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An Introduction to Modern Astrophysics Cambridge University Press

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

An Introduction to Modern Stellar Astrophysics Benjamin-Cummings Publishing Company

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.

An Introduction to Modern Galactic Astrophysics and Cosmology Benjamin-Cummings Publishing Company

This introductory textbook for undergraduate courses in galactic astrophysics and cosmology was developed as a more compact and focused alternative to its parent volume, An Introduction to Modern Astrophysics. Aimed at astronomy and physics majors, it offers thorough coverage of

galactic structure and evolution, active galaxies, cosmology, and the

Foundations of Astrophysics Cambridge University Press

A contemporary and complete introduction to astrophysics for astronomy and physics majors taking a two-semester survey course.

An Introduction to Modern Astrophysics

"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 moden astrophysics.

An Introduction to Stellar Astrophysics John Wiley & Sons

An Introduction to Stellar Astrophysics aspires to provide the reader with an intermediate knowledge on stars whilst focusing mostly on the explanation of the functioning of stars by using basic physical concepts and observational results. The book is divided into seven chapters, featuring both core and optional content: Basic concepts Stellar Formation Radiative Transfer in Stars Stellar Atmospheres Stellar Interiors Nucleosynthesis and Stellar Evolution and Chemically Peculiar Stars and Diffusion. Student-friendly features include: Detailed examples to help the reader better grasp the most important concepts A list of exercises is given at the end of each chapter and answers to a selection of these are presented. Brief recalls of the most important physical concepts needed to properly understand stars. A summary for each chapter Optional and advanced sections are included which may be skipped without interfering with the flow of the core content. This book is designed to cover the most important aspects of stellar astrophysics inside a one semester (or half-year) course and as such is relevant for advanced undergraduate students following a first course on stellar astrophysics, in physics or astronomy programs. It will also serve as a basic reference for a full-year course as well as for researchers working in related fields.

An Introduction to Modern Cosmology John Wiley & Sons

An Introduction to Modern Cosmology Third Edition is an accessible account of modern cosmological ideas. The Big Bang Cosmology is explored, looking at its observational successes in explaining the expansion of the Universe, the existence and properties of the cosmic microwave background, and the origin of light elements in the universe. Properties of the very early Universe are also covered, including the motivation for a rapid period of expansion known as cosmological inflation. The third edition brings this established undergraduate textbook up-to-date with the rapidly evolving observational situation. This fully revised edition of a bestseller takes an approach which is grounded in physics with a logical flow of chapters leading the reader from basic ideas of the expansion described by the Friedman equations to some of the more advanced ideas about the early universe. It also incorporates up-to-date results from the Planck mission, which imaged the anisotropies of the Cosmic Microwave Background radiation over the whole sky. The Advanced Topic sections present subjects with more detailed mathematical approaches to give greater depth to discussions. Student problems with hints for solving them and numerical answers are embedded in the chapters to facilitate the reader’s understanding and learning. Cosmology is now part of the core in many degree programs. This current, clear and concise introductory text is relevant to a wide range of astronomy programs worldwide and is essential reading for undergraduates and Masters students, as well as anyone starting research in cosmology. The accompanying website for this text, http://booksupport.wiley.com, provides additional material designed to enhance your learning, as well as errata within the text.

Introduction to Cosmology Cambridge University Press

A substantial update of this award-winning and highly regarded cosmology textbook, for advanced undergraduates in physics and astronomy.

Astrophysics for Physicists Cambridge University Press

Designed for teaching astrophysics to physics students at advanced undergraduate or beginning graduate level, this textbook also provides an overview of astrophysics for astrophysics graduate students, before they delve into more specialized volumes. Assuming background knowledge at the level of a physics major, the 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. Topics such as general relativity and plasma physics, which are not usually covered in physics courses but used extensively in astrophysics, are developed from first principles. While the emphasis is on developing the fundamentals thoroughly, recent important discoveries are highlighted at every stage.

