

PHOTOSHOP YOUR WAY TO AMAZING ASTROPHOTOS III: FIX STAR BLOAT VIA MINIMUM FILTER METHOD

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This tutorial is a slight variation of a method that Don Taylor introduced me to. It allows bloated stars in otherwise excellent astrophotos to be lessened in diameter thereby improving the visual appeal of the image. Interested? Well, you'll need your trusty ol' copy of Photoshop (any version will do) to do these operations.

Please refer to my earlier tutorial documents on basic and advanced image editing in Photoshop to get the image looking good.

I'll assume you all have photoshop and are comfortable enough in opening image files in this program.

For the purposes of this tutorial, I'll use a narrowband image of M27 – the Dumbell nebula taken using H-alpha and O-III narrowband filters and processed into a pleasing high resolution, high dynamic range image.

I noticed that the H-alpha portion (red channel) displayed some star bloat. So, this is a good image to utilize for this tutorial.

Open up the image in Photoshop. It's a 16 bit TIFF file in RGB colorspace, but even 8 bit jpegs in RGB or grayscale can be utilized.

The familiar Photoshop window will look something like this....

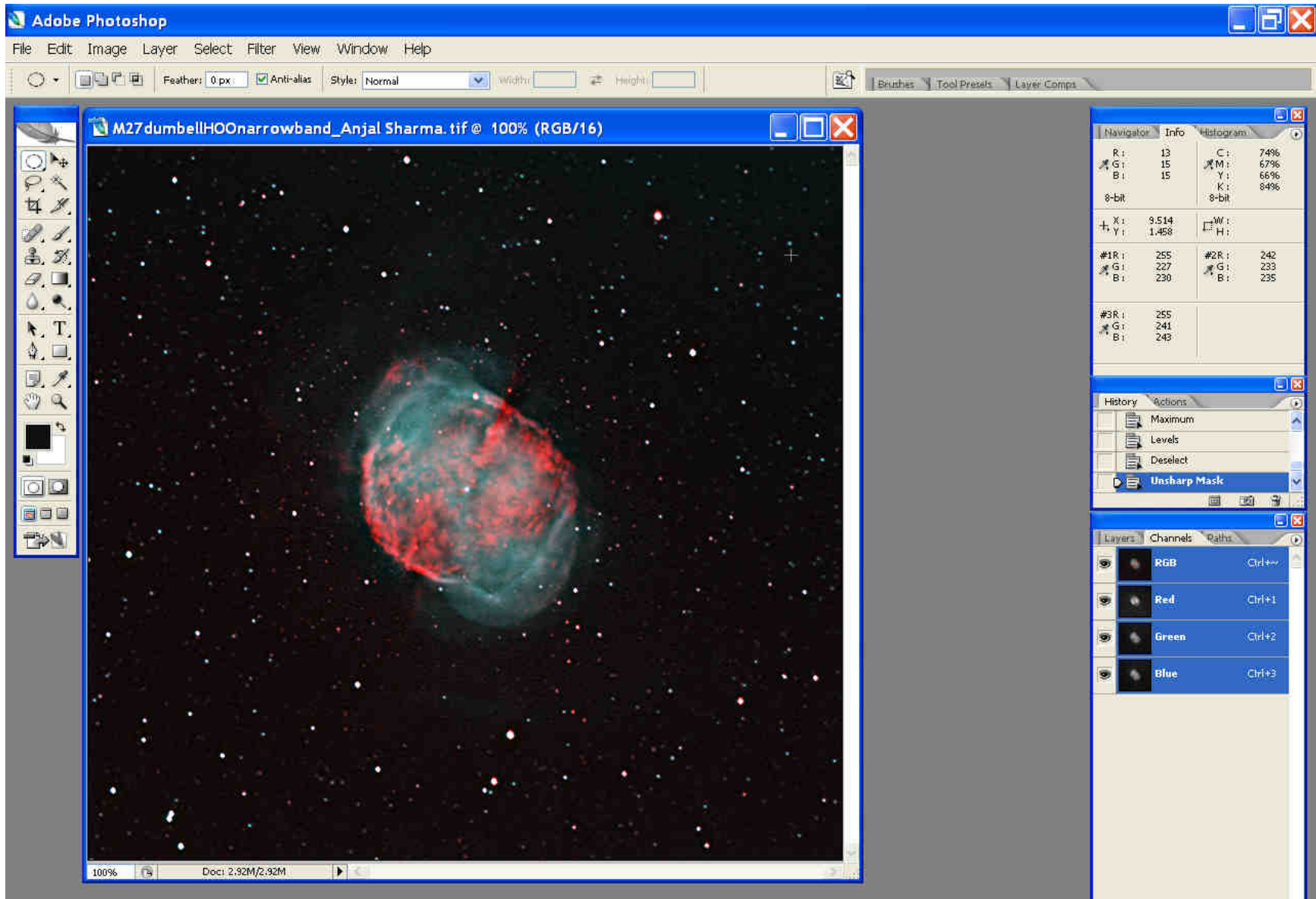
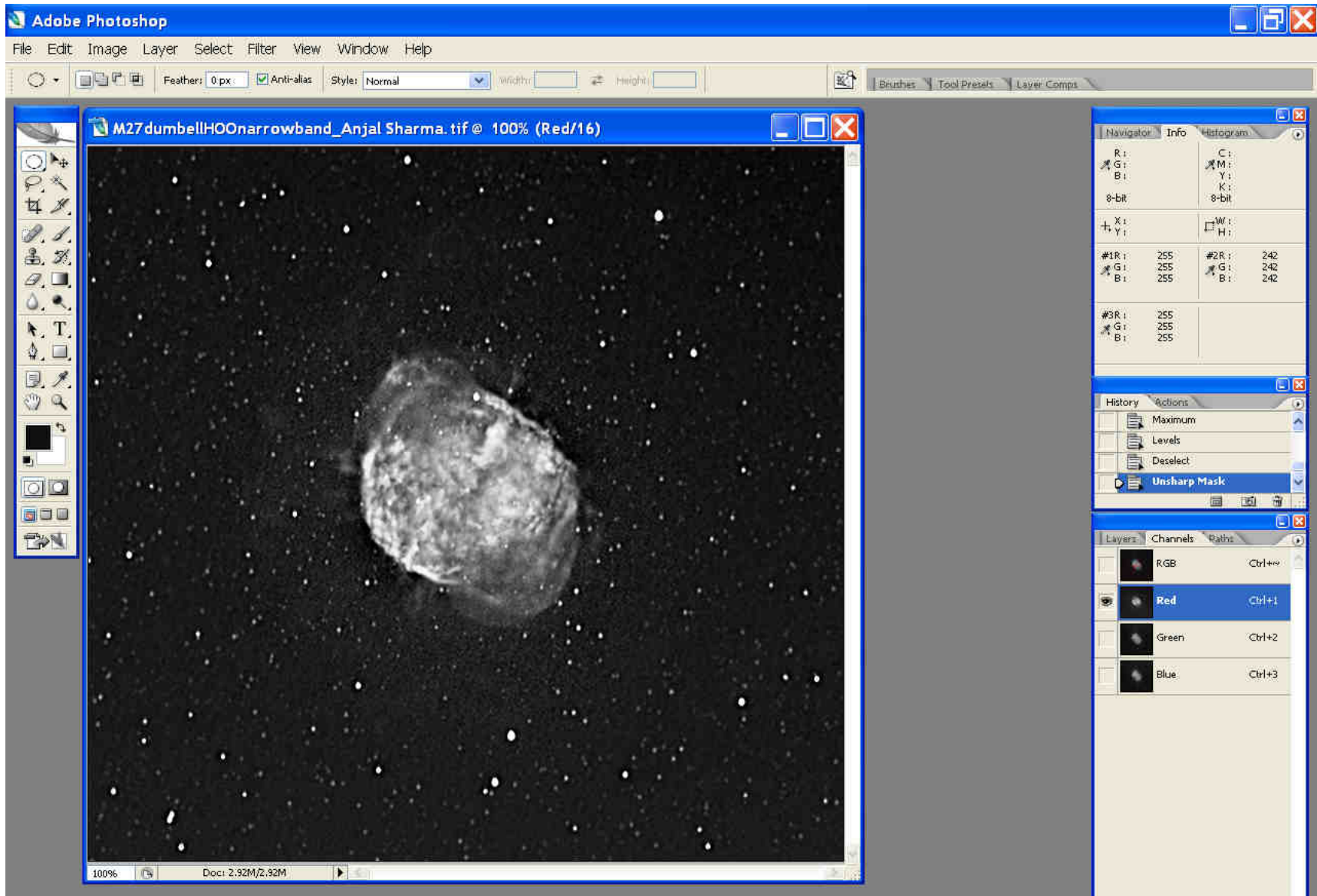
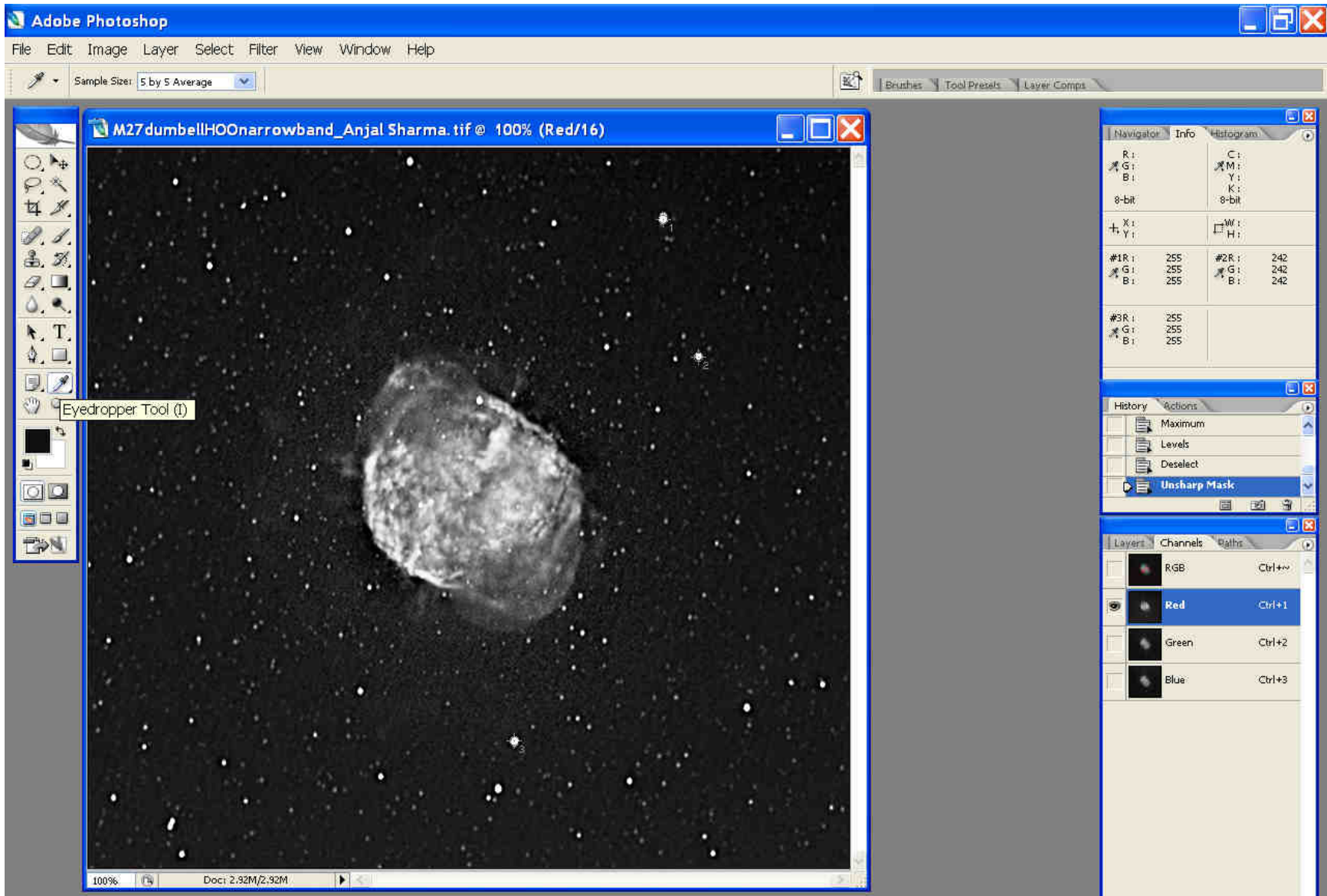


