

Photography



From Dusk



Till Dawn

Night Photography Rewards

- *Capturing images at night or in very low light conditions can be very rewarding and surprising.*
- *Creating images at night the camera reveals many things that we cannot see with our unaided eyes.*
- *There are many different images to create which are not obtainable under normal conditions*
- *The camera can see colour where we only see only shades of grey*



Star trails





Photographer Preparation

- *Torch to see where to go (there may be a cliff close by)*
- *Compass to locate south*
- *Seat for R 'n R*
- *Clothing for conditions if cold have sufficient warm clothing on hand.*
- *Refreshments, nibbles. (coffee, tea, snacks etc.)*
- *What ever comforts you need to enjoy the Evening (not too many stronger refreshments)*

Camera preparation for the night

- *Camera (know your camera and its controls locations)*
- *Any Suitable Lens Will capture star trails however better results are achieved with faster Wide Angle lenses $f2$ or $f2.8$ at 18 mm (or wider)*
- *Sturdy Tripod*
- *Turn off any accessories that may drain your battery.(Live view)*
- *Ensure you have Spare Batteries / Cards*
- *Pre focus on infinity and remember to **TURN OFF** Auto Focus*
- *Remote Shutter Release Single or Programmable.*
- *Set white balance to DAYLIGHT*
- *Ensure when Camera is on the tripod, that both batteries and camera cards can be replaced without moving the camera.*

Choosing your Location:

- *Locations with foreground structures such as buildings, grave stones, bodies of water, foliage, stockyards, trains, bridges etc. can give added interest to images.*
- *Research the area prior to taking images where possible, to choose the best site for setting up.*
- *Trails may be captured in town, any location is satisfactory however better images will be achieved when images are generally created away from areas where there is any form of city lighting, which can interfere with your image.*

