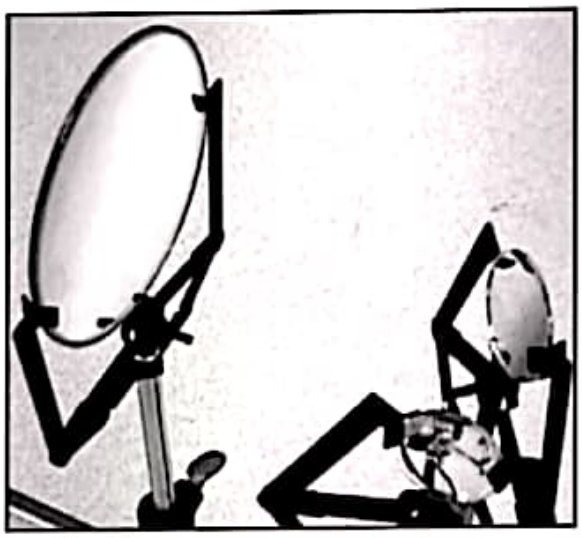
Station 3: A Newtonian Telescope



At this station, a reflecting telescope is set up. The picture shows an oblique view of the telescope. The primary mirror is in the upper left. The diagonal secondary mirror is in the middle right and the eyepiece lens is in the lower right.

1. Measure and compute the characteristics of the mirrors and lenses in this system.

Measure the diameter of the primary mirror.

Primary mirror diameter = _____ [mm].

With the eyepiece lens removed, but the secondary mirror in place, measure the focal length of the primary mirror by projecting an image onto a piece of paper held to the side, near the secondary mirror, and moving the paper until the image is in focus. Measure the distance from the paper to the center of the secondary mirror and add the distance from the secondary to the primary.

Measured distance from image focus to secondary mirror center = _____ [mm].

Measured distance from secondary mirror center to primary mirror center = _____ [mm].

Computed focal length of primary mirror = _____ [mm].

Computed focal ratio (f/#) of primary mirror = _____.

Check your primary focal length by measuring it directly (that is, without the use of the secondary mirror). Measured focal length of primary mirror = _____ [mm].

Next, measure the focal length of the eyepiece lens, as you did for the first station.

Measured focal length of eyepiece lens = _____ [mm].

Predicted angular magnification of telescope = _____.

2. Examine a distant object with this telescope. Which aspects of the view through this telescope are superior to those of the view through the station 1 telescope?

Are there any aberrations similar to those seen through the refracting telescope? _____

Are there any new aberrations? _____