

An Introduction To Astronomy And Astrophysics By Pankaj Jain

Introduction to Astrophysics AN INTRODUCTION TO ASTROPHYSICS A Source Book in Astronomy and Astrophysics, 1900-1975 **Cosmology and Astrophysics Through Problems** **Fundamentals of Neutrino Physics and Astrophysics** *Numerical Python in Astronomy and Astrophysics* *The New Cosmos* **An Introduction to Astronomy and Astrophysics** **Astrophysics Essential Astrophysics** *Foundations of Astrophysics* *New Challenges in Astrophysics* **An Introduction to Modern Astrophysics** **Introductory Astronomy and Astrophysics** **Cosmology and Particle Astrophysics** *Observational Astrophysics* **Atomic Astrophysics and Spectroscopy** *Unsolved Problems in Astrophysics* *Introduction to Astronomy and Astrophysics* *Fundamentals of Astrophysics* *Essential Astrophysics* **Lectures on Astrophysics** *Tides in Astronomy and Astrophysics* **Understanding the Universe** **Rocket Science for Babies** *A Companion to Astronomy and Astrophysics* *Introductory Astronomy & Astrophysics* **An Introduction to Modern Stellar Astrophysics** **Astronomy and Astrophysics Abstracts** **Astrophysics: A Very Short Introduction** *Physics and Astrophysics of Neutrinos* **Particles and Astrophysics** *Essential Astrophysics* *The Physics and Astrophysics of Neutron Stars* **An Introduction to Astronomy and Astrophysics** **Astronomy and Astrophysics Abstracts** **Astrophysics for Young People in a Hurry** *An Invitation to Astrophysics* **Cosmology: Astronomy and Astrophysics** **Physics and Astrophysics**

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Atomic Astrophysics and Spectroscopy Jun 19 2021 Spectroscopy enables the precise study of astronomical objects and phenomena. Bridging the gap between physics and astronomy, this is the first integrated graduate-level textbook on atomic astrophysics. It covers the basics of atomic physics and astrophysics, including state-of-the-art research applications, methods and tools. The content is evenly balanced between the physical foundations of spectroscopy and their applications to astronomical objects and cosmology. An undergraduate knowledge of physics is assumed, and relevant basic material is summarized at the beginning of each chapter. The material is completely self-contained and features sufficient background information for self-study. Advanced users will find it handy for spectroscopic studies. A website hosted by the authors contains updates, corrections, exercises and solutions, as well as news items from physics and astronomy related to spectroscopy. A link to this can be found at www.cambridge.org/9780521825368.

Observational Astrophysics Jul 21 2021 For the last twenty years astronomy has been developing dramatically. Until the nineteen-fifties, telescopes, spectrometers, and photographic plates constituted a relatively simple set of tools which had been refined to a high degree of perfection by the joint efforts of physicists and astronomers. Indeed these tools helped at the birth of modern astrophysics: the discovery of the expansion of the Universe. Then came radioastronomy and the advent of electronics; the last thirty years have seen the application to astrophysics of a wealth of new experimental techniques, based on the most advanced fields of physics, and a constant interchange of ideas between physicists and astronomers. Last, but not least, modern computers have sharply reduced the burden of dealing with the information painfully extracted from the skies, whether from ever scarce photons, or from the gigantic data flows provided by satellites and large telescopes. The aim of this book is not to give an extensive overview of all the techniques currently in use in astronomy, nor to provide detailed instructions for preparing or carrying out an astronomical project. Its purpose is methodological: photons are still the main carriers of information between celestial sources and the observer. How we are to collect, sample, measure, and store this information is the unifying theme of the book. Rather than the diversity of techniques appropriate for each wavelength range, we emphasize the physical and mathematical bases which are common to all wavelength regimes.

