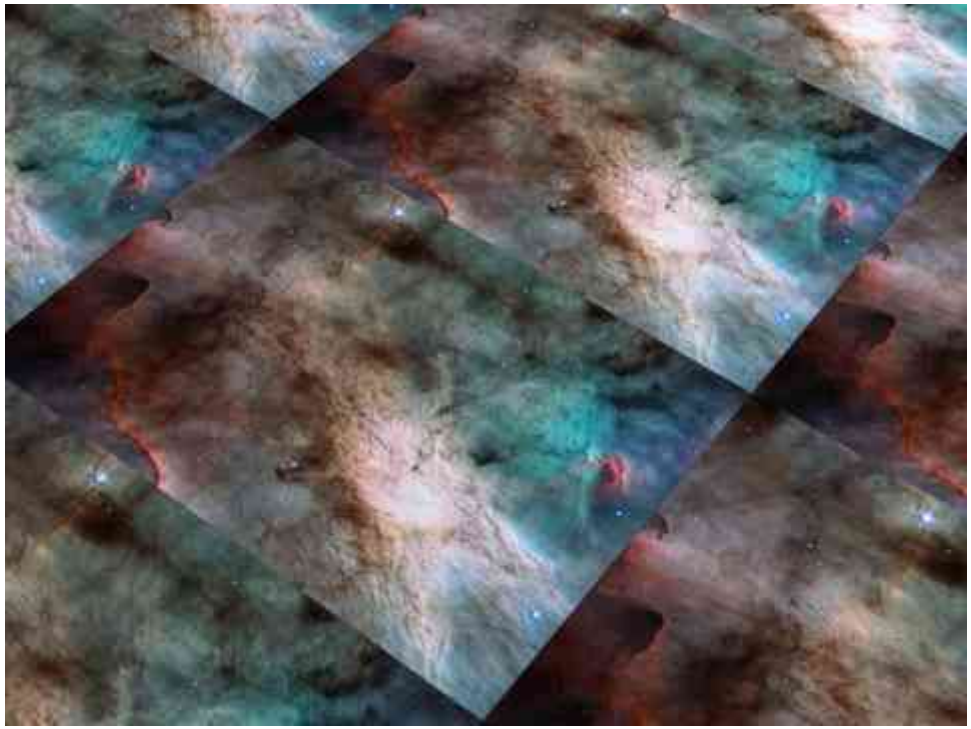
Creating Seamless Tileable and Spherical Maps

I promised to create a tutorial on how to manually edit maps to make them seamless/tileable, and how to edit maps for seamless spherical mapping.

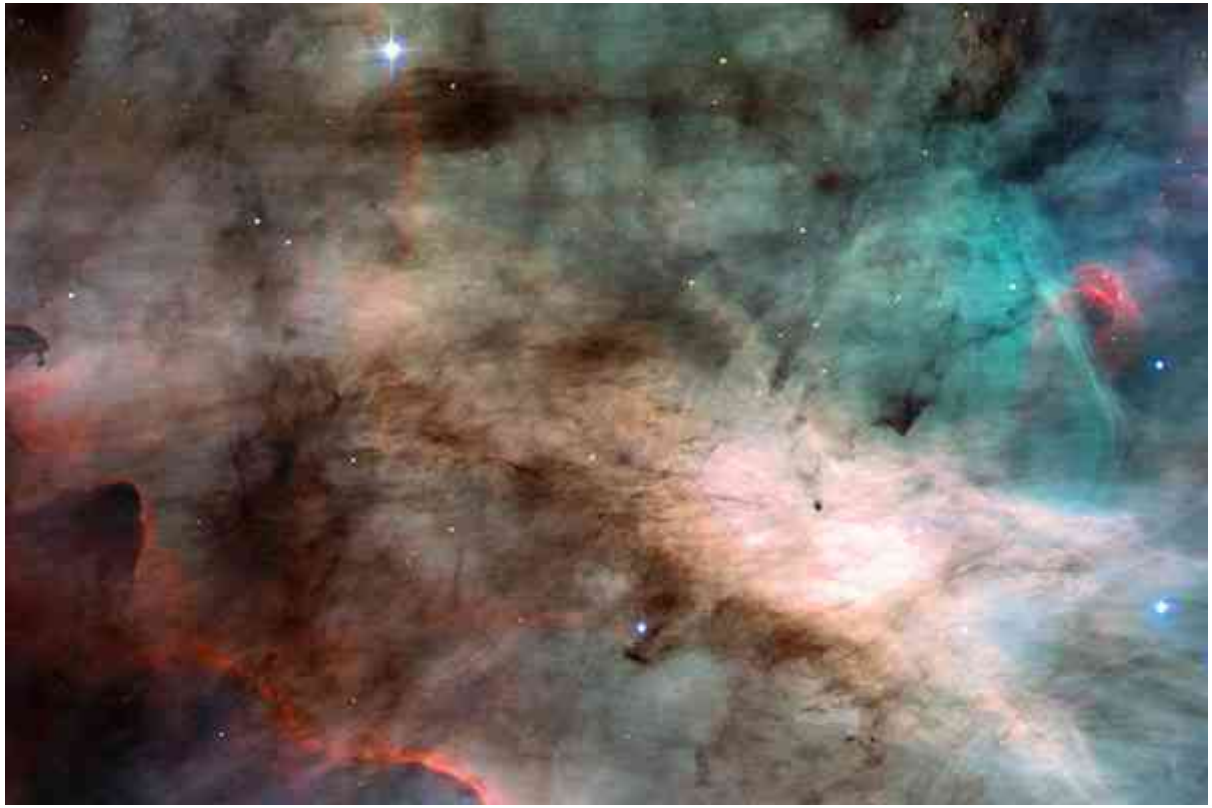
So, here we go

As can be seen below, the problem with many images maps, is that they create seams.
Tiling maps creates very obvious seams around all 4 edges of the maps.
Spherical maps create a seam at the back, and the top and bottom of the sphere shows pinching.



