

## Astronomy 1013 Writing A: Constellations & The Night Sky

Focus: the sky (day and night) has predictable patterns that can be observed, described, and understood.

Goals: from a series of inquiries about night sky patterns, summarize the behaviors studied, then create a brief written statement. Answering the questions should take about 30 minutes.

Please answer the questions in any format (any of single or double spacing, font size any, etc.), ensuring that you answer each of the questions as a series of responses, or in essay form. Submit it on paper (only, no electronic submissions) to the professor by the date specified in the syllabus or as otherwise noted by your professor.

1. Choose one of the following on-line planetarium programs, then look for the specific instructions (at the end) for the one you've chosen.

- <http://www.skyviewcafe.com/skyview.php>
- <http://www.astroviewer.com/interactive-night-sky-map.php>
- <http://www.heavens-above.com>

2. Set your observing location and time zone. Each tool should show a large fraction of the sky, either as a whole-sky chart (on-line tools) or as a pseudo-horizon (Stellarium).

### A. Exploration of Daily Motion

- a) Set the software for the current date. To which constellation is the Sun closest?
- b) Increase the time by one hour (using a 24-hour clock). Toward which direction does the Sun move?
- c) How does the position of the Sun compare to the constellation of question A.a?
- d) Advance the time to sunset. How does the position of the Sun compare to the constellation of A.a?
- e) Advance the time to sunrise. How does the position of the Sun compare to the answer of A.a?
- f) What general statement can you make about the motion of the Sun and the stars?

### B. Exploration of Longer-term Motion

- a) Set the star map to sunset for today. To which constellation is the Sun closest?
- b) Set the date to tomorrow. How does the Sun's position compare to the answer of B.a?
- c) Set the date to one week from now. How does the Sun's position compare to the answer of B.a?
- d) Set the date to two weeks from now. How does the Sun's position compare to the answer of B.a?

- e) Set the date to one month from now. How does the Sun's position compare to the answer of B.a?
- f) Set the date to two months from now. How does the Sun's position compare to the answer of B.a?
- g) Set the date to three months from now. How does the Sun's position compare to the answer of B.a?
- h) Set the date to six months from now. How does the Sun's position compare to the answer of B.a?
- i) Set the date to nine months from now. How does the Sun's position compare to the answer of B.a?
- j) What general statement can you make about the motion of the Sun and the stars? Which direction does the Sun move relative to the background stars?
- k) If a student generalized the behavior as 'the constellations seem to drift slowly westward compared to the position of the Sun, with the Sun covering constellations at the rate of about one per week', would you agree or disagree? What evidence would you cite to support your answer?

#### C. Exploration of the Motion in Greater Detail

- a) Return to the settings of section A. Advance the clock in 2-hour increments for a total of 12 hours. Are there any constellations that never rise or set? If so, what are their names?
- b) In what direction do the constellations appear to move? What two explanations account for that behavior?
- c) Do you agree or disagree (and supply an explanation for your reasoning) with the following summary: The amount of time that all stars are above the horizon is 12 hours because it takes 12 hours for a star to rise in the east and set in the west.

#### D. Exploration of the Motion of the Moon

- a) Return to the settings of section A. Is the Moon visible in the sky? If 'yes', note the constellation in which it appears, then move on to the next question; if 'no', advance the date until the Moon appears, then note the constellation in which it appears.
- b) Advance the date by 1 day. What happens to the Moon? In what direction does it appear to move? What is its relation to the Sun? Approximately what phase is the Moon?
- c) Advance the date by 5 days. What happens to the Moon? In what direction does it appear to move? What is its relation to the Sun? Approximately what phase is the Moon?
- d) Advance the time by 6 hours. What happens to the Moon? In what direction does it appear to move?
- e) A classmate summarizes the Moon's motion as "the moon moves from east to west as it orbits the Earth and that explains all of the motion we see" do you agree or disagree? Provide a brief explanation.

### Writing Assignment

Summarize the description of the motion of the night sky. Do so as if you were speaking to someone who is not familiar with the motions of the night sky, but do remember that you are in a quantitative class, so you should back up your comments with quantitative statements or data. You may make historical connections. Be creative and engaging! The end result should be approximately one page long (ie, about 3 decent-sized paragraphs).