Essential Astrophysics Feb 02 2020 This book takes a reader on a tour of astronomical phenomena: from the vastness of the interstellar medium, to the formation and evolution of stars and planetary systems, through to white dwarfs, neutron stars, and black holes, the final objects of the stellar graveyard. At its heart, this book is a journey through the evolutionary history of the birth, life, and death of stars, but detours are also made to other related interesting topics. This highly accessible story of the observed contents of our Galaxy includes intuitive explanations, informative diagrams, and basic equations, as needed. It is an ideal guide for undergraduates with some physics and mathematics background who are studying astronomy and astrophysics. It is also accessible to interested laypeople, thanks to its limited equations. Key features: Includes coverage of some of the latest exciting research from the field, including star formation, exoplanets, and black holes Can be utilised as a stand-alone textbook for a one-term course or as a supplementary textbook for a more comprehensive course on astronomy and astrophysics Authored by a team respected for research, education, and outreach Shantanu Basu is an astrophysicist and a professor at The University of Western Ontario, Canada. He is known for research contributions on the formation of gravitationally-collapsed objects in the universe: stars, planets, brown dwarfs, and supermassive black holes. He is one of the originators of the migrating embryo scenario of episodic accretion onto young stars. He has been recognized for his teaching excellence and his contributions to the astronomical community include organizing many conferences and training schools. Pranav Sharma is an astronomer and science historian known for his work on the history of the Indian Space Program. He has curated the Space Museum at the B. M. Birla Science Centre (Hyderabad, India). He is in-charge of the history of Indo-French scientific partnership project supported by the Embassy of France in India. He is a national-award-winning science communicator and has extensively worked on the popularization of astronomy education in India.

Foundations of Astrophysics Dec 26 2021 "This book provides a contemporary and complete introduction to astrophysics for astronomy and physics majors."--

Numerical Python in Astronomy and Astrophysics May 31 2022 This book provides a solid foundation in the Python programming language, numerical methods, and data analysis, all embedded within the context of astronomy and astrophysics. It not only enables students to learn programming with the aid of examples from these fields but also provides ample motivation for engagement in independent research. The book opens by outlining the importance of computational methods and programming algorithms in contemporary astronomical and astrophysical research, showing why programming in Python is a good choice for beginners. The performance of basic calculations with Python is then explained with reference to, for example, Kepler's laws of planetary motion and gravitational and tidal forces. Here, essential background knowledge is provided as necessary. Subsequent chapters are designed to teach the reader to define and use important functions in Python and to utilize numerical methods to solve differential equations and landmark dynamical problems in astrophysics. Finally, the analysis of astronomical data is discussed, with various hands-on examples as well as guidance on astronomical image analysis and applications of artificial neural networks.

Lectures on Astrophysics Jan 15 2021 Stars -- Binaries -- The interstellar medium -- Galaxies.

Introductory Astronomy & Astrophysics Aug 10 2020 This advanced undergraduate text provides broad coverage of astronomy and astrophysics with a strong emphasis on physics. It has an algebra and trigonometry prerequisite, but calculus is preferred.

An Invitation to Astrophysics Aug 29 2019 This unique book provides a clear and lucid description of several aspects of astrophysics and cosmology in a language understandable to a physicist or beginner in astrophysics. It presents the key topics in all branches of astrophysics and cosmology in a simple and concise language. The emphasis is on currently active research areas and exciting new frontiers rather than on more pedantic topics.

Many complicated results are introduced with simple, novel derivations which strengthen the conceptual understanding of the subject. The book also contains over one hundred exercises which will help students in their self study. Undergraduate and graduate students in physics and astrophysics as well as all physicists who are interested in obtaining a quick grasp of astrophysical concepts will find this book useful.

