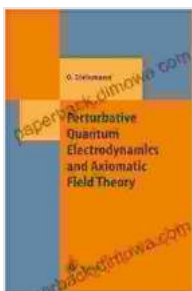


# Perturbative Quantum Electrodynamics and Axiomatic Field Theory: Delving into the Foundations of Modern Physics

In the vast tapestry of scientific inquiry, the exploration of the subatomic realm stands as a testament to our insatiable curiosity and relentless pursuit of knowledge. Among the groundbreaking theories that have shaped our understanding of this enigmatic domain, perturbative quantum electrodynamics (QED) and axiomatic field theory occupy places of paramount importance.

Perturbative QED, developed primarily by the esteemed physicist Richard Feynman, provides a powerful framework for comprehending the interactions of light and matter at the subatomic level. It posits that these interactions can be described as a sequence of particle exchanges, allowing physicists to make precise predictions about a vast range of phenomena, including the scattering of electrons and the emission of photons.



## Perturbative Quantum Electrodynamics and Axiomatic Field Theory (Theoretical and Mathematical Physics)

by Othmar Steinmann

★★★★☆ 4.2 out of 5

Language : English

File size : 3910 KB

Text-to-Speech: Enabled

Screen Reader: Supported

Print length : 364 pages

Hardcover : 130 pages

Item Weight : 4.7 ounces

Dimensions : 7.32 x 0.48 x 10.46 inches

Paperback : 48 pages



Axiomatic field theory, on the other hand, offers a rigorous foundation for the study of quantum fields, the ethereal entities that permeate the fabric of spacetime and give rise to the fundamental forces of nature. It employs mathematical axioms to establish the properties and behaviors of these fields, laying the groundwork for a comprehensive understanding of particle physics.

In the book "Perturbative Quantum Electrodynamics and Axiomatic Field Theory," renowned physicist R. Shankar masterfully weaves together these two pillars of modern physics, providing a comprehensive and accessible to their theoretical underpinnings. With meticulous clarity and an unwavering dedication to pedagogical excellence, Shankar guides readers through the intricate concepts and mathematical intricacies that underpin these fields.

Drawing upon his decades of experience as an esteemed educator and researcher, Shankar presents a lucid and engaging exposition of perturbative QED, delving into its fundamental principles, techniques, and applications. He elucidates the concept of renormalization, a crucial tool for eliminating infinities that arise in perturbative calculations, and underscores its profound implications for our understanding of quantum field theory.

Venturing beyond the confines of QED, Shankar extends his exploration to encompass axiomatic field theory. With characteristic rigor and clarity, he introduces the fundamental axioms that govern the behavior of quantum fields, laying bare the mathematical underpinnings of such phenomena as

particle creation and annihilation, as well as the emergence of fundamental forces.

Through a series of illuminating examples and thought-provoking exercises, Shankar demonstrates the practical applications of these theories in a wide range of physical contexts. Readers are guided through the calculation of scattering cross-sections, the analysis of bound states, and the exploration of quantum field theories beyond QED.

Enriched by Shankar's unparalleled pedagogical skills, "Perturbative Quantum Electrodynamics and Axiomatic Field Theory" transcends the boundaries of a mere textbook, transforming into a captivating intellectual journey for both students and seasoned physicists alike. It invites readers to delve into the very foundations of modern physics, fostering a profound appreciation for the elegance, power, and transformative potential of theoretical physics.

For those seeking to deepen their understanding of the subatomic realm, this book stands as an indispensable resource. It is a testament to Shankar's exceptional ability to distill complex scientific concepts into a form that is both accessible and deeply engaging.