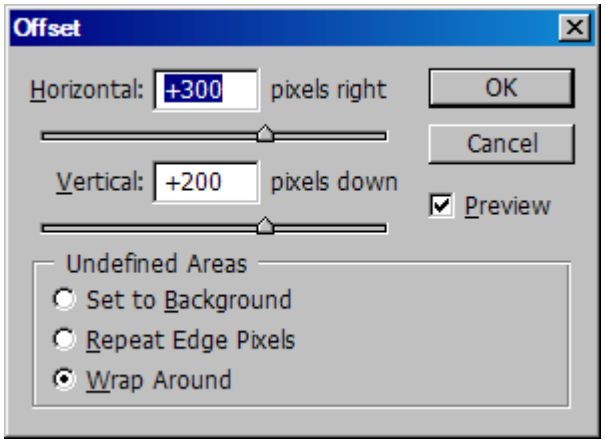
Easier to fix than you'd think. The technique is very simple.

First, we will be using this astronomical picture below (I like the stars)

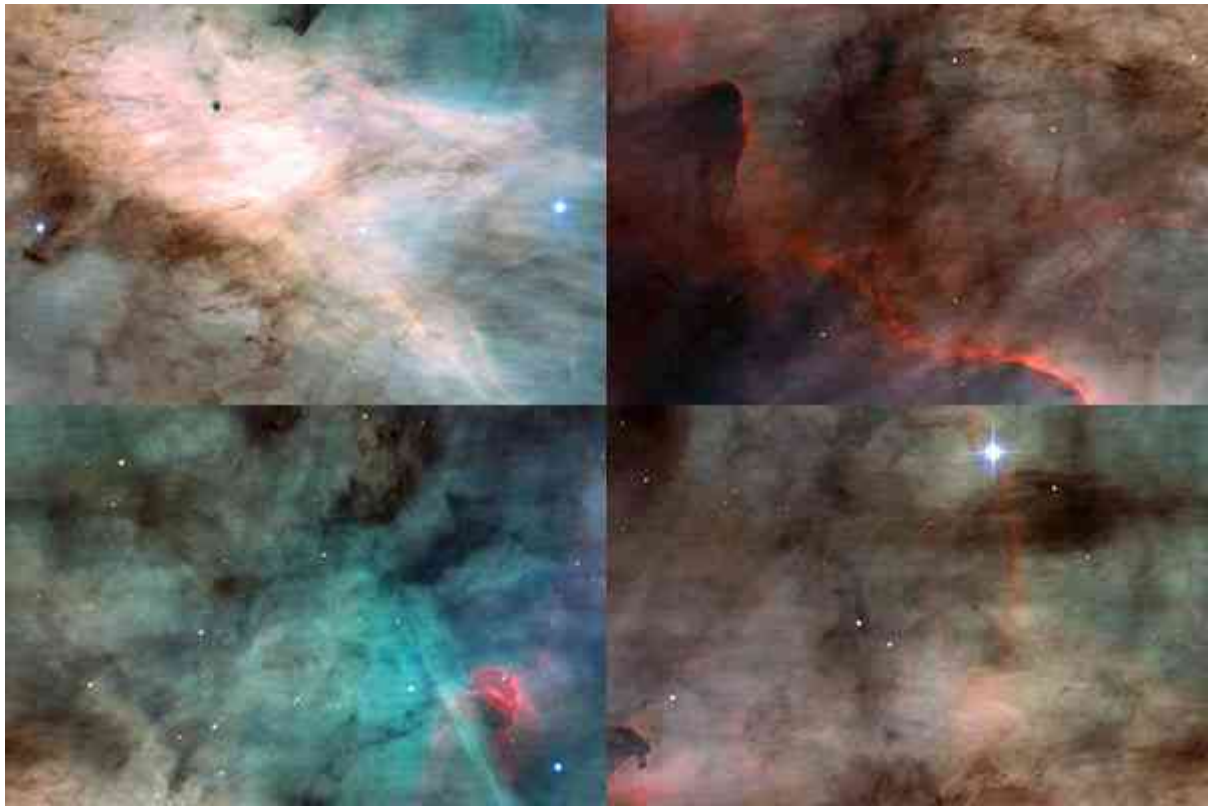


Tileable Maps

First, Load the image into photoshop.
Select Filter > Other > Offset



Set the image to wrap around, and offset the image by half its dimensions (The space image is 600x400), and you will see the image has been shifted so that the seam is now in the center of the image



The next step is to use whatever tools are neccary to paint out the seams. Some maps may only require a simple blurring the seams. This one needs a lot of careful work.
I used the clone tool to paint out the seam using other parts of the image as my brush, and tried to make the edited parts blend more into the rest of the image, rather than leaving what can still be an obvious seam.