An Introduction to Astronomy and Astrophysics Dec 02 2019 Astronomy is the field of science devoted to the study of astronomical objects, such as stars, galaxies, and nebulae. Astronomers have gathered a wealth of knowledge about the universe through hundreds of years of painstaking observations. These observations are interpreted by the use of physical and chemical laws familiar to mankind. These interpretations supply information about the nature of these astronomical objects, allowing for the deduction of their surface and interior conditions. The science associated with these interpretations is called astrophysics. An Introduction to Astronomy and Astrophysics offers a comprehensive introduction to astronomy and astrophysics, complete with illustrative examples and illuminating homework problems. Requiring a familiarity with basic physics and mathematics, this undergraduate-level textbook: Addresses key physics concepts relevant to stellar observations, including radiation, electromagnetic spectrum, photometry, continuous and discrete spectrum, and spectral lines Describes instruments used for astronomical observations as well as how the radiation received is characterized and interpreted to determine the properties of stars Examines the structure of stars, the basic equations which explain stars in equilibrium, and the fusion reactions occurring in stellar cores Discusses the evolution of stars, the solar system, the dynamics of galaxies, and the fundamentals of modern cosmology Explores the universe at high redshifts, where it is dominated by objects such as active galaxies Solutions manual and figure slides available with qualifying course adoption An Introduction to Astronomy and Astrophysics teaches students how to interpret the night sky, providing them with a critical understanding of the stars and other heavenly bodies.

Introduction to Astrophysics Nov 05 2022 A concrete, mid-level treatment, this readable and authoritative translation from the French provides an excellent guide to observational astrophysics. Methods of research and observation receive as much attention as results. Topics include stellar photometry and spectroscopy, classification and properties of normal stars, construction of Hertzsprung- Russell diagrams, Yerkes two-dimensional classification, and much more. Reprint of Introduction à l'astrophysique: les étoiles, Max Leclerc et Cie, 1961.

Astrophysics for Young People in a Hurry Sep 30 2019 Neil deGrasse Tyson's #1 New York Times best-selling guide to the cosmos, adapted for young readers. From the basics of physics to big questions about the nature of space and time, celebrated astrophysicist and science communicator Neil deGrasse Tyson breaks down the mysteries of the cosmos into bite-sized pieces. Astrophysics for Young People in a Hurry describes the fundamental rules and unknowns of our universe clearly—and with Tyson's characteristic wit, there's a lot of fun thrown in, too. This adaptation by Gregory Mone includes full-color photos, infographics, and extra explanations to make even the trickiest concepts accessible. Building on the wonder inspired by outer space, Astrophysics for Young People in a Hurry introduces an exciting field and the principles of scientific inquiry to young readers.

An Introduction to Astronomy and Astrophysics Mar 29 2022 Astronomy is the field of science devoted to the study of astronomical objects, such as stars, galaxies, and nebulae. Astronomers have gathered a wealth of knowledge about the universe through hundreds of years of painstaking observations. These observations are interpreted by the use of physical and chemical laws familiar to mankind. These interpret

Fundamentals of Neutrino Physics and Astrophysics Jul 01 2022 Our Universe is made of a dozen fundamental building blocks. Among these, neutrinos are the most mysterious - but they are the second most abundant particles in the Universe. This book provides detailed discussions of how to describe neutrinos, their basic properties, and the roles they play in nature.

Astronomy and Astrophysics Abstracts Jun 07 2020 From the reviews: Astronomy and Astrophysics Abstracts has appeared in semi-annual volumes since 1969 and it has already become one of the fundamental publications in the fields of astronomy, astrophysics and neighbouring sciences. It is the most important English-language abstracting journal in the mentioned branches. ... The abstracts are classified under more than hundred subject categories, thus permitting a quick survey of the whole extended material. The AAA is a valuable and important publication for all students and scientists working in the fields of astronomy and related sciences. As such it represents a necessary ingredient of any astronomical library all over the world." Space Science Reviews #1 "Dividing the whole field plus related subjects into 108 categories, each work is numbered and most are accompanied by brief abstracts. Fairly comprehensive cross-referencing links relevant papers to more than one category, and exhaustive author and subject indices are to be found at the back, making the catalogues easy to use. The series appears to be so complete in its coverage and always less than a year out of date that I shall certainly have to make a little more space on those shelves for future volumes." The Observatory Magazine #1