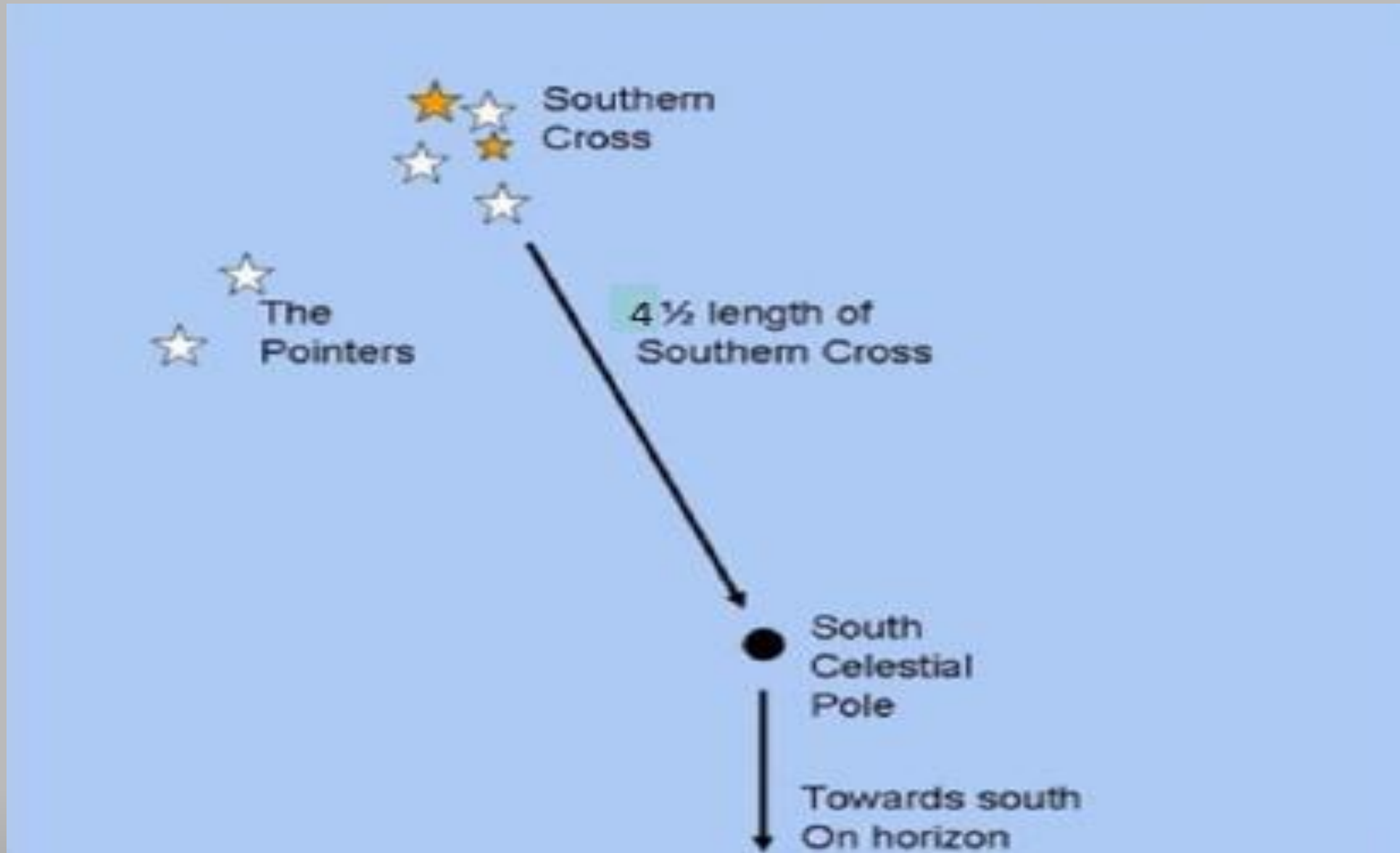




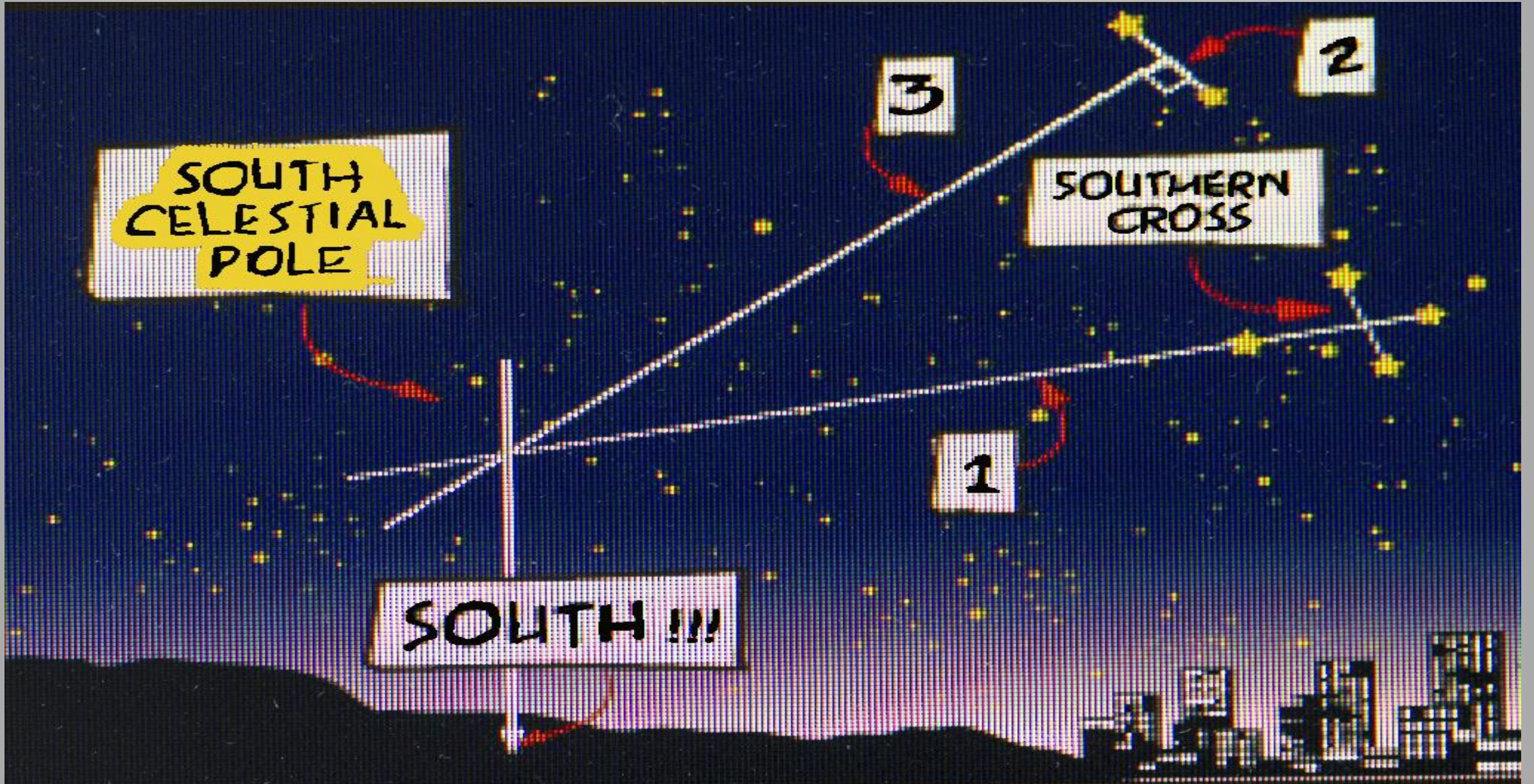
Locating south without compass

1. *The first step is to identify the Southern Cross – it is a compact group of bright stars close together in the sky with the two Pointer stars always pointing to them from nearby.*
2. *Then extend the main axis of the Cross from and in the direction of its brightest star by four and a half times its length.*
3. *You have now reached the South Celestial Pole – the point about which the Cross and all stars turn in the sky.*
4. *From the Pole drop a line straight down to the horizon – that is south.*
5. *It is worth practicing this from your backyard as such knowledge will be most helpful if you are ever lost in the bush. To find direction*
6. *When facing the south north is behind you, West to the right and east to the left.*

Rough location south using the Southern Cross



Finding South Another Method



The Milky Way

- *When the milky way can be seen spreading from the northern to southern horizon the sky is dark and star trails are possible.*
- *When only a few stars can be seen faintly in the sky or when the moon is up or nearly so, star trails are also possible-they just require a little more planning - and shorter exposures.*
