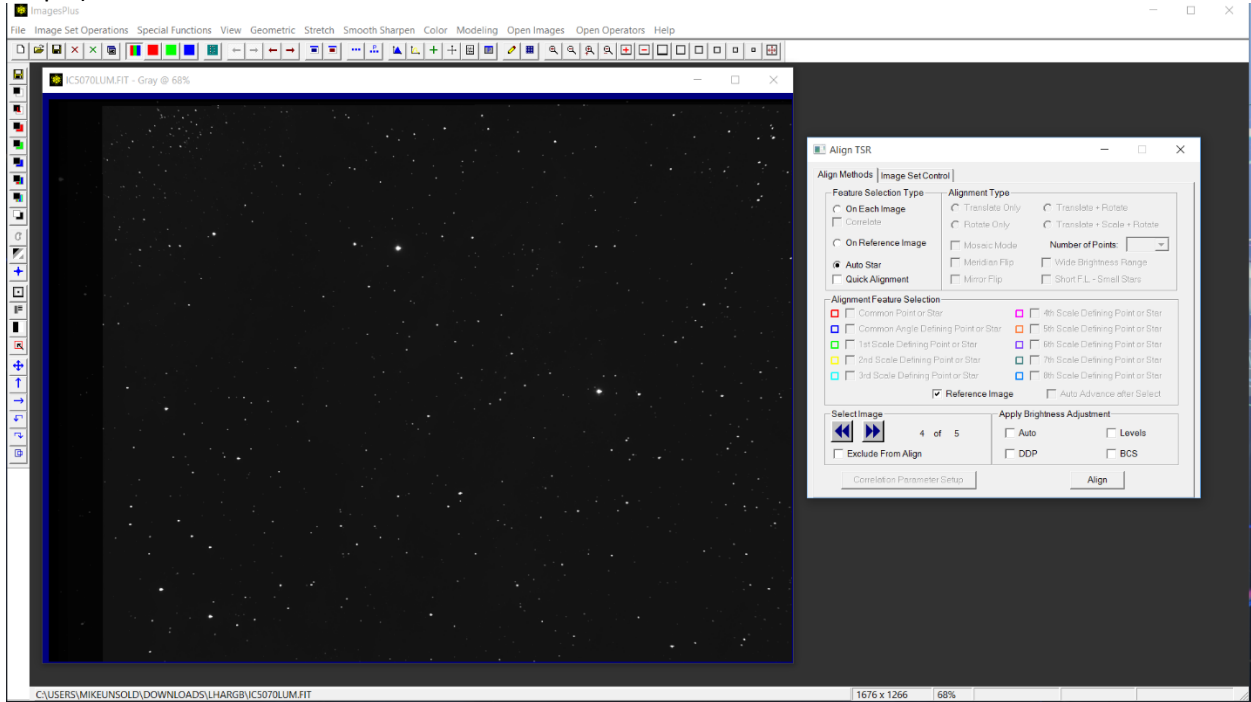


## General Workflow for Processing L, Ha, R, G, and B Components in ImagesPlus

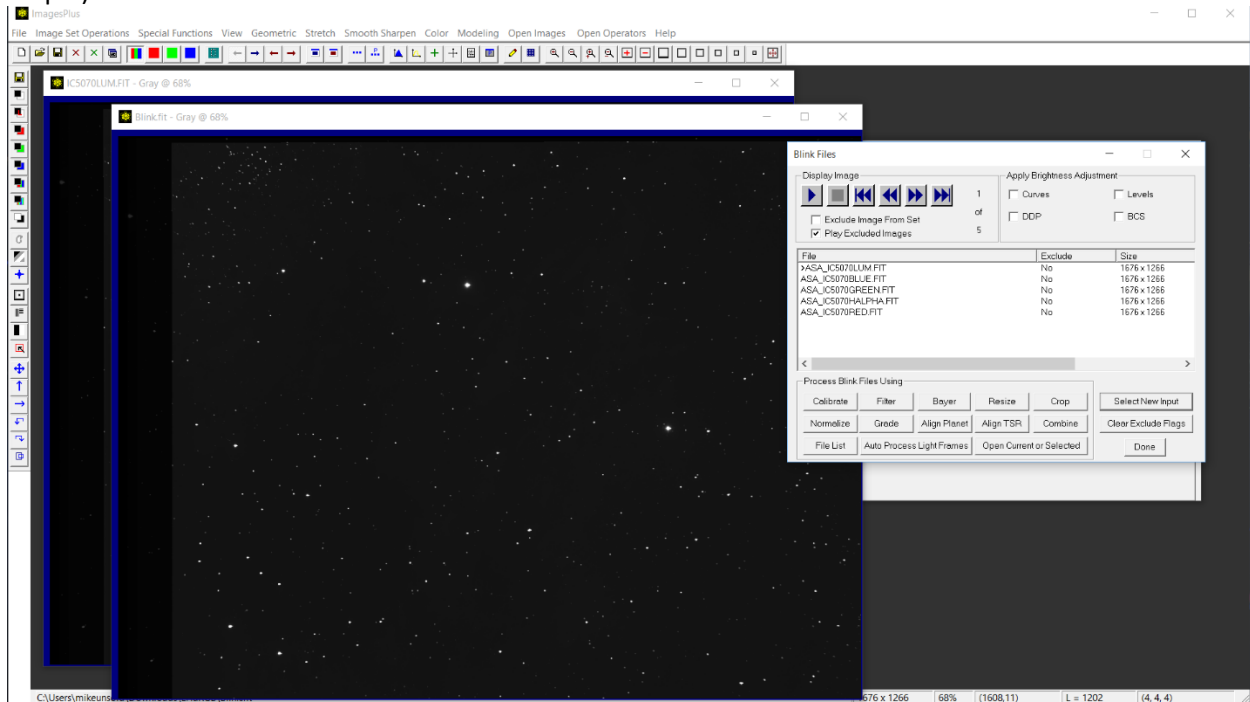
This general workflow can be used with component images from a DSLR, one shot color CCD, or monochrome CCD with minor adjustment to the component images.

