

# Gauge Theories of the Strong, Weak, and Electromagnetic Interactions: Second Edition

*By Chris Quigg*

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
## **Gauge Theories of the Strong, Weak, and Electromagnetic Interactions: Second Edition** By Chris Quigg

This completely revised and updated graduate-level textbook is an ideal introduction to gauge theories and their applications to high-energy particle physics, and takes an in-depth look at two new laws of nature--quantum chromodynamics and the electroweak theory. From quantum electrodynamics through unified theories of the interactions among leptons and quarks, Chris Quigg examines the logic and structure behind gauge theories and the experimental underpinnings of today's theories. Quigg emphasizes how we know what we know, and in the era of the Large Hadron Collider, his insightful survey of the standard model and the next great questions for particle physics makes for compelling reading.

The brand-new edition shows how the electroweak theory developed in conversation with experiment. Featuring a wide-ranging treatment of electroweak symmetry breaking, the physics of the Higgs boson, and the importance of the 1-TeV scale, the book moves beyond established knowledge and investigates the path toward unified theories of strong, weak, and electromagnetic interactions. Explicit calculations and diverse exercises allow readers to derive the consequences of these theories. Extensive annotated bibliographies accompany each chapter, amplify points of conceptual or technical interest, introduce further applications, and lead readers to the research literature. Students and seasoned practitioners will profit from the text's current insights, and specialists wishing to understand gauge theories will find the book an ideal reference for self-study.

- Brand-new edition of a landmark text introducing gauge theories
- Consistent attention to how we know what we know
- Explicit calculations develop concepts and engage with experiment
- Interesting and diverse problems sharpen skills and ideas
- Extensive annotated bibliographies

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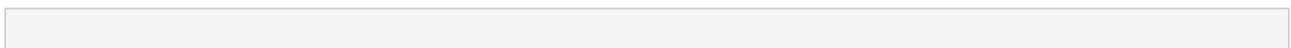
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#### Review

"Building on the 1983 first edition of the work, ... widely used as a textbook in advanced graduate courses, the new iteration achieves a new level of excellence and completeness that will make it a valued resource for graduate students and researchers. *Gauge Theories of the Strong, Weak, and Electromagnetic Interactions* will, for many years, remain as a standard textbook in particle theory. I highly recommend it for a two-semester advanced graduate course in particle physics and as a valuable addition to the collection of every particle physicist." -- **R. N. Mohapatra, Physics Today**

"It is hard to find words to describe Quigg's clean, high-quality work; as an author he is a virtuoso performer."--**Johann Rafelski, CERN Courier**

"I find this book extremely useful, because it signifies the importance of modern ideas and perspectives in particle physics."--**Gert Roepstorff, Zentralblatt MATH**

"*Gauge Theories of the Strong, Weak, and Electromagnetic Interactions* will, for many years, remain as a standard textbook in particle theory. I highly recommend it for a two-semester advanced graduate course in particle physics and as a valuable addition to the collection of every particle physicist."--**Rabi Mohapatra, Physics Today**

"It is hard to find words to describe Quigg's clean, high-quality work: as an author he is a virtuoso performer."--**Johann Rafelski, CERN Courier**

#### From the Back Cover

"*Gauge Theories of the Strong, Weak, and Electromagnetic Interactions* is an indispensable reference for both advanced graduate students and experts in collider physics phenomenology. Quigg's broad experience is seen in the clear and thorough exposition of the principles underlying the interactions of gauge fields and elementary particles. The book's numerous examples will aid students in understanding technical details."--**Sally Dawson, Brookhaven National Laboratory**

"This textbook represents the author's state-of-the-art knowledge of particle physics and the history of its modern formulation. Providing a clear picture of physical laws and new perspectives, the book is elegantly written and wonderfully engaging."--**Christopher Tully, Princeton University**

"This nearly perfect textbook will be valuable for advanced graduate students and researchers working in theoretical and experimental particle physics, and related fields such as cosmology and nuclear theory. With elegance and clarity, it sets a good example for other texts to follow. I salute the author for such a great piece of work."--**Tao Han, University of Pittsburgh**

#### About the Author

**Chris Quigg** is a member of the Theoretical Physics Department of the Fermi National Accelerator

Laboratory. He received the American Physical Society's 2011 J. J. Sakurai Prize for outstanding achievement in particle theory.

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