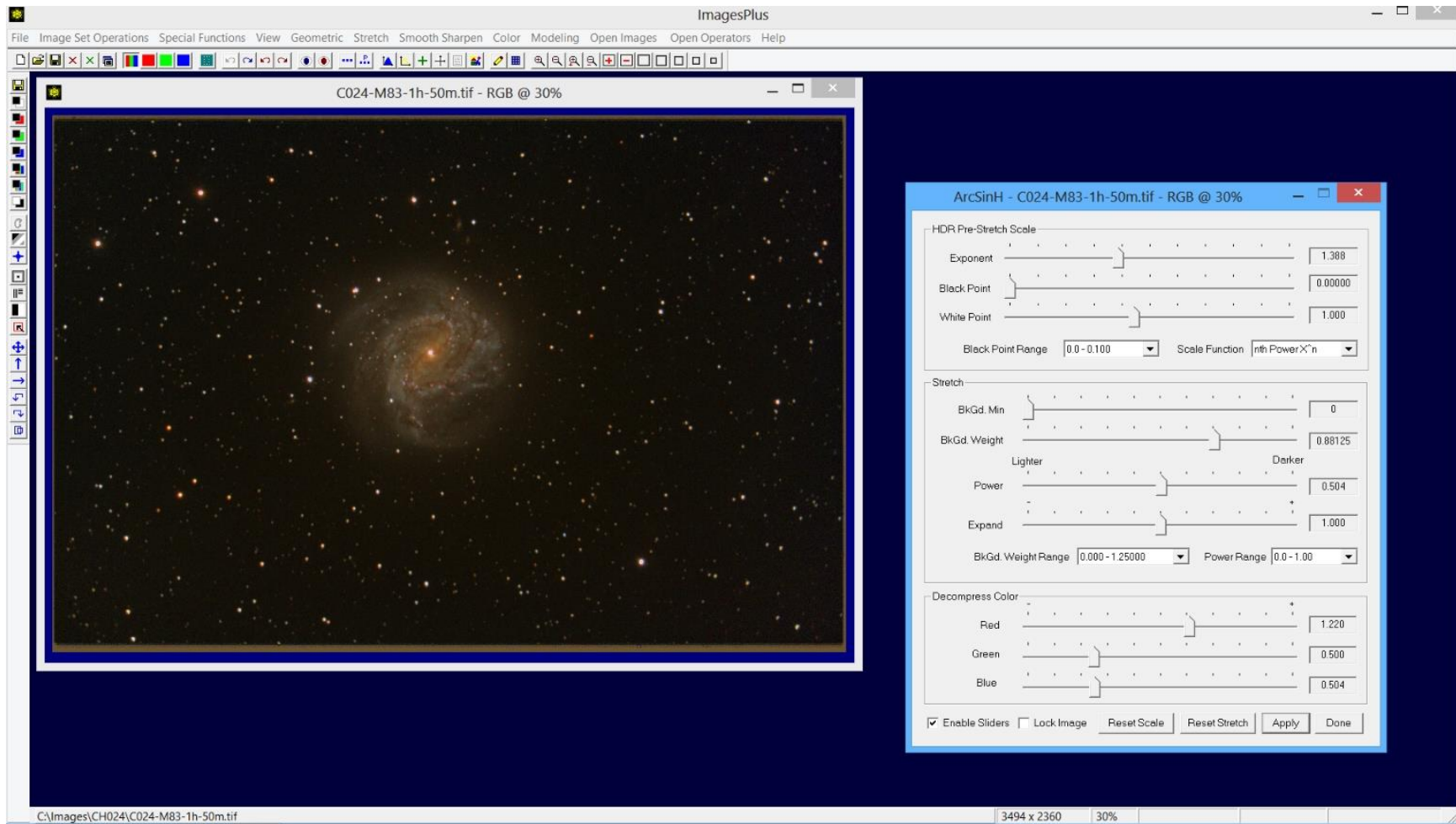


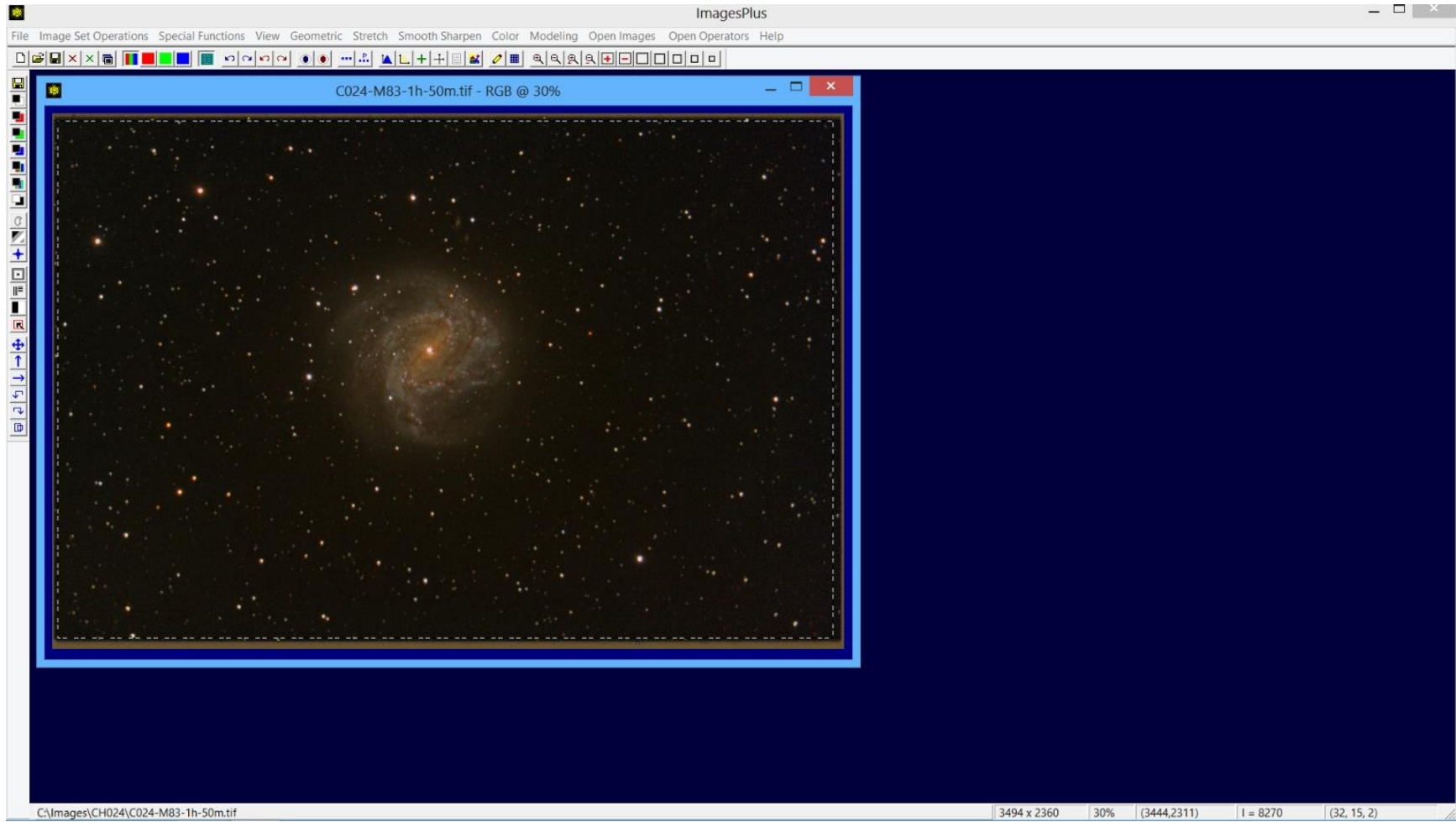
[Digital Astro Image Processing Yahoo Group](#) challenge C024 M83. Data provided by Chuck Kimball using a modified Canon 350D with Meade LX 200 12" SCT. The challenge image is a stack of 11 x 10 minute ISO 800 raw images with dithering.

