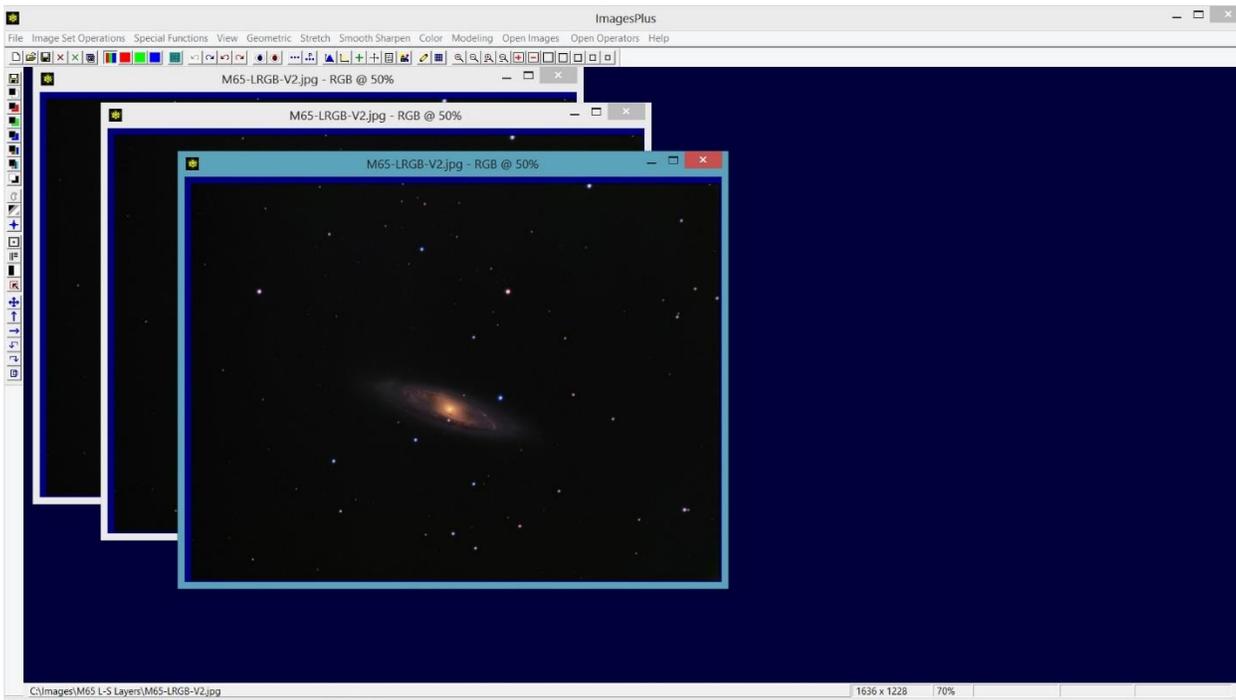


Enhancing Small and Large Scale Structure Using the High Pass Filter

The High Pass Filter tool in ImagesPlus can be used to create small and large scale structure versions of an image. The small and large scale structure versions of the image can then be used to enhance contrast and sharpen an image by layering them on top of the original image using Pin Light, Overlay, and Soft Light blend modes. The large scale version is usually used with Soft Light blend mode while the small scale image is used with Overlay or Pin Light blend mode. A masks can be assigned to the large or small scale structure image to soften the contrast and sharpening. Opacity of the large and small scale structure layers can also be used to blend the contrast enhancement and sharpening with the original image.

