

## Editing an RGB image with Ha and O-III filter captures with PixInsight (version 1.8) and GIMP (version 2.10)

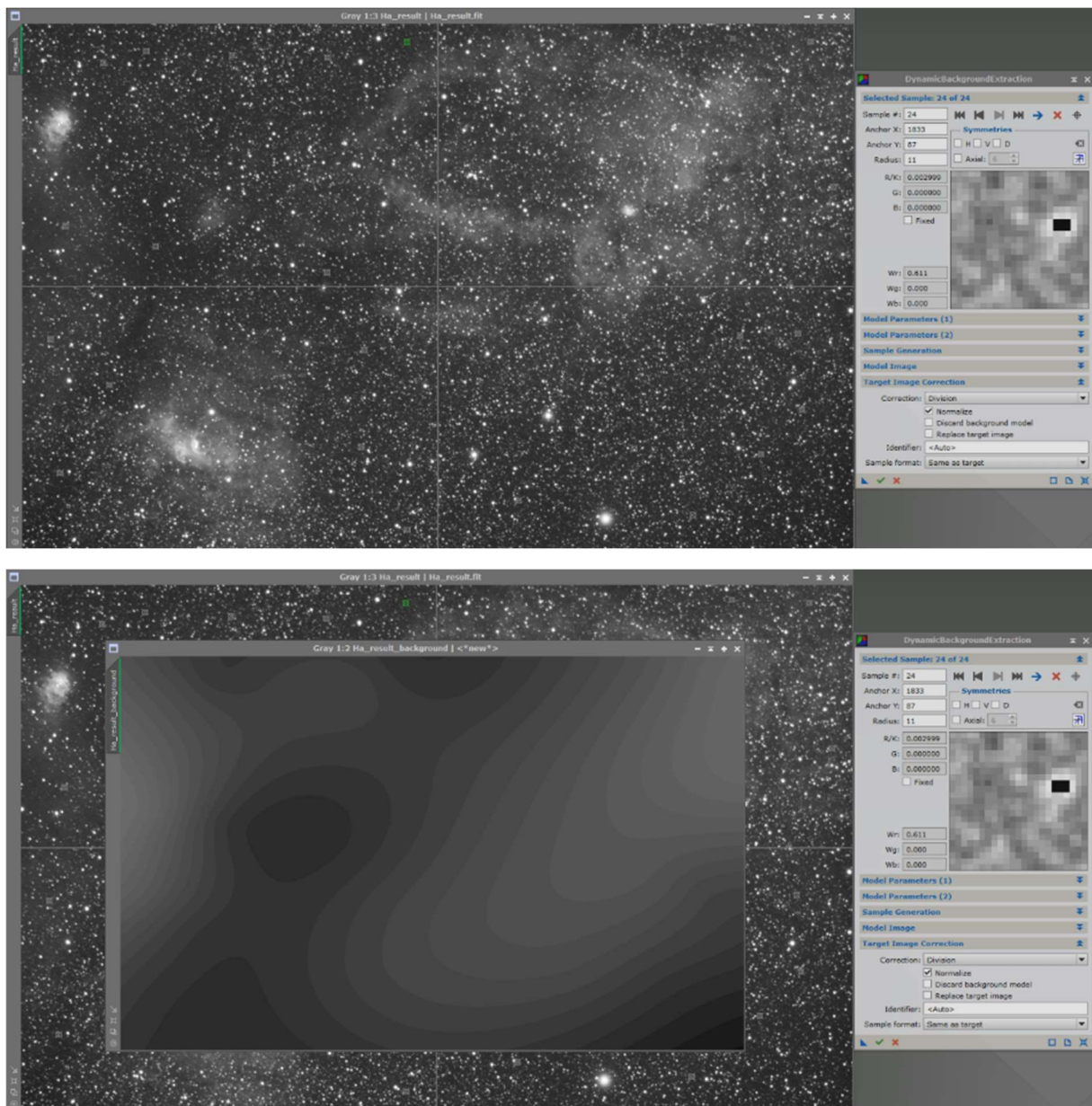
To combine the Ha and O-III narrowband captures with the RGB captures, the narrowband captures must be processed using the PixInsight program, and the nebulae have to be extracted.

To neutralize the background a bit more, 'DynamicBackgroundExtraction' is started for both the Ha channel and the O-III channel.

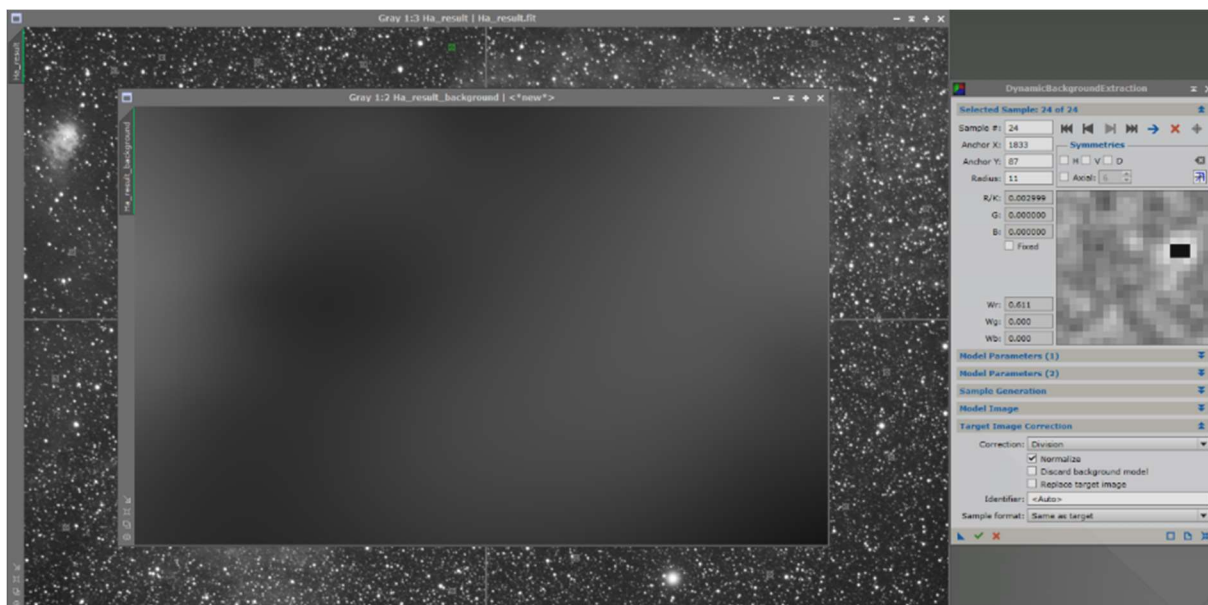
More information can be found e.g. in the Astrophotocast of Frank Sackenheim at <https://www.youtube.com/watch?v=lgXgDCS63QM>.