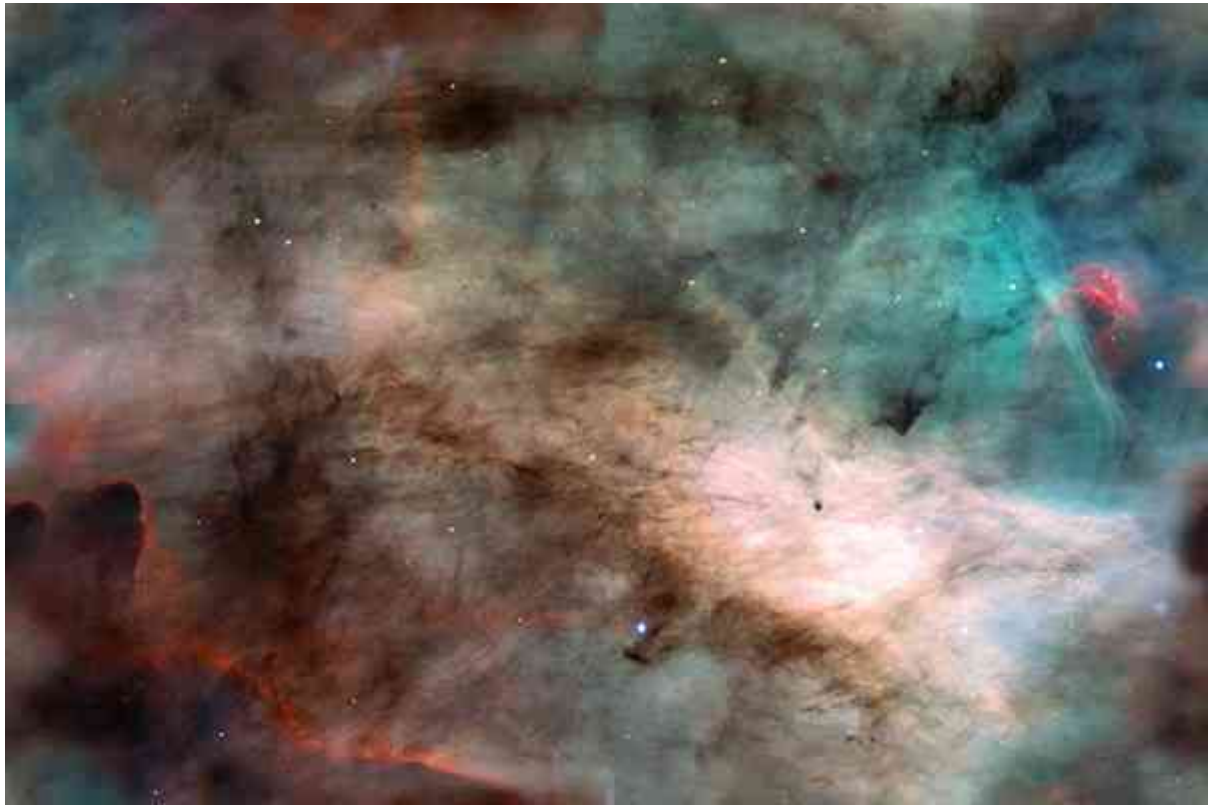
In this image, the most difficult part is trying to make the extreme differences between the 4 corners blend and look like they belong together. It all comes down to artistic decision.

Here is the result I came up with

This is now the 'seam' that will show when you attempt to tile the map.

