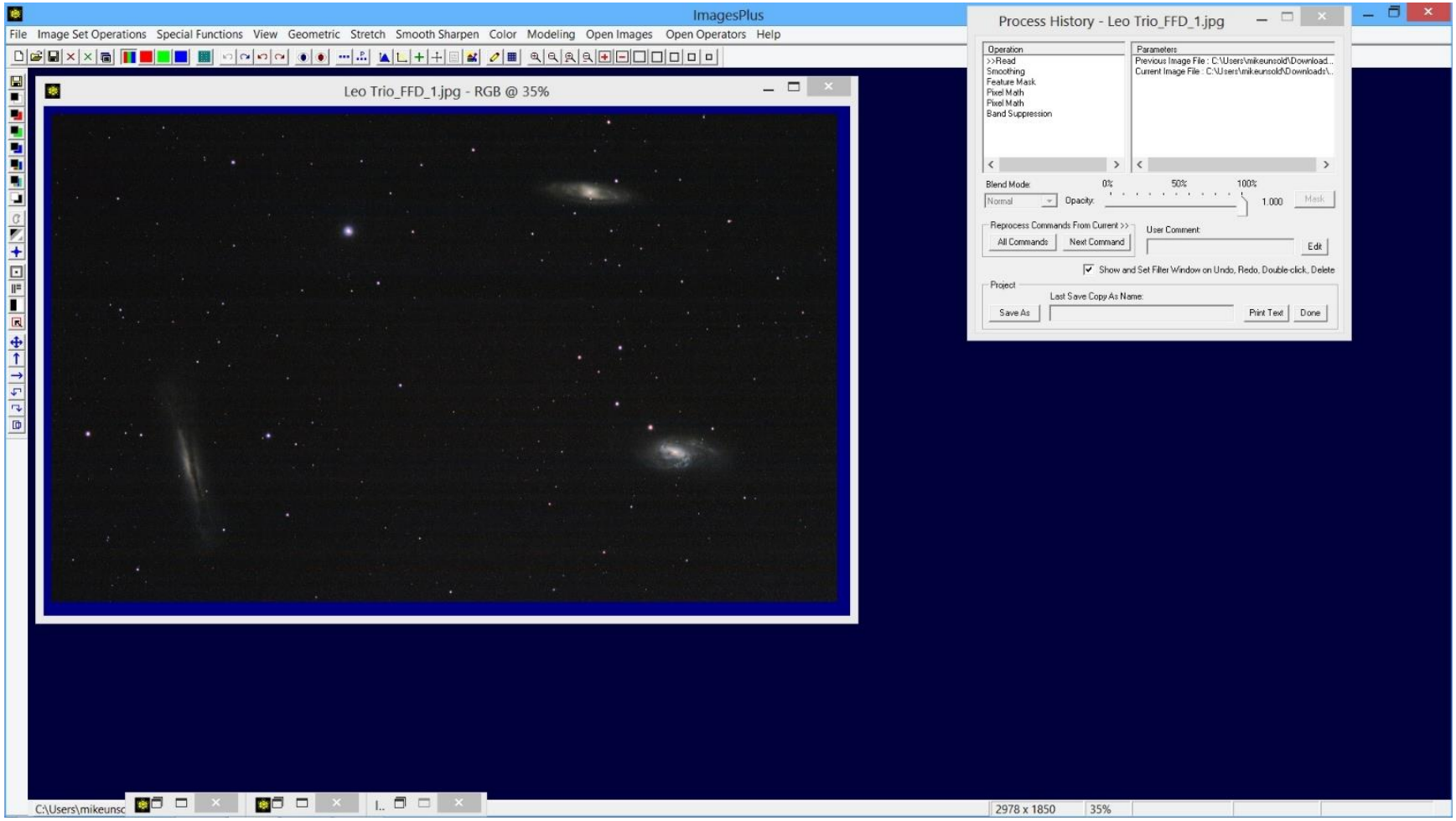
# Advanced Band Suppression

The Band Suppression and Line Suppression tools are usually applied after the Feature Mask tool is used to remove stars and other bright objects to prevent suppression artifacts. Pixel Math can be used to extend the areas removed by the Feature Mask tool. The processing example shown below uses Pixel Math after the Feature Mask tool to completely remove the three galaxies in the Leo Trio sample image before horizontal band suppression is applied. The result is a band suppressed image with star and galaxy detail unchanged and no band suppression artifacts.

