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Optical Trapping: From Ultrastable Measurements to Simple Biophysical Experiments ASHLEY CARTER, Amherst Coll — It has been about thirty years since Ashkin and colleagues first used a focused laser to optically trap micron-sized particles, ushering in a new era of precision measurement. Today, the most fascinating applications of optical traps are in biophysics where we can use these systems to sort cancerous cells, to measure individual molecular motors walking along protein filaments, to watch DNA or proteins fold and unfold, or to observe single ribosomes translate mRNA into protein. I'll discuss the physics of optical trapping and some of these exciting experiments, including a recent measurement of a helicase, RecBCD, that is able to miraculously open multiple base-pairs of double-stranded DNA at once. Measurements at this scale require an ultrastable optical trapping system that is state of the art. Then I'll move on to discussing measurements of DNA condensation, some of which can easily be done in the undergraduate laboratory.

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