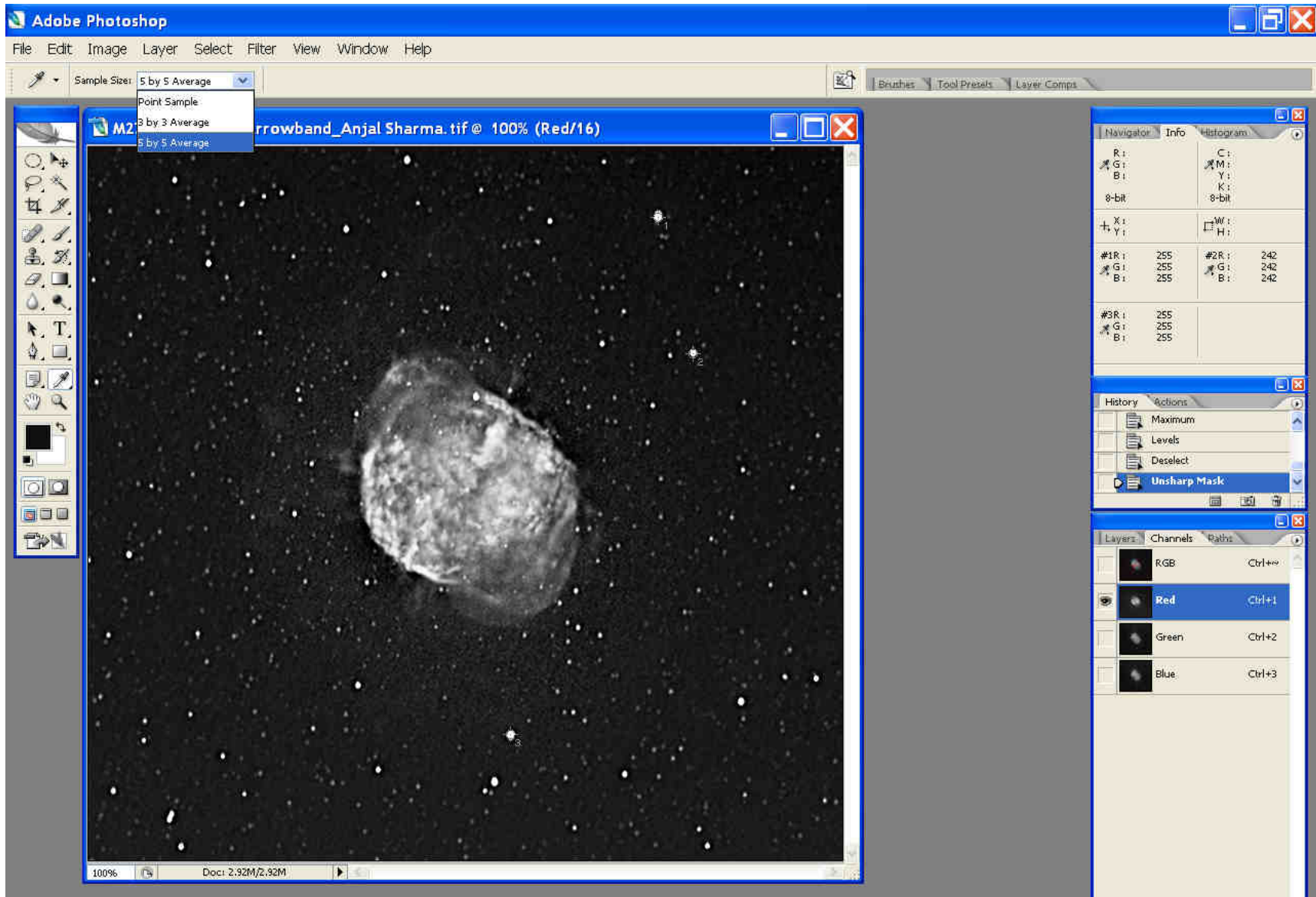
Image of the Dumbbell nebula opened in Photoshop CS2. Note that the bright stars display bloating in the red channel.