An Introduction to Modern Astrophysics Oct 24 2021 "An Introduction to Modern Astrophysics, "Second Edition has been thoroughly revised to reflect the dramatic changes and advancements in astrophysics that have occurred over the past decade. The Second Edition of this market-leading book has been updated to include the latest results from relevant fields of astrophysics and advances in our theoretical understanding of astrophysical phenomena. The Tools of Astronomy: The Celestial Sphere, Celestial Mechanics, The Continuous Spectrum of Light, The Theory of Special Relativity, The Interaction of Light and Matter, Telescopes; The Nature of Stars: Binary Systems and Stellar Parameters, The Classification of Stellar Spectra, Stellar Atmospheres, The Interiors of Stars, The Sun, The Process of Star Formation, Post-Main-Sequence Stellar Evolution, Stellar Pulsation, Supernovae, The Degenerate Remnants of Stars, Black Holes, Close Binary Star Systems; Planetary Systems: Physical Processes in the Solar System, The Terrestrial Planets, The Jovian Worlds, Minor Bodies of the Solar System, The Formation of Planetary Systems; Galaxies and the Universe: The Milky Way Galaxy, The Nature of Galaxies, Galactic Evolution, The Structure of the Universe, Active Galaxies, Cosmology, The Early Universe; Astronomical and Physical Constants, Unit Conversions Between SI and cgs, Solar System Data, The Constellations, The Brightest Stars, The Nearest Stars, Stellar Data, The Messier Catalog, Constants, A Constants Module for Fortran 95 (Available as a C++ header file), Orbits, A Planetary Orbit Code (Available as Fortran 95 and C++ command line versions, and Windows GUI), TwoStars, A Binary Star Code (Generates synthetic light and radial velocity curves; available as Fortran 95 and C++ command line versions, and Windows GUI), StatStar, A Stellar Structure Code (Available as Fortran 95 and C++ command line versions, and Windows GUI), StatStar, Stellar Models, Galaxy, A Tidal Interaction Code (Available as Java), WMAP Data. For all readers interested in modern astrophysics.

AN INTRODUCTION TO ASTROPHYSICS Oct 04 2022 This invaluable book, now in its second edition, covers a wide range of topics appropriate for both undergraduate and postgraduate courses in astrophysics. The book conveys a deep and coherent understanding of the stellar phenomena, and basic astrophysics of stars, galaxies, clusters of galaxies and other heavenly bodies of interest. Since the first appearance of the book in 1997, significant progress has been made in different branches of Astronomy and Astrophysics. The second edition takes into account the developments of the subject which have taken place in the last decade. It discusses the latest introduction of L and T dwarfs in the Hertzsprung-Russel diagram (or H-R diagram). Other developments discussed pertain to standard solar model, solar neutrino puzzle, cosmic microwave background radiation, Drake equation, dwarf galaxies, ultra compact dwarf galaxies, compact groups and cluster of galaxies. Problems at the end of each chapter motivate the students to go deeper into the topics. Suggested readings at the end of each chapter have been complemented.

Astrophysics Feb 25 2022 This Book Introduces The Subject Of Astrophysics To Honours And Post-Graduate Students Of Physics, Without The Necessity Of Their Being Familiar With All The Practical Details Of Modern Astronomical Techniques Of Observation And Deduction Of Data. The Emphasis Is On Showing How An Application Of The Commonly Known Laws Of Physics Gives Us Important Information About The Properties Of Celestial Objects And Phenomena.

A Companion to Astronomy and Astrophysics Sep 10 2020 Astronomy and Astrophysics is a comprehensive, fundamental, and up-to-date reference book. It is filled with vital information and basic facts for amateur astronomers and professional astrophysicists, and for anyone interested in the Universe, from the Earth and other planets to the stars, galaxies and beyond. An exceptionally thorough Index cross-references concepts, discoveries and individuals in both the Timeline section and Dictionary section. The combined result is a unique stand-alone reference volume in which the reader can quickly locate information, while also discovering new and unexpected knowledge.

An Introduction to Modern Stellar Astrophysics Jul 09 2020 This exciting text opens the entire field of modern astrophysics to the reader by using only the basic tools of physics. Designed for the junior-level astrophysics course, each topic is approached in the context of the major unresolved questions in astrophysics. The core chapters have been designed for a course in stellar structure and evolution, while the extended chapters provide additional coverage of the solar system, galactic structure, dynamics, evolution, and cosmology.

