



# PARTICLES AND QUANTUM FIELDS

*KLEINERT HAGEN*

Download now

[Click here](#) if your download doesn't start automatically

# PARTICLES AND QUANTUM FIELDS

KLEINERT HAGEN

## PARTICLES AND QUANTUM FIELDS KLEINERT HAGEN

This is an introductory book on elementary particles and their interactions. It starts out with many-body Schrödinger theory and second quantization and leads, via its generalization, to relativistic fields of various spins and to gravity. The text begins with the best known quantum field theory so far, the quantum electrodynamics of photon and electrons (QED). It continues by developing the theory of strong interactions between the elementary constituents of matter (quarks). This is possible due to the property called *asymptotic freedom*. On the way one has to tackle the problem of removing various infinities by renormalization. The divergent sums of infinitely many diagrams are performed with the renormalization group or by *variational perturbation theory* (VPT). The latter is an outcome of the Feynman-Kleinert variational approach to path integrals discussed in two earlier books of the author, one representing a comprehensive treatise on path integrals, the other dealing with critical phenomena. Unlike ordinary perturbation theory, VPT produces uniformly convergent series which are valid from weak to strong couplings, where they describe critical phenomena.

The present book develops the theory of effective actions which allow to treat quantum phenomena with classical formalism. For example, it derives the observed anomalous power laws of strongly interacting theories from an extremum of the action. Their fluctuations are not based on Gaussian distributions, as in the perturbative treatment of quantum field theories, or in asymptotically-free theories, but on deviations from the average which are much larger and which obey power-like distributions.

Exactly solvable models are discussed and their physical properties are compared with those derived from general methods. In the last chapter we discuss the problem of quantizing the classical theory of gravity.

### Contents:

- Fundamentals
- Field Formulation of Many-Body Quantum Physics
- Interacting Nonrelativistic Particles
- Free Relativistic Particles and Fields
- Classical Radiation
- Relativistic Particles and Fields in External Electromagnetic Potential
- Quantization of Relativistic Free Fields
- Continuous Symmetries and Conservation Laws. Noether's Theorem
- Scattering and Decay of Particles
- Quantum Field Theoretic Perturbation Theory
- Extracting Finite Results from Perturbation Series. Regularization, Renormalization
- Quantum Electrodynamics
- Formal Properties of Perturbation Theory
- Functional-Integral Representation of Quantum Field Theory
- Systematic Graphical Construction of Feynman Diagrams
- Spontaneous Symmetry Breakdown
- Scalar Quantum Electrodynamics
- Exactly Solvable  $O(N)$ -Symmetric  $\phi^4$ -Theory for Large  $N$
- Nonlinear  $\sigma$ -Model

- The Renormalization Group
- Critical Properties of Nonlinear  $\sigma$ -Model
- Functional-Integral Calculation of Effective Action. Loop Expansion
- Exactly Solvable  $O(N)$ -Symmetric Four-Fermion Theory in  $2+\epsilon$  Dimensions
- Internal Symmetries of Strong Interactions
- Symmetries Linking Internal and Spacetime Properties
- Hadronization of Quark Theories
- Weak Interactions
- Nonabelian Gauge Theory of Strong Interactions
- Cosmology with General Curvature-Dependent Lagrangian
- Einstein Gravity from Fluctuating Conformal Gravity
- Purely Geometric Part of Dark Matter

**Readership:** Students and researchers in theoretical physics.

 [Download PARTICLES AND QUANTUM FIELDS ...pdf](#)

 [Read Online PARTICLES AND QUANTUM FIELDS ...pdf](#)

## Download and Read Free Online PARTICLES AND QUANTUM FIELDS KLEINERT HAGEN

---

### From reader reviews:

#### **Rebecca Burks:**

As people who live in typically the modest era should be upgrade about what going on or data even knowledge to make them keep up with the era which is always change and progress. Some of you maybe will update themselves by studying books. It is a good choice for yourself but the problems coming to you is you don't know what type you should start with. This PARTICLES AND QUANTUM FIELDS is our recommendation to help you keep up with the world. Why, because this book serves what you want and need in this era.

#### **Angela Gagne:**

This PARTICLES AND QUANTUM FIELDS is great publication for you because the content which is full of information for you who all always deal with world and have to make decision every minute. This particular book reveal it facts accurately using great manage word or we can claim no rambling sentences included. So if you are read it hurriedly you can have whole information in it. Doesn't mean it only gives you straight forward sentences but tough core information with beautiful delivering sentences. Having PARTICLES AND QUANTUM FIELDS in your hand like keeping the world in your arm, details in it is not ridiculous one. We can say that no guide that offer you world throughout ten or fifteen minute right but this book already do that. So , it is good reading book. Hello Mr. and Mrs. stressful do you still doubt which?

#### **Richard Oneal:**

Reading a book being new life style in this 12 months; every people loves to study a book. When you study a book you can get a wide range of benefit. When you read textbooks, you can improve your knowledge, mainly because book has a lot of information onto it. The information that you will get depend on what forms of book that you have read. If you would like get information about your analysis, you can read education books, but if you want to entertain yourself read a fiction books, this sort of us novel, comics, as well as soon. The PARTICLES AND QUANTUM FIELDS will give you new experience in examining a book.

#### **Gloria Quinones:**

In this age globalization it is important to someone to receive information. The information will make someone to understand the condition of the world. The condition of the world makes the information much easier to share. You can find a lot of references to get information example: internet, magazine, book, and soon. You can view that now, a lot of publisher this print many kinds of book. The book that recommended to you personally is PARTICLES AND QUANTUM FIELDS this reserve consist a lot of the information on the condition of this world now. This kind of book was represented how do the world has grown up. The dialect styles that writer use for explain it is easy to understand. The writer made some exploration when he makes this book. Here is why this book suitable all of you.

**Download and Read Online PARTICLES AND QUANTUM  
FIELDS KLEINERT HAGEN #70QRB4Y86OH**

## **Read PARTICLES AND QUANTUM FIELDS by KLEINERT HAGEN for online ebook**

PARTICLES AND QUANTUM FIELDS by KLEINERT HAGEN Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read PARTICLES AND QUANTUM FIELDS by KLEINERT HAGEN books to read online.

### **Online PARTICLES AND QUANTUM FIELDS by KLEINERT HAGEN ebook PDF download**

**PARTICLES AND QUANTUM FIELDS by KLEINERT HAGEN Doc**

**PARTICLES AND QUANTUM FIELDS by KLEINERT HAGEN Mobipocket**

**PARTICLES AND QUANTUM FIELDS by KLEINERT HAGEN EPub**