[Books] Introduction To Modern Stellar Astrophysics

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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.

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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.

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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, 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.

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An Introduction to Modern Astrophysics - Bradley W. Carroll - 2017-09-07
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.

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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.

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.

An Introduction to the Study of Stellar Structure - Subrahmanyan Chandrasekhar - 1958
Rigorous examination of relationship between loss of energy, mass, and
and temperatures are measured or derived. The author then shows how original (1939) edition. "The material is throughout presented with enviable crispness and clarity of expression. The work will undoubtedly become an indispensable handbook for future researchers in the field." — Nature.

**An Introduction to the Study of Stellar Structure** - Subrahmanyan Chandrasekhar - 1958
Rigorous examination of relationship between loss of energy, mass, and radius of stars in a steady state. Unabridged, corrected republication of original (1939) edition. "The material is throughout presented with enviable crispness and clarity of expression. The work will undoubtedly become an indispensable handbook for future researchers in the field." — Nature.

**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.

**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 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
India. He is a national-award-winning science communicator and has extensively worked on the popularization of astronomy education in India.

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**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.

**Advanced Stellar Astrophysics** - William K. Rose - 1998-04-16
This advanced 1998 textbook on stellar astrophysics provides a comprehensive and self-contained introduction for graduate 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,
to introduce only the fundamentals of stellar astrophysics. You will find little 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

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**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

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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,

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.

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,
vital to understand other astrophysical objects from accreting black holes and galaxies to the Universe itself. The structure of a star can be described mathematically by differential equations derived from the principles of hydrodynamics, electromagnetic theory, thermodynamics, quantum mechanics, atomic and nuclear physics. The basic equations of a spherical star are derived in detail at an accessible level. The topics discussed include modes of energy transport, the equation of state, the physics of the opacity sources and the nuclear reactions. Attention is also given to the virial theorem, polytropic gas spheres and homology principles and the procedure for numerical solution of the equations is outlined. This book tracks the evolution of stars from their main-sequence evolution through the exhaustion of various nuclear fuels to the end points of evolution and also introduces the topic of interacting binary stars. The aim is to take the reader from the essential underlying physical principles to the doors to current research on stellar interiors.

**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 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.

**Introduction to Cosmology** - Barbara Ryden - 2016-11-17
A substantial update of this award-winning and highly regarded cosmology textbook, for advanced undergraduates in physics and astronomy.

**Introduction to Stellar Winds** - Henny J. G. L. M. Lamers - 1999-06-17
The first comprehensive introduction to the observations and theories of stellar winds; a long-awaited graduate textbook, written by two founders of the field.

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**Stars and Stellar Processes** - Mike Guidry - 2019-02-07
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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).

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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.

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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).

Astrophysics in a Nutshell - Dan Maoz - 2016-02-23
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.
exploration of the science of stars, from the mechanisms that allow stars to
topics Uses simple, short, and clear derivations of physical results Trains
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Stars: A Very Short Introduction - Andrew King - 2012-07-26
Every atom of our bodies has been part of a star. Our very own star, the
Sun, is crucial to the development and sustainability of life on Earth. This
Very Short Introduction presents a modern, authoritative examination of
how stars live, producing all the chemical elements beyond helium, and how
they die, sometimes spectacularly, to end as remnants such as black holes.
Andrew King shows how understanding the stars is key to understanding
the galaxies they inhabit, and thus the history of our entire Universe, as well
as the existence of planets like our own. King presents a fascinating
exploration of the science of stars, from the mechanisms that allow stars to
form and the processes that allow them to shine, as well as the results of
their inevitable death. 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.

Theoretical Astrophysics: Volume 2, Stars and Stellar Systems - T.
Padmanabhan - 2000
This authoritative text guides graduate students and researchers through
the key physical processes governing 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.

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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.
Dynamics of Stellar Systems - K. F. Ogorodnikov - 2016-10-13
Dynamics of Stellar Systems focuses on the theoretical problems in stellar dynamics. The book first offers information on stellar dynamics, including historical development, fundamentals of synthetic method, and value of stellar dynamics. The text discusses the fundamental concepts of stellar statistics. Properties of univariate distribution functions; multivariate distribution functions; and statistical properties of stars are explained. The text then describes the elementary theory of galactic rotation and irregular forces in stellar systems. The text also tackles statistical stellar dynamics of neglecting encounters. Considerations include Boltzmann equation in curvilinear coordinates; importance of using one-valued integrals of the motion; and fundamental differential equation of stellar dynamics. The book also underscores the regular orbit of stars and dynamics of centroids. The text describes the dynamics of spherical stellar and rotating stellar systems. The theory of polytropic spheres; basic equations for spherical systems; masses and rotation of galaxies; and boundaries of galaxies are discussed. The text is widely recommended for readers interested in stellar dynamics.

An Introduction to Modern Cosmology - Andrew Liddle - 2015-04-27
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.
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**Fundamentals of Astrophysics** - Stan Owocki - 2021-06-03

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.

**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 halos, 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
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The Physical Universe - Frank Shu - 1982
"This is a truly astonishing book, invaluable for anyone with an interest in astronomy." Physics Bulletin "Just the thing for a first year university science course." Nature "This is a beautiful book in both concept and execution." Sky & Telescope

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

Stars and Their Spectra - James B. Kaler - 1997-03-27
This book 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.

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**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.

**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
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**The Virial Theorem in Stellar Astrophysics** - George William Collins - 1978

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**New Worlds, New Horizons in Astronomy and Astrophysics** - National Research Council - 2011-02-04
Driven by discoveries, and enabled by leaps in technology and imagination, our understanding of the universe has changed dramatically during the course of the last few decades. The fields of astronomy and astrophysics are making new connections to physics, chemistry, biology, and computer science. Based on a broad and comprehensive survey of scientific opportunities, infrastructure, and organization in a national and international context, New Worlds, New Horizons in Astronomy and Astrophysics outlines a plan for ground- and space- based astronomy and astrophysics for the decade of the 2010’s. Realizing these scientific opportunities is contingent upon maintaining and strengthening the foundations of the research enterprise including technological development, theory, computation and data handling, laboratory experiments, and human resources. New Worlds, New Horizons in Astronomy and Astrophysics proposes enhancing innovative but moderate-cost programs in space and on the ground that will enable the community to respond rapidly and flexibly to new scientific discoveries. The book recommends beginning construction on survey telescopes in space and on the ground to investigate the nature of dark energy, as well as the next generation of large ground-based giant optical telescopes and a new class of space-based gravitational observatory to observe the merging of distant black holes and precisely test theories of gravity. New Worlds, New Horizons in Astronomy and Astrophysics recommends a balanced and executable program that will support research surrounding the most profound questions about the cosmos. The discoveries ahead will facilitate the search for habitable planets, shed light on dark energy and dark matter, and aid our understanding of the history of the universe and how the earliest stars and galaxies formed. The book is a useful resource for agencies supporting the field of astronomy and astrophysics, the Congressional committees with jurisdiction over those agencies, the scientific community, and the public.
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