Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

**Automatic Renormalization of Local Tensor Networks**[1] ADAM JERMYN, University of Cambridge — Tensor networks have gained significant interest recently as efficient means for numerically representing and manipulating quantum states and as a way to represent classical partition functions. Progress has been made numerically analyzing these networks, but existing methods remain restricted to systems which either have just one extensive dimension or are infinite and periodic. Here we provide a new efficient method for numerically renormalizing finite local tensor networks in multiple dimensions with no symmetry or periodicity constraints. This method performs well on irregular lattices and with disordered bond energies. We demonstrate the efficacy of this method on large systems with thousands of tensors, reproduce free energy curves of classical spin systems, and investigate higher-order and long-range correlation functions.

[1]Marshall Scholarship

Adam Jermyn
University of Cambridge

Date submitted: 13 Sep 2016 Electronic form version 1.4