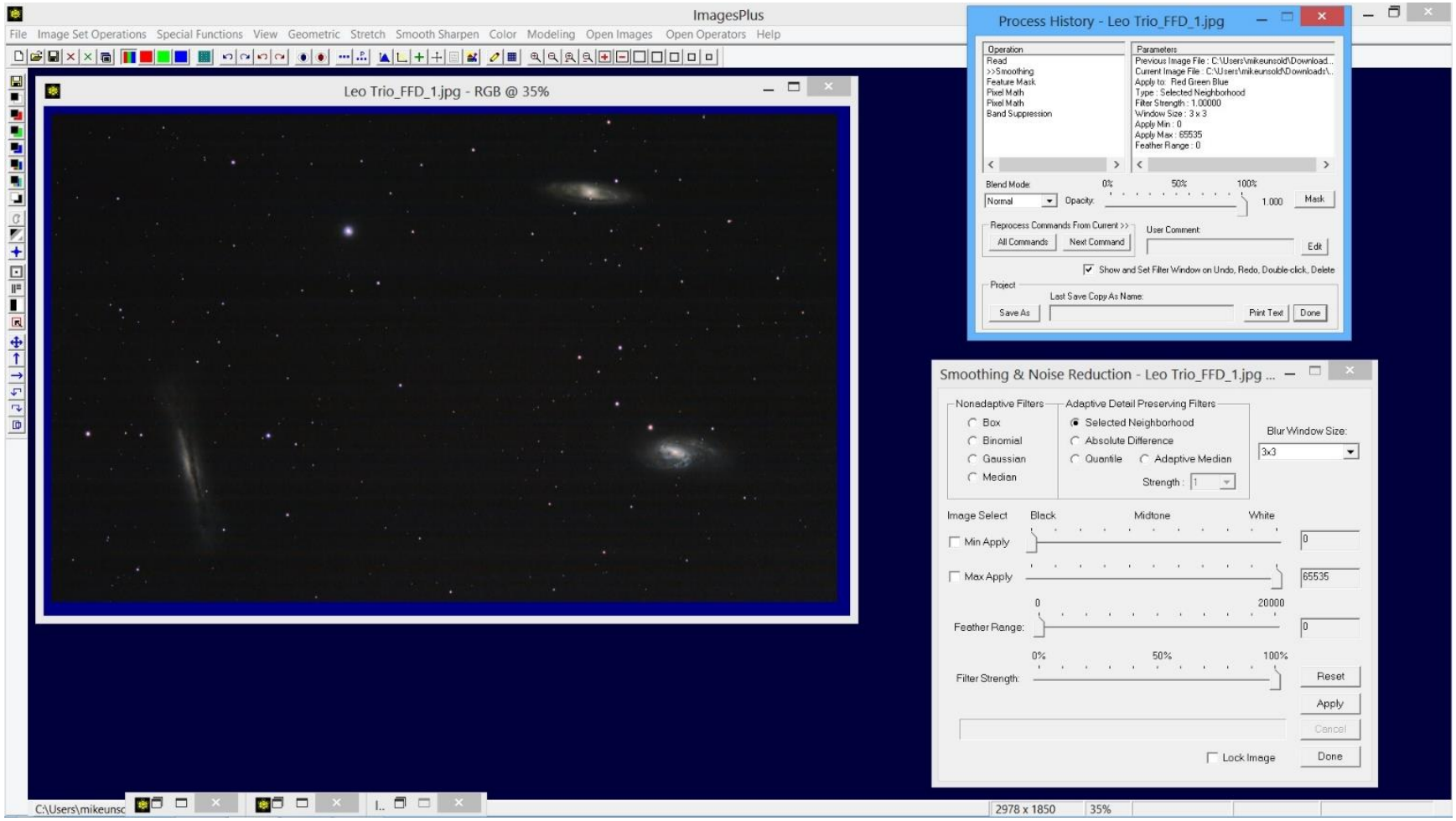
Sample data for this processing example was provided by Russ Brick.

