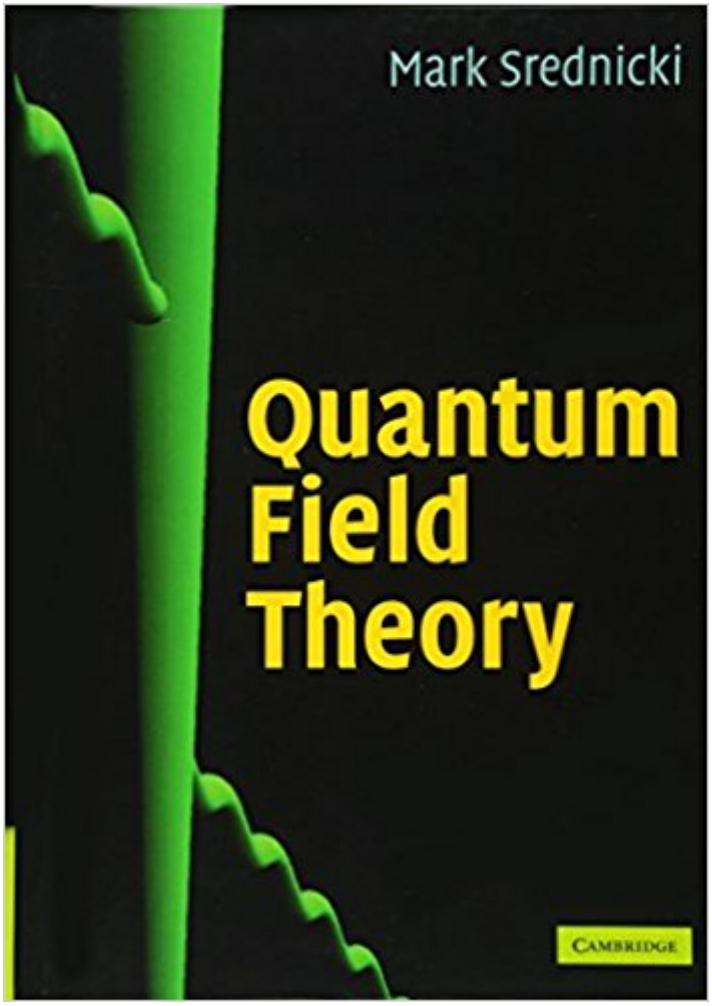
Quantum Field Theory



Synopsis

Quantum field theory is the basic mathematical framework that is used to describe elementary particles. This textbook provides a complete and essential introduction to the subject. Assuming only an undergraduate knowledge of quantum mechanics and special relativity, this book is ideal for graduate students beginning the study of elementary particles. The step-by-step presentation begins with basic concepts illustrated by simple examples, and proceeds through historically important results to thorough treatments of modern topics such as the renormalization group, spinor-helicity methods for quark and gluon scattering, magnetic monopoles, instantons, supersymmetry, and the unification of forces. The book is written in a modular format, with each chapter as self-contained as possible, and with the necessary prerequisite material clearly identified. It is based on a year-long course given by the author and contains extensive problems, with password protected solutions available to lecturers at www.cambridge.org/9780521864497.

Book Information

Hardcover: 660 pages

Publisher: Cambridge University Press; 1 edition (February 5, 2007)

Language: English

ISBN-10: 0521864496

ISBN-13: 978-0521864497

Product Dimensions: 6.8 x 1.5 x 9.7 inches

Shipping Weight: 3.2 pounds (View shipping rates and policies)

Average Customer Review: 4.1 out of 5 stars 29 customer reviews

Best Sellers Rank: #103,957 in Books (See Top 100 in Books) #42 inÃ Â Books > Science & Math > Physics > Mathematical Physics #48 inÃ Â Books > Science & Math > Physics > Nuclear Physics #96 inÃ Â Books > Science & Math > Physics > Quantum Theory

Customer Reviews

"This accessible and conceptually structured introduction to quantum field theory will be of value not only to beginning students but also to practicing physicists interested in learning or reviewing specific topics. The book is organized in a modular fashion, which makes it easy to extract the basic information relevant to the reader’s area(s) of interest. The material is presented in an intuitively clear and informal style. Foundational topics such as path integrals and Lorentz representations are included early in the exposition, as appropriate for a modern course; later material includes a detailed description of the Standard Model and other advanced topics such as instantons,

