Module: Specialization: Experimental Physics

Module No.: physics61a

Course: Quantum Optics

Course No.: physics631

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	3+1	6	WT

Requirements for Participation:

Preparation:

Form of Testing and Examination:
Examination written or oral (announced at the beginning of the module).
Prerequisite for participation in the exam: successful work within the exercises.

Length of Course:
1 semester

Aims of the Course:
Make the students understand quantum optics and enable them to practically apply their knowledge in research and development.

Contents of the Course:
Quantization of the electromagnetic field, single-mode quantum optics
Representations of the light field; Quasi-probabilities
Coherence, correlation functions;
Nonclassical light
Interaction of quantized radiation and atoms;
Introduction to quantum information

Recommended Literature:
R. Loudon; The quantum theory of light (Oxford University Press 2000)
G. J. Milburn, D. F. Walls; Quantum Optics (Springer 1994)
C. Gerry, P. Knight; Introductory quantum optics (Cambridge University Press 2004)
D. Meschede; Optics, Light and Lasers (Wiley-VCH, 3rd ed. 2017)
M. O. Scully, M. S. Zubairy; Quantum Optics (Cambridge 1997)
P. Meystre, M. Sargent; Elements of Quantum Optics (Springer 1999)