[A Source Book in Astronomy and Astrophysics, 1900-1975](#) Sep 03 2022

[Introduction to Astronomy and Astrophysics](#) Apr 17 2021 This textbook provides the basic theoretical and practical knowledge of astronomy and astrophysics. It provides an overview from classical astronomy and observational methods to solar physics and astrophysics of stars and galaxies. It concludes with chapters on cosmology, astrobiology, and mathematical and numerical methods. Numerous color illustrations, examples of calculations, and exercises with solutions make this work a useful companion to undergraduate astronomy lectures. The book is suitable for students of physics and astronomy at teacher training level or in the Bachelor's degree - but also people interested in natural sciences with appropriate basic knowledge of mathematics and physics will find here an appealing introduction to the subject. This fourth edition has been updated and revised with respect to the latest developments in astronomy. The chapter on mathematical methods has been redesigned and the software used is now exclusively Python. From the contents: Spherical astronomy - History of astronomy - Celestial mechanics - Astronomical instruments - Physics of the bodies of the solar system - The Sun - State variables of the stars - Stellar atmospheres - Stellar structure - Stellar evolution - Interstellar matter - The Galaxy - Extragalactic systems - Cosmology - Astrobiology - Mathematical methods. This book is a translation of the original German 4th edition *Einführung in Astronomie und Astrophysik* by Arnold Hanslmeier, published by Springer-Verlag GmbH Germany, part of Springer Nature in 2020. The translation was done with the help of artificial intelligence (machine translation by the service DeepL.com). A subsequent human revision was done primarily in terms of content, so that the book will read stylistically differently from a conventional translation. Springer Nature works continuously to further the development of tools for the production of books and on the related technologies to support the authors.

Physics and Astrophysics of Neutrinos Apr 05 2020 Observations of neutrinos being emitted by the supernova SN1987A, star neutrinos, and atmospheric neutrinos have provided new insights into astronomy, as well as new unresolved phenomena such as the solar neutrino problem, spurring investigative studies among particle physicists and astrophysicists. One of the most important features of this book is its enumeration of a number of basic properties of neutrinos and their relationship to Grand Unified Theories, focusing on the origin of the neutrino's mass and the generation mixing of neutrinos. All the Kamiokande results, detector performances, and complete references are included.

The Physics and Astrophysics of Neutron Stars Jan 03 2020 This book summarizes the recent progress in the physics and astrophysics of neutron stars and, most importantly, it identifies and develops effective strategies to explore, both theoretically and observationally, the many remaining open questions in the field. Because of its significance in the solution of many fundamental questions in nuclear physics, astrophysics and gravitational physics, the study of neutron stars has seen enormous progress over the last years and has been very successful in improving our understanding in these fascinating compact objects. The book addresses a wide spectrum of readers, from students to senior researchers. Thirteen chapters written by internationally renowned experts offer a thorough overview of the various facets of this interdisciplinary science, from neutron star formation in supernovae, pulsars, equations of state super dense matter, gravitational wave emission, to alternative theories of gravity. The book was initiated by the European Cooperation in Science and Technology (COST) Action MP1304 "Exploring fundamental physics with compact stars" (NewCompStar).

Particles and Astrophysics Mar 05 2020 This book is an introduction to "multi-messenger" astrophysics. It covers the many different aspects connecting particle physics with astrophysics and cosmology and introduces astrophysics using numerous experimental findings recently obtained through the study of high-energy particles. Taking a systematic approach, it comprehensively presents experimental aspects from the most advanced laboratories and detectors, as well as the theoretical background. The book is aimed at graduate students and post-graduate researchers with a basic understanding of particle and nuclear physics. It will also be of interest to particle physicists working in accelerator/collider physics who are keen to understand the mechanisms of the largest accelerators in the Universe. The book draws on the extensive lecturing experience of Professor Maurizio Spurio from the University of Bologna.

