Download the following file:

http://ucolick.org/~cdorman/Rm4_astro.tar

Unarchive (double-click on) the .tar file and move the whole folder system to where you want it on your computer. The rest of the instructions will assume you moved it to your Desktop. Check to see that the folder system contains folders labeled 'plots', 'data','MILES', and 'programs'.

Open a Terminal or X11 window. Go to the data folder by typing `cd Desktop/Rm4_astro/data/`

Type `ls` to see the data available in this folder. The 10 'ap*****_phot.fits' files contain PHAT photometric information for the ten clusters. The 'ap*****_skyphot.fits' files contain photometric information for "background" stars in an annulus around each cluster. The 'spec1d.***fits.gz' files contain Keck spectra of the objects.

Type `cd ../programs/` and then `ls` to see the pre-written programs. I used plot_cmd.py to generate the CMDs we used in last week's unit, and you'll use it again later today or next week, but for now we'll use plot_spectra.py. You can open this program to see what it looks like -- I recommend opening it in Aquamacs, but any text editor will work.

Run the program by typing `python plot_spectra.py --name ap15657`
This will produce spectra of all 10 clusters in the plots/ folder -- check to see that the plot was generated and looks reasonable.

Your first task is to change the smoothing length to something larger than 1. Document the effect this has on the spectra.

Your second task is to identify and block out (possibly using sets of vertical lines like the dummy one at 7000 angstroms) the locations of the two non-physical artifacts we discussed: the chip gap and telluric bands.

Your third task is to describe the properties of each of the clusters in as much detail as you can. To help, we've included template spectra from the Milky Way. These are spectra of stars with known temperature (Teff), metallicity ([Fe/H]), surface gravity (log g), and color (B-I). To see the spectra of these template stars, run plot_miles_spectra.py.