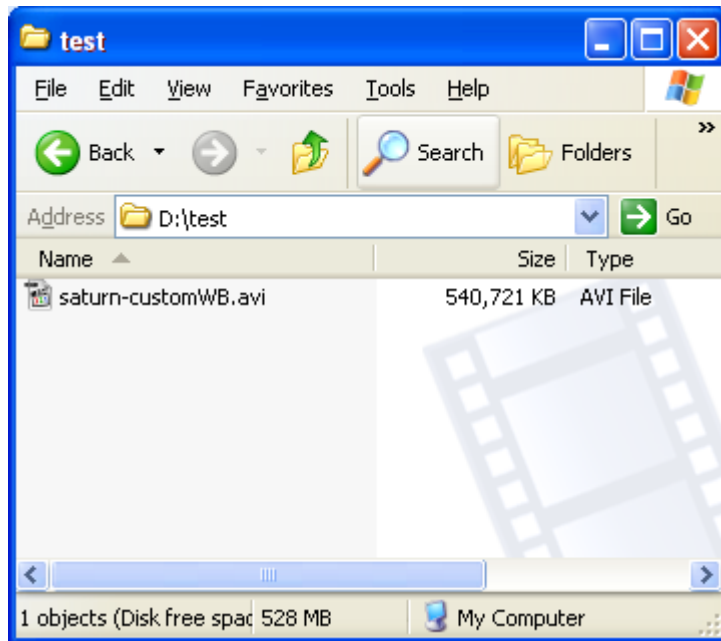


How to process planetary images taken with a webcam

This tutorial will cover planetary image processing, describing the steps and methods I use to process planetary images captured with a webcam attached to the telescope.

Capture the data

This is the avi video file taken with the Phillips SPC900N attached prime focus to my telescope Vixen VC200L.



Processing the data

You'll need the following programs to follow the processing routine.

Virtual Dub

Used to convert the avi into a set of bitmap (BMP) files. The bitmap files are required because the programs in the following steps work on bitmap files, not videos.

Ninox

Windows command-line tool used to crop centre and rank the BMP files.

Registax

A program used to align, optimize, stack and process the BMP files.

AstralImage

A program used to perform deconvolution on the resulting BMP image.

Photoshop CS

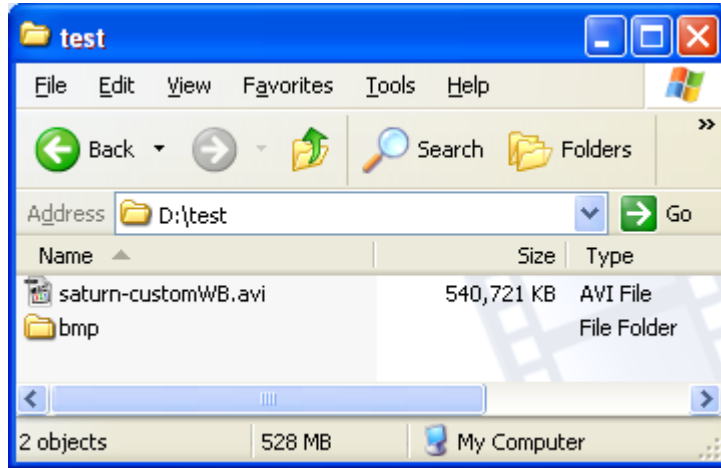
Used for final adjustments of color balance, levels, contrast, sharpness and preparation for web posting.

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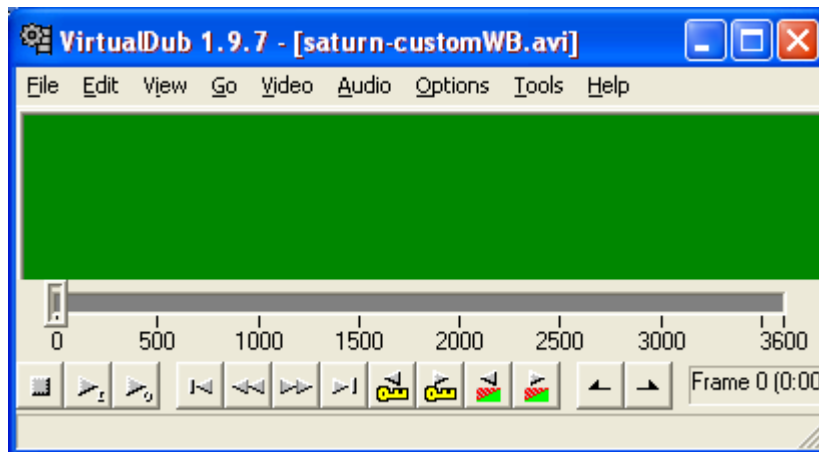
Processing Steps