Step 1)



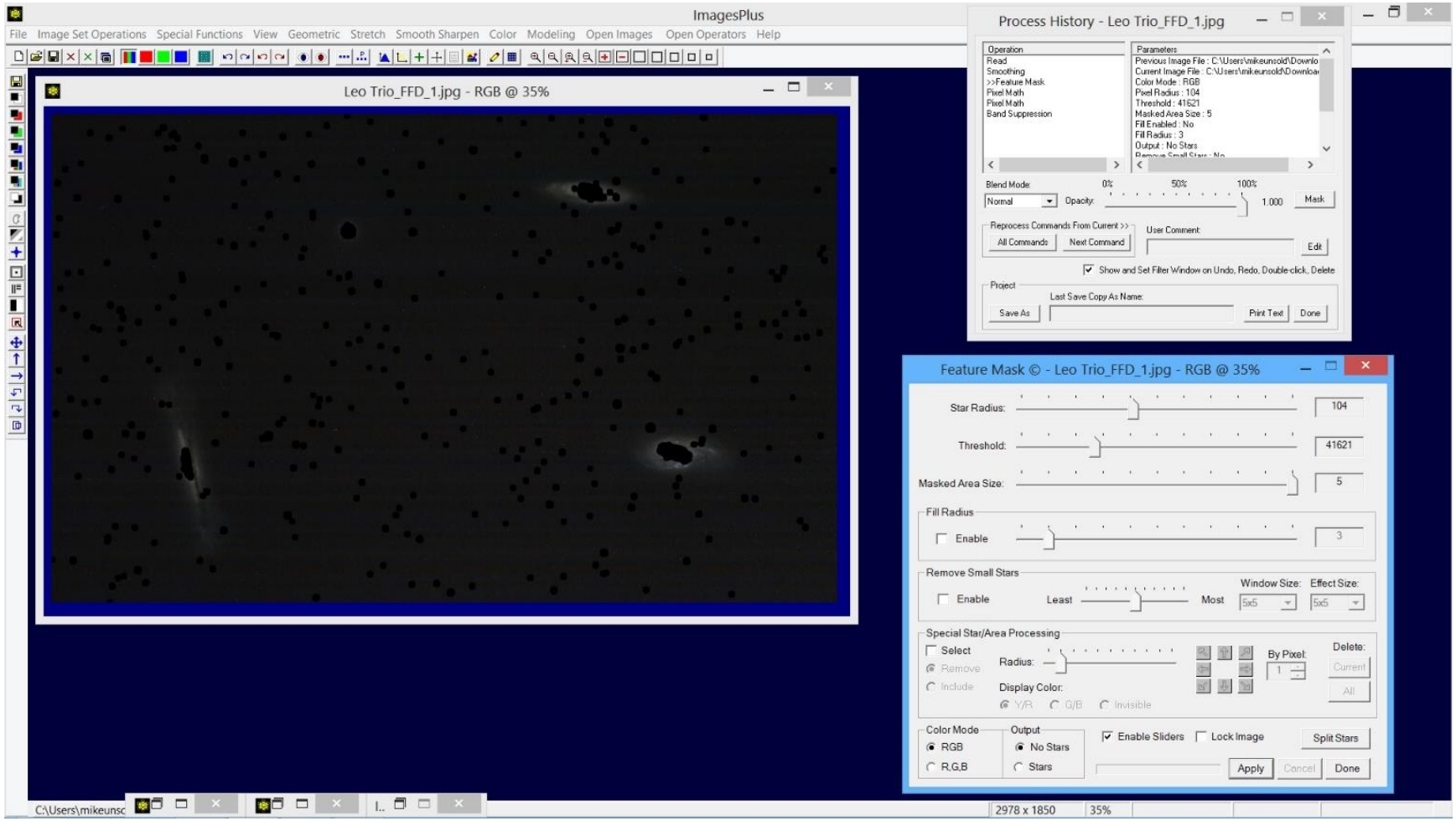

Initial image with horizontal bands and fine grain noise pattern by Russ Brick. Adjust the zoom % to see the horizontal bands and fine grain noise if necessary.

