Exoplanet Transit and Variable Star Photometry with Astroart 5.0

Introduction
This document provides a step-by-step procedure for processing a sequence of CCD images obtained during the transit of the exoplanet Qatar 1b.

For this example you will need ASTROART 5.0 but it can be performed with the demo version also. We assume that, in addition to a set of sequential star field images, you also have dark frames, flat frames and flat-dark frames.

In this example, we will:
1 Setup ASTROART for this task.
2 Calibrate and align the images.
3 Plot a light curve of the transit.

Setup Astroart
From the Menu **[File] -> [Preferences]** select the **[Options]** tab and edit the *Radius* and *Coronas* text boxes
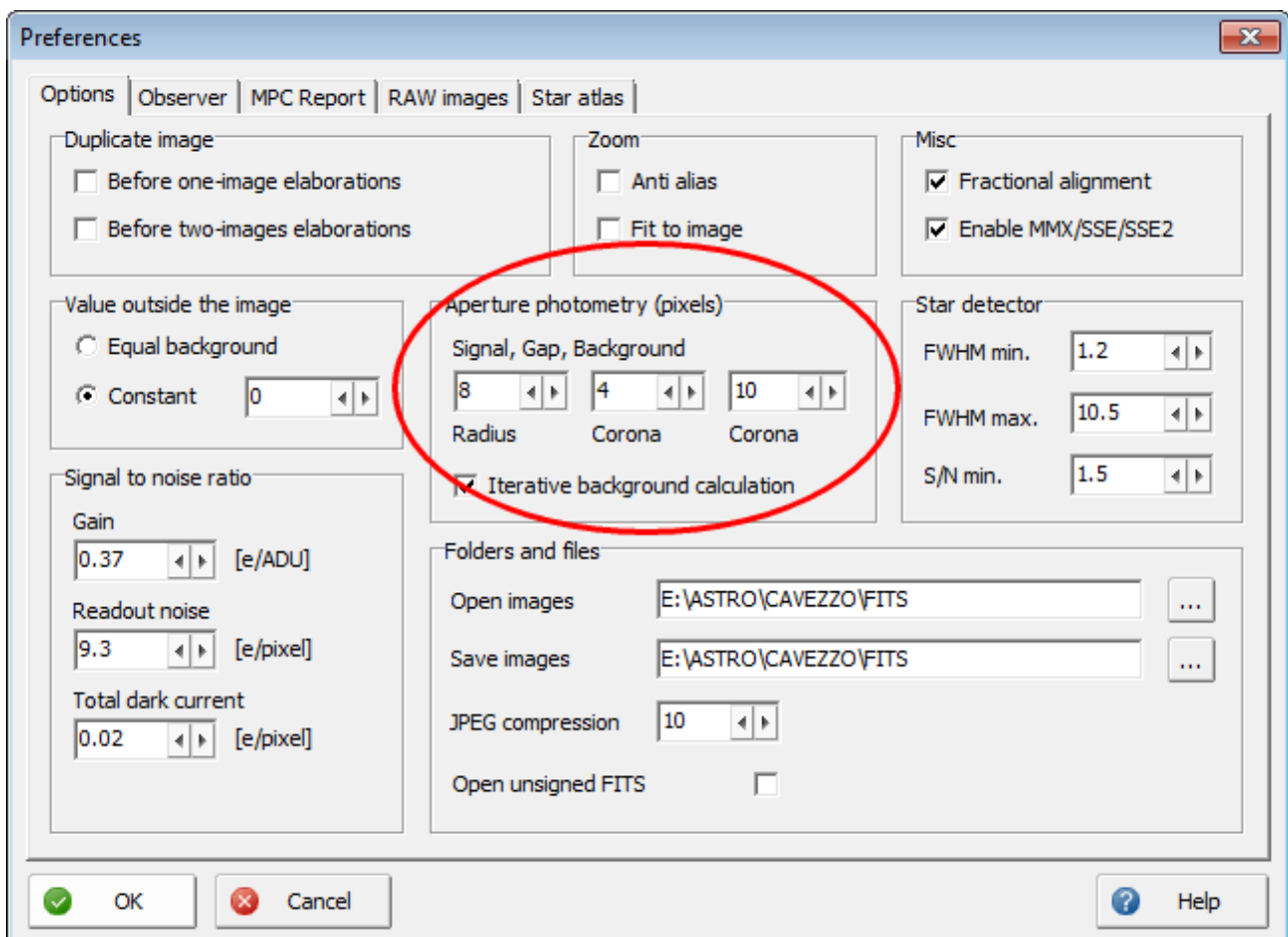

The radius value is critical: you should chose a value (in pixels) around 1.5 - 2.0 the average FWHM value of the image stars.