### Step 1)



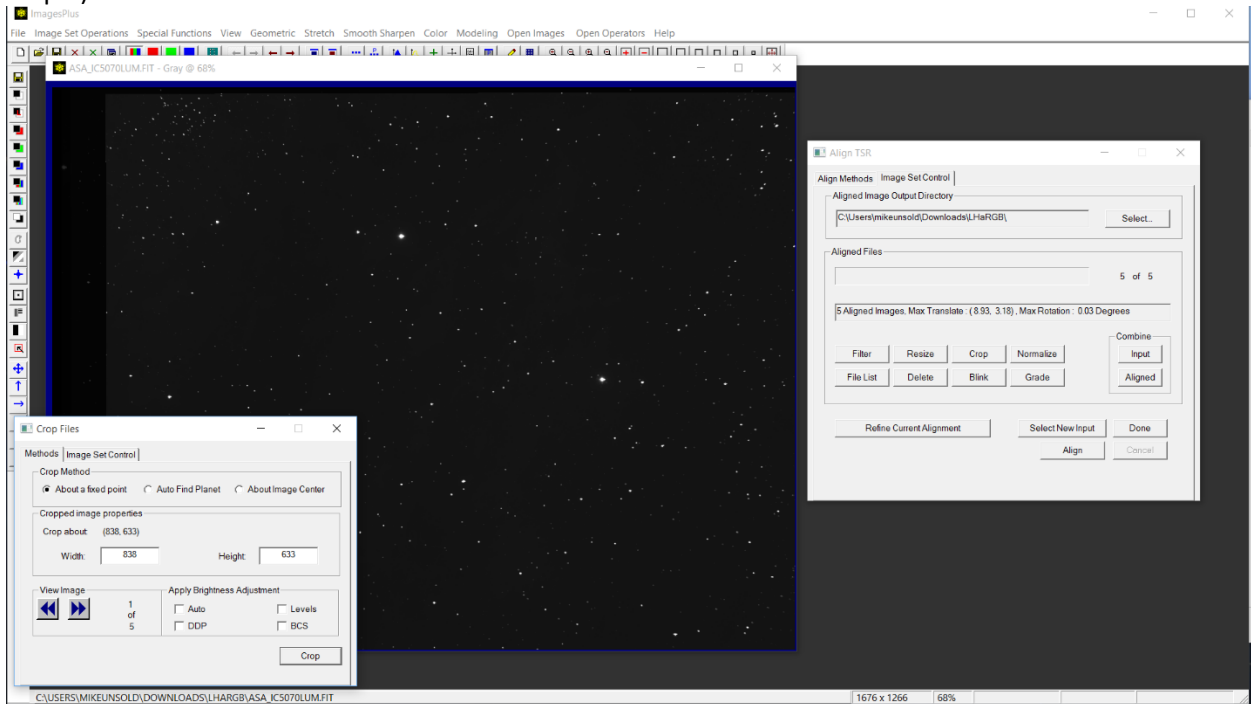
First use Align TSR to align the L, Ha, R, G, and B components. If you are using a DSLR or one shot color CCD then you will have L, Ha, and RGB components. Use the Select Image >> button to display the luminance image then check the Reference Image box. In this case Auto Star is used to align the component images but you may need to use On Reference or On Each alignment options and select alignment stars. Press the Align button to start alignment.

