



Astrophysics in a Nutshell

By Dan Maoz

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
A concise but thorough introduction to the observational data and theoretical concepts underlying modern astronomy, *Astrophysics in a Nutshell* is designed for advanced undergraduate science majors taking a one-semester course. This well-balanced and up-to-date textbook covers the essentials of modern astrophysics--from stars to cosmology--emphasizing the common, familiar physical principles that govern astronomical phenomena, and the interplay between theory and observation.

In addition to traditional topics such as stellar remnants, galaxies, and the interstellar medium, *Astrophysics in a Nutshell* introduces subjects at the forefront of modern research, including black holes, dark matter, gravitational lensing, and dark energy, all updated with some of the latest observational results. To aid physical understanding, mathematical derivations are kept as simple, short, and clear as possible, and order-of-magnitude estimates, dimensional analysis, and scaling arguments are frequently used. These no-nonsense, "back-of-the-envelope" calculations train students to think like physicists. The book is amply illustrated with simple, clear figures and each chapter ends with a set of problems.

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 up-to-date astrophysics textbook for science majors
- Contains a broad and well-balanced choice of traditional subjects and current research topics
- Uses simple, short, and clear derivations of physical results
- Trains students in the essential skills of order-of-magnitude analysis
- Includes teaching problems with each chapter

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Editorial Review

Review

Winner of the 2009 Chambliss Astronomical Writing Award for an academic book, American Astronomical Society

One of *Choice's* Outstanding Academic Titles for 2007

"Tel Aviv University professor Dan Maoz aims to provide a concise guide to the subject for advanced science undergraduates. The essentials of modern astrophysics are covered, from traditional topics such as stellar remnants and galaxies to recent research including dark matter and dark energy, while training students in order-of-magnitude analysis."--***Times Higher Education***

"[M]aoz makes generous and excellent use of back-of-the-envelope calculations and approximations to the more complete theory, accurate enough to both illustrate the physics and to arrive at decent numerical answers...Lots of material is squeezed into this thin volume. The treatment of stellar physics is particularly insightful; other topics--galaxies and galactic structure and cosmology, are also very well done."--**K.L. Schick, *Choice***

"The presentation of so much material within 250 pages is done very skillfully, with a judicious balance between mathematical discussion and physical argument. The pedagogic value of the text is greatly enhanced by the problems given at the end of each chapter. Altogether, the book lives well up to the publisher's declared aims."--**Leon Mestel, *The Observatory***

From the Back Cover

Praise from professors who have adopted the book: "*Astrophysics in a Nutshell* is a wonderful addition to the advanced undergraduate textbook literature. It covers the important physics with sufficient depth to capture the students' curiosity without getting them lost in too much detail. The book is extremely broad, reaching from stellar to extragalactic to cosmological physics. Nevertheless, from the instructor's point of view, the book is constructed in a convenient modular way, so that one can easily select the relevant parts for one's specific course in any of those areas. Finally, the book emphasizes to the student the fundamental interconnectedness of the different astrophysical subfields."--**Volker Bromm, University of Texas at Austin**

Praise from professors who have adopted the book: "*Astrophysics in a Nutshell* is an ideal text for a Junior/Senior course. The essential fundamentals are covered, and there are liberal hints of more to come."--**James R. Houck, Cornell**

Praise from professors who have adopted the book: "*Astrophysics in a Nutshell* provides a commendably concise and clear presentation of the core material needed for an advanced undergraduate astrophysics class. Students will welcome both the clarity and the consistent mathematical level of Maoz's text."--**Phil Armitage, University of Colorado, Boulder**

Praise from professors who have adopted the book: Many texts are aimed at being useful to a broad audience. Their aims are generally to be terse, yet informative and pedagogical, accessible, yet current. No book succeeds at this the way *Astrophysics in a Nutshell* by Maoz does. Despite being cast as an upper-level undergraduate text, I routinely recommend this book for students from beginning undergraduates to beginning graduate students and they all benefit from studying it."--**Andrew Zentner, University of Pittsburgh**

Praise from professors who have adopted the book: "*Astrophysics in a Nutshell* is an important addition to the suite of textbooks for undergraduate astronomy and physics majors. It gives a broad introduction to the major areas of astrophysics, and impels students to think through concepts rather than overwhelming them with detail. Due to its broad coverage, I recommend this book to my graduate students preparing for their preliminary examinations."--**Rodger Thompson, University of Arizona**

"This is, without a doubt, one of the best books that I have used for an introductory course in astrophysics over the past decade. The book is unique in providing a pedagogical and authoritative overview of all the important topics in present-day astrophysics with mathematical rigor. The equations are self-contained and well explained, and the results are derived in a concise, factual manner with careful attention to details. My students, teaching assistant, and I have all found the book to be outstanding."--**Avi Loeb, Harvard University**

"Dan Maoz's *Astrophysics in a Nutshell* is perfect for an advanced astrophysics course for physical science majors. It covers modern topics from stars to galaxies and cosmology. I've already begun using problems from the book to test our first-year graduate students."--**John Huchra, Harvard University**

"*Astrophysics in a Nutshell* is just that--a no-nonsense, fast-paced textbook that authoritatively covers the concepts underlying modern astronomy at an advanced undergraduate level. Dan Maoz does a remarkably good job of presenting the widest range of material that can be reasonably contained in a serious one-semester course. The book's scholarship is excellent and fully up to date, and I will certainly adopt it in my undergraduate class."--**Greg Laughlin, University of California, Santa Cruz**

"I have nothing but praise for this textbook. It is a significant contribution to a field that is short on introductions to astronomy for science majors. *Astrophysics in a Nutshell* fills a basic need, and I will give it a try in my course."--**Lynne Hillenbrand, California Institute of Technology**

"*Astrophysics in a Nutshell* introduces the serious student to the tools, diversity, and power of modern astrophysical theory. In one panoramic volume, both text and reference, the author presents and applies essential concepts and equations, introducing the methods by which we seek to understand the inner workings of the cosmos. It will make a useful addition to the libraries of novice and pundit alike."--**Adam Burrows, University of Arizona**

"Despite the glut of introductory descriptive astronomy texts, there is a serious need for a one-semester introductory astronomy/astrophysics textbook that caters to mathematically literate students. This book fills that void and is a welcome addition on that count."--**Ronald F. Webbink, University of Illinois, Urbana-Champaign**

About the Author

Dan Maoz is Professor of Physics and Astronomy at Tel-Aviv University. His main research interests are supermassive black holes, gravitational lensing, and supernovae.

Users Review

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Melissa Chandler:

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