



**Lecture Course in the Integrated Research Training Group (IRTG)
of the SFB 676 "Particles, Strings and the Early Universe"**

Summer Term 2018

Quantum Field Theory II

G. Arutyunov

Course Description:

Quantum field theories emerged from the confluence of quantum mechanics and special relativity, and provide an amazingly accurate theoretical framework for describing the behaviour of subatomic particles and forces. This course is based on the course Quantum Field Theory I and contains renormalization techniques and the S-matrix of QED. It discusses the electron self-energy, the vacuum polarization, and the anomalous magnetic moment of the electron. Non-abelian gauge theories will be covered, the covariant Faddeev–Popov Method and the BRST-Symmetry will be introduced. Spontaneous symmetry breaking, the Goldstone theorem as well as the Higgs mechanism also belong to the syllabus. Topological topics of QFT (Solitons, Monopoles, Instantons) will be treated as well.

Prerequisites:

Special Relativity, Electrodynamics, Quantum Mechanics, Quantum Field Theory I.

Literature:

Lecture notes by G. Arutyunov.

Date and Place: Mon, 8:30 – 10:00, Hörsaal III, Jungiusstraße 9

Wed, 8:45 – 10:15, Hörsaal III, Jungiusstraße 9

Problem Classes: Mon, 10:15-11.45, SR 2+3, Jungiusstraße 9

Starting on: 9 April 2018

Starting on: 4 April 2018