Calibrate and Align the Images

At first you must open the first image of the sequence, then:

1 - With the mouse go over the object to study (Qatar 1 star) and left click to select the stars. Remember that in Astroart, if you want to see the circles around the stars in the main image, you must zoom it by 200%.

2 - The first one is the object to be measured, the other stars are the reference stars. If you select more than one reference stars then Astroart will use the differential ensemble photometry as explained in chapter 4.2 of the AAVSO CCD Observing Manual.
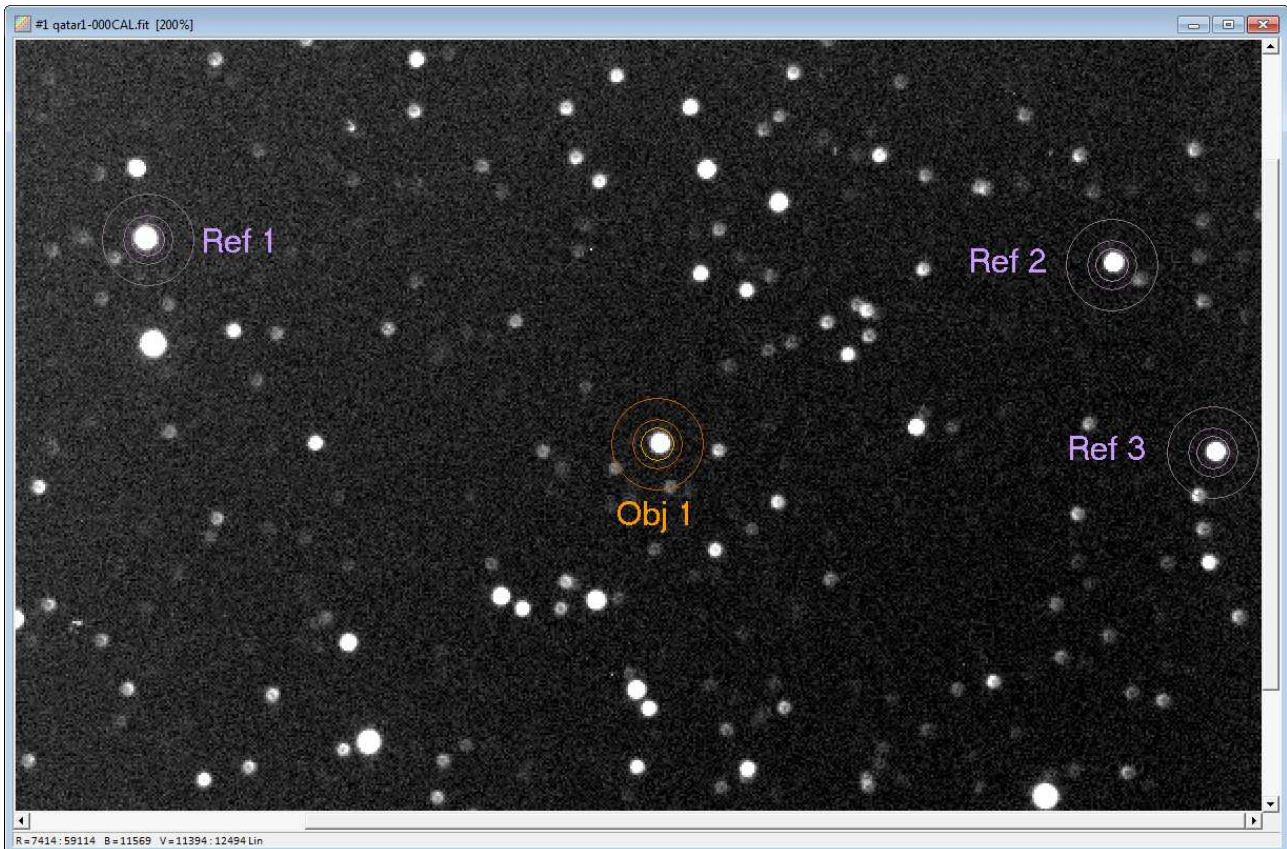

3 - (Optional) You can check the selected stars opening the *Stars Window* (from the **Menu View** select **Stars**).

