An Introduction to Stellar Astrophysics - Francis LeBlanc 2011-08-24

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.

Introduction to Stellar Astrophysics: Volume 3 - Erika Böhm-Vitense 1992-01-16

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. 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.

Introduction to Stellar Dynamics - Luca Ciotti 2021-06-10

The study of stellar dynamics is experiencing an exciting new wave of interest thanks to observational campaigns and the ready availability of powerful computers. Whilst its relevance includes many areas of astrophysics, from the structure of the Milky Way to dark matter haloes, few texts are suited to advanced students. This volume provides a broad overview of the key concepts beyond the elementary level, bridging the gap between the standard texts and specialist literature. The author reviews Newtonian gravity in depth before examining the dynamical properties of collisional and collisionless stellar-dynamical systems that result from gravitational interactions. Guided examples and exercises ensure a thorough grounding in the mathematics,
while discussions of important practical applications give a complete picture of the subject. Readers are given a sound working knowledge of the fundamental ideas and techniques employed in the field and the conceptual background needed to progress to more advanced graduate-level treatises.

**An Introduction to the Theory of Stellar Structure and Evolution**

Dina Prialnik 2009-10-29 Using fundamental physics, the theory of stellar structure and evolution can predict how stars are born, how their complex internal structure changes, what nuclear fuel they burn, and their ultimate fate. This textbook is a stimulating introduction for undergraduates in astronomy, physics and applied mathematics, taking a course on the physics of stars. It uniquely emphasises the basic physical principles governing stellar structure and evolution. This second edition contains two new chapters on mass loss from stars and interacting binary stars, and new exercises. Clear and methodical, it explains the processes in simple terms, while maintaining mathematical rigour. Starting from general principles, this textbook leads students step-by-step to a global, comprehensive understanding of the subject. Fifty exercises and full solutions allow students to test their understanding. No prior knowledge of astronomy is required, and only a basic background in physics and mathematics is necessary.

**Stellar Evolution, Nuclear Astrophysics, and Nucleogenesis**

A. G. W. Cameron 2013-02-20 Along with classic papers by Fowler, Hoyle, and the Burbidges, this work stands as a key foundation in the development of nuclear astrophysics. Long out of print and very hard to find, this remarkable work has been edited and re-typeset by an atomic expert. Now available in an affordable paperback edition for the very first time, it addresses interrelated questions — What are stars? How does the sun shine? Why is gold so rare, and Where did the elements come from? — that have puzzled observers from time immemorial. Edited and re-typeset reprint of the original Atomic Energy of Canada, Ltd., 1957 edition.

**Introduction to Stellar Astrophysics: Volume 1, Basic Stellar Observations and Data**

Erika Böhm-Vitense 1989-08-25 This textbook introduction to the basic elements of fundamental astronomy and astrophysics serves as a foundation for understanding the structure, evolution, and observed properties of stars. The first half of the book explains how stellar motions, distances, luminosities, colors, radii, masses and temperatures are measured or derived. The author then shows how data of these sorts can be arranged to classify stars through their spectra. Stellar rotation and stellar magnetic fields are introduced. Stars with peculiar spectra and pulsating stars also merit special attention. The endpoints of stellar evolutions are briefly described. There is a separate chapter on the Sun and a final one on interstellar absorption. The usefulness of this text is enhanced by the inclusion of problems for students, tables of astronomical constants, and a selective bibliography. This is an excellent textbook for undergraduate and beginning graduate students studying astronomy and astrophysics.
**Starlight**-Keith Robinson 2009-10-03 This is a book about the physics of stars and starlight. The story of starlight is truly fascinating. Astronomers analyze and interpret the light from stars using photometry and spectroscopy, then inspirational detective work combines with the laws of physics to reveal the temperatures, masses, luminosities and outer structure of these far away points of light. The laws of physics themselves enable us to journey to the very center of a star and to understand its inner structure and source of energy! Starlight provides an in-depth study of stellar astrophysics that requires only basic high school mathematics and physics, making it accessible to all amateur astronomers. Starlight teaches amateur astronomers about the physics of stars and starlight in a friendly, easy-to-read way. The reader will take away a profoundly deeper understanding of this truly fascinating subject - and find his practical observations more rewarding and fulfilling as a result.