For this, some areas with few objects/stars are selected from the background.

Ha-channel:

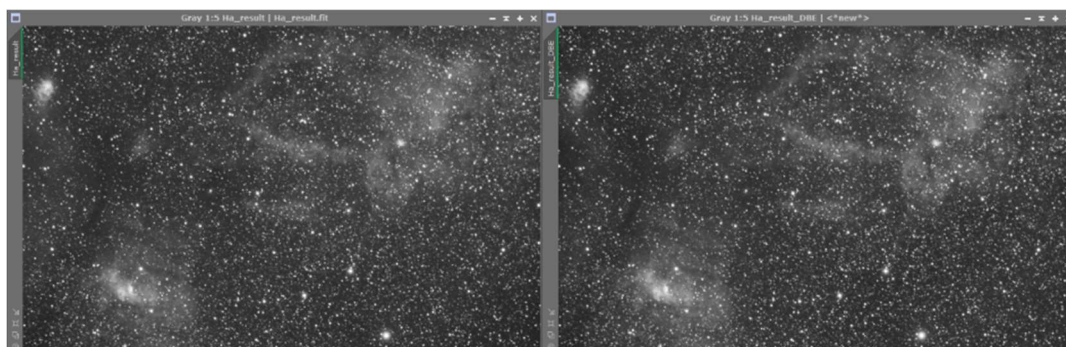


The gradient image can be displayed in finer detail:



Before:

After:



The same can be done with the O-III channel:

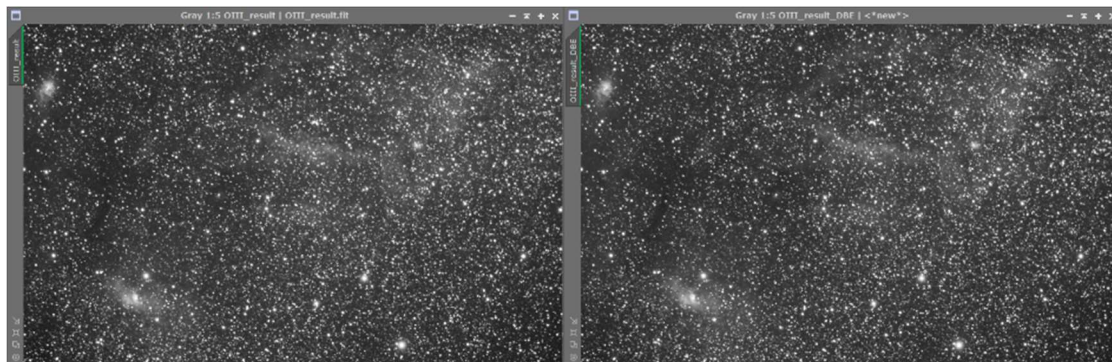






Before:

After:



Now the two images are stretched. To do this, move the sliders in the 'HistogramTransformation' until a satisfactory result is obtained.

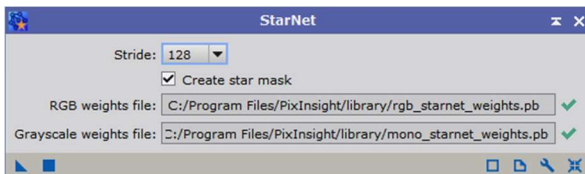
Ha:



O-III:

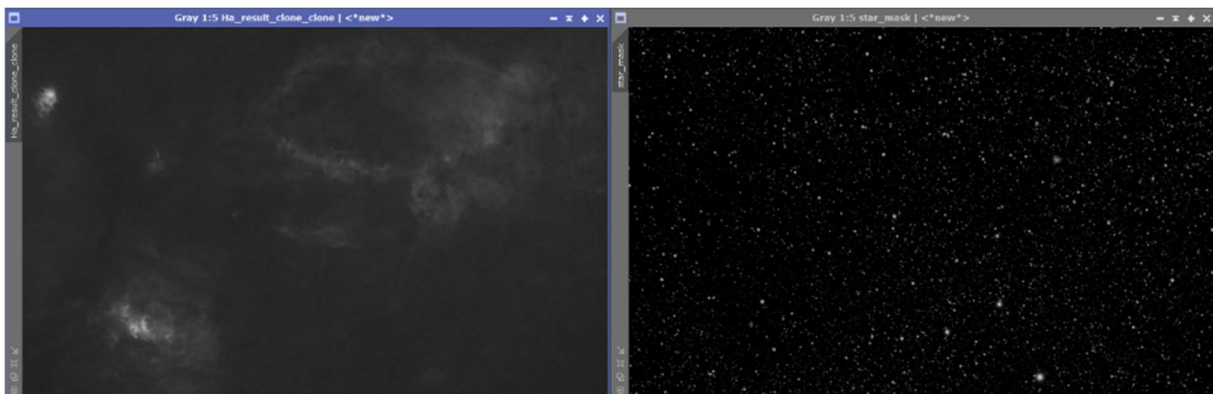


The 'StarNet' process then extracts the stars from the background.

