

Acces PDF Astrophysics Is Easy An Introduction  
For The Amateur Astronomer The Patrick Moore  
Practical Astronomy Series

# **Astrophysics Is Easy An Introduction For The Amateur Astronomer The Patrick Moore Practical Astronomy Series**

This textbook provides the basic theoretical and practical knowledge of astronomy and astrophysics. It provides an overview from classical astronomy and observational

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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

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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

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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

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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.

Neil deGrasse Tyson's #1 New York Times best-selling guide to the cosmos, adapted for young readers. From the basics of physics to big questions about the nature of space and time, celebrated astrophysicist and science

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communicator Neil deGrasse Tyson breaks down the mysteries of the cosmos into bite-sized pieces. *Astrophysics for Young People in a Hurry* describes the fundamental rules and unknowns of our universe clearly—and with Tyson's characteristic wit, there's a lot of fun thrown in, too. This adaptation by Gregory Mone includes full-color photos, infographics, and extra explanations to make even the trickiest concepts accessible. Building on the wonder inspired by outer space, *Astrophysics for Young People in a Hurry* introduces an

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exciting field and the principles of scientific inquiry to young readers.

High-energy astrophysics covers cosmic phenomena that occur under the most extreme physical conditions. It explores the most violent events in the Universe: the explosion of stars, matter falling into black holes, and gamma-ray bursts - the most luminous explosions since the Big Bang.

Driven by a wealth of observations, there has been a large leap forward in our understanding of these phenomena. Exploring

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modern topics of high-energy astrophysics, such as supernovae, neutron stars, compact binary systems, gamma-ray bursts, and active galactic nuclei, this 2007 textbook is ideal for undergraduate students in high-energy astrophysics. It is a self-contained, relevant overview of this exciting field of research. Assuming a familiarity with basic physics, it introduces all other concepts, such as gas dynamics or radiation processes, in an instructive way. An extended appendix gives an overview of some of the most important



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high-energy astrophysics instruments, and each chapter ends with exercises.

Astronomy is written in clear non-technical language, with the occasional touch of humor and a wide range of clarifying illustrations. It has many analogies drawn from everyday life to help non-science majors appreciate, on their own terms, what our modern exploration of the universe is revealing. The book can be used for either a one-semester or two-semester introductory course (bear in mind, you can customize your version and include

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only those chapters or sections you will be teaching.) It is made available free of charge in electronic form (and low cost in printed form) to students around the world. If you have ever thrown up your hands in despair over the spiraling cost of astronomy textbooks, you owe your students a good look at this one. Coverage and Scope Astronomy was written, updated, and reviewed by a broad range of astronomers and astronomy educators in a strong community effort. It is designed to meet scope and sequence

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requirements of introductory astronomy  
courses nationwide. Chapter 1: Science and  
the Universe: A Brief Tour Chapter 2:  
Observing the Sky: The Birth of Astronomy  
Chapter 3: Orbits and Gravity Chapter 4:  
Earth, Moon, and Sky Chapter 5: Radiation  
and Spectra Chapter 6: Astronomical  
Instruments Chapter 7: Other Worlds: An  
Introduction to the Solar System Chapter 8:  
Earth as a Planet Chapter 9: Cratered Worlds  
Chapter 10: Earthlike Planets: Venus and Mars  
Chapter 11: The Giant Planets Chapter 12:

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Rings, Moons, and Pluto Chapter 13: Comets  
and Asteroids: Debris of the Solar System  
Chapter 14: Cosmic Samples and the Origin of  
the Solar System Chapter 15: The Sun: A  
Garden-Variety Star Chapter 16: The Sun: A  
Nuclear Powerhouse Chapter 17: Analyzing  
Starlight Chapter 18: The Stars: A Celestial  
Census Chapter 19: Celestial Distances  
Chapter 20: Between the Stars: Gas and Dust  
in Space Chapter 21: The Birth of Stars and  
the Discovery of Planets outside the Solar  
System Chapter 22: Stars from Adolescence to

