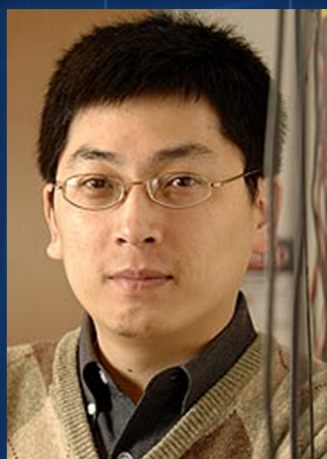


Optical Control of Atomic Interactions at Nano-Kelvin Temperatures



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Optical control of atomic interactions is a long-sought goal in cold-atom research, and its realization can lead to exotic quantum phases and quantum dynamics. Previous attempts have been hindered by short lifetimes and parasitic optical force. Here, we report a generic scheme to optically induce a Feshbach resonance in a Bose condensate, which yields long lifetimes to study equilibrium and non-equilibrium physics, and zero dipole force. We show that fast and local control of interactions in a Bose condensate leads to intriguing quantum dynamics in new regimes, highlighted by the formation of van der Waals molecules and partial collapse of a Bose condensate.

