# *Re-Building an Optical Tweezers Setup Incorporating an AOM*

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## INTRO

- Highly focused laser light has the potential to trap dielectric particles within the Rayleigh size regime
- The action of optical trapping is caused by the transfer of momentum from photons to the particle
- The two forces responsible are the dominant gradient force and the lesser scattering force
- An acousto-optic modulator (AOM) takes an RF drive frequency to alter the refractive index of a crystal -creating a variable diffraction grating. This produces a moveable trap
- The setup consists of two traps. One stationary, while the other tunable, allowing for mutual interaction of trapped objects

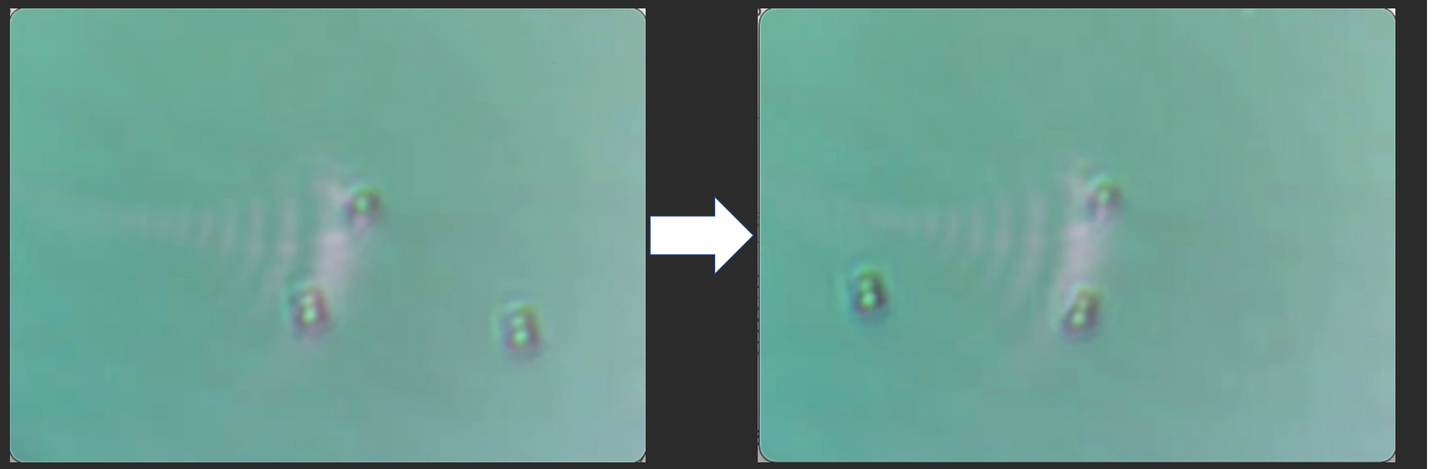
## METHODS

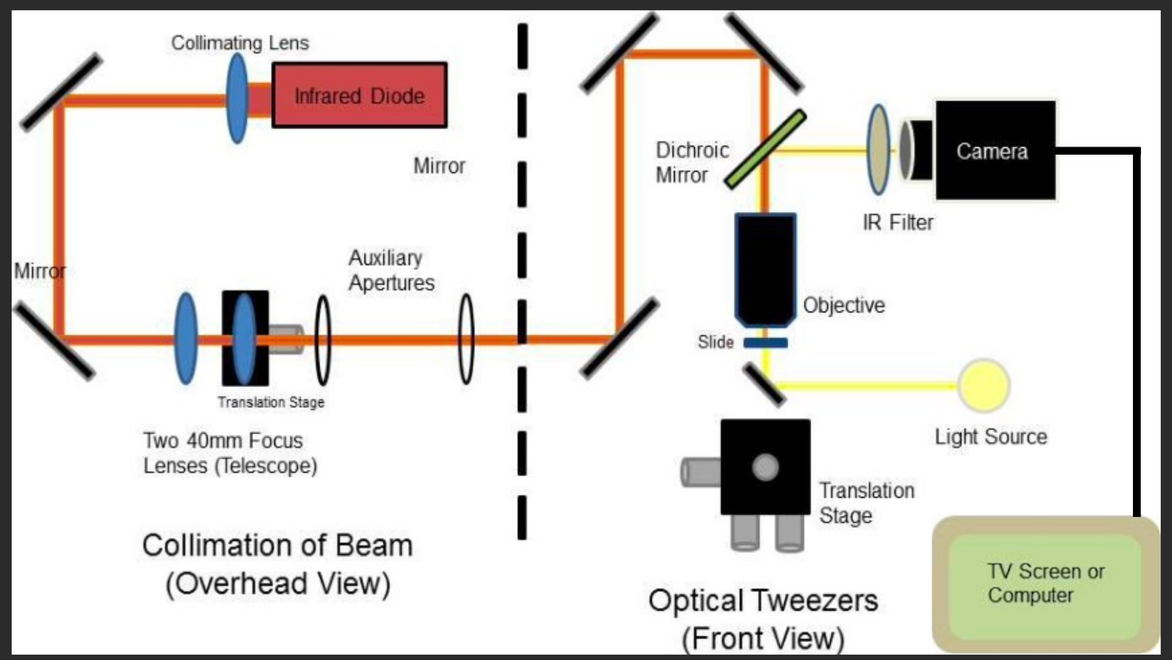
1. Using an 810 nm IR diode laser
2. This is directed through a homemade microscope with a 40x objective
3. A dichroic mirror is used to parse the visible light into a webcam for imaging
4. An electronically controlled stage can translate the slide under the objective
5. The AOM has been separately demonstrated and can produce an additional adjustable beam
6. Incorporated the AOM and trapped beads

