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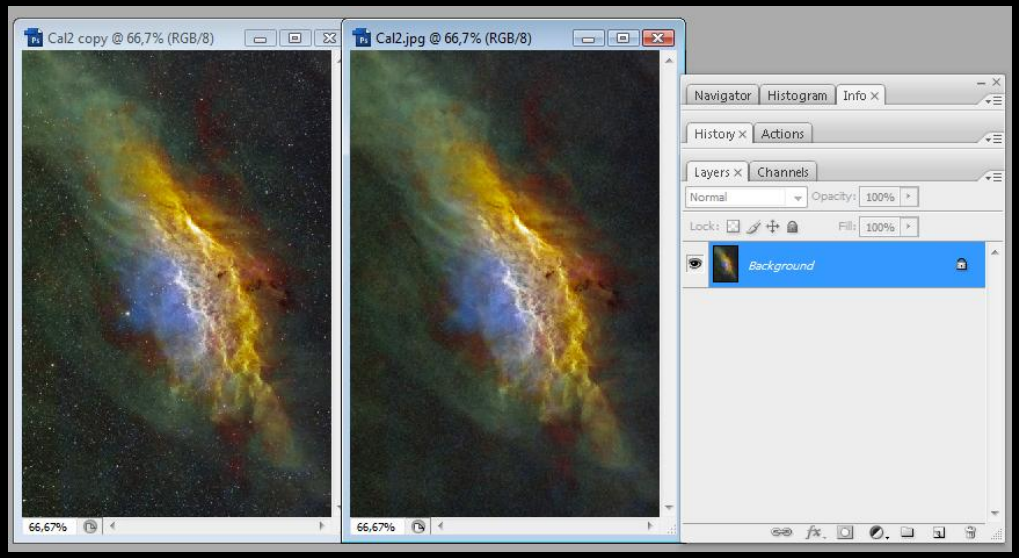
3D-Stereo Pair from a 2D-Astro Image

A Method by J-P Metsavainio

General notes

- If you want to build as realistic model as possible, look for available information about the target. Distance of the object, size, known Star distances, etc...
- Many details of the object can be figured out just by looking and thinking
- Observe the image and try to figure out relative positions of the image elements. Dark nebula has to be a front of emission one, a bright Star is probably closer than a dimmer one. Are there known Stars triggering the ionization of the nebula. If the Nebula is relatively close, main part of the surrounding Stars has to be behind it.
- The resulting 3D-image is always an estimation of the real shapes and forms, this should be mentioned when the image is published .
- Images has to be in 8bit per Channel mode.
- Don’t be too serious, this should be fun!

Step I



- Make two copys
- Do a Star Removal procedure to a Right image (You'll find it from a "Tone Mapping" document)

NOTE: In this example I'm building a Parallel Vision Stereo Pair. If you want to work with a Cross Vision version, just swap images in the opposite order.

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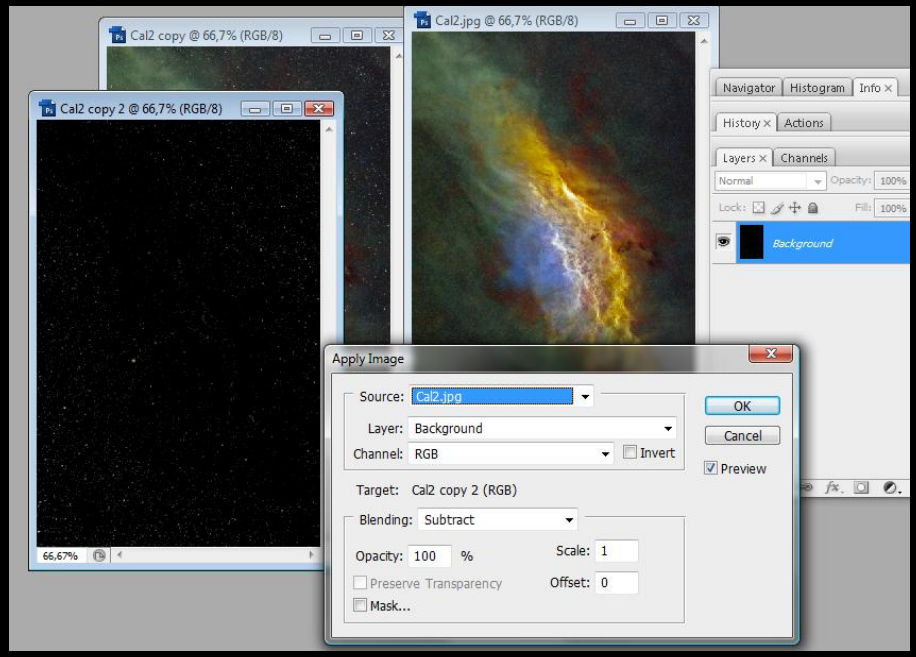
Step II



