NOTE: Part of the homework assignment this week (see reverse) is to collect, organize, and tabulate the data from Lab 2, and to think about ways you could present your results graphically. The report itself is NOT due next week. We will discuss the results in class first.

The Leuschner 30-inch telescope has a focal length of 20 feet. The CCD attached to the telescope is a rectangle of about 4000 x 2700 pixels. The pixels are square and 9 microns on a side.

1. Suppose you want to observe $\epsilon$ Lyrae, whose separation is 2.4" with this telescope and CCD. How far apart will the images of the two stars appear in the focal plane?

2. What will the separation between the two $\epsilon$ Lyrae stars be in pixels?

3. The second binary in the $\epsilon$ Lyrae double-double star system is about 208" away from the first binary. If you place the first binary at the center of the CCD field of view, will the other binary appear on the CCD?

4. Suppose you how attach a 40 mm eyepiece to the telescope (instead of the CCD). How far apart will the 2.4" binary appear to your eye (what will the apparent angular separation be)?

5. You decide you want to take some picture of the full moon with the CCD on Leuschner. Will you be able to capture the whole moon in one image? Why or why not? Show your work.
6. Preliminary work for Lab 2 lab report

(i) Collect the three charts of Cassiopeia from Lab 2: one should show your results for observations with unaided eyes, one for observations with binoculars, and one should be blank.

(ii) Use the xeroxed magnitude key from the Tirion Atlas to measure the magnitudes of all the stars that you observed or attempted to observe. For all named stars (proper, Bayer, or Flamsteed name), record the name in at least one format. Please do NOT mix Bayer and Flamsteed names!

(iii) For each of the two Cassiopeia charts, create a table that summarizes your results. We will discuss possible formats for these tables in class. Tables may be combined if clarity is not sacrificed (or is improved!) by doing so. Tables should be given numbers and titles (e.g., Table 1: observations with unaided eyes). Tables should be typed or written by hand very neatly. PLEASE KEEP COPIES OF THESE TABLES FOR YOURSELF; you will need them for next week’s homework.

(iv) For each set of observations (unaided eyes and binoculars), think about ways you could represent your results graphically. Remember that the goal of these observations was to determine the magnitude limit. What kind of graphical representation could help you determine this, and effectively demonstrate your findings in your report? For this homework, you may either create a sample graph and attach it to the homework, or else write down ideas about how this could be done in the space below.