**An Introduction to Modern Stellar Astrophysics**-Dale A. Ostlie 2007
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.

**Theory of Stellar Atmospheres**-Ivan Hubeny 2014-10-26
This book provides an in-depth and self-contained treatment of the latest advances achieved in quantitative spectroscopic analyses of the observable outer layers of stars and similar objects. Written by two leading researchers in the field, it presents a comprehensive account of both the physical foundations and numerical methods of such analyses. The book is ideal for astronomers who want to acquire deeper insight into the physical foundations of the theory of stellar atmospheres, or who want to learn about modern computational techniques for treating radiative transfer in non-equilibrium situations. It can also serve as a rigorous yet accessible introduction to the discipline for graduate students. Provides a comprehensive, up-to-date account of the field Covers computational methods as well as the underlying physics Serves as an ideal reference book for researchers and a rigorous yet accessible textbook for graduate students An online illustration package is 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.

**An Introduction to Modern Stellar Astrophysics**-Dale A. Ostlie 2007
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.

**Principles of Stellar Evolution and Nucleosynthesis**-Donald D. Clayton
1983 Donald D. Clayton's Principles of Stellar Evolution and Nucleosynthesis remains the standard work on the subject, a popular textbook for students in astronomy and astrophysics and a rich sourcebook for researchers. The basic principles of physics as they apply to the origin and evolution of stars and physical processes of the stellar interior are thoroughly and systematically set out. Clayton's new preface, which includes commentary and selected references to the recent literature, reviews the most important research carried out since the book's original publication in 1968.

**An Introduction to Close Binary Stars**-R. W. Hilditch 2001-03-12
This 2001 book was the first to provide a pedagogical and comprehensive introduction to binary stars for advanced students.

**An Introduction to Close Binary Stars**-R. W. Hilditch 2001-03-12
This 2001 book was the first to provide a pedagogical and comprehensive introduction to binary stars for advanced students.
Stellar Interiors-Carl J. Hansen 2012-12-06 That trees should have been cut down to provide paper for this book was an ecological affront. From a book review. - Anthony Blond (in the Spectator, 1983) The first modern text on our subject, Structure and Evolution of the Stars, was published over thirty years ago. In it, Martin Schwarzschild described numerical experiments that successfully reproduced most of the observed properties of the majority of stars seen in the sky. He also set the standard for a lucid description of the physics of stellar interiors. Ten years later, in 1968, John P. Cox's two-volume monograph Principles of Stellar Structure appeared, as did the more specialized text Principles of Stellar Evolution and Nucleosynthesis by Donald D. Clayton—and what a difference ten years had made. The field had matured into the basic form that it remains today. The past twenty-plus years have seen this branch of astrophysics flourish and develop into a fundamental pillar of modern astrophysics that addresses an enormous variety of phenomena. In view of this it might seem foolish to offer another text of finite length and expect it to cover any more than a fraction of what should be discussed to make it a thorough and self-contained reference. Well, it doesn't. Our specific aim is to introduce only the fundamentals of stellar astrophysics. You will find little reference here to black holes, millisecond pulsars, and other "sexy" objects.

Introduction to Astrophysics-Jean Dufay 2012-10-17 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 ASTROPHYSICS-BAIDYANATH BASU 2010-01-01 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.

Essential Astrophysics-Shantanu Basu 2021-09-27 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
Stellar Astrophysics - Roger John Tayler 1992

Stellar Astrophysics contains a selection of high-quality papers that illustrate the progress made in research into the structure and evolution of stars. Senior undergraduates, graduates, and researchers can now be brought thoroughly up to date in this exciting and ever-developing branch of astronomy.

Introduction to Stellar Astrophysics: Volume 1, Basic Stellar Observations and Data - Erika Böhm-Vitense 1989-08-25

This textbook introduction to the basic elements of fundamental astronomy and astrophysics serves as a foundation for understanding the structure, evolution, and observed properties of stars. The first half of the book explains how stellar motions, distances, luminosities, colors, radii, masses and temperatures are measured or derived. The author then shows how data of these sorts can be arranged to classify stars through their spectra. Stellar rotation and stellar magnetic fields are introduced. Stars with peculiar spectra and pulsating stars also merit special attention. The endpoints of stellar evolutions are briefly described. There is a separate chapter on the Sun and a final one on interstellar absorption. The usefulness of this text is enhanced by the inclusion of problems for students, tables of astronomical constants, and a selective bibliography. This is an excellent textbook for undergraduate and beginning graduate students studying astronomy and astrophysics.