Step 2)



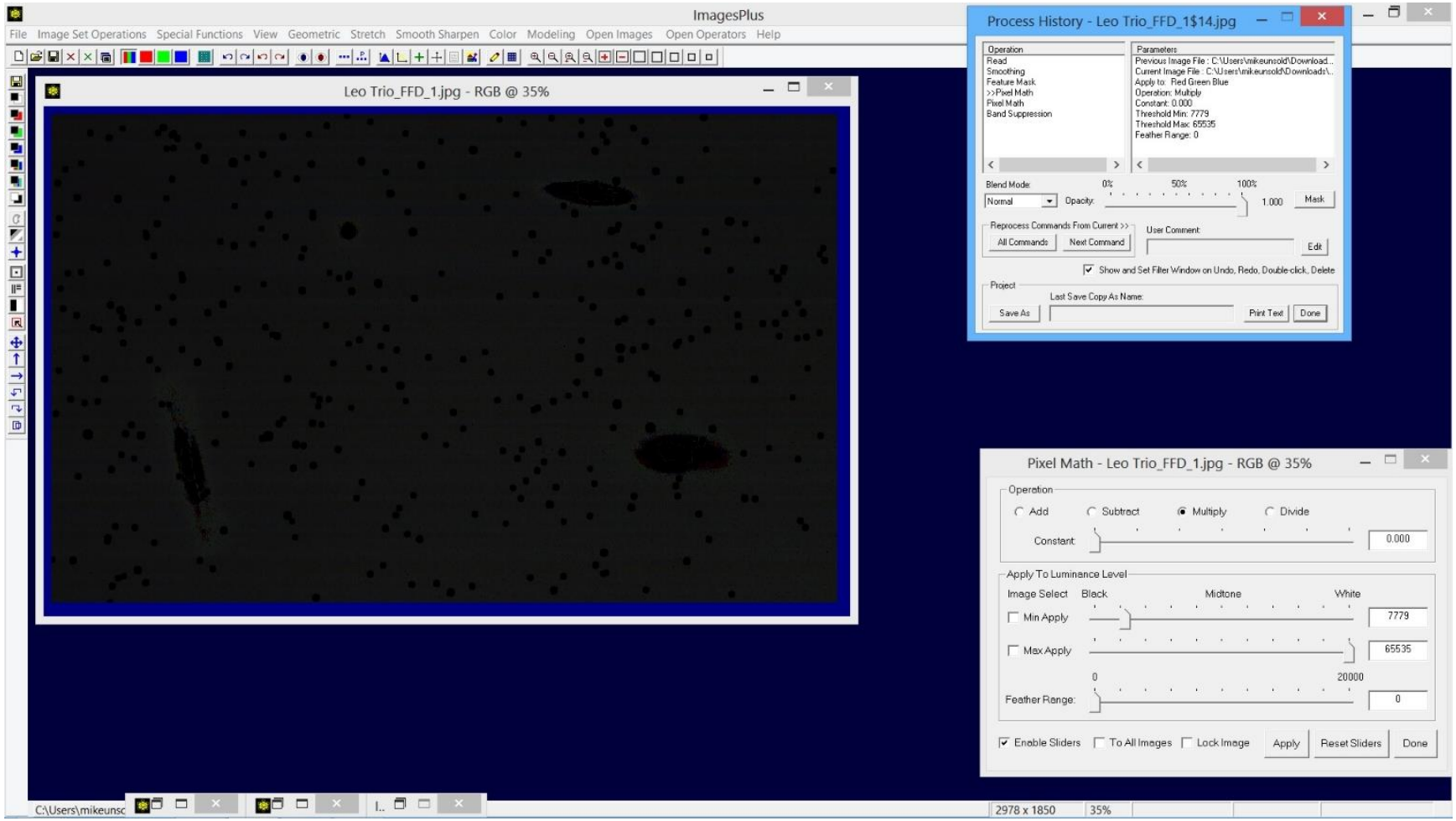

The Smooth Sharpen | Smoothing & Noise Reduction tool is used first to remove the fine grain noise pattern. The adaptive detail preserving Selected Neighborhood option with a 3x3 blur window size is used to remove the fine grain noise without loss of image detail.

