PHYS 103: Astronomy

Observing Project Requirements

Minimum Information: All observation reports must contain at least the following information:

1. Your name.
2. The local date of the observation.
3. The time (and time-zone) to the nearest minute for the start and end of the observations and of any particular measurements.
4. Your location where the observation was made, in latitude (to the nearest tenth of a degree) and longitude (to the nearest tenth of a degree) and the source of that information (such as a map, for example).
5. The weather conditions (e.g. clear, partly cloudy, etc.).
6. The observation method [naked eye, binoculars (specify objective diameter and power), telescope (specify objective diameter and power)] .

To get latitude and longitude data, consult maps at the library or use the web site:

- http://www.zipinfo.com/search/zipcode.htm (give latitude and longitude from zip code).

Project Grading

60 pts	Being there:	You actually looked at sky objects in an organized way. You can lose these points by reporting things that were not visible.
10 pts	Minimum requirements:	Your report contains the minimum information listed above.
10 pts	Following directions:	You followed the directions for your particular project, given below.
10 pts	Consistent, accurate record:	Your report records what was observed in an informative way.
10 pts	Beyond requirements:	Exceptional in some respect such as writing or added material.

General Advice

Compass Directions: For all of these projects, you should know which directions are North, East, South, and West. The simplest and best way to do that is to go to your observing location at sunset. Note the distant object (house, tree, etc.) that the Sun is setting behind. That object is West of you. When you face that object, South is to your left, North is to your right, and East is directly behind you. Pick out distant horizon objects that correspond to those directions.

Weather: Look at a picture of the Earth as seen from space. Notice that about half of it is white. Those are clouds. You cannot do an observing project if one of them is overhead and they are overhead about half the time. Fixed-time events such as sky-watches and meteor showers are at the mercy of the weather – Do not count on them. Leaving your project until the week before it is due is a sure way to guarantee a week of very bad weather and no project.

Beyond Requirements: Credit will be given for additional material that makes your observations easier to understand. Note that this is NOT extra credit. Some sort of extra material is expected in order to get the last 10% of the grade. It is left up to you to decide what that extra material will be. A short narrative paragraph describing your experience would add credit to a project (such as Moon watching) that does not require a narrative report. Extra information about the instruments used or the objects viewed can be downloaded from the web and included in your report for extra credit (citing the source of course). Exceptional presentation in an observing report would correspond to well-organized tables, a well-written narrative, or pictures of the instruments used or the objects observed.

Possible Observing Projects

Moon Watching: Pick a safe location where you can see the sky toward the east, south, and west with minimal obstructions (i.e., few tall trees, buildings, etc. to block your view of the sky). Choose a convenient evening (after sunset) time to make at least 20 consecutive daily observations of the Moon from this location. Using a **single** 8.5x11 inch piece of white paper (long-side horizontal), sketch the major objects along the horizon from your observing site, stretching from the east on the left side of the paper to south in the middle of the page and west on the right side. Keep the horizon objects within the lower third of the page so that there is ample space to draw the sky above them.

Each night at the same time, go to your observing location and look carefully for the Moon. Draw the Moon (always on the same sheet of paper) such that the shape (phase) of the Moon shows and the orientation of the phase can be seen. Carefully position each image of the moon on your drawing based on which buildings, trees, etc. it appears above and how high above those objects the moon appears. Be sure to write the date next to each moon image. If you do not see the moon on a given night, do not draw anything that night.

Make a table of observations that lists: Date, time, nearest direction the Moon appears, whether or not the Moon was visible, and if the weather was too cloudy to see the Moon.

Sky Watch: The Science Museum and the Richmond Astronomical Society sponsor a free monthly telescope observing session for the public in front of the Science Museum of Virginia on the third Friday of the month between 7 p.m. and 8:30pm (depending on the time of the year). This semester, they will be held Sep. 21, Oct. 19, Nov. 16. Write reports (minimum three pages, typed), which include all of the minimal data listed above; describe what you saw through the telescopes; and what type of telescopes you looked through. **[NOTE: Sky Watch is held only on clear nights. If the sky is overcast at 5pm on the scheduled day, it is cancelled.**

Meteors: The only major meteor shower this semester is the Leonids, peaking on Nov 18, 2007. That shower will be too late for your project. The Orionids peak on October 21, 2007 but are usually a weak shower. More information about meteor showers can be found at the website: http://comets.amsmeteors.org/meteors/calendar.html. More than you probably want to know can be found at the website: http://www.imo.net/calendar/2007.

Find a safe observing location with as wide open a view of the sky as possible and spend at least 3 hours watching for meteors. In addition to the above minimum data, record the time of each meteor you see, its direction of travel, and a rough estimate of its brightness (e.g. very bright, very dim, medium brightness), and note color (if any). You will need patience and a very dark location, far from any city lights to see much.

Observatories: Two observatories within reasonable driving distance have public observing nights. Attend one (or more) of these sessions and write a report (include the same data as listed in the Sky Watch project above.) The nearest one is at Randolph Macon College in Ashland. Information about this observatory and its public nights will be found at its web site: *http://www.rmc.edu/directory/academics/phys/keeble/*. The Leander McCormick Observatory at the University of Virginia in Charlottesville also has public nights. For information about these, see this web site: *http://www.astro.virginia.edu/pubnite/*.

Artificial Satellites: Artificial, Earth orbiting satellites can be seen with the naked eye almost any clear night, if you know when and where to look. You can get accurate predictions for almost any location for free from this web site: *http://www.heavens-above.com/selecttown.asp?CountryID=US* After selecting the city, you will get a page of links for different types of satellites. Clicking on one of those links gives you a table of predicted information for each satellite pass. Print out the tables several days in advance of your observations. This website frequently becomes overloaded and unavailable, so be prepared!

Make at least 5 separate observations of satellites using predictions from the above web site. You have to actually see a satellite for it to count toward the 5 observations. Include in your report the name of the satellite, the predicted times, directions and maximum elevation of passage and the actual times, directions, and maximum elevations of passage as recorded by you. *Hint:* Good satellites to spot are ISS, and any of the Iridium satellites with predicted magnitude numbers smaller than 2.

Other Projects: To do an observing project other than the ones suggested here, submit a one-page description of the project for approval before the due date. That page, with my written approval on it, must be included with the project. Remember, the project must involve you observing night sky objects in an organized way and recording meaningful things about what you observe.