PREPARING FOR APERTURE PHOTOMETRY

USING THE

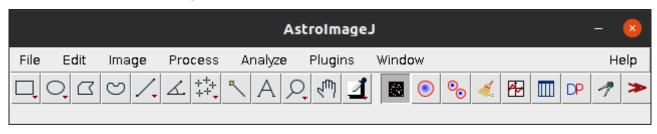
AstroImageJ

SOFTWARE

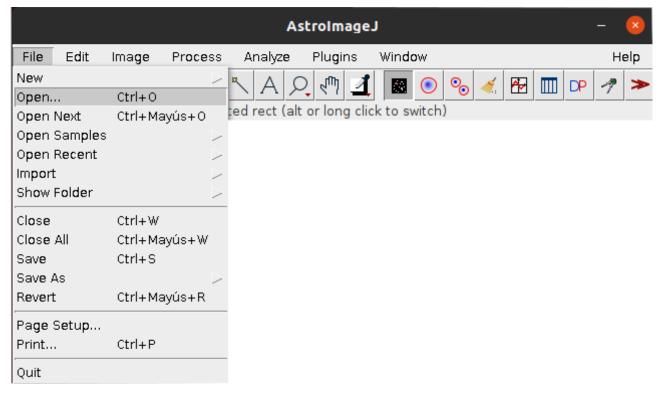
Stelios Pyrzas

CEFCA, 2025

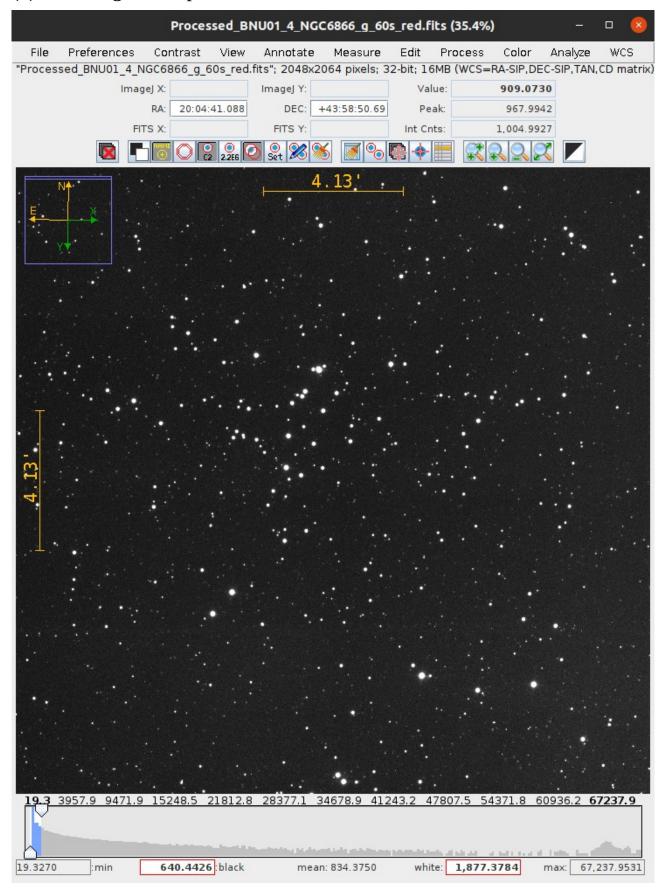
(1) Launch AstroImageJ.



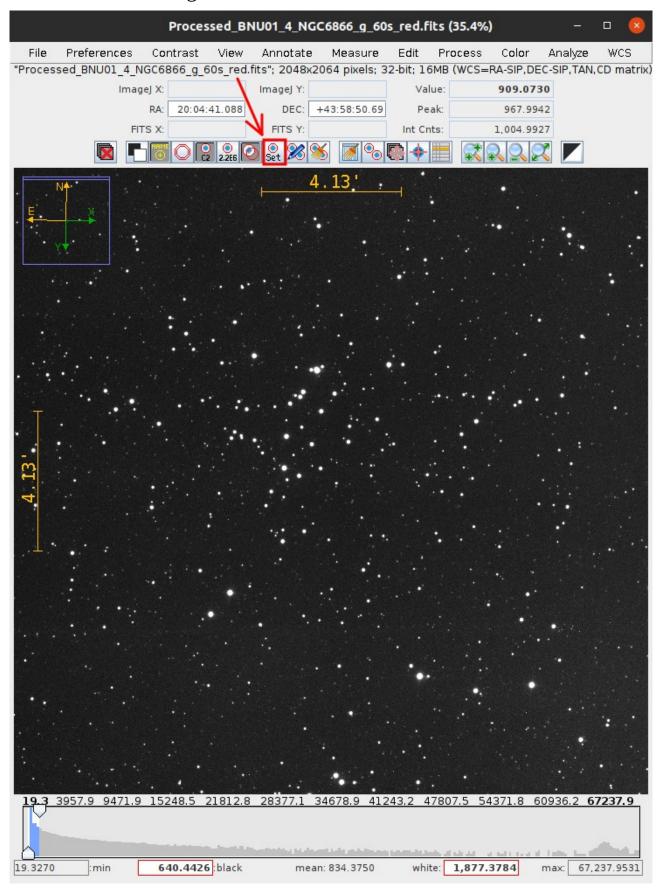
(2) Select "File" and then "Open" to open a single image.