Step 3)



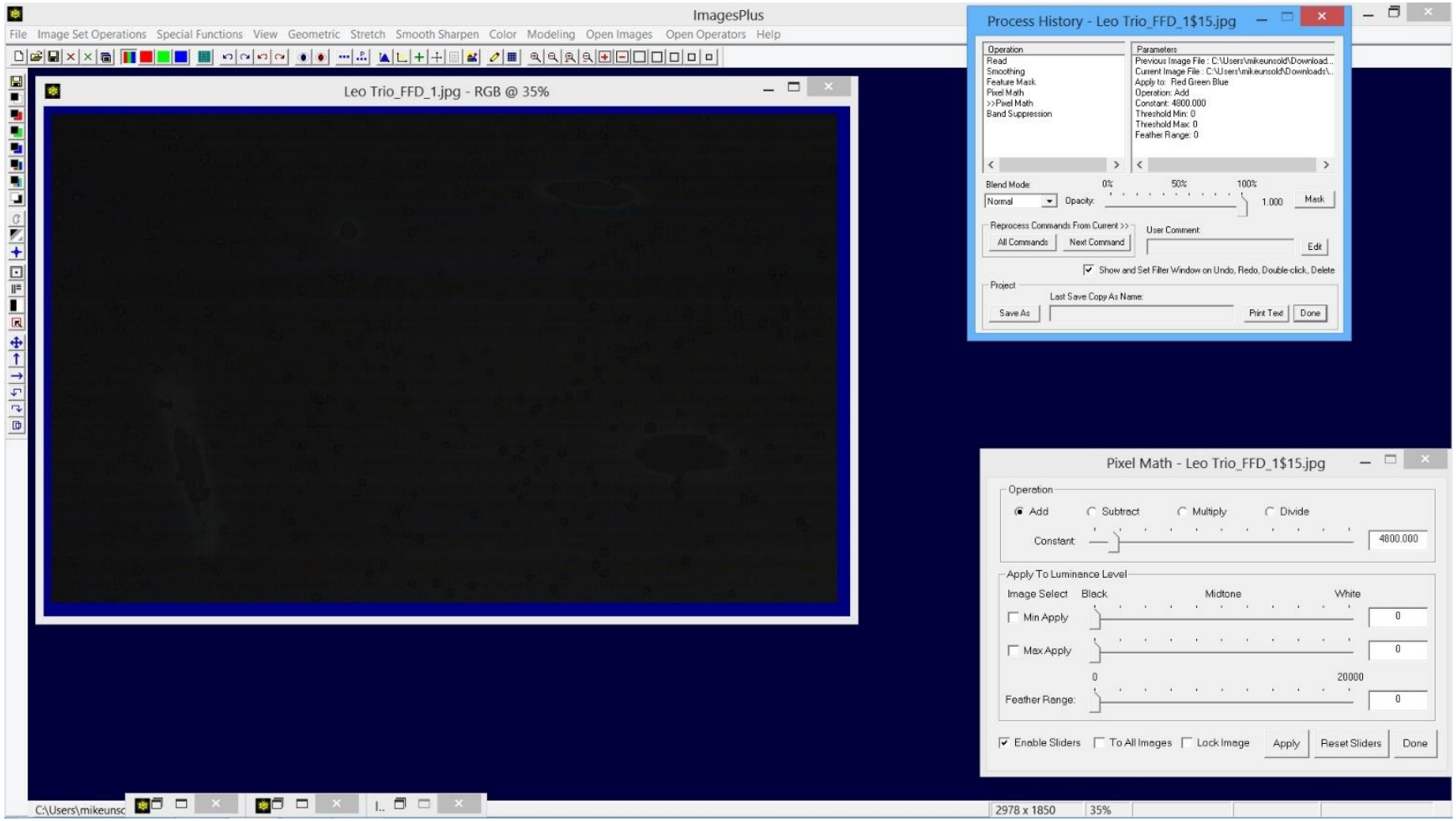

Special Functions | Mask Tools | Feature Mask is used to set stars and the bright cores of the galaxies to black. Note that the Fill Radius | Enable option of the Feature Mask is not checked so that the areas set to black are not filled in by the Feature Mask tool. Pixel Math will be used as shown in the next two steps to extend and fill in the black areas created by the Feature Mask tool.

