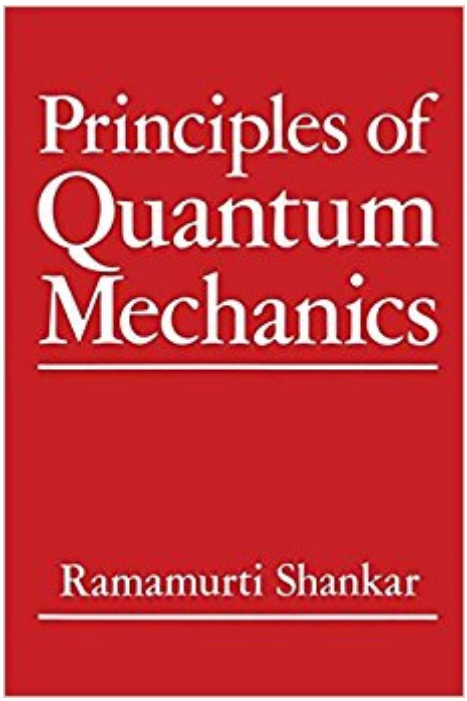
Principles Of Quantum Mechanics



Synopsis

Publish and perish-Giordano Bruno Given the number of books that already exist on the subject of quantum mechanics, one would think that the public needs one more as much as it does, say, the latest version of the Table of Integers. But this does not deter me (as it didn't my predecessors) from trying to circulate my own version of how it ought to be taught. The approach to be presented here (to be described in a moment) was first tried on a group of Harvard underÃ Â- graduates in the summer of '76, once again in the summer of '77, and more recently at Yale on undergraduates ('77-'78) and graduates ('78-'79) taking a year-long course on the subject. In all cases the results were very satisfactory in the sense that the students seemed to have learned the subject well and to have enjoyed the presentation. It is, in fact, their enthusiastic response and encouragement that convinced me of the soundness of my approach and impelled me to write this book. The basic idea is to develop the subject from its postulates, after adÃ Â- dressing some indispensable preliminaries.

Book Information

Paperback: 612 pages
Publisher: Springer; Softcover reprint of the original 1st ed. 1980 edition (December 6, 2013)
Language: English
ISBN-10: 146157675X
ISBN-13: 978-1461576754
Product Dimensions: 6 x 1.4 x 9 inches
Shipping Weight: 1.9 pounds (View shipping rates and policies)
Average Customer Review: 4.2 out of 5 stars 120 customer reviews
Best Sellers Rank: #344,511 in Books (See Top 100 in Books) #197 inÃ Â Books > Science & Math > Physics > Mathematical Physics #310 inÃ Â Books > Science & Math > Physics > Quantum Theory #1120 inÃ Â Books > Textbooks > Science & Mathematics > Physics

Customer Reviews

`An excellent text....The postulates of quantum mechanics and the mathematical underpinnings are discussed in a clear, succint manner.' - American Scientist, from a review of the First Edition --This text refers to the Digital edition.

Reviews from the First Edition: "An excellent text Ã¢â ¬Â¦ The postulates of quantum mechanics and the mathematical underpinnings are discussed in a clear, succinct manner." (American

Scientist) "No matter how gently one introduces students to the concept of DiracÃ¢â ¬â„¢s bras and kets, many are turned off. Shankar attacks the problem head-on in the first chapter, and in a very informal style suggests that there is nothing to be frightened of." (Physics Bulletin) Reviews of the Second Edition: "This massive text of 700 and odd pages has indeed an excellent get-up, is very verbal and expressive, and has extensively worked out calculational details---all just right for a first course. The style is conversational, more like a corridor talk or lecture notes, though arranged as a text. Ã¢â ¬Â¦ It would be particularly useful to beginning students and those in allied areas like quantum chemistry." (Mathematical Reviews) Ã Â > - Clear, accessible treatment of underlying mathematics - A review of Newtonian, Lagrangian, and Hamiltonian mechanics - Student understanding of quantum theory is enhanced by separate treatment of mathematical theorems and physical postulates - Unsurpassed coverage of path integrals and their relevance in contemporary physics The requisite text for advanced undergraduate- and graduate-level students, Principles of Quantum Mechanics, Second Edition is fully referenced and is supported by many exercises and solutions. The bookÃ¢â ¬â„¢s self-contained chapters also make it suitable for independent study as well as for courses in applied disciplines. --This text refers to the Digital edition.

I will make it real simple. It has been over a half of a year since I bought this book. When I first got it, it seemed really hard, you have to really read this book line for line. With the help of scham's outline, quantum mechanics and quantum mechanics demystified I got through it without a teacher. It now seems real easy and I cannot understand why I had trouble. One review says it breaks down after chapter seven. Well it does not. Only after I started doing quantum field theory did I start to understand why this book is written the way it is. Plain and simple this book prepares you for QFT. All other Quantum Mechanics books seem easy after going through this book. Only after doing QFT do some of the chapters in this book now make sense. The chapters starting with 10 are a preparation for QFT. A good Physics book is one that prepares one to go on to harder subjects. This book does just that. Read it slow and understand it step by step, I had to re-read some chapters 3-4 times. You need strong linear algebra and partial differential equations skills. Go on youtube MIT offers linear algebra and differential equations courses, free. OFT is hard but this book paved the way. You have to derive the equations along with the author and fill in the missing steps to really get the most from this book. Good luck, not really just really hard work.