(3) The image will open in a new window that looks like this:



(4) First, we need to set up some parameters. Click on the "**Set**" button identified on the image below:



(5a) A new window called "Aperture Photometry Settings" will open. Make sure that your setup is the same as the one shown in the image below. The important parameters are highlighted.

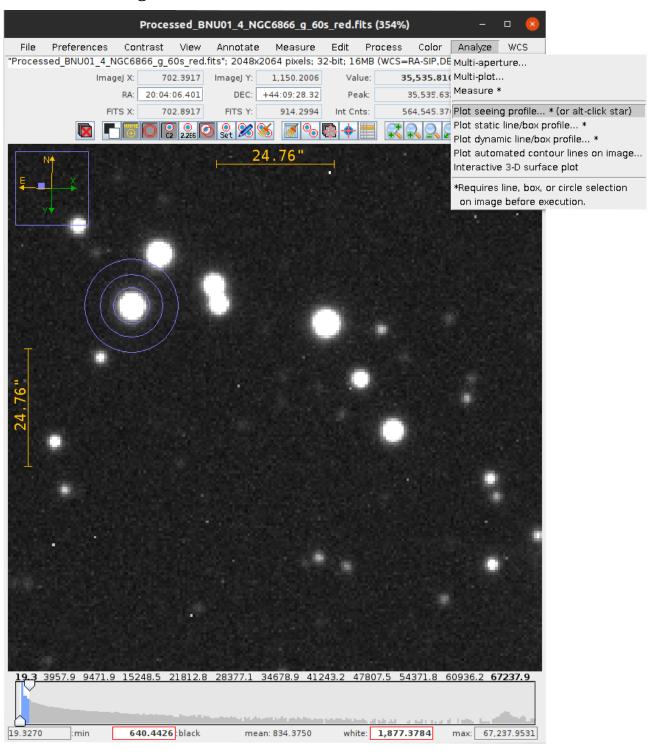
	Ape	rture Photometry Setting	s			×		
Radius of object aperture Inner radius of background annulus Outer radius of background annulus		7.000 12.000 18.000						
□Use variable aperture (Multi-Aperture only) FWHM factor (set to 0.00 for radial profile mode) Radial profile mode normalized flux cutoff		1))					
▼Centroid apertures ▼Jse Howell centroid method □Fit background to plane ▼Remove stars from backgnd □Mark removed pixels ▼Use exact partial pixel accounting in source apertures (if deselected, only pixels having centers inside the aperture radius are counted) □Frompt to enter ref star absolute mag (required if target star absolute mag is desired) ▼List the following FITS keyword decimal values in measurements table:								
Keywords (comma separated):	JD_SOBS,JD_U	TC,HJD_UTC,BJD_TDB,AIRMASS	ALT_OBJ,CCD-TEMP,EXPTIME,RAOBJ	2K,DECOBJ2K				
CCD gain CCD readout noise	1.840000	[e-/count] [e-]						
CCD dark current per sec or - FITS keyword for dark current per exposure [e-/pix]	0.800008.0	[e-/pix/sec]						
▼ Saturation warning ('Saturated' in table) (red bord for levels higher than		Panel)						
Variety warning (yellow border in Ref Star Panel). for levels higher than								
				More Settings Canc	el	ок		

(5b) When ready, click on the "More Settings" button and you will see a new window. Make sure that your setup is the same!

	- 8								
Select single aperture items to display in measurements table:									
Filename (Label)	☐Slice Number (slice)	▼Time Stamps (JD UTC, etc)	▼ World Coordinates (RA, DEC)						
FITS Coords (X(FITS), Y(FITS))	□ Coords (X(), Y())	□Aperture Radii	☐Aperture variance (Variance)						
₹ Source Counts (Source-Sky)	√Source Peak (Peak)*	Source Mean (Mean)	Sky Background (Sky/Pixel)						
▼ Source FWHM (Width)	▼Moment Widths (X-Width, Y-Width)	Orientation Angle (Angle)	Roundness (Roundness)						
✓Source Error (Source Error)**	▼Source SNR (Source SNR)**	☐N Source Pixels (N Src Pixels)	☐N Sky Pixels (N Sky Pixels)						
Select Multi-Aperture items to display in measurements table:									
▼Relative Flux (rel flux)	Rel. Flux Error(rel flux err)**	Rel. Flux SNR(rel flux SNR)**	▼Total Comp Star Cnts (tot C cnts)						
(*to disable, Saturation and Linearity Warnings must be disabled in 'Main Settings' panel) (**requires gain, readout noise, and dark current info in 'Main Settings' panel) Multi-Aperture settings:									
✓ Allow left/right double click for fast zoom-in/out (adds slight delay to aperture placement)									
R Always default Multi-Aperture and Stack Aligner first slice to slice 1 Representation R									
Maximum number of apertures per image : 2000									
Select aperture items to display (or clear) in image overlay:									
▼Object Aperture ▼Sky Annulus ▼Source Number □Value(s)									
♥Clear overlay after use □Clear overlay before use									
			Main Settings Cancel OK						

➤ Keep in mind the option shown in orange, "Sky Annulus". When working with a variable keep it enabled. When working with a cluster, come back and disable it.

- **(6)** Finally, we will plot the stellar seeing profile to read the information we need about the aperture radii and the FWHM.
 - Put your cursor over a star in the image and press "Alt" + left click
 - ➤ If the above does not work, place your cursor over a star, do a left click, and then select "Analyze" & "Plot seeing profile..." as shown in the image below:



(7) Quick reminder of which numbers we need from the profile plot:

