2019

Basic Image Processing Techniques

USING GIMP

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1 Introduction

This document is a brief outline of several techniques used to process a captured image using GIMP. The image processed in the examples was captured by a Revolution Imager 2 camera. The image was produced as 368 frames in a SharpCap Live Stack session by SharpCap Forum user *@donstim*. The image used in this document can be found in forum post:

https://forums.sharpcap.co.uk/viewtopic.php?f=12&t=1132 .

	
Captured image	Processed in GIMP

The captured image has three areas to be considered:

1. The colour-balance – this can be addressed by image processing software such as GIMP (free/donation), FastStone Image Viewer (free/donation), PhotoShop (~£10 per month subscription) and others.
2. The shape of the histogram – this needs to be worked on at image capture time.
3. Stacking artefacts at the left and top of the image.

There was no requirement to use *Curves* in GIMP to stretch the image.

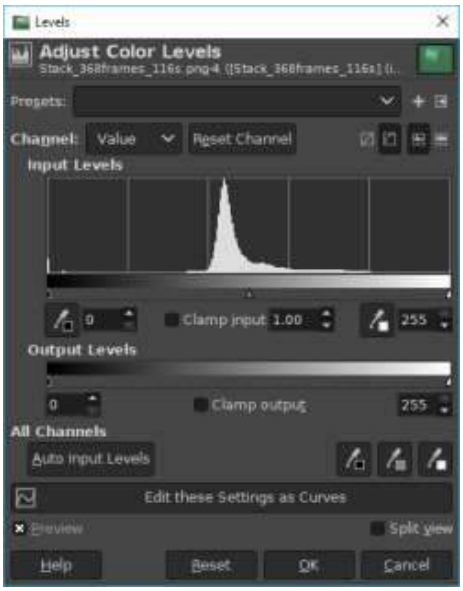
Download GIMP from https://www.gimp.org/ . GIMP 2.10 (preferred) can handle 16-bit images. [Note: Gimp 2.8 will convert 16-bit images to 8-bit and thus reduce detail].

There may be different techniques which can achieve the same result. Please use whatever works for you.

2 Getting Started

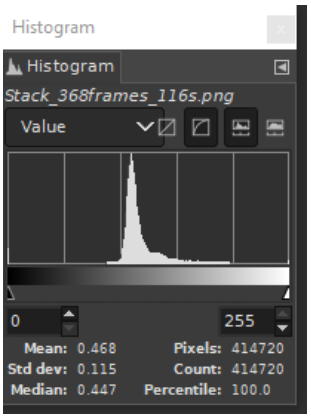
1. Start GIMP and drag and drop the image to be processed onto the GIMP workspace.

2. Choose *Colors > Levels*.

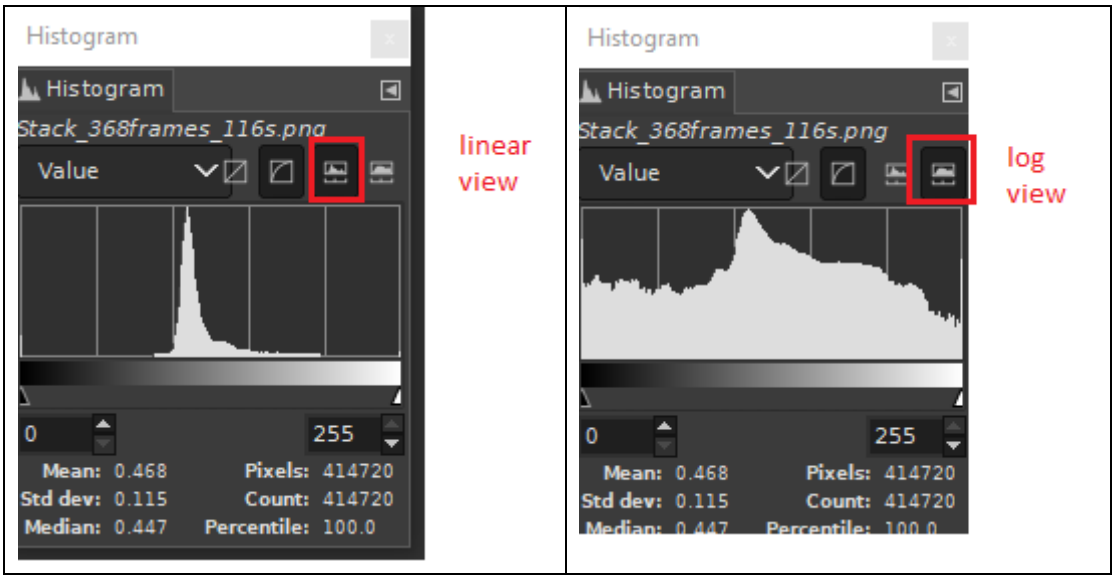


3. The histogram is also required. If the histogram is not visible, then from the menu select:

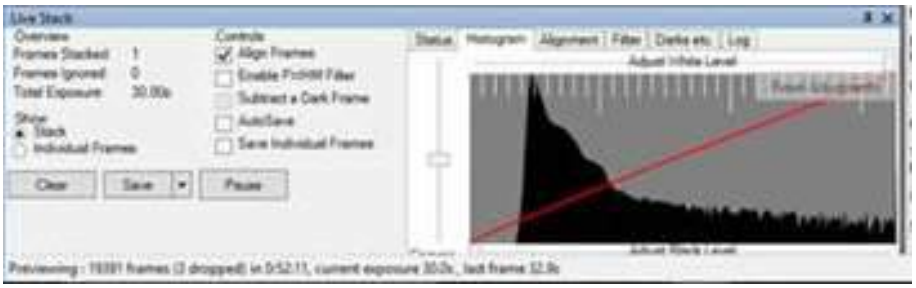
   Windows > Dockable Dialogs > Histogram