## Step 2)

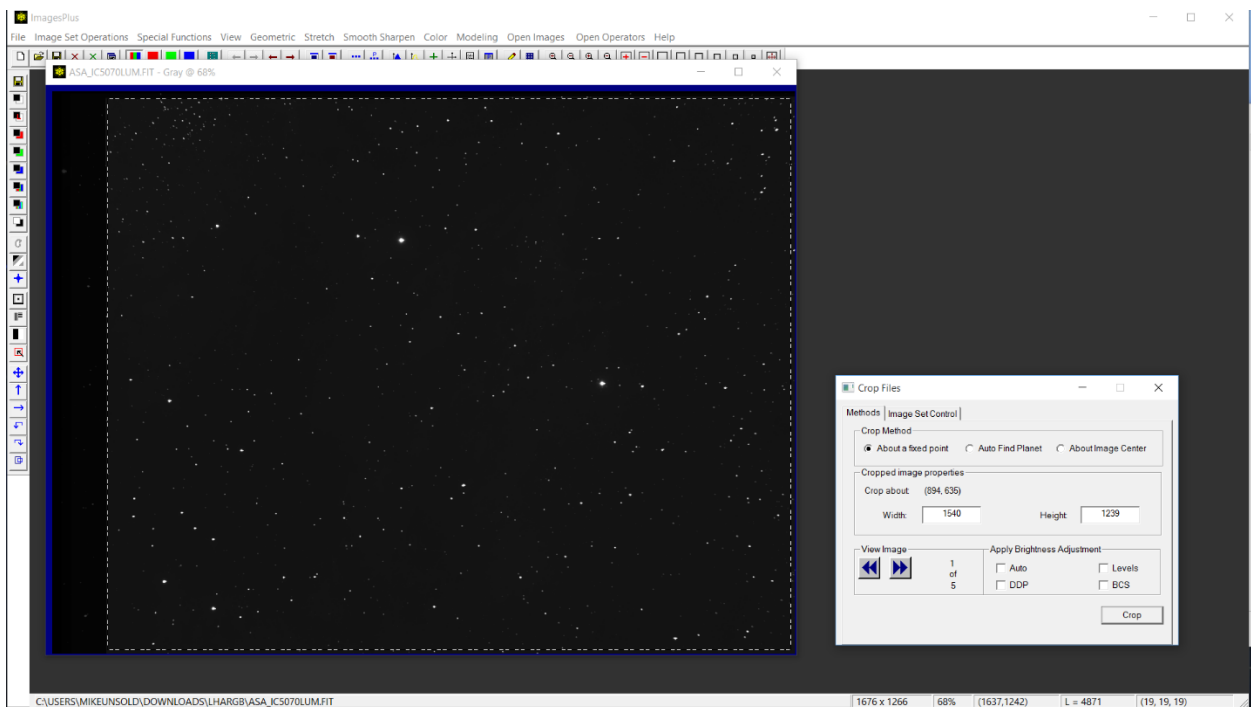


After alignment is finished press the Blink button on the Image Set Control tab of Align TSR and blink through the aligned components. With good alignment stars will twinkle when blinked but not shift in position. If shift is detected then use the On Reference or On Each align option with more stars. The Refine Current Alignment button on Align TSR can be used to perform an additional alignment or you can choose more stars or different align option and rerun Align TSR.

### Step 3)

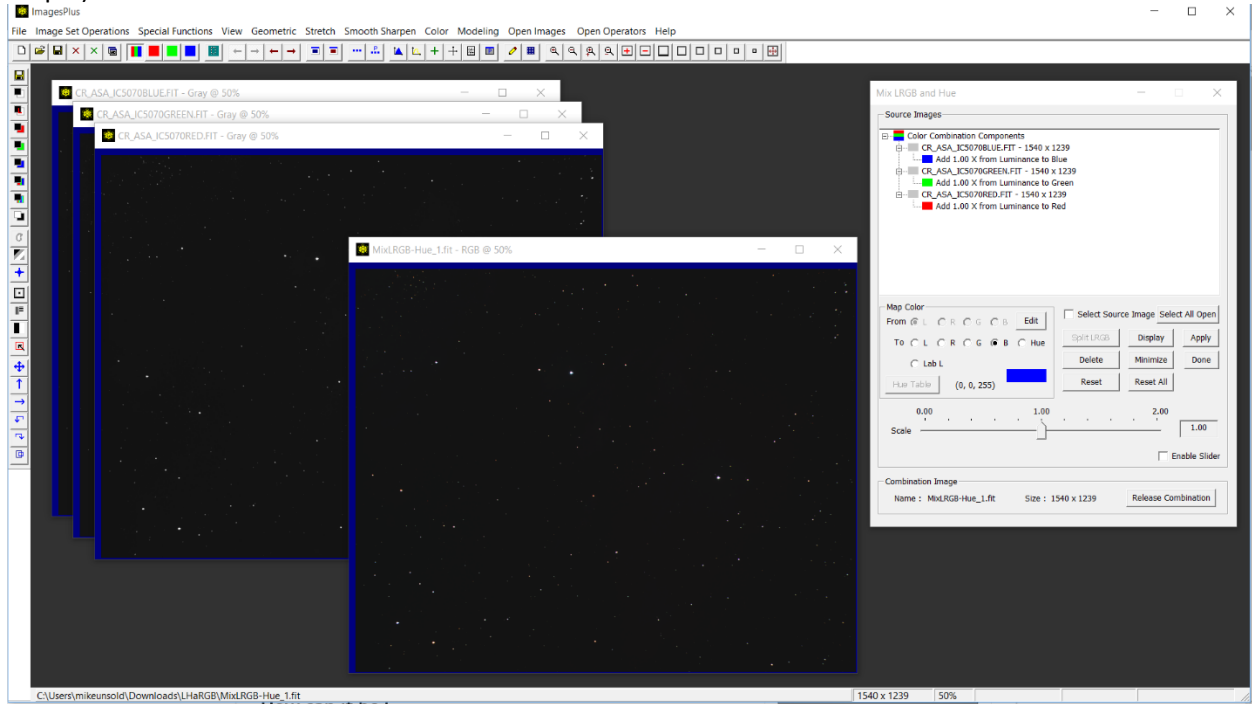


Optional – Press the Crop button on the Image Set Control tab of Align TSR to crop the aligned components if necessary.