Step1: Saving the AVI as BMP's using VirtualDub

Create the directory \bmp

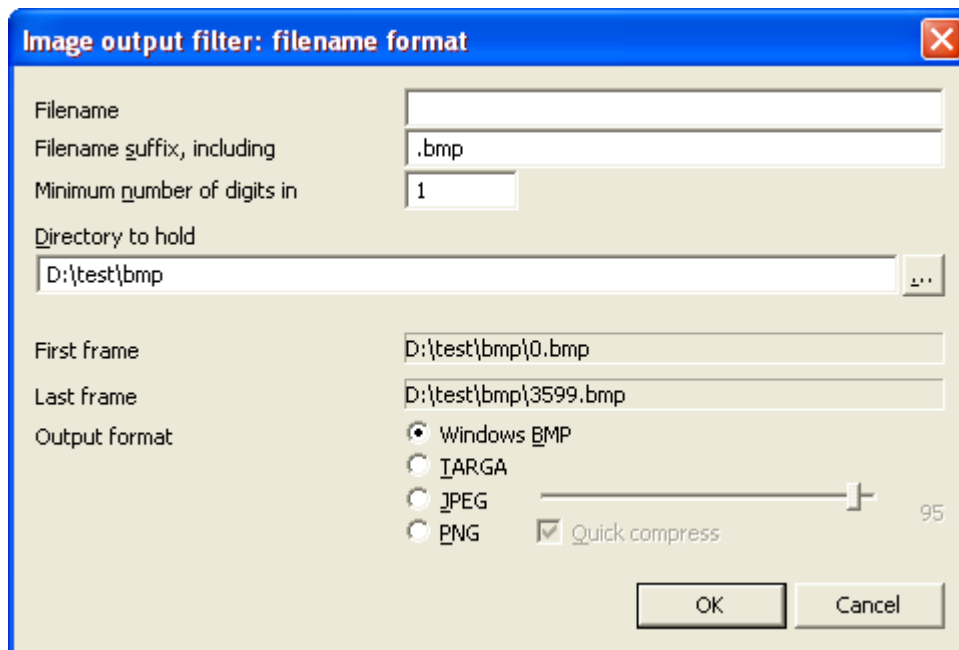
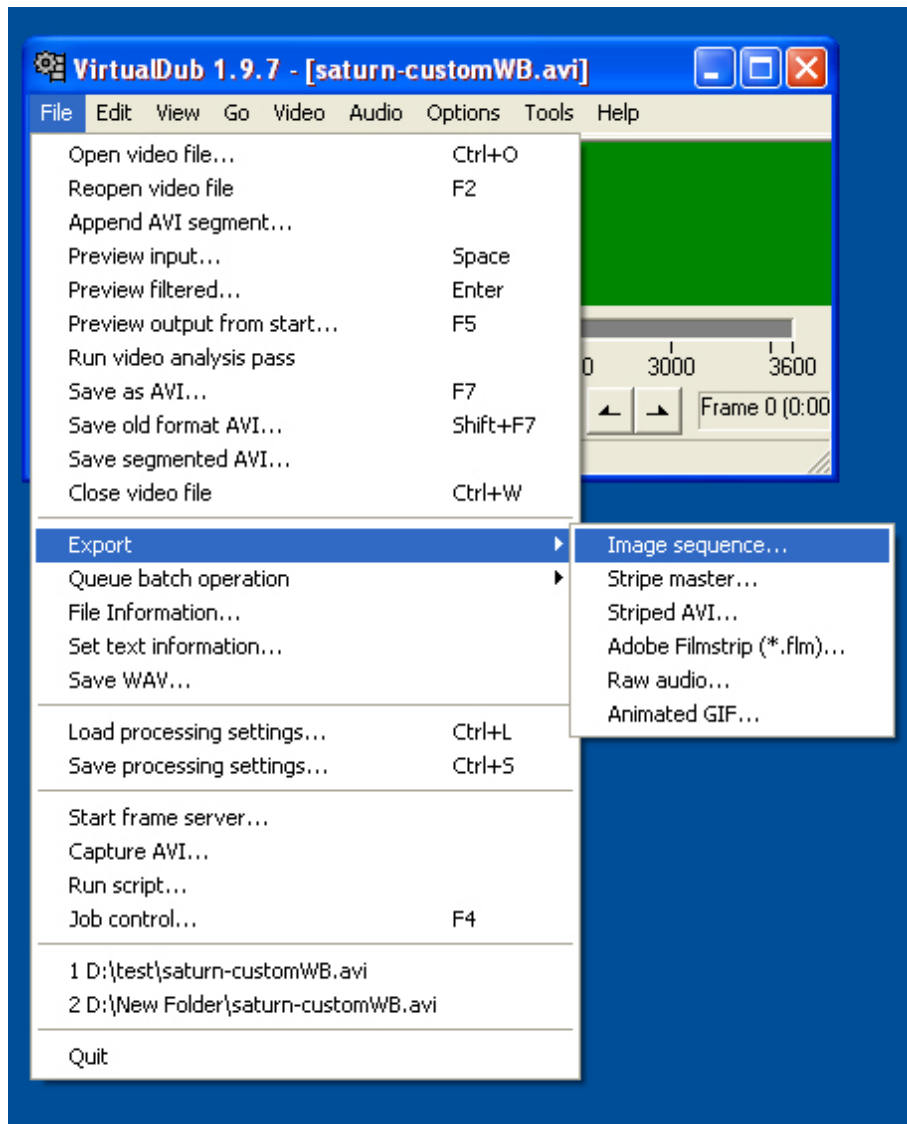


