



FAULKES TELESCOPE

Colour Imaging

Making a Colour Image with SalsaJ

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Introduction

These instructions will show you how to produce colour images from the FITS files obtained from the Faulkes Telescopes.

These instructions also require you to download a plugin for SalsaJ called 'Align RGB' which can also be found on the Faulkes Telescope Colour Imaging page.

Loading FITS files

When you open SalsaJ you will see two windows appear.

One is the main SalsaJ menu bar, most of the options you will use are found here.



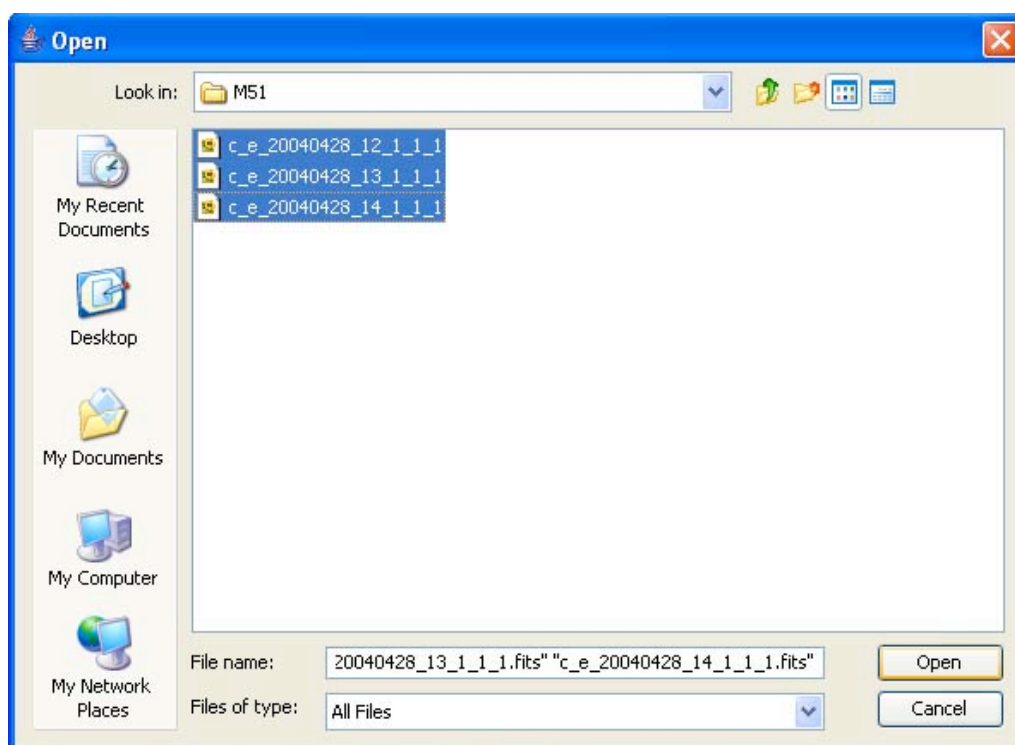
The other window is a Command Window, you will not use it but do not close it. If you do SalsaJ will shutdown and you will lose any unsaved work.

To open your FITS files, click on **File>Open**

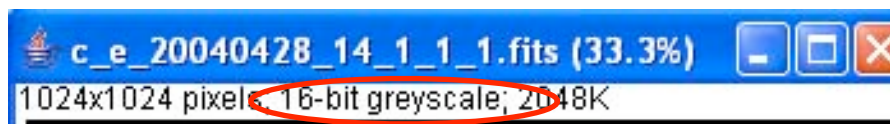


In the dialog box that opens, find where you have saved your FITS files. Then, using the **Ctrl** key, select the three images you want to open, one for each colour filter (red, green and blue).

Then click the **open** button.



Each image will then be loaded into SalsaJ in individual windows. The Information Bar of each image should read **16-bit greyscale**.