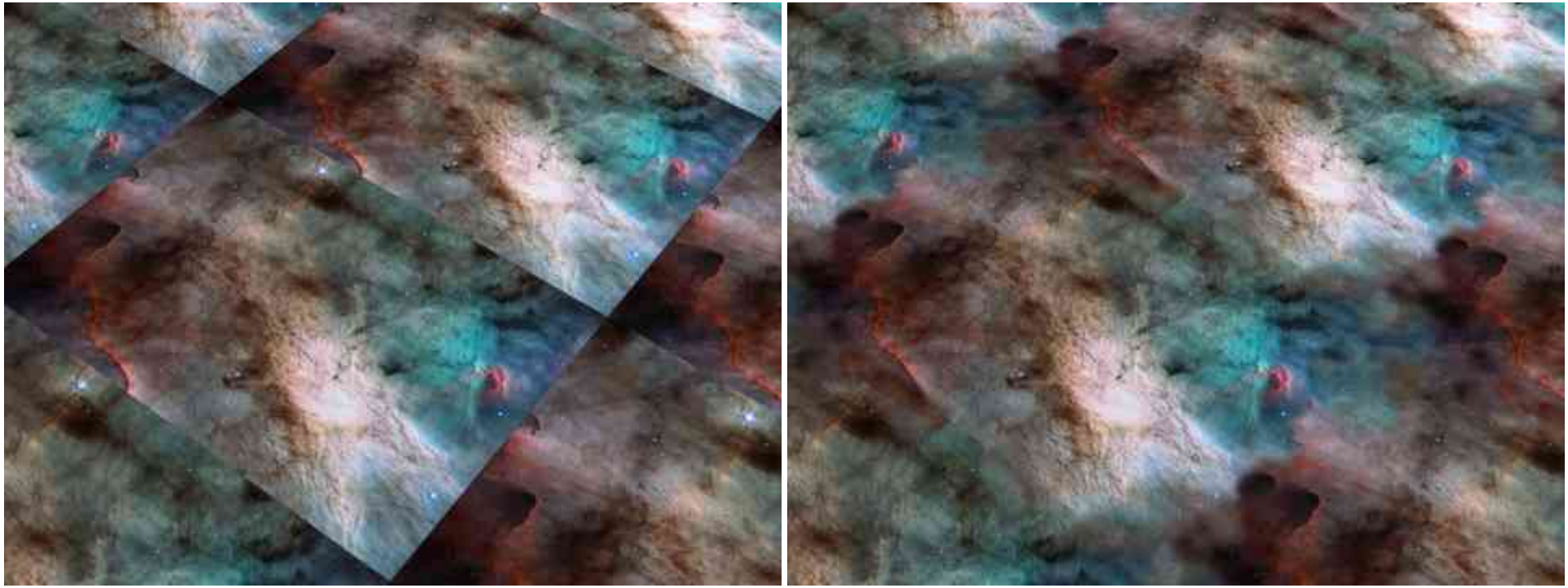
Now use "offset" again to return the image back to it's original position. Sometimes, depending on exactly what you did, you may find when you return the image to it's original position, that there is a new glitch in the center of the image that is like a + sign. This just needs to be fixed

as well.



This is now your "seamless tileable map"

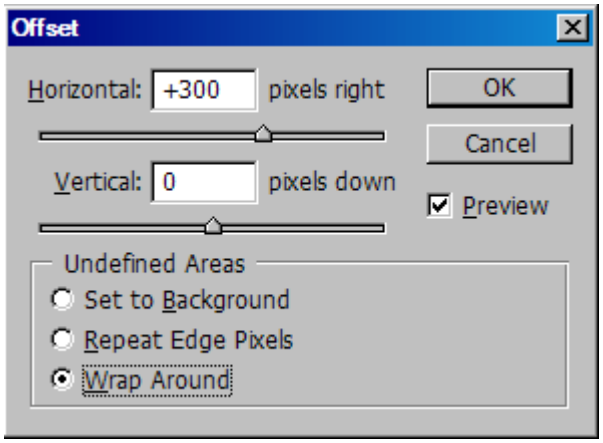
Here is a resulting render. Compare to the image without the editing we just did

