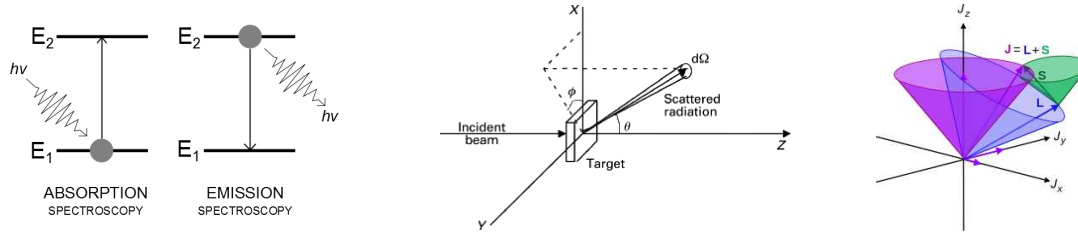


Quantum Mechanics II



Content

- Quantum mechanics I: harmonic oscillator, hydrogen atom
- Time-independent perturbation theory: Brillouin-Wigner method
- Time-dependent perturbation theory: absorption and emission of radiation
- Scattering theory: scattering amplitude and cross-section, Rutherford scattering
- Addition of angular momenta: Clebsch-Gordan coefficients, Landé factors
- Relativistic wave equations: Klein-Gordon and Dirac equation

References

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- R. P. Feynman and A. R. Hibbs, *Quantum Mechanics and Path Integrals*, McGraw Hill, 1965
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- H. Kleinert, *Path Integrals in Quantum Mechanics, Statistics, Polymer Physics, and Financial Markets*, 5th Edition, World Scientific, 2009
- D. H. McIntyre, *Quantum Mechanics - A Paradigms Approach*, Pearson, 2012
- G. Münster, *Quantentheorie*, Walter de Gruyter, 2006
- H. Reinhardt, *Quantenmechanik 1 - Pfadintegralformulierung und Operatorformalismus*, 2. Auflage, Walter de Gruyter, 2019
- H. Reinhardt, *Quantenmechanik 2 - Pfadintegralformulierung und Operatorformalismus*, 2. Auflage, Walter de Gruyter, 2020
- J.J. Sakurai and J. Napolitano, *Modern Quantum Mechanics*, Third Edition, Cambridge University Press, 2021
- L. I. Schiff, *Quantum Mechanics*, Third Edition, McGraw-Hill, 1968

- R. Shankar, *Principles of Quantum Mechanics*, Second Edition, Kluwer Academic, 1994
- F. Schwabl, *Quantenmechanik (QMI)*, 7. Auflage, Springer, 2007
- F. Schwabl, *Quantenmechanik für Fortgeschrittene (QMII)*, 5. Auflage, 2008

Organizational Remarks

- **Lectures:**

- 4 hours per week
- 8 ECTS credits
- Certificate for active participation:
 - * Seminar talk of 15 minutes at semester end
 - * Suggestions for topics announced before Christmas

- **Exercises:**

- 2 hours per week
- 4 ECTS credits
- Certificate for active participation:
 - * 50 % from all points of all exercise sheets
 - * Five times calculations at the black board
- Two students can submit one group solution of a problem set for evaluation.
- Drop the solutions in the post box on the 5th floor of building 46 or, in case of illness/quarantine, send them via email to jkrauss@rhrk.uni-kl.de

- **Oral module exam possible**