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Old Age Chapter 23: The Death of Stars  
Chapter 24: Black Holes and Curved  
Spacetime Chapter 25: The Milky Way Galaxy  
Chapter 26: Galaxies Chapter 27: Active  
Galaxies, Quasars, and Supermassive Black  
Holes Chapter 28: The Evolution and  
Distribution of Galaxies Chapter 29: The Big  
Bang Chapter 30: Life in the Universe  
Appendix A: How to Study for Your  
Introductory Astronomy Course Appendix B:  
Astronomy Websites, Pictures, and Apps  
Appendix C: Scientific Notation Appendix D:

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Units Used in Science Appendix E: Some  
Useful Constants for Astronomy Appendix F:  
Physical and Orbital Data for the Planets  
Appendix G: Selected Moons of the Planets  
Appendix H: Upcoming Total Eclipses  
Appendix I: The Nearest Stars, Brown Dwarfs,  
and White Dwarfs Appendix J: The Brightest  
Twenty Stars Appendix K: The Chemical  
Elements Appendix L: The Constellations  
Appendix M: Star Charts and Sky Event  
Resources

An Introduction to Modern Stellar Astrophysics

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The Physical Universe

An Introduction to Stellar Astrophysics

Astrophysics: A Very Short Introduction

Second Edition

*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*

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*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*



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*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 modern ideas on cosmology and on the physical basis of*

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*the general theory of relativity. The title reflects the author's contention that the remarkable degree of isotropy, rather than the expansions, can be regarded as the central observational feature of the universe. The various theories and ideas in "big bang" cosmology are discussed, providing an insight into current problems. The book is written at an intermediate level, beyond that of the many elementary books on cosmology, as an introduction*

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*to the more advanced works and research literature.*

*"In An Introduction to Nuclear Astrophysics, Richard N. Boyd includes basic nomenclature and information so that students from astronomy or physics can quickly orient themselves. Subsequent chapters describe earthbound and spaceborne instruments operating in service to nuclear astrophysics worldwide; background topics such as nuclear and neutrino physics,*

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*scattering formalism, and thermonuclear reaction rates; and information on galactic chemical evolution, solar nucleosynthesis, s- and r-processes, and gamma-ray bursts. Each chapter includes problem sets against which students may test their knowledge before moving ahead, and Boyd has included copious references intended to guide students to further study" --Jacket.*

*A concrete, mid-level treatment, this*

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*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*

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*étoiles, Max Leclerc et Cie, 1961.*

*An Introduction*

*Introduction to Astronomy and*

*Astrophysics*

*Introduction to Astrophysics*

*An Introduction to Modern Cosmology*

*Astrophysics in a Nutshell*

Numerical Methods in Astrophysics: An

Introduction outlines various

fundamental numerical methods that can

solve gravitational dynamics,

hydrodynamics, and radiation transport

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equations. This resource indicates which methods are most suitable for particular problems, demonstrates what the accuracy requirements are in numerical simulations, and suggests ways to test for and reduce the inevitable negative effects. After an introduction to the basic equations and derivations, the book focuses on practical applications of the numerical methods. It explores hydrodynamic problems in one dimension, N-body

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particle dynamics, smoothed particle hydrodynamics, and stellar structure and evolution. The authors also examine advanced techniques in grid-based hydrodynamics, evaluate the methods for calculating the gravitational forces in an astrophysical system, and discuss specific problems in grid-based methods for radiation transfer. The book incorporates brief user instructions and a CD-ROM of the numerical codes, allowing readers to experiment with the



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codes to suit their own needs. With numerous examples and sample problems that cover a wide range of current research topics, this highly practical guide illustrates how to solve key astrophysics problems, providing a clear introduction for graduate and undergraduate students as well as researchers and professionals.

Beginning from first principles and adopting a modular structure, this book develops the fundamental physical

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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

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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

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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.

A coherent introduction for researchers in astronomy, particle physics, and cosmology on the formation and evolution of galaxies.