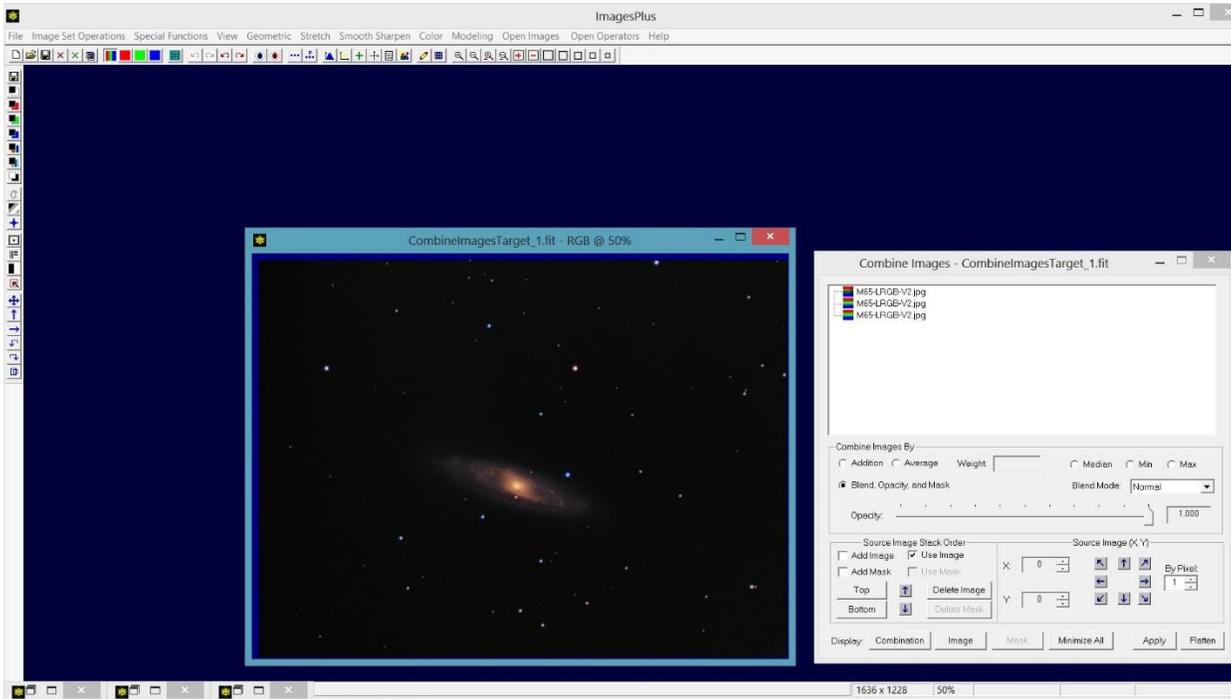
The following steps show how to implement one version of the above general concept. There are many different variations so feel free to experiment.

Step 1)



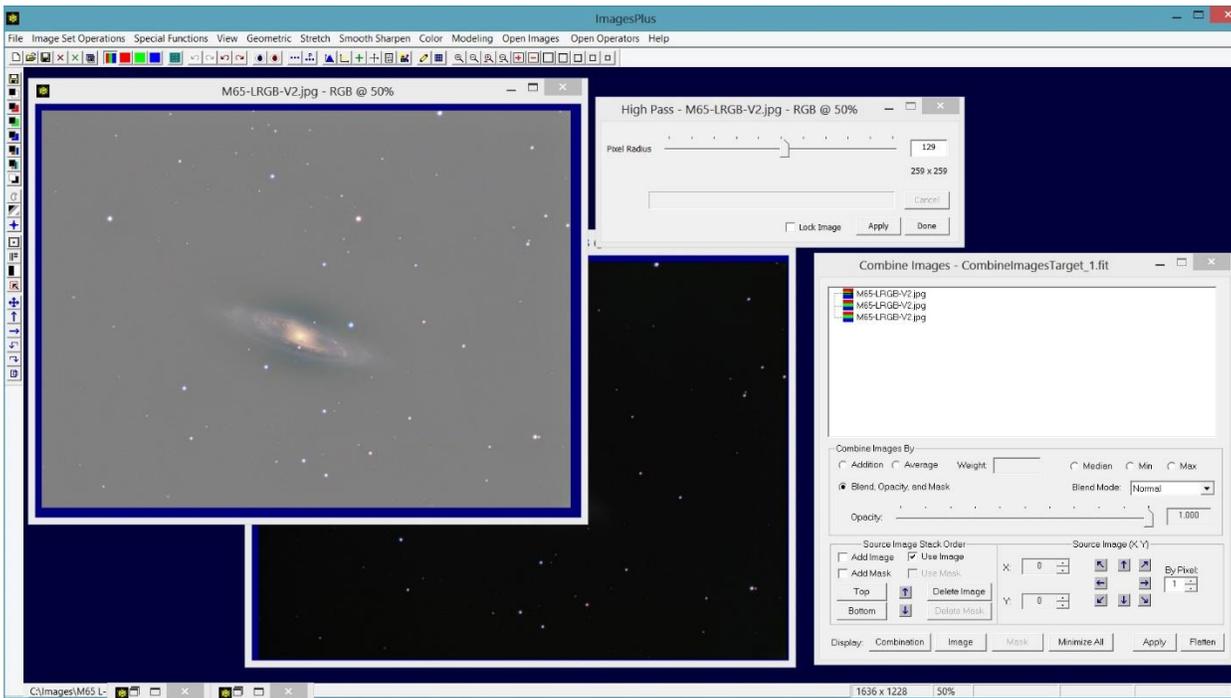
Open a color or mono image and duplicate it twice using the ... button on the top horizontal toolbar.