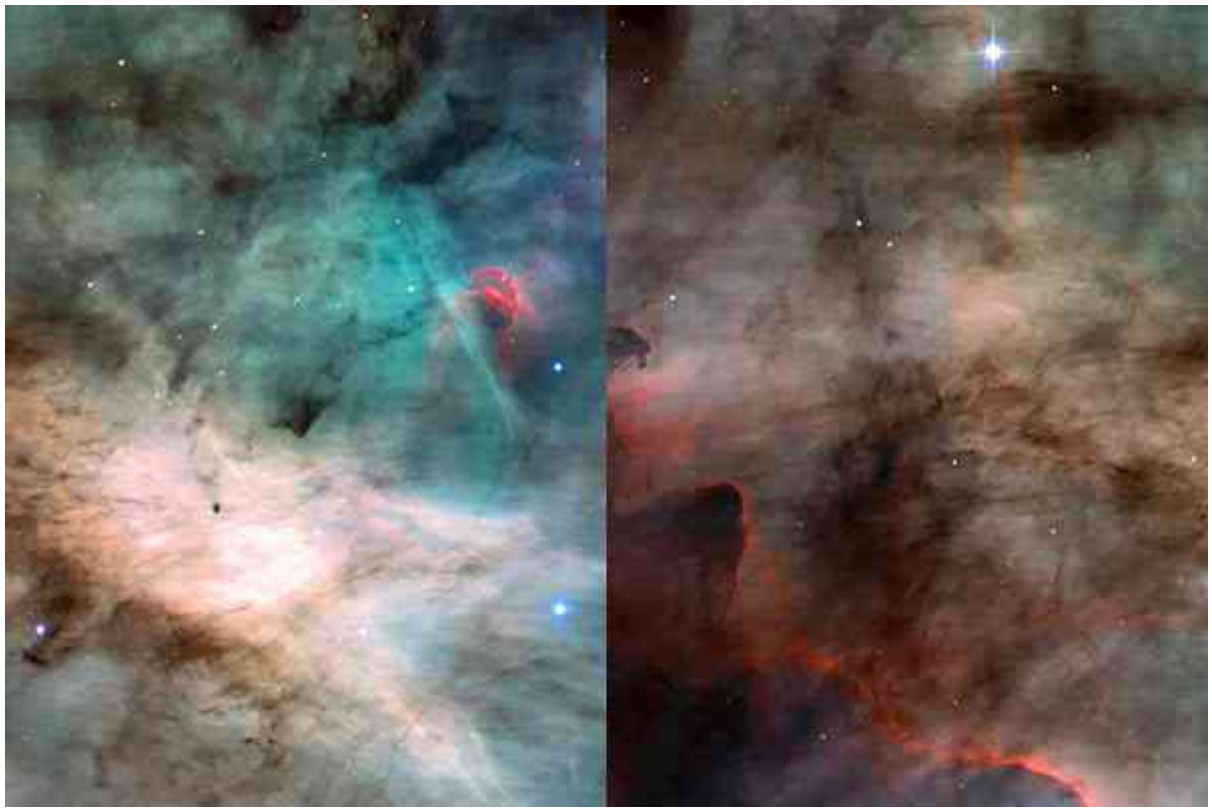


Spherical Maps

When Dealing with spherical maps, the first step is very simple. We need to eliminate a seam like we just did, however there is only seam that need to be fixed.

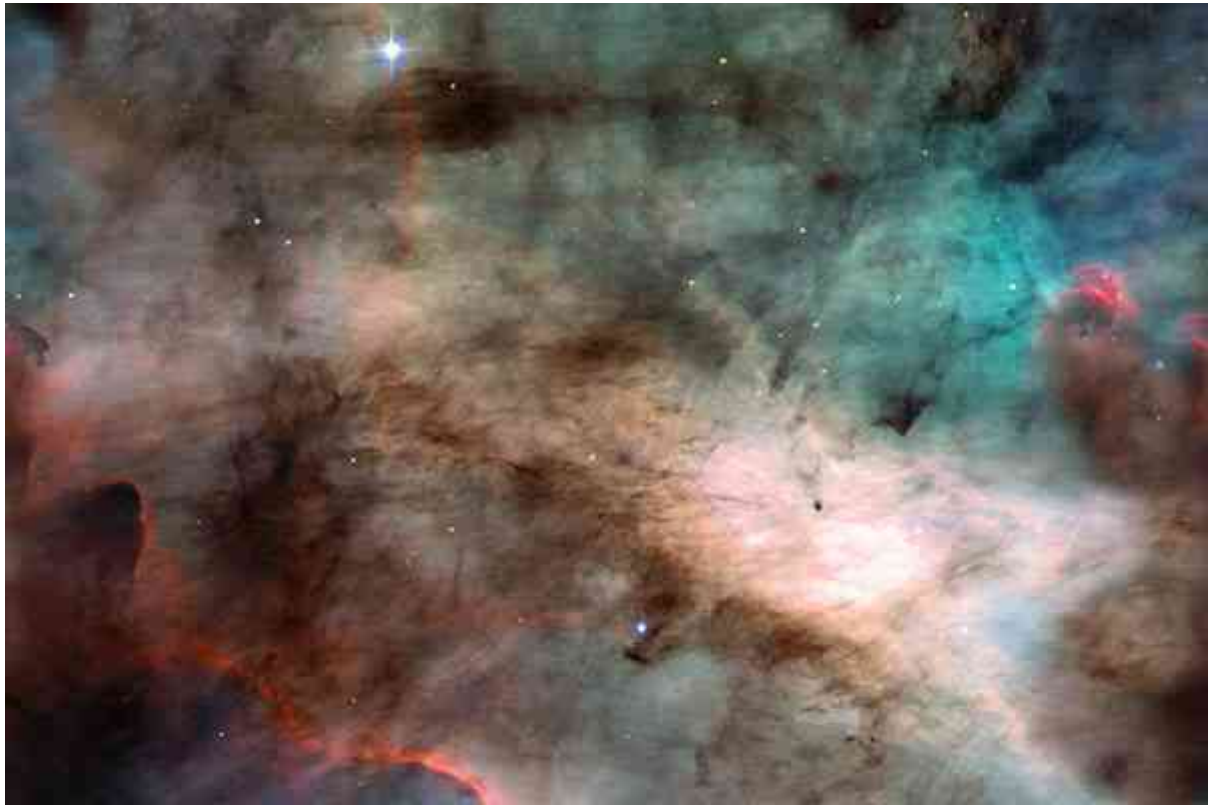
Once again, select Filter > Other > Offset
This time, only offset it horizontally to reveal the vertical seam





Once again, edit out the seam

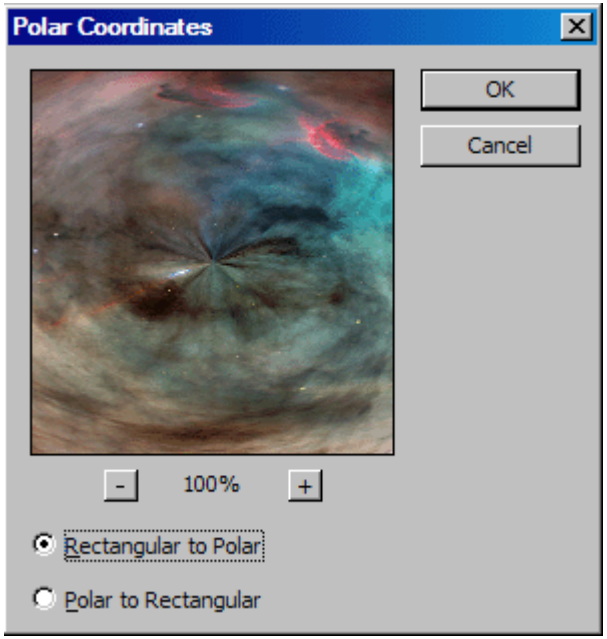
And set the offset back to normal



That takes care of the vertical seam, now to deal with the pinching at the top and bottom

