Name: _____ **Date of Session:** _____

Astronomy 210: Night Observations

Purpose: (1) To observe the broad features of the night sky and identify bright stars and constellations; and (2) to observe in more detail specific night sky objects: the moon, planets, star clusters, nebulae and galaxies, with a telescope.

When you go: There will be four stations, each tended by an instructor:

(1) 12″ Telescope (inside the dome),
(2) 4″ Telescope I (outside the dome),
(3) 4″ Telescope II (outside the dome),
(4) a naked-eye tour of the constellations (outside the dome).

You should visit all of the stations, but you may do so in any order. At each station, the instructor will review information about the object that you will be observing, and will assist you in observing the object with a telescope or with your eyes.

Read the questions below before you start observing and *answer them as you progress* through the lab. Ask the instructor for assistance with answering questions. *Answers in this report should be in your own words. You may discuss the questions with your classmates and the instructors, but you must write your own responses in your own words.*

1. (a) What is the date and time of your observations?

   (b) What are the sky conditions (e.g., clear, partly cloudy)?

2. Look at each of the two kinds of telescopes you use, and answer the following questions. Are you using a reflecting or refracting telescope? What is the diameter of the biggest mirror or lens? What is the focal length of the telescope and of the eyepiece? Use these to calculate the magnification: $M = f_{\text{lens}}/f_{\text{eyepiece}}$.

   12″ Telescope

   4″ Telescope

3. Fill in an entry in the table below for each station that you attend. The declination δ is one of the two angles that makes up an object's coordinates on the sky. Specifically, it is the equivalent of latitude: the angle between the object and the celestial equator. You can *estimate* declination as follows. (1) Find (with help) the North Star, Polaris– this lies approximately at the North Celestial Pole. (2) Now estimate the angle (call it θ) between Polaris and your object, noting that with your arms outstretched, your fist is about 10° across. Enter this number in the table. (3) Finally, Polaris itself is at the NCP and thus has a declination of $\delta = +90°$. To find the Dec of your object, take the angle θ from Polaris and subtract it from 90°: $\delta = 90° - \theta$ (you may get a negative number, which just means the object is south of the celestial equator).

Station	Name of Object	Angle θ from Polaris	Declination $\delta = 90° - \theta$
$12''$ Telescope			
$4''$ Telescope I			
$4''$ Telescope II			
Naked-Eye Constellations			

4. For each station, sketch and label the objects you see.

   • If it is the Moon, note its phase and draw the surface features that you observed through the telescope.

   • If it is a planet, note its color, shape and the presence of any moons.

   • If it is a star cluster, note the general shape, the colors of the stars, the approximate number of the stars, and what type of cluster (open or globular) it is.

   • If it is a galaxy, note its shape and color.

   • If it is a nebula, note its shape and how it differs from a star.

   • If it is a constellation, draw the star pattern and indicate the relative intensities of the stars by numbering them from the brightest to dimmest (1=brightest).

– Additional space for sketches –

After you go: Write a brief paragraph about one of the objects you have seen through the telescopes. What is the object physically? That is, you see a 2-D image on the sky; what is the physical nature of the object in real space? If you haven't talked about this in class, ask the instructor. How did the object's appearance through the telescope compare with images you have seen in class? *For this question only*, your answer should be typed on a separate page. This part of the report is not collaborative and should be written *in your own words.*