PH2900 (Astronomy)
Complex Problem 3

If you are unable to do an observing session for Practical #3, you should carry out the equivalent analysis using data from other members of the class. In addition you should do the 'complex problem' below:

Go to the SkyView website, `skyview.gsfc.nasa.gov`. This is a data base of astronomical images that can be accessed as a 'virtual telescope'. Go to the non-astronomers interface and browse through the documentation. Take a look at the basic interface as well, but for our present purposes the non-astronomers interface is easiest.

Download a picture of the Pleiades. (Enter Pleiades in 'Sky Coordinates or Object' to get the coordinates, select 'optical', set the image size to 3 degrees, and click on submit.) Save a copy on disk in FITS format.

Now look at the image using the program ImageJ. Using the selection tools, figure out how to draw a circle around a star and to measure the total pixel contents in the circle. (Analyze $\rightarrow$ Measure.) Then move the circle away from the star to an empty part of the field and repeat the measurement to estimate the background. Correcting for background, estimate the relative intensities of several (say, at least four) of the stars in the Pleiades. From these numbers, find the differences between the magnitudes of the stars. (Unfortunately we do not have enough information supplied with these images to do a meaningful error analysis, so you only need to find the magnitude differences.)

Now go back to SkyView and find some other objects to download and analyze (try, e.g., a galaxy, globular cluster, planetary nebula, etc.). Experiment around with the different interfaces and look at data from different surveys.

Using the web or other resources, do some research about the targets that you have looked at and describe briefly what they are and why they are of astronomical interest. You can discuss, for example, to what extent you would be able to study the targets using the RHUL telescope.

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14 November, 2006