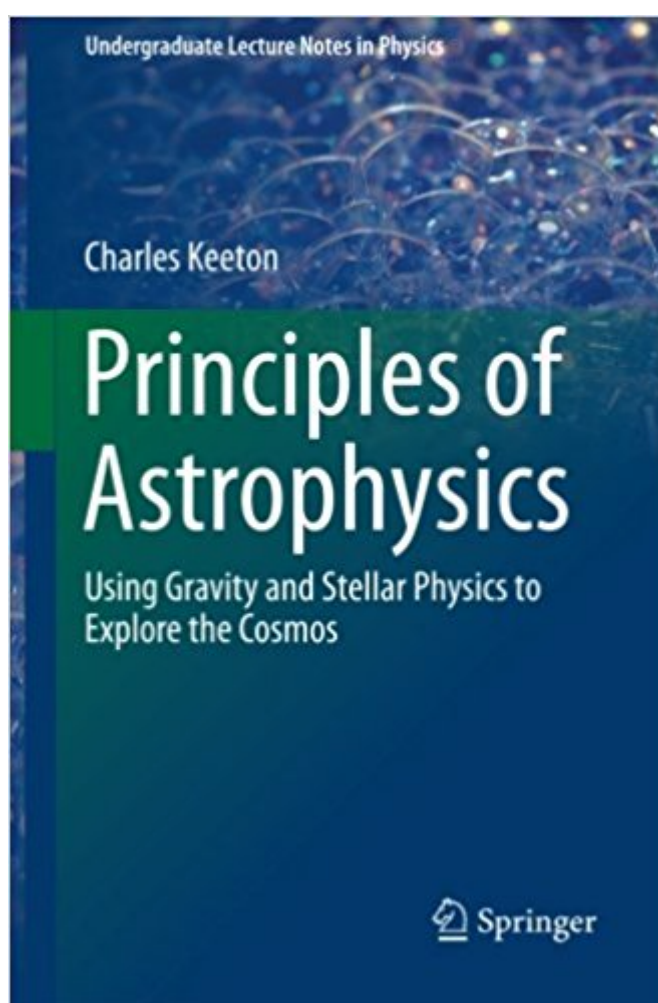


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Principles Of Astrophysics: Using Gravity And Stellar Physics To Explore The Cosmos (Undergraduate Lecture Notes In Physics)



Synopsis

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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From the book reviews: “The book is divided into two parts, each part corresponding to a one semester course. This book is an excellent introduction to astrophysics. It can be used as a text for courses on the subject. Problems are included at the end of each chapter with solutions in the back. Also, each chapter ends with a list of references for further study.” (Stephen Wollman, zbMATH, Vol. 1302, 2015)

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Excellent textbook; requires a mature audience. Its up-to-date content and topic selection are most welcome for whoever is tired of plowing through more hum-drum material before getting to the really interesting stuff. The book does not pretend to offer an exhaustive coverage, but its focus on gravitation and some of the myriad phenomena that observers encounter is most enlightening. Highly recommended for upper level undergraduates or as a quick reference for graduate students. The problems are wonderful.. Appendix is very helpful.

I have a Kindle version of this text on my iPad. The only negative aspect is that equations, and there

are many equations, are hard to read without enlarging them. This is a typical issue for Kindle text books in physics and astronomy. Keeton has given us a fine astrophysics text book. He clearly covers the subject matter and gives occasional examples to clarify the mathematics. Knowledge of calculus and physics is essential to get the most out of this text, but his prose is sufficiently clear for a casual reader to get the drift of his arguments even if the equations are only scanned.

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