Step 2)



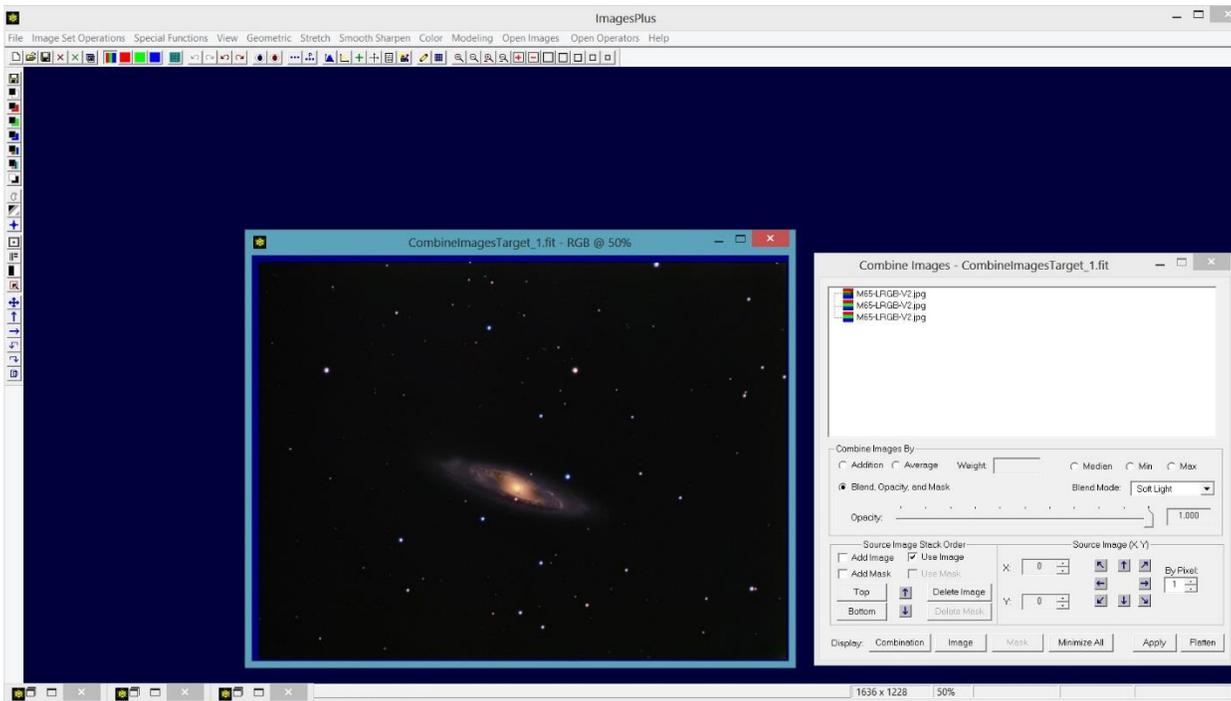
Use Special Functions | Combine Images using Blend, Opacity, and Mask to layer the three identical images. Minimize all image except the layered combination image. The controls on the Combine Images tool are used to select and display the different layer image when filters need to be applied to them.

Step 3)