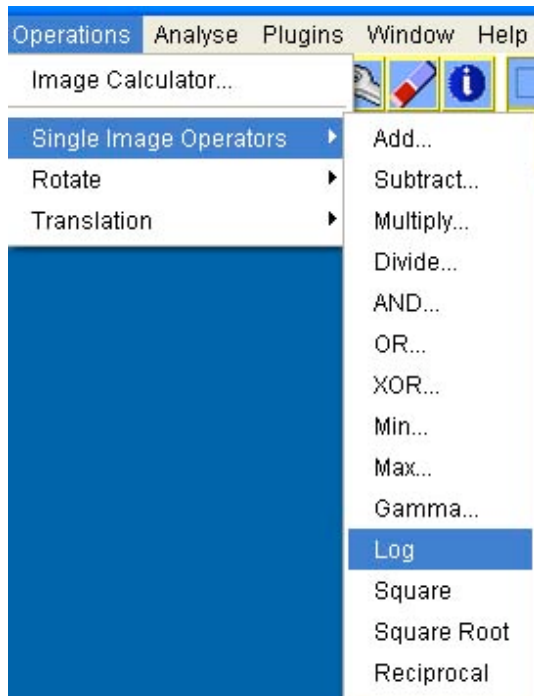


In order to make working with these images easier, you can tile them by clicking on **Window>Tile**.

Scaling the Brightness of the Images

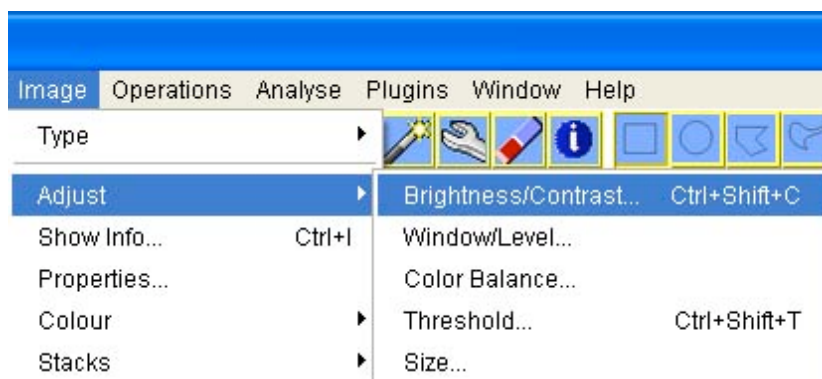
Currently, you may not be able to see much in your images, perhaps only some of the brighter details such as stars or a galactic core. We can increase the visibility of an object by scaling the brightness of the images.

Select your first image, working from left to right helps you to know which images you have changed and which ones you haven't.



The first thing you can do to improve your image is a logarithmic stretch, this helps to bring out dimmer regions of the image without brightening the already bright areas too much. Click on **Operations>Single Image Operations>Log**

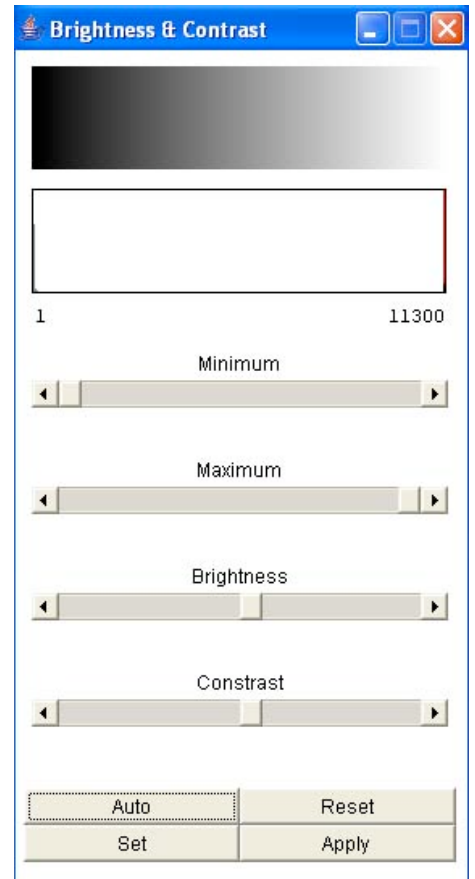
Next, you can adjust the brightness and contrast of the image to make the overall image darker or lighter. Click on **Image>Adjust>Brightness/Contrast**



and another window will appear with sliding bars.

