Physics 108 Assignment#7 (due on 5/21/2018)

Reading materials:

Pedrotti 3rd Edition:	**Chapter 23:** 23-1 through 23-7 **Chapter 25**: 25-1 through 25-6
Lecture Notes:	pp. 78 - 95

Homework: (Pedrotti 3rd Edition)

1. 23-19
2. 23-21
3. 25-1
4. 25-7
5. 25-8
6. 25-9
7. (**Extra 2 point**) Explain how the color of a rainbow changes with the height from the ground using $n^2(\omega) = 1 + \frac{\omega_p^2}{\omega_0^2 - \omega^2}$. The sun shine comes from the back of the observer. You can treat rain water droplets as being spherical with a natural frequency ω_0 larger than ω of visible light.
8. (**Extra 2 points**) From $\sigma_b = \hat{n} \cdot \vec{P} = \hat{n} \cdot (\chi \varepsilon_0 \vec{E})$, prove that $\varepsilon = \vec{E}_0 / \vec{E} = 1 + \chi$ either using capacitor arrangement or Gauss's law and $\vec{D} = \varepsilon_0 \vec{E} + \vec{P}$.