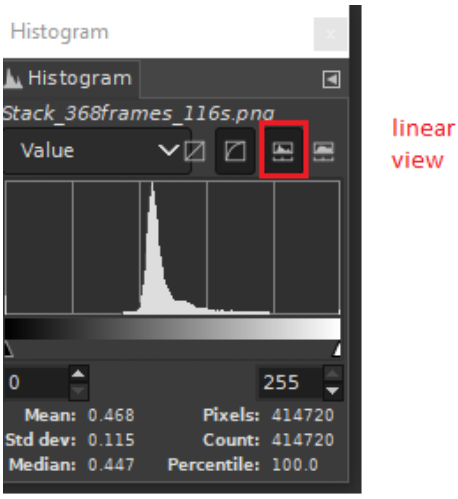
4. The histogram can be displayed in 2 ways – *logarithmic* and *linear* using the buttons shown.



5. The *log view* shows that the histogram is hitting both the left-hand and right-hand side. With Live Stack or conventional imaging of a deep sky object, at capture time, aim for a histogram shape as shown below.



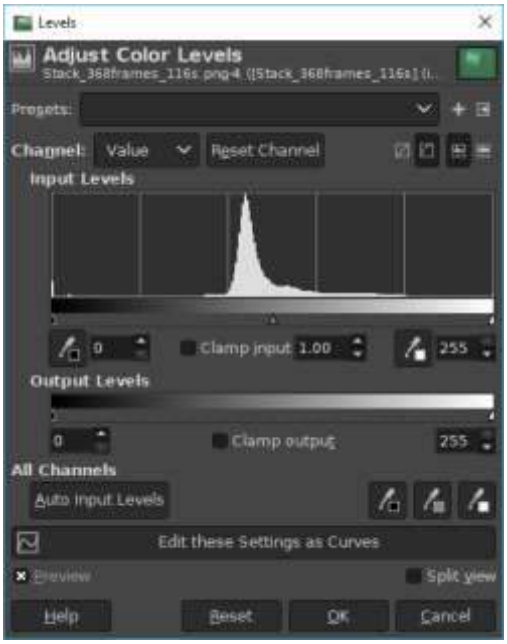
6. For the next steps, set the histogram to *linear mode*.



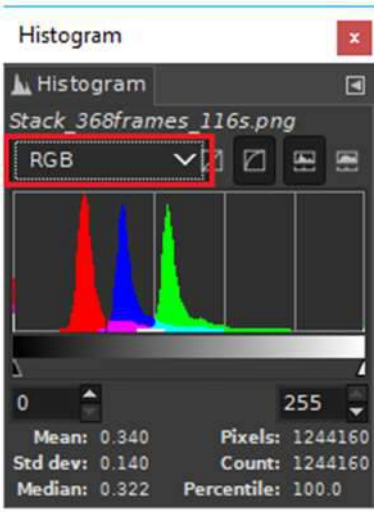
3 Balance Colour levels

These steps describe how to address colour balance issues.

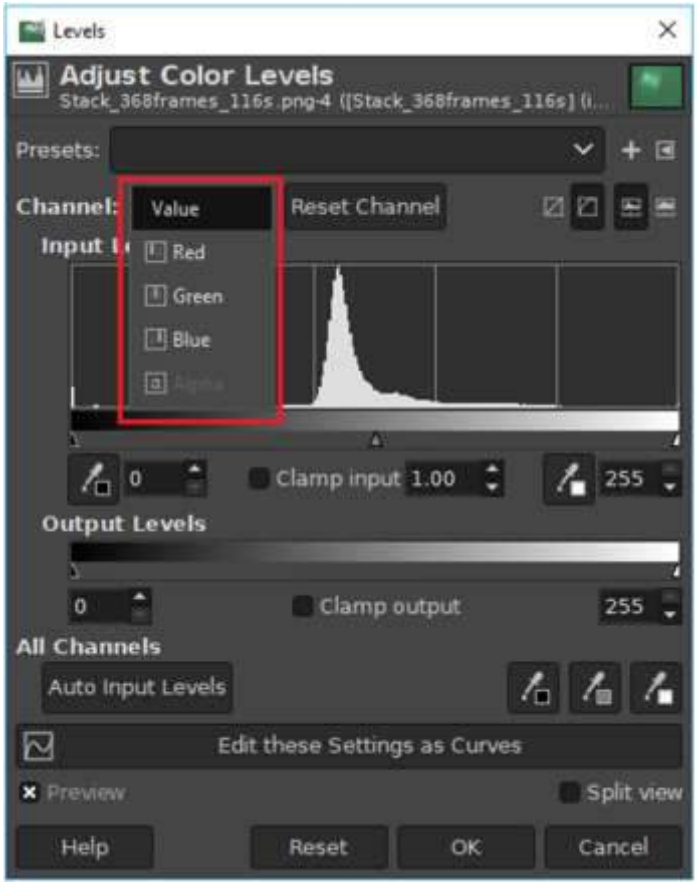
1. From the menu, select *Colors* > *Levels*.



