexible AC Transmission System (FACTS) enables planning and operation of power systems at minimum costs, without compromising security. This is based on modern high power electronic systems that provide fast controllability to ensure ‘flexible' operation under changing system conditions. This book presents a comprehensive treatment of the subject by discussing the operating principles, mathematical models, control design and issues that affect the applications. The concepts are explained often with illustrative examples and case studies. In particular, the book presents an in-depth coverage of: Applications of SVC, TCSC, GCSC, SPST, STATCOM, SSSC, UPFC, IPFC and IPC for voltage/power control in transmission systems; Application of DSTATCOM, DVR and UPQC for improving power quality in distribution systems; Design of Power Oscillation Damping (POD) controllers; Discrete control of FACTS for

improving transient stability; Mitigation of SSR using series FACTS Controllers; Issues affecting control design such as electromagnetic and harmonic interactions. The book can serve as a text or reference for a course on FACTS Controllers. It will also benefit researchers and practicing engineers who wish to understand and apply FACTS technology.

Astrophysical Black Holes - Francesco Haardt 2015-11-03

Based on graduate school lectures in contemporary relativity and gravitational physics, this book gives a complete and unified picture of the present status of theoretical and observational properties of astrophysical black holes. The chapters are written by internationally recognized specialists. They cover general theoretical aspects of black hole astrophysics, the theory of accretion and ejection of gas and jets, stellar-sized black holes observed in the Milky Way, the formation and evolution of supermassive black holes in galactic centers and quasars as well as their influence on the dynamics in galactic nuclei. The final chapter addresses analytical relativity of black holes supporting theoretical understanding of the coalescence of black holes as well as being of great relevance in identifying gravitational wave signals. With its introductory chapters the book is aimed at advanced graduate and post-graduate students, but it will also be useful for specialists.

Data Analysis in Cosmology - Vicent J. Martinez 2009-07-09

The amount of cosmological data has dramatically increased in the past decades due to an unprecedented development of telescopes, detectors and satellites. Efficiently handling and analysing new data of the order of terabytes per day requires not only computer power to be processed but also the development of sophisticated algorithms and pipelines. Aiming at students and researchers the lecture notes in this volume explain in pedagogical manner the

best techniques used to extract information from cosmological data, as well as reliable methods that should help us improve our view of the universe.

Dynamical Chaos in Planetary Systems - Ivan I. Shevchenko 2021-09-01

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.

Strong Performers and Successful Reformers in Education Lessons from PISA for Korea - OECD 2014-03-14

The story of Korean education over the past 50 years is one of remarkable growth and achievement. Korea is one of the top performing countries in the Programme for International Student Assessment (PISA) survey and among those with the highest ...

A Genealogical History of the Descendants of Joseph Peck - Ira Ballou Peck 1868

A genealogical history of the descendants of Joseph Peck who emigrated with his family to this country in 1638: and records of his father's and grandfather's families in England: with the pedigree extending back from son to father for twenty generations: with their coat of arms and

copies of wills.

Daily Language Review Grade 5 - Evan-Moor Educational Publishers 1998-03

This book includes Monday to Friday lessons for each day of a 36-week school year and short daily lessons. The Monday to Thursday lessons include two sentences to edit, including corrections in punctuation, capitalization, spelling, grammar, and vocabulary and three items practicing a variety of language and reading skills. Friday practice cycles through five formats: language usage, identifying and correcting mistakes, combining sentences, choosing reference materials and figurative speech (similes, metaphors). The pages are reproducible and the book includes a skills list and answer keys.

Core Mathematics 2 - Greg Attwood 2004

Easing the transition from GCSE to AS level, this textbook meets the 2004 Edexcel specifications and provides numerous worked examples and solutions to aid understanding of key concepts.