- Make a copy of the image with Stars
- Open ”Apply Image” tool
- Set blending mode to a ”Subtract”
- Set the Source image to a Starless one
- After ”Apply Image” command you’ll have an image containing just the Stars!

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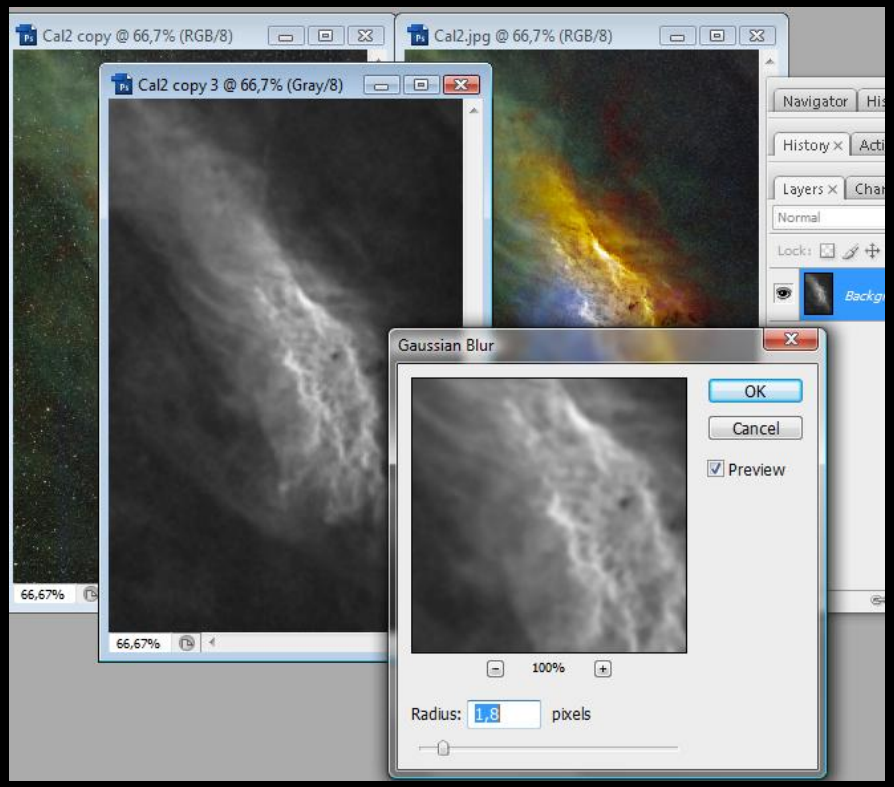
Step III



- Make a copy from a Starless image
- Turn it into Gray scale
- Add Gaussian blur, radius 1-2
- Save image in a PhotoShop PSD-format under a name ”HightMap”

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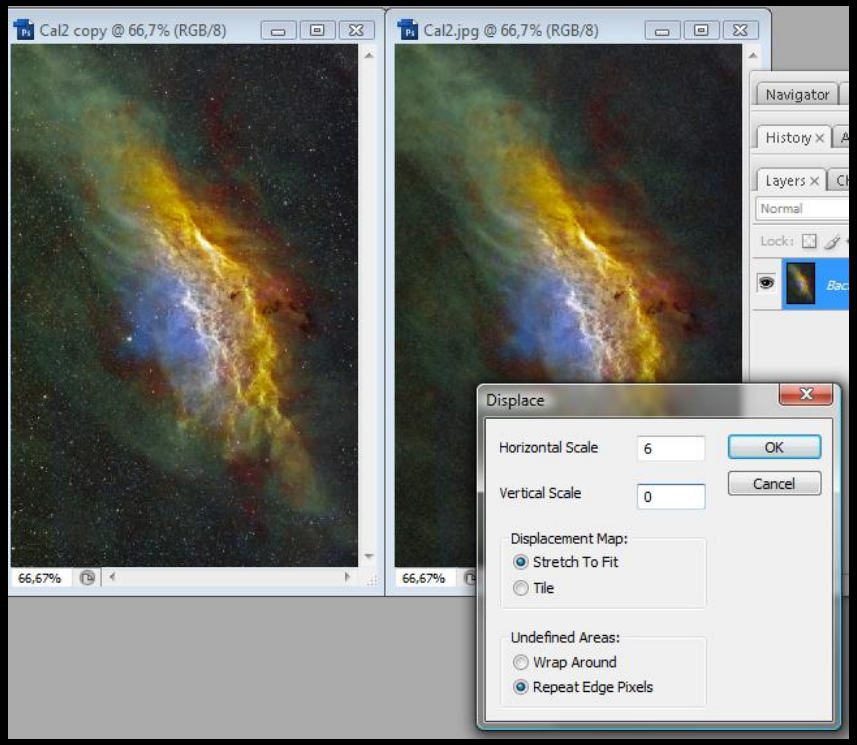
Step IV



- Select the Starless image
- Open the ”Displace” command
- Set Horizontal Scale between 3-10 (This will set the strenght of the Stereo effect. You’ll might need to try several values)
- Set Vertical Scale to 0
- OK
- Select the saved ”HightMap.PSD” image when asked
- After this command you can see the Stereo effect first time. Images in this example are in ”Parallel Vision” order. If you need to have a ”Cross Vision” version, just swap the images in opposite order.

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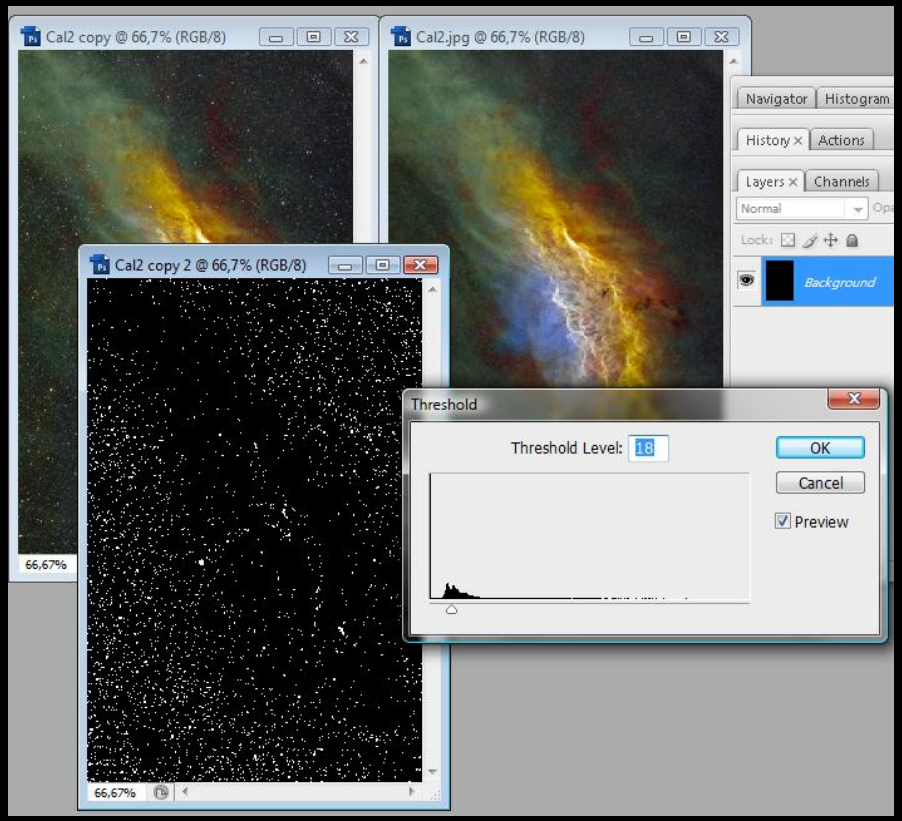
Step V