### ImagesPlus Processing Workflow Step 1)



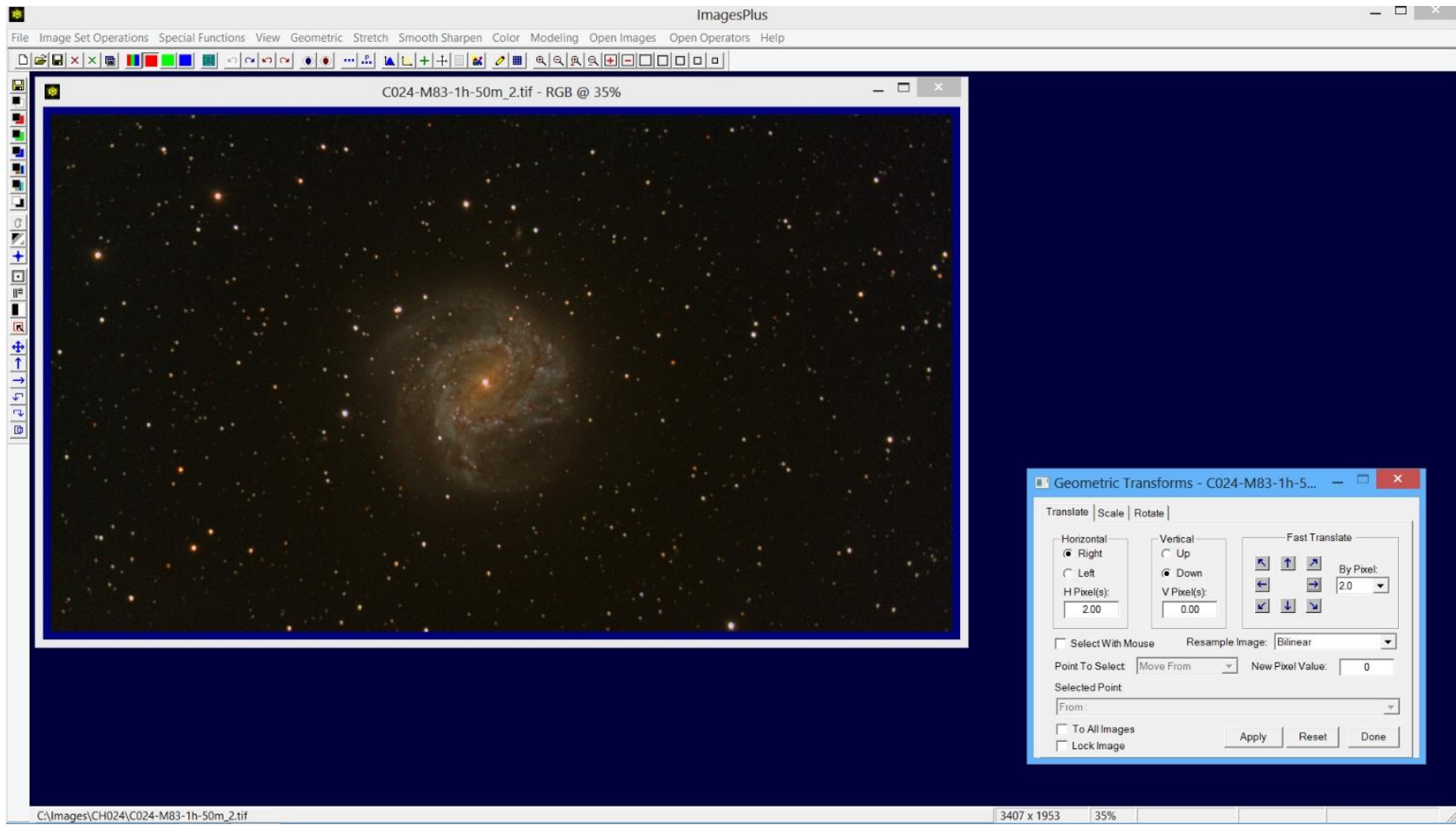
Stretch | ArcSinH is used for the initial stretch. Red color decompression is moved pretty far to the right to increase red.

Step 2)



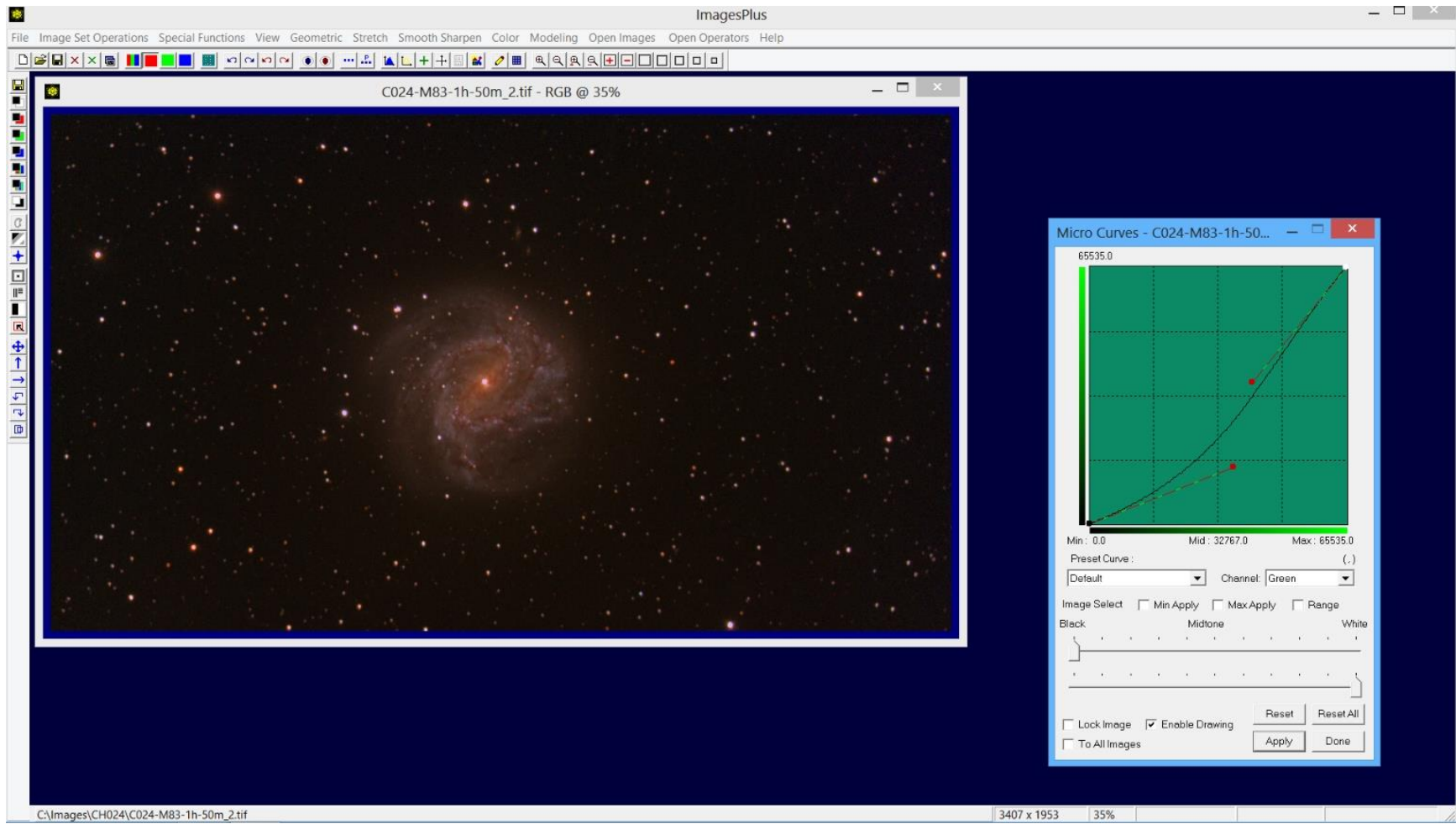
The Copy Portion toolbar button is pressed then a left-click and drag a rectangle around the area to be cropped out and placed in a new image.