Processing and Fabrication of Advanced Materials - Alan Kin Tak Lau 2011-11-29

The 20th International Symposium on the Processing and Fabrication of Advanced Materials (PFAMXX) was organized by Hong Kong Polytechnic University, during the 15-17th December 2011, in Hong Kong. The main purpose of this interdisciplinary symposium was to bring together state-of-the-art developments regarding all aspects of the processing and fabrication of advanced materials, spanning the entire gamut of metallic, intermetallic, ceramic, ceramic-matrix composites, metal-matrix composites, intermetallic-matrix composites, advanced polymers and polymer-matrix composites; together with surface and high-temperature coatings. The symposium provided an attractive forum for the presentation of the latest advances, in materials processing and fabrication, by researchers and engineers from industry, research laboratories and academia. The proceedings cover the areas of: Advanced

Composite Materials (Polymer, Metal and Ceramics); Natural Fibres (Plant- or Animal-Based) Composites; Nanostructural Materials; Properties of Materials; Failure Analysis; Computational Analysis and Simulations; Advanced Manufacturing Processes; Bio-materials and Bio-composites; Materials Characterizations. The result is an excellent and timely overview of the subject.

National Guide to Funding for Community Development - 1998

Mirror-travels - Jennifer L. Roberts 2004

Offering a critical analysis of Smithson's view of time, it provides comprehensive case studies of three of his most influential projects: "The Monuments of Passaic," a sardonic tour of a decaying New Jersey city conducted in the wake of the passage of the National Historic Preservation Act; "Incidents of Mirror-Travel in the Yucatan," a textual-sculptural-photographic travelogue that coincided with a series of revolutionary discoveries about Maya history; and the Spiral Jetty."--BOOK JACKET.

Turbulence in Rotating, Stratified and Electrically Conducting Fluids - P. A. Davidson 2013-09-12

There are two recurring themes in astrophysical and geophysical fluid mechanics: waves and turbulence. This book investigates how turbulence responds to rotation, stratification or magnetic fields, identifying common themes, where they exist, as well as the essential differences which inevitably arise between different classes of flow. The discussion is developed from first principles, making the book suitable for graduate students as well as professional researchers. The author focuses first on the fundamentals and then progresses to such topics as the atmospheric boundary layer, turbulence in the upper atmosphere, turbulence in the core of the earth, zonal winds in the giant planets, turbulence within the interior of the sun, the solar wind, and turbulent flows in

accretion discs. The book will appeal to engineers, geophysicists, astrophysicists and applied mathematicians who are interested in naturally occurring turbulent flows.

Children Learning Mathematics - Linda Dickson 1988

Character Studies in the Fourth Gospel - Hunt, et al 2016

Using various narrative approaches and methodologies, an international team of forty-four Johannine scholars here offers probing essays related to individual characters and group characters in the Gospel of John. These essays present fresh perspectives on characters who play a major role in the Gospel (Peter, Nicodemus, the Samaritan woman, Thomas, and many others), but they also examine characters who have never before been the focus of narrative analysis (the men of the Samaritan woman, the boy with the loaves and fishes, Barabbas, and more). Taken together, the essays shed new light on how complex and nuanced many of these characters are, even as they stand in the shadow of Jesus. Readers of this volume will be challenged to consider the Gospel of John anew.

The Primordial Density Perturbation - David H. Lyth 2009-06-11

The origin and evolution of the primordial perturbation is the key to understanding structure formation in the earliest stages of the Universe. It carries clues to the types of physical phenomena active in that extreme high-density environment. Through its evolution, generating first the observed cosmic microwave background anisotropies and later the distribution of galaxies and dark matter in the Universe, it probes the properties and dynamics of the present Universe. This graduate-level textbook gives a thorough account of theoretical cosmology and perturbations in the early Universe, describing their observational consequences and showing how to relate such

observations to primordial physical processes, particularly cosmological inflation. With ambitious observational programmes complementing ever-increasing sophistication in theoretical modelling, cosmological studies will remain at the cutting edge of astrophysical studies for the foreseeable future.

Invention, Creation, & Public Policy Symposium - 2009

National Geographic Kids Ultimate Dinopedia - Don Lessem 2017

Shares in-depth information about all currently known dinosaur species organized under major periods, providing details on such topics as physical characteristics, diet, and discovery dates.

Interstellar Turbulence - Jose Franco 1999-05-28

This timely volume presents a series of review articles covering every aspect of interstellar turbulence--from accretion disks, molecular clouds, atomic and ionized media, through to spiral galaxies - based on a major international conference held in Mexico City.With advances in observational techniques and the development of more efficient computer codes and faster computers, research in this area has made spectacular progress in recent years. This book provides a comprehensive overview of the most important developments in observing and modelling turbulent flows in the cosmos. It provides graduate student and researchers with a state-of-the-art summary of observational, theoretical and computational research in interstellar turbulence.