N#	Xc	Yc	ADU	A	P	R.A.°	DEC.°	R.A.	DEC	Mag.	O-C pos	O-C mag	Fwhm X	Fwhm Y	S/N	S-G-B
1	478.69	246.01	383580										5.51	4.91	138.81	8-4-10
2	234.83	343.17	748004										5.79	6.32	253.79	8-4-10
3	694.05	331.74	246531										4.50	5.49	91.50	8-4-10
4	742.48	241.98	243504										3.91	4.86	90.44	8-4-10

4 . From the **Menu Tools** select **Batch photometry**: the *Preprocessing* window will open. Drag&Drop the files into the correspondent box (see below):
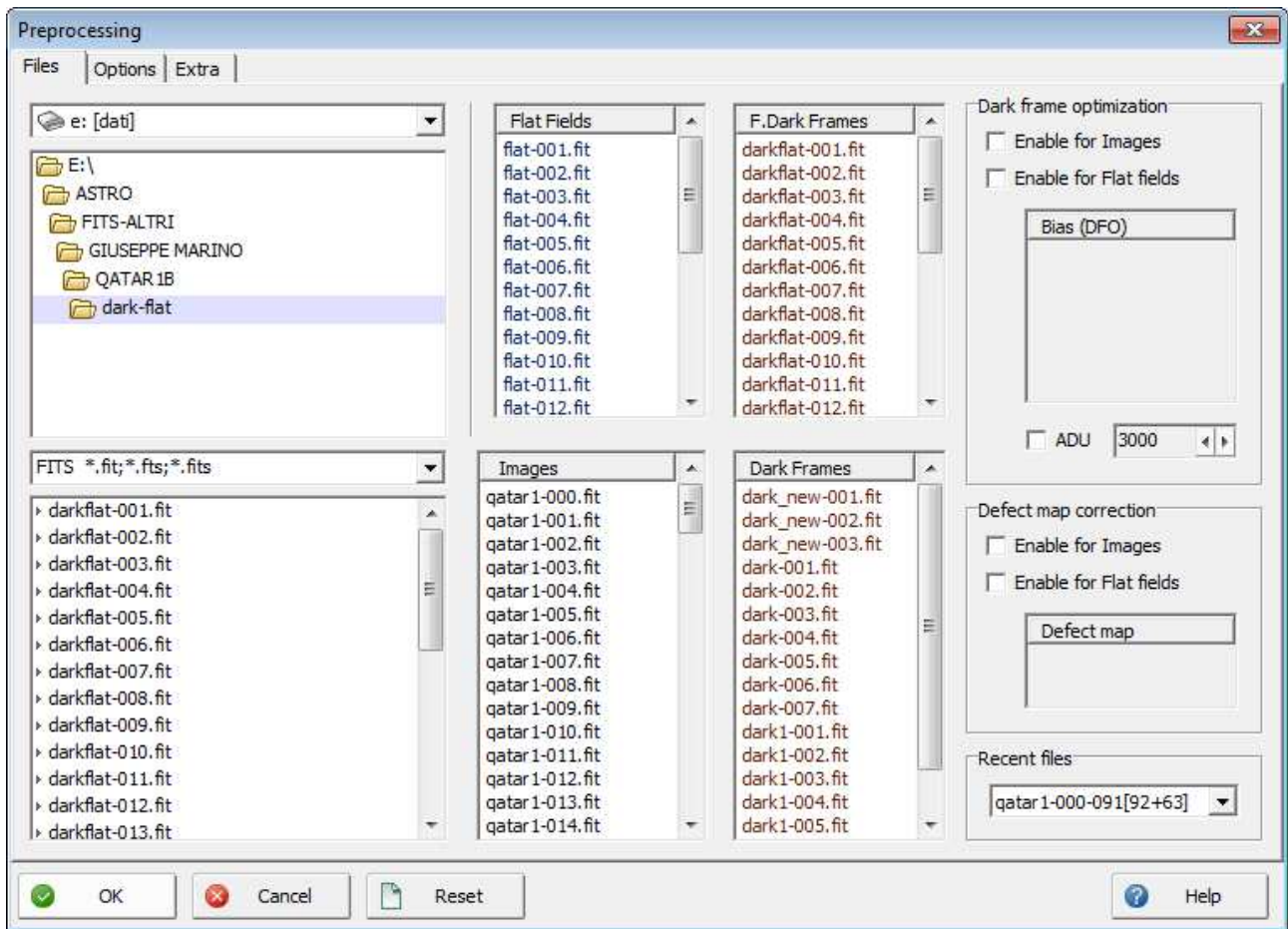

