PERIMETER
SCHOLARS
INTERNATIONAL

Quantum Theory
Reference Guide

20 September to 3 October 2023

Comments on Suggested References

- *Quantum Field Theory and the Standard Model* by Schwartz
  A modern introduction to quantum field theory. Most of the topics covered in this course are also covered in this textbook.

- *An Introduction to Quantum Field Theory* by Peskin and Schroeder
  The classic QFT text for many years, and still a great book to learn QFT from. Most of the topics covered in this course are also covered in this textbook. Sometimes has more detailed explanations than Schwartz.

- Lecture notes on QFT by Tong
  Easier to read than the above two references. We will cover some topics that are not discussed in Tong, and discuss some topics in greater detail than Tong.

- *Quantum Field Theory in a Nutshell* by Zee
  Zee presents many insights into QFT and is great for understanding the concepts. The book is light on mathematical details, and a number of the explanations use the functional integral formulation.

- *Quantum Field Theory* by Srednicki
  Srednicki focuses on functional integral quantization instead of canonical quantization. A few topics we will discuss are not discussed in the other suggested references.

Lecture-by-Lecture Suggested Reading

If you would like to read something other than the lecture notes, here are a few suggestions for different references that cover similar material:

- Lecture 8
  - Schwartz 3.1-3.3
  - Peskin and Schroeder 2.1, 2.2
  - Tong 1

- Lecture 9
  - Schwartz 2.3, 15.1, 15.2

- Peskin and Schroeder pages 19-26
- Tong pages 21-36

- Lecture 10
  - Schwartz 6.1
  - Peskin and Schroeder 7.2
  - Srednicki 5

- Lecture 11
  - Schwartz 6.2, 7.2
  - Peskin and Schroeder 4.2, 4.3, Klein-Gordon propagator subsection on pages 29-31
  - Tong 3.1, 3.2, 3.3, 2.7

- Lecture 12
  - Schwartz 7.1.1
  - Peskin and Schroeder 4.4
  - Tong 3.7.1

- Lecture 13
  - Schwartz 7.3, 7.4 (stop after 7.4.1)
  - Peskin and Schroeder 4.6
  - Tong 3.4, 3.5 (skip 3.5.2), 3.7.1

- Lecture 14
  - Peskin and Schroeder 7.1 (up to An Example: The Electron Self-Energy)
  - Srednicki 13, 14 (up to eqn 14.8), 16