Use these bars to adjust the image to your preference. If you want the computer to adjust the image automatically, press the **Auto** button; this will cycle through some preset values and you can choose which one you like the most.

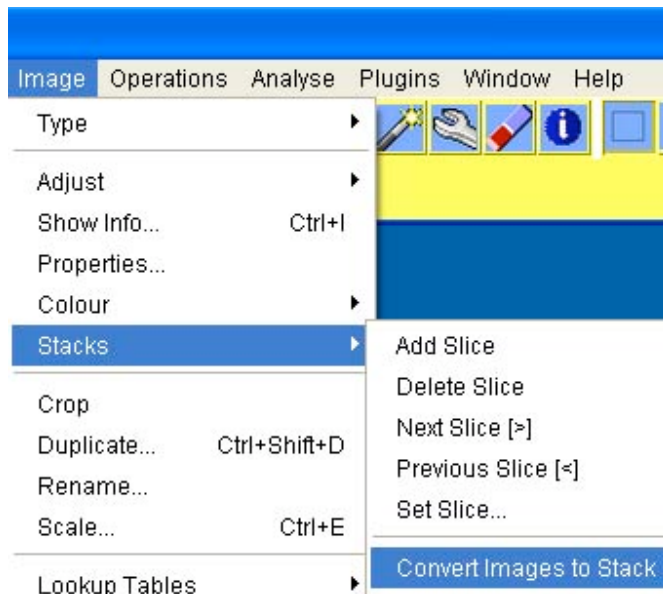
Then repeat this procedure for your other two images.



Stacking

To make a colour image we have to combine these three images into one, but before we do that we have to make sure the images are aligned correctly.

To do this, click on **Image>Stacks>Convert Images to Stack**



This will take your three images and put them into one window. At the bottom of this window there is another slider bar. Move this bar to the left and right to change the image you are looking at.

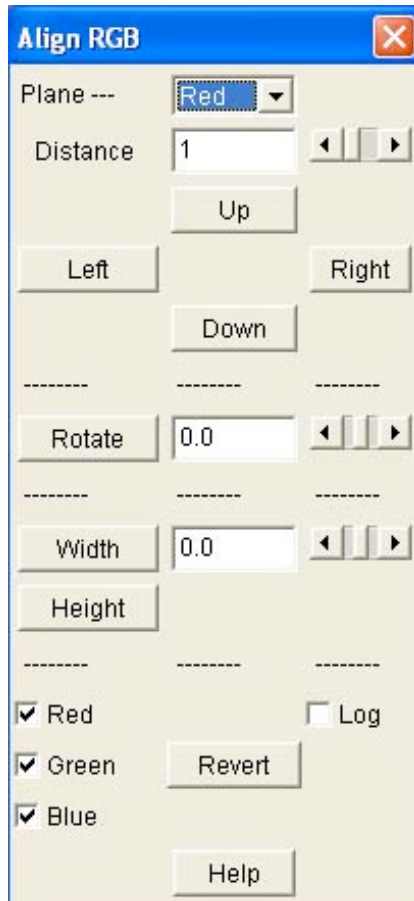
If you move that slider back and forth quickly you effectively make a three frame video of your images. You may see that the image appears to jump back and forth as you move the slider; this is because your image is not aligned.

To make it easier to identify which layer is for which colour, we shall convert the current Greyscale stack to an RGB (Colour) stack. To do this click on **Image>Colour>Convert Stack to RGB**. You will then see that your image turns from a greyscale image, to a colour image and you will still find that the layers are not aligned.

Aligning

This is where you will use the SalsaJ plugin. This can be accessed from the SalsaJ Plugin Menu, found at **Plugins>Align RGB Planes**

Then, the **Align RGB** box will appear.



The first thing to do is to identify which layer is out of alignment, for example, the red and blue could be aligned and not the green.

In the **Plane** drop down menu, select the colour layer you wish to move. Then using the **Distance** slider, select how many pixels you wish to move the layer by.