Step 4)



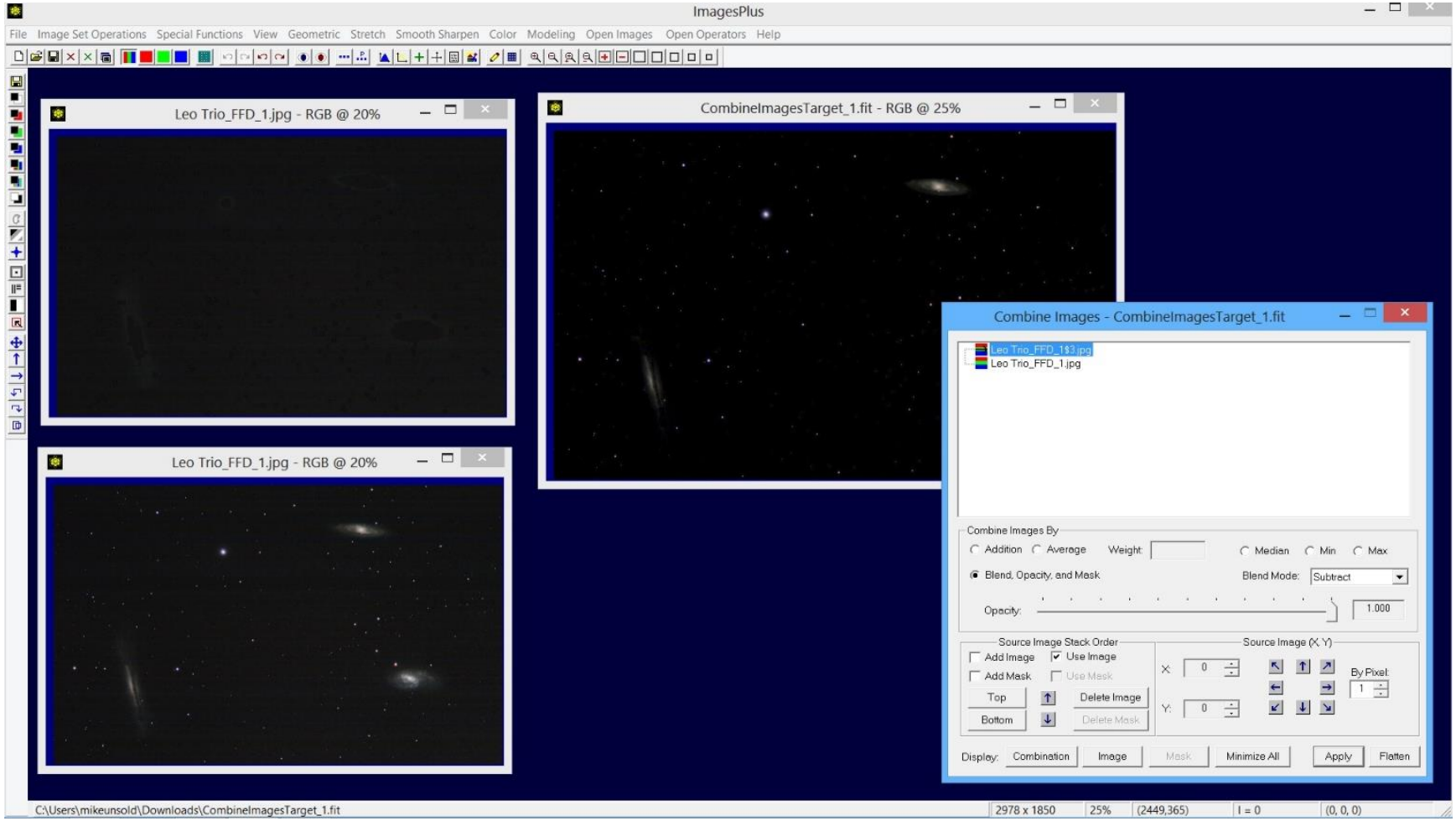

Special Functions | Pixel Math is used to blacken the remaining brighter parts of the galaxies. Set the Pixel Math operation to Multiply with a value of 0.00 then adjust the Min Apply slider to the right so that the galaxies are black and the background with horizontal bands is not changed.