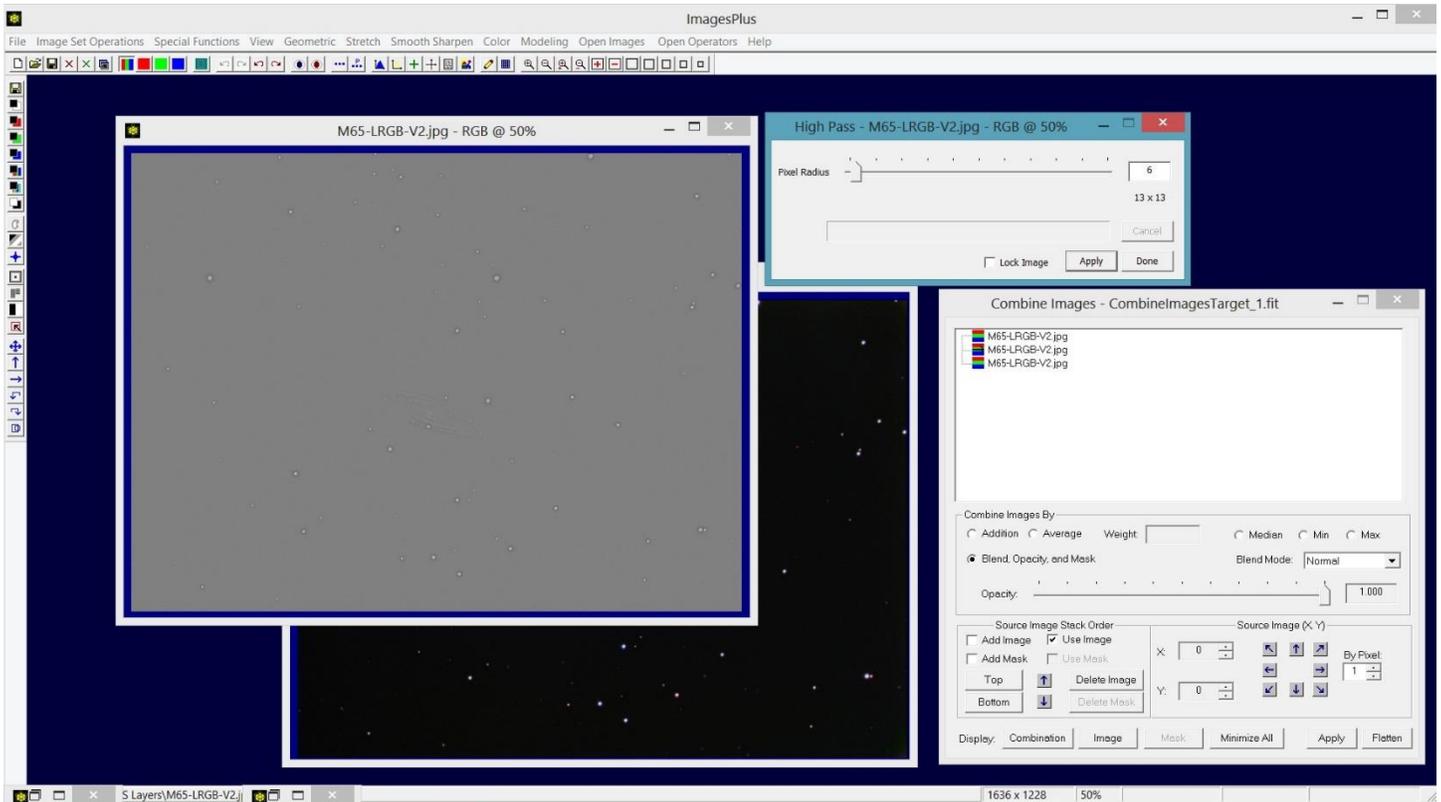
Select the top image layer in the tree on Combine Images then press the Display : Image button to display the top layer. Open the High Pass Filter tool from the left vertical toolbar and apply a large pixel radius to the top layer image to create