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

Astrophysics for Young People in a  
Hurry

An Introduction to Astronomy

Practical Astronomy

An Introduction to Modern Astrophysics

An Introduction for the Amateur

Astronomer

*As in all other fields of astronomy, progress in*

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*instrumentation and observational techniques has in recent years brought a wealth of new information about the sun. This introduction presents a complete overview of solar physics, of what we know and would like to know. The increasing number of observations of solar phenomena on neighbouring stars makes this book valuable not only for students specializing in solar physics but also for researchers interested in stellar structure and the solar-stellar connection.*

*Astrophysics is often - with some justification - regarded as incomprehensible without at least degree-level mathematics. Consequently, many amateur astronomers skip the math, and miss out on the fascinating fundamentals of the subject. In Astrophysics Is Easy! Mike*

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*Inglis takes a quantitative approach to astrophysics that cuts through the incomprehensible mathematics, and explains the basics of astrophysics in accessible terms. The reader can view objects under discussion with commercial amateur equipment.*

*This book presents the amateur with fine examples of astronomical sketches and step-by-step tutorials in each medium, including pencil, pen and ink, chalks and pastels, painting and computer graphics programs. This unique book can teach almost anyone to create beautiful sketches of celestial objects by following simple, illustrated, step-by-step instructions. Readers can select a chapter related to their preferred class of object, and rapidly learn techniques in several media. Each chapter contains useful information*

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*regarding equipment, techniques for preserving and archiving sketches, and suggestions for accurate record keeping.*

*This book is an introduction to “multi-messenger” astrophysics. It covers the many different aspects connecting particle physics with astrophysics and cosmology and introduces astrophysics using numerous experimental findings recently obtained through the study of high-energy particles. Taking a systematic approach, it comprehensively presents experimental aspects from the most advanced laboratories and detectors, as well as the theoretical background. The book is aimed at graduate students and post-graduate researchers with a basic understanding of particle and nuclear physics. It will also be*



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*of interest to particle physicists working in  
accelerator/collider physics who are keen to understand the  
mechanisms of the largest accelerators in the Universe. The  
book draws on the extensive lecturing experience of  
Professor Maurizio Spurio from the University of Bologna.*

**AN INTRODUCTION TO ASTROPHYSICS**

*The Isotropic Universe,*

*An Introduction to Physics and Astrophysics*

*Extragalactic Astronomy and Cosmology*

*Theoretical Astrophysics*

**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**

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**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.**

**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**

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**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**

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**come up (and vital aspects of vector calculus are reviewed in the Appendix).**

**Astrophysics is Easy!An Introduction for the Amateur AstronomerSpringer Science & Business Media**

**Essential Astrophysics is a book to learn or teach from, as well as a fundamental reference volume for anyone interested in astronomy and astrophysics. It presents astrophysics from basic principles without requiring any previous study of astronomy or astrophysics. It serves as a comprehensive introductory text, which takes the student through the field of astrophysics in lecture-sized chapters of basic**

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**physical principles applied to the cosmos. This one-semester overview will be enjoyed by undergraduate students with an interest in the physical sciences, such as astronomy, chemistry, engineering or physics, as well as by any curious student interested in learning about our celestial science. The mathematics required for understanding the text is on the level of simple algebra, for that is all that is needed to describe the fundamental principles. The text is of sufficient breadth and depth to prepare the interested student for more advanced specialised courses in the future. Astronomical examples are provided throughout the**



**text, to reinforce the basic concepts and physics, and to demonstrate the use of the relevant formulae. In this way, the student learns to apply the fundamental equations and principles to cosmic objects and situations. Astronomical and physical constants and units as well as the most fundamental equations can be found in the appendix. Essential Astrophysics goes beyond the typical textbook by including references to the seminal papers in the field, with further reference to recent applications, results, or specialised literature.**

**Principles of Astrophysics**

**Astrophysics for Physicists**

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## **Introductory Astronomy and Astrophysics**

### **Introduction to Stellar Dynamics**

### **High Energy Astrophysics**

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.

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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.