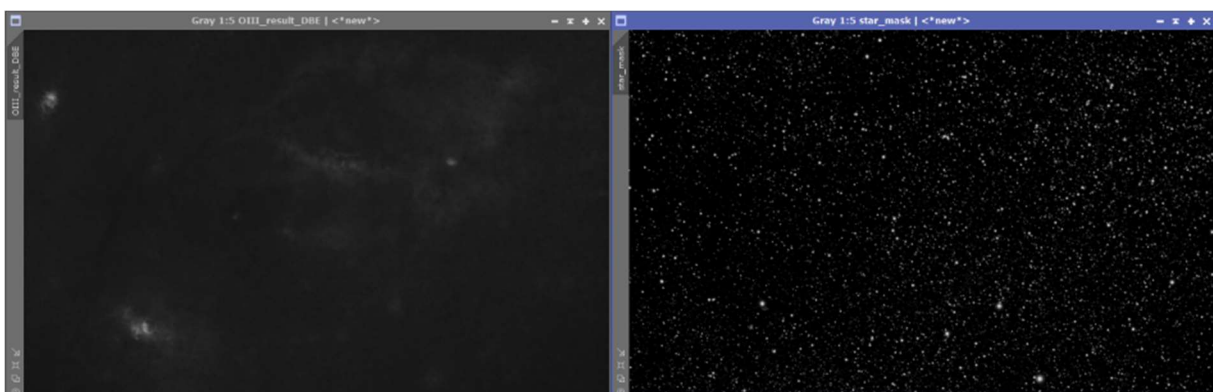


Select the files from the folder via Settings (second icon at the bottom right) and **check Create Star Mask!**

Ha:

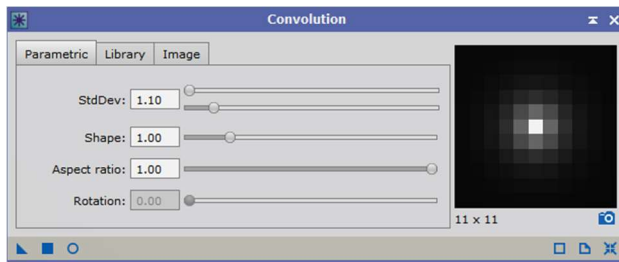


O-III:

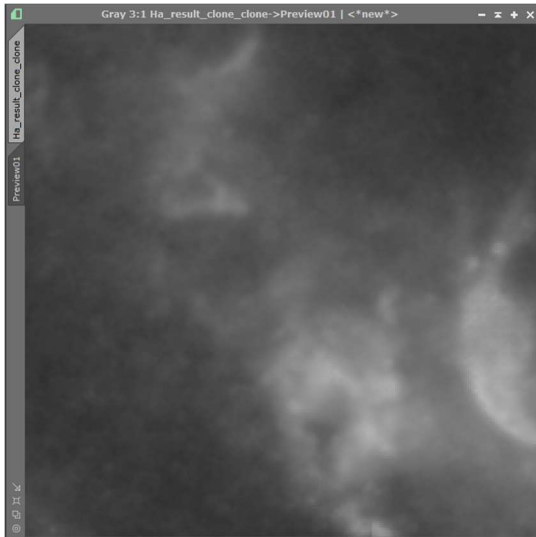


The star masks can be closed.

Via the 'Process' 'Convolution' the nebulae can be softened a bit.



Before:



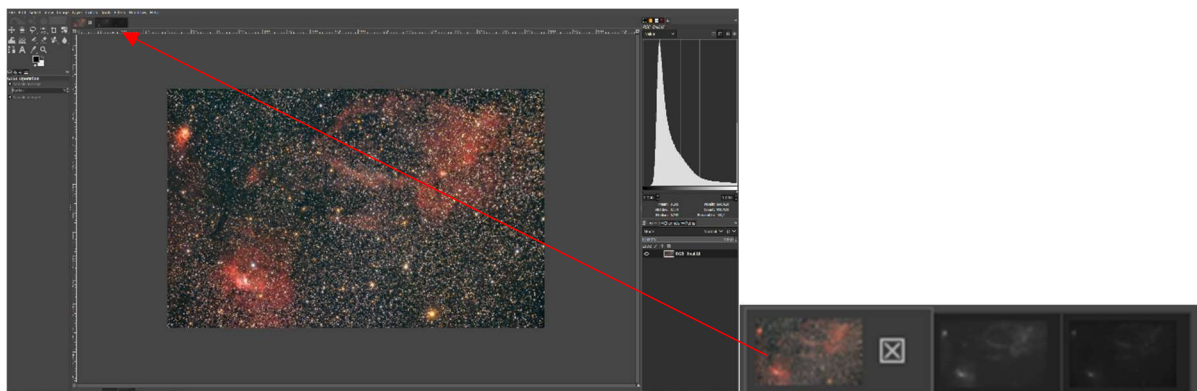
After:



Afterwards, the images are saved as a 16 bit-TIF-file in a folder, because from here on it can be further processed with the programs GIMP or Photoshop.

For additional processing, the free program GIMP is used here.