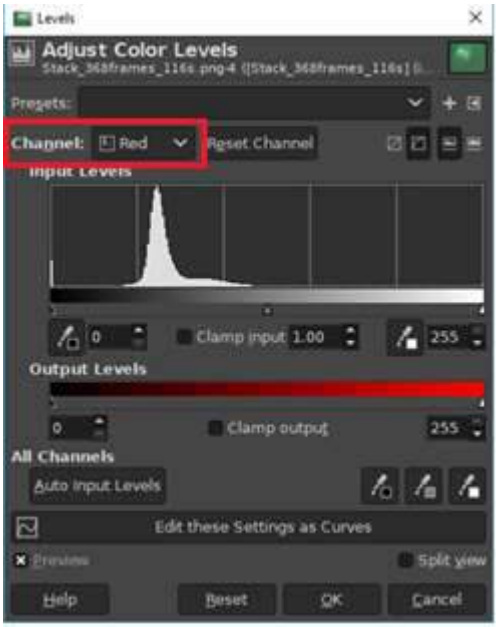
2. From the histogram select *RGB*. This demonstrates the lack of colour balance as the Red, Green and Blue histograms should be stacked on top of each other.



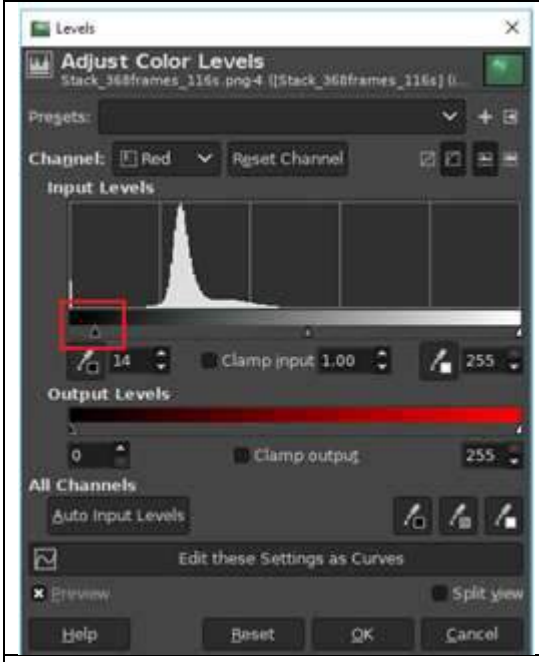
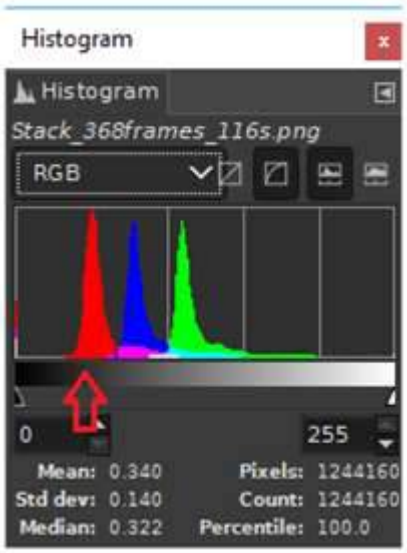
3. In levels, the *Channel* dropdown is used to select the colour to work on.



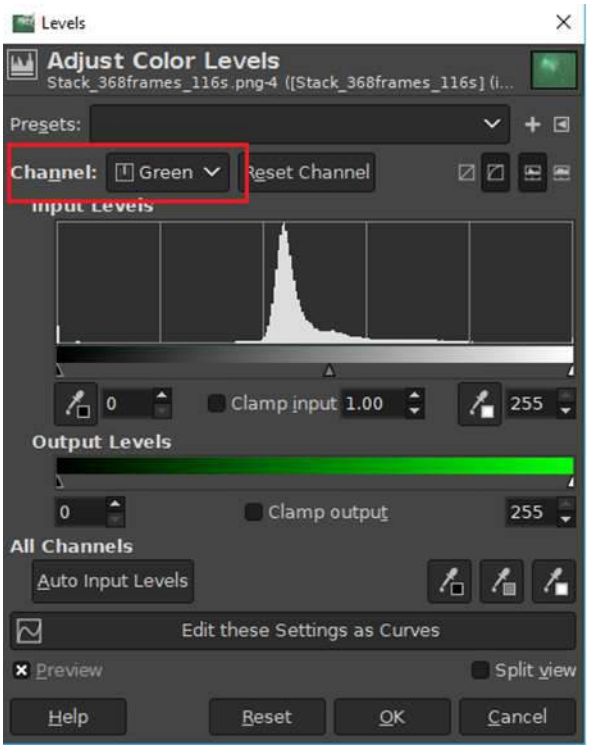
4. In the *Channel* dropdown, select Red.



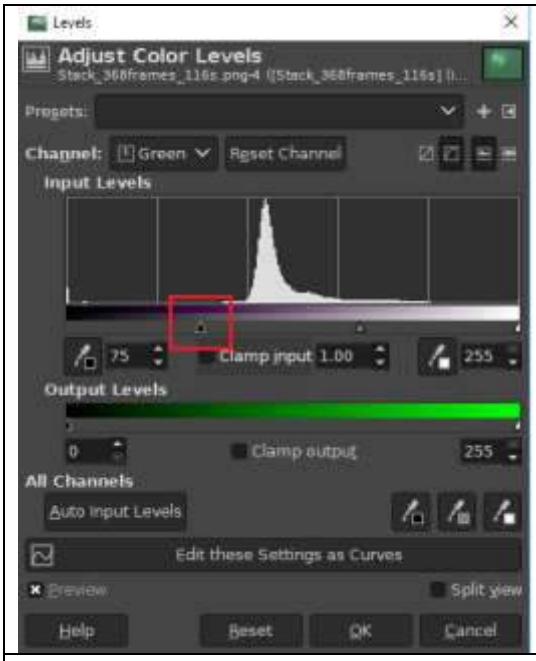
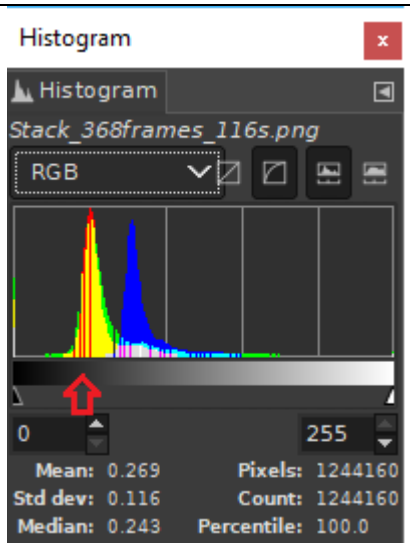
5. Adjust the red channel.