- *High thin clouds can add a more dramatic milkiness to an image as can the milky way itself.*
- *Remember its your image make it as you like it and enjoy the outcome*



Camera Settings

- White Balance Set white balance to daylight
- Mode Set the camera mode dial to Bulb Manual
- ISO Set 100 Set the camera to manual mode /“Bulb”

- Long Exposure Noise Reduction
- Turn off (Timing till the next shot will be the same as the time taken to shoot the previous image. Noise reduction process time.
(Canon Custom Function II-1)
- Turn off high ISO reduction (Canon Custom. Function II-2)

Considering the Sky

- *There are differing views in relation to sky selection*
- *Generally a sky away from any form of unnatural lighting is best.*
- *Some photographers like dark skies*
- *Other photographers like light or blue skies*

Light Conditions

1. *There is no visible glow in the direction the image is being taken. Sometimes these glows are only noticed after long exposures.*
2. *The sun has set for at least 90 mins and it is at least 90 mins before sunrise.*
3. *The moon can be used to get light onto foreground objects when the foreground is distant from the camera or large in appearance.*
4. *The above are dependant on the style of image you wish to create.*
5. *The phase of the moon can be useful in lighting up foregrounds, backgrounds or other points of interest in your images.*

Shutter speed Calculation

- *To find out how long to expose an image use the following formula for a 1.6 crop factor:*
- *Divide 500 by the focal length in 35 mm terms to find the maximum number of seconds of exposure without noticeable Trailing.*
- *That is to say if you are using a 10mm lens on a 1.6 crop factor camera $500/(1.68*10)=29.77$ seconds (30 seconds). See shutter speed calculator included in handout.*
- *If a 200mm lens is used trails begin to show at around 1.6 seconds due to the closeness of the shot.*
- *A wider angled lens will need a longer exposure to trail.*

500 / 600 Rule Quick Reference Guide

Focal Length	1.5 Crop Sensor (Nikon / Sony)		1.6x Crop Sensor (Canon)		Full Frame Sensor	
	500 rule	600 rule	500 rule	600 rule	500 rule	600 rule
8mm	42s	50s	39s	47s	63s	75s
14mm	24s	29s	22s	27s	36s	43s
17mm	19s	23s	18s	22s	29s	35s
24mm	14s	17s	13s	16s	21s	25s
35mm	9s	11s	9s	11s	14s	17s
50mm	7s	8s	6s	7.5s	10s	12s
70mm	5s	6s	4s	5s	7s	9s