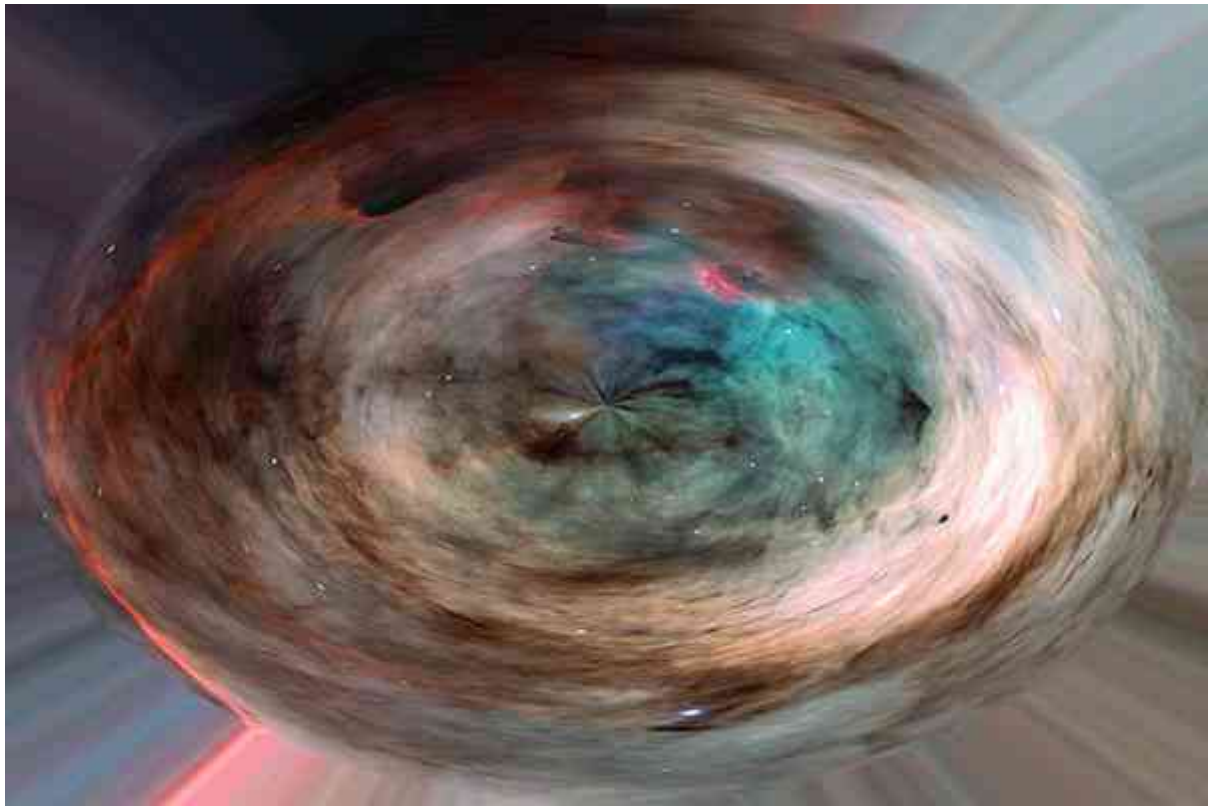
Before we proceed, this technique involves distorting the image and remapping to different co-ordinate systems, back and forth, many times. To protect the image and reduce the chances of glitches etc in the image, you shouls resize your image. Scale up to at least 2x the size, 3x or 4x is even better.
(I will show the unscaled versions here)

