Observing Project — Naked-Eye Astronomical Observations

Resources:

Stardate Moon Phase Calendar: http://stardate.org/nightsky/moon

Get Moonrise and moonset times from either the USNO site liked at Stardate or:
http://www.timeanddate.com/worldclock/moonrise.html

Sky and Telescope’s Observing Pages including week by week guides and star charts: http://www.skyandtelescope.com/observing/

KCET Best Places to see the sky in LA County: http://www.kcet.org/living/travel/socal_wanderer/night-sky/stargazing/8-places-to-see-stars-in-los-angeles-county.html

General Instructions:

- Choose 1 of the observing projects described on the following pages.
- Choose your project immediately
  - some can be done in a single long session
  - some will take a month or longer to complete
- Follow the instructions carefully.
- If weather is bad on one or more nights/days of a long term project, just record that you were “rained out” on that occasion. For a single-night project, that won’t work!
- A second observing project (a different one) may be completed for extra credit up to 5% added to the final grade.
Project Star Party:

Take part in a public star party. This semester there will be star parties at Griffith Observatory on October 17 & Nov 21. There is one at Vasquez Rocks Oct 10. There will be one at College of the Canyons on the Canyon Country Campus 10/16. There may be other local opportunities. Organizations that regularly hold star parties reasonably locally are:

- Griffith Park Observatory in conjunction with several local clubs. [http://www.griffithobservatory.org/pstarparties.html](http://www.griffithobservatory.org/pstarparties.html)
- The “Local Group” in Santa Clarita [http://www.lgscv.org/events](http://www.lgscv.org/events)

To receive credit for this project, you must:

1. Attend a star party
2. Observe at least two celestial objects with at least two different telescopes
3. Take a photograph documenting your experience — it could be an image of a telescope you used, the general scene, or an astronomical image taken through one of the cameras — I’ve seen some amazing mobile phone photos taken at star parties!
4. Record your observations.
   - Give the date, time & location of the star party
   - Credit the hosting organization
   - For each object, record:
     - description of the telescope
     - name of the object
     - type of object (planet, moon, nebula etc.)
     - description in your own words
     - sketch or picture
5. Write a brief report (100-500 words) about the star party
Project Moon Phases

Observe the moon at least 5 nights a week for at least four weeks. Notice how not only the appearance of the moon changes over the course of a month, but how its rise and set times change.

To receive credit for this project you must:

1. Write a brief report (100-500 words) describing your experience.
2. Have at least 20 observations recorded over a four-week period.
3. Observe the moon during the day at least once. (between 9 AM and 4 PM). (Don’t look directly at the sun!)
4. Record your observations. For each observation you must include:
   • the date and time of day
   • your approximate location (I don’t need to know where you live)
   • the location of the moon. Was it near the eastern horizon, the western horizon or very high in the sky? How far above the horizon?
   • a sketch of the moon’s appearance — phase and orientation relative to horizon
   • any other observations you made
Project Lunar Eclipse

Observe the lunar eclipse in the early evening on September 27th. This is a total lunar eclipse that is just visible from the LA area. 2:11 UT is 7:11 PM local time and the moon will rise in eclipse. You’ll need to set aside about three hours for this. You may enjoy using a pair of binoculars for this if you have access to some.

To receive credit for this project you must:

1. Write a brief report (100-500 words) describing your experience.
2. Watch the progression of the eclipse from moonrise until the eclipse has completed (roughly 6:40 PM to 9:30 PM).
3. Record your observations at approximately 10 minute intervals. Include
   - a preamble
   - description of the location from which you made the observation (urban or dark sky, clear horizon or tall buildings, etc.)
   - description of the moon — it’s phase, how high in the sky it was, overall visibility.
   - For each observation, include
     - the time
     - a description of the moon’s appearance including color and brightness
     - any other notes.
Project Sunrise/Sunset Location

Observe the location of the sun on the horizon at either sunrise or sunset over the course of the semester. Choose a location you can easily return to twice a week at either sunrise or sunset. Return to that location when the Sun is as close as possible to the horizon, and record its location on the horizon. (Be careful not to look directly at the Sun!)

You will need to devise a method for determining the position of the Sun on the horizon. Some possibilities include

- making a skyline sketch or taking a photo if the horizon has recognizable landmarks near the position of sunrise or sunset
- using a compass or compass app
- marking/recording the line of sight to your original observation and then measuring how much the line of sight has changed from that.
- Here is an example of one way to go about this:


To receive credit for this project you must:

1. Write a brief report (100-500 words) describing your experience.
2. Have at least 20 observations about equally spread out over the semester.
3. Have a clear method to determine the location of sunrise/set.
4. Document your observations.
   - preamble: describe your location and your method for determining the position of sunrise/set
   - For each observation, record:
     - date & time
     - position of sunrise or sunset (may be a sketch or photo)
     - statement of how the position has changed (or not changed) since the start of the project.
Project Understanding Solar vs. Clock time

Make a sundial following the instructions on the Sky & Telescope website: http://www.skyandtelescope.com/observing/make-your-own-sundial/. Use your sundial to determine the difference between local solar time and wall-clock time.

To receive credit for this project, you must:

1. Write a brief report (100-500 words) describing your experience.
2. Construct the sundial. **Take a picture of your working model.**
3. Carefully align the sundial according to the instructions, and take a measurement of the local solar time, or local apparent time. Compare this to an accurate measurement of Pacific daylight time. Record your results.
4. Repeat the procedure at least six times spread out over the semester.
5. Document your results.
   - For each occurrence, describe your setup, the date and PDT. Include your longitude.
   - In summary describe and explain the differences between the time you record with your sundial and the time your watch records.
Project Diurnal Motion

Observe how objects in the night sky appear to move during a single night, using 3 observations with 1-2 hours between them. You will need a clear night and a reasonably dark location for this.

- Choose a night sky object or pattern that you can recognize.
  - Preferably, choose an object that is to the east at the time your observing session begins.
  - Depending on the conditions and date some choices might be the Summer Triangle with the bright star Vega, the Moon, a planet — any object or pattern you can come back and recognize later in the evening. Polaris, the North star, is NOT a good choice, but you could use the Big Dipper.
- Choose a location from which to make your observations. You need to be able to find your way back to the same spot in an hour or two.
- Choose a fixed point of reference. The point of reference can be anything large and stationary, like a utility pole, a building, a mountain, etc.
- Observe and record the location of the pattern or object you have chosen.
- Repeat the observation once 1-2 hours later, and again 1-2 hours after that, for a total of 3 observations.

You might wind up with something like this:

To receive credit for this project, you must:

1. Write a brief report (100-500 words) describing your experience.
2. Document your observations:
   - Preamble: describe your location and the object you have chosen to observe.
   - For each observation:
     - Describe or sketch the position of the object. Accurately represent the position and orientation of the object relative the reference point you chose to the best of your ability.
     - Conclusion: What changes did you observe?