

Lectures of the
Regional Training Network in Theoretical Physics

Quantum Chromodynamics, part 2
Akaki Rusetsky (University of Bonn)

Theory: Wednesday 13:00-15:00,
Exercises Thursday 15:00-17:00 (German time)
Prerequisites: Quantum Mechanics 1+2, Quantum Field Theory 1

Plan:

1. Renormalization group in QCD; QCD scale
2. Deep inelastic scattering; Structure functions
3. Operator product expansion; Renormalization of the composite operators
4. Introduction to lattice QCD
5. Instantons; Theta-vacua; Strong CP problem and axions
6. Low-energy effective field theories of QCD

Literature:

1. T. Muta, Foundations of Quantum Chromodynamics
2. F.J. Yndurain, The Theory of Quark and Gluon Interactions,
3. R. Rajaraman, An Introduction to Solitons and Instantons in Quantum Field Theory