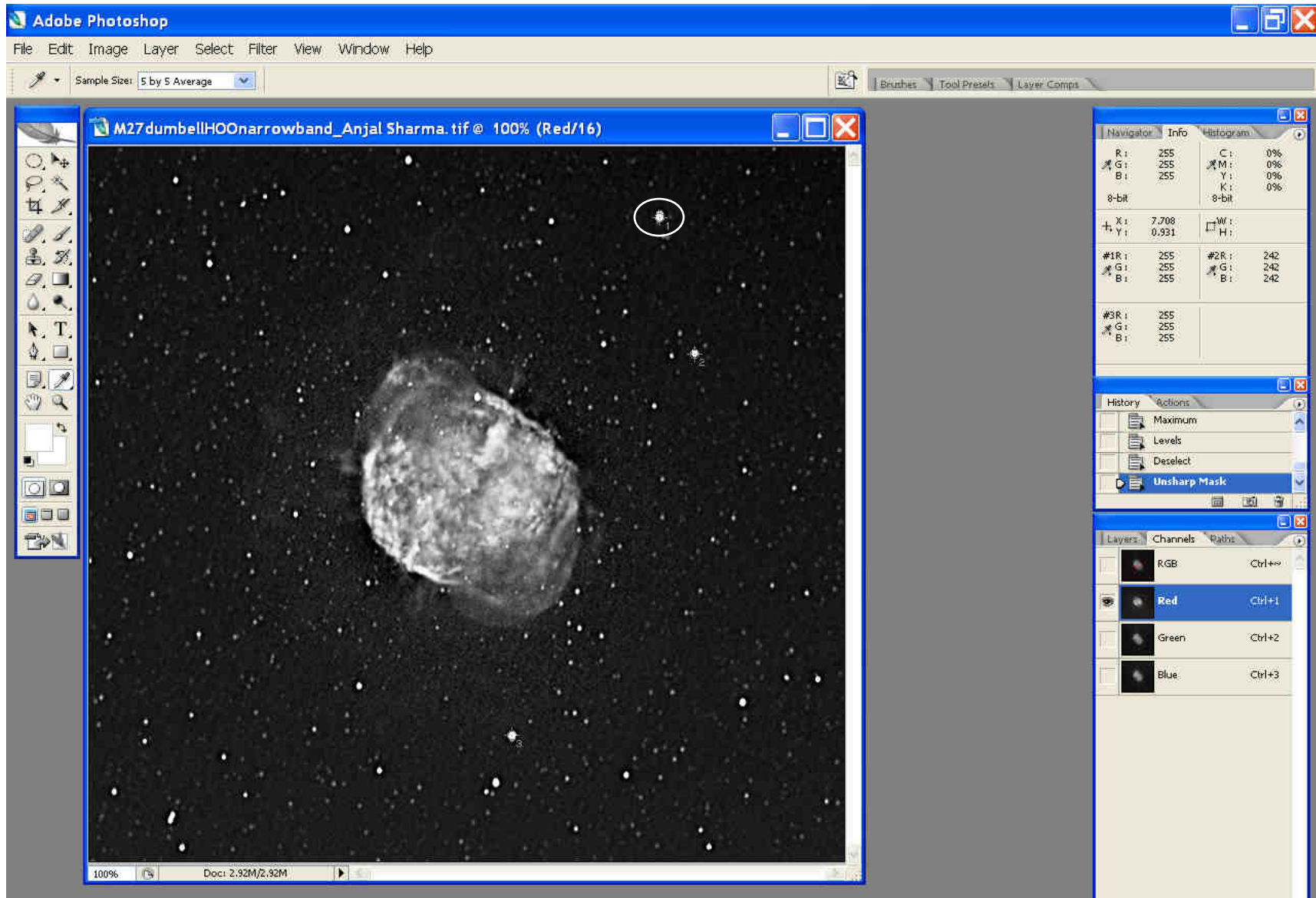
In the Channels window on the lower right of the program window, click on the red channel and make it the only channel visible by clicking on the eye symbol. As can be seen the stars appear a bit large, particularly the bright ones.



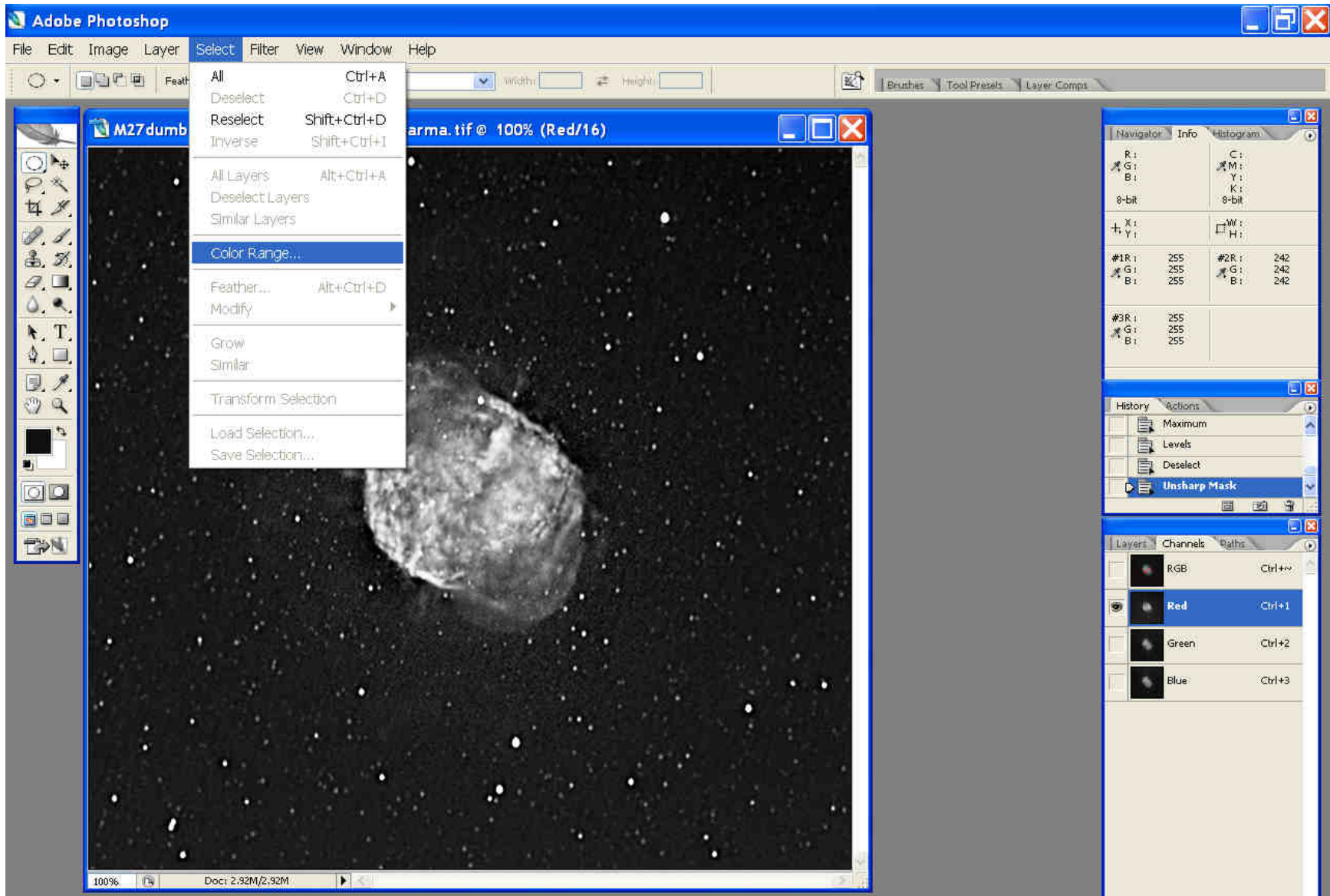
Ensure that the red channel is the active one (click on the “Red” channel line and it is highlighted in blue) and is the only visible one (click on the small square on the left of the channels lines for the blue and green channels to deactivate them and make them invisible). On the left hand side, is the tools palette. Click on and select the Eyedropper Tool).