the large scale structure version of the image.

Step 4)



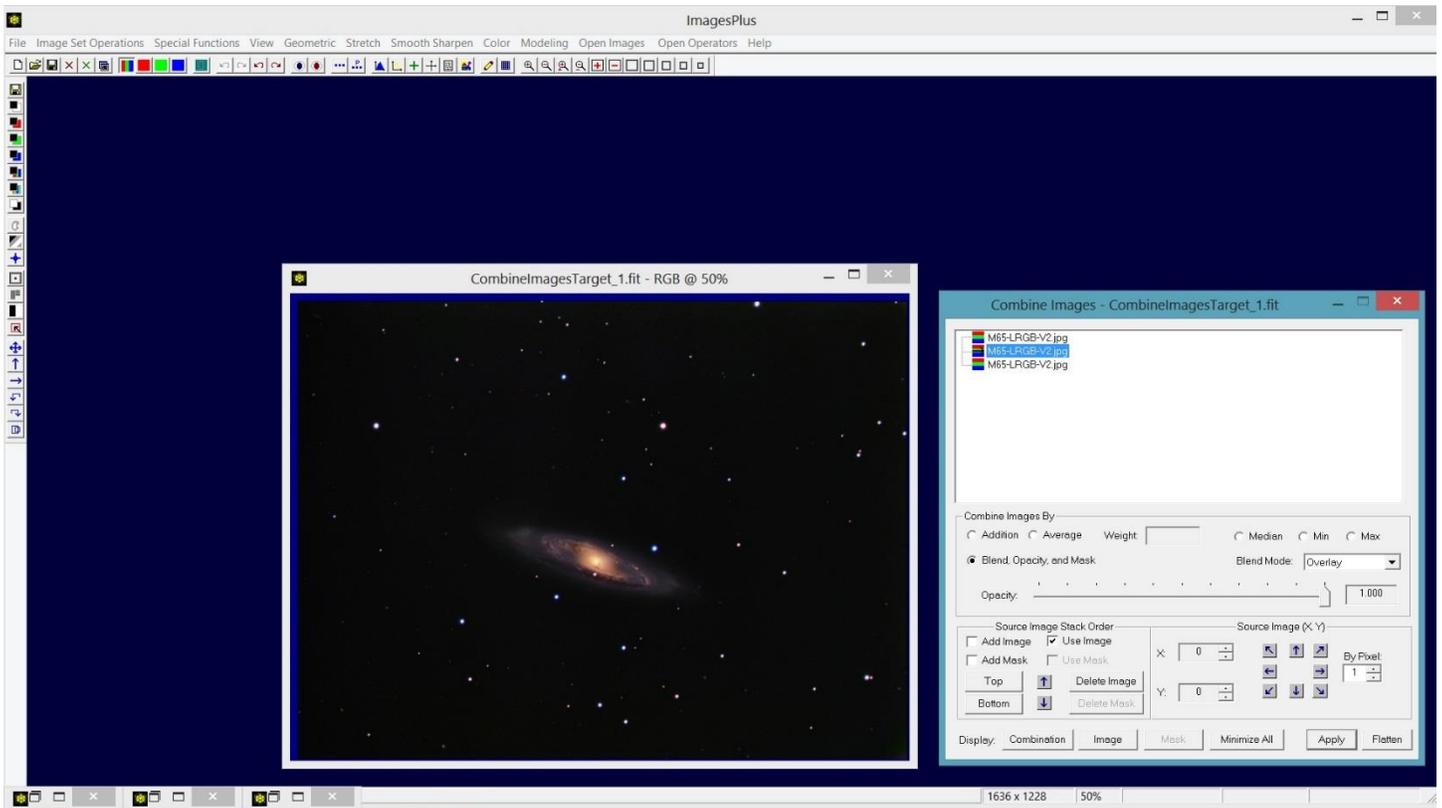
Minimize the top layer image, close the High Pass Filter tool then set the blend mode of the top layer to Soft Light. Note that the contrast is increased with a mild overall sharpening.