Now, select **Filter > Distort > Polar Co-ordinates**

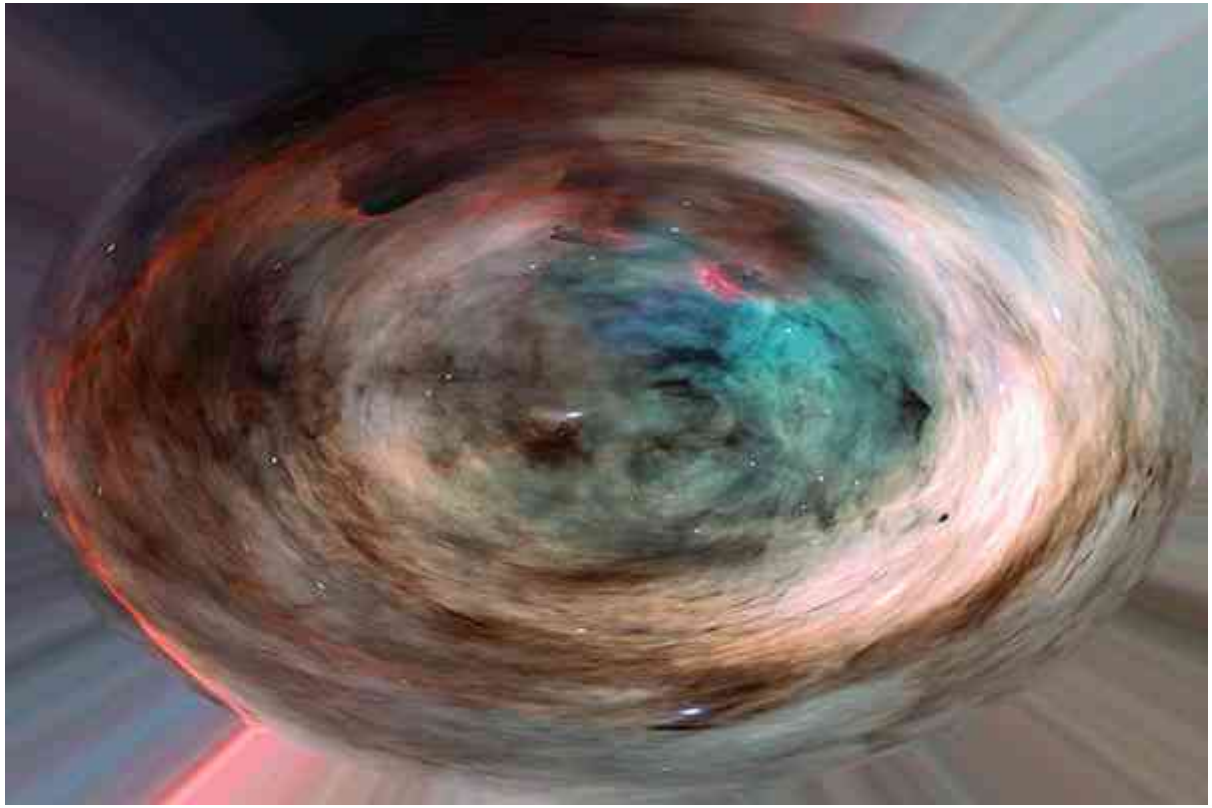


Select "Rectangular to Polar"

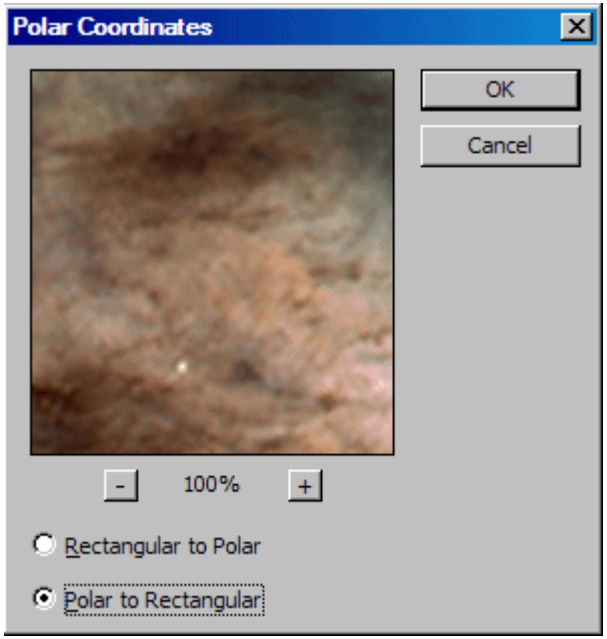
and you should see the resulting distorion looking like this



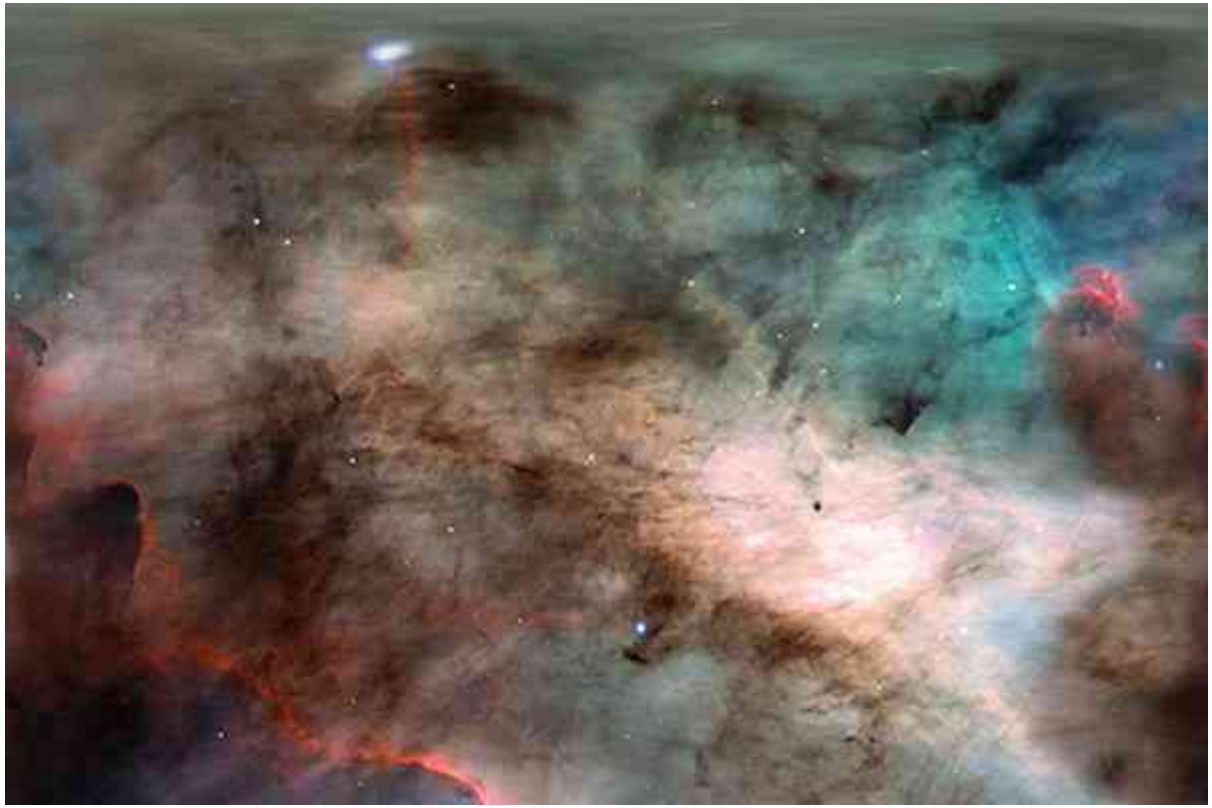
You can now see the pinching at the top of the sphere (and I noticed a slight seam I didn't quite eliminate entirely... oops).
Use whichever tools you need to paint over and eliminate the pinching/seam