Semiconductor and Metal Nanocrystals - Victor I. Klimov 2003-11-07

The vast technological potential of nanocrystalline materials, as well as current intense interest in the physics and chemistry of nanoscale phenomena, has led to explosive growth in research on semiconductor nanocrystals, also known as nanocrystal quantum dots, and metal nanoparticles.

Semiconductor and Metal Nanocrystals addresses current topics impacting the field including synthesis and assembly of nanocrystals, theory and spectroscopy of interband and intraband optical transitions, single-nanocrystal optical and tunneling spectroscopies, electrical transport in nanocrystal assemblies, and physical and engineering aspects of nanocrystal-based devices. Written by experts who have contributed pioneering research, this reference comprises key advances in the field of semiconductor nanocrystal quantum dots and metal nanoparticles over the past several years. Focusing specifically on nanocrystals generated through chemical techniques, Semiconductor and Metal Nanocrystals Merges investigative frontiers in physics, chemistry, and engineering Documents advances in nanocrystal synthesis and assembly Explores the theory of electronic excitations in nanoscale particles Presents comprehensive information on optical spectroscopy of interband and intraband optical transitions Reviews data on single-nanocrystal optical and tunneling spectroscopies Weighs controversies related to carrier relaxation dynamics in ultrasmall nanoparticles Discusses charge carrier transport in nanocrystal assemblies Provides examples of lasing and photovoltaic nanocrystal-based devices Semiconductor and Metal Nanocrystals is a must read for scientists, engineers, and upper-level undergraduate and graduate students interested in the physics and chemistry of nanoscale semiconductor and metal particles, as well as general nanoscale science. About the Editor: VICTOR I. KLIMOV is Team Leader, Softmatter Nanotechnology and Advanced Spectroscopy Team, Chemistry Division, Los Alamos National Laboratory, New Mexico. The recipient of the Los Alamos Fellows Prize (2000), he is a Fellow of the Alexander von Humboldt Foundation, leader of the Nanophotonics and Nanoelectronics Thrust of the Center for

Integrated Nanotechnologies (U.S. Department of Energy), a member of the Los Alamos Board of Governors of the Institute for Complex Adaptive Matter, and a member of the Steering Committee for the Los Alamos Quantum Institute. He received the M.S. (1978), Ph.D. (1981), and Dr. Sci. (1993) degrees from Moscow State University, Russia.

Handbook of Geomathematics - Amir Z. Averbuch 2011

Nanocrystal Quantum Dots - Victor I. Klimov 2017-12-19

A review of recent advancements in colloidal nanocrystals and quantum-confined nanostructures, Nanocrystal Quantum Dots is the second edition of Semiconductor and Metal Nanocrystals: Synthesis and Electronic and Optical Properties, originally published in 2003. This new title reflects the book's altered focus on semiconductor nanocrystals. Gathering contributions from leading researchers, this book contains new chapters on carrier multiplication (generation of multiexcitons by single photons), doping of semiconductor nanocrystals, and applications of nanocrystals in biology. Other updates include: New insights regarding the underlying mechanisms supporting colloidal nanocrystal growth A revised general overview of multiexciton phenomena, including spectral and dynamical signatures of multiexcitons in transient absorption and photoluminescence Analysis of nanocrystal-specific features of multiexciton recombination A review of the status of new field of carrier multiplication Expanded coverage of theory, covering the regime of high-charge densities New results on quantum dots of lead chalcogenides, with a focus studies of carrier multiplication and the latest results regarding Schottky junction solar cells Presents useful examples to illustrate applications of nanocrystals in biological labeling, imaging, and diagnostics The book also includes a review of

recent progress made in biological applications of colloidal nanocrystals, as well as a comparative analysis of the advantages and limitations of techniques for preparing biocompatible quantum dots. The authors summarize the latest developments in the synthesis and understanding of magnetically doped semiconductor nanocrystals, and they present a detailed discussion of issues related to the synthesis, magneto-optics, and photoluminescence of doped colloidal nanocrystals as well. A valuable addition to the pantheon of literature in the field of nanoscience, this book presents pioneering research from experts whose work has led to the numerous advances of the past several years.