Astrophysics is often – with some justification – regarded as incomprehensible without the use of higher mathematics. Consequently, many amateur

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astronomers miss out on some of the most fascinating aspects of the subject. *Astrophysics Is Easy!* cuts through the difficult mathematics and explains the basics of astrophysics in accessible terms. Using nothing more than plain arithmetic and simple examples, the workings of the universe are outlined in a straightforward yet detailed and easy-to-grasp manner. The original edition of the book was written over eight years ago, and in that time, advances in observational astronomy have led to new and significant changes to the theories of astrophysics. The new theories will be reflected in both the new and expanded chapters. A unique

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aspect of this book is that, for each topic under discussion, an observing list is included so that observers can actually see for themselves the concepts presented – stars of the spectral sequence, nebulae, galaxies, even black holes. The observing list has been revised and brought up-to-date in the Second Edition.

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

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physical and chemical laws familiar to mankind.

These interpr

Astrophysics is the physics of the stars, and more widely the physics of the Universe. It enables us to understand the structure and evolution of planetary systems, stars, galaxies, interstellar gas, and the cosmos as a whole. In this Very Short Introduction, the leading astrophysicist James Binney shows how the field of astrophysics has expanded rapidly in the past century, with vast quantities of data gathered by telescopes exploiting all parts of the electromagnetic spectrum, combined with the rapid advance of computing power, which has allowed

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increasingly effective mathematical modelling. He illustrates how the application of fundamental principles of physics - the consideration of energy and mass, and momentum - and the two pillars of relativity and quantum mechanics, has provided insights into phenomena ranging from rapidly spinning millisecond pulsars to the collision of giant spiral galaxies. This is a clear, rigorous introduction to astrophysics for those keen to cut their teeth on a conceptual treatment involving some mathematics. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in

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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

**Introduction to High-Energy Astrophysics**

**Introduction to Cosmology**

**Understanding the Universe**

**Particles and Astrophysics**

**An Introduction to Nuclear Astrophysics**

This is a truly astonishing book, invaluable for anyone with an interest in astronomy and surely the bargain



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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

High-energy astrophysics has unveiled a Universe  
very different from that only known from optical  
observations. It has revealed many types of objects in  
which typical variability timescales are as short as  
years, months, days, and hours (in quasars, X-ray  
binaries, etc), and even down to milli-seconds in  
gamma ray bursts. The sources of energy that are  
encountered are only very seldom nuclear fusion, and  
most of the time gravitation, a paradox when one  
thinks that gravitation is, by many orders of

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magnitude, the weakest of the fundamental interactions. The understanding of these objects' physical conditions and the processes revealed by high-energy astrophysics in the last decades is nowadays part of astrophysicists' culture, even of those active in other domains of astronomy. This book evolved from lectures given to master and PhD students at the University of Geneva since the early 1990s. It aims at providing astronomers and physicists intending to be active in high-energy astrophysics a broad basis on which they should be able to build the more specific knowledge they will need. While in the first part of the book the physical processes are described and derived in detail, the

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second part studies astrophysical objects in which high-energy astrophysics processes are crucial. This two-pronged approach will help students recognise physical processes by their observational signatures in contexts that may differ widely from those presented here.

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

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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,

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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

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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)

An Introduction to Stellar Astrophysics aspires to provide the reader with an intermediate knowledge on stars whilst focusing mostly on the explanation of the

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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

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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.

The Stars

Essential Astrophysics

Introduction to Astronomy and Cosmology

An Introduction to Radio Astronomy

Astronomical Sketching: A Step-by-Step Introduction



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This edition has been revised to reflect dramatic changes and advancements in astrophysics that have occurred over the past decade. It includes the latest results from relevant fields of astrophysics and advances in our theoretical understanding of astrophysical phenomena.

This well-established, graduate-level textbook is a thorough introduction to radio telescopes and techniques for students and researchers new to the subject.

This second edition has been updated and substantially expanded. Starting with the description of our home galaxy, the Milky

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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

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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. 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,

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