Basics

Setting Up

- ❖ *Setting up before last light where possible you can make all your settings and changes prior to losing daylight.*
- ❖ *If you want a lighter sky for your image you can take it before it gets dark.*
- ❖ *You can select a sky the colour, tone you want.*
- ❖ *You can select a good focused image with a good foreground for merging/stacking later.*

Focusing

- *Turn off auto focusing by setting lens to MF*
- *I find it is easier to set your focus to infinity and leave it there.
(foreground objects and stars will probably be in focus at very wide apertures if using a wide angle lens.)*
- *It is not easy to get a lock on AF when it is dark , do not fear if you wish to use AF there are solutions at hand.*
- *If you have to use AF once you have your focus set, then be sure to set it to MF before you start, otherwise your exposure is likely to change with each image taken.*

Capturing Star Trails

- *When the shutter speed is too slow for moving objects motion blur occurs.*
- *The longer exposures used and needed for night photography allow the earth to rotate sufficiently to streak the stars.*
- *To obtain a more natural looking sky the exposure time should be just sufficient to allow streaking to show. This is to say more images over a long period of time*
- *The gap between each image should be minimal*
- *Full circle images can take hours.*

Intermission



Image Processing

- *Download images from your camera card in your normal manner.*
- *Convert RAW images into tiff or jpeg for processing by your normal means.*
- *Block convert to save time for multiple images*
- *Block converting can be done with any program you wish to use
e.g.: Adobe Lightroom, Canon DPP etc.*
- *In lightroom you can edit one image and pass on changes to all images prior to stacking.*
- *I find it is easier to process the final stacked image in Photoshop.*

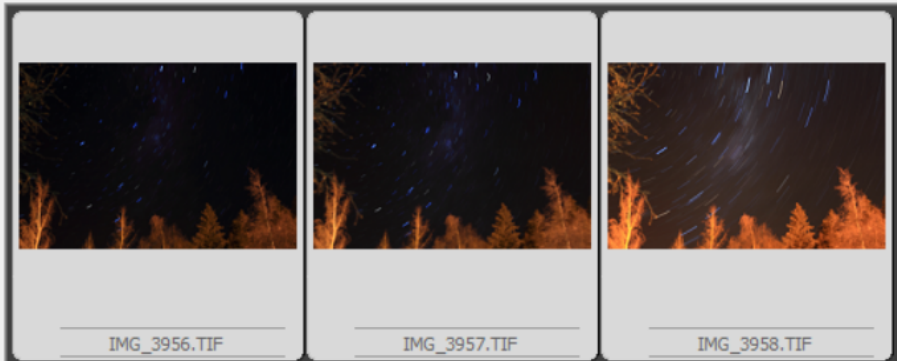
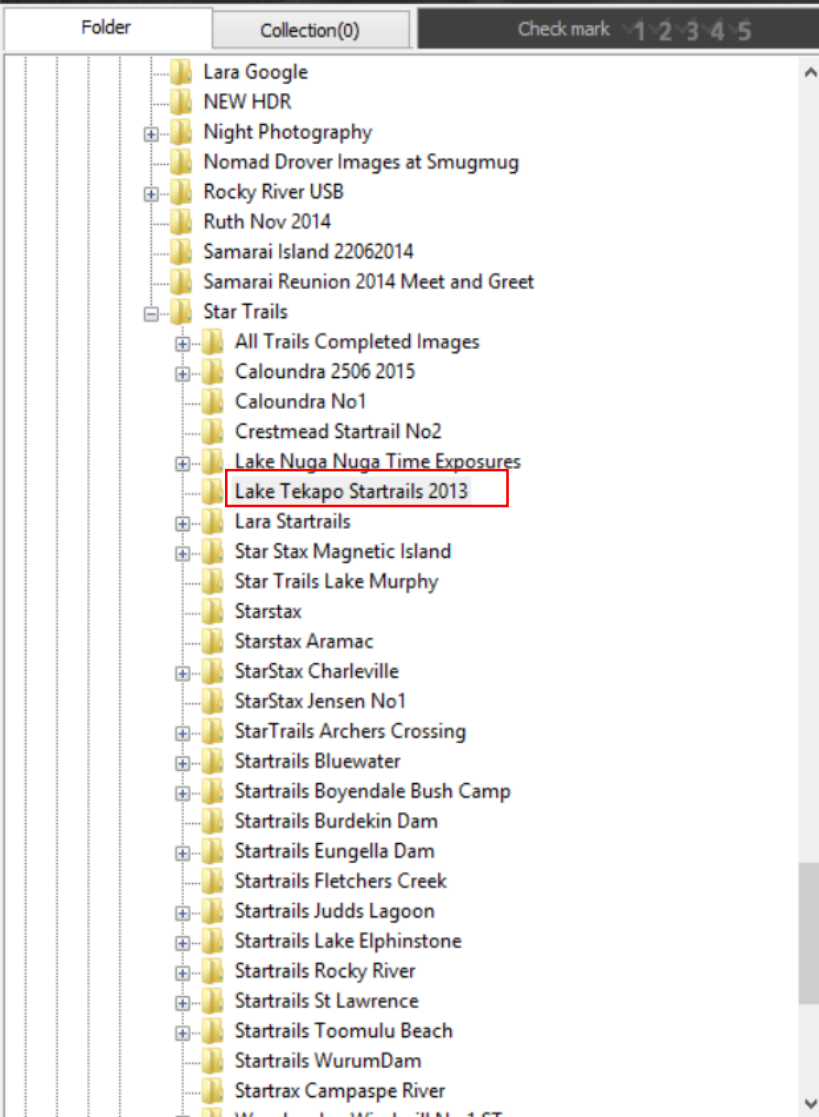
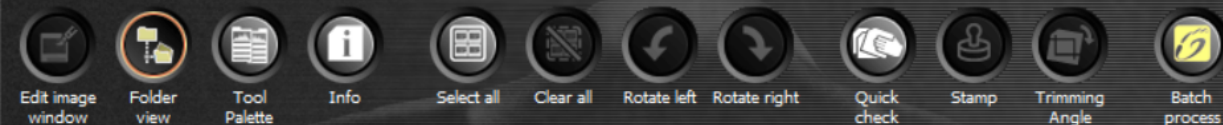
Stacking Images

