

Lab 3

The Motions of the Planets

Weekly Observation – All Semester
Due April 28

The word planet derives from the Greek word for wanderer, because the Greeks and many civilizations before them noted that five stars moved in the sky with respect to each other and the other stars. This semester, Venus, Mars, and Saturn are all in the evening sky, and change their positions very dramatically over four months. The goal of this lab is to follow their motions.

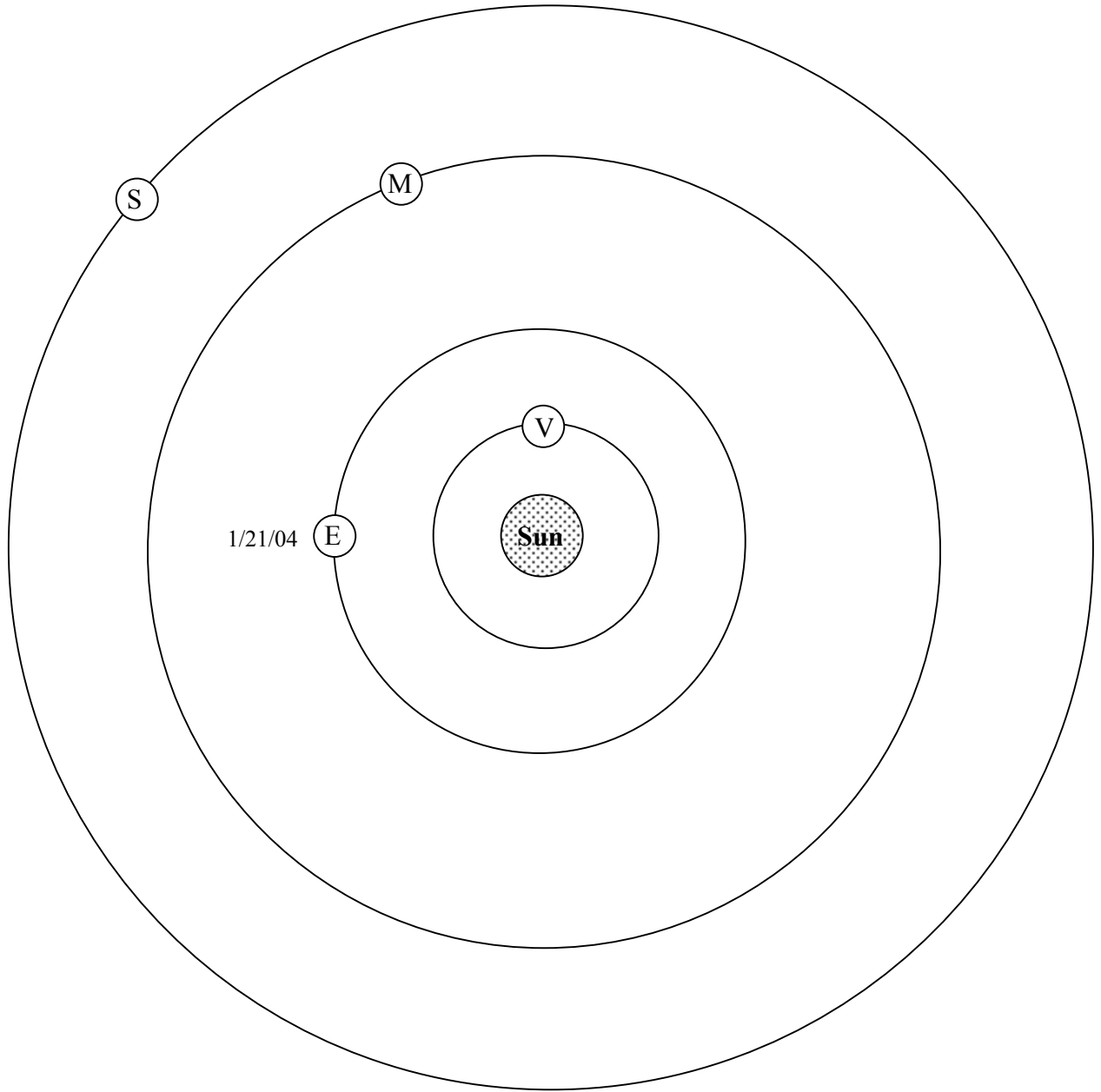
Compared to diurnal or lunar motions, planetary motions are relatively slow. So the observations for this lab need be made only once every week or so. All observations should be made at the same time of day; since in April the Sun sets at around 7:00 pm, you will have to make all of your observations throughout the semester at a time later than, say 8:00 p.m. so that the sky is dark. **Remember** - when daylight savings time begins later in the semester, you will have to shift your observation to one hour later (e.g., 8:00 pm to 9:00 pm)!