Step 5)



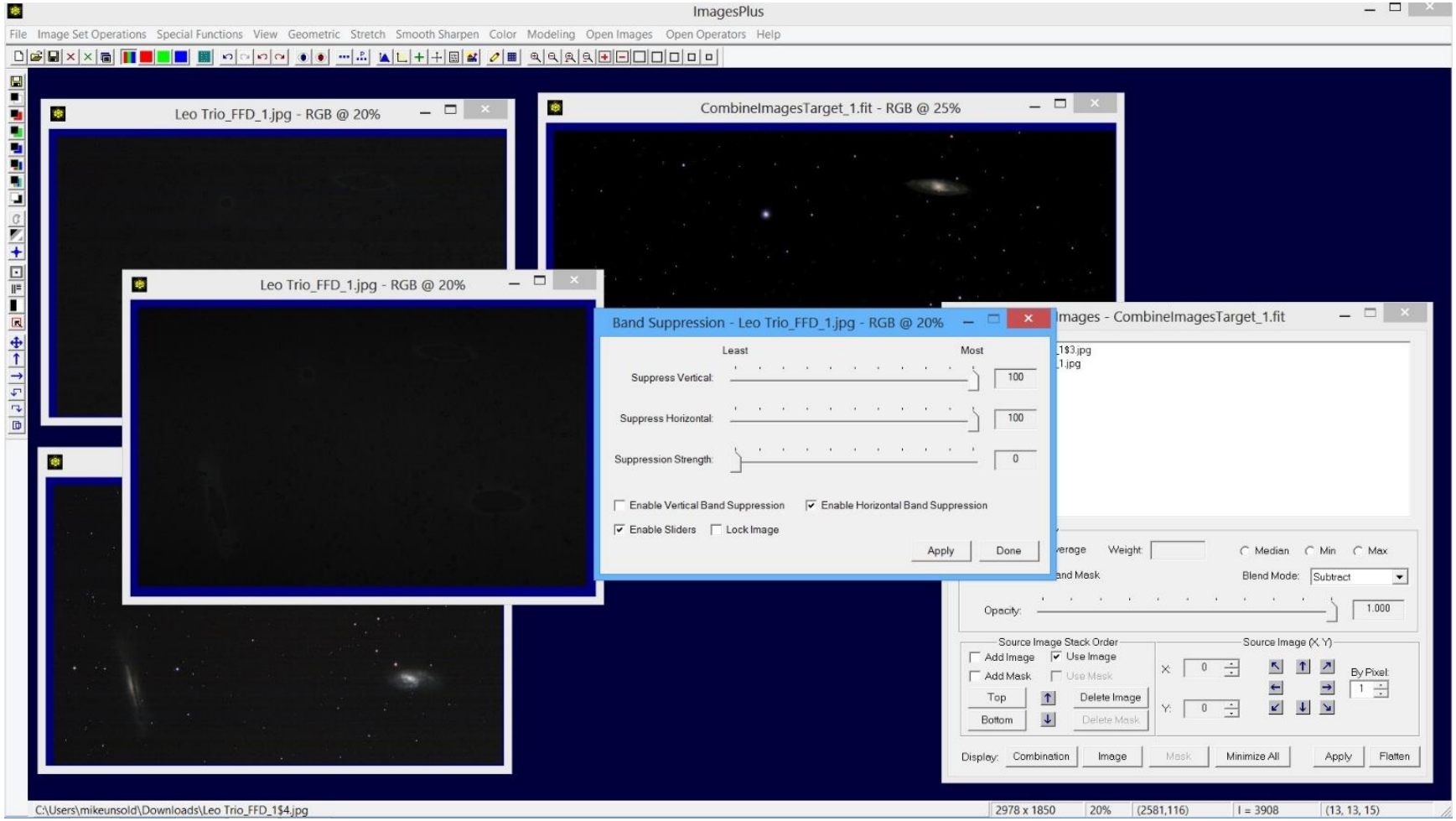

First press the Set View Using the Image Currently Displayed button on the top horizontal toolbar to save the first application of Pixel Math from the previous step and allow Pixel Math to be applied a second time with different parameters. Pixel Math will now be used to set the black areas created by the previous two steps to a value a little higher than the average background level. Set the Max Apply value to 0 so that only areas that are black with a value of 0 are changed. Now set the Pixel Math operation to Add and adjust the slider to a value of 4800 which is a little higher than the average background level.

