

A Phonon Laser

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Red-detuned laser pumping of an atomic resonance will cool the motion of an ion or atom. The complementary regime of blue-detuned pumping is far less explored and widely thought of as a regime of heating. Theory and experiment instead show that stimulated emission of centre-of-mass phonons occurs, providing saturable amplification of the motion. A threshold for transition from thermal to coherent oscillating motion has been observed, thus establishing this system as a mechanical analogue to an optical laser: a phonon laser.

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