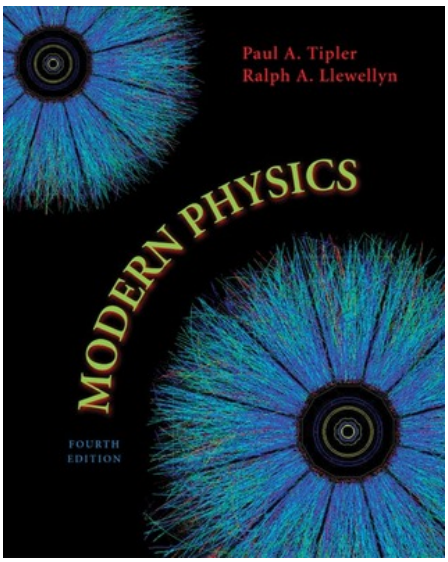

Modern Physics

Paul A. Tipler , Ralph A. Llewellyn

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Tipler and Llewellyn's acclaimed text for the intermediate-level course (not the third semester of the introductory course) guides students through the foundations and wide-ranging applications of modern physics with the utmost clarity--without sacrificing scientific integrity.

Modern Physics Details

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From Reader Review Modern Physics for online ebook

Bojan Tunguz says

Modern Physics is a funny concept. What Physicists consider to be modern consists of discoveries that in some instances happened just over a century ago. In this view what makes these topics and discoveries modern is not their relative age, but rather the conceptual shift from the Physics that has dominated the scientific worldview since at least the time of Galileo. Even more importantly, this "old" scientific worldview is based on "common sense" notions about the space, time and matter that everyone has taken for granted ever since people started to think about these concepts. In that regard the implications of modern physics go far beyond anything that had been discovered up to that point, and take a long time to wrap our minds around. Because the modern physics is has such a deep and revolutionizing impact on the way that we think about the world, and because it is comprised of the scientific discoveries of the greatest minds that ever lived, it is illusory to expect that a single semester course would do justice to all of its complexity. This textbook, like most others for this subject, has to work with these daunting constraints. When that is taken into consideration, one can't but conclude that the textbook is on par with similar other ones in this category. It certainly has its shortcomings, but overall this is as good of a book as any to gain make first steps in direction of understanding the modern Physics.

Because of the way that the concepts form modern Physics run counter to our intuition, it takes a while to get used to them. Physics is not just an agglomeration of equations and mathematical formulas designed to be applied to some data. It is also a collection of stories and mental pictures that have been developed in order to make a better sense of the meaning of the world around us. These stories are especially useful and needed when we encounter new physical theories for the first time. From that point, this textbook is a wonderful resource. It provides many interesting and insightful stories that accompany our understanding of the fundamental physical phenomena.

What this book is not very good at is the derivation of equations and formulae. Oftentimes the reader is left in the dark, and additional work on one's own may be required. This is particularly frustrating when it comes to some more complicated equations or results, like the "derivation" of Lorentz transformations or the Rutherford scattering formula. Granted, most of these derivations are better handled in an advanced Physics course where they can be given more careful treatment, but nonetheless one feels that they are not given as good of a treatment at this level as possible.

To conclude, this is a decent book on one of the most amazing topics in science. It is best to take it as an introduction to the field, rather than a comprehensive and exhaustive treatment. With those caveats, it is possible to gain a decent understanding of what the modern Physics is all about from this textbook.

Evan says

An average textbook. Sometimes can be a bit too hand-wavy with the math. Additionally, some sections can only be found on the book's website, which can be quite annoying.

Byung Kyu Park says

This is the only lower-division physics textbook I know which covers special relativity as it should be covered, with proper use of spacetime diagrams.

Yes, apparently there are numerous typos, especially in quantum mechanics section, but even so, this is a much better textbook than, for example, Giancoli, for those who actually want to understand special relativity and quantum mechanics, not just learn a few formulas that you can plug in numbers into.

Nick Black says

Review 1000!

An extraordinary text for those of us with no desire to become professional physicists. Rather than focusing on technical derivations and the more complex mathematical methods and approximation schemes found in standard advanced undergraduate and graduate texts, Tipler expounds -- with understandable, solid writing -- on those problems of modern physics which will be encountered by engineer-scientists such as myself. Most of my physicist friends hold this book in disdain, and understandably so: the mathematics are indeed hand-wavy, and I don't feel this book would give you the background one needs to move into serious graduate physics (for instance, I know more solid-state physics, despite not having taken a class in that subject, than this book gets into). For those of us merely needing to calculate band gaps, resistance to thermal damage, and conductivity, though, the presentation is lucid and at just the right level of difficulty. Knowledge of the Lagrangian and Hamiltonian formalisms (the point at which I typically say 'fuck it', being generally bewildered by classical mechanics and regrettably undeft, these days at least, with symplectic manifolds) is unnecessary, though (as in Quantum Mechanics for Scientists and Engineers) you'll need fluency with linear and angular momenta concepts, as well as a head for ∂EQs. Good treatment of relativistic mechanics, where appropriate.

I read the Fourth Edition (on loan from a friend downstairs), comparing it with my Third Edition (purchased after reading the first few chapters), and feel you could get by with either one. The problem sets look somewhat improved in the Fourth Edition, though.

One star deducted due to much material having been moved from the book to the webpage.