At first, you may wish to simply guess how many to move it by. If you are unsure, use the zoom tool to zoom close into a single star and count the number of pixels by which to move a layer.

Then, select a direction to move the layer - **Up, Down, Left or Right**.

When you press a direction button the layer will move by the specified number of pixels.

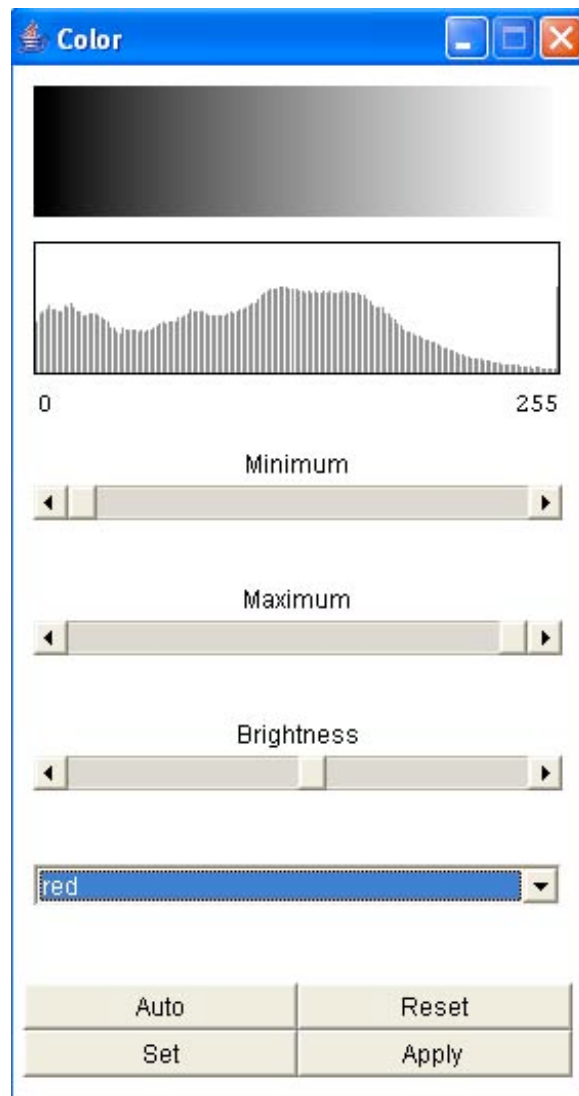
Cosmetics

There are more adjustments you can make towards your image. First you can adjust the **Colour Balance** by going to **Image>Adjust>Colour Balance**. You will see a window much like the Brightness/Contrast window.

Select the colour layer you wish to adjust from the drop down menu at the bottom of the window.

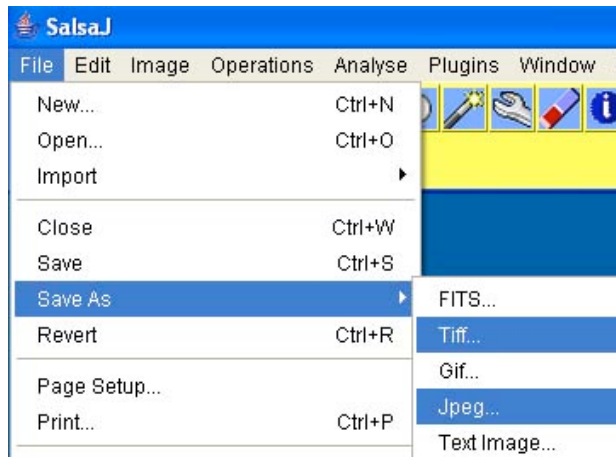
Then use the sliders to adjust the properties of the layer. You must click the **Apply** button for each change to remain.

You can also adjust the image as a whole by selecting **R/V/B** from the drop down menu.



Saving Your Image

Finally, you can save your image by going to **File>Save As**. From this menu you will be given several formats to save your image in. **TIFF** and **JPEG** are common formats for images, with JPEGs often being smaller and more convenient for sharing on the Internet.



Then navigate to a location on your computer you want the image saved, and click the **Save** button.
