

Physics 108 Assignment#6 (due on 5/22/2017)

Reading materials:

Pedrotti 3rd Edition: **Chapter 25:** 25-1 through 25-6;
 Chapter 14: 14-1

Lecture Notes: pp. 103-118

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 ω_0 larger than ω of visible light.
5. **(Extra 2 points)** From $\sigma_b = \hat{n} \cdot \vec{P} = \hat{n} \cdot (\chi \epsilon_0 \vec{E})$, prove that $\epsilon = \vec{E}_0 / \vec{E} = 1 + \chi$ either using capacitor arrangement or Gauss's law and $\vec{D} = \epsilon_0 \vec{E} + \vec{P}$.
6. 14-2
7. 14-3
8. 14-4