OUTSIDE LAB 1: Observing the Heavens

OBJECTIVE: *To become familiar with some of the more conspicuous constellations and to observe the motions of stars in the night sky.*

DISCUSSION:

Most people are unfamiliar with the night sky, glancing up at it only occasionally. The purpose of this laboratory is to familiarize you with the night sky and the motions of the objects in it.

EXERCISES:

EXERCISE 1:
  a) Your instructor will point out several prominent constellations (groupings of stars) in various parts of the sky. Make a careful sketch of each constellation and any ground objects (trees, buildings, *etc*.) around them. Use ×'s to mark the positions of the stars. Record the time of your first sketch. After at least 45 minutes sketch the new positions of the stars. Use ○'s to mark them.

Direction: _____ **First Sketch Time:** _____ **Second Sketch Time:** _____

b) Repeat the process for the stars and any other celestial objects in the western sky, noting the times at which the observations are made. Again make sure the sketches are at least 45 minutes apart.

Direction: _____ **First Sketch Time:** _____ **Second Sketch Time:** _____

EXERCISE 2:

        After you finish your first set of sketches, sketch one or more constellations designated by your TA. Using the magnitude diagrams on the last page of this lab as a reference, estimate and label the magnitudes of the stars.

EXERCISE 3:

        Your instructor will point out other constellations and show you various astronomical objects through the binoculars and telescopes.

EXERCISE 4:

        After at least 45 minutes have elapsed finish Exercise 1. Make sure you are sitting in the same place where you made your first sketches and that you sketch the same parts of the sky.

EXERCISE 5:

a) Examine the sketches from Exercises 1. What type of motion has occurred in each case?

b) What can you conclude about the apparent motions of the stars from these two sets of sketches?

EXERCISE 6:

Now open up your computer and start the Starry Night program.   Click on the Options tab and then on Constellations and make sure the "Stick Figures" box is checked. Next find the bright stars whose magnitudes you estimated.   Put the curser over them and find their correct magnitudes. Compare the actual value with your value in each case. **Note that your TA does not expect that you will have a perfectly accurate answer.** The idea here is to make a serious attempt at estimating the magnitude and then to see how well you did.

Apparent Magnitude Scale	
Sirius	-1.5
Capella	0
Vega	0
Altair	0.8
Aldebaran	0.9
Polaris	2.3

3.7

Betelgeuse
0.4

Bellatrix
1.7

1.7   2.5

1.8

Orion

3.1

Procyon
0.4

Canis Minor

Rigel
0.1

Cassiopeia

Schedar
2.5

3.6

Caph
2.4

2.8   2.8

3.4

Cygnus

3.9

Deneb
1.3

3.0

2.3

4.0

2.6

3.4

Alberio
3.2