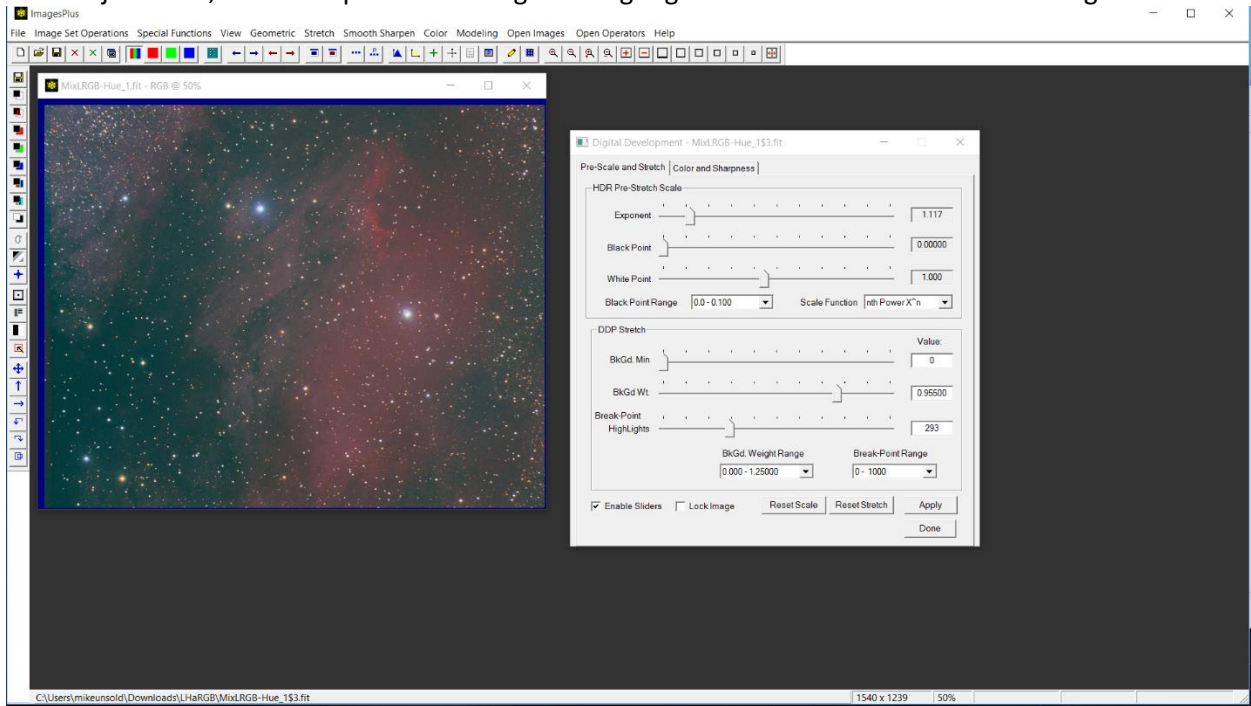
Use the brightness adjustment if the images are too dark then left click and drag a rectangle on the image to define the area that will be cropped out of the full image. Press the Crop button to crop all of the aligned components in the same way. Use the File List button on the Image Set Control tab of Crop Files to display the cropped files buy using a double click on the file in the output list.

## Step 4)

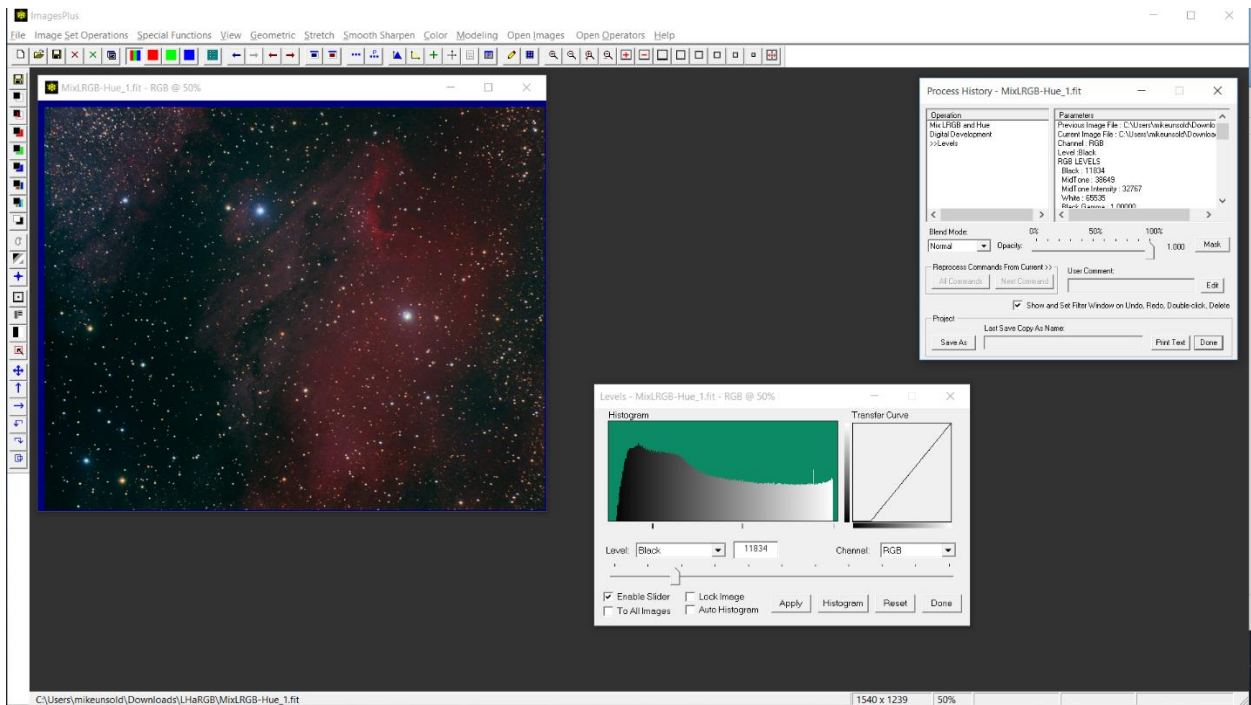


Open the cropped and aligned R, G, and B components and open the Color | Mix LRGB & Hue tool. Press the Select All Open button then assign the R, G, and B components to red, green, and blue. Press the Apply button to build the color RGB image. This step is not necessary if you are using a DSLR or one shot color CCD since the color components are already in a single RGB image.

Step 5) RGB Processing – Process the RGB to its best using any of the smoothing, sharpening, stretch, color adjustment, and multi point flattening tool to get good star color with a smooth background.