- We now bring the Stars back to the Starless image
- Select the image, with just the Stars, created in a step II.
- Use ”Threshold” command to select all the Stars by setting threshold level litle above a background value
- Use ”Select Color Range” command to select all the white areas from the image, use value 200 to select.
- Drag the selection , with a pressed Shift key, over the image with the Stars.
- Drag the content of the selection, with pressed Shift key, over the Starless image.
- Now you have all the stars in a separate layer over the Starless image.

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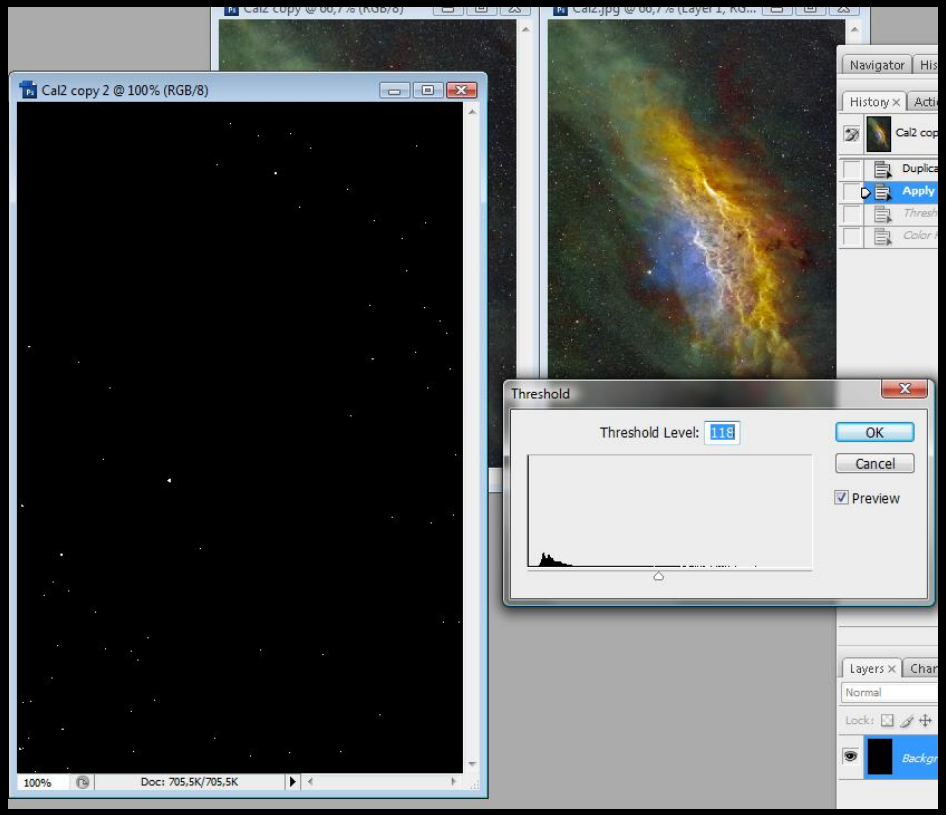
Step VI



- All the Stars are in one level, we want them to form a smooth volume in a three dimensional Space.
- First select the image with just the Stars and go back in history to an ”apply Image” state.
- Use the ”Threshold” command to select just the brightest stars. Try different values, you’ll see the effect right away in the preview window.
- Select by using ”Color Range” command
- Drag the selection over the Layer containing Stars and expand the selection by a few pixels.
- Make a new Layer via Cut
- Repeat previous steps with dimmer Stars. Three iterations will be enough.

