

Optics I Theory CPHY 62250/72250
Assignment 5

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Due: Dec. 12, 2018.

December 2, 2018

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1. Light is normally incident on a cholesteric liquid crystal cell with planar alignment. The propagation direction is along the helix axis. The refractive indices are $n_o = 1.4$ and $n_e = 1.7$.
 - (a) What is the pitch if the center of the reflection band (the average of the wavelengths at the band edges) is at $\lambda_c = 514nm$?
 - (b) What is the width of the reflection band?

2. Describe the polarization of light in the cholesteric at the band edges.

3. For a Gaussian beam, define the following quantities:
 - (a) beam waist
 - (b) Rayleigh range
 - (c) FWHM

4. A HeNe laser pointer has a cavity length $L = 2cm$. What is the beam divergence?