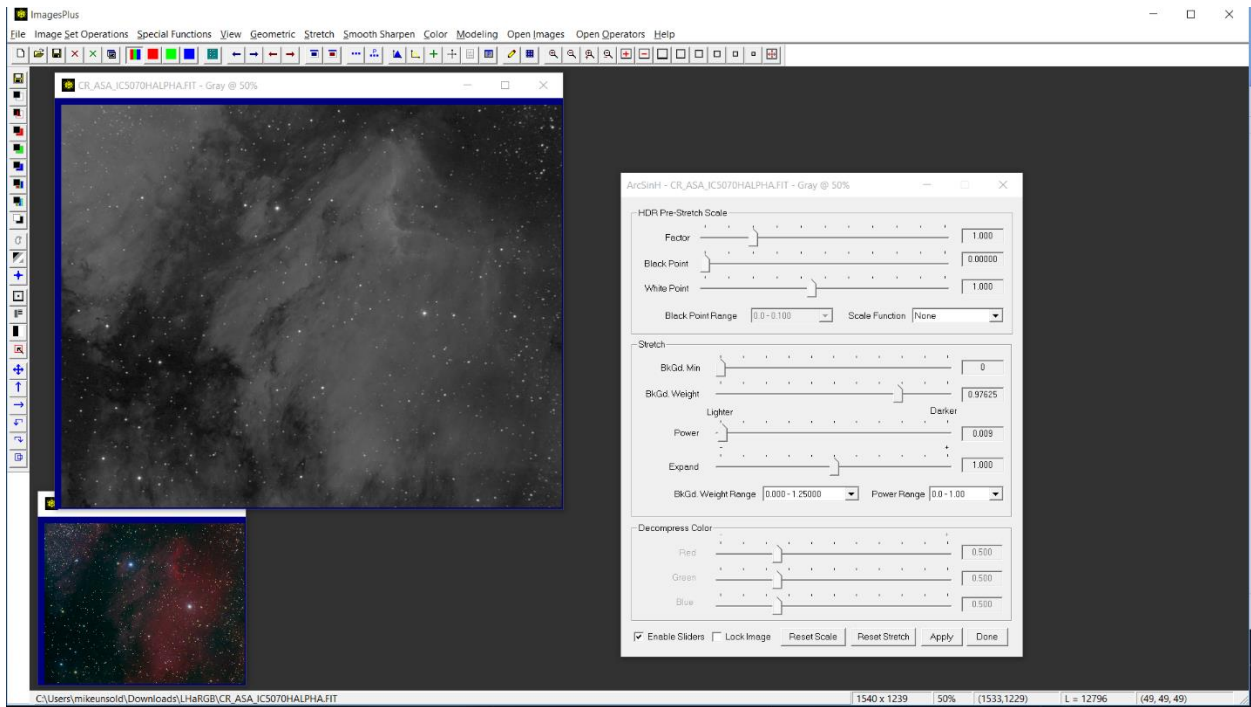


Digital development or other stretch is applied.

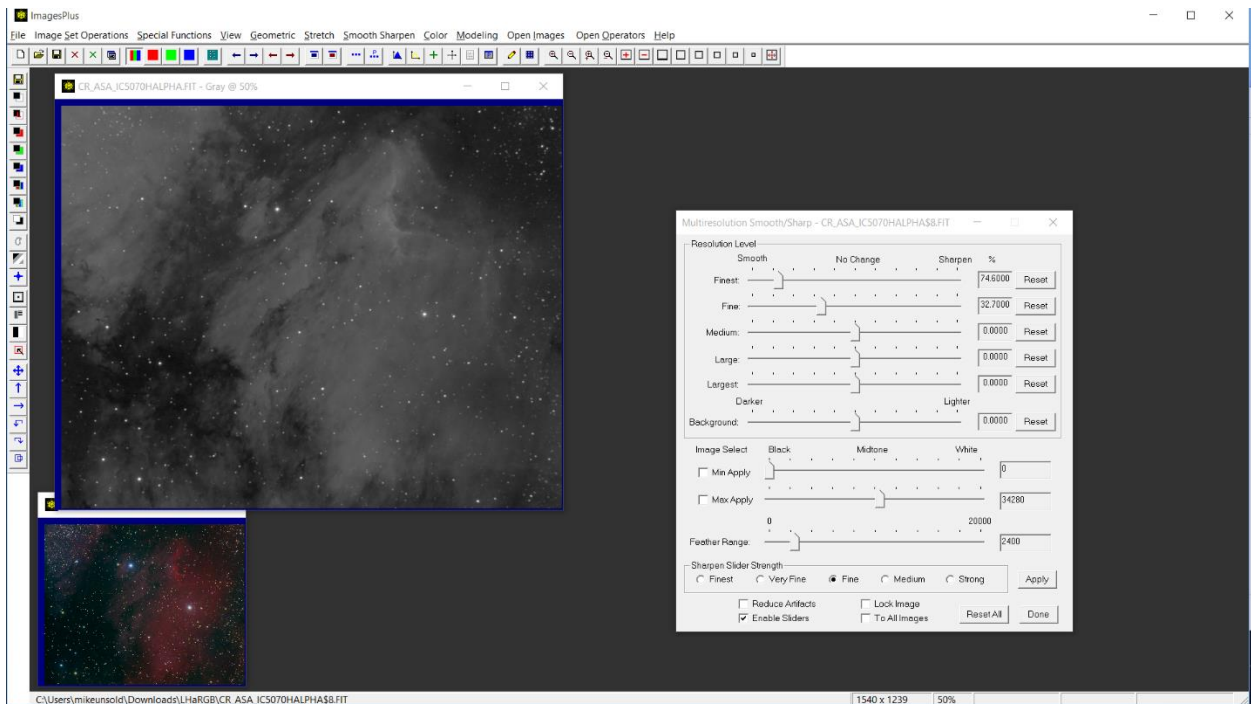


Levels is used to set the black and white points.