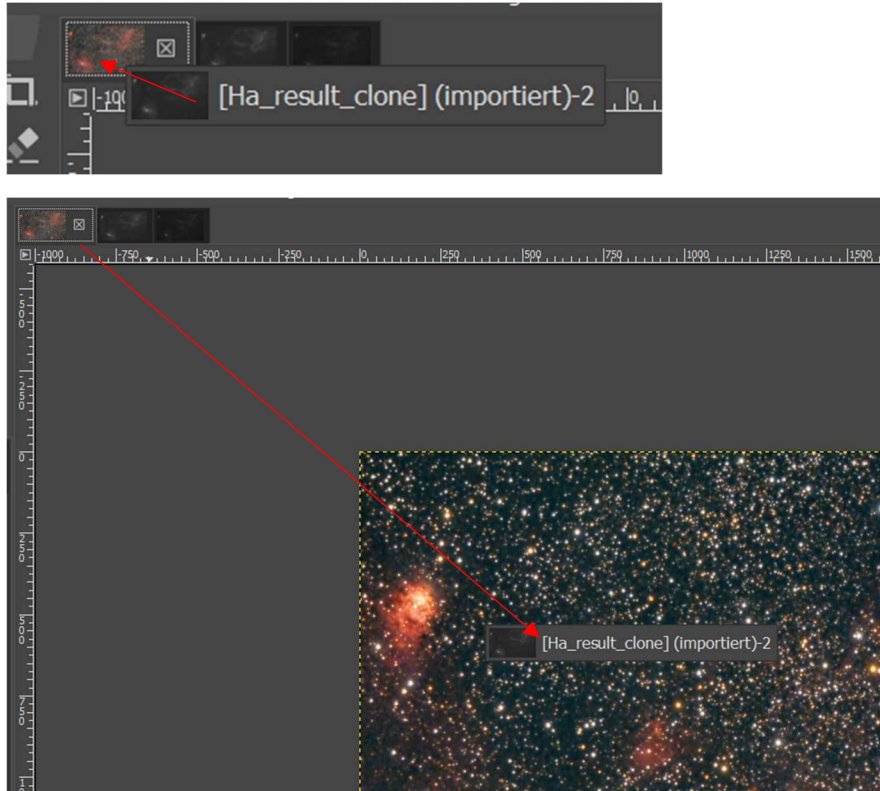
For this, the RGB image processed in instruction 3 and the two narrow band images are opened in GIMP.



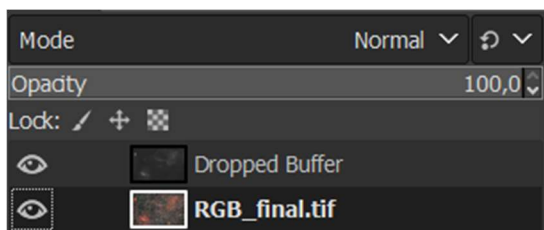


If artifacts are still visible in the narrow band images, these can be reworked via 'Blur'.

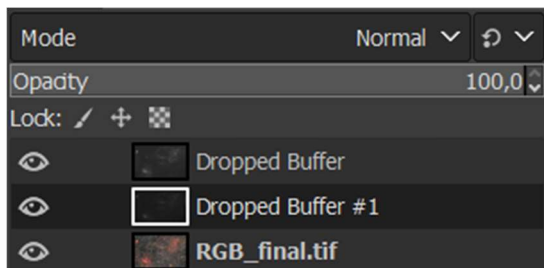
To merge the images, the Ha image is dragged onto the thumbnail of the RGB image with the left mouse button held down until the RGB image opens, and (with the left mouse button still held down) the Ha image is dragged down onto the RGB image.



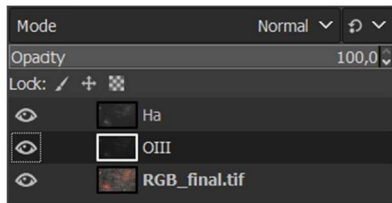
The Ha image now appears in the right menu bar as a layer in the RGB image.



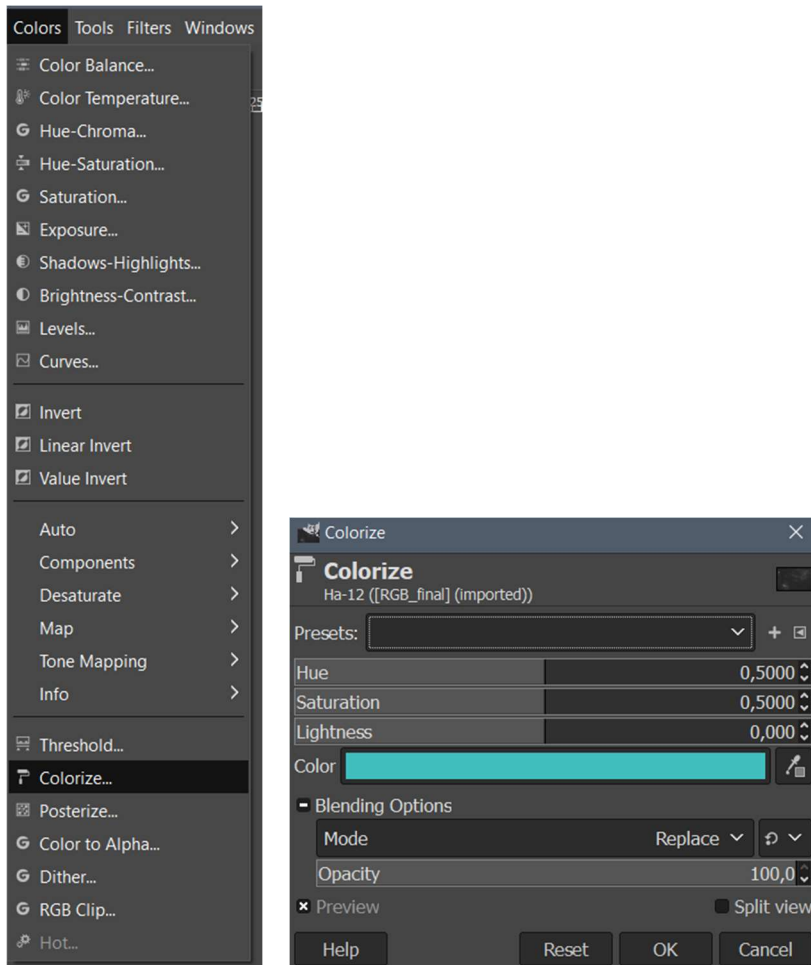
The same is done with the O-III image.