Cosmology: Astronomy and Astrophysics Jul 29 2019 The study of the universe, its origin, evolution and future is under the scope of cosmology. Astronomy is the science concerned with celestial objects such as stars, galaxies, planets, gamma ray bursts, etc. and their associated phenomena, origin and evolution. Cosmology deals with the universe as a whole, while astronomy studies individual celestial objects of the universe. Astrophysics is a branch of astronomy, which integrates the principles of physics and chemistry for the study of the nature of astronomical objects. The objects studied in astrophysics are stars, extrasolar planets, galaxies, cosmic microwave background and the interstellar medium. The studies of these are approached from both theoretical and observational astrophysics. This book is a compilation of chapters that discuss the most vital concepts and emerging trends in the fields of cosmology, astrophysics and astronomy. Different approaches, evaluations, methodologies and advanced studies in these fields have been included in this book. It is meant for students who are looking for an elaborate reference text on these domains.

Physics and Astrophysics Jun 27 2019 Physics and Astrophysics discusses some major problems concerned with macrophysics. Such topics as the controlled thermonuclear fusion, high-temperature superconductivity, and metallic exciton liquid in semiconductors are covered. The definition and elements related to microphysics are discussed. This section focuses on mass spectrum, quarks and gluons, and the interaction of particles at high and super high energies. The book gives a brief overview of the general theory of relativity. The production and origin of gravitational waves are discussed in detail. Cosmology is the study of space and time on a large scale. This definition was made as an introduction to the chapter that focuses on the cosmological problems, quasars and galactic nuclei, and formation of galaxies. The necessity of new physics in astronomy is also considered. The text includes a section on the physics of black holes, neutron stars, and pulsars. The book will provide useful information to physicists, cosmologists, engineers, students, and researchers in the field of physics.

New Challenges in Astrophysics Nov 24 2021 The Inter-University Centre For Astronomy And Astrophysics, An Autonomous Institution Of The University Grants Commission, Was Formally Dedicated To The Academics Participating In The Centres Activities On 28Th December, 1992. This Occasion Was Marked By A Two-Day International Dedication Seminar. Several Distinguished Astronomers And Astrophysicists From All Over The World Participated In This Seminar And Delivered Invited Lectures. This Volume Presents The Written Version Of These Lectures. In Addition To A Brief History Of How Iucaa Came Into Being, The Volume Contains Written Version Of The Lectures Delivered By Several Eminent Scientists Including Late Professor S. Chandrasekhar (Nobel Laureate). The Topics Range From The History Of Indian Astronomy To The Details Of The Structure Formation In The Expanding Universe. Each Lecture Is Fairly Detailed And Provides A Comprehensive Review Of The Subject.

Unsolved Problems in Astrophysics May 19 2021 Essays discuss the present state of knowledge following recent discoveries about the structure of the universe, galaxies, quasars, neutrinos, and other topics, and suggest areas for future research

Astrophysics: A Very Short Introduction May 07 2020 Astrophysics is the physics of the stars, and more widely the physics of the Universe. It enables us to understand the structure and evolution of planetary systems, stars, galaxies, interstellar gas, and the cosmos as a whole. In this Very Short Introduction, the leading astrophysicist James Binney shows how the field of astrophysics has expanded rapidly in the past century, with vast quantities of data gathered by telescopes exploiting all parts of the electromagnetic spectrum, combined with the rapid advance of computing power, which has allowed increasingly effective mathematical modelling. He illustrates how the application of fundamental principles of physics - the consideration of energy and mass, and momentum - and the two pillars of relativity and quantum mechanics, has provided insights into phenomena ranging from rapidly spinning millisecond pulsars to the collision of giant spiral galaxies. This is a clear, rigorous introduction to astrophysics for those keen to cut their teeth on a conceptual treatment involving some mathematics. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable