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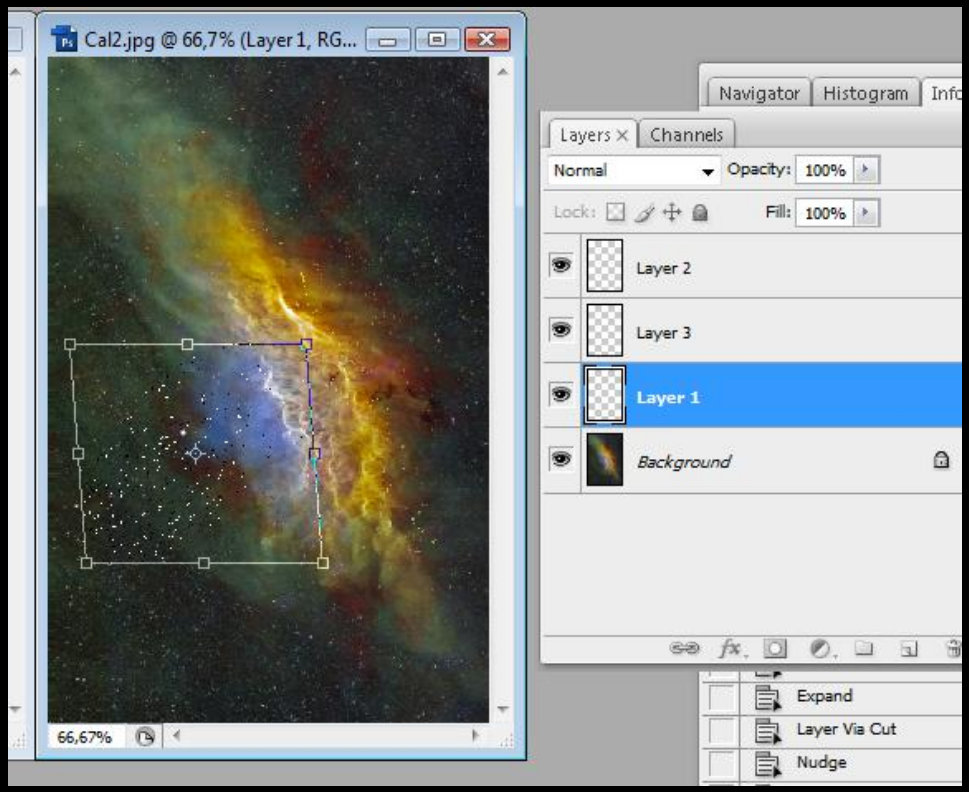
Step VII



Note!
The Star Menkib, HIP18614, is the one main source for ionization in NGC1499. It has to locate very close to Nebula. Place it separately in right location by moving it Right or Left, when looking the image as a Stereo at the same time.

- Now you have least Three layers in the image containing Stars from Brightest to Dimmest.
- Look image pair as a Stereo
- Move layers by arrow buttons. Brightest Stars to closer to a viewer = Left Dimmest away from a viewer = Right. (This apply to a Parallel version, it'll be opposite in Cross Vision version)
- Do not over do, small movements are enough
- Stars are now in three different distance. Very unnatural
- Make some random selections with a "Lasso" tool and use command "Skew" to greate a small variations in a depth.
- Repeat previous in all the layers few times .
- Look result as a Stereo to see when Stars form a smooth volume.