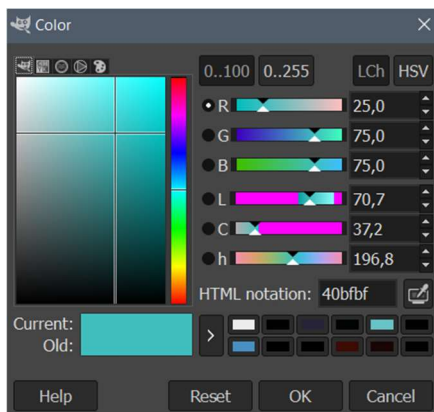
The eye icons can be used to show and hide the respective layers, and a right-click on the layer can be used to assign a name via the layer properties.



Zuerst wird nur die Ha Ebene ausgewählt (die beiden anderen Ebenen werden über das Auge-Icon ausgeblendet). Über den Menüpunkt ‚Farben‘ wird der Unterpunkt ‚Einfärben‘ gewählt.

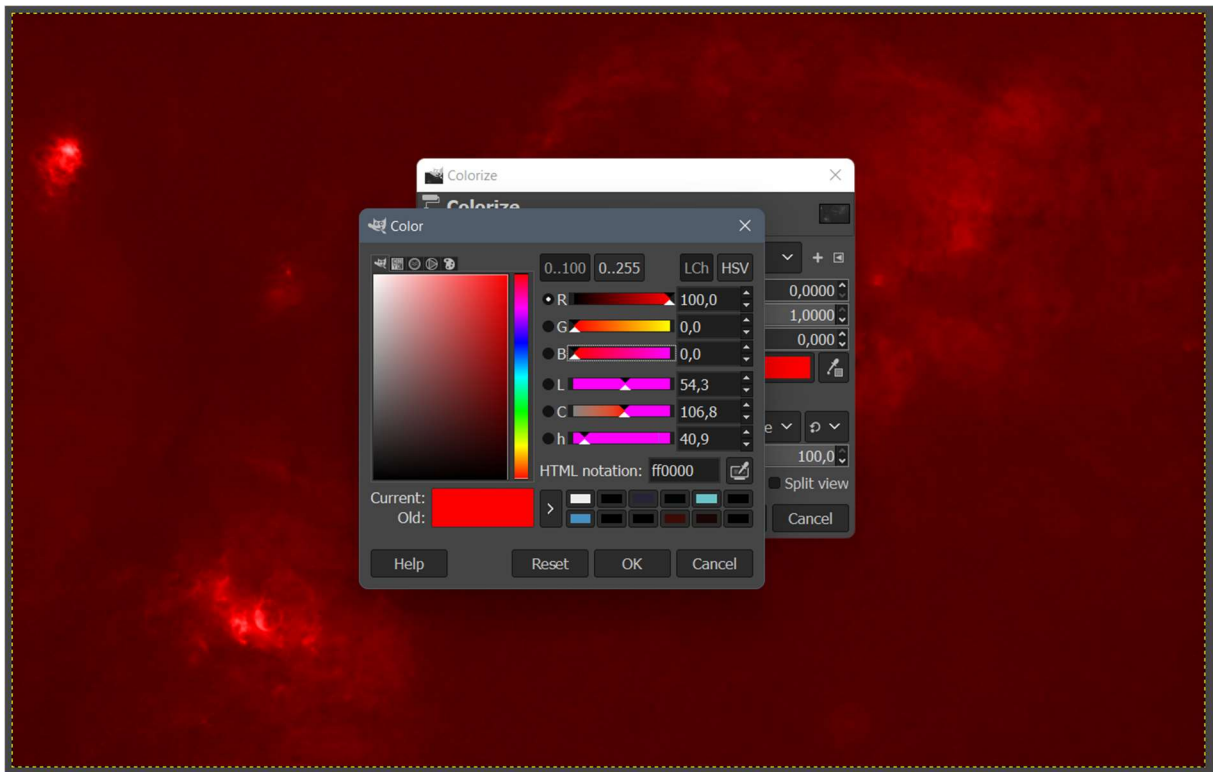


Clicking on the color field opens the following window:

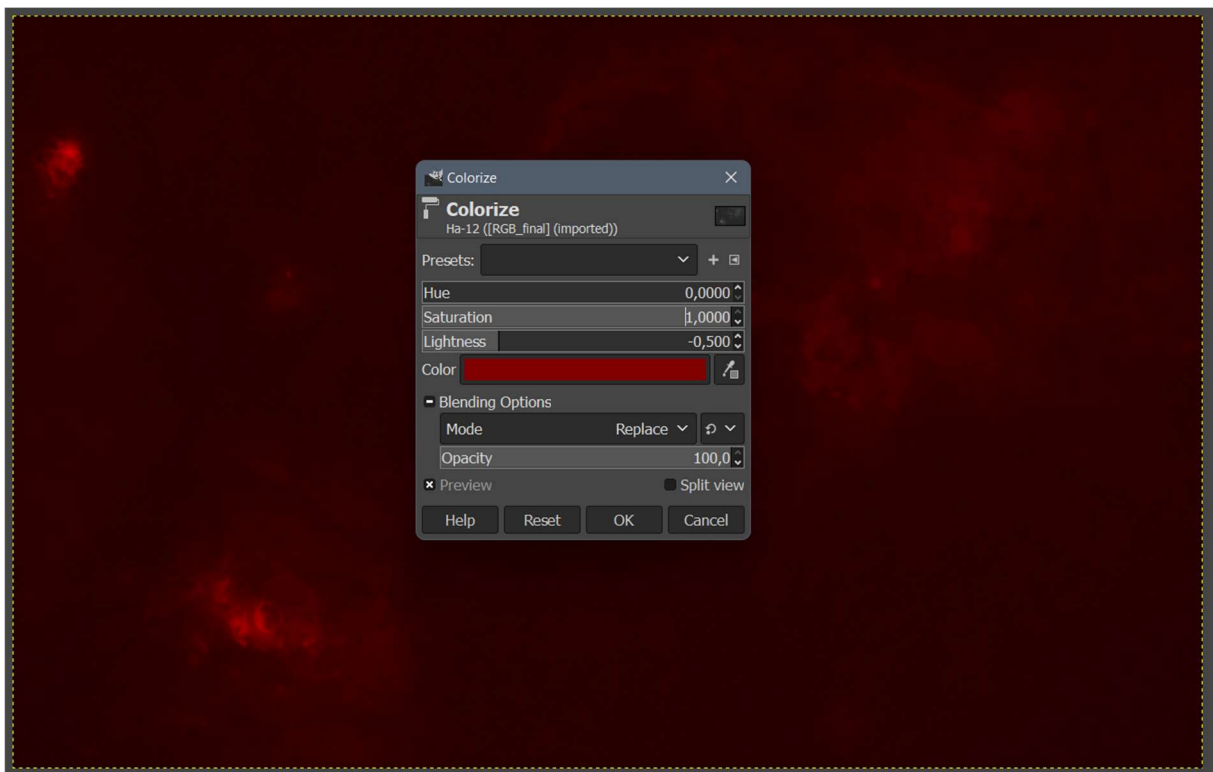


Since the Ha curve is at 656 nm, a red tone is selected.

To do this, move the slider for red all the way to the right, and the sliders for green and blue all the way to the left, and then confirm the settings with 'OK'.

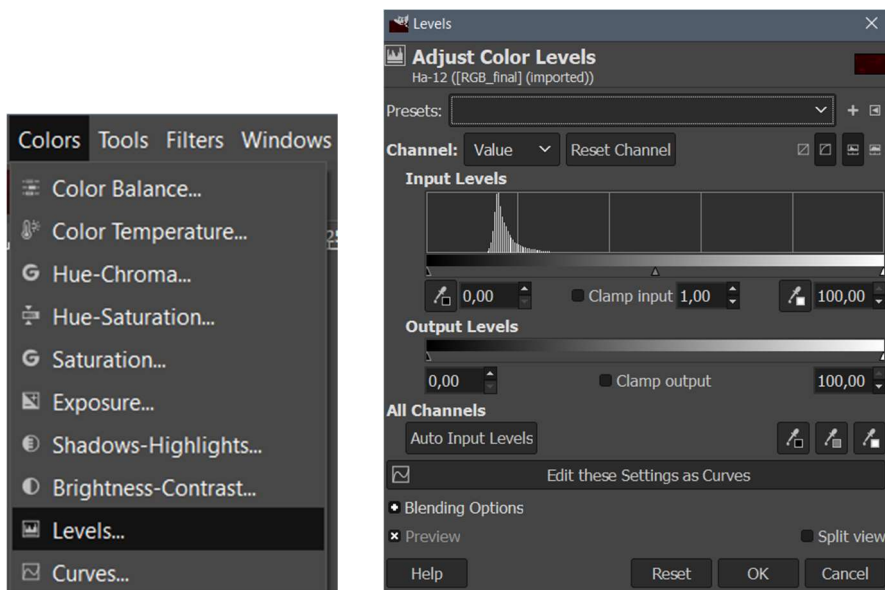


In the main window, the lightness is now set to -0.5, so that the object does not glow as much.

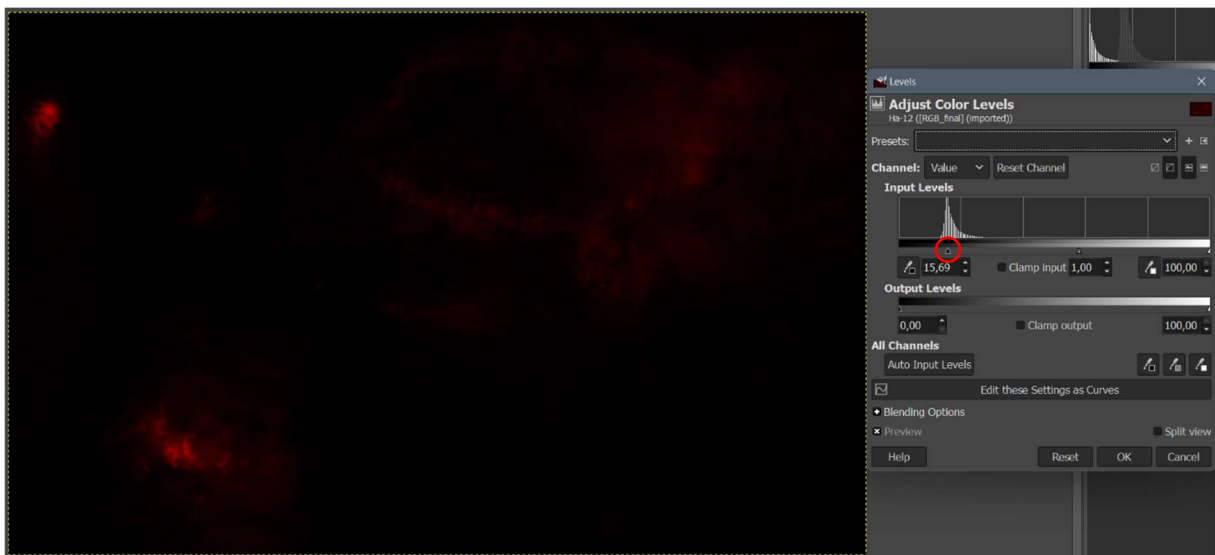




Then the submenu 'Levels' is opened via the menu point 'Colors'.

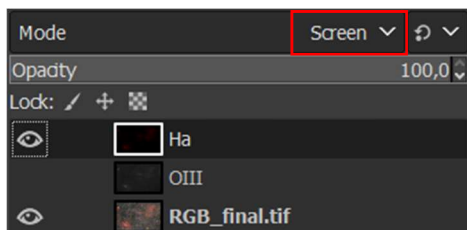


The histogram curve of the image opens. Now the left slider is moved to the maximum of the curve.