Open saturn-customWB.avi in VirtualDub

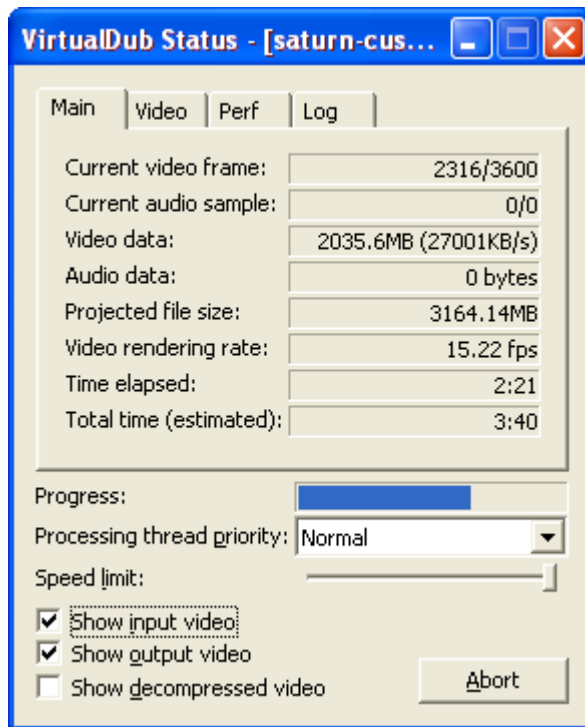


Export the BMP files from the avi file and save them into your BMP directory

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Step2: Run the BMPs through Ninox

Using Ninox has three main advantages:

- **Centering the planet in the middle of the frame**

Great for those with inaccurate tracking because registax seems to handle aligning much better when the tracking is accurate. It also makes registax faster.

- **Cropping**

Cropping to 400x400 (more or less) is good because it makes the whole processing in registax much faster.