Step 5)

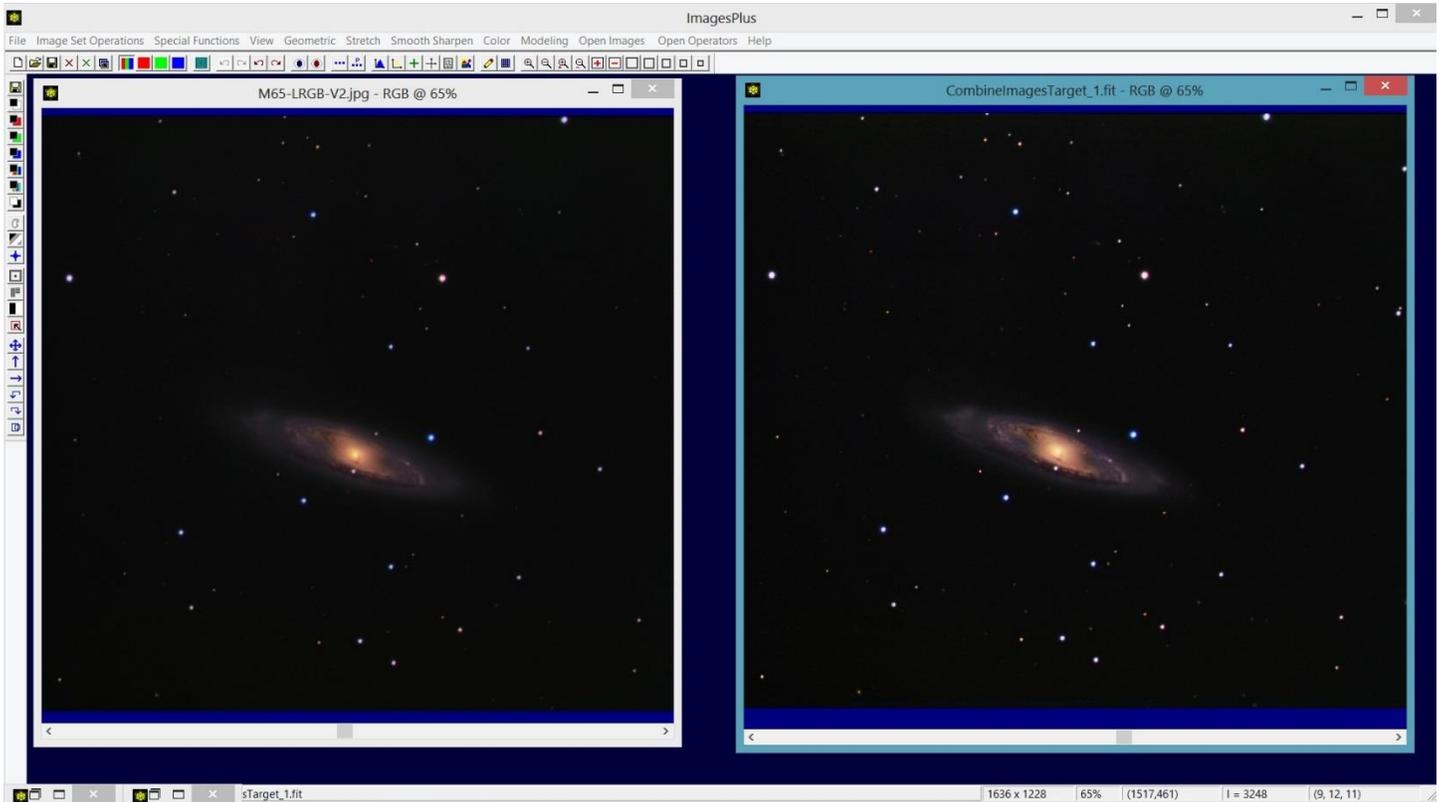


Select the middle layer in the tree and press Display : Image to display the middle layer. Apply the High Pass Filter with small pixel radius to the middle layer to create the small scale structure image.

Step 6)



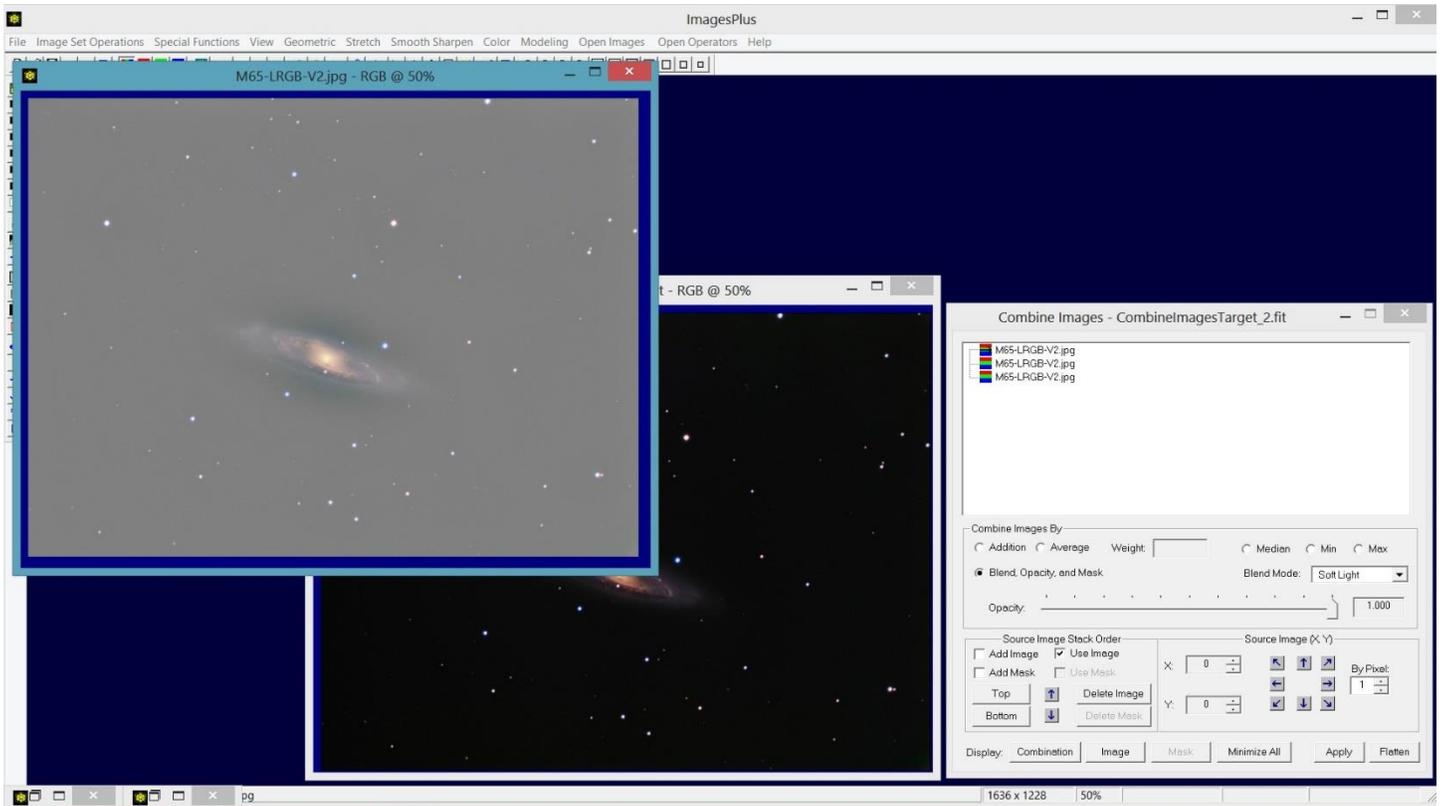
Minimize the middle layer image, close the High Pass Filter and set the middle layer blend mode to Overlay or Pin Light. Note the additional contrast and sharpening enhancement.



