

## **POST PROCESSING YOUR ASTRO IMAGES USING AUTOSTAR IP AND PHOTOSHOP CS2**

Following is a suggested workflow that only includes Meade Autostar IP and Photoshop CS2/FITS Image Liberator (free) to align, combine, colour combine and post process images that produces great results. It assumes that, when the photos are taken, they are all saved (not combined in real time) in FITS format for later processing.

### **1. ALIGN & COMBINE IMAGE GROUPS PER COLOUR (Autostar IP)**

For each set of photos (L, R, G, and B) do the following:

- 1.1 GROUP --> NEW --> [Select all FITS files for the colour you are processing]
- 1.2 GROUP --> ALIGN --> TWO STAR --> [Select two stars that are clear, and far enough apart to remove any field rotation etc]
- 1.3 GROUP --> COMBINE --> MEDIAN
- 1.4 Save the resulting FITS image as COMBINED\_[Object Name]\_[L/R/G/B].fts

### **2. ALIGN COMBINED IMAGES (Autostar IP)**

Each of the images saved from the above step will most probably not be aligned with each other.

- 2.1 GROUP --> NEW --> [Select the COMBINED FITS files saved from 1.4. There will be four files (one each for L/R/G/B).
- 2.2 GROUP --> ALIGN --> TWO STAR --> [Select two stars that are clear, and far enough apart to remove any field rotation etc). Look carefully, as the four images may not be closely aligned. Draw your two alignment star selection boxes carefully ONLY over the stars to be used for alignment.
- 2.3 The aligned master images will be automatically saved in the background as ALIGNED\_[Filename].fts in the same directory saved to in 1.4.

### **3. OPEN THE ALIGNED MASTER FILES IN PHOTOSHOP CS2**

For each of the files in step 2.3, perform the following steps:

- 3.1 Open the file in Photoshop CS2
- 3.2 When the FITS Liberator screen shows, click on the Black Level Picker Tool (looks like a pen with a black triangle above it) under the PROCESSING tab.
- 3.3 Click on an area of your image that you want registered as black - remember this position as you will select the same position for each of the L, R, G and B images when you open them.
- 3.4 Your image will alter contrast according to the black point that you set. If the contrast is no good, reselect the black point.
- 3.5 Click OK, and your image will be opened in Photoshop

#### 4. SHARPEN AND CLARIFY YOUR LUMINANCE IMAGE IN PHOTOSHOP CS2

You need to get the most detail that you can from the Luminance image. This is extremely important.

4.1 As a general guide, you can use an Unsharp Mask on the image to varying degrees. Select FILTER --> SHARPEN --> UNSHARP MASK

4.2 Make sure that the PREVIEW check box is selected in the Unsharp Mask pop-up control box.

4.3 Depending on your image, you may want to use maximum settings up to:

- AMOUNT: 60%
- RADIUS: 1.2 pixels
- THRESHOLD: 0 levels

4.4 Click OK when you are satisfied with the detail that you have in the Luminance Image. Make sure that you haven't made the finer areas pixelated.

#### 5. CREATE A NEW RGB MASTER IMAGE

5.1 On any one of the images, SELECT --> ALL

5.2 EDIT → COPY

5.3 FILE --> NEW

5.4 Alter settings as follows:

- PRESET: Clipboard
- COLOR MODE: RGB Color 16 Bit
- BACKGROUND CONTENTS: White

5.5 Click OK

#### 6. IMPORT YOUR COLOUR COMPOSITES INTO THE RGB MASTER IMAGE

6.1 Make sure that your new white master image is in the foreground (ie. make sure it's active)

6.2 Hit F7 to ensure that the LAYERS palette is open. If it disappears, hit F7 again and it will re-appear.

6.3 Select the CHANNELS tab in the LAYERS Palette.

6.4 For each of the R, G and B channels, perform the following for each colour (the example will be for BLUE):

6.4.1 In the CHANNELS tab of the LAYERS Palette, select BLUE

6.4.2 Select your BLUE image

6.4.3 SELECT --> ALL

6.4.4 EDIT --> COPY (this will copy your Blue image to the clipboard)

6.4.5 Select your RGB Master Image

6.4.6 EDIT --> PASTE (this will paste your Blue image into the Blue Channel in the RGB Master Image)

6.4.7 Do the same for Red and Green.

## **7. ADJUST COLOUR SATURATION**

7.1 In the RGB Master Image, select the RGB channel in the CHANNELS tab in the LAYERS palette.

7.2 Your colour composite will appear.

7.3 If the image is too pixelated, you may wish to make adjustments here (Gaussian Blur etc). Maximum detail is not required in this layer, that is what the Luminance image will be used for later on.

