Ultracold atoms in novel optical lattices

NATHAN LUNDBLAD, Bates College — We report progress towards optical lattice experiments using a planned Bose-Einstein condensate of $^{87}$Rb. We describe vacuum chamber construction, design and construction of a spin-flip Zeeman slower, characterization of laser cooling tools, the results of magnetic trapping and evaporative cooling, and plans for a hybrid dipole trap approach for reaching BEC, as well as optical lattice design and construction.