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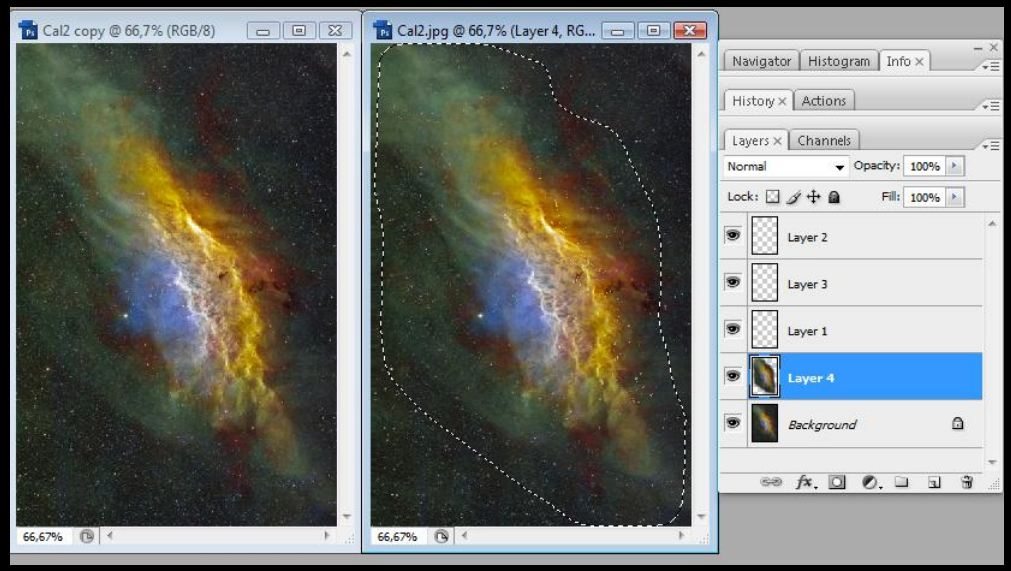
Step VIII



- The Stereo pair starts to be ready.
- Final tweaking can be done now, when stars are still in separate layers
- We can move small parts of the image to create variations in a depth .
- In the example image here, I have made a separate layer from a Nebula and used a ”Skew” command to give it some diagonal depth
- There is some Dark Nebulae in the image. Select them by a lasso tool.
- Form a new layers from Dark Nebulae and move them to Left to bring them in front of the main Nebula. Look at the image as a Stereo while doing this.

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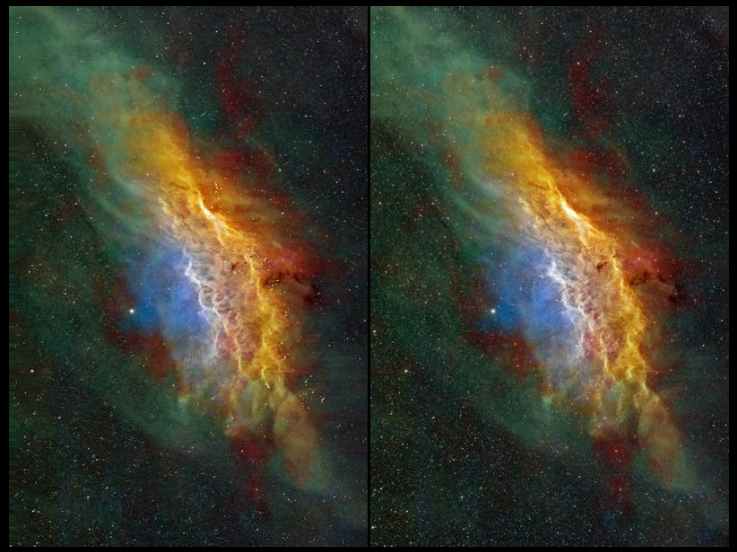
Image pair as an animation

Final Stereo pairs of NGC1499

Parallel vision



Cross vision