	
Move the left-hand slider to the right	Until the red histogram is at 20% (first vertical white line from left)

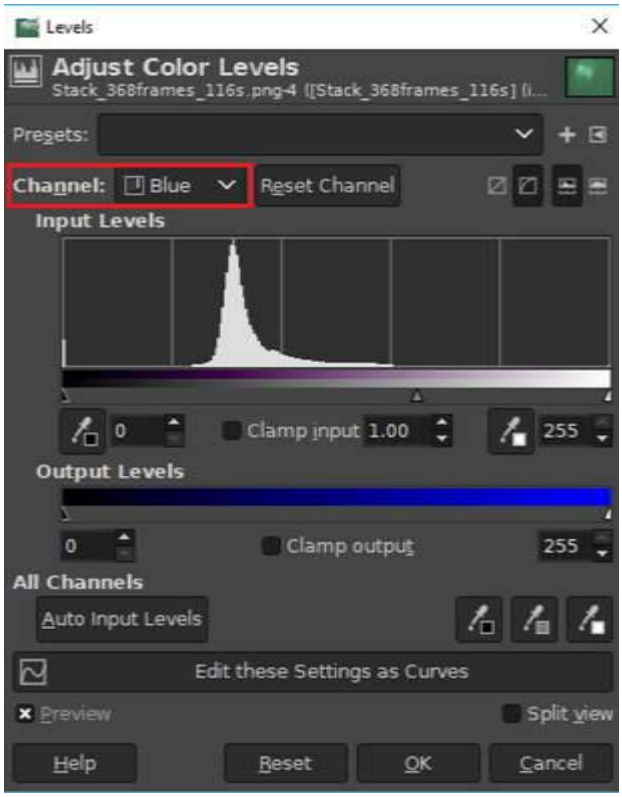
6. In the *Channnel* dropdown select Green.



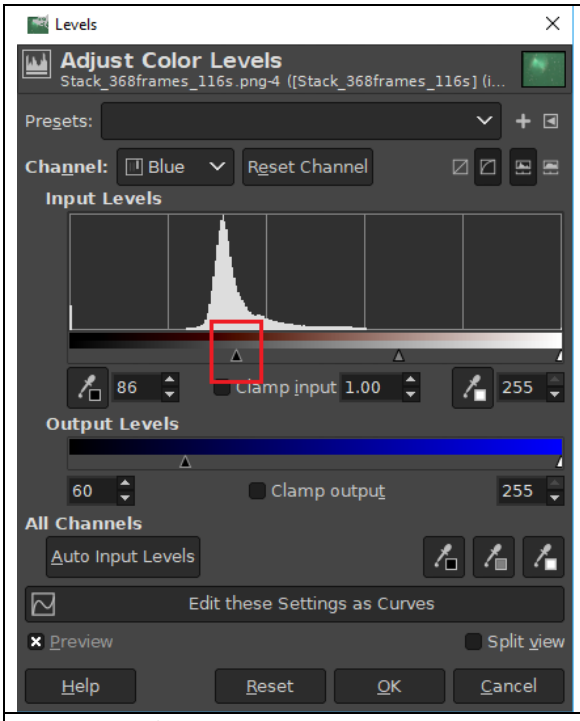
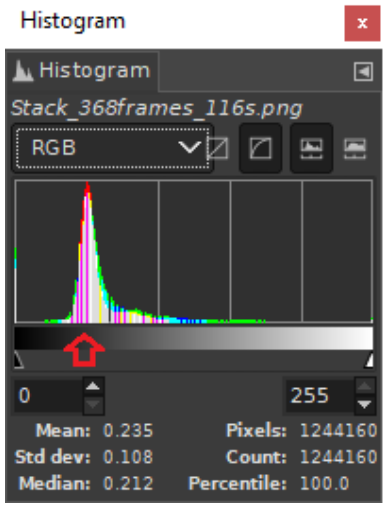
7. Adjust the green channel.

	
Move the left-hand slider to the right	Until the green histogram overlays the red histogram

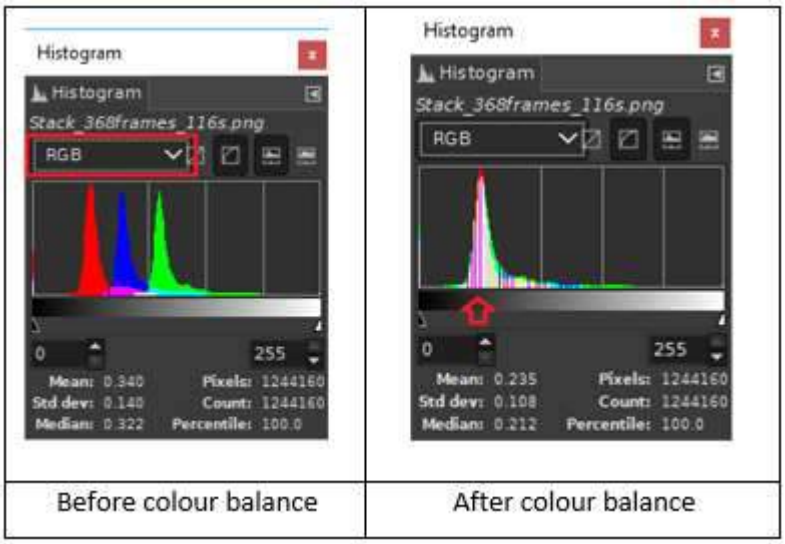
8. In the *Channnel* dropdown select Blue.