Once that is done, you can now convert the image back to its rectangular co-ordinates
Again, select **Filter > Distort > Polar Co-ordinates** and this time, select "Polar to Rectangular"



And here you have now eliminated the top 'pinching' (as well as the vertical seam previously)



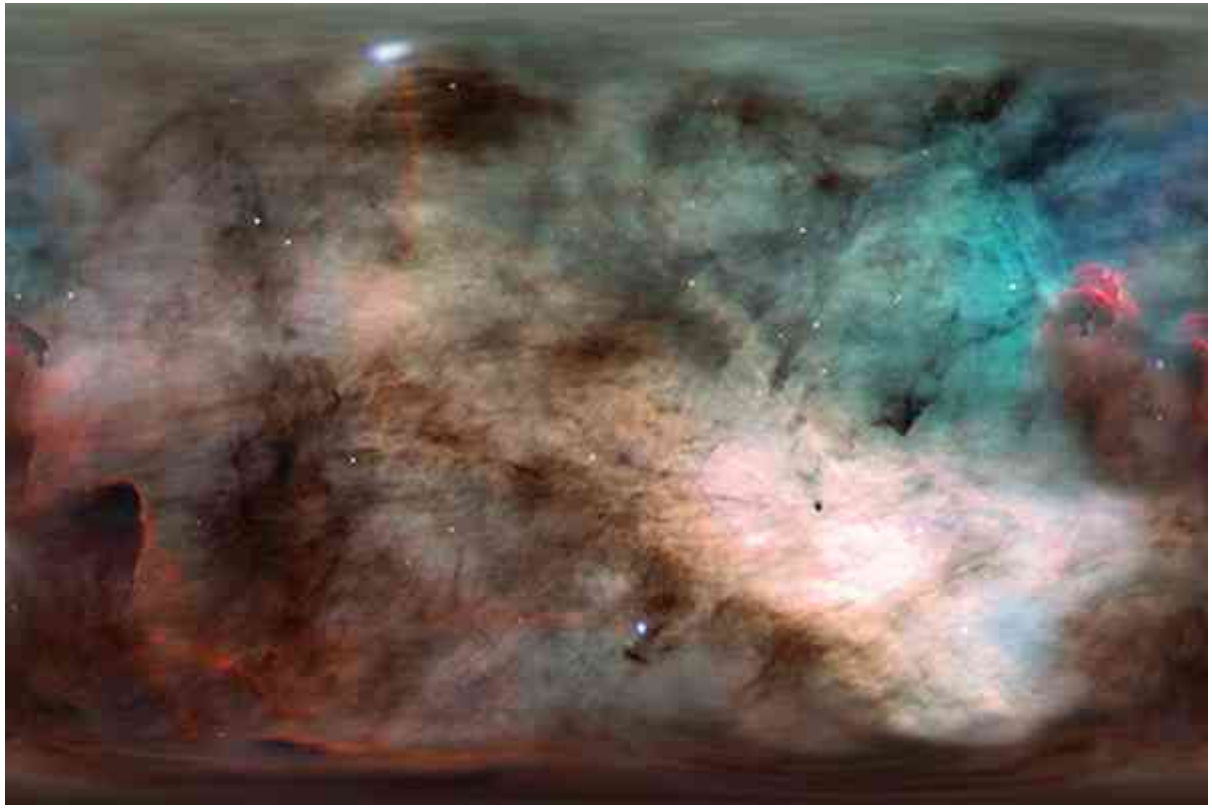
Now, we need to do the same again to eliminate the bottom "pinch"

Select **Image > Rotate Canvas > Flip Canvas Vertical**

Now once again, go through changing to polar co-ordinates, editing out the 'pinch', returning to rectangular co-ordinates, and again flip the image back upright.

Also, because we rescaled the image up before, you can now scale it back down to it's original size.

Congratulations, you have now finished creating a spherical map.



And you can see the differences here