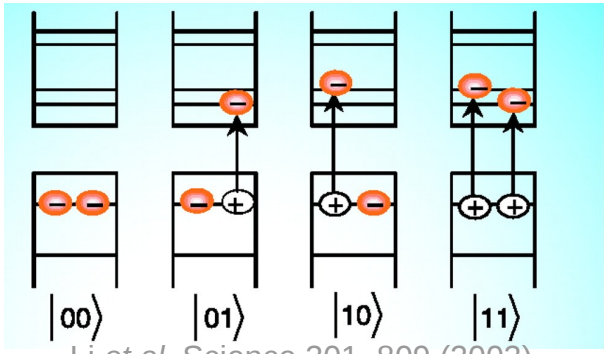
Theory Seminar on the Optical Properties of Semiconductors

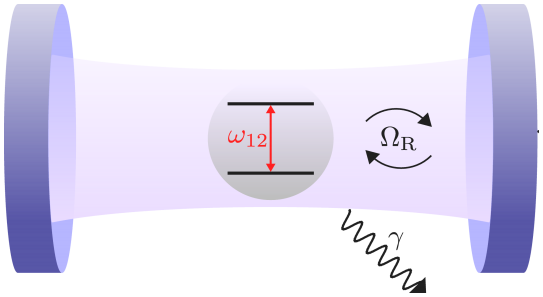
- Interaction with light provides information for fundamental physical processes
  - phonons, carrier interactions, etc.
- Numerous technological applications in everyday life
  - LEDs, solar cells, etc.
- Possibilities for future applications
  - quantum computers, telecommunications, etc.

Excitonic quantum gate

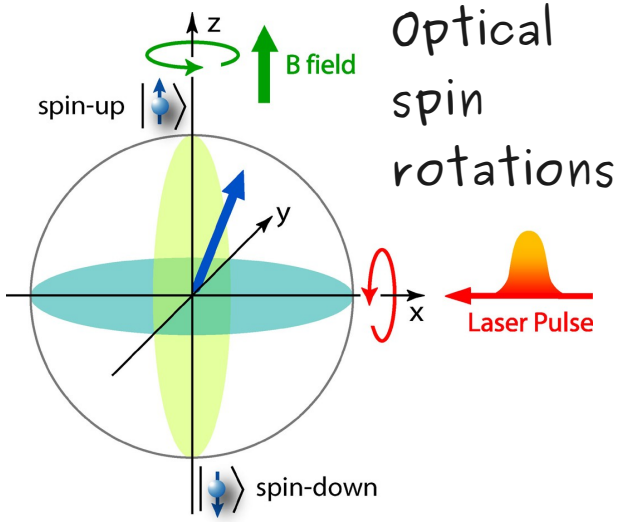


Li *et al*, Science 301, 809 (2003)

$$\frac{\partial \rho}{\partial t} = i[\rho, H]$$

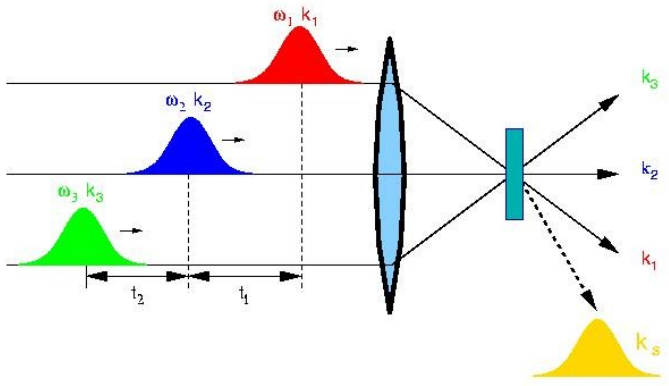


Cavity electrodynamics



Optical spin rotations

Press & Yamamoto, SPIE (2009)



Wave mixing spectroscopy

Theory Seminar on the Optical Properties of Semiconductors

Dr. E. Kavousanaki, Prof. G. Burkard — 2 Std., Di 10-12 Uhr, P812

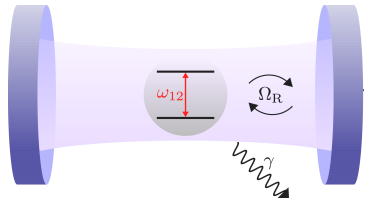
LIST OF TOPICS

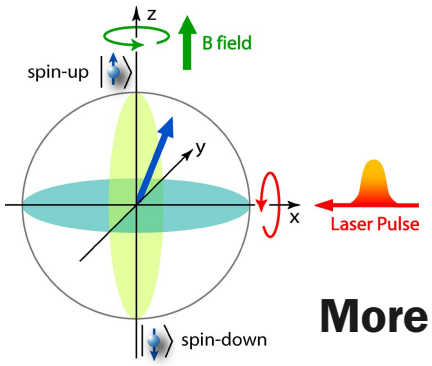
- Optical absorption
- Free carrier transitions
- Excitons in bulk & nanostructures
- Polaritons
- Semiconductor Bloch equations
- Optical Stark effect
- Wave mixing spectroscopy
- Magneto-optics
- Coherent spin dynamics
- Optical pumping of nuclear polarization

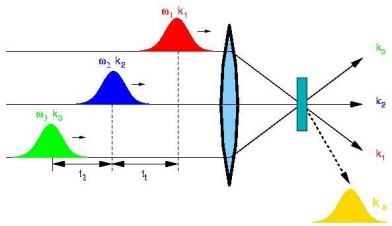
Course format: Presentation ~45 min + summary of 4-5 pages

Language: English strongly preferred, but German also possible

Prerequisites: Solid State Physics and/or Advanced Quantum Mechanics







First meeting: Tuesday 12.04 10-12, P812

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More info: http://theorie.physik.uni-konstanz.de/burkard/teaching/S11-OPSC