Physics of Strong Interactions

Winter 2015/2016

Course description: We will discuss physics of strong interactions. See the course syllabus on the next page for details.

Lectures: Prof. Kirill Melnikov (kirill.melnikov@kit.edu). Office hours: room 11/06, Monday, 10-11 am.

Exercises: Dr. Matthew Dowling (matthew.dowling@kit.edu) 11/19 ; Office hours: (send an e-mail or simply stop by)

Literature: Although we will not follow any book in this leecture, it might be useful to consult ``Weak interactions and modern particle theory" by H. Georgi, ``Dynamics of the Standard Model" by J. Donoghie, E. Golowich and B. Holstein.

Lectures: Friday, 11.30-13.00 , kleine HS A

Exercises: to be determined

Course Syllabus

Dates	Lecture
23/10/15 30/10/15	QCD Lagrangian, general properties, origin of the asymptotic freedom Uniqueness of QCD as a gauge theory of spin-one particle
06/11/15 13/11/15	Form factors and hadronic matrix elements Chiral symmetry in QCD and its breaking: linear and non-linear sigma-models
20/11/15 27/11/15	Chirtal Lagrangian for the SU(2) group; pion scattering at low energies External fields and the chiral Lagrangian; the pion charge radius
04/12/15 11/12/15	Chiral Lagrangian for the SU(3); relations between meson and quark meson masses Quantum anomalies and the WZW Lagrangian
18/12/15 08/01/16	Operator product analysis of e+e- annihilation QCD sum rules, meson parameters and QCD condensates
15/01/16 22/01/16	Deep inelastic scattering and the parton model Operator analysis of deep inelastic scattering, parton distribution functions from QCD
29/01/16 05/02/16	Parton collinear splittings Altarelli-Parisi equation and collinear evolution
12/02/16	Recap