Step 3)



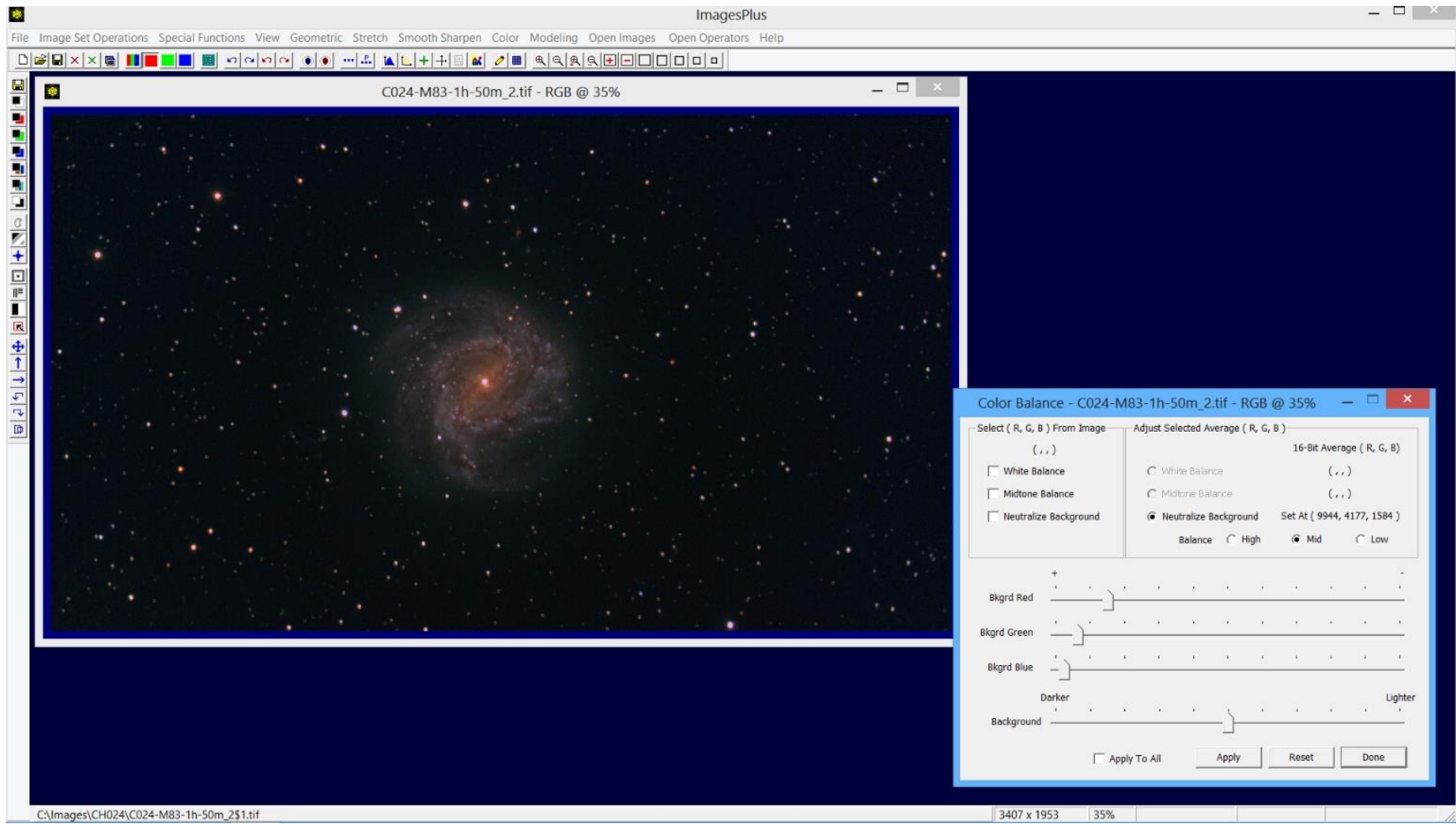
The red data needs to be aligned with the green and blue data. Geometric | Geometric Transforms | Translate is used to shift the red channel to the right by 2 pixels. Make sure the Apply Operator to the Red Channel Only button on the top horizontal toolbar is pressed so that Translate only shifts the red channel. After Translate is applied press the Apply Operator to the Red, Green, and Blue Channels toolbar button so that operations that follow are applied to all colors of the image.

Step 4)



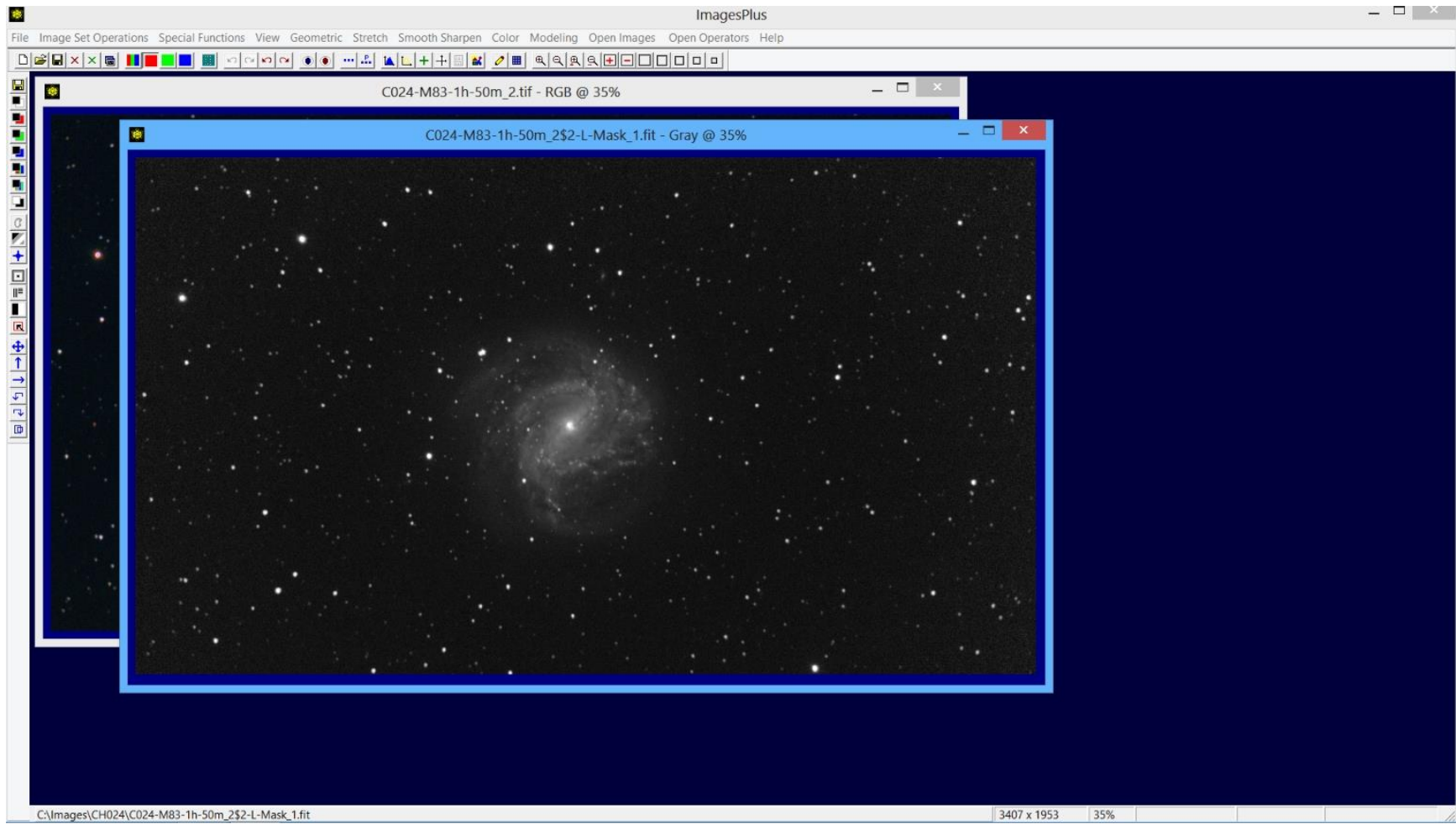
Stretch | Micro Curve is used to reduce green.

