

FOREWORD

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“... Quantum Chromodynamics (QCD), the theory of the strong force, is arguably the most comprehensive of the quantum field theories in use today, and in principle is a consistent closed theory with infinite bandwidth [...].

I think that [it is] necessary that the hadron physics community organizes itself better. It must not only identify itself and exhibit some political strength, but it must also define better what hadron physics comprises, what its fundamental scientific goals are, what the experimental programs are that deserve the greatest attention, and what the basic challenges to theory are [...].

But most fundamental of all is that there exists a vital community of experimental and theoretical physicists just doing hadron physics, no matter what the obstacles.”

James D. Bjorken (hep-ph/0006180 and hep-ph/0008048)

This book contains 38 reviews covering all aspects of (analytical) quantum chromodynamics, as we know it today. The articles have been written by recognized experts in this field, on the occasion of the 75th birthday of Professor Boris Ioffe. Combining features of a handbook and a textbook, this is the most comprehensive source of information on the current status of QCD. It is intended for students as well as mature physicists, both theorists and experimentalists.

Each review is self-contained and pedagogically structured, providing the general formulation of the problem, telling where it stands with respect to other issues, why it is interesting and important, presenting the history of the subject, qualitative insights, and so on. The first part of the book is historical in nature. It includes, among other articles, Ioffe's and Orlov's memoirs on high energy physics in the 1950's, a note by Ludwig Faddeev, on the early work on the covariant quantization of the Yang-Mills theory, and an essay on the discovery of asymptotic freedom written by David Gross.

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