Click on the *Options tab*
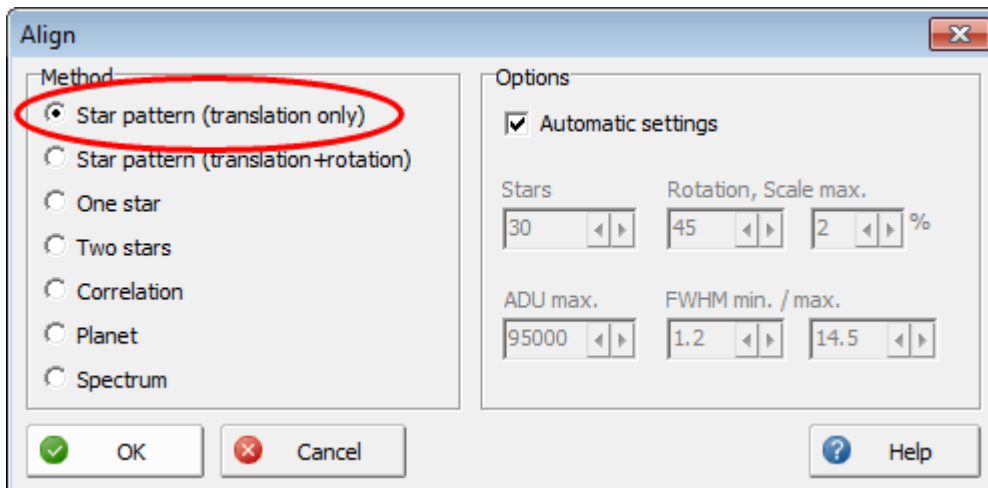
Select **Star pattern (translational only)** as aligning method if you do not have field rotational iussues (see in the figure above). Click OK to return to the *Options* tab.

6 . Select **Median** as stacking method for the dark frames.

7 . Select **Average** as staking method for the flat fields and again **Median** for the dark frames of the flat fields.

Click OK on the Preprocessing window to start the photometry batch processing.
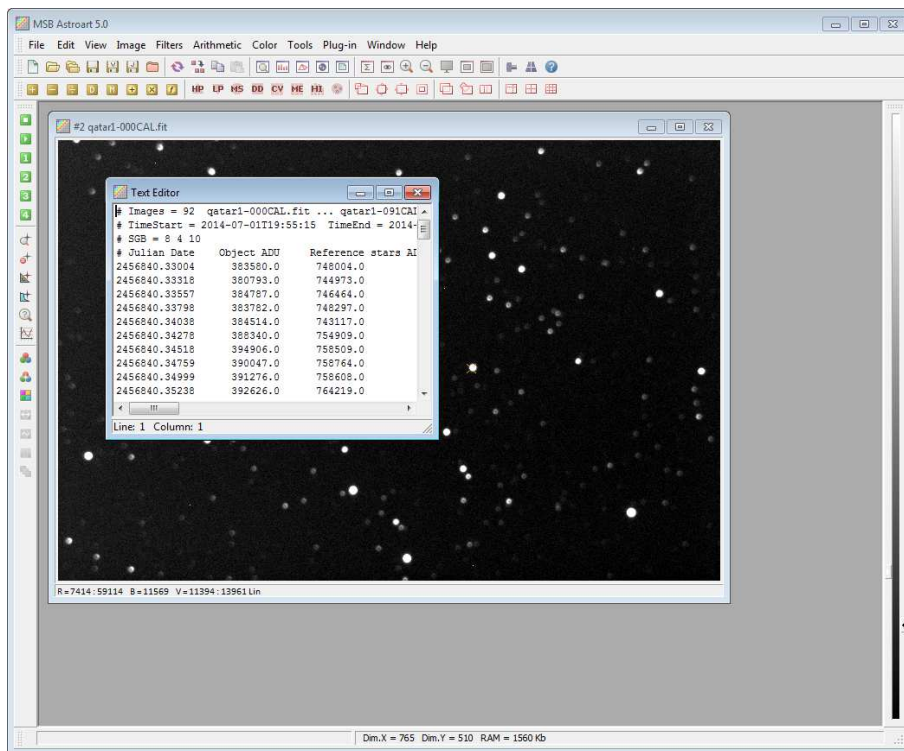
Plot a light curve of the transit