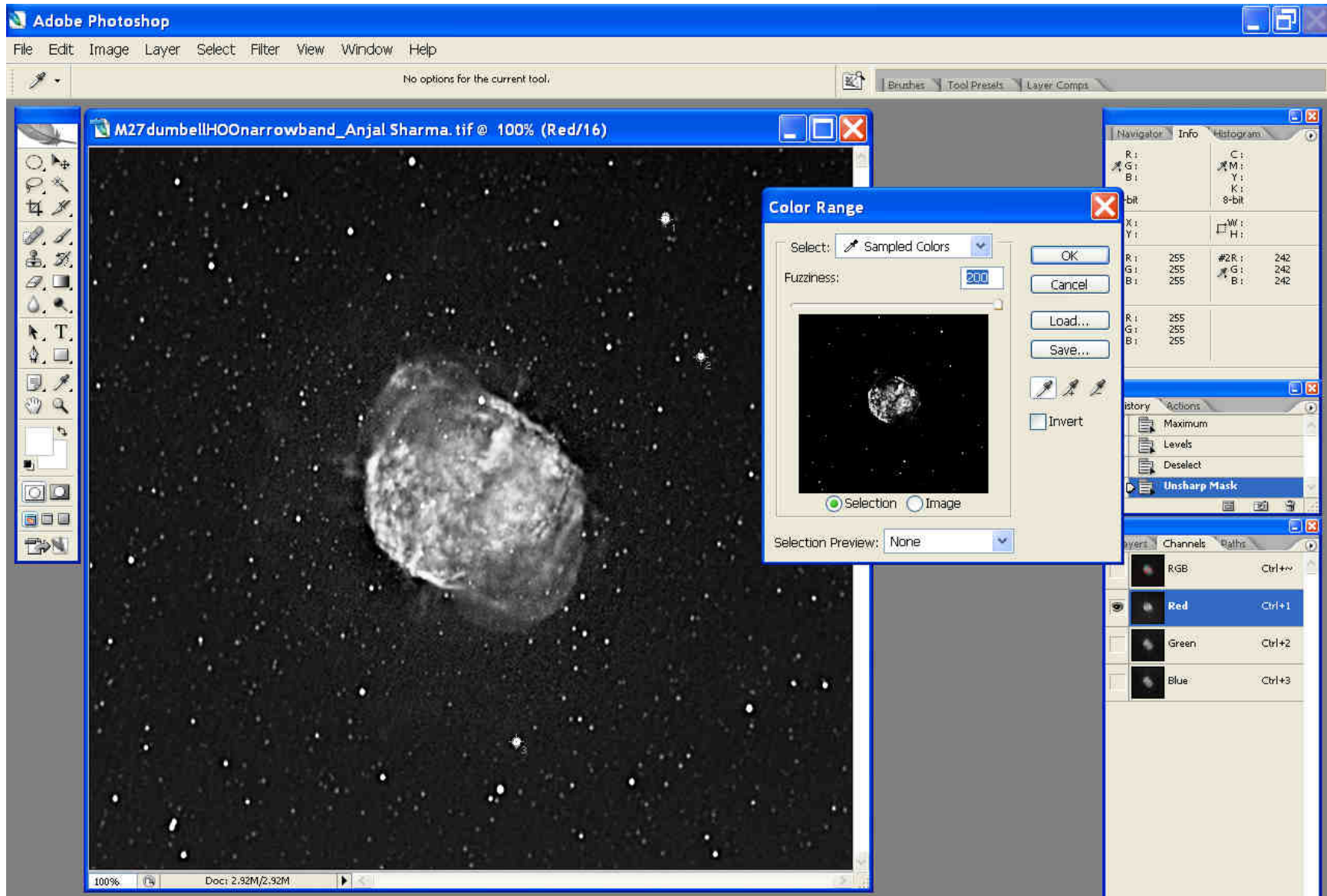
On the line below the menu items on top of the image, click on the window called "Sample Size". Scroll down to select "5 by 5 Average". This ensures that the color sampling done will be representative of the entire bright centroid of a selected star.



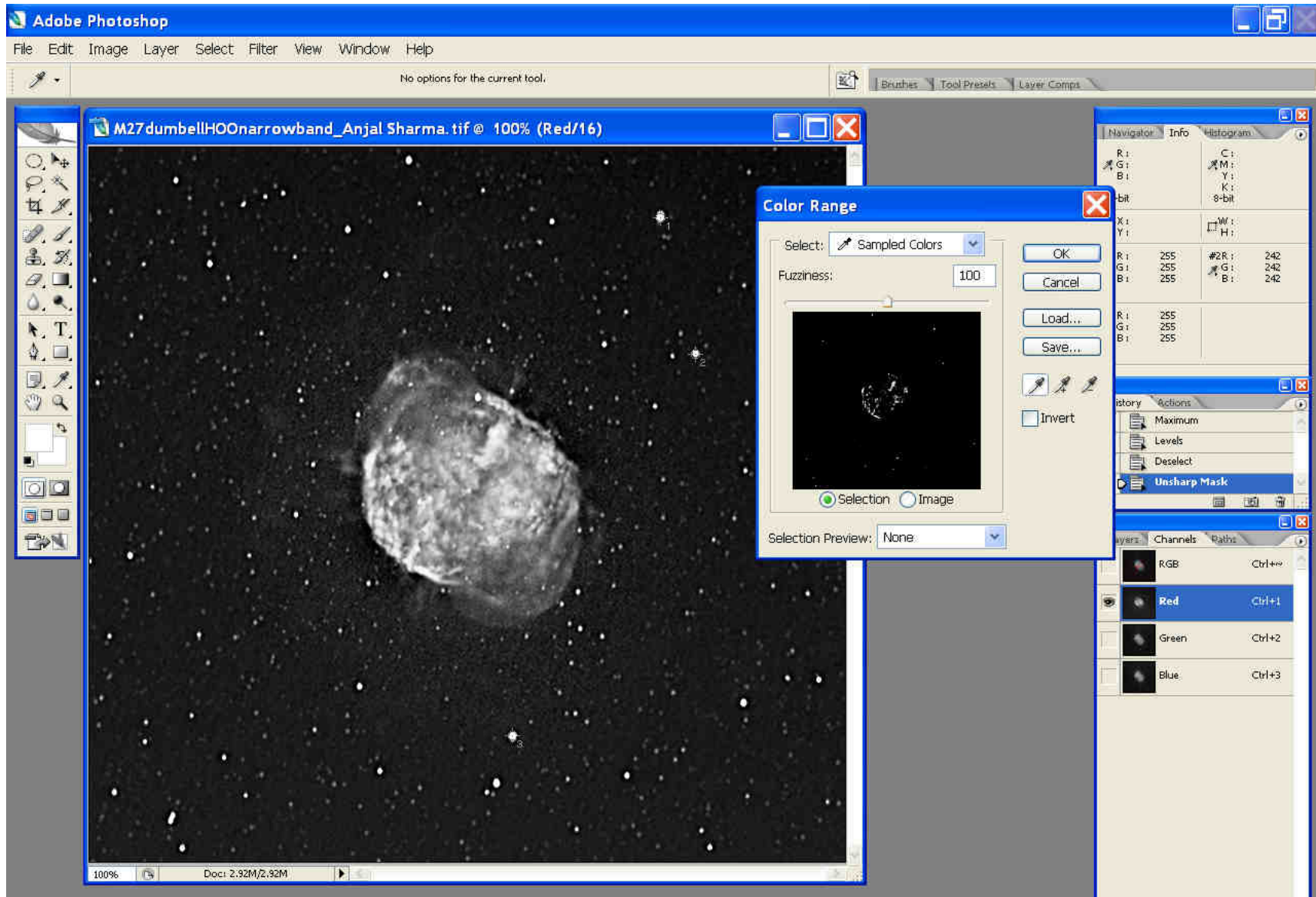
Now click on the center of what appears to be the brightest star in the image (in this case shown circled). You may want to zoom in, using the “View” item on the menu bar, to ensure that the center of this star is clicked on. Zoom back out after this is done.