Step 5)



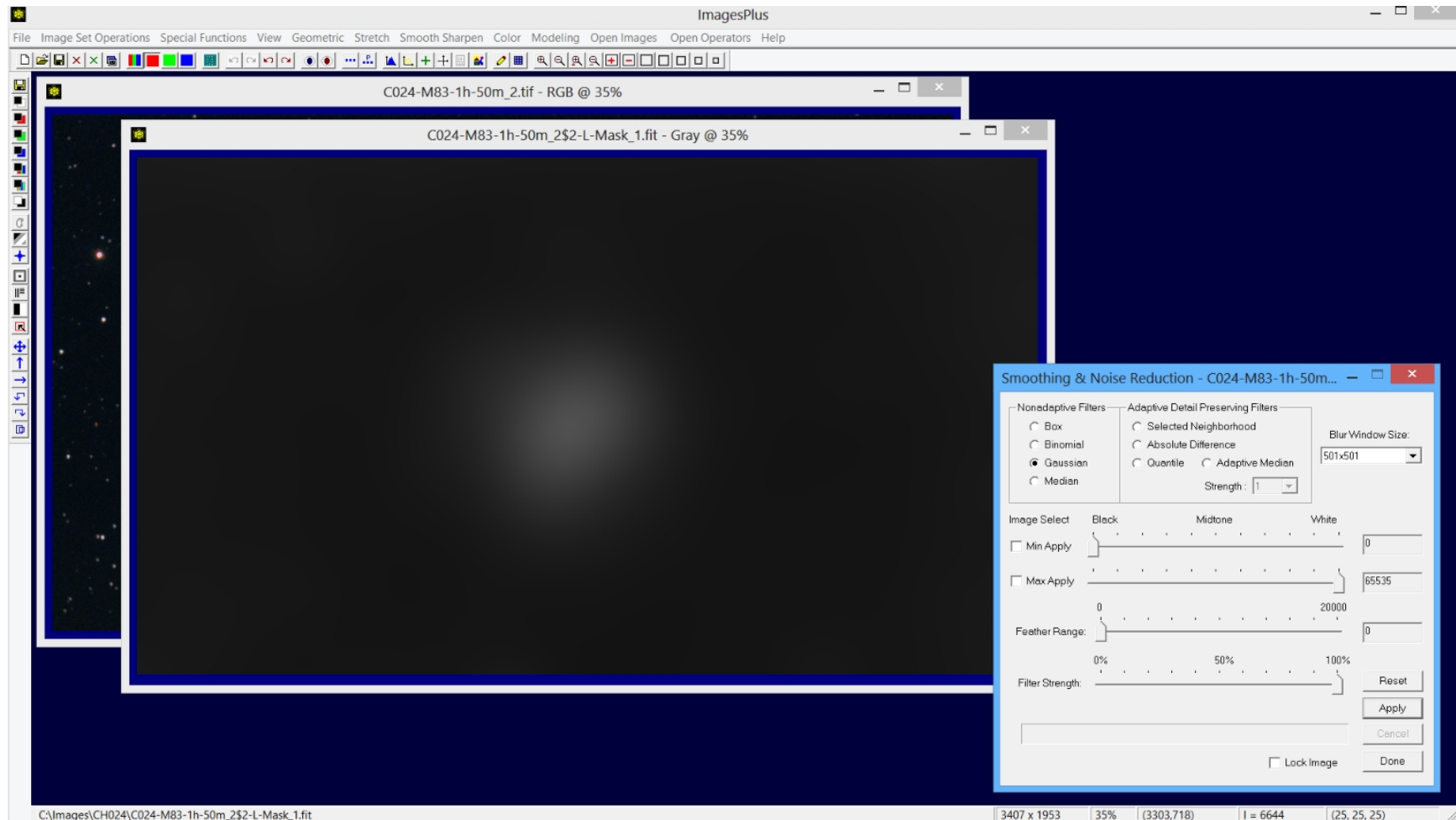
Color | Color Balance is used to neutralize the dark background of the image. Check the Neutralize Background box then left click on the dark background away from any stars, galaxy, or nebula.

Step 6)



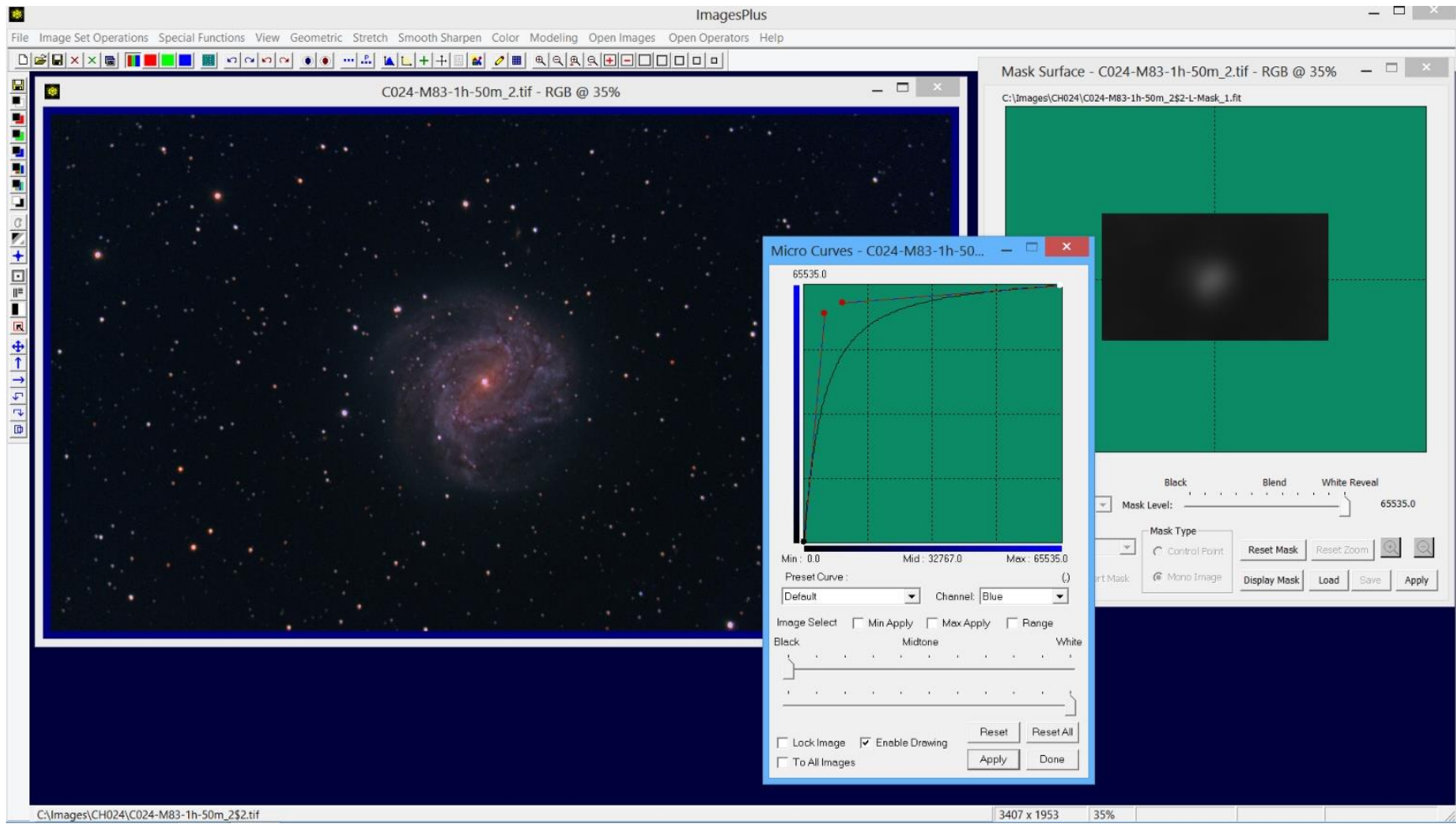
A simple mask of the galaxy is made next. First press the Luminance Mask button at the top of the left vertical tool bar to create a single channel luminance mask.