Step 6)



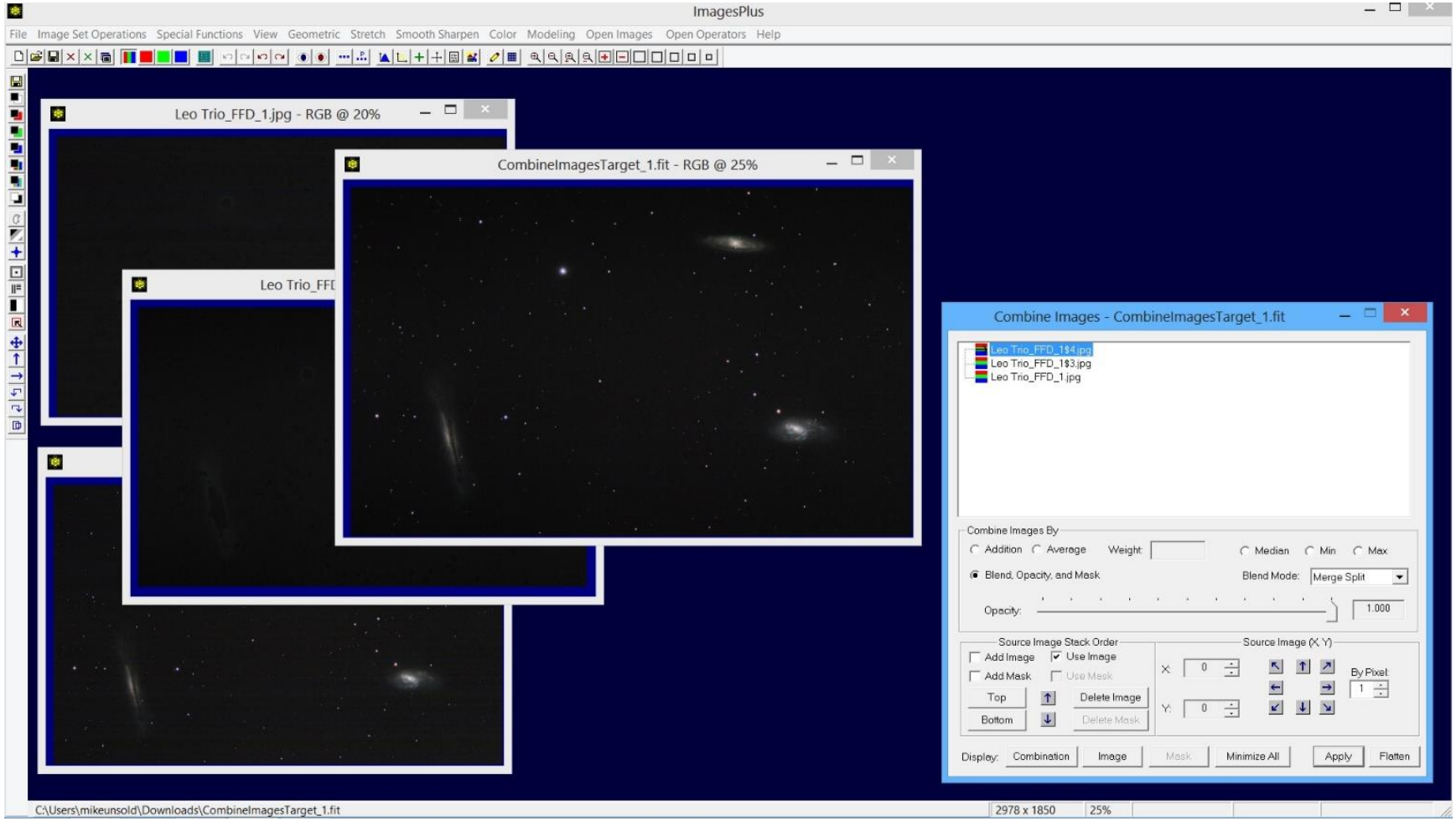

Use Special Functions | Combine Image | Blend, Opacity, and Mask to create a matching star and galaxy detail image by subtracting the background image with horizontal bands from the smoothed initial image. The smoothed initial image is the bottom layer with normal blend mode. The background image with horizontal bands is the top layer with subtract blend mode. The layered combination image with stars and galaxy detail is shown top center.

Step 7)




Make a copy of the background image with horizontal bands using the Duplicate button on the top horizontal toolbar. Apply the default setting of the Smooth Sharpen | Band Suppression tool with only horizontal band suppression enable to the duplicate background image to remove the horizontal bands.

Step 8)




Add the duplicate background image with horizontal bands removed as the top layer and set its blend mode to Merge Split. The layered combination image, shown top center, has star and galaxy detail but no horizontal bands or fine grain noise.

Initial image without band suppression.

Image after advanced band suppression is applied.