Magneto-Optical Production of a Molecular Bose-Einstein Condensate

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While photoassociation and the Feshbach resonance are, in principle, feasible means for creating a molecular Bose-Einstein condensate from an already-quantum-degenerate gas of atoms, in practice it turns out that irreversible decay puts serious limitations on achieving near-unit efficiency with either mechanism alone. By combining the two methods we propose to circumvent any and all losses, thereby enabling near-unit efficient production of a stable condensate of molecules. Ironically, it appears that fermionic potassium-40 is the current most suitable system for the initial quantum gas of atoms.