AN INTRODUCTION TO ASTROPHYSICS *PHI Learning Pvt. Ltd.*

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.

Fundamentals of Astrophysics *Cambridge University Press*

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.

Astrophysics in a Nutshell

Second Edition *Princeton University Press*

The ideal one-semester astrophysics introduction for science undergraduates—now expanded and fully updated Winner of the American Astronomical Society's Chambliss Award, Astrophysics in a Nutshell has become the text of choice in astrophysics courses for science majors at top universities in North America and beyond. In this expanded and fully updated second edition, the book gets even better, with a new chapter on extrasolar planets; a greatly expanded chapter on the interstellar medium; fully updated facts and figures on all subjects, 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)

Outlines and Highlights for Introduction to Modern Astrophysics by Bradley W Carroll, Isbn

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The Fundamentals of Modern Astrophysics

A Survey of the Cosmos from the Home Planet to Space Frontiers *Springer*

The Fundamentals of Modern Astrophysics provides an overview of the modern science of astrophysics. It covers the Sun, Solar System bodies, exoplanets, stars, and star life cycle, planetary systems origin and evolution, basics of astrobiology, our galaxy the Milky Way, other galaxies and galactic clusters, a general view of the Universe, its structure, evolution and fate, modern views and advanced models of cosmology as well as the synergy of micro- and macro physics, standard model, superstring theory, multiversity and worm holes. The main concepts of modern astrophysics and prospects for future studies are accompanied by numerous illustrations and a summary of the advanced projects at various astronomical facilities and space missions. Dr. Marov guides readers through a maze of complicated topics to demystify the field and open its wonders to all.

Introduction to Stellar Astrophysics: Volume 3 *Cambridge University Press*

This book is the final one in a series of three texts which together provide a modern, complete and authoritative account of our present knowledge of the stars. It discusses the internal structure and the evolution of stars, and is completely self-contained. There is an emphasis on the basic physics governing stellar structure and the basic ideas on which our understanding of stellar structure is based. The book also provides a comprehensive discussion of stellar evolution. Careful comparison is made between theory and observation, and the author has thus provided a lucid and balanced introductory text for the student. As for volumes 1 and 2, volume 3 is self-contained and can be used as an independent textbook. The author has not only taught but has also published many original papers in this subject. Her clear and readable style should make this text a first choice for undergraduate and beginning graduate students taking courses in astronomy and particularly in stellar astrophysics.

An Introduction to Modern Astrophysics *Createspace Independent Publishing Platform*

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 Tapestry of Modern Astrophysics

Table of contents

The Physical Universe

An Introduction to Astronomy *University Science Books*

This is a truly astonishing book, invaluable for anyone with an interest in astronomy and surely the bargain of the year.---Physics BulletinJust the thing for a first year university science course.---NatureThis is a beautiful book in both concept and execution.---Sky & Telescope

Introduction to Modern Astrophysics, Pearson New International Edition EBook

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,

Introduction to Astrophysics

The Stars *Courier Corporation*

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.

An Introduction to Astronomy and Astrophysics *CRC Press*

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 interpr

An Introduction to the Science of Cosmology *CRC Press*

A thorough introduction to modern ideas on cosmology and on the physical basis of the general theory of relativity, An Introduction to the Science of Cosmology explores various theories and ideas in big bang cosmology, providing insight into current problems. Assuming no previous knowledge of astronomy or cosmology, this book takes you beyond introductory texts to the point where you are able to read and appreciate the scientific literature, which is broadly referenced in the book. The authors present the standard big bang theory of the universe and provide an introduction to current inflationary cosmology, emphasizing the underlying physics without excessive technical detail. The book treats cosmological models without reliance on prior knowledge of general relativity, the necessary physics being introduced in the text as required. It also covers recent observational evidence pointing to an accelerating expansion of the universe. The first several chapters provide an introduction to the topics discussed later in the book. The next few chapters introduce relativistic cosmology and the classic observational tests. One chapter gives the main results of the hot big bang theory. Next, the book presents the inflationary model and discusses the problem of the origin of structure and the correspondingly more detailed tests of relativistic models. Finally, the book considers some general issues raised by expansion and isotropy. A reference section completes the work by listing essential formulae, symbols, and physical constants. Beyond the level of many elementary books on cosmology, An Introduction to

