

Vorlesung Quantenoptik

3SWS + 1 SWS Übungen

VL: Di/Mo 11-13, NEW 14 3'12

UE: Mo 11-13, NEW 14, 3'12

- 1. Introduction**
- 2. Quantization of the Electromagnetic Field**
- 3. Coherence Properties of the Electromagnetic Field**
- 4. Representations of the E.-Magn. Field**
- 5. Photon Pairs**
- 6. Entanglement**
- 7. Interaction of Atoms With a Classical Light Field**
- 8. Quantized Interaction of Light and Matter**
- 9. Atomic Coherence in Three-Level Atoms**
- 10. System-Reservoir-Interaction**
- 11. Quantum Theory of the Laser**
- 12. Cavity QED**
- 13. Laser Cooling**
- 14. Atom Traps**
- 15. Elements of Atom Optics**
- 16. Various Topics**

Literature:

- **D. F. Walls, G. J. Milburn, *Quantum Optics*, Springer**
- **P. Meystre, M. Sargent III, *Elements of Quantum Optics*, Springer**
- M. O. Scully, M. S. Zubairy, *Quantum Optics*, Cambridge Univ. Press
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- **L. Mandel, E. Wolf, *Optical Coherence and Quantum Optics*, Cambridge Univ. Press**
- R. Loudon, *The Quantum Theory of Light*, Oxford Science Publications
- H.-A. Bachor, *A Guide to Experiments in Quantum Optics*, Wiley-VCH
- H. Benisty, J.-M. Gerard, R. Houdre, J. Rarity, C. Weisbuch (eds.), *Confined Photon Systems*, Lecture Notes, Cargese-Summerschool, Springer
- H. Yokoyama, K. Ujihara (eds.), *Spontaneous Emission and Laser Oscillation in Microcavities*, CRC Press
- C. Cohen-Tannoudji, J. Dupont-Roc, G. Grynberg, *Photons and Atoms*, Wiley
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- **P. Meystre, *Atom Optics*, Springer**
- M. A. Nielsen, I. L. Chuang, *Quantum Computation and Quantum Information*, Cambridge Univ. Press