

Physics 5 - The Universe
Class Projects
Fall 2007

First Project: The Sun (more details in later handout)

At approximately one week intervals throughout the term, observe sunset from the SAME tall building on campus. Record the date and time of your observations as well as the general weather conditions. Make a drawing each time (or take a photograph, if you have the proper equipment) of the position of the setting Sun relative to stationary objects in the foreground. Wear sunglasses and do not stare for long at the setting Sun. Describe the apparent motion of the Sun with the passage of months and connect this apparent motion with the change in seasons.

Also at approximately one week intervals, measure the length and direction of pointing of the shadow of a tall vertical pole at noon. Discuss how these observations relate to the change of seasons from fall to winter.

Second Project: The Moon (more details in later handout)

Approximately twice a week during the term, find the Moon in the evening or early morning and note its direction and shape, recording the date and time of your observations. At least once during the term when the Moon is full, go out to record the Moon's position in the sky at midnight, noting its direction and angular elevation. Compare these numbers to those for the Sun at noon of the same day. Explain how the Moon's changing shape can be explained by its shining by reflected light from the Sun together with the changing orientation of the lit face as the Moon orbits the Earth. When the Moon is full, measure its approximate angular diameter by holding an appropriate object, for example, by marking an index card with two lines, at arms length along the line of sight to the Moon. Later, in the comfort of your room, measure the length of the distance between the two marks that has the same apparent size as the Moon's diameter and the length of your arm in front of your eyes. Divide the former by the latter to obtain an approximate answer for the Moon's angular diameter in radians. Convert your answer to degrees of arc using the rule that there are 180 degrees in 3.14159 radians. Compare your answer with the accepted value.

Extra Credit: As a check, repeat the measurement when the Moon is next full. Do you get the same answer? What do these results imply about the rough shape of the Moon's orbit about the Earth?

NO MORE THAN 5 TYPED DOUBLE-SPACED PAGES PER REPORT FOR THE TWO CLASS PROJECTS. LIST YOUR TEAM MEMBERS. EACH TEAM MEMBER MUST WRITE A SEPARATE REPORT.