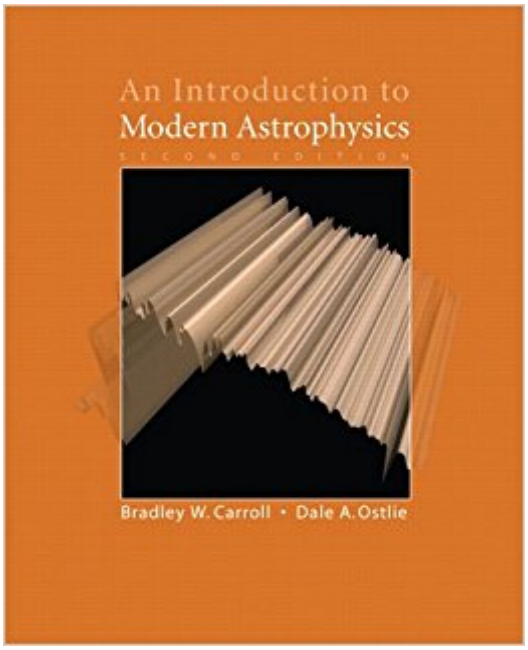
An Introduction To Modern Astrophysics (2nd Edition)



Synopsis

An Introduction to Modern Astrophysics, Second Edition has been thoroughly revised to reflect the dramatic changes and advancements in astrophysics that have occurred over the past decade. The Second Edition of this market-leading book has been updated to include the latest results from relevant fields of astrophysics and advances in our theoretical understanding of astrophysical phenomena. The Tools of Astronomy: The Celestial Sphere, Celestial Mechanics, The Continuous Spectrum of Light, The Theory of Special Relativity, The Interaction of Light and Matter, Telescopes; The Nature of Stars: Binary Systems and Stellar Parameters, The Classification of Stellar Spectra, Stellar Atmospheres, The Interiors of Stars, The Sun, The Process of Star Formation, Post-Main-Sequence Stellar Evolution, Stellar Pulsation, Supernovae, The Degenerate Remnants of Stars, Black Holes, Close Binary Star Systems; Planetary Systems: Physical Processes in the Solar System, The Terrestrial Planets, The Jovian Worlds, Minor Bodies of the Solar System, The Formation of Planetary Systems; Galaxies and the Universe: The Milky Way Galaxy, The Nature of Galaxies, Galactic Evolution, The Structure of the Universe, Active Galaxies, Cosmology, The Early Universe; Astronomical and Physical Constants, Unit Conversions Between SI and cgs, Solar System Data, The Constellations, The Brightest Stars, The Nearest Stars, Stellar Data, The Messier Catalog, Constants, A Constants Module for Fortran 95 (Available as a C++ header file), Orbits, A Planetary Orbit Code (Available as Fortran 95 and C++ command line versions, and Windows GUI), TwoStars, A Binary Star Code (Generates synthetic light and radial velocity curves; available as Fortran 95 and C++ command line versions, and Windows GUI), StatStar, A Stellar Structure Code (Available as Fortran 95 and C++ command line versions, and Windows GUI), StatStar, Stellar Models, Galaxy, A Tidal Interaction Code (Available as Java), WMAP Data. For all readers interested in moden astrophysics.

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Customer Reviews

A re-issued edition of this well-known modern astrophysics textbook. Designed for astronomy and physics majors, the Second Edition covers every major area of modern astrophysics, from the solar system and stellar astronomy to galactic and extragalactic astrophysics and cosmology, in one comprehensive and engaging volume. --This text refers to an alternate Hardcover edition.

An Introduction to Modern Astrophysics,Second Edition has been thoroughly revised to reflect the dramatic changes and advancements in astrophysics that have occurred over the past decade. The Second Edition of this market-leading book has been updated to include the latest results from relevant fields of astrophysics and advances in our theoretical understanding of astrophysical phenomena.The Tools of Astronomy: The Celestial Sphere, Celestial Mechanics, The Continuous Spectrum of Light, The Theory of Special Relativity, The Interaction of Light and Matter, Telescopes; The Nature of Stars: Binary Systems and Stellar Parameters, The Classification of Stellar Spectra, Stellar Atmospheres, The Interiors of Stars, The Sun, The Process of Star Formation, Post-Main-Sequence Stellar Evolution, Stellar Pulsation, Supernovae, The Degenerate Remnants of Stars, Black Holes, Close Binary Star Systems; Planetary Systems: Physical Processes in the Solar System, The Terrestrial Planets, The Jovian Worlds, Minor Bodies of the Solar System, The Formation of Planetary Systems; Galaxies and the Universe: The Milky Way Galaxy, The Nature of Galaxies, Galactic Evolution, The Structure of the Universe, Active Galaxies, Cosmology, The Early Universe; Astronomical and Physical Constants, Unit Conversions Between SI and cgs, Solar System Data, The Constellations, The Brightest Stars, The Nearest Stars, Stellar Data, The Messier Catalog, Constants, A Constants Module for Fortran 95 (Available as a C++ header file), Orbits, A Planetary Orbit Code (Available as Fortran 95 and C++ command line versions, and Windows GUI), TwoStars, A Binary Star Code (Generates synthetic light and radial velocity curves; available as Fortran 95 and C++ command line versions, and Windows GUI), StatStar, A Stellar Structure Code (Available as Fortran 95 and C++ command line versions, and Windows GUI), StatStar, Stellar Models, Galaxy, A Tidal Interaction Code (Available as Java), WMAP Data.For all readers interested in moden astrophysics.