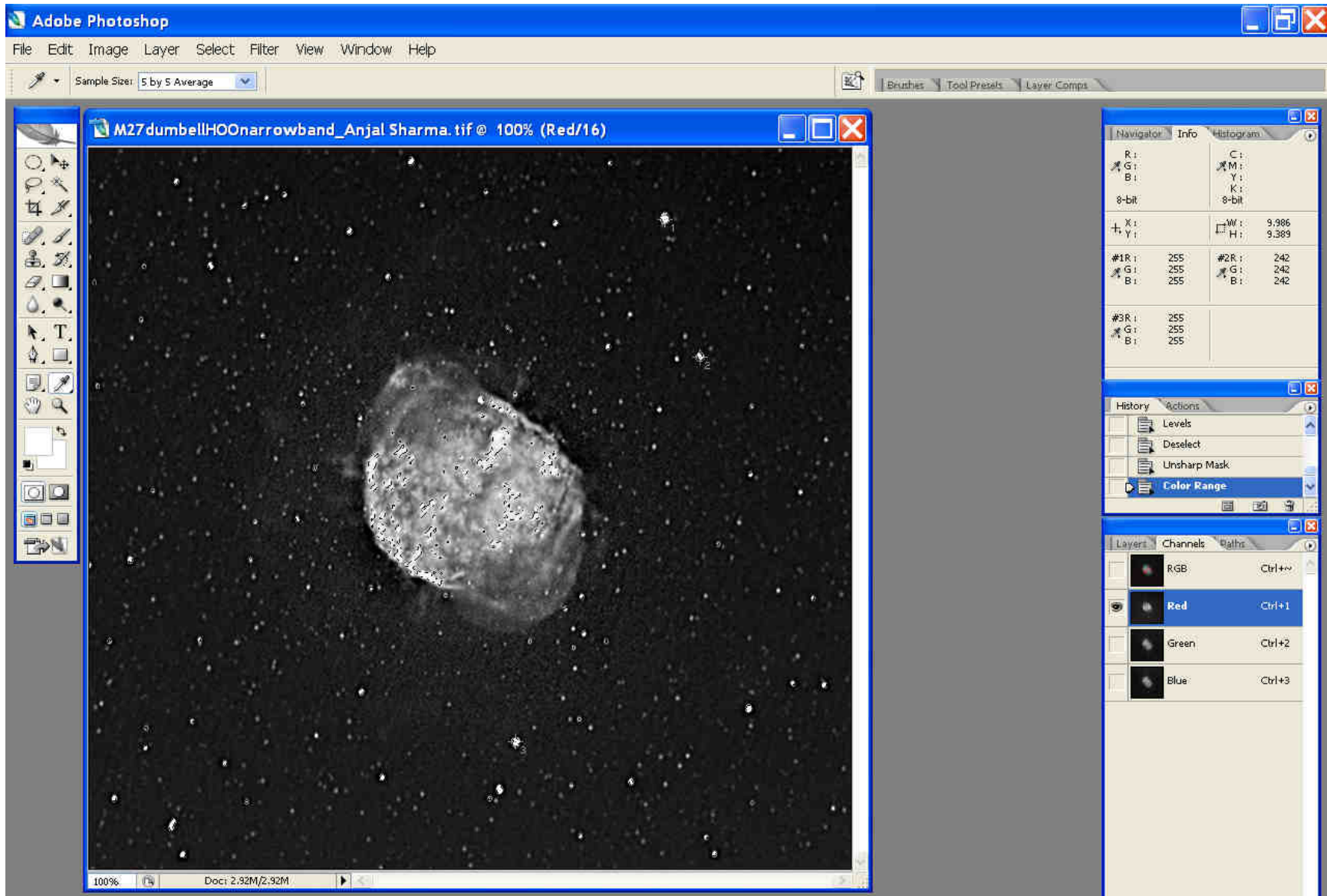
Now click on “Select” on the menu bar and scroll down to “Color Range”.



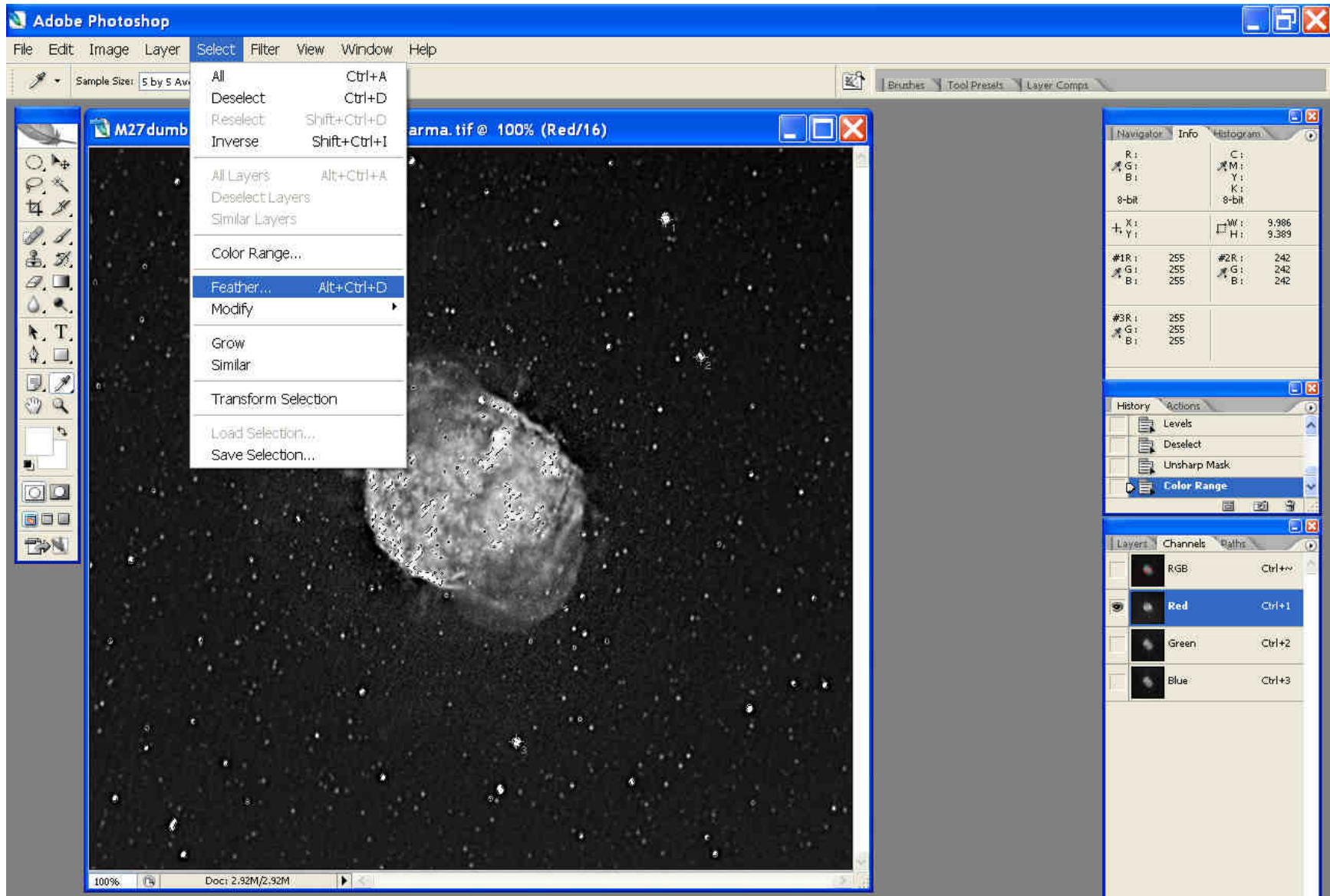
When “Color Range” is clicked on, a color range selection window pops up as shown. Note that you must ensure that in the “Select” box in this new window “Sampled Colors” is displayed. If something else is shown here (e.g. “Highlights”), click on this selection and scroll to and choose “Sampled Colors”.