Essential Astrophysics Jan 27 2022 Essential Astrophysics is a book to learn or teach from, as well as a fundamental reference volume for anyone interested in astronomy and astrophysics. It presents astrophysics from basic principles without requiring any previous study of astronomy or astrophysics. It serves as a comprehensive introductory text, which takes the student through the field of astrophysics in lecture-sized chapters of basic physical principles applied to the cosmos. This one-semester overview will be enjoyed by undergraduate students with an interest in the physical sciences, such as astronomy, chemistry, engineering or physics, as well as by any curious student interested in learning about our celestial science. The mathematics required for understanding the text is on the level of simple algebra, for that is all that is needed to describe the fundamental principles. The text is of sufficient breadth and depth to prepare the interested student for more advanced specialised courses in the future. Astronomical examples are provided throughout the text, to reinforce the basic concepts and physics, and to demonstrate the use of the relevant formulae. In this way, the student learns to apply the fundamental equations and principles to cosmic objects and situations. Astronomical and physical constants and units as well as the most fundamental equations can be found in the appendix. Essential Astrophysics goes beyond the typical textbook by including references to the seminal papers in the field, with further reference to recent applications, results, or specialised literature.

The New Cosmos Apr 29 2022 This new edition of the classic textbook The New Cosmos presents a comprehensive introductory survey of the whole field of astronomy and astrophysics. Among the topics covered are: - Classical astronomy and the Solar System - Instruments and observational methods - The Sun and the stars - The Milky Way and other galaxies - Cosmology - The origin of the Solar System - The evolution of the Earth and of life The observational methods and results of astronomical research as well as their theoretical foundations and interrelations are presented in an understandable format. The rapid progress of observational techniques and of theoretical understanding in the past decade are introduced and summarized in this timely and readable volume. This revised and extended new printing demonstrates the rapid advances in astronomical research and observation in the three years since the appearance of the 5th edition. The most important new results can be found within, providing in particular up-to-date information on our solar system, neutrino radiation from the Sun, the farthest galaxies and quasars and the development of the Universe.

Cosmology and Astrophysics Through Problems Aug 02 2022 An innovative textbook that provides a unique approach to beginning research in cosmology and high energy astrophysics through a series of problems and answers.

Essential Astrophysics Feb 13 2021 Essential Astrophysics is a book to learn or teach from, as well as a fundamental reference volume for anyone interested in astronomy and astrophysics. It presents astrophysics from basic principles without requiring any previous study of astronomy or astrophysics. It serves as a comprehensive introductory text, which takes the student through the field of astrophysics in lecture-sized chapters of basic physical principles applied to the cosmos. This one-semester overview will be enjoyed by undergraduate students with an interest in the physical sciences, such as astronomy, chemistry, engineering or physics, as well as by any curious student interested in learning about our celestial science. The mathematics required for understanding the text is on the level of simple algebra, for that is all that is needed to describe the fundamental principles. The text is of sufficient breadth and depth to prepare the interested student for more advanced specialized courses in the future. Astronomical examples are provided throughout the text, to reinforce the basic concepts and physics, and to demonstrate the use of the relevant formulae. In this way, the student learns to apply the fundamental equations and principles to cosmic objects and situations. All of the examples are solved with the rough accuracy needed to portray the basic result. Astronomical and physical constants and units as well as the most fundamental equations can be found in the appendix. Essential Astrophysics goes beyond the typical textbook by including references to the seminal papers in the field, with further reference to recent applications, results, or specialized literature. There are fifty set-aside focus elements that enhance and augment the discussion with fascinating details. They include the intriguing historical development of particular topics and provide further astrophysics equations or equations for other topics. Kenneth Lang is a world-renowned author on astrophysics. His books for professional astrophysicists as well as for students and the interested layman are highly acclaimed.

Understanding the Universe Nov 12 2020 Intended for undergraduate non-science majors, satisfying a general education requirement or seeking an elective in natural science, this is a physics text, but with the emphasis on topics and applications in astronomy. The perspective is thus different from most undergraduate astronomy courses: rather than discussing what is known about the heavens, this text develops the principles of physics so as to illuminate what we see in the heavens. The fundamental principles governing the behaviour of matter and energy are thus used to study the solar system, the structure and evolution of stars, and the early universe. The first part of the book develops Newtonian mechanics towards an understanding of celestial mechanics, while chapters on electromagnetism and elementary quantum theory lay the foundation of the modern theory of the structure of matter and the role of radiation in the constitution of stars. Kinetic theory and nuclear physics provide the basis for a discussion of stellar structure and evolution, and an examination of red shifts and other observational data provide a basis for discussions of cosmology and cosmogony.

