## ASTR 101, Spring 2018.

Homework assignment #2. Due on Friday 9/29.

Please answer in a separate sheet of paper. Write your name clearly at the top the sheet (as it is in the class role) and staple multiple sheets together.

Please give detailed answers and write legibly; if the grader can't read your answer, it will be considered wrong.

You can discuss the problems with anybody or get help. But **answers should be in your own words,** with a full understanding of the answer. *Copying or cheating or will result* in a *zero* for the assignment for all involved.

## 1)

...Gladly then did goodly Odysseus spread his sail to the breeze; and he sat and guided his raft skillfully with the steering-oar, nor did sleep fall upon his eyelids, as he watched the Pleiades, and late-setting Bootes, and the Bear, which men also call the Wain, which ever circles where it is and watches Orion, and alone has no part in the baths of Ocean. For this star Calypso, the beautiful goddess, had bidden him to keep Bear on the left hand as he sailed over the sea...

the Odyssey by Homer

In the above excerpt from *the Odyssey*, Homer describes how Odysseus used stars to navigate on his voyage back home.

- a) What are the (i) constellations (ii) asterisms mentioned there?
- b) Are there any circumpolar stars or constellations mentioned?
- c) According to the above account, approximately in which direction was he sailing? Explain your answer.
- d) Homer had not mentioned about the North Star, which could have easily been used to navigate at sea. What could be the reason? Explain your answer.



2) Crux (or Southern cross) is a conspicuous southern constellation only visible from latitudes below  $20^{0}$ N (like Hawaii, Turkey..). But Greek astronomers had mentioned that it was visible from Athens in ancient times. How could that be possible? Explain.

3)

Adjacent photo shows the statue of Atlas, holding the Celestial sphere (ie. sky), a 2<sup>nd</sup> century Roman marble statue now at the National Archaeological Museum in Naples, Italy. It is supposed to be a replica of an earlier Greek work. Several constellations and the celestial equator are depicted on the sphere. It has been proposed that the arrangement of constellations represents the sky at the time of 129 BCE, thus suggesting a connection to the star catalog Hipparchus made around that time. Explain the possible reasoning behind for such an estimate of the date of constellations on the sphere.



Following two questions are based on facts you learned on 8/31 (see slides). Answer them on this sheet and attach to your homework.

4.

	-v *	
south-west	West	north-west

I. The illustration above shows the western horizon and the setting sun as viewed from Oxford MS (latitude 34<sup>0</sup>N) in mid September. The arrow indicates the direction in which the sun has been moving prior to the sunset. On the same illustration, sketch the approximate location and direction of the sunset in a similar way for a date in mid June and a date in mid December (use a black pen or pencil). Label the illustration clearly to indicate which is which

5.



- I. The illustration above shows a few stars rising near the eastern horizon, as viewed from Oxford, MS (latitude 34<sup>0</sup>N). Draw arrows (using a **blue** pen or pencil) to show the directions that these stars will appear to move just after rising (like in the diagram of question 5, but pay attention to the orientation of the diagram with respect to cardinal directions).
- II. How would the movements of those stars differ, if instead we were viewing them from the equator? Draw arrows in **black** to show their movement.
- III. What would be the location of those stars in the sky after three months at the same time of the day?