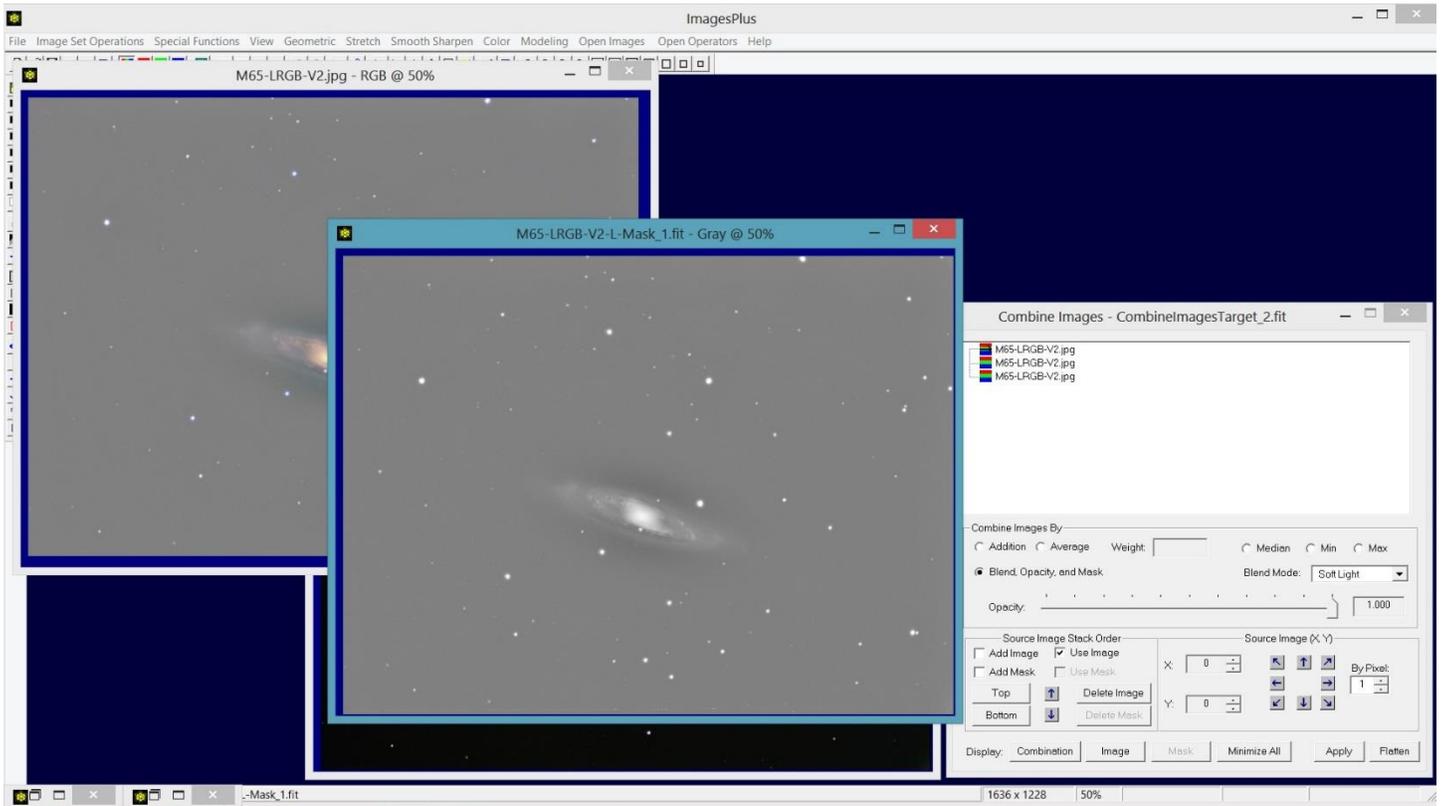
Above is a comparison of the initial image on left with the large and small structure enhanced image on the right.

If the contrast and sharpening enhancement is too harsh then a mask can be assigned to the large or small structure image layers and their opacity can be reduced to soften and blend the enhancement with the initial image. In this tutorial a luminance mask will be created and assigned to the top large scale structure layer only but you could also add a mask to the middle small scale structure layer and adjust the layer opacity.

