

Field theory books – Physics 811

There are many good field theory books. I don't intend to directly follow any particular book but most of the material can be found in most of the books. Because the course is aimed at students of all backgrounds, I am going to ask you to pick the book that appeals to you the most. It is good to have a QFT book to turn to during the course and to be familiar with afterwards, so I would encourage you to buy a book. If you plan to have a group to work together (a fine idea) maybe you should buy different books and share. I have the books marked with a * in my office – please stop by if you would like to look through them. You can also use them as references during the course. In the following list, I generally just give the authors - the title is a variation of *Quantum Field Theory* unless otherwise noted. If you don't want to wade through this list, or are unable to choose, let me suggest Srednicki as a reasonable and safe choice.

Peskin and Schroeder *

Probably the most standard of the modern textbooks. Big – 800 pages. There is a little material on condensed matter field theories, but only after the main development of QED.

Srednicki *

New-ish text. It seems nicely pedagogical to me and might be a good alternative to Peskin and Schroeder. All the physics is developed with a scalar field first, as I will also partially do, before moving on to Dirac spinors and gauge fields.

Itzykson and Zuber*

My personal favorite. However, I am not sure that it is as pedagogical as some of the other texts.

Zee *

This is a quirky book written in a breezy style, with many condensed matter applications. It presents an excellent overview of how to really think about QFT. However, it skips all the details, so it might not be a help in solving problems. It would be useful in conjunction with a more standard introduction.

Mandl and Shaw*

I have read that many people like this book because it is very explicit. It does seem like a reasonable introduction.

Lahiri and Pal

This looks like a very good introduction. I have not seen the book (just the table of contents), but I know the second author and he has good pedagogic instincts.

Amit * (Field Theory, the Renormalization Group and Critical Phenomenon)

Solid book with a CM focus. It is overall more advanced than our introductory course will be, but there are sections of the book that should be useful.

Cheng and Li * (Gauge Theory of Elementary Particle Physics)

I like this book a lot and use it as a reference. The introductory material is reasonably detailed.

Ramond *

A good source for functional methods.

Banks

A new book that came out this fall. The contents look very promising. Its subtitle is “a concise introduction” and it does seem brief – 240 pages. I’m trying to get it for the library.

I also have in my office books by **Bjorken and Drell, Steven Weinberg, Lowell Brown, Wentzel, Henley and Thirring, La Bellac, Itzykson and Drouffe, Schweber, T.D.Lee, Bogoliubov and Shirkov, and Ryder** (I told you that there were a lot of books!) You are welcome to use this selection as references also.