the Science of Cosmology encompasses numerous recent developments and ideas in the area. It provides more detailed coverage than many other titles available, and the inclusion of problems at the end of each chapter aids in self study and makes the book suitable for taught courses.

Extragalactic Astronomy and Cosmology

An Introduction Springer

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.

A Modern Introduction to Neutrino Physics Morgan & Claypool Publishers

A deeper understanding of neutrinos, with the goal to reveal their nature and exact role within particle physics, is at the frontier of current research. This book reviews the field in a concise fashion and highlights the most pressing issues and areas of strongest topical interest. It provides a clear, self-contained, and logical treatment of the fundamental physics aspects, appropriate for graduate students. Starting with the relevant basics of the SM, neutrinos are introduced, and the quantum mechanical effect of oscillations is explained in detail. A strong focus is then set on the phenomenon of lepton number violation, especially in Onbb decay, as the crucial probe to understand the nature of neutrinos. The role of neutrinos in astrophysics, expected to be of increasing importance for future research, is then described. Finally, models to explain the neutrino properties are outlined. The central theme of the book is the nature of neutrino masses and the above topics will revolve around this issue.

Theoretical Astrophysics

An Introduction John Wiley & Sons

Beginning from first principles and adopting a modular structure, this book develops the fundamental physical methods needed to describe and understand a wide range of seemingly very diverse astrophysical phenomena and processes. For example, the discussion of radiation processes including their spectra is based on Larmor's equation and extended by the photon picture and the internal dynamics of radiating quantum systems, leading to the shapes of spectral lines and the ideas of radiation transport. Hydrodynamics begins with the concept of phase-space distribution functions and Boltzmann's equation and develops ideal, viscous and magneto-hydrodynamics all from the vanishing divergence of an energy-momentum tensor, opening a natural extension towards relativistic hydrodynamics. Linear stability analysis is introduced and used as a common and versatile tool throughout the book. Aimed at students at graduate level, lecturers teaching courses in theoretical astrophysics or advanced topics in modern astronomy, this book with its abundant examples and exercises also serves as a reference and an entry point for more advanced researchers wanting to update their knowledge of the physical processes that govern the behavior and evolution of astronomical objects.

An Introduction to Gauge Theories and Modern Particle Physics Cambridge University Press

A comprehensive treatment of modern theoretical and experimental particle physics, in two volumes.

Introduction to Modern Astrophysics

Observational Astrophysics Cambridge University Press

Combining a critical account of observational methods (telescopes and instrumentation) with a lucid description of the Universe, including stars, galaxies and cosmology, Smith provides a comprehensive introduction to the whole of modern astrophysics beyond the solar system. The first half describes the techniques used by astronomers to observe the Universe: optical telescopes and instruments are discussed in detail, but observations at all wavelengths are covered, from radio to gamma-rays. After a short interlude describing the appearance of the sky at all wavelengths, the role of positional astronomy is highlighted. In the second half, a clear description is given of the contents of the Universe, including accounts of stellar evolution and cosmological models. Fully illustrated throughout, with exercises given in each chapter, this textbook provides a thorough introduction to astrophysics for all physics undergraduates, and a valuable background for physics graduates turning to research in astronomy.

