Exoplanet Name: _____

Observing Assignment #4 – The Milky Way + Meteor Shower
Due on Wednesday, November 14 in class

Each of these observations must be done on a sheet of blank paper

Part 1 – Taurid Meteor Shower
For this assignment, you will observe the Taurid meteor shower, which occurs because the Earth is making its annual trek through a cloud of debris left behind in the inner solar system by a comet called Encke. This causes a number of "shooting stars" (meteors) near the constellation of Taurus. The shower will be best this year on the nights of November 4, 5, 11 and 12, but don't wait until one of these nights to watch them! If it is clear, do your observations!

The meteors associated with the Taurids will appear in the general direction of the constellation Taurus, but can be reasonably far away so keep watch over a wide field of view in that direction. The constellation Orion is a good landmark to use to find Taurus, as the red star Aldebaran (the eye of Taurus the bull) is just to the northeast of Orion.

Before going out to do your observations, use your planisphere to make sure that Taurus and Orion are both up. You should go to a dark location (e.g. Book and Plow Farm) a little ahead of when you're going to start your meteor counting and sketch your horizon in the direction of Taurus. Sketch the constellations of Orion and Taurus (remember to sketch only what you see, not what you think you should see). The meteors will all originate in this area, but leave some room around Taurus and Orion (i.e. don't draw them too big), as some of the meteors will trace quite long paths that you'll want to record.

Once you've sketched your horizon and reference constellations (and given your eyes some time to adjust), set a timer for 30min. Each time you see a meteor, sketch its path relative to the constellations on your drawing. The constellations will continue to rise over this 30min period, so it may be that some of the meteors extend below what you've drawn as your horizon (new stars may appear here too, and you can sketch these in below your horizon as well as reference points for your meteor paths).

Label each meteor path on your diagram with the time (to the nearest minute) as well as anything else you noticed about it (e.g. if it was particularly bright or long).

Questions:
1. Did the meteors originate from a common point or area of the sky? If so, where? If not, describe how varied the apparent points of origin were.
2. Use the explanation above for the cause of the meteor shower to explain the geometry that you observed.

3. How many total meteors did you see, and what was the average rate in meteors per minute?
4. How much variation did you observe in the (a) arrival time, (b) length of the meteor's path and (c) brightness? Did any of those measureables seem to vary together?
5. How did this observation compare to what you expected to see? Describe at least one thing that you found surprising about it.

Part 2: The Milky Way

Once you are through observing meteors, you should be very well dark adapted and able to see the Milky Way, which rises like steam from the spout of the teapot-shaped Saggitarius constellation and passes right up through the summer triangle. Sketch the path of the Milky Way from Saggitarius to the Summer Triangle. It can help to avert your eye a bit and look out of the corner when viewing faint things, so try that trick if you're having trouble. If you still can't see it, you probably need to find a darker site. Once you've located the Milky Way, use fist and finger measurements to estimate both (a) how wide it is on average and (b) what the range in width is across whatever swath you see. Label the widths at at least two locations (the narrowest and widest points in the swath you sketched) in your drawing.

Questions

1. Describe in words the degree of variation that you see in the brightness of the Milky Way.
   a. How uniform in brightness is it?
   b. Do you see any dark patches? If so, about how big are they?
2. Describe in words the degree of variation in the width of the Milky Way.
   a. How wide is it on average and how did you determine that?
   b. What is the approximate degree of variation in the width of the Milky Way and how did you determine that?