The background is then completely black, and this is confirmed with 'OK'.

Now the layer of the RGB image is shown and the mode 'Screen' is selected for the Ha image:



By switching the Ha layer on and off, you can observe the effect of the nebula brightening.

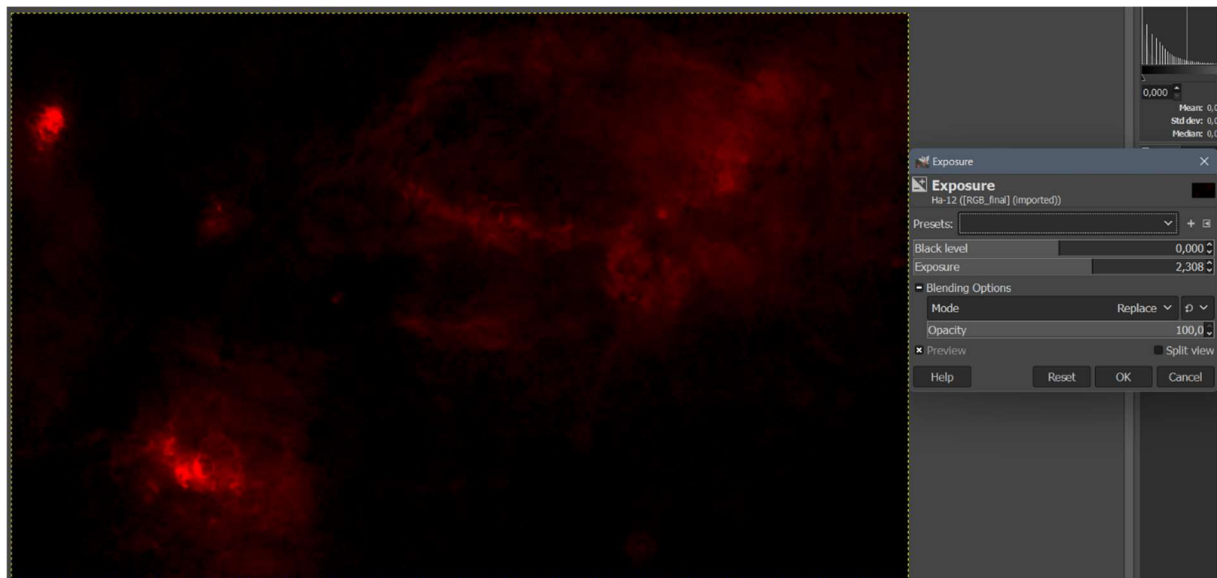
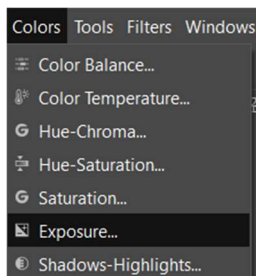
Without:



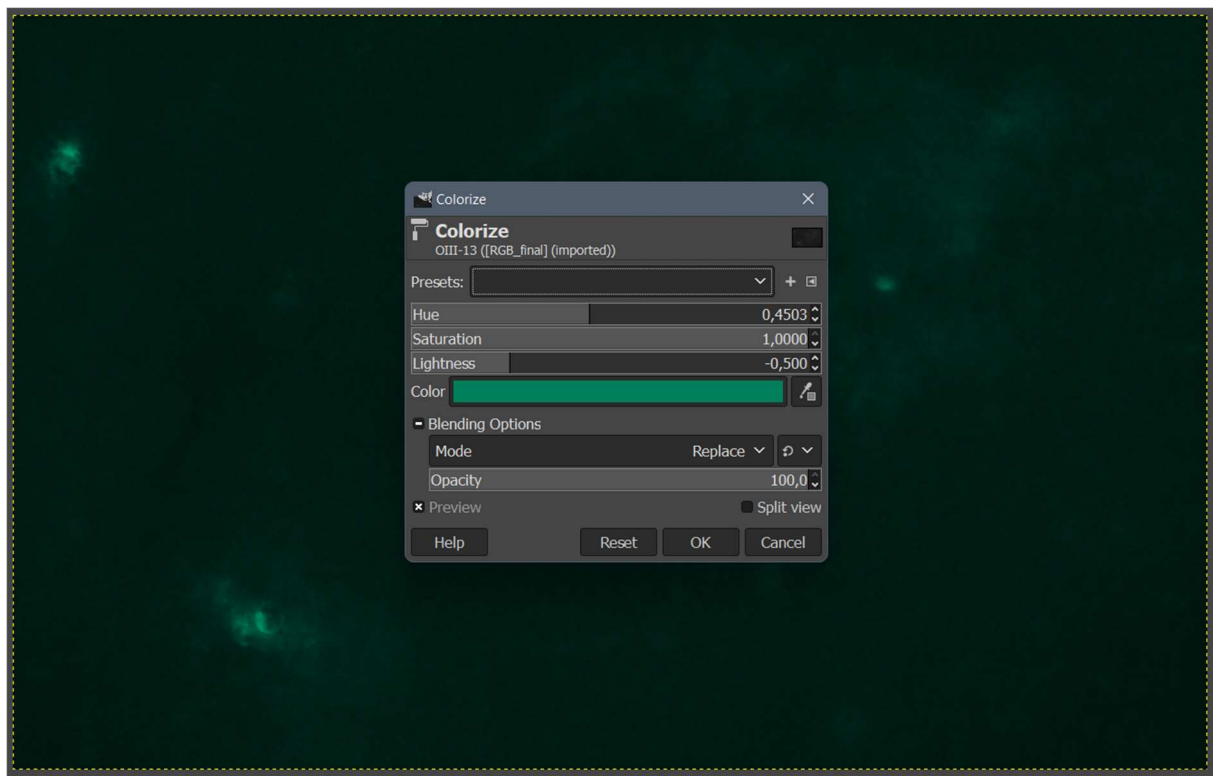
With:



If the effect is not sufficient, the effect can be increased via the menu item 'Colors' 'Exposure' when the Ha layer is activated. With the RGB layer switched off (via the eye icon), the effect can be tracked.