9. Adjust the blue channel.

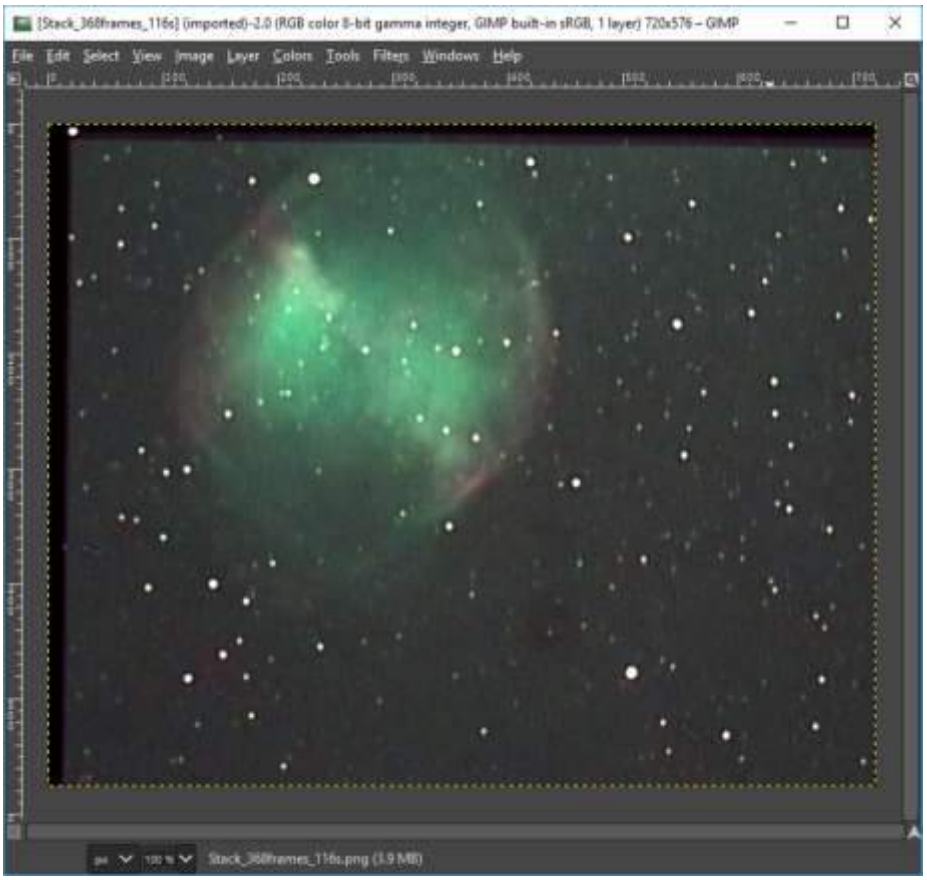
	
Move the left-hand slider to the right	Until the blue histogram overlays the red & green histograms

10. The colour channels are now in balance.



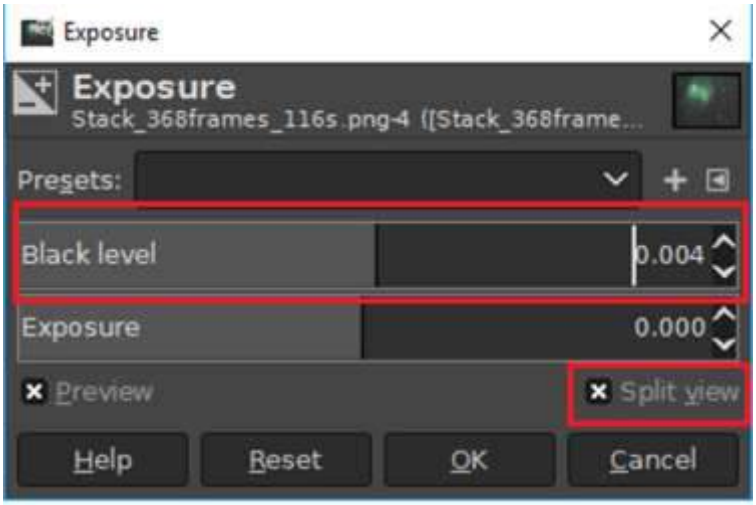
Before colour balance | After colour balance

