

Abstract Submitted  
for the DAMOP16 Meeting of  
The American Physical Society

**Measurement-induced control using a nondestructive quantum gas microscope**<sup>1</sup> IVAYLO S. MADJAROV, MINWOO JUNG, JACOB RABINOWITZ, ZOE WELLNER, HUIYAO Y. CHEN, HIL F. H. CHEUNG, YOGESH SHARAD PATIL, MUKUND VENGALATTORE, Cornell University — We present progress toward a quantum gas microscope that extends the paradigm of single-site imaging to one of single-site control. The basis for this scheme is our work on nondestructive lattice imaging and measurement-induced localization [1,2], where we show that lattice dynamics can be influenced by continuous measurement. The combination of nondestructive in situ imaging, single-site resolution, and spatially nonuniform measurement landscapes presents exciting prospects for new experimental studies of quantum thermodynamic processes that utilize information, such as the Szilard engine [3]. We present our recent results towards experimental realizations of such systems.

[1] Y. S. Patil *et al.* PRA 90, 033422 (2014)

[2] Y. S. Patil *et al.* PRL 115, 140402 (2015)

[3] S. W. Kim *et al.* PRL 106, 070401 (2011)

<sup>1</sup>This work is supported by the ARO MURI on non-equilibrium dynamics.

Yogesh Sharad Patil  
Cornell University

Date submitted: 28 Jan 2016

Electronic form version 1.4