PHY517 / AST443: Observational Techniques

Homework 2

1. Log into the Astro Computing Lab and change your password. Add a screenshot of successfully running `passwd` on `kirk.astro.sunysb.edu` to the homework submission as evidence.

2. On the days of the equinox (day and night are equal length), at what azimuth angle does the Sun rise? Where does it set?

3. The celestial coordinates of the star Altair are approximately $19^{\rm h}50^{\rm m}, +08^\circ52'$.

   (a) What is the maximum altitude it can be seen from Stony Brook?

   (b) What is its distance from the zenith then?

   (c) At a Local Sidereal Time (LST) of $18^{\rm h}50^{\rm m}$, what is the hour angle of Altair? Is it to the East or to the West of the meridian?

4. Orion culminates at 1am in September; at what time does it culminate 3 months later? Describe how you arrived at your answer.

5. What is the observed flux ratio between the faintest galaxies in the Hubble Ultra Deep Field and the Sun? (Use the apparent magnitudes listed in the lecture slides.)

6. Look up the focal length of our telescope, and the size of the STL-1001E CCD. You can find both in the manuals linked from the *Observing Equipment* tab on the class wiki. Calculate the field-of-view of the camera when attached to the telescope.

7. Looking up references and compiling LaTeX(see the wiki page):

   - Download the `example.tex` file, and **read** and compile it.
   - Look up 3 references for your object from HW1, and read their abstracts.
   - Write a short paragraph about this object, briefly summarizing the conclusions from these 3 papers.
   - Include the references via BibTex. Use "\citep" and "\citet" at least once each. If you don't understand what I'm talking about, go back and read `example.tex`.
   - Also include the finding chart and the StarAlt plot (altitude vs. time) from HW1 as floating figures in the document. Make sure that each figure has a caption, and reference each figure in the text with the "\ref" command.
   - Submit the compiled "paper".

8. Work with your lab partner(s)

(a) select an interesting astronomical object that is up in the sky soon after twilight (such that to be observable early) to take a pretty image of for your Lab 1. You can e.g. use the Stellarium app (can be planet, star cluster, etc)

(b) settle with your lab partner(s) on which Lab 2 you are going to conduct and report it to the instructor and TA.

(c) request 3 dates for Lab 2 with dates no later than March 1st.

(d) For groups doing the exoplanet transient lab:

   i. (As a group:) Follow the target selection section on the wiki (Lab 2.1). For each transit: submit the mid-transit time, the transit duration, and the magnitude dip, as well as the StarAlt plot with these times marked. State when you should arrive at the telescope.