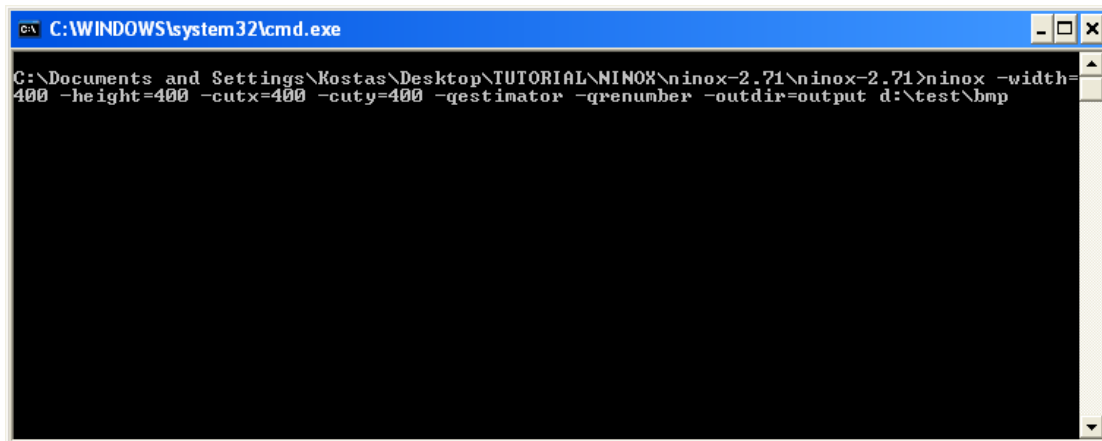
- **Ranking**

If you use the qestimator and renumber functions, it basically does a "gradient" analysis on each frame, and then renumbers them to rank them in best to worst order. Now when you drag them into registax, frame 0000 is the best. When you align in registax, you can choose the alignment feature on the best frame, which generally means registax should align and rank the frames much more accurately.

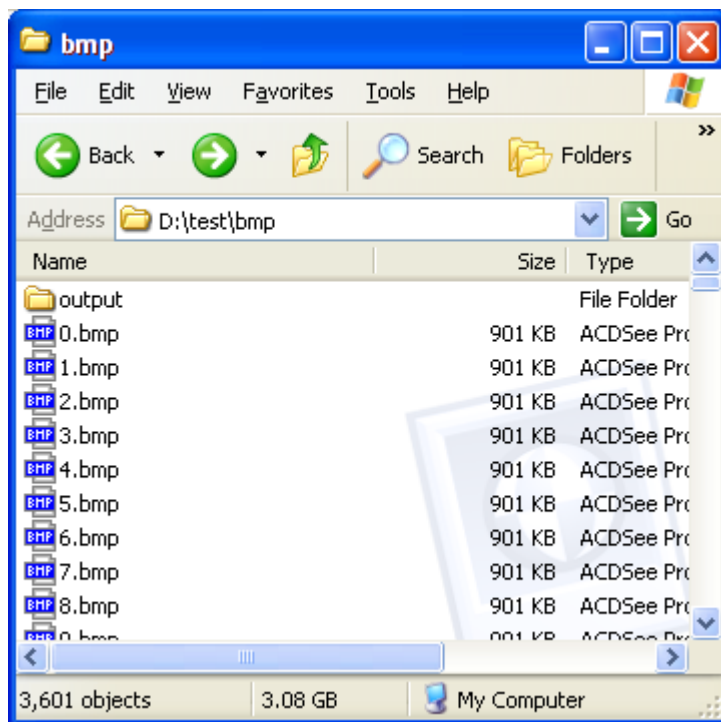
To run it from DOS, open up a dos window (Start -> Run -> "cmd"), and change directory to your imaging directory by typing "`cd d:\test\bmp`". Run Ninox by typing the following:

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```
ninox -width=400 -height=400 -cutx=400 -cuty=400 -qestimator -qrenumber -outdir=output d:\test\bmp
```

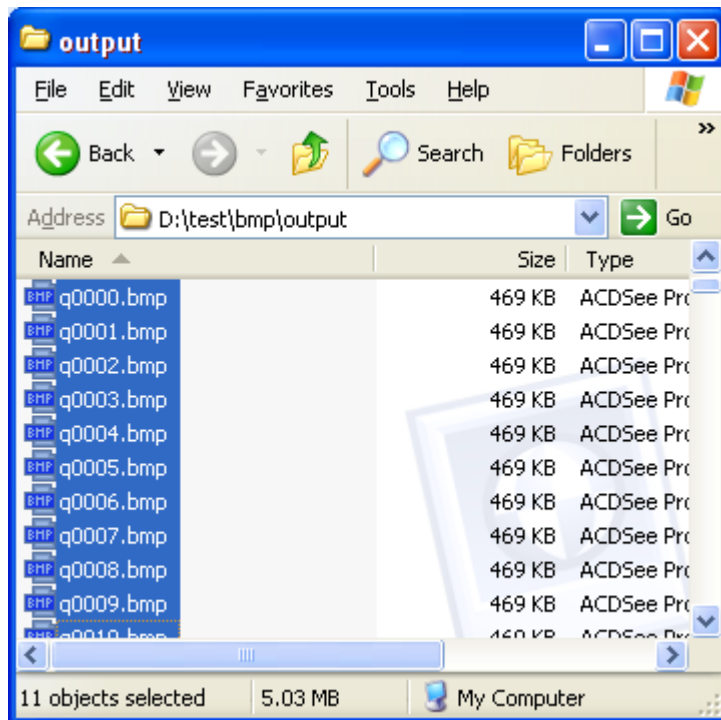


Ninox automatically puts processed BMP files in the subdirectory output



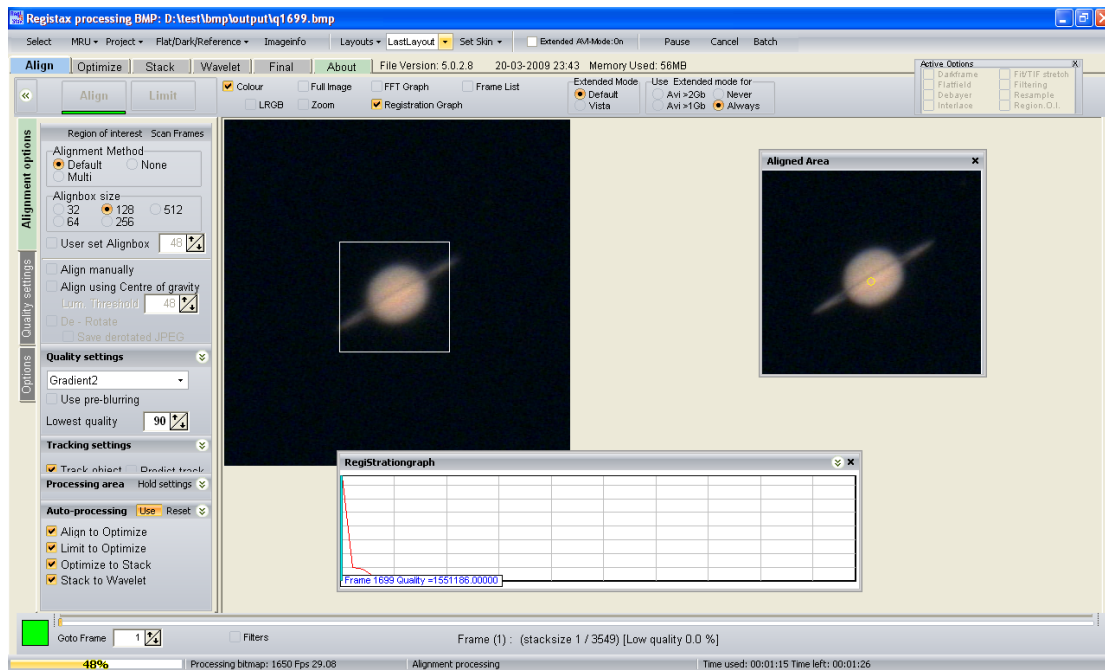
The renumbered part of the filename will start with the letter **q** followed by that files ranking in the quality list, highest quality will have rank 0.