11. The green cast has been removed.

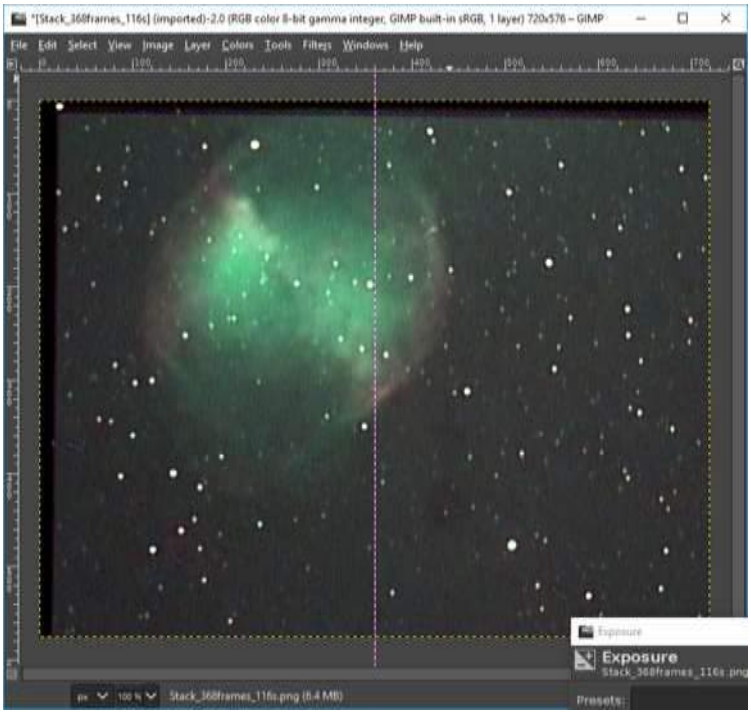


4 Adjust the Black Level

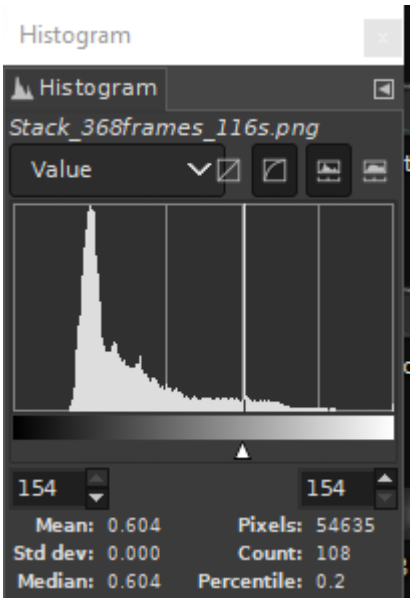
1. From the menu select *Colours > Exposure*. Click the *Split View* – the screen to the left-hand side of the vertical dotted line is after adjustment has been made, the right-hand side is before adjustment.



2. Adjust *Black Level* to taste – it needs to be less than black because the sky is not black.

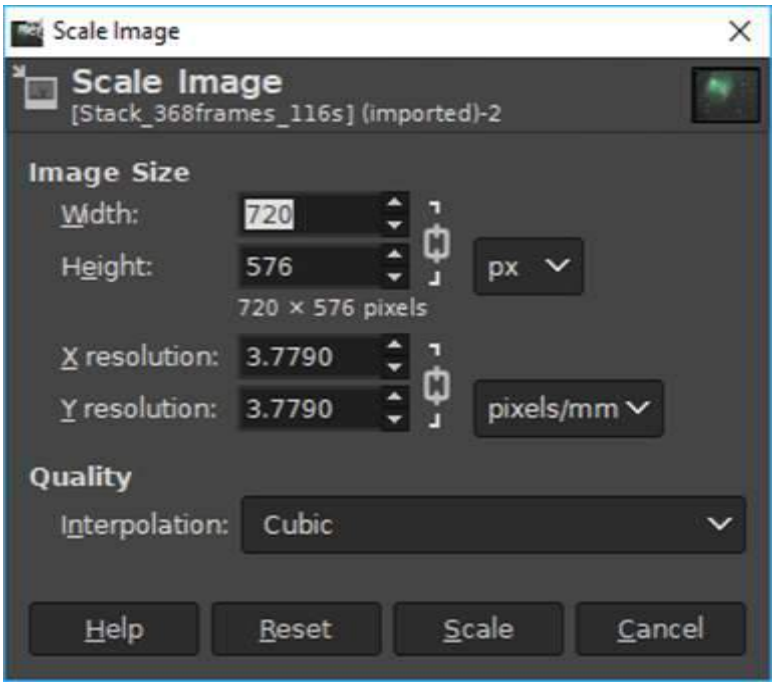


3. When doing this, keep an eye on the histogram to ensure it does not touch the left-hand side (black level clipping which would result in the loss of faint data).

