Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

**Competing interactions and symmetry breaking in the Hubbard-Holstein model** JOHANNES BAUER, Max-Planck Insitute for Solid State Research, Heisenbergstr.1, 70569 Stuttgart, Germany — Competing interactions are often responsible for intriguing phase diagrams in correlated electron systems. Here we analyze the competition of instantaneous short range Coulomb interaction $U$ with the retarded electron-electron interaction induced by an electron-phonon coupling $g$ as described by the Hubbard-Holstein model. The ground state phase diagram of this model in the limit of infinite dimensions at half filling is established. The study is based on dynamical mean field theory combined with the numerical renormalization group. Depending on $U$, $g$, and the phonon frequency $\omega_0$, the ground state is antiferromagnetically (AFM) or charge ordered (CO) [1]. The transition between the states is found to occur when the electron-electron coupling strength $U$ and the induced interaction $\lambda$ due to electron-phonon coupling approximately coincide. The transition is continuous for small couplings and large phonon frequencies $\omega_0$ and becomes discontinuous for large couplings and small values of $\omega_0$. We present results for the static and dynamic electronic and bosonic properties near the transition. We also comment on the behavior of the model away from half filling.

[1] J. Bauer, cond-mat/0907.3751 (2009).

Johannes Bauer
Max-Planck Insitute for Solid State Research

Date submitted: 25 Nov 2009 Electronic form version 1.4