PHY517 / AST443: Observational Techniques

Homework 2

1. Log into the Astro Computing Lab and change your password. Send a screenshot of successfully running `passwd` on `kirk.astro.sunysb.edu` to the instructor (by e-mail or on slack) 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. (You do not need to submit the compiled example document.)
   - 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" and `.tex` file .

8. Work with your lab partners to select a target for the Lab 1 "pretty picture". Some suitable targets include star clusters, nebulae, galaxies, etc. Select targets that are well observable in the evening, are relatively bright, and a good match to the field of view of the STL-1001E CCD. Request 3 observing dates by e-mailing / messaging the TAs and the instructor. Make sure to include a documentation of the above criteria in your request, e.g. include the StarAlt plot. Note that these observations need to be taken after the day-time part of Lab 1 (they *can be* taken on the same day, or later though ideally not more than 2 weeks later), and before Lab 2.