



PHYS2610 Quantum electrodynamics

[30h] 5 credits

This course is taught in the 1st semester

Teacher(s): Jean-Marc Gérard
Language: French
Level: Second cycle

Aims

- (1) To provide the basic language used to describe quantum systems with an infinite numbers of degrees of freedom.
- (2) To study in detail quantum electrodynamics, the prototype of a quantum field theory, including renormalization.

Main themes

The contents vary from one year to another, depending on the teacher who gives the course. The main themes are the following:

- Classical electromagnetism
- Canonical quantization and covariant quantization
- QED symmetry
- Mass and charge renormalization
- Feynman rules in QED and applications

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Prerequisites: mandatory programme PHYS 21; the courses PHYS 2300, Advanced quantum mechanics (II) and PHYS 2123, Laboratory of theoretical and mathematical physics.

Evaluation: written and oral examination.

Reference books: Mandl-Shaw, Quantum Field Theory; Peskin-Schroeder, An Introduction to Quantum Field Theory.

Openings:

PHYS 2221, Special questions of mathematical physics

PHYS 2310, Quantum mechanics (III) relativist

PHYS 2440, Special questions of theoretical physics

Openings: 3d cycle teaching and research in theoretical physics

Other credits in programs

PHYS22/G Deuxième licence en sciences physiques (5 credits)