I am a graduate student (2008) with a BA degree in geoscience/astronomy. I have had Carroll and Ostlie's (C-O) "An Introduction to Modern Astrophysics" or as we students referred to it: "Bob" (for Big Orange Book) both first and second editions, for over 10 years and I find that I consult it often: e.g. when I get stuck on a concept such as spectral line-widths or absorption line wings and depths. The math is there and can be intimidating, but folks, you can't learn the phenomena behind the things you see in telescopes or hear on the news unless you know a bit of math! A normal introductory astronomy textbook just does not have the depth of explanation that C-O 2ed has.Great things about this book:1.) It is pretty complete giving a bit of historical insight into astronomy all the way through Celestial Dynamics, the Solar System, Galaxies and the Universe, Cosmology plus modern Lambda Cold Dark Matter (CDM), the current consensus model of the universe's structure and possible fate.2.) The physics are covered in-line in the text meaning, contextually and in an applied manner. An example is the Radiative Processes (bound-bound, bound-free, free-free, and Electron-scattering are covered in Chapter 9 applied to opacity in stellar atmospheres. This is the best way for astronomers to learn the supporting physics as opposed to the author just throwing out the theory with its arcane math as an "exercise for the student" to apply!.3.) The authors have given consistent ongoing support for the text on a website with errata, supporting diagrams as download-able .jpegs, plus all of the data (constants, planetary info, etc) in download-able datafiles. I just applied over 100 corrections for typos that the authors have collected on the second edition!This one feature is worth the price of the text and it wasn't cheap! I have to say that, in my many years as a student of science, that "An Introduction to Astrophysics, 2Ed" is almost unique in its ongoing support of the text with errata corrections.4.) Be warned: there are no trivial problems at the ends of the chapters in my experience. No "plug and chug" calculations. I have learned there is a solutions manual and I am working on acquiring that. The problems start at a challenging level for first year graduate astrophysics students and go up from there. You might not get an answer after working for some hours on these problems, but you will learn a lot in the process!In summary, there is no text I have found of comparable scope, written with more effective pedagogical technique, and with more lasting value for the serious astrophysics student than "An Introduction to Modern Astrophysics, 2nd Ed" by Carroll and Ostlie.

My Purdue Astrophysics classes use Foundations of Astrophysics by Ryden as the required reading for the course.. And I still don't understand the department's reasoning. This is an excellent textbook that has good, intuitive explanations and derives equations (at least explains the reasoning well

enough that it can be followed) much better than the Foundations text. I bought this text as supplemental reading, and have been wishing I had not left it in summer storage on campus! Love the textbook, it has been very worth the buy!My last semester professor pulled homework questions from this text even though the required reading was Foundations.. They know it’s a superior book too!

I purchased this textbook when I was getting into astrochemistry and I wanted something that would provide a solid introduction to the rest of astrophysics. The title says it all, as this textbook has served me well in that aim. While it is slightly heavy on stellar processes, it still provides a reasonable introduction to most topics of astrophysics.

Any instructor who has used the first edition of this book can attest to its fine quality of presentation and its didactic power. The second edition continues this tradition, and in addition offers more material that reflects the many discoveries and developments in astrophysics that have taken place since the first edition. The observational tools in astronomy have become even more refined over the years since the first edition along with computing power, and these two facts combined with a robust community of theoreticians have pushed the limits of astrophysical knowledge. This book is of course a sizable one, and this reviewer did not read it in its entirety, but instead focused on those sections that addressed the new developments since the first edition.One of the interesting topics that are discussed in the book whose explanation was not found in the first edition is that of gamma ray bursts. After a brief historical discussion of their first detection, the authors address the question as to the origin of the bursts, i.e. whether galactic or extragalactic. They perform some rudimentary calculations that show how energetic the bursts must be if they were located in the solar system or from a distant galaxy. Early thinking on the cause of gamma ray bursts associated them with neutron stars, but the authors explain the problems with this explanation, and most interestingly, give arguments that support the assertion that there is an edge to the distribution of the gamma sources. Clever observational techniques resulted in the conclusion that gamma ray bursts are extragalactic. The `collapsar’ and `supranova’ models of gamma ray bursts are discussed, but the discussion is way too brief for those who want the in-depth details of these models. However the authors give up-to-date references for readers who want to dig deeper. From a perusal of these references it is apparent that the supranova model has gained the most popularity at the present time, even though some of the observations cannot as yet be reconciled with this model.Another topic of great current interest is that of dark matter, which is discussed in the last chapter of the

book, and which the authors describe as one of the most important theoretical issues in cosmological astrophysics. This discussion is also short, but references are given, and its inclusion since the first edition reflects the theoretical interest. The paucity of experimental evidence for the candidates of dark matter has stymied theoretical developments, with most of the effort devoted to putting bounds on the candidates, such as axions and weakly interacting massive particles.No doubt this book will continue to be used in the classroom in years to come, and new discoveries will be included in future editions. With the CERN collider coming on line in the next few years, everyone interested will see the interplay between high-energy physics and astrophysics. The collider will give the theoretical astrophysical community new bounds on cosmological quantities, and in fact may open up whole new lines of research, all of it exciting, and proof positive that the twenty-first century is the most exciting time to be alive.

Certainly an exhaustive study of astrophysics. This is a required text for some college courses, which explains the stiff price. But the print and the illustrations are very small (maybe OK for typical students, but tough for geezers) and all in tepid B&W. Color would add greatly to the pics and graphs.Authors: increase the price if you must, but go to a larger format, larger print and color for the next edition.

Very enjoyable and will make a good reference for my home library. Want to relate to, follow as well appreciate the great discoveries and the scientific discoveries being made..... this is the book that enables that ability.

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