Introduction to Classical Mechanics

With Problems and Solutions Cambridge University Press

This textbook covers all the standard introductory topics in classical mechanics, including Newton's laws, oscillations, energy, momentum, angular momentum, planetary motion, and special relativity. It also explores more advanced topics, such as normal modes, the Lagrangian method, gyroscopic motion, fictitious forces, 4-vectors, and general relativity. It contains more than 250 problems with detailed solutions so students can easily check their understanding of the topic. There are also over 350 unworked exercises which are ideal for homework assignments. Password protected solutions are available to instructors at www.cambridge.org/9780521876223. The vast number of problems alone makes it an ideal

supplementary text for all levels of undergraduate physics courses in classical mechanics. Remarks are scattered throughout the text, discussing issues that are often glossed over in other textbooks, and it is thoroughly illustrated with more than 600 figures to help demonstrate key concepts.

An Introduction to Star Formation Cambridge University Press

Guiding the reader through all the stages that lead to the formation of a star such as our Sun, this advanced textbook provides students with a complete overview of star formation. It examines the underlying physical processes that govern the evolution from a molecular cloud core to a main-sequence star, and focuses on the formation of solar-mass stars. Each chapter combines theory and observation, helping readers to connect with and understand the theory behind star formation. Beginning with an explanation of the interstellar medium and molecular clouds as sites of star formation, subsequent chapters address the building of typical stars and the formation of high-mass stars, concluding with a discussion of the by-products and consequences of star formation. This is a unique, self-contained text with sufficient background information for self-study, and is ideal for students and professional researchers alike.

Textbook of Astronomy and Astrophysics with Elements of Cosmology CRC Press

Designed for students who have a basic understanding of physics and mathematics, this text provides a fundamental, three-in-one introduction to astronomy, astrophysics, and cosmology. The astronomy section explores fundamental topics such as the celestial coordinate system, stellar classification schemes, H-R diagrams, and the masses and radii of stars. The astrophysics section addresses stellar structure, stellar atmospheres, energy generation in stars, and nucleosynthesis. Also covering galactic structure and rotation, the cosmology section introduces the Robertson-Walker metric and Friedman models of the universe and discusses the present status of the Hubble constant along with problems associated with the age of the universe. Numerous problems, diagrams, and up-to-date references make this an ideal introductory text for graduate courses in physics, mathematics, space physics, or any program for which astronomy is an option.

A Student's Guide to the Mathematics of Astronomy Cambridge University Press

Plain-language explanations and a rich set of supporting material help students understand the mathematical concepts and techniques of astronomy.

Astronomy: A Physical Perspective Cambridge University Press

This fully revised and updated text is a comprehensive introduction to astronomical objects and phenomena. By applying some basic physical principles to a variety of situations, students will learn how to relate everyday physics to the astronomical world. Starting with the simplest objects, the text contains explanations of how and why astronomical phenomena occur, and how astronomers collect and interpret information about stars, galaxies and the solar system. The text looks at the properties of stars, star formation and evolution; neutron stars and black holes; the nature of galaxies; and the structure of the universe. It examines the past, present and future states of the universe; and final chapters use the concepts that have been developed to study the solar system, its formation; the possibility of finding other planetary systems; and the search for extraterrestrial life. This comprehensive text contains useful equations, chapter summaries, worked examples and end-of-chapter problem sets.

Introduction to Modern Astrophysics Createspace Independent Publishing Platform

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.

Formation of Planetary Systems

An Introduction to the Sun and Stars Cambridge University Press

An elementary university text about stars for introductory courses in astronomy and astrophysics.

Introduction to Astronomy and Astrophysics Springer

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.

Understanding Our Universe *W. W. Norton*

Research shows that active learning supports deeper, long-term understanding. The Third Edition text and media package gives students more opportunities to interact with astronomy--both in real life and online. The new edition provides all the resources you need to make it easy to

incorporate active learning into the classroom.

Cosmology *Oxford University Press*

This is a uniquely comprehensive and detailed treatment of the theoretical and observational foundations of modern cosmology, by a Nobel Laureate in Physics. It gives up-to-date and self contained accounts of the theories and observations that have made the past few decades a golden age of cosmology.

Introductory Astronomy and Astrophysics *Saunders College Publishing*