0. Complete HW2 (problems 2 and 5, involving RA and Dec)

1. **Binary star target** Find out as much as you can about the binary star that was assigned to you. How far away is it? What kind of stars make it up (spectral types, masses, etc)? Are more than two stars present? How far apart are the different stars in the system? What is/are the orbital period(s) of the system, if known? Write your notes about the object on a separate sheet of paper and include references. Use at least two different sources of information.

2. **Deep-sky target** Find out as much as you can about the deep-sky target that was assigned to you. What is it? How does it fit into our broader knowledge of stars and galaxies in the Universe? How far away is it, what is its angular size, and what is its physical size? Write your notes about the object on a separate sheet of paper and include references. Use at least two different sources of information.

3. **Calibrating your hands for angular measures**

   Last week we calibrated our hands for angular measurements on the sky using chalk marks on the blackboard at 1-degree intervals, and standing 10 meters away from the board. How far apart must the marks on the board be to span 1 degree? Show your work and state result to the nearest mm.

4. **Angular size of the Moon**

   (i) Look up the diameter and average distance to the Moon in kilometers:
   
   Moon diameter =
   
   average moon distance =

   (ii) Compute the angular size (angular diameter) of the Moon as viewed from Earth. State your result in degrees and in arcminutes. Show your work.

   (iii) The Moon’s orbit has an eccentricity of 0.055 meaning that it is sometimes 5.5% closer and sometimes 5.5% time farther than average from Earth. Compute the minimum and maximum angular size of the Moon as viewed from Earth. State results in degrees and in arcminutes. Show your work.
5. Angular size of the Sun

(i) Repeat #4 (all three parts) for the Sun (using the characteristics of Earth’s orbit around the Sun). Show all your work (attach a separate sheet of paper as needed).

(ii) Compare your results for the Sun and Moon and comment on their significance for eclipses. Under what conditions will total solar eclipses occur?

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STAR WHEEL REVIEW: please read over the graded HW1 before doing these exercises.

6. At what time (PST and PDT) will the following objects rise, and from what direction on Sept 15?

Capella, the brightest star in Auriga:
Aldebaran, the brightest star in Taurus:
the star-forming region M42 in Orion:

7. At about what time (PST and PDT) will the following objects set, and in what direction on Sept 15?

M22, a globular cluster in Sagittarius:
Arcturus:
Mizar:

8. At about what time (PST and PDT) will the following be on the meridian on Sept 15?

the globular cluster M13 in Hercules:
M31, the Andromeda galaxy
Fomalhaut, the brightest star in Piscis Austrinus