Astronomy 115: Homework Assignment #1

Due Date: Thursday, September 5

Please submit your answers to each of the questions below. Do not submit the questions. To receive full credit, show your work rather than just giving an answer. If you are having trouble with a problem, read it again carefully (it may even help to read it aloud.) Think about what you already know about topics in the question. You are also welcome to consult with the professor during office hours.

Submission Instructions

- **In Person Students:** Turn in your homework papers in class on the day they are due. Typed or hand written submissions are fine, but please make sure your writing is clear.

  On line Students: All homework is submitted electronically via Canvas.sfsu.edu Homework assignments should be typed and formatted as a .PDF file. {Also, please double check the file you submit to make sure it is the correct file.}

Questions

The Size & Scope of the Universe (Ch. 1)

1. The following important terms will be used throughout the course. First, write down what the term means to you or how you've heard it before. Then look up the words in a dictonary or online and note any differences. (Common terms sometimes have different meanings in a scientific context.)

   - A.) Planet
   - B.) Star
   - C.) Solar System
   - D.) Galaxy
   - E.) Universe.

2. The speed of light is 300,000,000 meters per second (m/s).
   A.) Express this number in kilometers per second (km/s).
   B.) Use a conversion factor (1 km = 0.6 miles) to find how many miles light moves in one second.

3. What is special about the star Polaris, and its position in space? How can it be used?

4. What is the ecliptic?

5. Describe in your own words what must happen for you to witness a **total solar eclipse**. Can this happen at any phase of the Moon?

6. Suppose you had a young niece or nephew who asked "Why do we have seasons?" Explain how you would answer in one paragraph. (Optioal: Include a diagram).

7. What is the astronomical origin of these common units of time, from the calendar? That is, what happens, astronomically, within each time period?

    - A.) Year
    - B.) Day
    - C.) Month

Getting Experience with Very Large Numbers

8. How many **seconds** are there in 1 year? To calculate this, start with what you know about a second or a year, and expand on that. Show your work. Express your answer in scientific notation. (NOTE: Remember this number, you'll be use it again.)

9. Why do we on Earth see the Moon go through phases over a typical month?

10. What is your 'astronomy connection'? Describe either a moment in your life when you took note of an astronomical event (eg. a sunset, a moonrise, a shooting star, etc.) or an activity you have done that has some connection to astronomy.

11. *Optional, Extra Credit* Download software for your computer or an app for your cell phone that lets you see which planets & stars are in the sky right now. (Search for "Planetarium Software") Run the software while outside at night and try to identify some stars an planets. Write a brief (1 paragraph) review of the software, and describe how you used it. Did it work well?