Astronomy Online Observing Projects

Students will need to complete two projects during the semester. Several project suggestions are listed below. These are only suggestions and you can make some modifications. Ideally, one project is completed each quarter of the semester. Be sure to record dates, times, locations, and any other important information. A typewritten report should be completed for each project that contains three sections: (1) an introduction describing what you will do for your project and some theory; (2) procedure, data collection, sketches, and photos; (3) conclusions- write about what was learned from your project.

1. Constellation Photography. Photography will be done with a 35mm camera and tripod supplied by the instructor. Include at least 5 photos in your project. Name some of the brighter stars in your photos and maybe even include a little constellation mythology. As well as constellations you could photograph the Northern lights if they are active, satellite trails (see item #2), Iridium flares, or planetary groupings. Be sure to record all the information on the Photography Data Sheet as you take each picture.

2. Satellite Tracking. Find when a satellite is visible from our location using the Heavens-Above website. Go outside and observe the pass. Describe all details (brightness, speed, colors, etc.) as you watch. Try to view three or more different satellite events. Include maps and printouts in the report. The Space Shuttle and the International Space Station are easily seen as they pass overhead.

3. Make a Sketch of the Full Moon. Make a 5" diameter circle on your paper. Sketch in as much detail of the full moon as you can see with only your eyes- no binoculars or telescopes will be used. Record the date, time, and sky conditions (slightly hazy, crystal clear, etc.). After the drawing is complete, compare the detail on the drawing with a good map of the full moon and label the features that can be identified. (The Moon viewed naked eye appears about the same size as Mars does as seen through a telescope at high power.) You may need to do more than one sketch since you will probably notice more detail on a second attempt.

4. Star Magnitudes. Compare the magnitude of the faintest stars you can see at times of new moon versus full moon. Download a map and determine magnitudes.

5. Light Pollution. This project is similar to #4 except you could determine the magnitude of the faintest stars seen in the country versus the city. Light pollution effects can be measured.

6. Galileo's Telescope. Using cardboard tubes and two lenses, build a small telescope similar to Galileo's in 1609. Make sketches of Jupiter and Saturn showing detail he would have seen.

7. Telescope Observing. If you already have a small telescope at home, you could view the moons of Jupiter and Saturn. For example, how many days does it take Titan to orbit Saturn? Or how long does it take Callisto to orbit Jupiter? Include sketches, dates, and times in your report. After you have determined the length of the orbit in days, compare with the accepted value.

8. Project Starshine. I have put in a request for our class to participate in tracking the Starshine 3 satellite. The Heavens-Above website is used to predict overhead passes. You can observe the satellite and turn in valuable tracking data to Project Starshine. This is a satellite in a low orbit that is

encountering atmospheric drag. The orbit is getting lower with time and after several months the satellite will burn up as it re-enters the atmosphere.

9. Observe a Meteor Shower. Relax on a lawn chair on a clear night and make notes of the time and appearance of meteors. Find the dates and intensities of known showers.

10. Youngest Moon Observing. On the first few evenings after new moon a thin crescent is seen low in the Western sky. Determine how soon after new moon the thin crescent can be seen.

11. Virtual Telescope Program. This website allows students to submit a proposal to receive an astronomical image taken by a large telescope at one of several observatories. The object name, coordinates, special requirements, and an explanation of why you are interested in the object are all sent to the specific observatory and in one to two weeks, a CCD image should appear in your e-mail. Write about the telescope and observatory that produced the photo.

12. Sundials. Make sundial models for different locations on earth and explain why the angles on the sundials vary. Test the sundial made specifically for our location to see if it tells the correct time. A program called Shadows can be downloaded and used for sundial design.

13. Self-Determined Project. Maybe there is a topic in astronomy you have been curious about. The sky is the limit, but let's talk about it first.