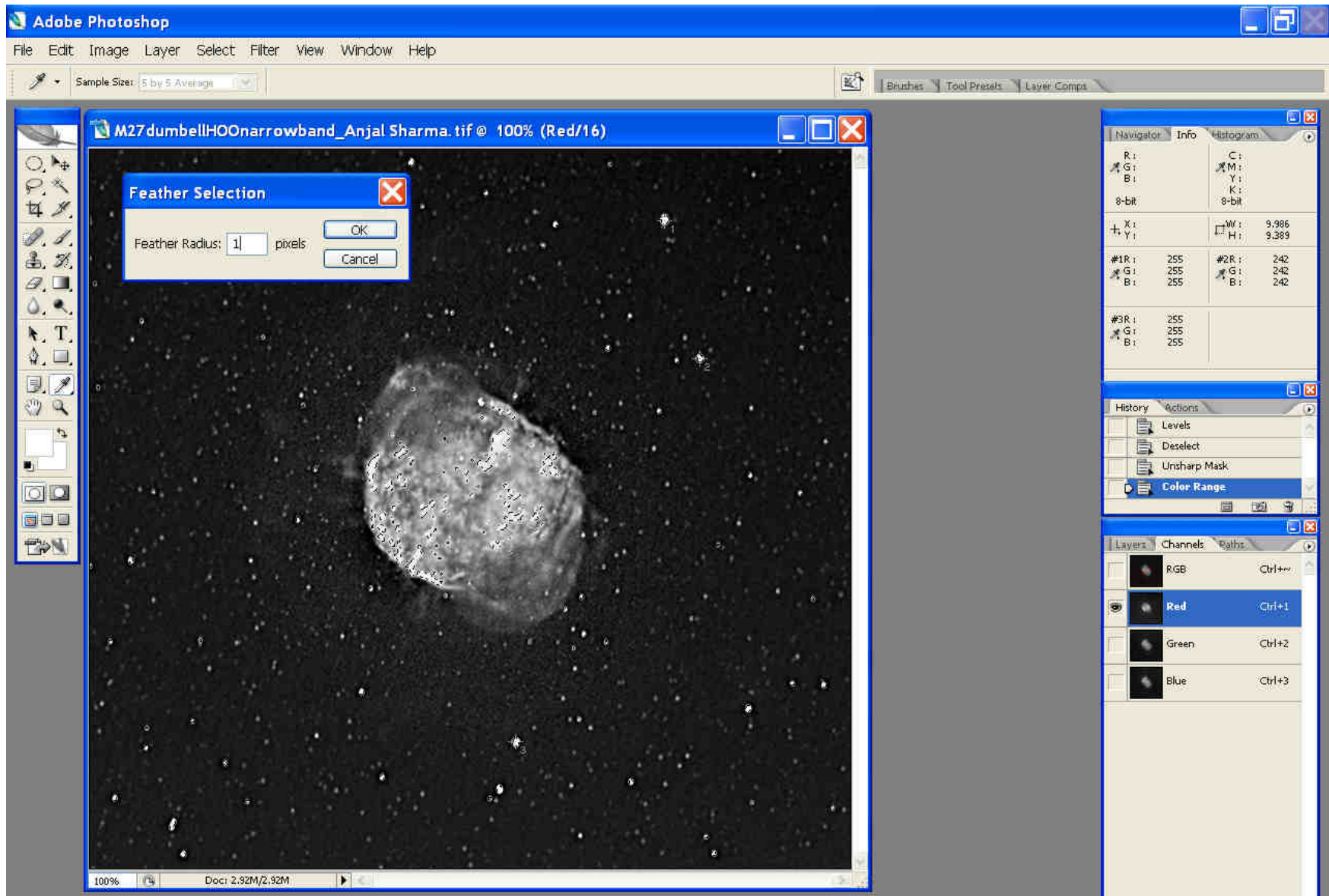
Now, use the slider below the “Fuzziness” to define the cut off for the sampled colors range. For this image I chose the Fuzziness value to be 100, but every situation is different. Basically, you want a value which shows all the bright stars that you want to fix in the window below, without choosing too much of the actual nebular area. Click “OK”.



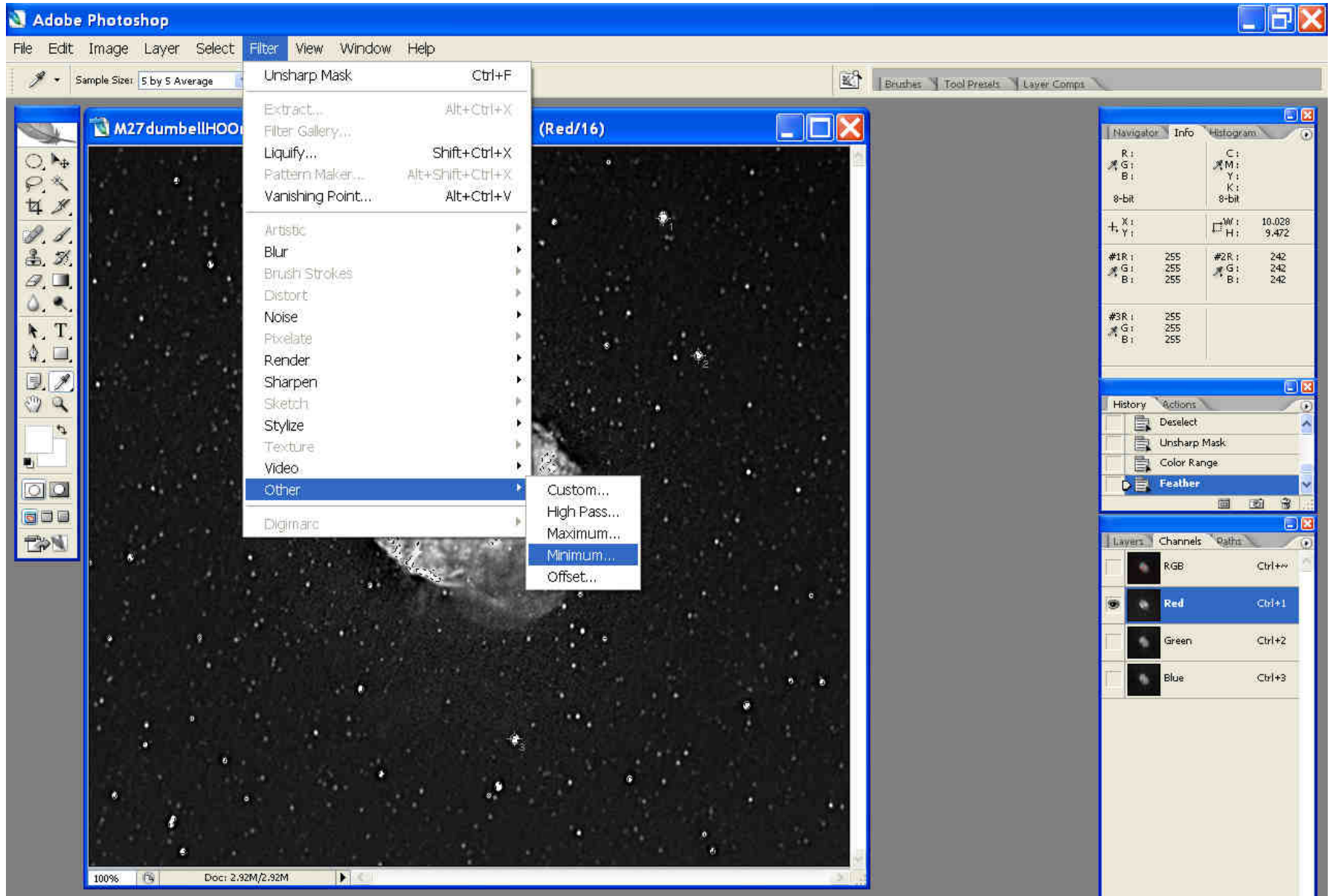
This operation just chose the brightest regions as shown by the dotted lines. A few bright nebular areas have also been chosen, but please don't worry about this. If you wish, you could go back and decrease the Fuzziness slider to have a lower value, but it is possible that some of the bloated stars which aren't quite as bright as your chosen one would be missed.



