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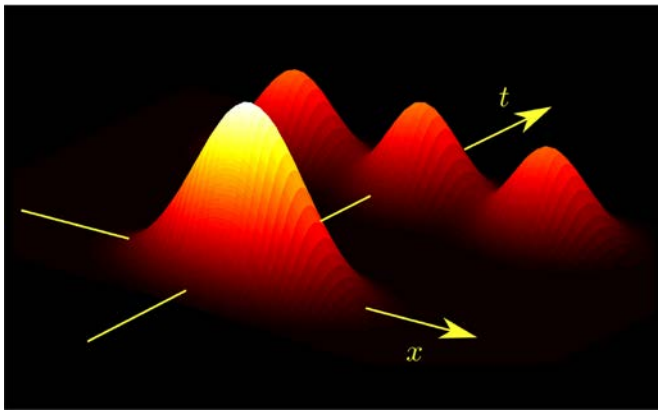
Physikalischen Kolloquium

Montag, 01.02.2016
16:15 Uhr in N24/H13

Professor Dr. Michael Fleischhauer
Fachbereich Physik
Theoretische Quantenoptik
Universität Kaiserslautern

Non-local nonlinear optics with Rydberg gases

Photons do not easily interact with each other and nonlinear processes on the few-photon level can usually be realized only under very special conditions. Recently is was shown that coupling of weak light fields to atoms involving Rydberg states may change this picture. Under conditions of electromagnetically induced transparency (EIT) such a coupling leads to the formation of Rydberg polaritons which are quasi-particles with tunable composition and effective mass, and strong, non-local interactions. The latter can turn photons into hard-sphere objects with a finite avoided volume in two particle correlations or lead to bound states of photon pairs, i.e. photonic molecules. I will explain the physics of Rydberg polaritons, review the experimental status and discuss interesting many-body effects arizing from the long-range interaction such as the formation of Wigner crystals of individual photons.



Ab 16.00 Kaffee, Tee und Kekse vor dem Hörsaal H13
Organisation: **Prof. Dr. F. Jelezko, Tel. 23750**
Host: **Prof. Dr. W. Schleich, Tel. 23080, off.: 23081**