Step 7)



Smooth the luminance mask to remove stars and leave a bright spot of the galaxy using the Smooth Sharpen | Smoothing & Noise Reduction with a 501x501 Gaussian filter. With IP 5.75a x64 on Win 7 or Win 8 x64 and good video card this operation takes about 1 second since the Gaussian filter is GPU accelerated. Save the smoothed luminance mask using the Save As Then Copy Mask button at the top of the left vertical toolbar.

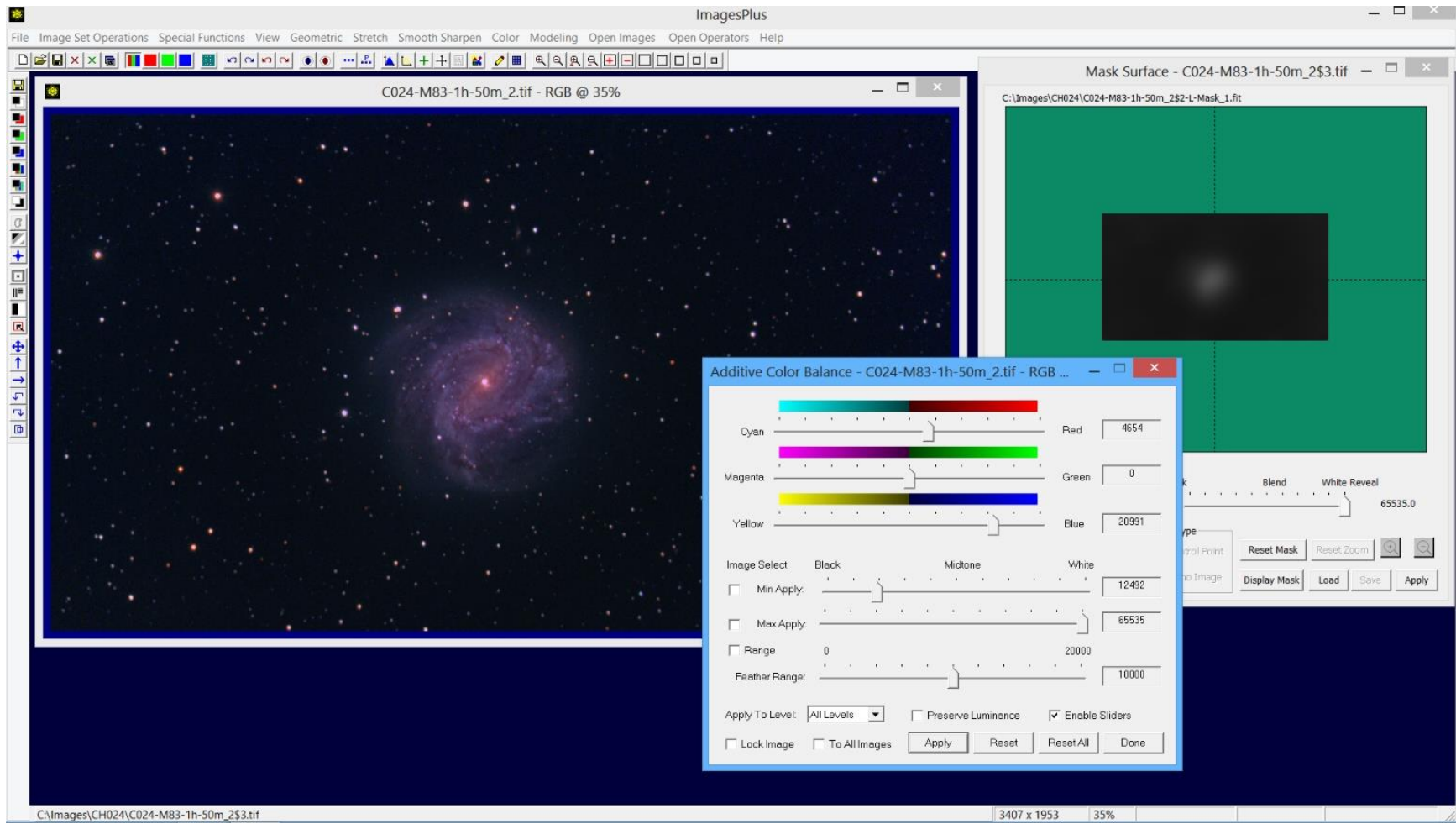
Step 8)



Increase blue using Micro Curves with the smoothed luminance mask.

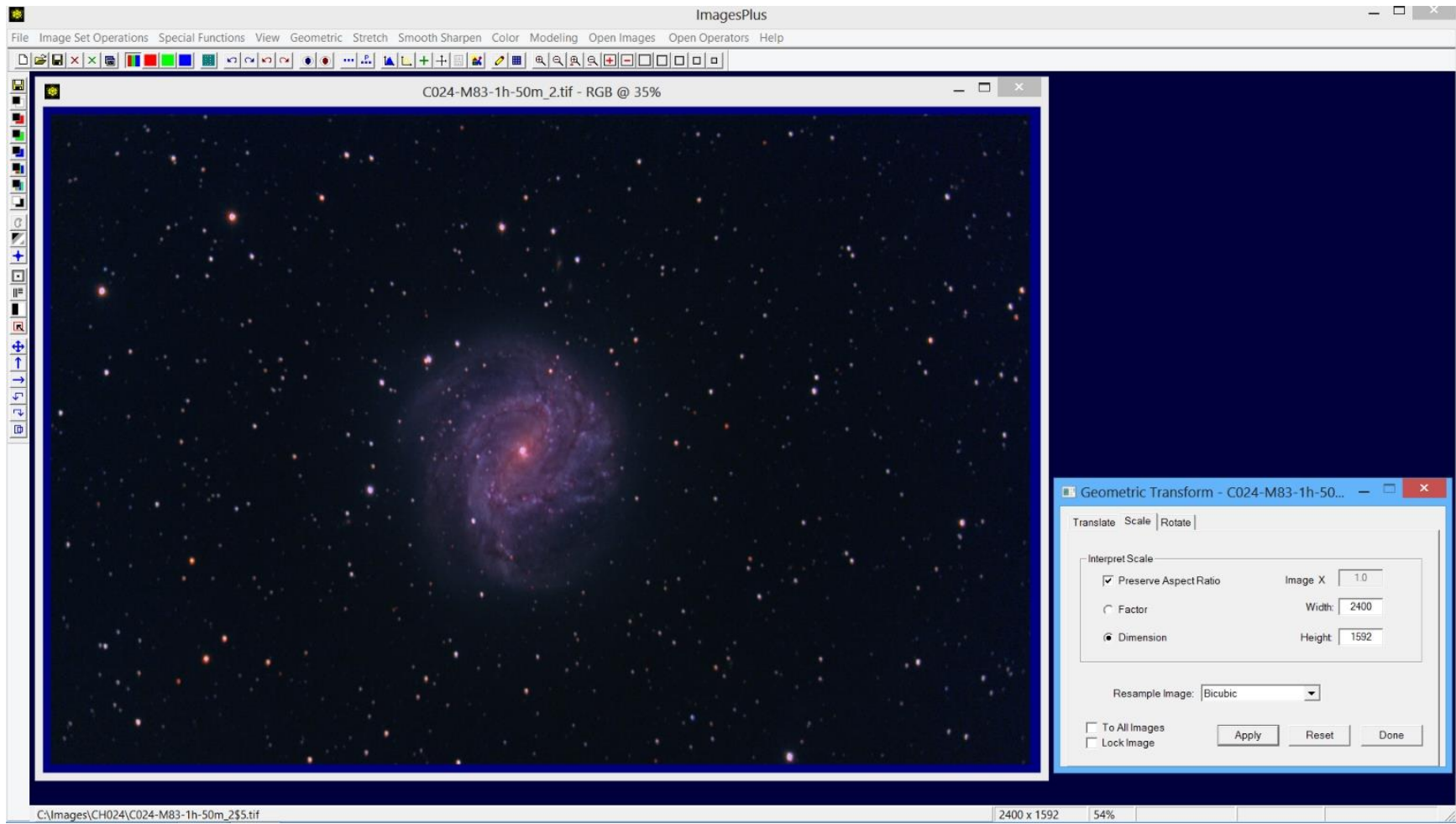


Step 9)



