

## QCD references

A few references to go along with the lecture. The list below will be extended as the lecture progresses.

### A few original references

Strong interactions as an SU(3) gauge theory?

- H. Fritzsch, Murray Gell-Mann, and H. Leutwyler. Advantages of the Color Octet Gluon Picture. *Phys. Lett. B*, 47:365–368, 1973

Discovery of asymptotic freedom

- David J. Gross and Frank Wilczek. Ultraviolet Behavior of Nonabelian Gauge Theories. *Phys. Rev. Lett.*, 30:1343–1346, 1973
- H. David Politzer. Reliable Perturbative Results for Strong Interactions? *Phys. Rev. Lett.*, 30:1346–1349, 1973

Renormalization, dimensional regularization

- Gerard 't Hooft and M.J.G. Veltman. Regularization and Renormalization of Gauge Fields. *Nucl. Phys. B*, 44:189–213, 1972

Chiral Perturbation Theory (CHPT)

- Steven Weinberg. Phenomenological Lagrangians. *Physica A*, 96(1-2):327–340, 1979
- J. Gasser and H. Leutwyler. Chiral Perturbation Theory to One Loop. *Annals Phys.*, 158:142, 1984
- J. Gasser and H. Leutwyler. Chiral Perturbation Theory: Expansions in the Mass of the Strange Quark. *Nucl. Phys. B*, 250:465–516, 1985

Soft-Collinear Effective Theory (SCET)

- Christian W. Bauer, Sean Fleming, Dan Pirjol, and Iain W. Stewart. An Effective field theory for collinear and soft gluons: Heavy to light decays. *Phys. Rev. D*, 63:114020, 2001, hep-ph/0011336
- Christian W. Bauer, Dan Pirjol, and Iain W. Stewart. Soft collinear factorization in effective field theory. *Phys. Rev. D*, 65:054022, 2002, hep-ph/0109045
- M. Beneke, A.P. Chapovsky, M. Diehl, and T. Feldmann. Soft collinear effective theory and heavy to light currents beyond leading power. *Nucl. Phys. B*, 643:431–476, 2002, hep-ph/0206152

## QCD text books

All modern field theory books contain a discussion of QCD, e.g.

- Michael E. Peskin and Daniel V. Schroeder. *An Introduction to quantum field theory*. Addison-Wesley, Reading, USA, 1995
- George F. Sterman. *An Introduction to quantum field theory*. Cambridge University Press, 8 1993
- Matthew D. Schwartz. *Quantum Field Theory and the Standard Model*. Cambridge University Press, 3 2014

The following two books focus on collider QCD

- R.Keith Ellis, W.James Stirling, and B.R. Webber. *QCD and collider physics*, volume 8. Cambridge University Press, 2 2011
- John Campbell, Joey Huston, and Frank Krauss. *The Black Book of Quantum Chromodynamics: A Primer for the LHC Era*. Oxford University Press, 12 2017

## Specialized topics

More on Lie Groups and Lie Algebras

- R.N. Cahn. *Semi-Simple Lie Algebras and Their Representations*. Dover Publications, 2014

A detailed discussion of group-theory factors in Feynman diagrams is in

- T. van Ritbergen, A.N. Schellekens, and J.A.M. Vermaseren. Group theory factors for Feynman diagrams. *Int. J. Mod. Phys. A*, 14:41–96, 1999, hep-ph/9802376

Renormalization in QCD

- Matthias Neubert. Les Houches Lectures on Renormalization Theory and Effective Field Theories. *Les Houches Lect. Notes*, 108, 2020, 1901.06573

A detailed discussion of integrating out heavy particles is given in

- Andrey G. Grozin. Introduction to effective field theories. 1. Heisenberg-Euler effective theory, decoupling of heavy flavours. In *Helmholtz International School - Workshop on Calculations for Modern and Future Colliders*, 8 2009, 0908.4392

Introductions to Chiral Perturbation Theory (CHPT)

- Antonio Pich. Effective field theory: Course. In *Les Houches Summer School in Theoretical Physics, Session 68: Probing the Standard Model of Particle Interactions*, pages 949–1049, 6 1998, hep-ph/9806303

- Stefan Scherer. Introduction to chiral perturbation theory. *Adv. Nucl. Phys.*, 27:277, 2003, hep-ph/0210398
- Bastian Kubis. An Introduction to chiral perturbation theory. In *Workshop on Physics and Astrophysics of Hadrons and Hadronic Matter*, 3 2007, hep-ph/0703274
- Stefan Scherer and Matthias R. Schindler. *A Primer for Chiral Perturbation Theory*, volume 830. 2012
- Antonio Pich. Effective Field Theory with Nambu-Goldstone Modes. *Les Houches Lect. Notes*, 108, 2020, 1804.05664

#### Introductions to Soft-Collinear Effective Theory (SCET)

- Thomas Becher, Alessandro Broggio, and Andrea Ferroglia. *Introduction to Soft-Collinear Effective Theory*, volume 896. Springer, 2015, 1410.1892
- Thomas Becher. Les Houches Lectures on Soft-Collinear Effective Theory. *Les Houches Lect. Notes*, 108, 2020, 1803.04310