

from the observed properties of white dwarfs to the latest results from precision cosmology; and additional instructive problem sets. Throughout, the text features the same focused, concise style and emphasis on physics intuition that have made the book a favorite of students and teachers. Written by Dan Maoz, a leading active researcher, and designed for advanced undergraduate science majors, *Astrophysics in a Nutshell* is a brief but thorough introduction to the observational data and theoretical concepts underlying modern astronomy. Generously illustrated, it covers the essentials of modern astrophysics, emphasizing the common physical principles that govern astronomical phenomena, and the interplay between theory and observation, while also introducing subjects at the forefront of modern research, including black holes, dark matter, dark energy, and gravitational lensing. In addition to serving as a course textbook, *Astrophysics in a Nutshell* is an ideal review for a qualifying exam and a handy reference for teachers and researchers. The most concise and current astrophysics textbook for science majors—now expanded and fully updated with the latest research results. Contains a broad and well-balanced selection of traditional and current topics. Uses simple, short, and clear derivations of physical results. Trains students in the essential skills of order-of-magnitude analysis. Features a new chapter on extrasolar planets, including discovery techniques. Includes new and expanded sections and problems on the physics of shocks, supernova remnants, cosmic-ray acceleration, white dwarf properties, baryon acoustic oscillations, and more. Contains instructive problem sets at the end of each chapter. Solutions manual (available only to professors).

This latest edition of the proven and comprehensive treatment on the topic -- from the bestselling author of "Tapestry of Modern Astrophysics" -- has been updated and revised to reflect the newest research results. Suitable for AS0000 and AS0200 courses, as well as advanced astrophysics and astronomy lectures, this is an indispensable theoretical backup for studies on celestial body formation and astrophysics. Includes exercises with solutions.

An Introduction to Modern Astrophysics is a comprehensive, well-organized and engaging text covering every major area of modern astrophysics, from the solar system and stellar astronomy to galactic and extragalactic astrophysics, and cosmology. Designed to provide students with a working knowledge of modern astrophysics, this textbook is suitable for astronomy and physics majors who have had a first-year introductory physics course with calculus. Featuring a brief summary of the main scientific discoveries that have led to our current understanding of the universe; worked examples to facilitate the understanding of the concepts presented in the book; end-of-chapter problems to practice the skills acquired; and computational exercises to numerically model astronomical systems, the second edition of *An Introduction to Modern Astrophysics* is the go-to textbook for learning the core astrophysics curriculum as well as the many advances in the field.

The purpose of this textbook is to provide a basic knowledge of the main parts of modern astrophysics for all those starting their studies in this field at the undergraduate level. The reader is supposed to have only a high school training in physics and mathematics. In many respects this *Introduction to Advanced Astrophysics* could represent a volume of the Berkeley Physics Course. Thus, the primary audience for this work is composed of students in astronomy, physics, mathematics, physical chemistry and engineering. It also includes high school teachers of physics and mathematics. Many amateur astronomers will find it quite accessible. In the frame of approximations proper to an introductory textbook, the treatment is quite rigorous. Therefore, it is also expected to provide a firm background for a study of advanced astrophysics on a postgraduate level. A rather severe selection is made here among various aspects of the Universe accessible to modern astronomy. This allows us to go beyond simple information on astronomical phenomena - to be found in popular books - and to insist upon explanations based on modern general physical theories. More precisely, our selection of topics is determined by the following considerations: The study of the solar system (the Moon

and the planets) has recently progressed at a tremendous rate. However, the very rich harvest of observations provided by space research is mainly purely descriptive and is perfectly presented in review papers of Scientific American, Science, Physics Today and similar magazines.

An update of this bestselling textbook presenting a clear, concise and up-to-date introduction to cosmology for physicists or anyone with an interest in cosmology.

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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.

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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.

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.

A comprehensive and engaging textbook, covering the entire astrophysics curriculum in

physics majors, it offers thorough coverage of galactic structure and evolution, active galaxies, cosmology, and the
Never HIGHLIGHT a Book Again! Virtually all of the testable terms, concepts, persons, places, and events from the textbook are included. Cram101 Just the FACTS101 studyguides give all of the outlines, highlights, notes, and quizzes for your textbook with optional online comprehensive practice tests. Only Cram101 is Textbook Specific. Accompanys: 9780805304022 .

Table of contents

This second edition has been updated and substantially expanded. Starting with the description of our home galaxy, the Milky Way, this cogently written textbook introduces the reader to the astronomy of galaxies, their structure, active galactic nuclei, evolution and large scale distribution in the Universe. After an extensive and thorough introduction to modern observational and theoretical cosmology, the focus turns to the formation of structures and astronomical objects in the early Universe. The basics of classical astronomy and stellar astrophysics needed for extragalactic astronomy are provided in the appendix. While this book has grown out of introductory university courses on astronomy and astrophysics and includes a set of problems and solutions, it will not only benefit undergraduate students and lecturers; thanks to the comprehensive coverage of the field, even graduate students and researchers specializing in related fields will appreciate it as a valuable reference work.

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"This textbook develops astrophysics from the basics without requiring any previous study in astronomy or astrophysics. Physical concepts, mathematical derivations and observational data are combined in a balanced way to provide a unified treatment"--Provided by publisher.

An Introduction to Modern Astrophysics Cambridge University Press

An introduction to modern astrophysics, which aims to communicate the fact that even the most advanced scientific ideas can be discussed intelligently at their most basic level using mathematics no more complicated than undergraduate-level algebra and geometry.

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This book introduces ten equations that transcend the boundaries of time and space. It takes readers through a journey of self-discovery where they will learn the history, science, and significance of these equations in the context of their lives. Moreover, the mathematical beauty of these equations is presented in a profoundly modest fashion to highlight the idea that equations are eternal but humans are transient. Each chapter offers readers a sublime experience and provides insights into the laws of nature that address the ever-expanding intricacy of our universe. The history of humankind, according to Franz Kafka, is the instant

between two strides taken by a traveler. Therefore, what remains eternal when we finish our journey on this tiny rocky planet is our deep desire to connect with everything else in this universe. These equations capture the essence of that aspiration and remain everlasting while we continue our trivial human pursuits. These equations change the way we live and view the world and will outlast even the most enduring signs of our civilization. They have the potential to take us from planet to planet and perhaps to make us a cosmic species. They can destroy the last strand of DNA to terminate life as we know it and generate life again from the fundamental laws of nature. While these equations remain intangible, they can create a tangible world yet remain truly eternal.

Designed to provide students with a working knowledge of modern astrophysics, this textbook is suitable for astronomy and physics majors who have had a first-year introductory physics course with calculus. Featuring a brief summary of the main scientific discoveries that have led to our current understanding of the universe; worked examples to facilitate the understanding of the concepts presented in the book; end-of-chapter problems to practice the skills acquired; and computational exercises to numerically model astronomical systems, the book of Introduction to Modern Astrophysics is the go-to textbook for learning the core astrophysics curriculum as well as the many advances in the field.

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. Designed for sophomore-level astrophysics for astronomy and physics majors, An Introduction to Modern Astrophysics is now offered in two derivative versions: Introduction to Modern Stellar Astrophysics,

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