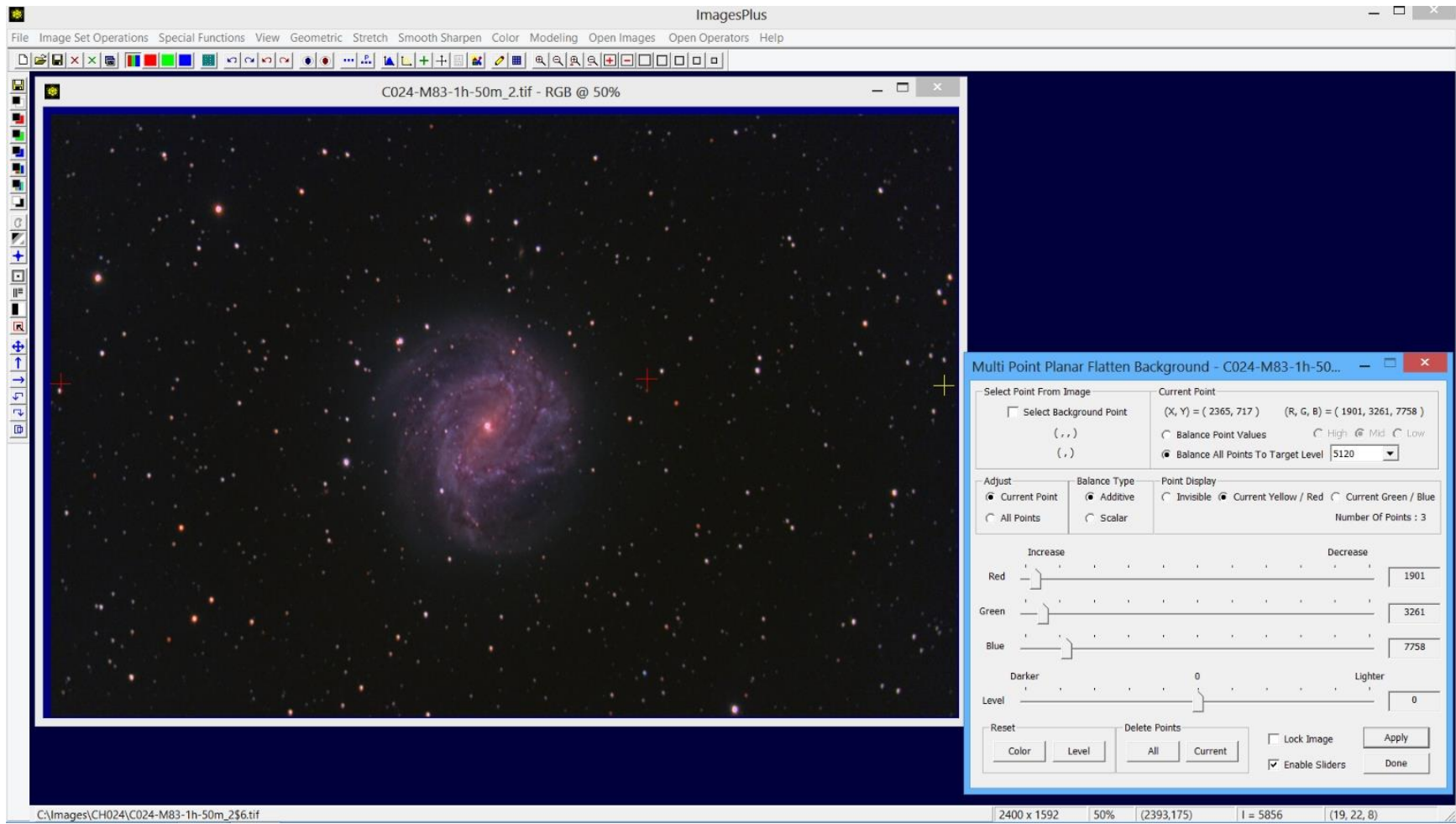
Increase red and blue using the Color | Additive Color Balance tool with the smoothed luminance mask.

Step 10)



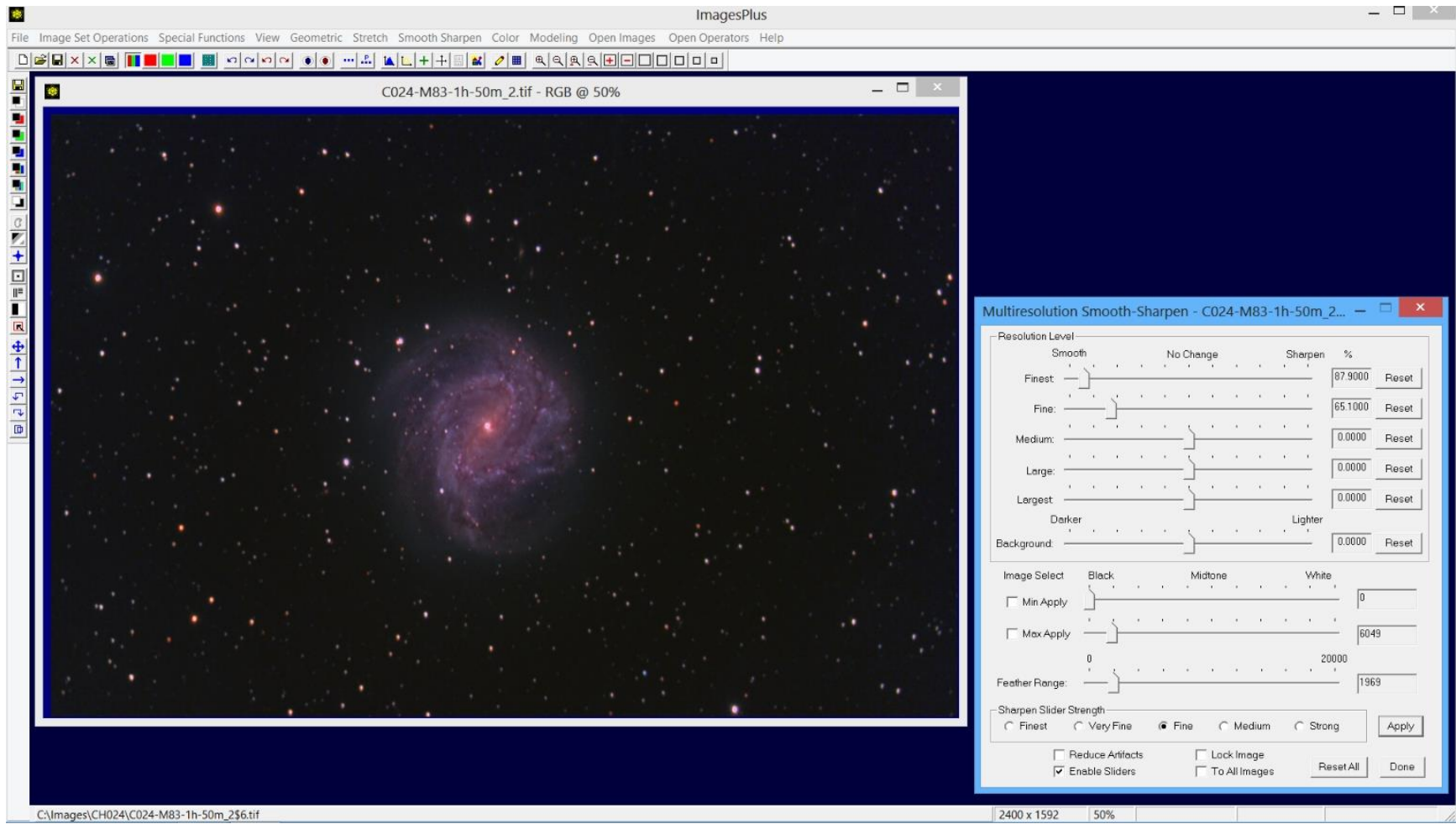
Scale the image down to 2400 x 1592 for display on the web. Bi-cubic interpolation is used to resample the image.