Introduction to Stellar Astrophysics: Introduction to stellar astrophysics - E. Böhnm-Vitense 1989

The Virial Theorem in Stellar Astrophysics - George William Collins 1978

Introduction to Stellar Structure - Walter J. Maciel 2015-09-16

This book provides a comprehensive overview of stellar structure, evolution and basic stellar properties. It includes integrated problems within the chapters, with worked solutions. In the first part of this book, the author presents the basic properties of the stellar interior and describes them thoroughly, along with deriving the main stellar structure equations of temperature, density, pressure and luminosity, among others. The process and application of solving these equations is explained, as well as linking these results with actual observations. The second part of the text describes what happens to a star over time and how to determine this by solving the same equations at different points during a star’s lifetime. The fate of various stars is quite different depending on their masses and this is described in the final parts of the book. This text can be used for an upper level undergraduate course or an introductory graduate course on stellar physics.

The Fundamentals of Stellar Astrophysics - George William Collins 1989

This textbook designed for advanced undergraduate students covers the foundations and principles in the field, and gives the necessary background for advanced courses. Beginning with a survey of some of the fundamentals of statistical mechanics, Collins builds up the physics of stellar structure step by step, showing where complexities arise due to the failure of assumptions. Annotation copyrighted by Book News, Inc., Portland, OR

Introduction to Stellar Astrophysics - 1992

Introduction to Stellar Astrophysics: Stellar atmospheres - E. Böhmn-Vitense 1989

Downloaded from www.wpmseattle.com on November 23, 2021 by guest
Stellar Evolution and Nucleosynthesis - Sean G. Ryan 2010-01-07 An ideal bridging text for astrophysics and physics majors looking to move on from the introductory texts.

Stellar Rotation - Jean-Louis Tassoul 2000-04-13 Like the Earth and planets, stars rotate. Understanding how stars rotate is central to modelling their structure, formation and evolution, and how they interact with their environment and companion stars. This authoritative volume, first published in 2000, provides a lucid introduction to stellar rotation and the definitive reference to the subject. It combines theory and observation in a comprehensive survey of how the rotation of stars affects the structure and evolution of the Sun, single stars and close binaries. This book will be of primary interest to graduate students and researchers studying solar and stellar rotation and close binary systems. It will also appeal to those with a more general interest in solar and stellar physics, star formation, binary stars and the hydrodynamics of rotating fluids - including geophysicists, planetary scientists and plasma physicists.

Introduction to Stellar Astrophysics: Volume 2 - Erika Böhm-Vitense 1989-10-26 This work conveys the basic physical ideas and laws used in the study of the outer layers of a star. It introduces stellar magnitudes, spectra and temperatures and includes a discussion of radiative transfer in a stellar atmosphere. The accessible structural components are also described.

Introduction to the Interstellar Medium - Jonathan P. Williams 2021-01-31 A comprehensive yet accessible textbook introducing the nature of the rarefied matter that pervades the space between stars.

Evolution of Stars and Stellar Populations - Maurizio Salaris 2005-12-13 Evolution of Stars and Stellar Populations is a comprehensive presentation of the theory of stellar evolution and its application to the study of stellar populations in galaxies. Taking a unique approach to the subject, this self-contained text introduces first the theory of stellar evolution in a clear and accessible manner, with particular emphasis placed on explaining the evolution with time of observable stellar properties, such as luminosities and surface chemical abundances. This is followed by a detailed presentation and discussion of a broad range of related techniques, that are widely applied by researchers in the field to investigate the formation and evolution of galaxies. This book will be invaluable for undergraduates and graduate students in astronomy and astrophysics, and will also be of interest to researchers working in the field of Galactic, extragalactic astronomy and cosmology. comprehensive presentation of stellar evolution theory introduces the concept of stellar population and describes "stellar population synthesis" methods to study ages and star formation histories of star clusters and galaxies presents stellar evolution as a tool for investigating the evolution of galaxies and of the universe in general.