Cosmic Rays in the Earth's Atmosphere and Underground - Lev Dorman 2013-03-19

The present monograph as well as the next one (Dorman, M2005) is a result of more than 50 years working in cosmic ray (CR) research. After graduation in December 1950 Moscow Lomonosov State University (Nuclear and Elementary Particle Physics Division, the Team of Theoretical Physics), my supervisor Professor D. I. Blokhintsev planned for me, as a winner of a Red Diploma, to continue my education as an aspirant (a graduate student) to prepare for Ph. D. in his very secret Object in the framework of what was in those time called the Atomic Problem. To my regret the KGB withheld permission, and I, together with other Jewish students who had graduated Nuclear Divisions of Moscow and Leningrad Universities and Institutes, were faced with a real prospect of being without any work. It was our good fortune that at that time there was being brought into being the new Cosmic Ray Project (what at that time was also very secret, but not as secret as the Atomic Problem), and after some time we were directed to work on this Project. It was organized and headed by Prof. S. N. Vernov (President of All-Union Section of Cosmic Rays) and Prof. N. V. Pushkov (Director of IZMIRAN);

Prof. E. L. Feinberg headed the theoretical part of the Project.

Black-Hole Accretion Disks - □□□□ 2008-03

Since publication of the first edition, models of advection-dominated accretion flows and their comparison with observations have been much developed and deepened, including the cases of super-Eddington accretion. The launch of the Rossi X-ray Timing Explorer led to the discovery of high-frequency oscillations, which opened a new field of discoseismology. In addition, development of observational techniques show that the time when we see a direct image or silhouette of black holes is in the near future. Considering these situations, we fully revised the first edition in order to meet the developments mentioned above.

The Chemical Evolution of Phosphorus - Enrique Macia-Barber 2019-12-11

Here is a fascinating reader-friendly exploration of “the phosphorus enigma.” The volume attempts to answer the questions: How did phosphorus atoms, which are produced inside the inner cores of a handful of huge stars, become concentrated in relatively high proportions in the organisms composing Earth’s biosphere? And how did these phosphate derivatives manage to be included in such a great variety of organic molecules playing essential biochemical roles in all known life forms? Due to the interdisciplinary nature of the topic, the volume is arranged in three sections. The first section introduces the fundamental concepts and notions of physics, chemistry, and biology necessary for the proper understanding of the topics discussed within an astronomical framework. The author then focuses on the role of phosphorus and its compounds within the context of chemical evolution in galaxies, considering its relevance in most essential biochemical functions as well as its peculiar chemistry under different physicochemical conditions. The third section provides an overall perspective on the role of phosphorus and its

compounds in current areas of research of solid state physics, materials engineering, nanotechnology or medicine.

Rotating Relativistic Stars - John L. Friedman 2013-02-11

The masses of neutron stars are limited by an instability to gravitational collapse and an instability driven by gravitational waves limits their spin. Their oscillations are relevant to x-ray observations of accreting binaries and to gravitational wave observations of neutron stars formed during the coalescence of double neutron-star systems. This volume includes more than forty years of research to provide graduate students and researchers in astrophysics, gravitational physics and astronomy with the first self-contained treatment of the structure, stability and oscillations of rotating neutron stars. This monograph treats the equations of stellar equilibrium; key approximations, including slow rotation and perturbations of spherical and rotating stars; stability theory and its applications, from convective stability to the r-mode instability; and numerical methods for computing equilibrium configurations and the nonlinear evolution of their oscillations. The presentation of fundamental equations, results and applications is accessible to readers who do not need the detailed derivations.

The Origin of the Galaxy and Local Group - Joss Bland-Hawthorn 2014-02-11

This volume contains the updated and expanded lecture notes of the 37th Saas-Fee Advanced Course organised by the Swiss Society for Astrophysics and Astronomy. It offers the most comprehensive and up to date review of one of the hottest research topics in astrophysics - how our Milky Way galaxy formed. Joss Bland-Hawthorn & Ken Freeman lectured on Near Field Cosmology - The Origin of the Galaxy and the Local Group. Francesca Matteucci’s chapter is on Chemical evolution of the Milky Way and its Satellites. As designed by the SSAA, books in this series – and this one too – are targeted at

graduate and PhD students and young researchers in astronomy, astrophysics and cosmology. Lecturers and researchers entering the field will also benefit from the book.