Step 11)



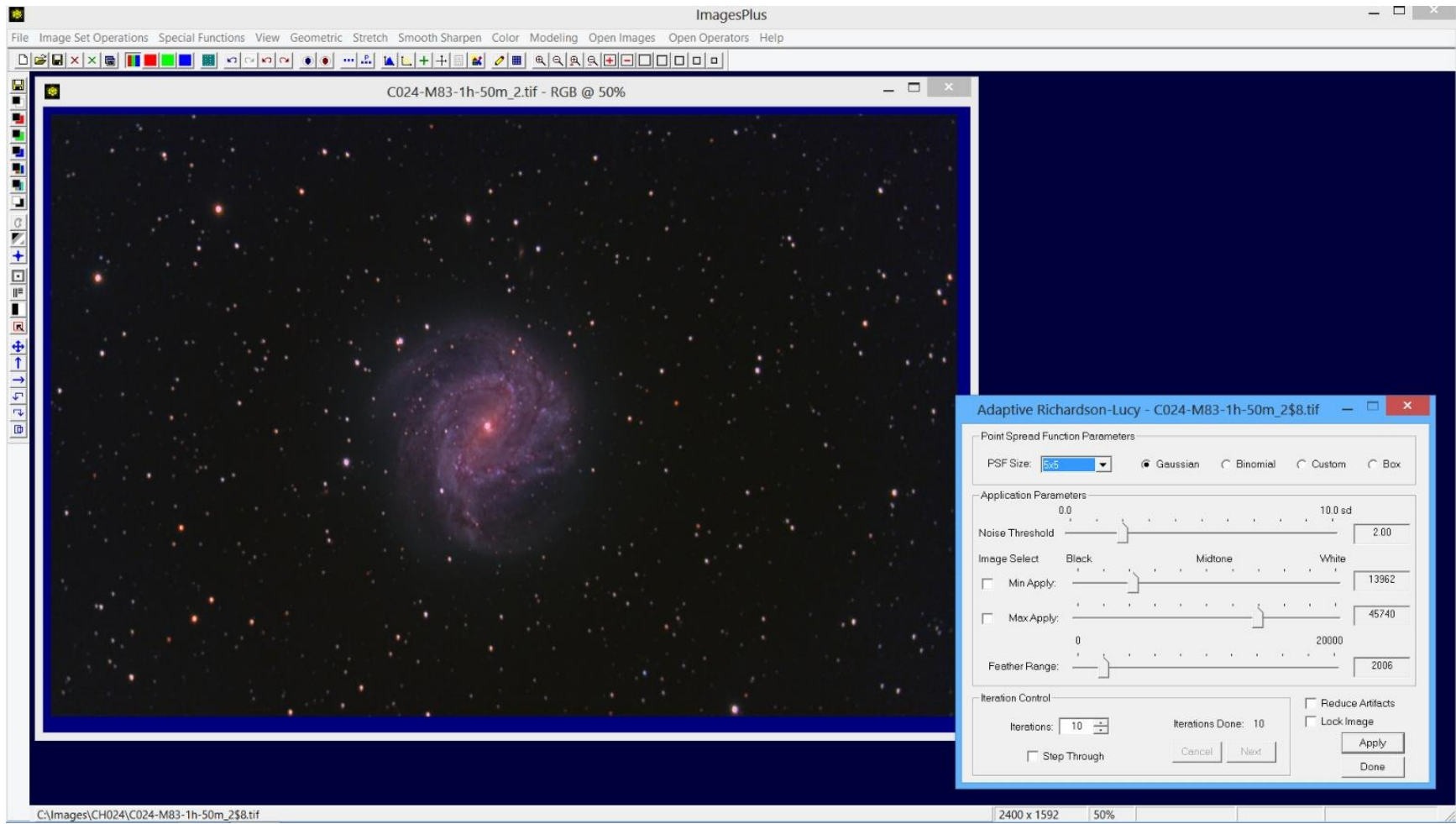
Special Functions | Multi Point Flatten is used to flatten and color balance the background to very dark gray.

Step 12)



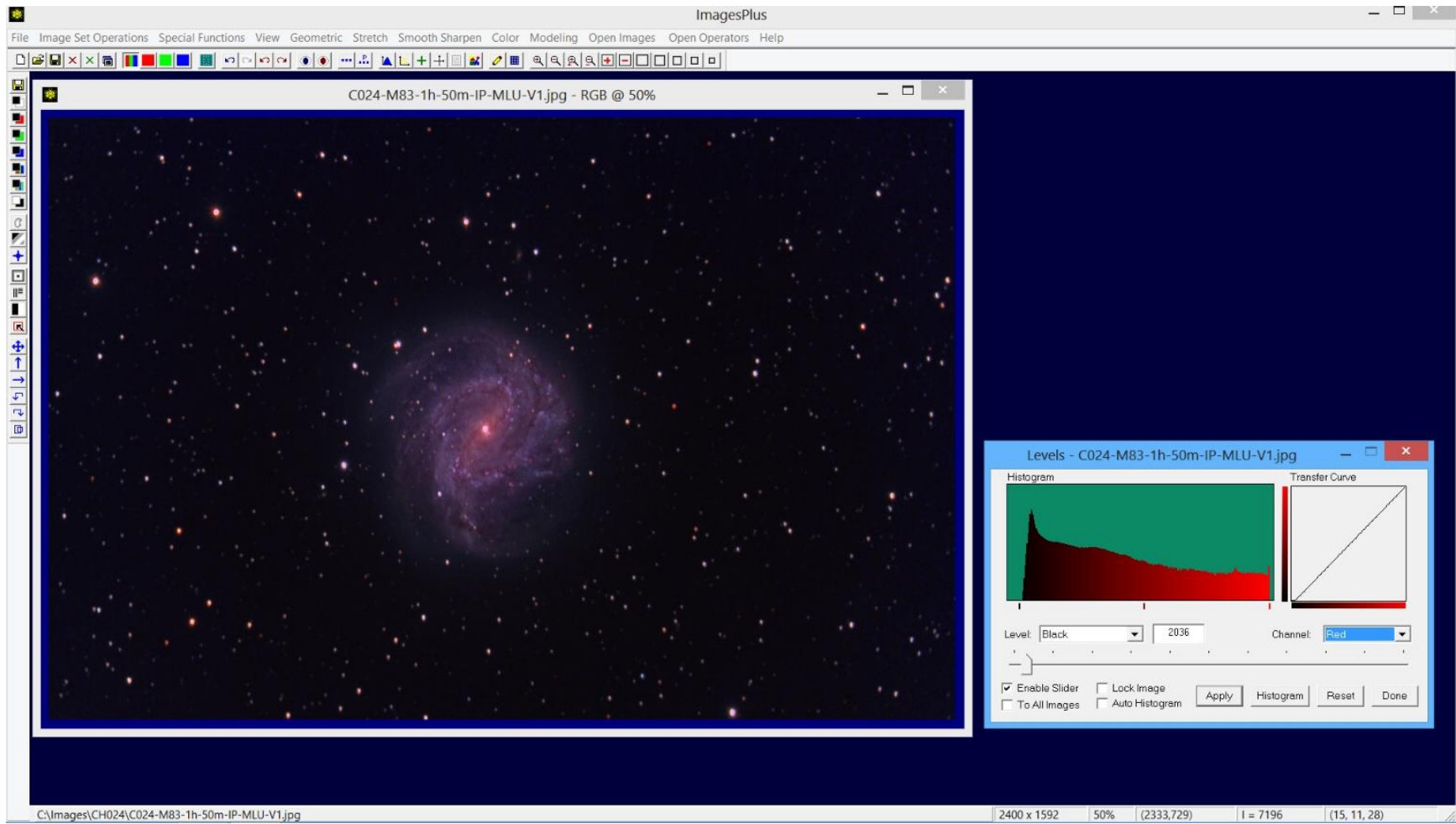
Smooth Sharpen | Multi-resolution is used to smooth the dark background since the min max luminance range is set to [0, 6049] with a feather radius of 1969.