The great strength of this book is that it explains quantum mechanics extremely clearly. The downside of this book is that....it spares no expanse of the book (676 pages, about 9 inches by 6

inches in dimension!). Some of the exercises are a joke, and are mostly completed in the problem statement. All things considered, however, I'm able to visualize separate -ket spaces, degenerate subspaces, rotation operators (Chapter 12 is a *superb* supplement that explains things that I simply did not understand at a first reading of Sakurai), the Wigner-Eckart theorem, tensor operators, etc. It has been a privilege to learn QM from this book...my only complaint is that I used it in a grad-level course, and the book really could be tackled by an undergraduate. Of course...there is the venerable Griffiths for the undergraduate...and *that* text's greatest strength is its expanse of clever exercises (and its weakness: the expanse of material *left to* the exercises).I guess I'd recommend Shankar as a supplement to Griffiths, although I haven't had the experience of using the text as a stand-alone reference to understand another book.So in summary...Shankar is a cure for any doubts or shakiness in your grasp of quantum mechanics, whereas most other texts (in QM and in physics in general) are a stage upon which to let your skills in grappling with *hard* uncertainty develop. (The extreme example of this, of course, seems to be Jackson's text).

Great book. Clear and to the point. Only criticism is the example problems. They are good problems but hard to find. They are hidden in the text and only italicized. They are hard to spot if your looking for them. There are also solutions online so its good for practice. Link to solutions: [...]

As other reviewers have remarked this is an excellent book, and if you are interested in really learning quantum mechanics, this is where I'd recommend you start.Here are some of the things I particularly liked about this book, and some of the ways I thought it could have been better.The first chapter provides the necessary mathematical background for quantum mechanics. It is a long chapter, but very well done. Regardless, make no mistake, you should not attempt this book at all without a solid background in differential equations and linear algebra. This chapter is very helpful though as a review and for fixing notation. I also approved of its stated goal: to put the math first rather than trying to interleave it with the physics. Physics is hard enough without trying to tackle the math and the physics at the same time.Chapter two is a quick review of classical mechanics. Advanced classical mechanics. If you are not already comfortable with the Lagrangian and Hamiltonian formulations of classical mechanics before you attempt this book, well you probably shouldn't attempt this book. But if you are, this chapter is an excellent and concise review done with an eye towards quantum mechanics.Chapter four presents quantum mehcanics in a postulatory manner, and builds the subject deductively from there. Of the quantum mechanics books I've read, the ones that proceed in this fashion tend to be clearest, and this one is no exception.Chapter five

presents a collection of one dimensional problems. This chapter is one of the few that I felt could have been better. I did not think there was enough discussion of tunneling and scattering, which struck me as odd. Certainly I have seen other introductions to quantum mechanics do a better job with these topics.Chapter ten is on systems with more degrees of freedom and covers the tricky subject of identical particles in quantum mechanics. It is a very clear treatment.Chapters twelve and thirteen extend the treatment to three dimensional systems and the Hydrogen atom in particular. While good, I thought the author could have done a better job building intuition for the special functions that appear in this section of the book, like the spherical harmonics. The author even states that many other books provide graphs and additional information for these very important functions. Ok, so why not this one as well? For a book that is so complete in so many other ways, this omission seemed odd.Chapters fourteen and fifteen cover spin and the addition of angular momentum. Challenging topics in quantum mechanics. For the most part the discussion is very lucid, and among the best I've seen.Chapters sixteen through eigthteen cover approximation methods. They are superb. Chapter eighteen is a particular standout here. The discussion of the quantization of the electromagnetic field is outstanding, and very unusual in an introductory book.Chapter nineteen is on scattering, and is probably the clearest introduction to this (rather tricky) subject I have seen.Chapter twenty is on the Dirac equation. Almost never seen in an introductory book, this is again an outstanding feature of this work.Finally, as other reviewers have mentioned, this book discusses path integrals in two chapters: eight and twenty-one. These discussions are five star worthy. This topic is also highly unusual in an introductory book, but as the author points out it is of central importance in contemporary physics.The last chapter -- twenty-one -- is definitely the most advanced in the book. It disusses the Quantum Hall Effect, the imaginary time formalism, the connections between quantum mechanics, quantum statistical mechanics, and classical statistical mechanics via path integrals, and ends with discussion of fermionic path integrals which are central to quantum field theory. All of these are advanced topics, and the author does an excellent job preparing the reader to tackle them. Kudos!There are numerous problems throughout, most of which are rather simple.This is an excellent book for anyone looking really to sink their teeth into QM.

Love Shankar, he always try his best to explain every theory with the most possible elegant language without losing mathematical rigorous. Good for both undergraduate and graduate. But indeed it's harder than Griffiths, you need to read some paragraphs several times to be able to understand it throughly. Yes, QM is hard.Also you will probably get used to Dirac notation after

learning this book and it helps a lot to understand linear vector space and simplify a lot of hard concepts of QM.