UH

Universität Hamburg
DER FORSCHUNG I DER LEHRE I DER BILDUNG

CHAMPP
CENTER IN HAMBURG FOR
ASTRO-, MATHEMATICAL AND
PARTICLE PHYSICS

LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

Summer Term 2022

Quantum Field Theory II

Timo Weigand

Course Description:

This course is the second part of an introduction to Quantum Field Theory, building upon the results obtained in the Master course Quantum Field Theory I taught in winter term 2021/22. The material discussed forms the theoretical basis for our current understanding of particle physics and, more generally, is indispensible for everyone who aims to study modern theoretical physics. The topics include:

- Path integral quantisation
- Renormalisation of Quantum Field Theory
- Quantisation of Yang-Mills theory
- Symmetries in QFT:
  Anomalies, spontaneous symmetry breaking, Higgs mechanism
- Instantons and non-perturbative aspects (time permitting)

Prerequisites:

The course builds upon the material discussed in QFT I:
- Canonical quantisation of the free scalar field, the free spin 1/2 field and the free spin 1 field
- Perturbation theory, Feynman rules and scattering theory
- QED at tree-level and basic concepts of its renormalisation at 1-loop

Date and Place:	Wed, 09:15 – 10:45, SR 2, Building 2a, Bahrenfeld
	Thu 12:00– 13:30, SR 2, Building 2a, Bahrenfeld
Problem Classes:	Wed, 11:15 – 12:45, SR 2, Building 2a, Bahrenfeld
Starting on:	6 April, 2022