supersymetry, and unification, which are essential knowledge for working particle physicists, but which are not treated in most other field theory texts." Washington Taylor, Massachusetts Institute of Technology"Over the years I have used parts of Srednicki’s book to teach field theory to physics graduate students not specializing in particle physics. This is a vast subject, with many outstanding textbooks. Among these, Srednicki’s stands out for its pedagogy. The subject is built logically, rather than historically. The exposition walks the line between getting the idea across and not shying away from a serious calculation. Path integrals enter early, and renormalization theory is pursued from the very start...By the end of the course the student should understand both beta functions and the Standard Model, and be able to carry through a calculation when a perturbative calculation is called for." Predrag Cvitanovic, Georgia Institute of Technology"This book should become a favorite of quantum field theory students and instructors. The approach is systematic and comprehensive, but the friendly and encouraging voice of the author comes through loud and clear to make the subject feel accessible. Many interesting examples are worked out in pedagogical detail." Ann Nelson, University of Washington"I expect that this will be the textbook of choice for many quantum field theory courses. The presentation is straightforward and readable, with the author’s easy-going ’voice’ coming through in his writing. The organization into a large number of short chapters, with the prerequisites for each chapter clearly marked, makes the book flexible and easy to teach from or to read independently. A large and varied collection of special topics is available, depending on the interests of the instructor and the student." Joseph Polchinski, University of California, Santa Barbara"This is an extraordinary book, a real gem. After a cursory glance, all will have the clear impression that this is a "revolutionary" book. In my opinion, this is simply the best QFT textbook ever written... it is absolutely invaluable." Giuseppe Nardelli, Mathematical Reviews

This textbook is an essential introduction to quantum field theory, covering all the key theories necessary to understand the standard model. It is ideal for graduate students studying quantum field theory and elementary particle theory. It contains extensive problems, with solutions available to lecturers at www.cambridge.org/9780521864497.

Srednicki’s book seems like an obvious next step after reading much of Ryder’s bookÃ Â Quantum Field Theory, especially since both books employ the Feynman integral approach to quantum field theory. One topic that is addressed by Srednicki that many QTF books ignore or gloss over is that of the dotted and undotted spinor notation. Srednicki’s treatment of dotted and undotted spinors is also made more understandable by first reading Ryder’s treatment of this topic. An understanding of

dotted and undotted spinors is particularly useful if you want to read advanced treatments that address the the Spin Statistics Theorem such as those of Streater and Wightman'sÃ Â PCT, Spin and Statistics, and All ThatÃ Â and Haag'sÃ Â Local Quantum Physics: Fields, Particles, Algebras (Theoretical and Mathematical Physics). Srednicki also deserves credit in making the pdf file for his book available on his University of California at Santa Barbara (UCSB) web site for no charge. He also lists his book's typos on that web site.

I've used three different QFT books, and this books stands out, at least in some ways. The theory at the beginning of the book is especially good, as it's treatment of creation and annihilation operators is sufficiently general. By contrast, Peskin and Schroeder introduce these operators with the Klein Gordon Equation, which is not general enough because particles only satisfy the KG equation when they are on shell, and free particles. Despite formulating these operators for one special case only, they are used throughout the book. Srednicki does not make this mistake, and his introduction of ladder operators is appropriate for all theories it is used for in the book.Further, Srednicki is very well laid out, and each chapter makes sense where it is. Even if you disagree with some of the chapter placement, the book is written in a modular way, so it's pretty easy to mix and match material. (Comparing it to P&S again, P&S is not written in either a logically sound way nor is it modular). Path integrals are introduced earlier, which I believe is the easier way to learn how to derive Feynman rules. The book also anticipates renormalization from the beginning, so it's not a huge surprise when it finally happens.However, the books main scalar theory of choice is phi^3, which is an uncommon theory in other textbooks/classes. Because of this, it's not always the best reference, since most classes expect you to understand phi^4 instead, so homework assignments will be closer to Phi^4. So when it's time to get your hands dirty and really work something out, it is the case (at least for me) that a different book is in order. Of course, if your professor wants to stick close to the book, or if you are studying on your own, neither of these are a problem.Finally, the homework problems are actually pretty good. They're short enough to be reasonable (unlike some other textbooks) but at the same time they are interesting and cover a lot of material. As mentioned by another reviewer, there is a field redefinition problem that is exceptionally good.

Excellent !

it also arrange its chapters by different spins, and I love his logic. You can read it together with peskin, but you need to be careful about the notation, they are different in these two books

If you have the match and the physics and want to know about Quantum Fields then you need to read this book. But be forewarned you need to have the background or be self taught as I am to understand the book.

Good experience.

Very good text for an advanced student (mastery of QM and EM) who wishes to teach themselves relevant portions of QFT at a quantitatively relevant level.

A decent textbook used as my first intro to QFT. not the easiest to read but the structure if fine.

Privacy

FAQ & Help