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Lecture:

Wed. 16:00–18:00 SRTP 0.179
Fri. 16:00–18:00 SRTL 307

Tutorial:

Thu. 10:00–12:00 SR 02.779

CONTENT:

- Quantization of the EM field; coherent states, non-classical states, phase-space representations
- Atom-field interactions; spontaneous emission, cavity quantum electrodynamics
- Master equations, quantum noise and input-output formulation
- Optical Bloch equations, lambda-systems and adiabatic passage
- Resonance fluorescence and light scattering
- Photodetection and photon statistics
- Quantum jumps and quantum trajectories
- Quantum non-demolition measurements
- Laser cooling of atoms

BIBLIOGRAPHY:

Note: There is no required textbook.

- Quantum optics — M.O. Scully and M.S. Zubairy
- Quantum Noise — C. Gardiner and P. Zoller
- Atom-photon interactions — C. Cohen-Tannoudji, J. Dupont-Roc and G. Grynberg
- The quantum theory of light — R. Loudon
- Optical coherence and quantum optics — L. Mandel and E. Wolf

PREREQUISITES:

- Electromagnetism
- Quantum Mechanics

EXAMINATION: written final exam. To take the final exam there is a minimum requirement of presenting two exercises during the tutorials.