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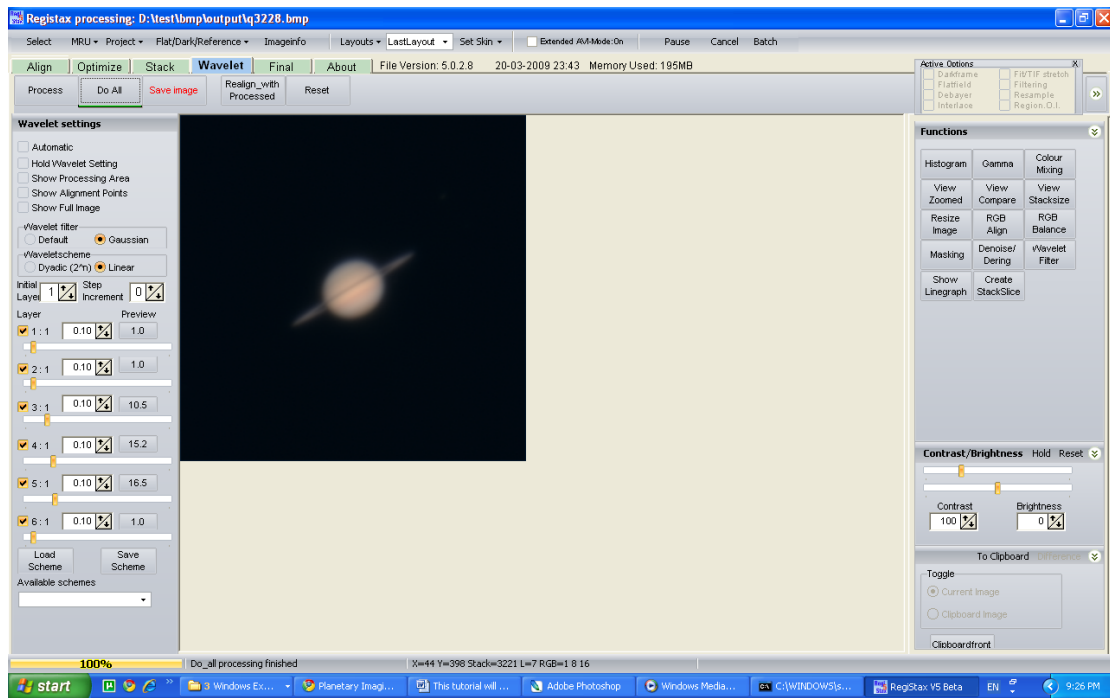
Step3: Registax Processing

Open up registax, and then back in Windows Explorer, select all of the bitmaps in your output directory starting with qxxxx.bmp. Drag them onto the registax window and let registax automatically make the processing.

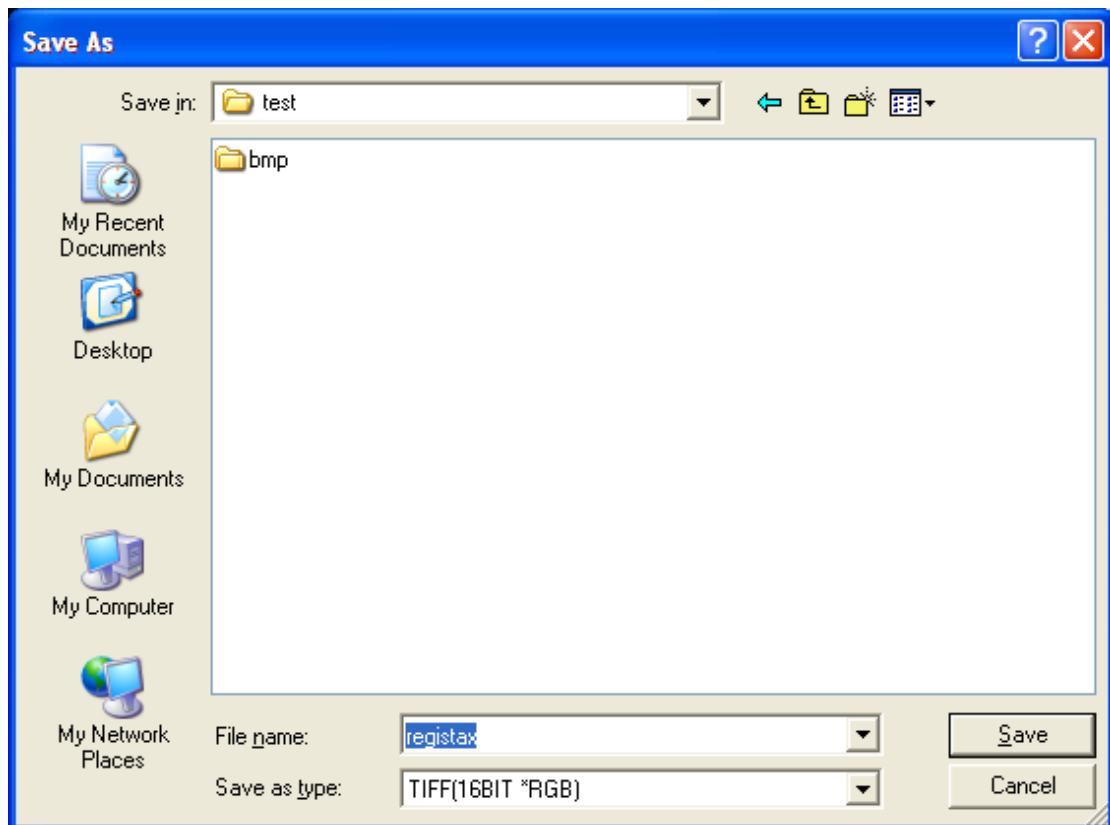


