

The Moon in its Orbit

I. Objectives

1. Record the appearance and location of the Moon relative to the Sun for at least a month.

II. Resources and Readings

1. Nine Planets Moon, <http://seds.lpl.arizona.edu/nineplanets/nineplanets/luna.html>
2. Phases of the Moon, <http://www.astrosociety.org/education/publications/tnl/12/12.html>
3. Solar Eclipses, <http://csep10.phys.utk.edu/astr161/lect/time/eclipses.html>
4. Lunar Eclipses, http://csep10.phys.utk.edu/astr161/lect/time/eclipses_lunar.html
6. Lunar Cycles, <http://www.treasure-troves.com/astro/LunarCycles.html>
7. Tides and Gravitational Locking, <http://csep10.phys.utk.edu/astr161/lect/moon/tidal.html>
8. Moon Images, <http://dv.pima.edu/~cfstewart/101lab03.htm>
9. Calculator

III. Lab Procedure

You will be able to begin obtaining data for this lab immediately, but it will make more sense following the next class. You will need to understand the celestial coordinate system in order to complete the lab. You will need to observe the position of the Moon among the stars several times a week during a single lunar month (beginning and ending when you choose) and record your observations. Do not delay ! You can't make up for missed observations later in the month ! Before leaving the classroom today we will discuss lab groups and you should establish a group of 3 to 4 people who can work together. If you spread the work out amongst you, you should have no trouble completing this assignment.

1. Using your data from the in-class portion of the lab, determine when the Moon should be in the sky. (you may need to check the phase on the class website)
2. Observe the Moon and make note of which stars constellations surround the Moon. Compare this to your SC-001 star chart (you will receive this next class) to approximate the celestial coordinates of the Moon at this time. Record those coordinates along with the date of the observation. Take care to be as accurate as possible.
3. Once you have the coordinates for a full lunar month, use a pencil (to avoid damaging the chart) to plot the positions you observed for the Moon on your SC-001 star chart. Use this plot (and your coordinates) to answer the questions.

Name:

Questions

1. Is the Moon's orbit in the same plane as the Earth's orbit ? Explain using the orbit plot.
2. If not, by how many degrees is it inclined ?
3. Which direction does the Moon move in its orbit ?
4. Approximate the RA and Dec for the full moon for the month you observed.
5. At which lunar phase did the Moon have the greatest declination (i.e. was highest in our sky) ?
6. Using your data and orbit plot, determine the approximate change in RA of the Moon's position in 24 hours.