Module title

FOKUS Research Module Relativistic Quantum Field Theory with Mini Research Project

Abbreviation

11-FM-RQFT-MF-092-m01

Module coordinator

chairperson of examination committee

Module offered by

Faculty of Physics and Astronomy

ECTS

16

Method of grading

Only after succ. compl. of module(s)

Duration

1 semester

Module level

graduate

Other prerequisites

Lectures Theoretische Physik (Theoretical Physics); Quantenmechanik 2 (Quantum Mechanics 2) recommended.

Contents

Specific and advanced knowledge of independent scientific work in the specialist field of Relativistic Quantum Field Theory. Symmetries, Lagrange formalism for fields, field quantisation, gauge principle and interaction, perturbation theory, Feynman rules, quantum electrodynamic processes in Born approximation, radiative corrections, renormalisation.

Intended learning outcomes

The students have special and advanced knowledge of independent scientific work in the field of relativistic quantum field theory. They know the principles and mathematical basics of relativistic quantum field theory and are able to apply perturbation theory and Feynman rules. They are able to summarise the acquired knowledge in an oral presentation. They are able to successfully implement the acquired methods in a mini research project and to write down the results in a report.

Courses

Relativistische Quantenfeldtheorie (Relativistic Quantum Field Theory): V (4 weekly contact hours) + Ü/P (2 weekly contact hours), German or English, once a year (winter semester)
Kompaktseminar Relativistische Quantenfeldtheorie (Block Taught Seminar Relativistic Quantum Field Theory): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (1 to 3 days) held towards the end of semester break or at the beginning of the subsequent semester)
Miniforschungsprojekt Relativistische Quantenfeldtheorie (Mini Research Project Relativistic Quantum Field Theory): P (2 weekly contact hours), German or English, details on availability to be announced (either block taught during semester break or approx. 3 weeks part time)

Method of assessment

This module has the following assessment components
1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages)
2. Seminar: talk (approx. 30 to 45 minutes)
3. Research project: project report (approx. 8 pages)

Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Assessment component 1 will be offered once a year in the winter semester; details on when assessment components 2 and 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.

Additional information

Referred to in LPO I (examination regulations for teaching-degree programmes)
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