

## ASSIGNMENT #2: PSF PHOTOMETRY

Due date: Apr 13, 2016

In class we identified two major tasks when doing PSF photometry: setting all parameters correctly and computing the PSF reliably. We demonstrated that on a small test image, and you will now apply it to real-world observations of M13 using Villanova's RCT. Download the M13 data from the course website.

- a) Reduce all M13 data and get them ready for photometry. There are only two science images, one in Johnson  $B$  and the other in Johnson  $V$  filter.
- b) Establish the appropriate values for all daophot task parameters and list them along with the arguments for their choice.
- c) Perform PSF photometry and provide a detailed report on the PSF model itself: how robust/reliable is it, how uniform is the subtracted image? In what regions of the image does PSF photometry fail?
- d) Using  $B$ - and  $V$ -photometry, calculate color index  $B - V$  for all photometered stars, and plot  $V$  vs.  $B - V$ . What is this plot and what does it tell you about M13?
- e) Document all parameters and procedures you used for the reduction and analysis and typeset them in a formal report.

Useful literature:

- daophot, phot and psf help files;
- Philip Massey: A User's Guide to CCD Reductions with IRAF, Feb 1997;
- Lindsey Davis: A Reference Guide to the IRAF/DAOPHOT Package, January 1994.