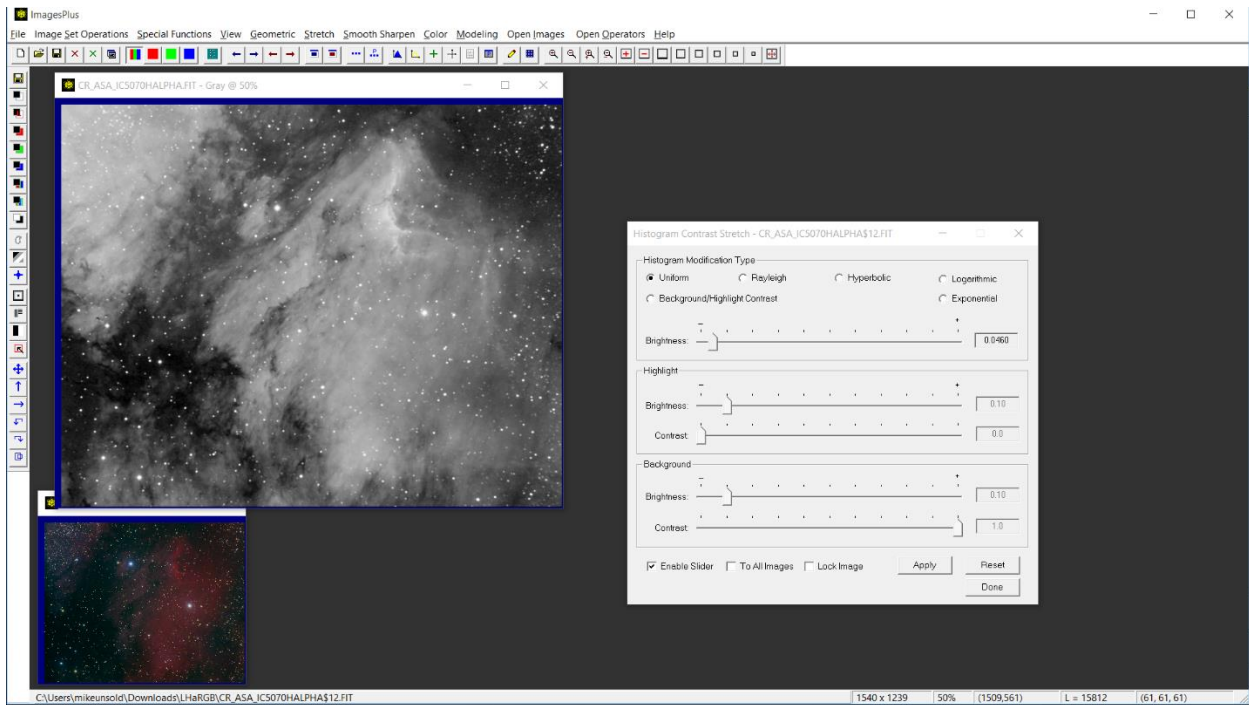
Step 6) H-alpha Processing - Process the H-alpha image to its best using any of the smoothing, sharpening, stretch, and multi point flattening tool to get good contrast and detail. Stars are removed from the image since star color from the processed RGB image is to be maintained.



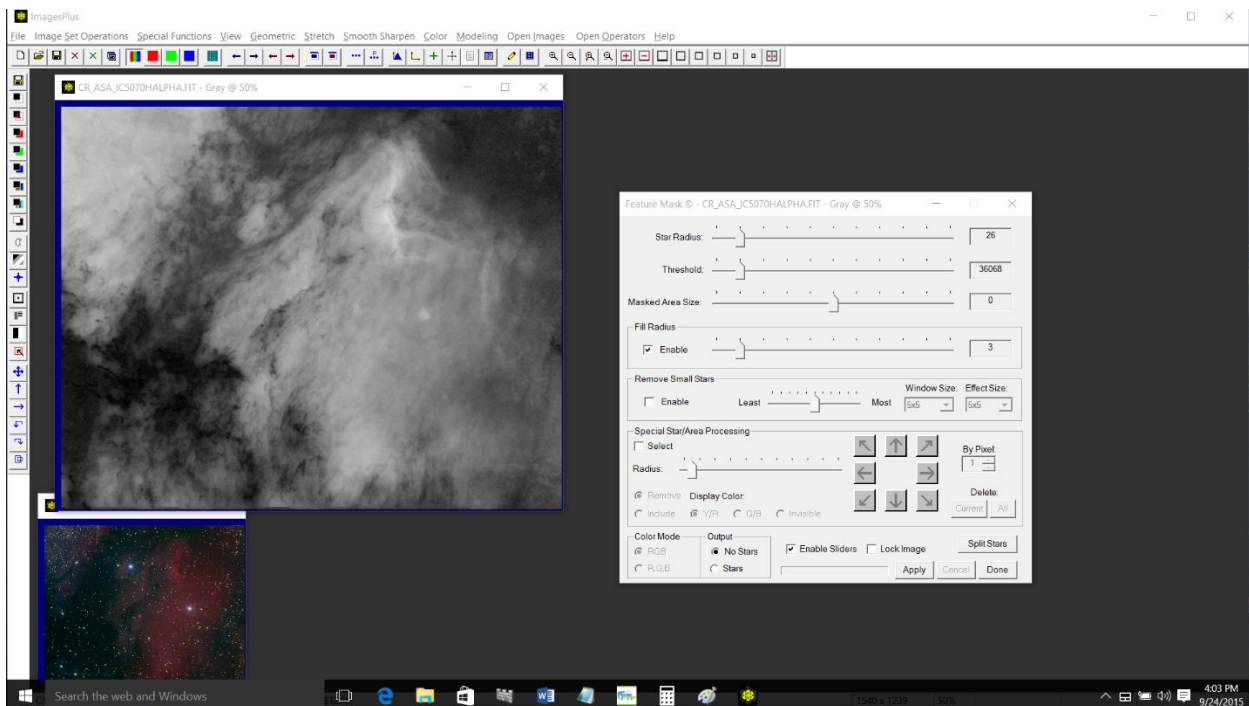
Stretch with ArcSinH or other tool. ArcSinH gives good detail with very small stars.