A *Text Editor* will appear with the photometric data ordered on columns (see picture above): right click with the mouse on the editor and from the popup menu select **Photometry Plot.**
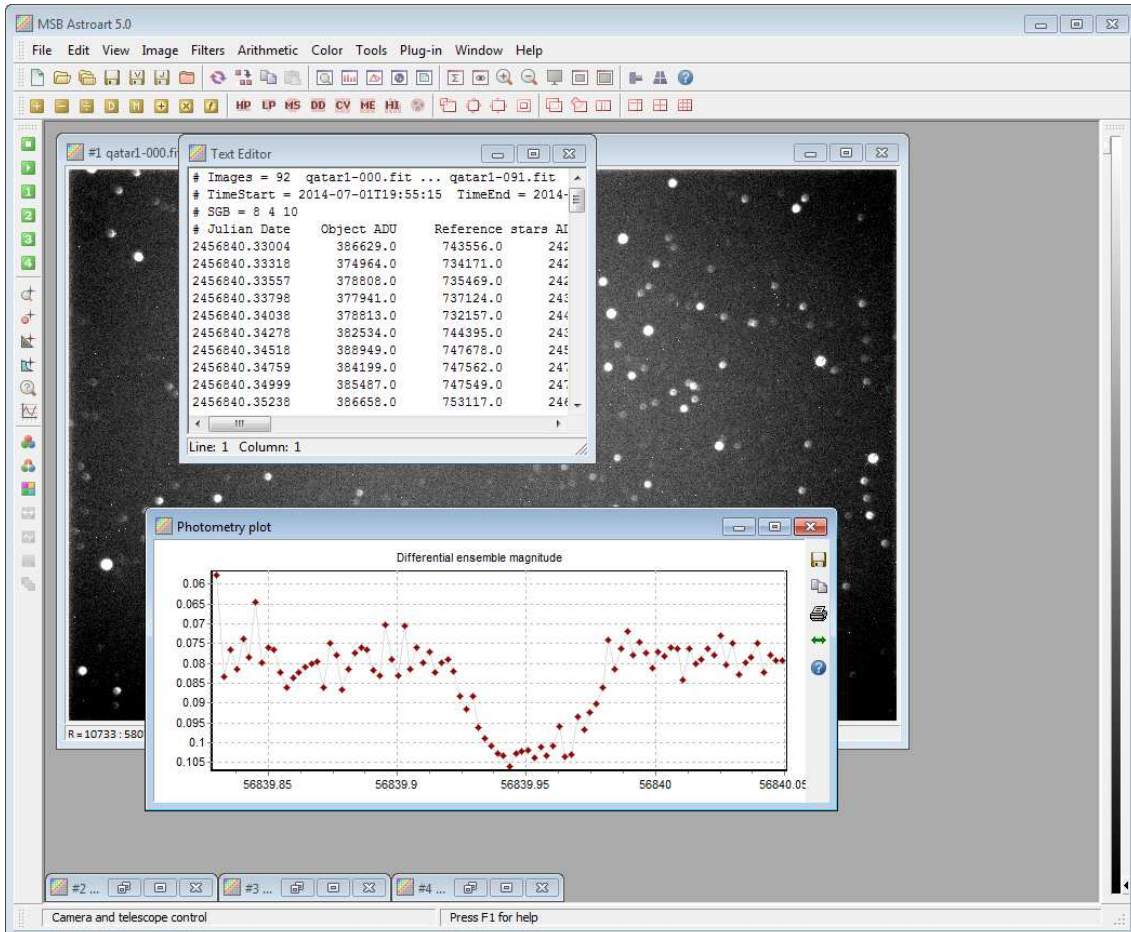
Link Utili:

https://www.aavso.org/sites/default/files/publications_files/ccd_photometry_guide/CCDPhotometryGuide.pdf

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