



# Quantum Field Theory: A Modern Introduction

By Michio Kaku

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The rise of quantum electrodynamics (QED) made possible a number of excellent textbooks on quantum field theory in the 1960s. However, the rise of quantum chromodynamics (QCD) and the Standard Model has made it urgent to have a fully modern textbook for the 1990s and beyond. Building on the foundation of QED, *Quantum Field Theory: A Modern Introduction* presents a clear and comprehensive discussion of the gauge revolution and the theoretical and experimental evidence which makes the Standard Model the leading theory of subatomic phenomena. The book is divided into three parts: Part I, Fields and Renormalization, lays a solid foundation by presenting canonical quantization, Feynman rules and scattering matrices, and renormalization theory. Part II, Gauge Theory and the Standard Model, focuses on the Standard Model and discusses path integrals, gauge theory, spontaneous symmetry breaking, the renormalization group, and BPHZ quantization. Part III, Non-perturbative Methods and Unification, discusses more advanced methods which now form an essential part of field theory, such as critical phenomena, lattice gauge theory, instantons, supersymmetry, quantum gravity, supergravity, and superstrings.

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## **Editorial Review**

### **Review**

"The book provides an excellent, up-to-date account of quantum field theory and the approach to quantum gravity. It is well written and well organized to be used not only by anyone who intends to do research work in this field but also for anyone at the level of an advanced graduate student or beyond who is interested in broadening his/her perspectives on what might be the elements of a 'final theory' in physics." --Hans J. Haubold, United Nations Office for Outer Space

"Unlike older textbooks that focused on quantum electrodynamics (QED), this text centers on the Standard Model and includes gauge theory. Each chapter concludes with a problem set." --SciTech Book News

"A massive work covering a grand variety of traditional subjects dealt with in most textbooks on this subject, and has done all of us the favor of including, in addition, a good number of current research topics that are normally dealt with only in conference proceedings or specialized texts of their own. This is a lot of book, especially for the relatively modest price." --International Journal of Quantum Chemistry

"Kaku discusses a mind-boggling variety of topics. . . valuable references. . .useful." --Physics Today

"This updated and expanded version of many of the standard QFT texts is refreshingly independent. . .an effective introduction to a breathtakingly wide range of topics, and gives an admirable general ordering and emphasis of life material. . .a fascinating resource for a wealth of information and explanation. What more can one expect between two covers with such a menu?" --Australian and New Zealand Physicist

### **About the Author**

Michio Kaku is at City College of CUNY.

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#### **Michael Barth:**

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