

Optics I: Theory CPHY 6/72250

Assignment 5.

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Due: Nov. 15, 2016

1. Monochromatic light propagating along the z -axis shines on a polarizer whose easy axis is along the y -axis. The light transmitted by this polarizer falls on a $\lambda/4$ plate whose slow axis is in the $x - y$ plane, making an angle θ with the x -axis. (A $\lambda/4$ plate introduces a phase shift of $\pi/2$ in the component of light polarized parallel to the slow axis.) Draw the polarization ellipse when $\theta = 0, \pi/6, \pi/4, \pi/3, \pi/2$ (Show 5 Figures.)
2. Plot R^σ and R^π for an air-glass interface ($n_1 = 1$, and $n_2 = 1.7$) for the cases. ($R = rr^*$)
 - (a) when light is incident from the air side
 - (b) when light is incident from the glass side.
3. As the sun rises over a frozen pond, an angle will be reached when its image on the surface of the ice is completely linearly polarized in a plane parallel to the surface. What is the incident angle?