- Stacking creates the final image by picking the brightest pixels from each image.
- Stacking can also employ averaging which has the great benefit of reducing noise.
- Images can be imported into StarStax or StarTrails for processing
- Once the final stacked image has been processed in the stacker, final post adjustment work can be completed in your preferred program.

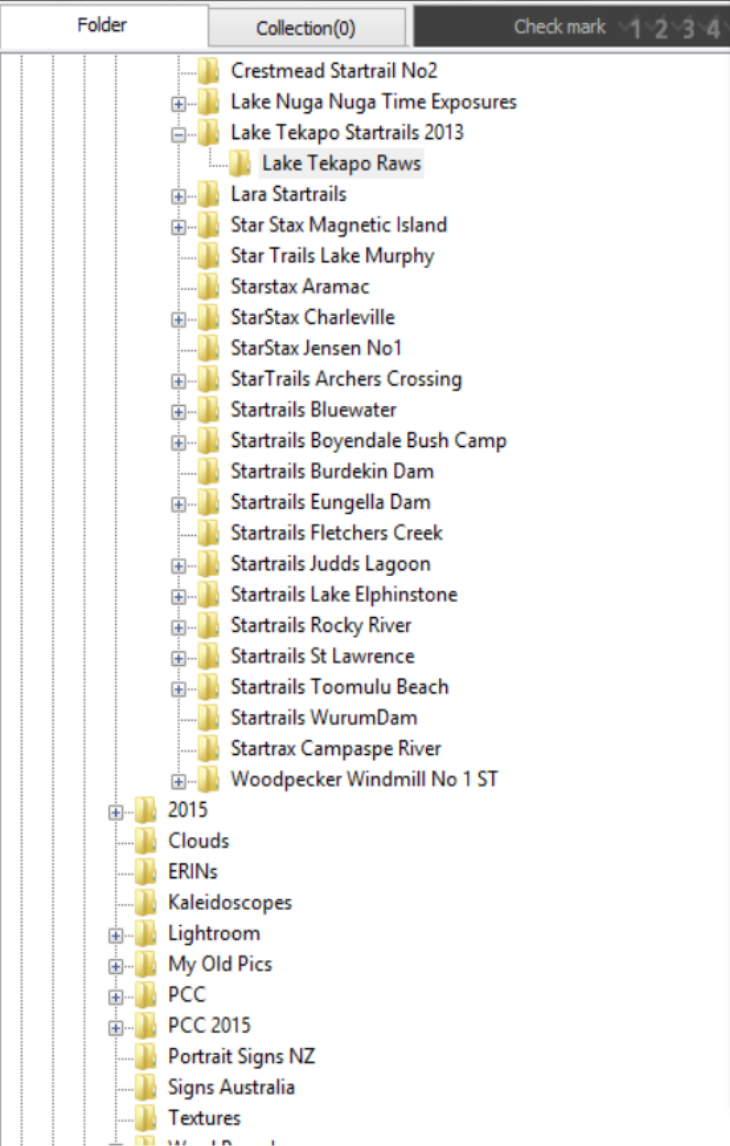
Block Converting with DPP

Select Program for batch processing





Locate and select images for processing then click on batch process



Batch settings

Save folder
D:\My Pictures\2014\Star Trails\Lake Tekapo Startrails 2013\Lake Tekapo Raws **Browse...**

File format
Kind of file: Exif-TIFF 8bit
Image quality: 10

Output setting
Output resolution: 350 dpi Embed ICC profile

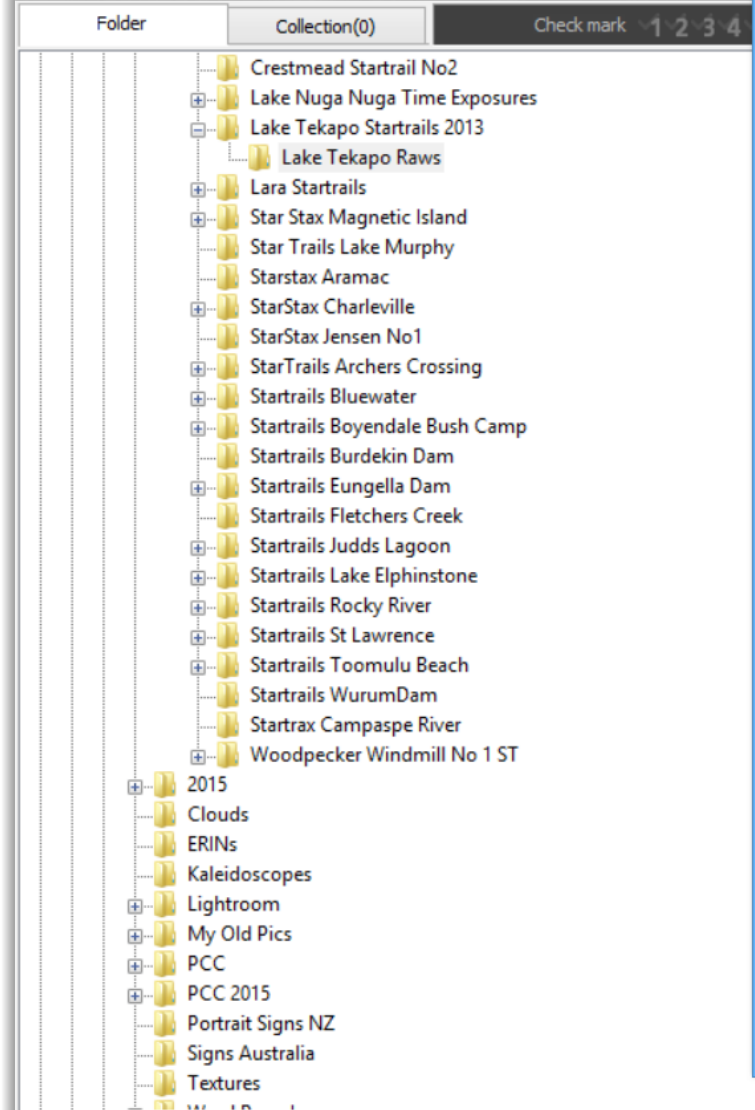
Resize setting
 Resize
Width: [] x Height: [] Unit: pixel
 Lock aspect ratio

File name
 Current file name
String: []
 New file name
String: DPP_ Sequence number: 9782
 Save sequence number
Ex.: IMG_3956.TIF, IMG_3957.TIF...

