SFB/TRR 21 - Colloquium

20. Juni 2014, Stuttgart

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Rydberg excitons in cuprous oxide

Solid state environment hosts a wide variety of excitations which are successfully described in the language of quasi-particles. One of the most fundamental ones is an exciton – bound state of electron and hole. Such an entity can be considered a solid-state analogy of the hydrogen atom with ladder of energy states described by the Rydberg formula. However, so far this analogy was known to be adequate only for just a few lowest lying energy states, as higher-excided states were not observed experimentally. In my talk I will report on the longest observed hydrogen-like excitonic series with principal number n up to 25. I will present the measurements demonstrating increased sensitivity of such highly excited states to external perturbations, such as magnetic field or the temperature. Finally, I will discuss the possibility to observe an effect of a dipole-blockade in such a system.

20. Juni 2014, 14:00 Uhr

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