Astrometry and Multicolor Images

ASTR250

March 22, 2018

Goals

1. Understand how to align astronomical images to a reference frame
2. Produce aligned images
3. Combine aligned images

In the last class we saw that the files for M42 did not have the correct Right Ascension and Declination. Our first goal is to fix that.

To start the process, please download Aladin

http://aladin.u-strasbg.fr/java/nph-aladin.pl?frame=downloading

It will also be useful to have the following website open to check our work from above.

http://nova.astrometry.net/upload

Question 1 We will want to find three stars in a 2MASS image to map between a catalog image and our images. By choosing three stars with a known RA and Dec, we should be able to create a transformation from the catalog to our images such that we know the RA and Dec of every pixel. Use Aladin to perform the alignment of one color image of M42.

Question 2 Lets check our above results by uploading a few of our images to astrometry.net. The goal here is to check the center coordinates that it gives versus what we found using Aladin. How much do these agree or disagree with each other? Why might this be the case?

Question 3 Use astrometry.net to align at least 1 R, G and B filter image of M42. Use ds9 to create a 3-color image and save it.

Question 4 We now want to make better individual images. We need to build a flat from the three pointing?s of M42. The we need to use the dark, bias, and flat to calibrate our images. Create these corrected images from the aligned data in the 6 images in a single color.

Question 5 Once we have individual calibrated images lets use SWarp to coadd the calibrated Images.