Step 13)



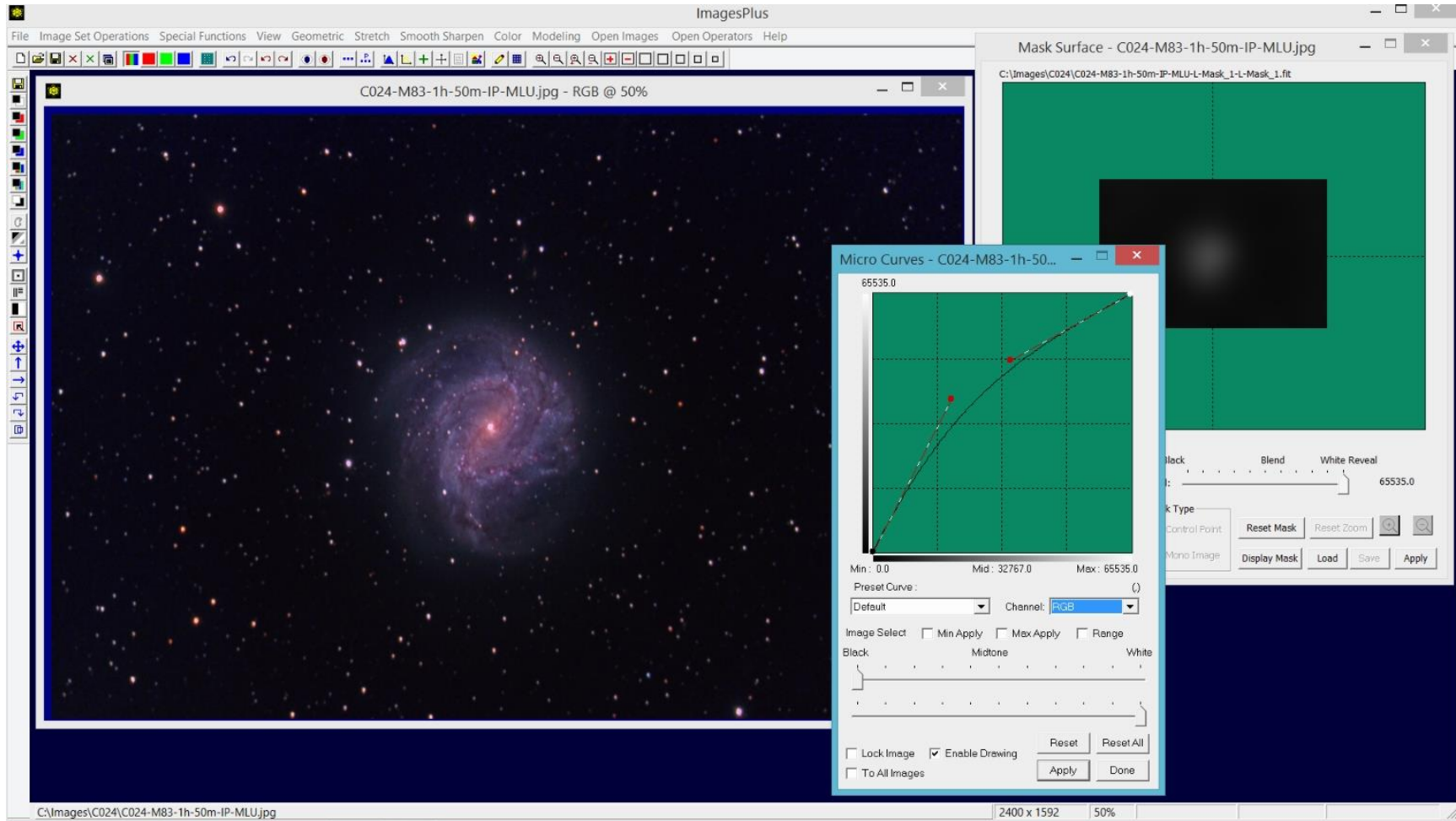
Smooth Sharpen Adaptive Richardson-Lucy deconvolution with min max luminance range of [13962, 45740] and feather radius of 2006 is used to sharpen the middle tones of the galaxy and stars.

Step 14)



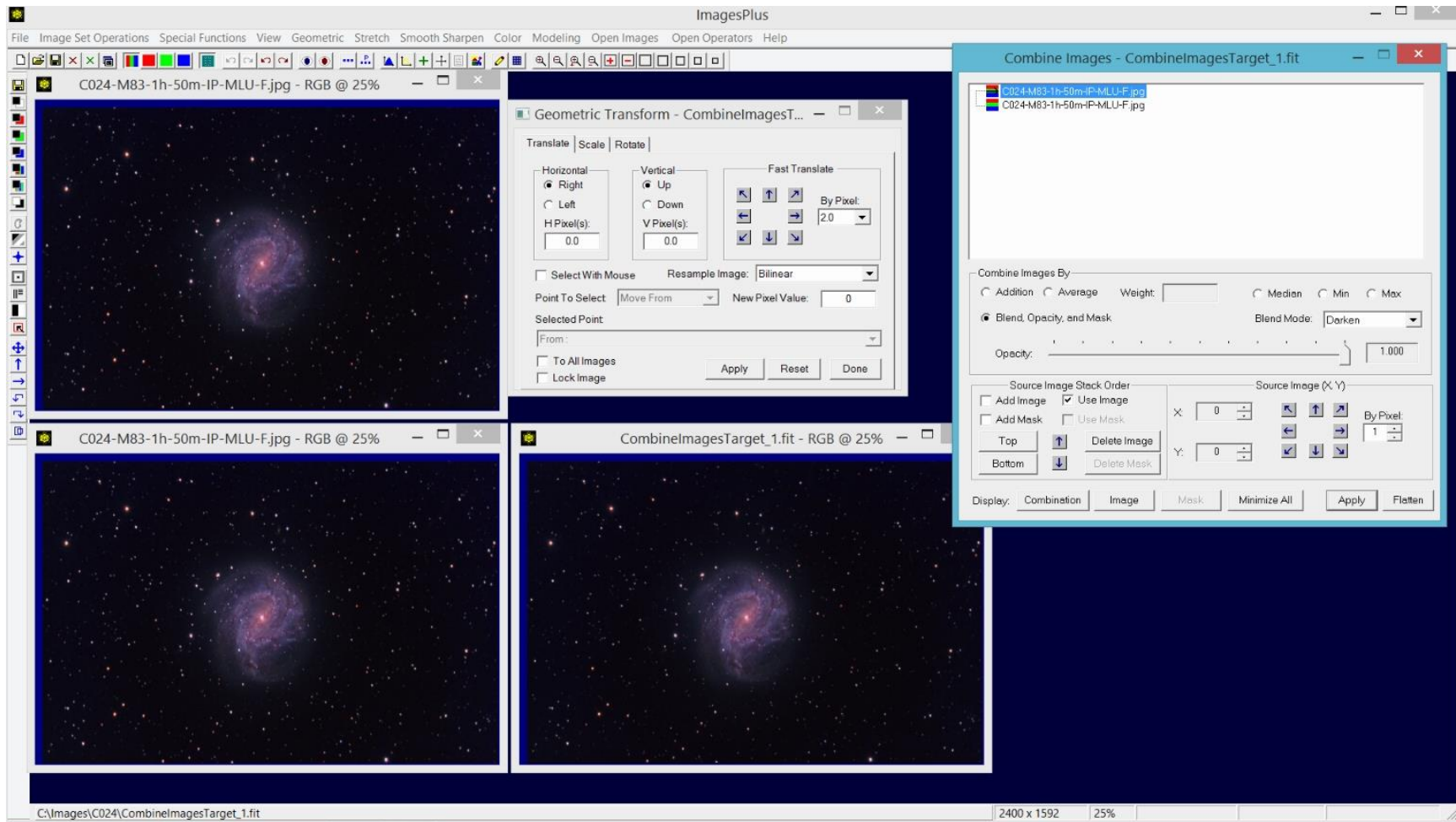
Red and green black point is set to the left side of the histogram using Stretch | Levels.

Step 15)



Final masked curves adjustment.

Step 16)



Elongated stars are fixed by first applying a shift of 2 pixels in the vertical direction to a copy of the image then layering the shifted copy on top of the image using darken (minimum) blend mode.





Final processed image of M83. Data provided by Chuck Kimball of the [Digital Astro Image Processing Yahoo Group](#)