

## Assignment 10

### 1. Radiation Pressure and Dipole Forces

- What is the high intensity limit of the radiation pressure force and explain why it makes intuitive sense?
- Explain why the dipole or gradient force is larger than the radiation pressure force at high intensities.

c) Show that  $\vec{F}_D = -\nabla U$

$$U = \frac{\hbar(\omega - \omega_0)}{2} \ln K \left[ (\omega - \omega_0)^2 + \frac{\omega_l^2}{2} + \frac{\Gamma^2}{4} \right]$$

Here K is a constant that makes the argument of the logarithm dimensionless.

### 2. Optical Disk

- How small an area can a 600 nm laser be focused into?
- How many bits of information can potentially be stored on a 10 cm. diameter optical diskette?
- If  $\lambda$  is reduced by a factor of two, by what factor does the amount of information storable on a disk change by?