

Theoretische Elementarteilchenphysik

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SS 2015

Mo, 12 - 14 Uhr (Lorentz Raum 05-127)
Fr, 10 - 12 Uhr (Lorentz Raum 05-127)

Topics

Part I: Foundations

- Abelian and non-abelian gauge theories, Feynman rules
- Quantization of an abelian gauge theory
- Quantization of a non-abelian gauge theory
- Loop diagrams and renormalization
- Running coupling constant and asymptotic freedom

Part II: Applications (a selection of...)

- Deep inelastic lepton-nucleon scattering: parton model, structure functions, spin of nucleon
- Standard Model of electroweak interactions
- Neutrino Physics

Literature

Field theory / QCD :

- M.E. Peskin and D. V. Schroeder,
An Introduction to Quantum Field theory
(Westview Press, Boulder, 1995).
- M. Srednicki,
Quantum Field Theory
(Cambridge University Press, Cambridge, 2007).
- T. Muta, *Foundations of Quantum Chromodynamics*
(World Scientific, Singapore, 1998).

Collider Physics :

- R.K. Ellis, W.J. Stirling, B.R. Webber, *QCD and Collider Physics*
(Cambridge University Press, Cambridge, 2003).