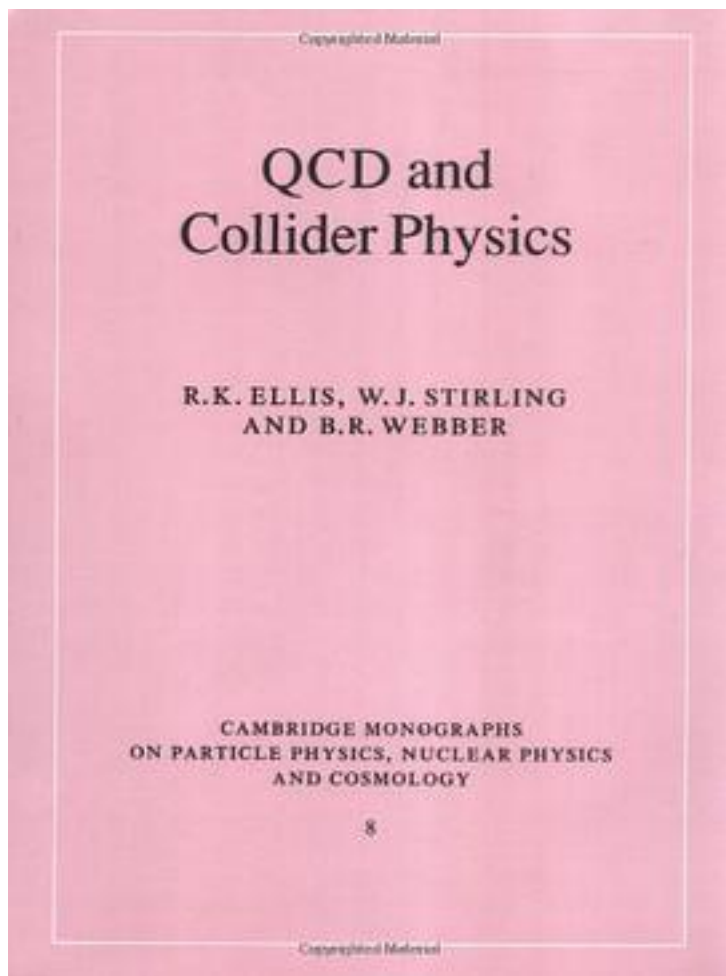


# QCD and Collider Physics



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One of the triumphs of modern particle physics has been the extent to which Quantum Chromodynamics (QCD) has successfully accounted for the strong interaction

processes observed at high-energy particle colliders, for example the production of heavy quarks and jets of particles, and the short-distance parton structure of the proton. This book gives a detailed overview of collider physics with special emphasis on the study of QCD. After a general description of the QCD Lagrangian, and the properties of asymptotic freedom and colour confinement which derive from it, the most important applications at high-energy colliders are described in detail. These include the production of jets, heavy quarks, electroweak gauge bosons and Higgs bosons. The various methods of measuring the strong coupling constant are summarised. Many of the theoretical results are calculated from first principles, and the book will be both a textbook and a valuable source of reference material for all particle physicists.

作者介绍:

<http://www.hep.phy.cam.ac.uk/theory/webber/QCDbook.html>

Contents

Preface; 1. Fundamentals of QCD; 2. Asymptotic freedom and confinement; 3. QCD in electron-positron annihilation; 4. Deep inelastic scattering; 5. Parton branching and jet simulation; 6. Jet properties beyond fixed order; 7. Hadroproduction of jets and photons; 8. Electroweak interactions; 9. The production of vector bosons; 10. Heavy quarks; 11. Higgs bosons at high energy colliders; 12. Measurements of the strong coupling constant; Index.

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