Cavity optomechanics with polarizable particles: From atoms to dielectric objects

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Polarizable objects, such as atoms, molecules, or dielectric objects, experience optical gradient and scattering forces when illuminated by a laser beam. These forces can optically trap the object in an optical tweezer, move it around, and control its motion to the quantum ground state. This lecture will cover topics about optical forces on atoms and silica nanoparticles, and how to control their motion in free space and optical cavities.