

Astronomy 350: Introductory Optics Lab

- 1. This lab concerns Lab exercise 9 in the Ferguson book. We don't have a ray tracing device so this lab will not be as sophisticated as in the book.
- 2. Work through this lab using the optical bench in the Astro lab. Determine the focal length for all three types of lenses. Be careful with lens B since we only have one of those lenses. Determine the focal length of each of the lenses.
- 3. See if you can tabulate data to determine the accuracy of the formula

$$\frac{1}{p} + \frac{1}{i} = \frac{1}{f}, \quad (1)$$

where p is the object distance, i is the image distance and f is the focal length.

- 3. For the refracting telescope part, use the lens holders attached to the meter rule.
- 4. Now pick any of the lenses and place an object at a distance p from the lens. Determine the image distance and check that these are consistent with equation (1). Now pick another lens and place it beyond lens 1 so that the image from lens 1 becomes the object for lens 2. Find the resultant image and its distance from lens 2. Is this still consistent with equation (1)?
- 5. See if you can, from the web, find the optical design of, either the Hubble Space Telescope or the Keck 10m telescope and describe this optical design in a couple of pages with some pictures if possible.