Introductory Astronomy and Astrophysics Sep 22 2021

Cosmology and Particle Astrophysics Aug 22 2021 Beginning with basic facts about the observable universe, this book reviews the complete range of topics that make up a degree course in cosmology and particle astrophysics. The book is self-contained - no specialised knowledge is required on the part of the reader, apart from undergraduate math and physics. This paperback edition targets students of physics, astrophysics and cosmology from advanced undergraduate to early graduate level.

Astronomy and Astrophysics Abstracts Oct 31 2019 From the reviews: Astronomy and Astrophysics Abstracts has appeared in semi-annual volumes since 1969 and it has already become one of the fundamental publications in the fields of astronomy, astrophysics and neighbouring sciences. It is the most important English-language abstracting journal in the mentioned branches. ... The abstracts are classified under more than hundred subject categories, thus permitting a quick survey of the whole extended material. The AAA is a valuable and important publication for all students and scientists working in the fields of astronomy and related sciences. As such it represents a necessary ingredient of any astronomical library all over the world." Space Science Reviews #1 "Dividing the whole field plus related subjects into 108 categories, each work is numbered and most are accompanied by brief abstracts. Fairly comprehensive cross-referencing links relevant papers to more than one category, and exhaustive author and subject indices are to be found at the back, making the catalogues easy to use. The series appears to be so complete in its coverage and always less than a year out of date that I shall certainly have to make a little more space on those shelves for future volumes." The Observatory Magazine #1

Fundamentals of Astrophysics Mar 17 2021 This concise textbook, designed specifically for a one-semester course in astrophysics, introduces astrophysical concepts to undergraduate science and engineering students with a background in college-level, calculus-based physics. The text is organized into five parts covering: stellar properties; stellar structure and evolution; the interstellar medium and star/planet formation; the Milky Way and other galaxies; and cosmology. Structured around short easily digestible chapters, instructors have flexibility to adjust their course's emphasis as it suits them. Exposition drawn from the author's decade of teaching his course guides students toward a basic but quantitative understanding, with 'quick questions' to spur practice in basic computations, together with more challenging multi-part exercises at the end of each chapter. Advanced concepts like the quantum nature of energy and radiation are developed as needed. The text's approach and level bridge the wide gap between introductory astronomy texts for non-science majors and advanced undergraduate texts for astrophysics majors.

Rocket Science for Babies Oct 12 2020 Fans of Chris Ferrie's ABCs of Biology, ABCs of Space, and Quantum Physics for Babies will love this introduction to aerospace engineering for babies and toddlers! Help your future genius become the smartest baby in the room! It only takes a small spark to ignite a child's mind. Written by an expert, Rocket Science for Babies is a colorfully simple introduction to aerospace engineering. Babies (and grownups!) will learn about the basics of how lift and thrust make things fly. With a tongue-in-cheek approach that adults will love, this installment of the Baby University board book series is the perfect way to introduce basic concepts to even the youngest scientists. After all, it's

never too early to become a rocket scientist! If you're looking for engineer board books, infant science books, or more Baby University board books to surprise your little one, look no further! Rocket Science for Babies offers fun early learning for your little scientist!

Tides in Astronomy and Astrophysics Dec 14 2020 Based on the lecture notes of a school titled 'Tides in Astronomy and Astrophysics' that brought together students and researchers, this book focuses on the fundamental theories of tides at different scales of the universe—from tiny satellites to whole galaxies—and on the most recent developments. It also attempts to place the study of tides in a historical perspective. Starting with a general tutorial on tides, the theme of tides is approached in 9 chapters from many directions. They allow non-experts to pick up a physical intuition and a sense of orders of magnitude in the theory of tides. These carefully prepared lecture notes by leaders in the field include many illustrative figures and drawings. Some even offer a variety of simple back-of-the-envelope problems.