Smooth noise in the darker background. A feather luminance range is used to define the darker area.

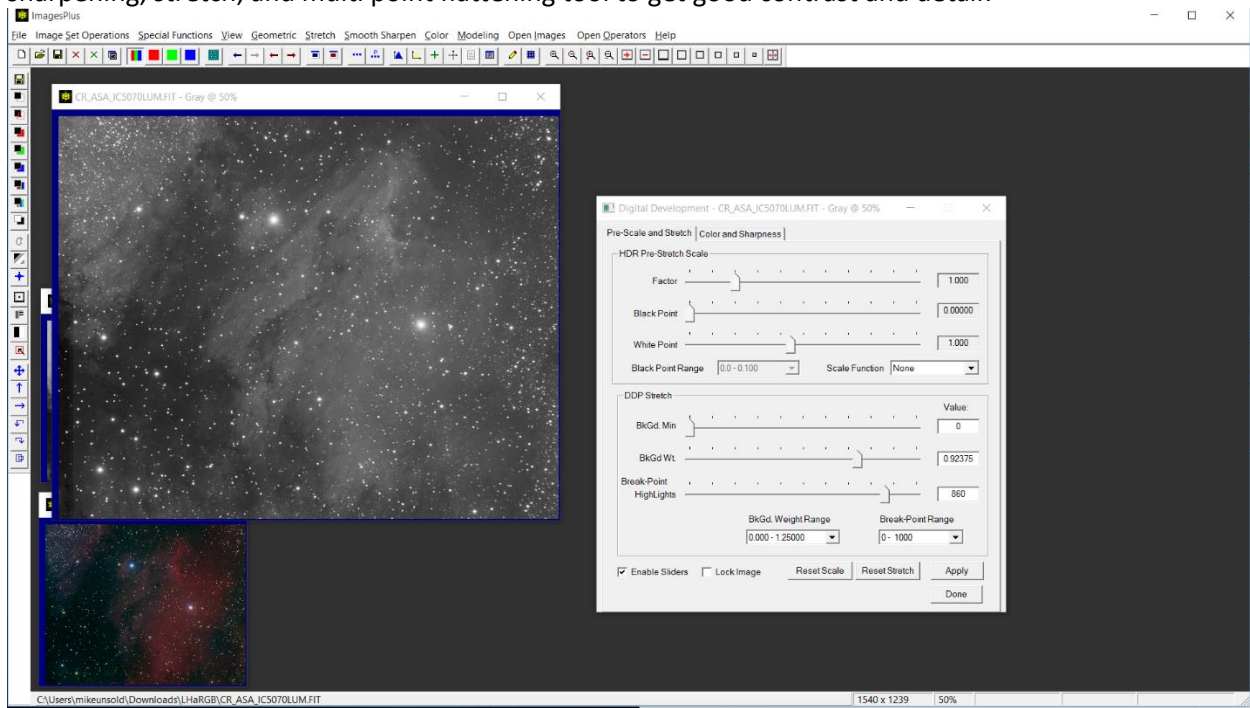


The Histogram Contrast Stretch tool is used to increase the stretch applied to the H-alpha image.



The Feature Mask tool is used to remove stars while detail and contrast is maintained. If the stars are not removed then star color can shift when the H-alpha data is applied to the RGB data.

