MAR08-2007-003983

Abstract for an Invited Paper
for the MAR08 Meeting of
the American Physical Society

Lars Onsager Prize Talk: A New Challenge for Cold Atom Physics: Achieving the Strongly Correlated Regimes for Cold Atoms in Optical Lattices.[1]

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Cold atoms in optical lattices show great promise to generate a whole host of new strongly correlated states and to emulate many theoretical models for strongly interacting electronic systems. However, to reach these strongly correlated regimes, we need to reach unprecedented low temperatures within current experimental settings. To achieve this, it is necessary to remove considerable amount of entropy from the system. Here, we point out a general principle for removing entropies of quantum gases in optical lattices which will allow one to reach some extraordinarily low temperature scales.

[1]Work suppored by NSF Grant DMR0705989 and by DARPA under the Army Research Office Grant No. W911NF-07-1-0464