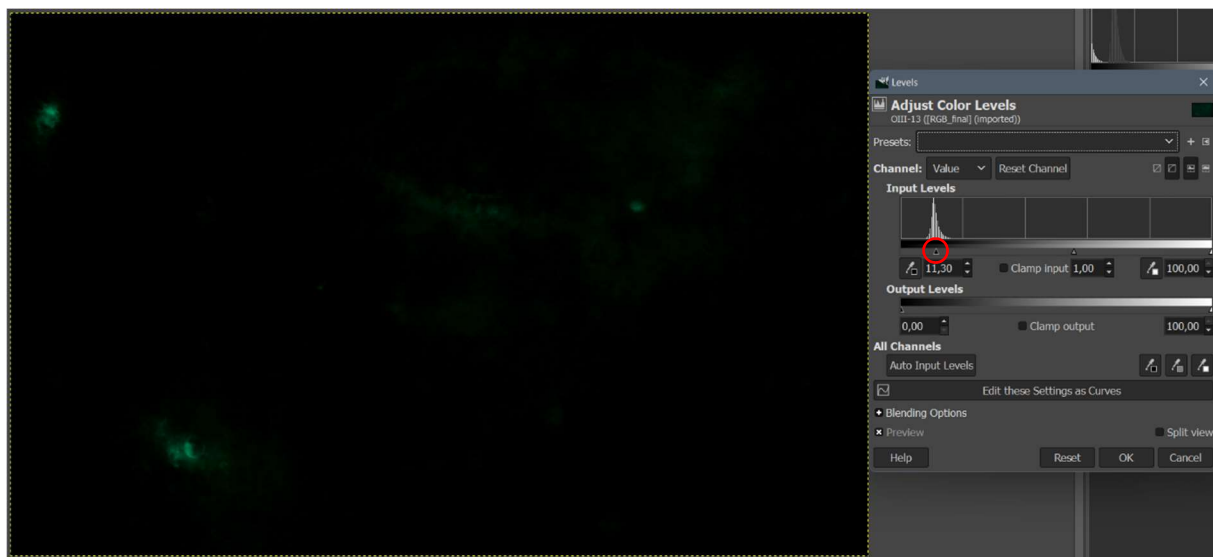


The same is done with the O-III channel, except that O-III emits at a wavelength of approx. 496 nm to 501 nm, which corresponds approximately to turquoise. However, there are no limits here in terms of color design. If it is to be displayed as blue, as in the Hubble palette, a pure blue can also be selected.

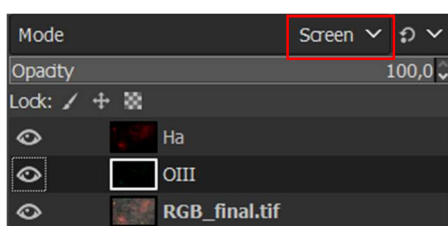


Here a turquoise-like hue was chosen (#00ffb3 corresponds to 496 nm), the saturation was set to 1 and the brightness to -0.5.

After adjusting the histogram curve, the following image can be seen:

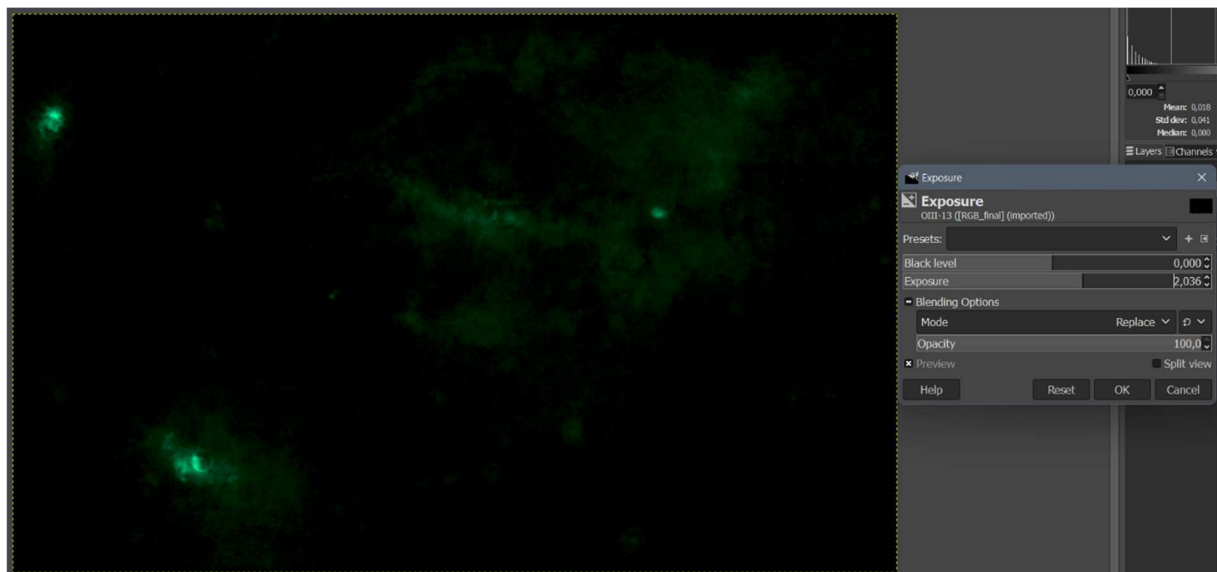


Here, too, the layer must then be set to 'Screen' again.





If the effect is too slight, it can be readjusted via the exposure.



Right-click on one of the layers and select 'Flatten image' to combine the layers into one image, and save the image via 'File' - 'Export as'.