### **Key Features:**

- Comprehensive and rigorous treatment of perturbative quantum electrodynamics and axiomatic field theory
- Clear and accessible exposition by renowned physicist R. Shankar
- In-depth coverage of renormalization and its implications for quantum field theory

- Practical applications of QED and axiomatic field theory in a wide range of physical contexts
- Illuminating examples and thought-provoking exercises to enhance understanding
- Ideal for students, researchers, and anyone seeking to delve into the foundations of modern physics

**Additional Information:**

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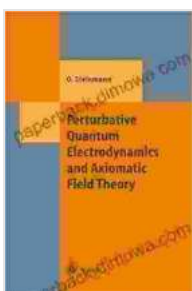
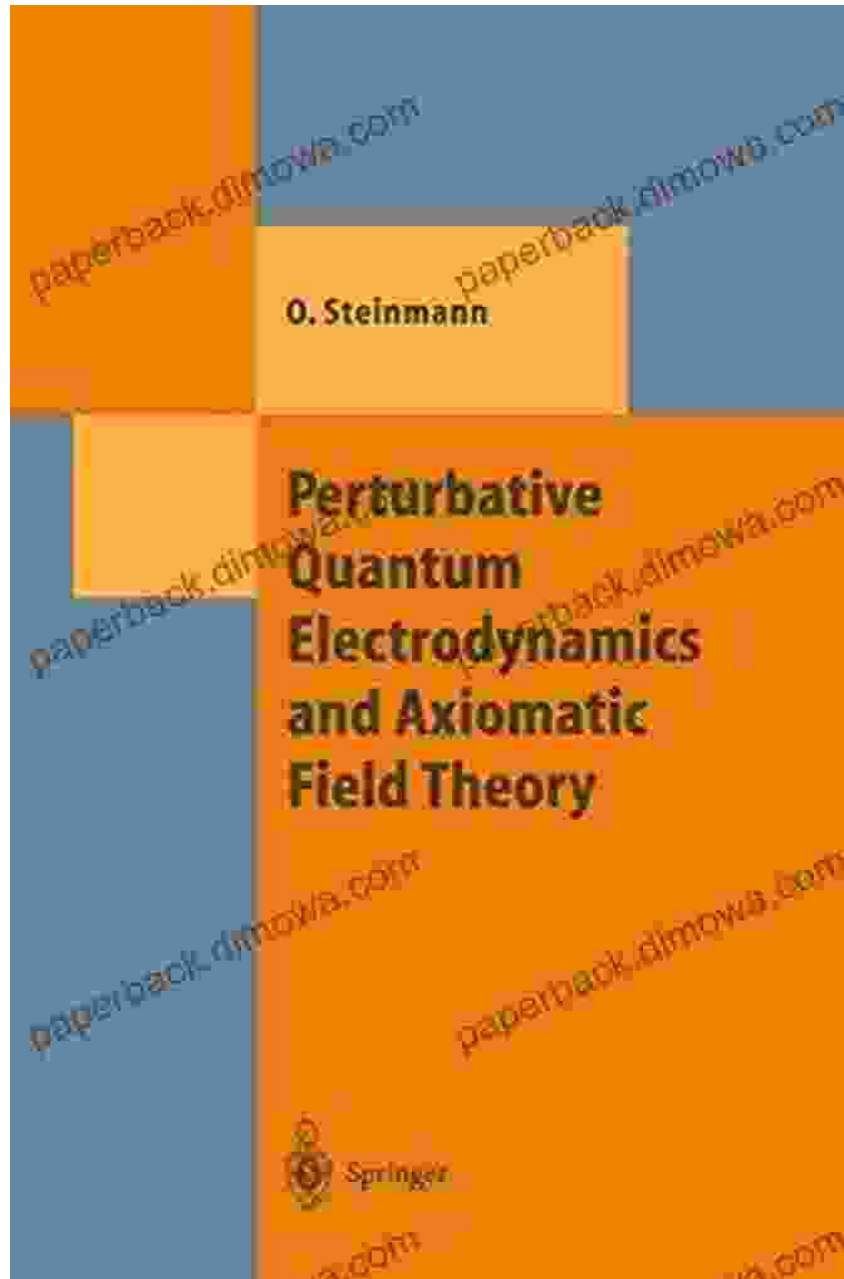
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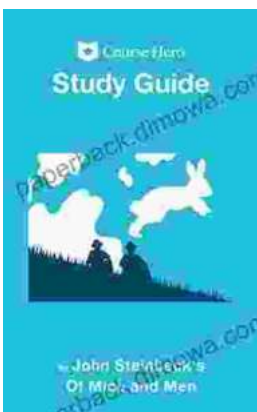
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