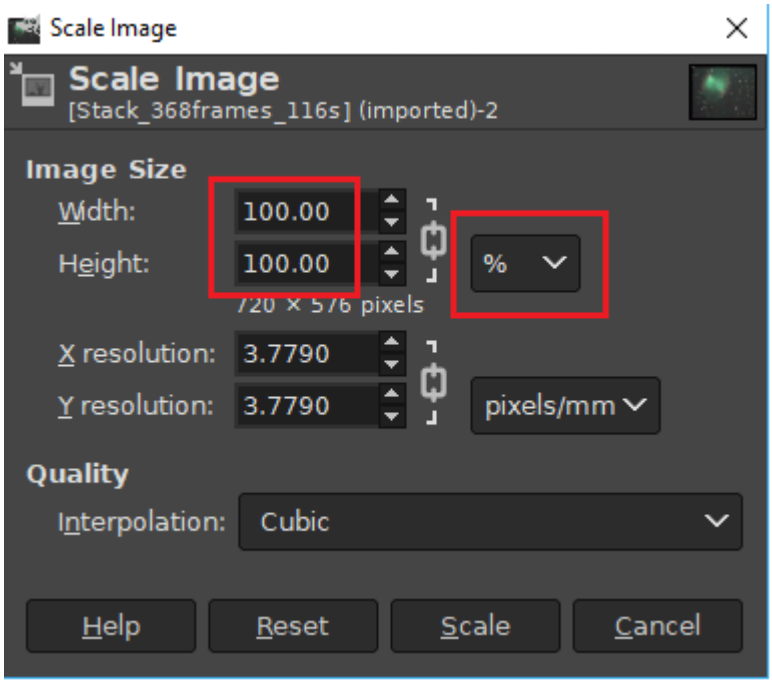


5 Scale the image

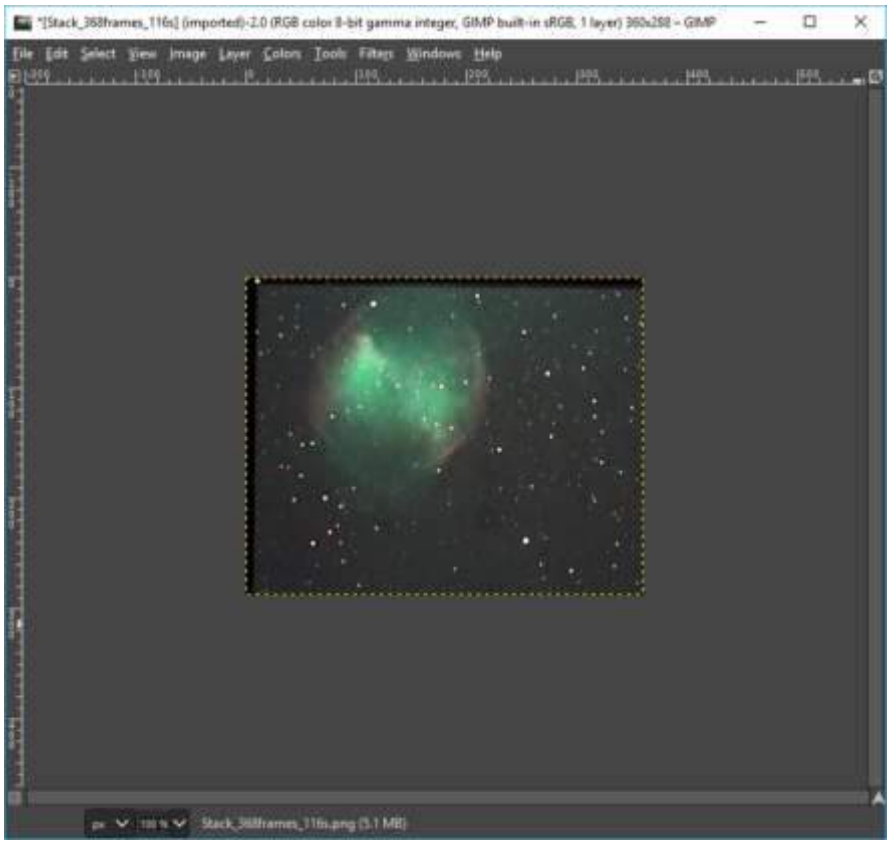
1. From the menu, select *Image* > *Scale Image*.



2. Choose *%* and set the *Width* and *Height* to 50



3. This results in 'tighter' stars.

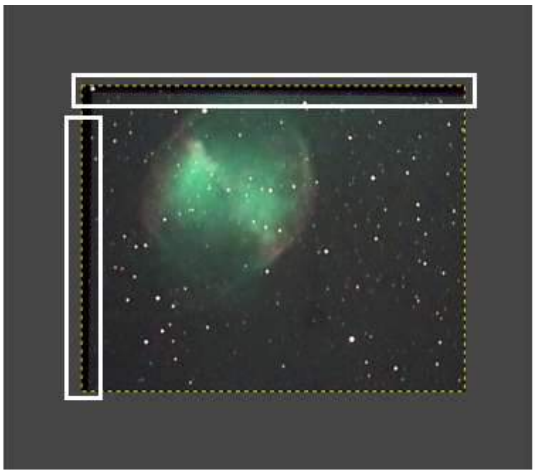


6 Crop Stacking Artefacts

The black lines at the top and left of the image are artefacts and have several possible causes:

- Less than perfect polar alignment
- Less than perfect tracking
- Less than perfect stacking

The first two can be addressed at the start of a session and will help with the third.