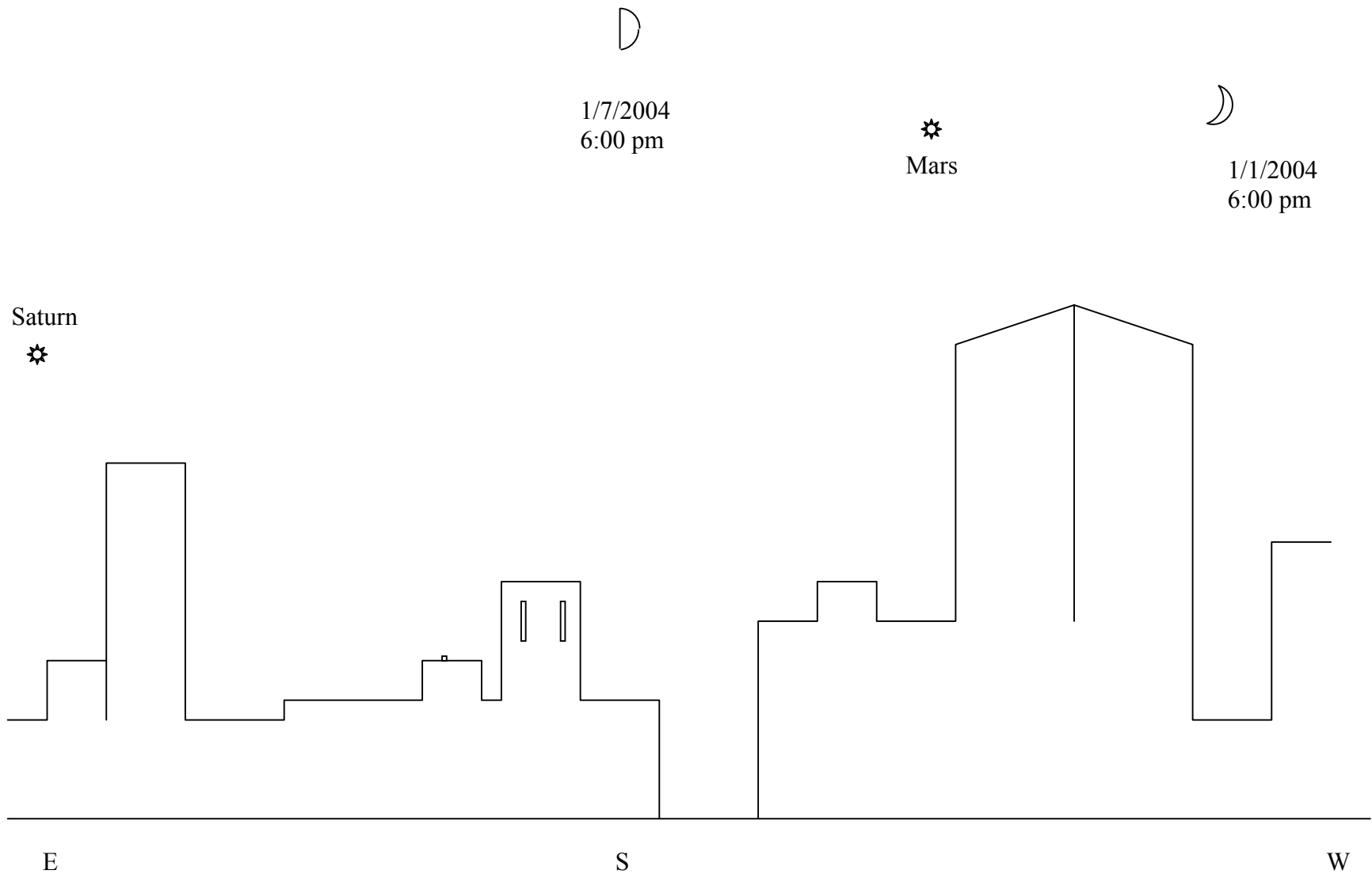
At whatever time you choose, mark the position of Venus, Saturn and Mars on a third copy of your sketch of the horizon. (Early in the semester Venus will be very bright but low near the western horizon.) Use distinct features on the horizon to mark their locations accurately. Then make approximately weekly observations for the rest of the semester, always observing at about the same time of day.

Turn in your sketch and answers to the questions below on **April 28**.

Questions;

- 1) The relative location of Venus, Earth, Mars and Saturn in their orbits at the beginning of the semester (mid-January) are shown in the figure on the next page. Show in the same figure where the three planets were in Mid-March and late-April by drawing circles like the ones shown at the appropriate places in their orbits.
- 2) Mark on each circle representing the Earth where Madison was located at the time that you made your observations (e.g., 8:00 pm).
- 3) Over the course of the semester, Mars and Jupiter moved closer to the western horizon, while Venus moved further away from the western horizon (i.e. higher in the western sky). Please explain why the planets' motions were in different directions with respect to the horizon.





Saturn and Mars should be visible as shown. Both are among the brightest objects in the sky, and Mars has a distinctive red color.

The positions and shapes of the moon are just for illustration and are not accurate.