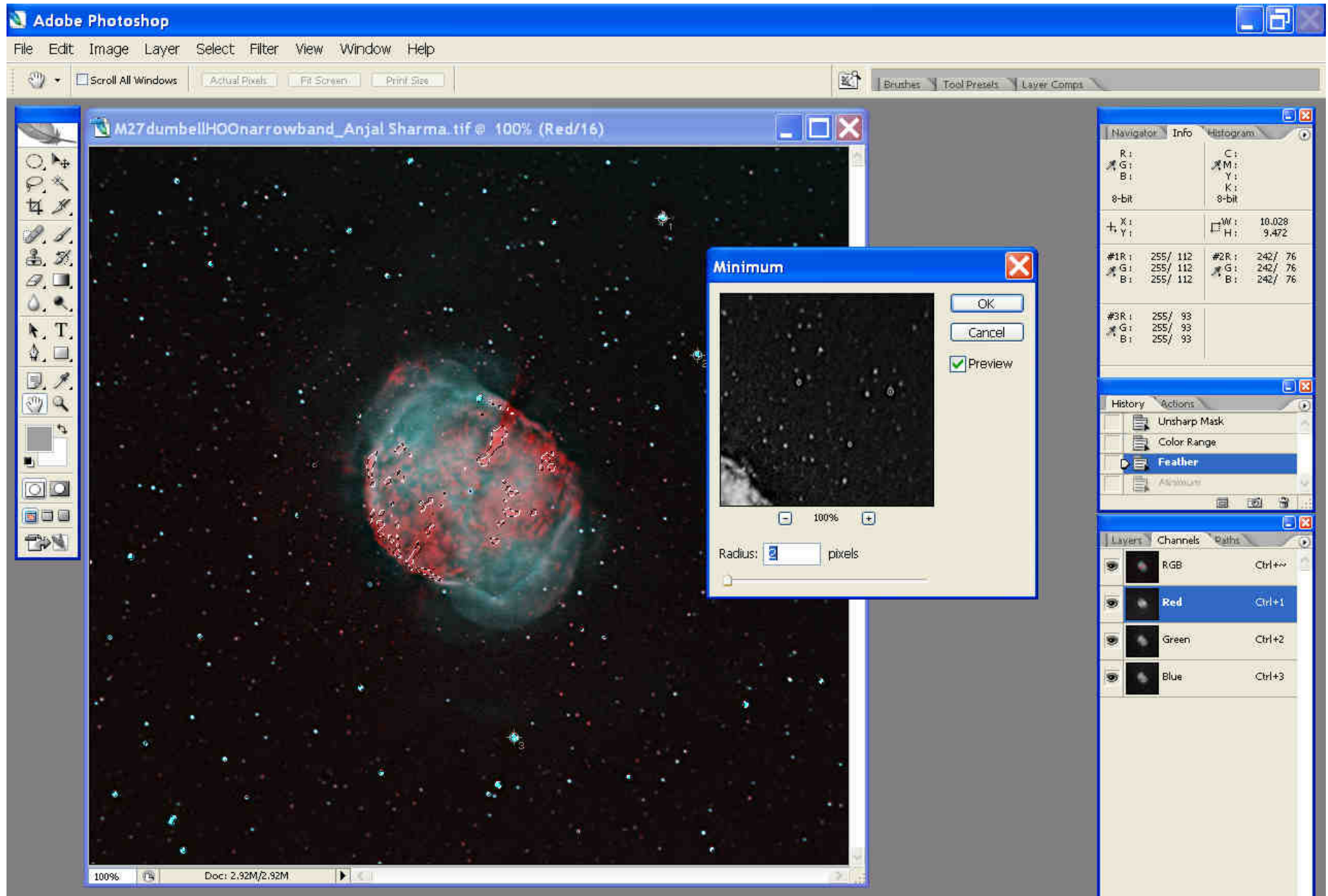
We will feather the selection by a small amount to ensure a smooth transition. For this click on “Select” in the menu bar and scroll down to “Feather”. Click on it.



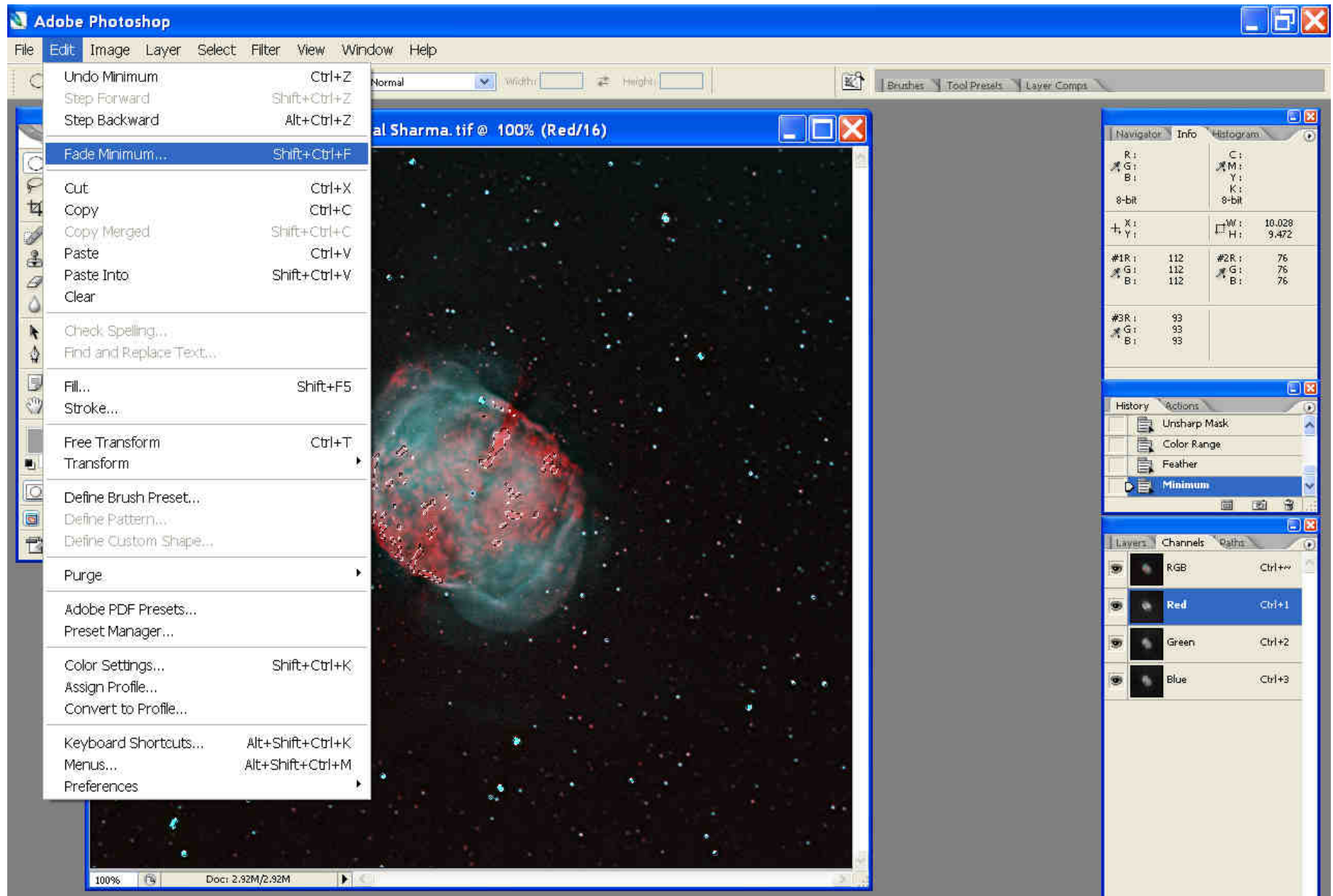
In the Feather Selection window that pops up, type in a small number, say 1 or 2 pixels worth.



