Lab 1.5 - The Night Sky In All Its Splendor

This laboratory is designed to introduce you to a variety of celestial objects visible with the 16-inch telescope. To complete this exercise, you will observe and sketch **three** objects. Sketches should be done on plain white paper and somehow firmly attached to the appropriate page of your notebook. Your grade on this exercise will be based on the written record of your observations, with half of the emphasis on your sketches and half on your descriptions.

Information recorded for each object should include: date and time, name of all observers present, weather conditions (cloudy, hazy, etc...), the name and coordinates of the object, the eyepiece focal length and magnification, and a fairly detailed description of the object, including direction (NSWE) and approximate scale (remember your field of view calculations?). You should also note any problems with the telescope, dome, eyepieces, computer, etc...

Some things to keep in mind when sketching are as follows: 1) Bright stars should be drawn as larger dots than fainter stars; **stars should not be drawn as little star shapes!** 2) Nebulousities should be shaded and should not, in general, have sharp outlines. 3) Notice the relative sizes and colors of objects you are observing.

To calculate the magnification of a particular eyepiece, simply divide the focal length of the telescope (in this case, 4700mm) by the focal length of the eyepiece. As such, the smaller the focal length of the eyepiece, the higher the magnification.

Contrary to popular opinion, higher magnification does not necessarily mean a better view. First of all, there is a trade off between magnification and field of view, as you can probably imagine; the higher the magnification, the less of an object you can see. This will not be true for individual stars, which are only points even under the highest magnification, but will certainly be true for star clusters, nebulae, galaxies, the moon, etc... More importantly, the higher the magnification, the greater the area over which the light from an extended object is spread. Thus galaxies and clusters in particular can often be seen much better through lower magnifications. Faint stars, on the other hand, will usual be easier to see with higher magnifications, since the star, which is essentially a point, does not get any fainter, but the sky, which is an extended object, will. Experiment with different eyepieces to see which works the best for each particular object.

Try to observe three different types of objects if you can. Planets currently available include Venus, visible just after sunset, Mars, which rises around 10pm or so, and Uranus, which may be tough to spot, but should be easy to locate with the software on the 11-inch. The crescent moon should be visible in the west in a few days and will be full in a week and a half. Other objects include a number of Messier objects visible at various times of night, as well as NGC galaxies and star clusters. Do some research on the internet to find suitable objects.