SFB/TRR 21 - Seminar
28. Juni 2011, Ulm

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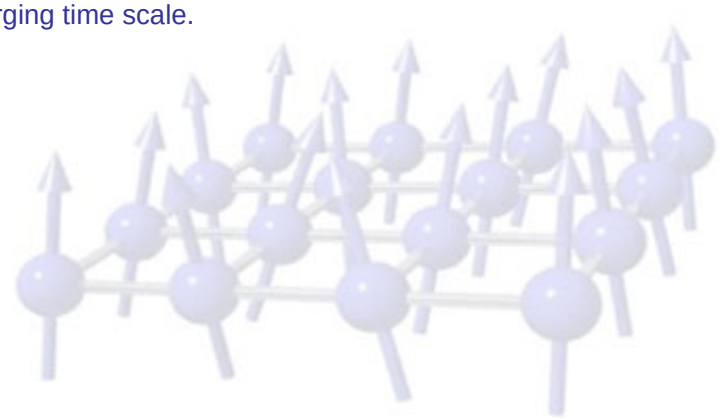
## Symmetry breaking and fluctuations at the Dicke quantum phase transition

The quantized motion of ultracold atoms coupled to the light field of an optical cavity realizes an effective version of the Dicke Hamiltonian. This system exhibits a zero-temperature phase transition from a normal phase to a superradiant phase which can be controlled by the coupling strength between the atoms and the light field. As the cavity field actively takes part in the coupled system dynamics, the photons leaking out of the cavity provide in-situ information about the system. This allows us to study the symmetry breaking process at the phase transition and to characterize the fluctuations below the phase transition. We observe temporal correlations of the fluctuations with a characteristic and diverging time scale.



**28. Juni 2011, 15:00 Uhr**

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