Apply the following wavelets to the image: 3 @ 10.5, 4 @ 15.2, 5 @ 16.5

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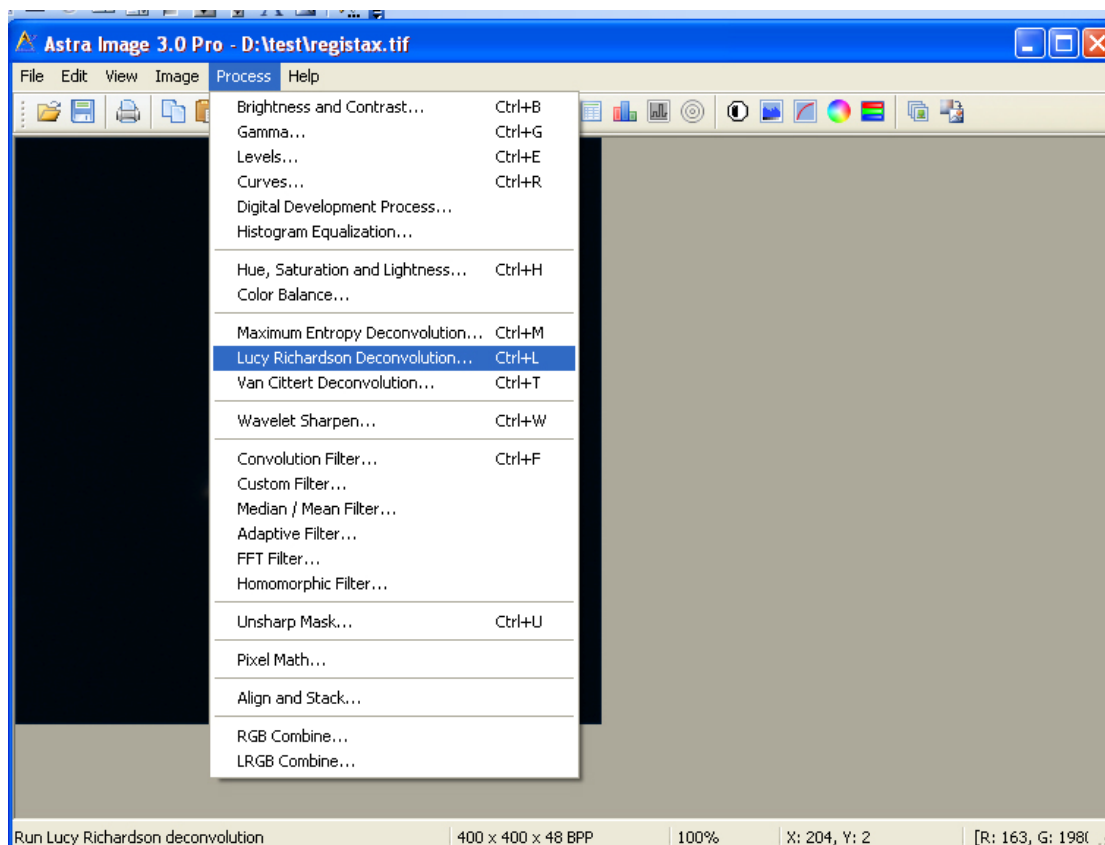
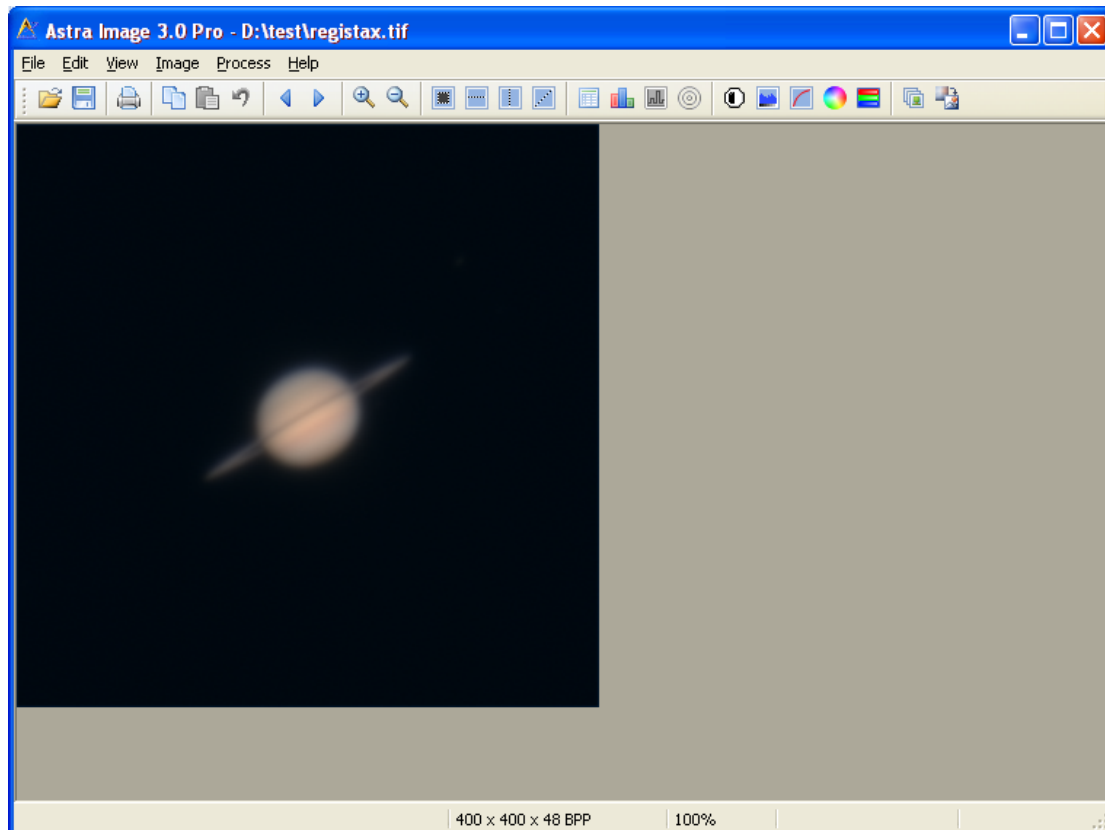
Save the final image



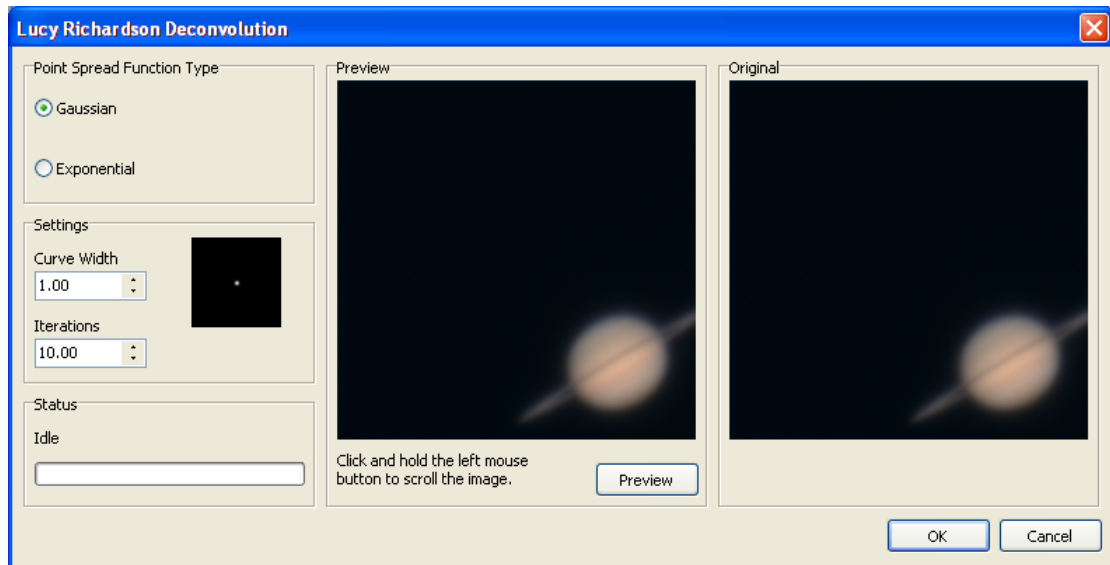
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Step 4: Astralimage Processing

Use Astralimage to perform deconvolution to the image saved from registax.



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This is the output after deconvolution



Step 5: Photoshop Processing

I use photoshop to do any final adjustments to the image, and also to save it for the web. The adjustments may include levels or curves adjustment, saturation, color balance and final unsharp mask. What final adjustments are needed depend mostly on personal taste.

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This is the final image of Saturn

Clear Skies!!!