7.4 If your colours are shifted too far into a particular spectrum, adjust the colour curves in IMAGE --> ADJUSTMENTS --> CURVES

7.5 Select each channel (R, G and B) and adjust their curves in turn until you reach the desired result

7.6 Click OK

7.7 IMAGE --> ADJUSTMENTS --> HUE/SATURATION

7.8 Adjust saturation to around the 30 - 35% mark - this is done as your colours will be washed out in the next step.

## **8. INTRODUCE THE LUMINANCE IMAGE INTO THE RGB MASTER**

8.1 Select the Luminance image (bring it to the foreground and make it the active window)

8.2 SELECT --> ALL

8.3 EDIT --> COPY

8.4 Select the RGB Master image (bring it to the foreground and make it the active window)

8.5 EDIT --> PASTE

8.6 Your Luminance image will be pasted into a new LAYER in the RGB composite image. The colour image will be replaced by your grey Luminance image. Don't worry, the colour layer is still there.

8.7 In the LAYERS tab of the LAYERS Palette, you will notice two layers now...BACKGROUND (your RGB composite) and LAYER 1 (your Luminance image).

8.8 Make sure that LAYER 1 is selected in the LAYERS tab of the LAYERS Palette.

8.8 In the LAYERS tab of the LAYERS PALETTE select the Opacity box on the right. A slider will appear.

8.9 Click on and drag the slider to the left...maybe to 50%. Watch as the colour starts bleeding through your Luminance image. Adjust the slider until you are happy with the mix of detail and colour.

## **9. SAVE YOUR COLOUR IMAGE IN NATIVE PHOTOSHOP FORMAT**

9.1 FILE --> SAVE AS...

9.2 Make sure that you save in PHOTOSHOP format, and that the LAYERS checkbox is selected.

9.3 Select SAVE

9.4 Now you have your image in a format that you can come back to later to adjust

## **10. FLATTEN YOUR IMAGE**

10.1 LAYERS --> FLATTEN IMAGE

## **11. REMOVE STAR BLOAT FROM YOUR IMAGE**

11.1 This may be necessary if your image has larger than expected stars (see the first image below). Brighter stars will saturate during imaging and will tend to bloat. Additionally, the following process can be used to remove the blue (or sometimes other coloured) halos that sometimes appear around your RGB stars when one channel has produced slightly more bloated stars than the other channels.

11.2 SELECT → COLOUR RANGE

11.3 Ensure that SAMPLED COLOURS is selected in the SELECT dialogue of this tool.

11.4 Select the middle of one of your bloated stars with the Eye Dropper

11.5 Adjust the FUZZINESS slider until only the largest stars are visible in the preview window (make sure that the radio button labeled SELECTION is selected at the bottom of the tool window).

11.6 Select OK

11.7 SELECT → MODIFY → EXPAND

11.8 Select a radius of 2 pixels

11.9 Select OK

11.10 FILTER → OTHER → MINIMUM

11.11 Select a radius of 1 pixel

11.12 Select OK

11.13 If your stars are now too small or have faded significantly, you can fade the MINIMUM filter. Make sure that your section of stars on the screen is still current (ie. You have not deselected anything yet).

11.14 EDIT → FADE MINIMUM... (note, this option will only be available if performed immediately after the MINIMUM filter has been applied, and your selection is still active)

11.15 Alter the MODE to DARKEN

11.16 Adjust the slider until your stars are aesthetically pleasing

11.17 Select OK

11.18 SELECT → DESELECT

11.19 Take a look at your image and check the results. You can perform this again if required. Make sure that you are not too aggressive with this tool, as it can leave black halos around objects.

## **12. FINAL SHARPENING AND ADJUSTMENT OF YOUR IMAGE**

12.1 FILTER --> SHARPEN --> UNSHARP MASK

12.2 Alter the sharpness of your image again if you need to.

12.3 You can also use the SHARPEN TOOL to specifically sharpen key areas. Likewise with the BLUR tool. Adjust the pen size to suit your needs.

12.4 If you need to, you can adjust the CURVES and LEVELS of your image to taste.

### 13. SAVE YOUR IMAGE

13.1 FILE --> SAVE AS

13.2 Save your file in the format that you prefer. Remember, you cannot save a file in JPEG and many other formats unless it is 8bit colour (16 bit colour is not supported in some formats).

Check IMAGE --> MODE and adjust as required.



Photo taken at first quarter under suburban skies using a 10" Meade LX200GPS unguided, a Meade DSI II Pro, and processed using the above process (the original is 1024x768). Star bloat has not been removed. Note the large stars and large galaxy nucleus.

*M83 (Spiral Galaxy)*



Same photo taken at first quarter under suburban skies using a 10" Meade LX200GPS unguided, a Meade DSI II Pro, and processed using the above process (the original is 1024x768). This time star bloat has been removed. Note the nucleus of the galaxy is more pleasing to the eye, and the larger stars no longer dominate the frame.

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