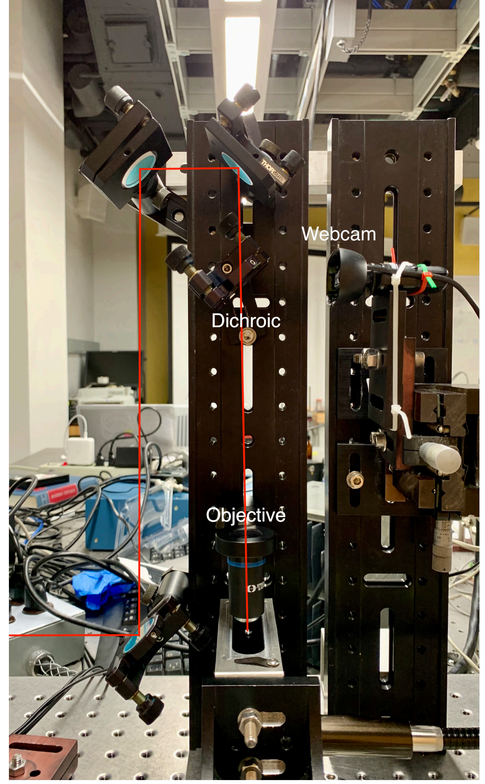
## RESULTS

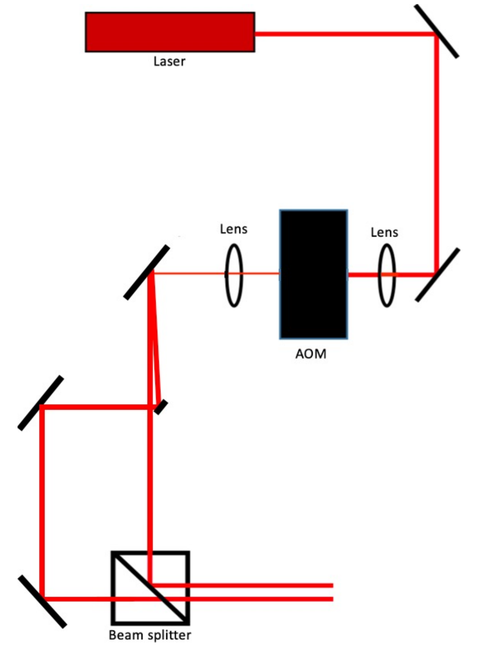
- Consistent trapping of 1.06 μm silica beads
- The AOM produces a second beam within the objective
- The second moveable trap pulls beads into focus
- Trapping of a second bead was not demonstrated

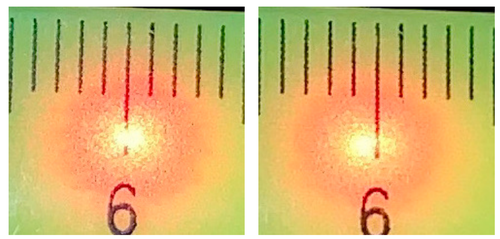
Using **laser** light and **sound** waves to **trap** and manipulate **microspheres**



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