

AST 301  
Homework #1  
Due Friday Sep. 3

1. I want you to do one of the calculations I did in class a bit more carefully than I did it. The Earth orbits around the Sun in a nearly circular orbit with a radius of  $1 \text{ AU} = 1.5 \times 10^8 \text{ km}$ . It takes one year to go around its orbit.

- What distance does it travel in one year? (Give the answer in km.)
- How long does it take it? (Give the answer in seconds.)
- What is its speed (in km/s)?
- How many times faster than your walking pace is that?

2. Let's do almost the same question for the Sun orbiting around the center of the Milky Way galaxy. The radius of the Sun's orbit is about 25,000 light-years, and it moves with a speed of about 200 km/s.

- How far (in km) does the Sun go around its orbit?
- How long does it take it to go around (in seconds)?
- How long does it take it to go around (in years)?
- The Sun is about 5 Gyr old. How many times has it been around the Milky Way?

3. Why are you taking this class?

4. Your assignment for the next week or so is to watch Venus, Mars, and Spica. Find a place you can go at about 8:30 PM where no buildings block your view to the west. Go there at least 3 times in the next 2 weeks. Sketch the positions of Venus, Mars, and Spica, as well as some landmarks on the horizon. Write down the date and time, your location, the weather, and the names of any companions. You should have made at least two of the observations by Sep. 3. (The planets will be too close to the Sun to be seen soon after that.) Include a copy of your first observation with this assignment. (But also include a copy with the others you hand in the next week.)