

Optics and Quantum-Optics in Semiconductor Nanostructures

Stephen Koch*

University of Marburg, Marburg, Germany

This talk gives a tutorial overview of a broad spectrum of optical effects in semiconductors. Semiconductor nanostructures are introduced as genuine designer materials with unique absorption, gain, luminescence and exciton properties. The modern theory used to compute semi-classical (gain/absorption) and quantum optical (luminescence, entanglement) properties is briefly reviewed. We then discuss examples for a variety of semiconductor systems and present examples for correlation and entanglement effects in semiconductor quantum wells.

*Corresponding Author.

Email Address. stephan.w.koch@physik.uni-marburg.de (Stephen Koch)