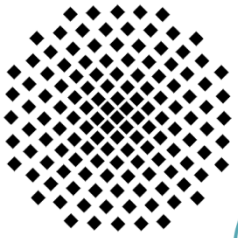
Stuttgarter Physikalisches Kolloquium

Fachbereich Physik, Universität Stuttgart
Max-Planck-Institut für Festkörperforschung
Max-Planck-Institut für Intelligente Systeme

Ansprechpartner: Prof. Harald Giessen
E-Mail: giessen@physik.uni-stuttgart.de
Telefon: 0711 - 685-65111



Dienstag, 29. November 2016	17:30 Uhr	Hörsaal V 57.01

Universität Stuttgart, Pfaffenwaldring 57, 70569 Stuttgart-Vaihingen

Gastgeber: Prof. Jörg Wrachtrup, Universität Stuttgart, Telefon: 0711 - 685-65278

Giant Interaction Effects of Rydberg Excitons in Cuprous Oxide

Manfred Bayer
Universität Dortmund

Abstract

Excitons are decisive for the optics of semiconductors. Their description as hydrogen atom-like complexes has turned out to be extremely successful. In Rydberg atoms an electron is promoted into a state with high principal quantum number leading to an extension of the wavefunction in the micrometer-range. Recently it has been shown that also an exciton can be highly excited by observing states with principal quantum number up to n=25 in high-quality natural cuprous oxide crystals. This corresponds to an average radius of more than 1 μm so that the exciton wave function is extended over more than 10 billion crystal unit cells. I will compare Rydberg excitons with their atomic counterparts, highlighting similarities and differences. In particular I will focus on interaction effects such as the Rydberg blockade and dressed states.