ASTR 101, Fall 2018, Homework #3

Due on Friday 11/6.

Please write your name clearly at the top the answer sheet 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. No Cheating or copying.

1)

a) What would be the phase of the Moon if it is rising at midnight
b) If the full moon is directly overhead, what would be the approximate time?

Explain your reasoning, preferably with the help of diagrams which show relative positions of the Sun, Moon and the Earth (similar to diagrams in slide 3 on 9/21).

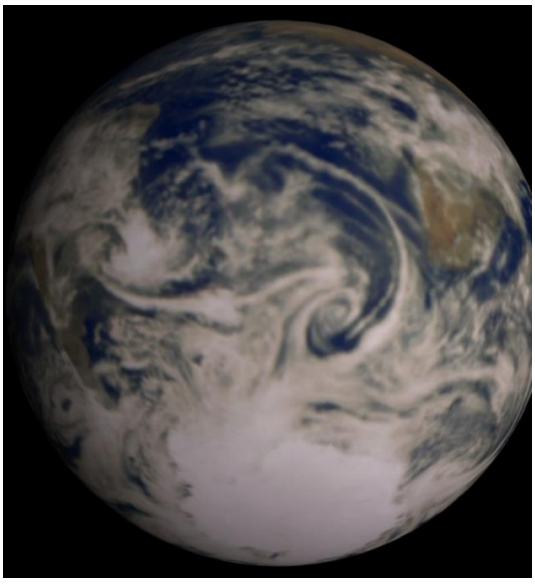
2) Suppose you see a quarter Moon in the evening sky, but cannot see any stars.

a. Is it the first quarter Moon or the third quarter moon?
b. What would be the position of the Moon in the sky?
c. How do you use the Moon to find the direction (approximate) in the above situation?

Explain the reasoning behind your answers, preferably with the help of a diagram.

3)

Photo in the right is an image taken by the Galileo spacecraft en route to Jupiter. Image shows southern part of Africa and Antarctica. What is your best estimate of the Month of the year this image was taken? explain your answer.



4.

a. What is a transit of the Sun by a planet?
b. Which planets can cause solar transits? Why don't others transit the Sun?
c. Why don't we see solar transits by planets so often?

5.

Jupiter completes one revolution around the sun in 12 years. Use Kepler's third law to estimate the distance between the Sun and Jupiter in astronomical units.

( follow a procedure similar to the example given in slide 26, 10/9. If you don't have a scientific calculator you could use http://www.calculatorsoup.com/calculators/algebra to calculate roots of numbers)