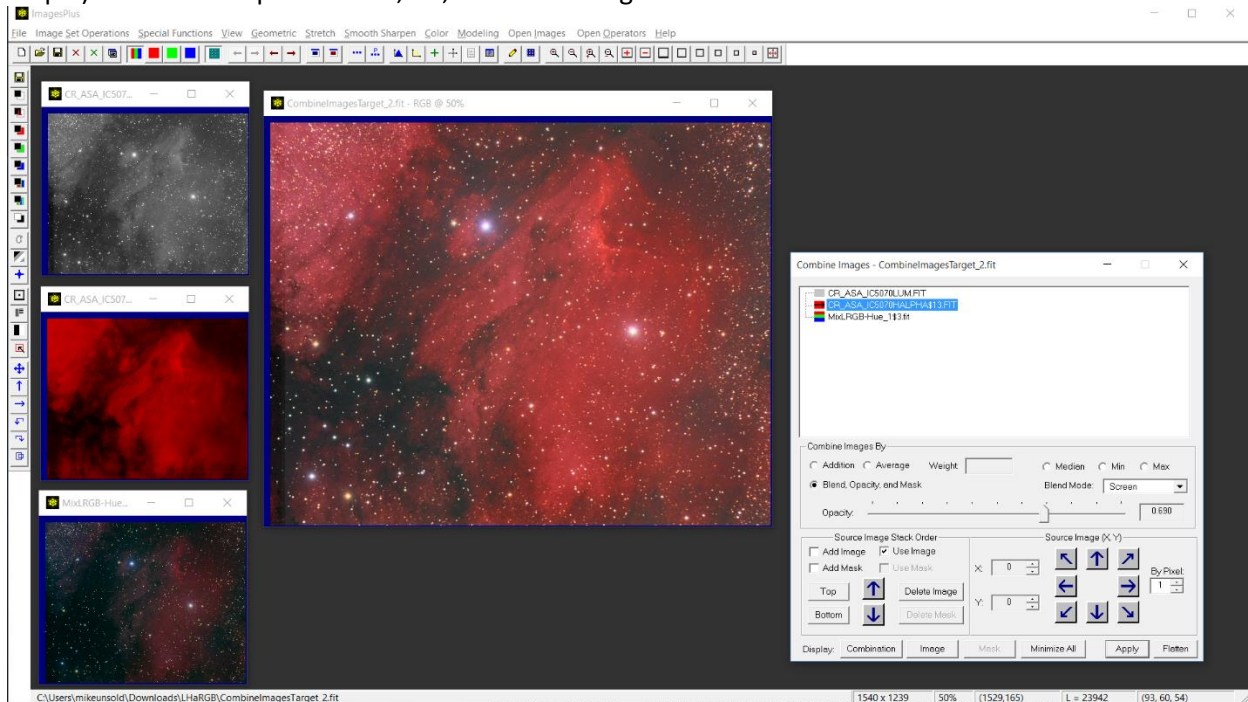
Step 7) Luminance Processing - Process the luminance image to its best using any of the smoothing, sharpening, stretch, and multi point flattening tool to get good contrast and detail.



Digital development is used for the initial stretch. In this case no further process was applied since the luminance image is pretty good but smoothing, sharpening, and other processing can be applied.

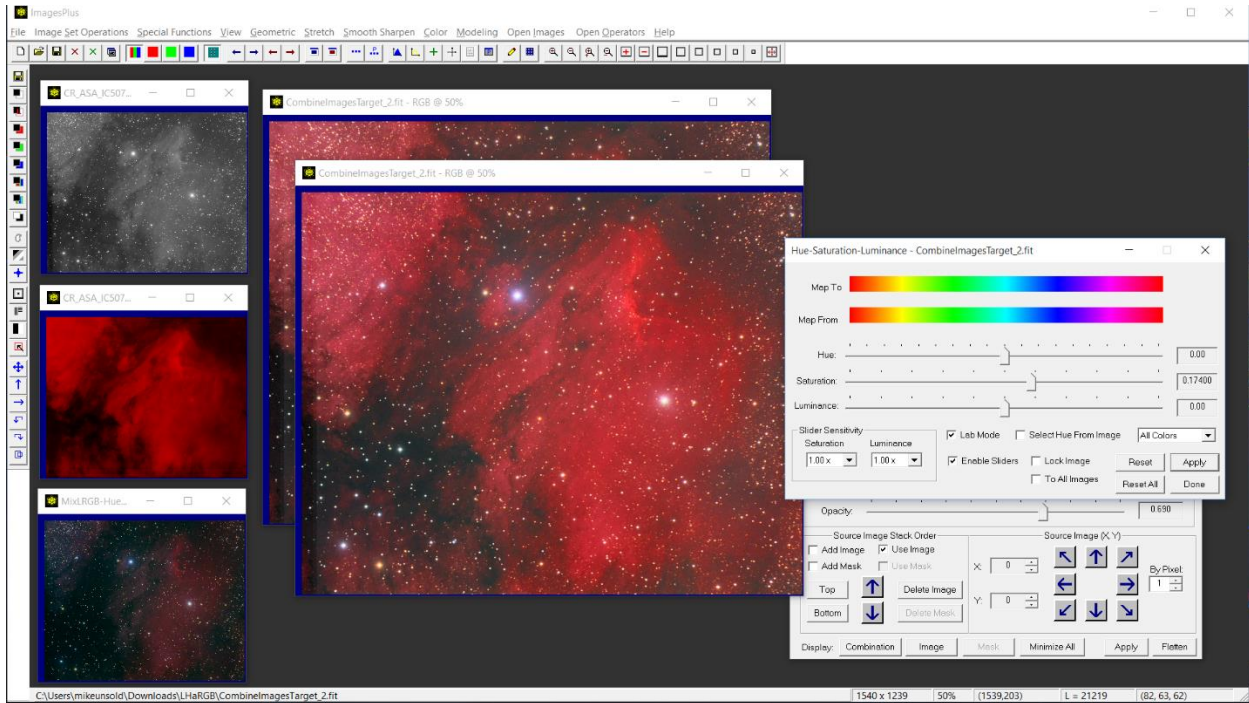


## Step 8) Combine the processed L, Ha, and color images.



The Combine Images layer tool is used to combine the L, Ha, and RGB components. The RGB component is used for the bottom layer with normal blend mode and opacity = 1.0. The Ha component is converted to a red channel image using the Color | Interpret & Mix tool so that it effects only the red data on the combination image. The red Ha image is added as the second or middle layer with screen blend mode and opacity = 0.690. The luminance image is used as the top layer with Lab luminance blend mode and opacity = 1.0.

The L, Ha, and RGB component images can be modified using any of the smooth, sharpen, color, or other filters. After a component is modified press Apply on Combine Images to rebuild the layered combination image.



To test processing of the combination image use the ... button on the horizontal toolbar to duplicate the image then apply filters. The Hue-Saturation-Luminance tool is used above to increase saturation of the duplicate combination image.



Final image built from L, Ha, and color components.