Physics 108 Assignment#7 (due on 5/23/2016)

**Reading materials**:

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| *Pedrotti 3rd Edition:* | **Chapter 25**: 25-1 through 25-6;<br>**Chapter 14**: 14-1 |
| *Lecture Notes:* | pp. 101-117 |

**Homework**: (Pedrotti 3rd Edition)

1. 25-7
2. 25-8
3. 25-9
4. (**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 $\omega_0$ larger than $\omega$ of visible light.
5. (**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 $\vec{D} = \varepsilon_0 \vec{E} + \vec{P}$.
6. 14-2
7. 14-3
8. 14-4