

Abstract Submitted  
for the DAMOP16 Meeting of  
The American Physical Society

**Combining Yb and Li: Rapid Quantum Degenerate Gas Production and Interacting Mixtures** ALAINA GREEN, RICHARD ROY, RYAN BOWLER, SUBHADEEP GUPTA, University of Washington — We detail a readily adaptable method for optimizing evaporative cooling efficiency in optical dipole traps (ODTs), reducing the production time of quantum degenerate gases. Utilizing the time-averaged 'painting' potential of a rapidly moving laser beam, we dynamically shape the trap over the course of evaporation to produce  $^{174}\text{Yb}$  Bose-Einstein condensates of  $(0.5-1.0) \times 10^5$  atoms in (1.6-1.8) seconds.<sup>1</sup> We also report on interaction studies in the quantum degenerate Bose-Fermi  $^{174}\text{Yb}$ - $^6\text{Li}$  mixture in the BEC-BCS crossover. Additionally, we present work on photoassociation spectroscopy on  $^6\text{Li}$ -Yb mixtures and the production of  $\text{YbLi}^*$  molecules in a dual magneto-optical trap, a first step toward coherent production of ultracold  $^2\Sigma$  molecules.

<sup>1</sup>R. Roy, A. Green, R. Bowler, and S.Gupta. *Rapid cooling to quantum degeneracy in dynamically shaped atom traps*. arXiv:1601.05103

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Date submitted: 29 Jan 2016

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