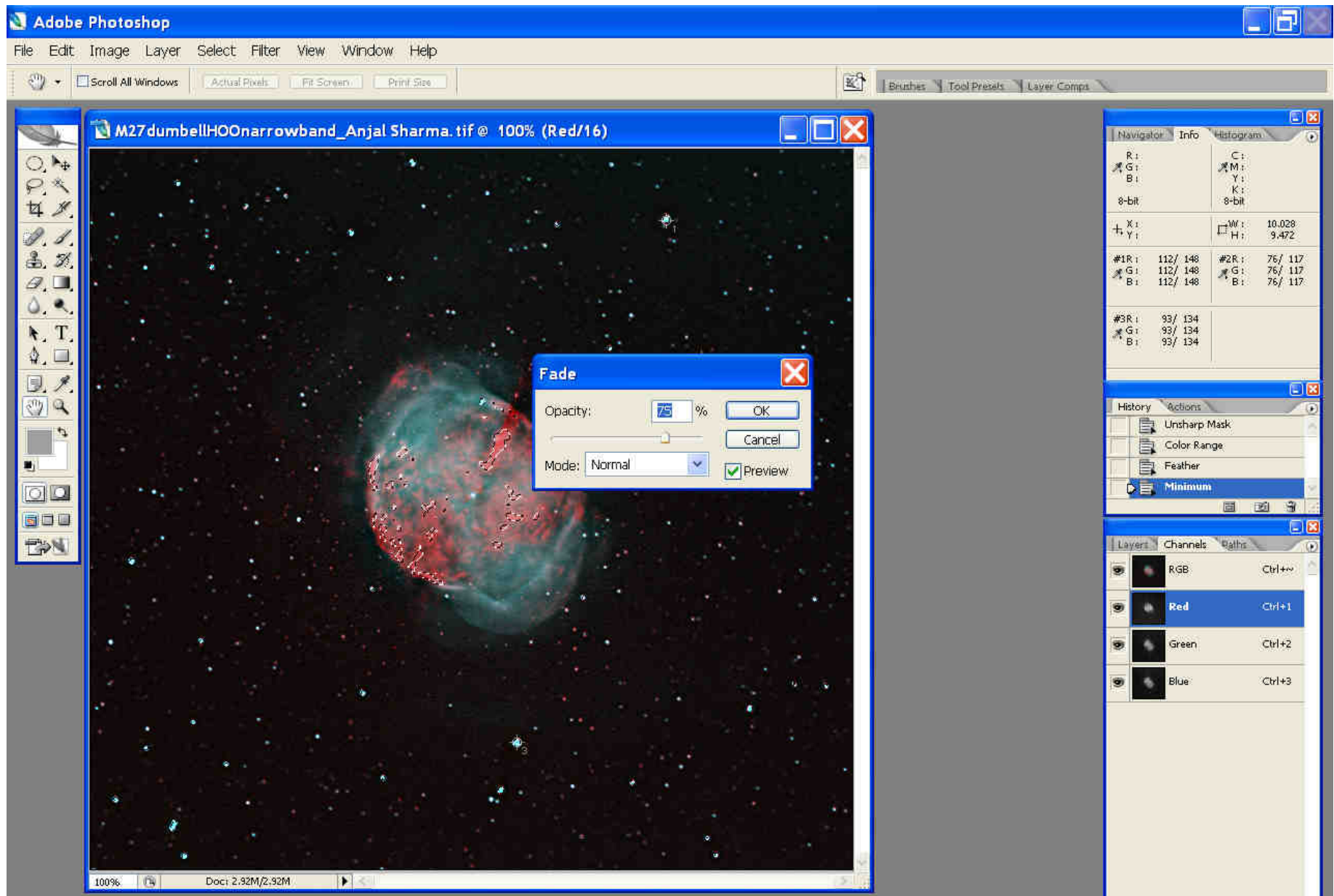
Now we can minimize the star bloat by clicking on “Filter” in the top menu bar and scrolling down to “Other” and clicking on “Minimum”.



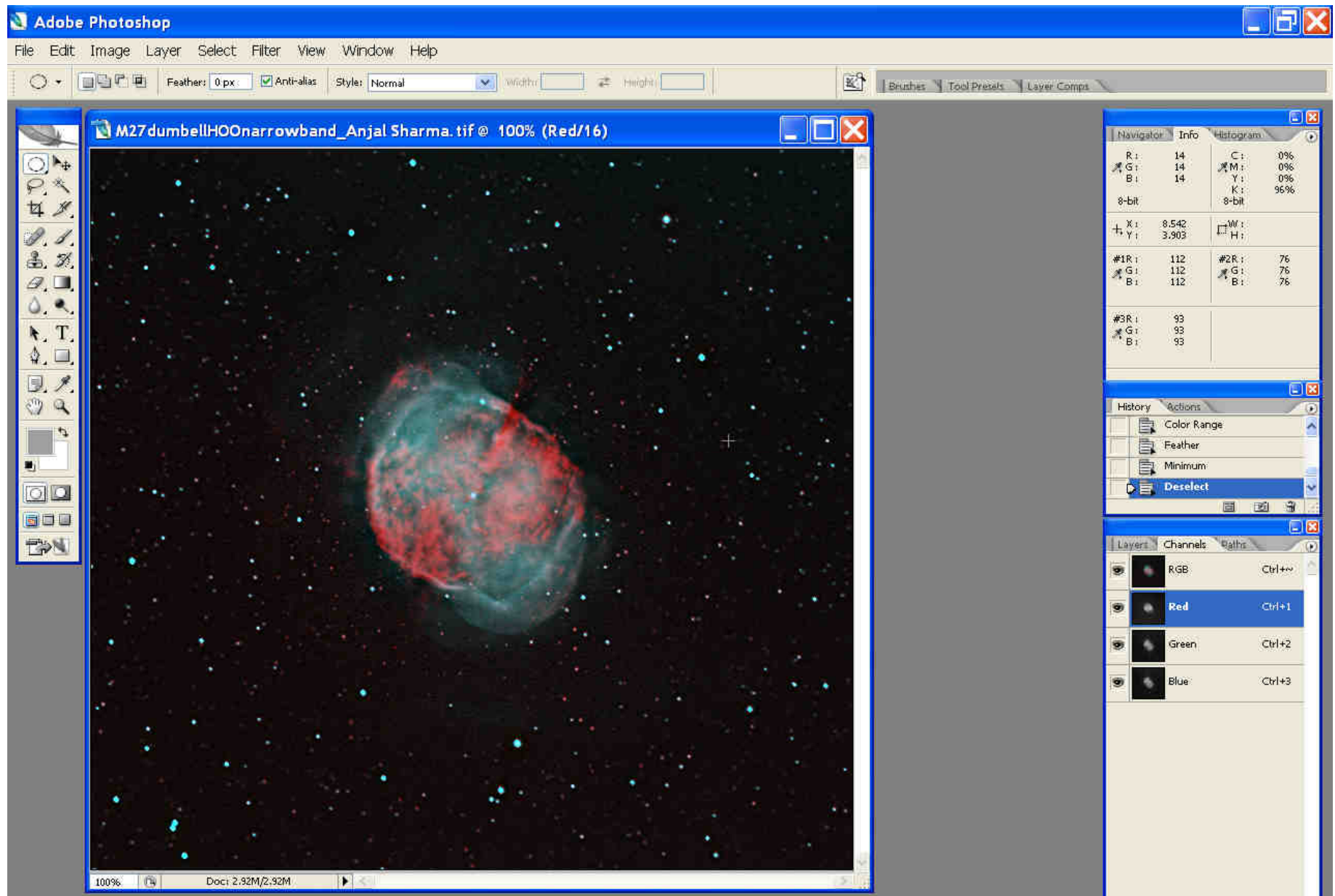
A new window called “Minimum” pops-up. Choose a small radius like 1 or 2 pixels. You want a value that decreases the star diameter, but doesn’t leave a small bright dot and a thick ring around it. Experiment here...Less is usually more. Click “OK” when satisfied.



Now for the final touch. Even with the utmost care in the earlier steps it is possible that the transition from bloated to smaller star diameter has created an artefact like a donut ring or very dark transitional boundary. If this happens, choose “Fade Minimum” from the “Edit” menu item.



Use the slider to select the amount of fade to be applied to the earlier used minimum filter. Usually anywhere from 50% to 80% is sufficient. Click "OK".



You may stop at this stage or repeat for the same channel or other channels in the image. It helps to zoom in a bit to see the result of each step. When you are satisfied, save the image. Note that the red halo so prominent in the starting image is now almost gone.



BEFORE



AFTER

Here's a direct comparison of how the red halo has been fixed using this technique. Although I stopped at this stage, it is easy to fix the other channels and get nice sharp stars in the same way.