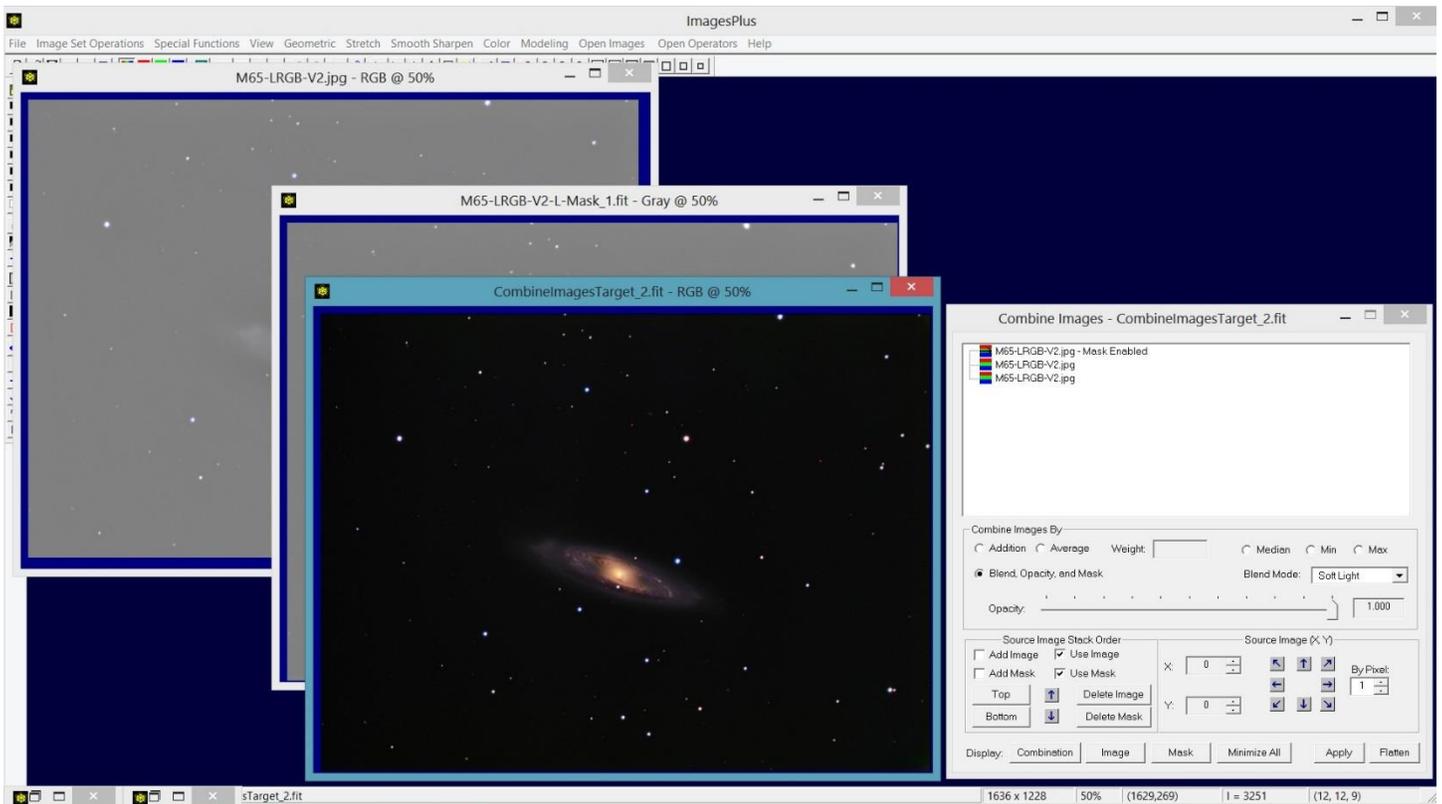
Step 7)



To create a mask for the top large scale structure select the top image in the layer tree and press Display : Image to display the image. Use the Luminance Mask, Custom Luminance Mask, Selective Color Luminance Mask, or Feature Mask tool on the left vertical tool bar to create a mask. In this case just a simple luminance mask is created using the Luminance Mask toolbar button as shown below.



Luminance mask created from the large scale structure image. To assign the luminance mask to the top large structure layer make sure the top layer is selected in the layer tree. Now check the Add Mask button on Combine Images then left click near the center of the luminance mask image. The luminance mask is assigned to the top layer and the combination image is updated using the mask as shown below.



Adjust the mask and opacity of the top layer so that contrast and sharpening are not too harsh.