Astrophysics for Physicists - Arnab Rai Choudhuri 2010-03-11 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.

Stars and Their Spectra - James B. Kaler 1997-03-27 This unique and informative text describes how stars are classified according to their spectral qualities and temperature. James Kaler explains the alphabet of stellar astronomy, running from cool M stars to hot O stars, and tells the story of their evolution. Before embarking on a voyage of cosmic discovery, the author discusses the fundamental properties of stars, their atomic
structure and the formation of spectra. Then, Kaler considers each star type individually and explores its spectra in detail. A review of unusual, hard-to-classify stars, and a discussion of data related to the birth, life and death of stars round out the text. This book is an important resource for all amateur astronomers and students of astronomy. Professionals will find it a refreshing read as well.

**Theoretical Astrophysics: Volume 3, Galaxies and Cosmology** - T. Padmanabhan 2000
This timely volume provides comprehensive coverage of all aspects of cosmology and extragalactic astronomy at an advanced level. Beginning with an overview of the key observational results and necessary terminology, it covers important topics: the theory of galactic structure and galactic dynamics, structure formation, cosmic microwave background radiation, formation of luminous galaxies in the universe, intergalactic medium and active galactic nuclei. This self-contained text has a modular structure, and contains over one hundred worked exercises. It can be used alone, or in conjunction with the previous two accompanying volumes (Volume I: Astrophysical Processes, and Volume II: Stars and Stellar Systems).

**Stellar Structure and Evolution** - Rudolf Kippenhahn 2012-12-06
A complete and comprehensive treatment of the physics of the stellar interior and the underlying fundamental processes and parameters. The text presents an overview of the models developed to explain the stability, dynamics and evolution of the stars, and great care is taken to detail the various stages in a star's life. The authors have succeeded in producing a unique text based on their own pioneering work in stellar modeling. Since its publication, this textbook has come to be considered a classic by both readers and teachers in astrophysics. This study edition is intended for students in astronomy and physics alike.

**Stars and Stellar Processes** - Mike Guidry 2019-02-07
Presents the physics of stars in relation to modern topics such as neutrino oscillations, supernovae, black holes, and gravitational waves.

**An Introduction to Nuclear Astrophysics** - J. Audouze 2012-12-06
TO NUCLEAR ASTROPHYSICS The Formation and the Evolution of Matter in the Universe

**Principles of Astrophysics** - Charles Keeton 2014-05-10
This book gives a survey of astrophysics at the advanced undergraduate level, providing a physics-centred analysis of a broad range of astronomical systems. It originates from a two-semester course sequence at Rutgers University that is meant to appeal not only to astrophysics students but also more broadly to physics and engineering students. The organisation is driven more by physics than by astronomy; in other words, topics are first developed in physics and then applied to astronomical systems that can be investigated, rather than the other way around. The first half of the book focuses on...
gravity. The theme in this part of the book, as well as throughout astrophysics, is using motion to investigate mass. The goal of Chapters 2-11 is to develop a progressively richer understanding of gravity as it applies to objects ranging from planets and moons to galaxies and the universe as a whole. The second half uses other aspects of physics to address one of the big questions. While "Why are we here?" lies beyond the realm of physics, a closely related question is within our reach: "How did we get here?" The goal of Chapters 12-20 is to understand the physics behind the remarkable story of how the Universe, Earth and life were formed. This book assumes familiarity with vector calculus and introductory physics (mechanics, electromagnetism, gas physics and atomic physics); however, all of the physics topics are reviewed as they come up (and vital aspects of vector calculus are reviewed in the Appendix).

An Introduction to Optical Stellar Interferometry-A. Labeyrie

2006-06-29 During the last two decades, optical stellar interferometry has become an important tool in astronomical investigations requiring spatial resolution well beyond that of traditional telescopes. This book, first published in 2006, was the first to be written on the subject. The authors provide an extended introduction discussing basic physical and atmospheric optics, which establishes the framework necessary to present the ideas and practice of interferometry as applied to the astronomical scene. They follow with an overview of historical, operational and planned interferometric observatories, and a selection of important astrophysical discoveries made with them. Finally, they present some as-yet untested ideas for instruments both on the ground and in space which may allow us to image details of planetary systems beyond our own.