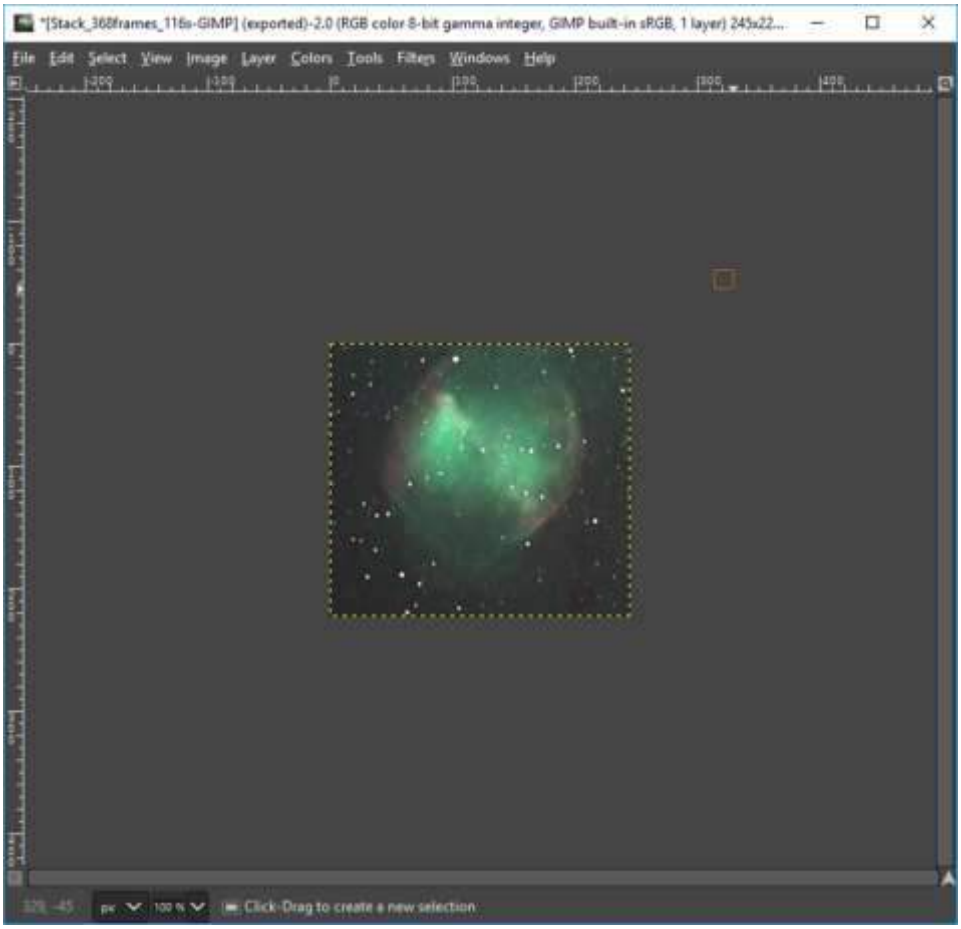


1. If the *Toolbox* panel is not visible, the from the menu select *Windows* > *Toolbox*.

2. Use the *Rectangle Select Tool* and drag a suitable rectangle on the image leaving out the stacking artefacts.

3. From the menu select *Image* > *Crop to Selection*.

4. This is the final cropped image.

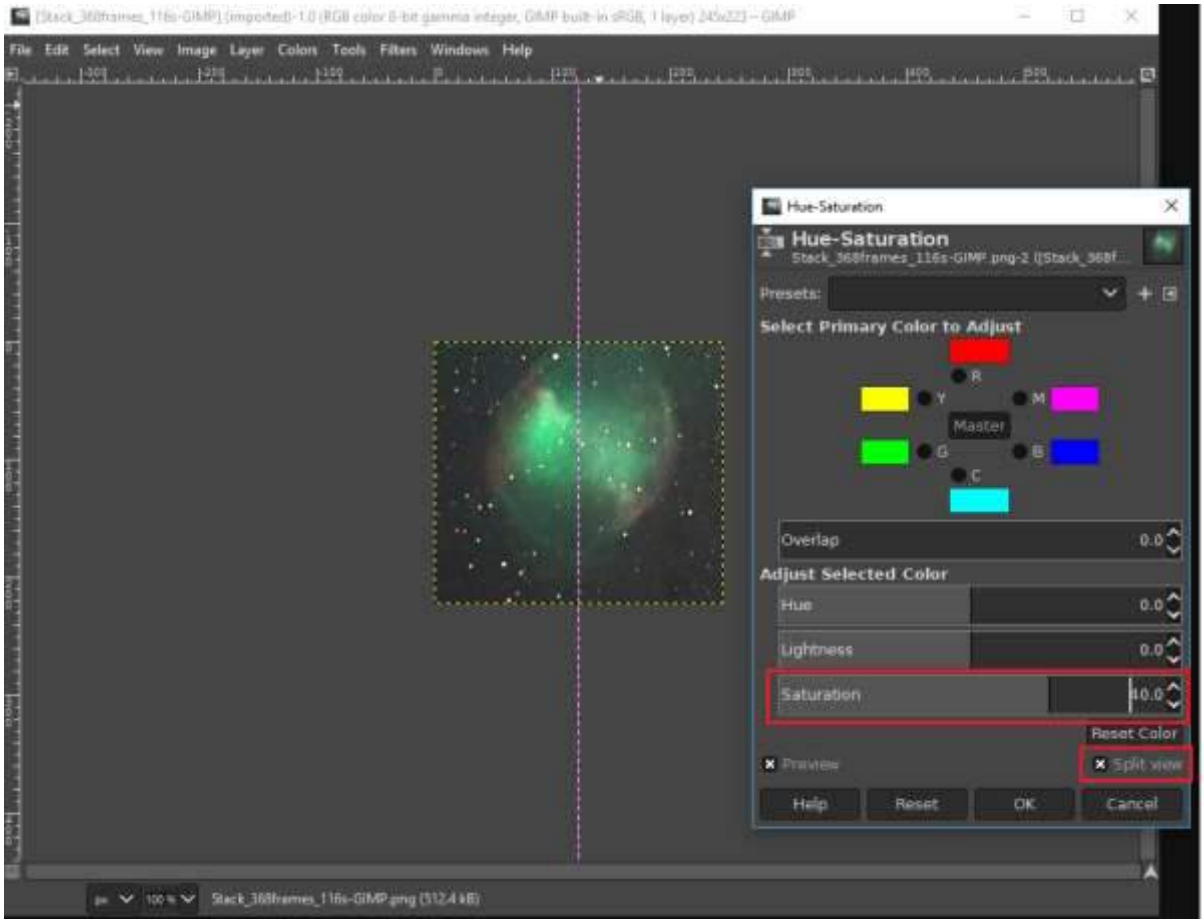


7 Adjust Saturation

1. From the menu, select *Colours* > *Hue-Saturation*.

2. Check *Split View*.

3. Adjust the *Saturation*. A figure up to 40 can improve the image.



8 Save the Processed Image

1. From the menu, *File* > *Save* will save the image in GIMP format (an XCF file) for future editing.

2. From the menu, *File* > *Export* As will save the file in a format such as PNG or JPG.