Image transfer settings
 Open image using software
[] **Browse...**

Convert RAW images only **Execute** Cancel

Check Save folder is correct location for saving stacked image



Batch settings

Save folder
D:\My Pictures\2014\Star Trails\Lake Tekapo Startrails 2013\ Lake Tekapo Raws

File format
Kind of file: **Exif-TIFF 8bit**

Image quality: 10

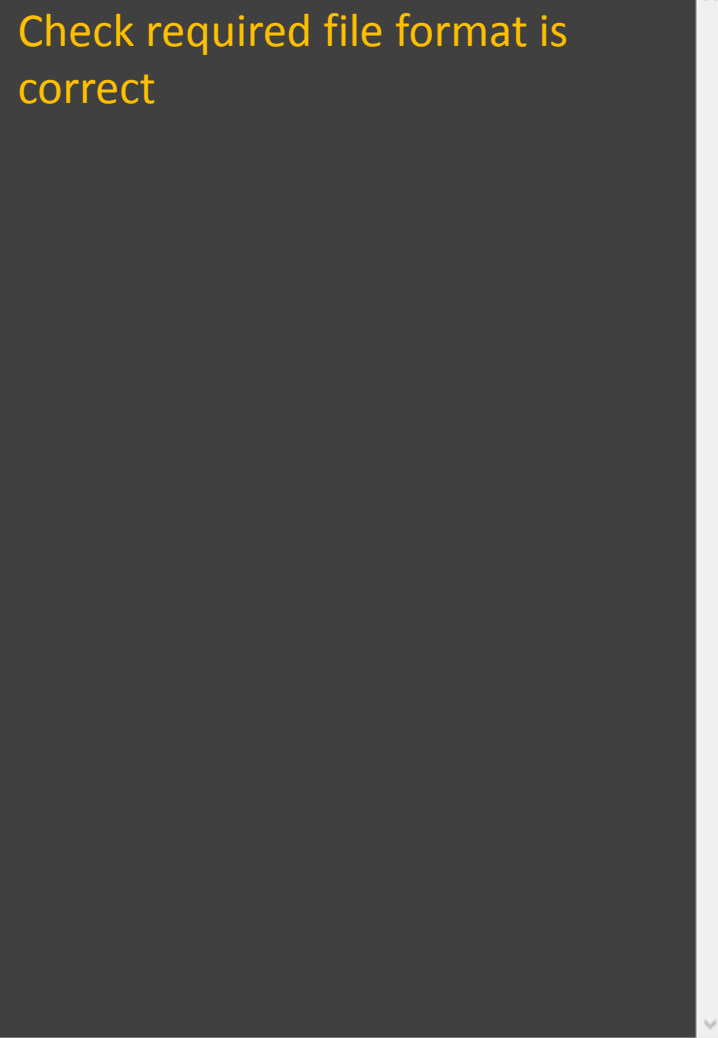
Output setting
Output resolution: 180 dpi Embed ICC profile

Resize setting
 Resize
Width: x Height: Unit: pixel Lock aspect ratio

File name
 Current file name
String:
 New file name
String: DPP_ Sequence number: 9782 Save sequence number
Ex.: IMG_3956.TIF, IMG_3957.TIF...

Image transfer settings
 Open image using software

Convert RAW images only Execute Cancel



Check required file format is correct

File Edit View Bookmark Label Adjustment Tools Window Help

Edit image window Folder view Tool Palette Info Select all Clear all Rotate left Rotate right

Folder Collection(0) Check mark 1 2 3 4

- Crestmead Startrail No2
- Lake Nuga Nuga Time Exposures
- Lake Tekapo Startrails 2013
 - Lake Tekapo Raws
- Lara Startrails
- Star Stax Magnetic Island
- Star Trails Lake Murphy
- Starstax Aramac
- StarStax Charleville
- StarStax Jensen No1
- StarTrails Archers Crossing
- Startrails Bluewater
- Startrails Boyendale Bush Camp
- Startrails Burdekin Dam
- Startrails Eungella Dam
- Startrails Fletchers Creek
- Startrails Judds Lagoon
- Startrails Lake Elphinstone
- Startrails Rocky River
- Startrails St Lawrence
- Startrails Toomulu Beach
- Startrails WurumDam
- Startrax Campaspe River
- Woodpecker Windmill No 1 ST

2015

- Clouds
- ERINs
- Kaleidoscopes
- Lightroom
- My Old Pics
- PCC
- PCC 2015
- Portrait Signs NZ
- Signs Australia
- Textures

Batch settings

Save folder
D:\My Pictures\2014\Star Trails\Lake Tekapo Startrails 2013\Lake Tekapo Raws Browse...

File format
Kind of file: Exif-TIFF 8bit
Image quality: 10

Output setting
Output resolution: 180 dpi Embed ICC profile

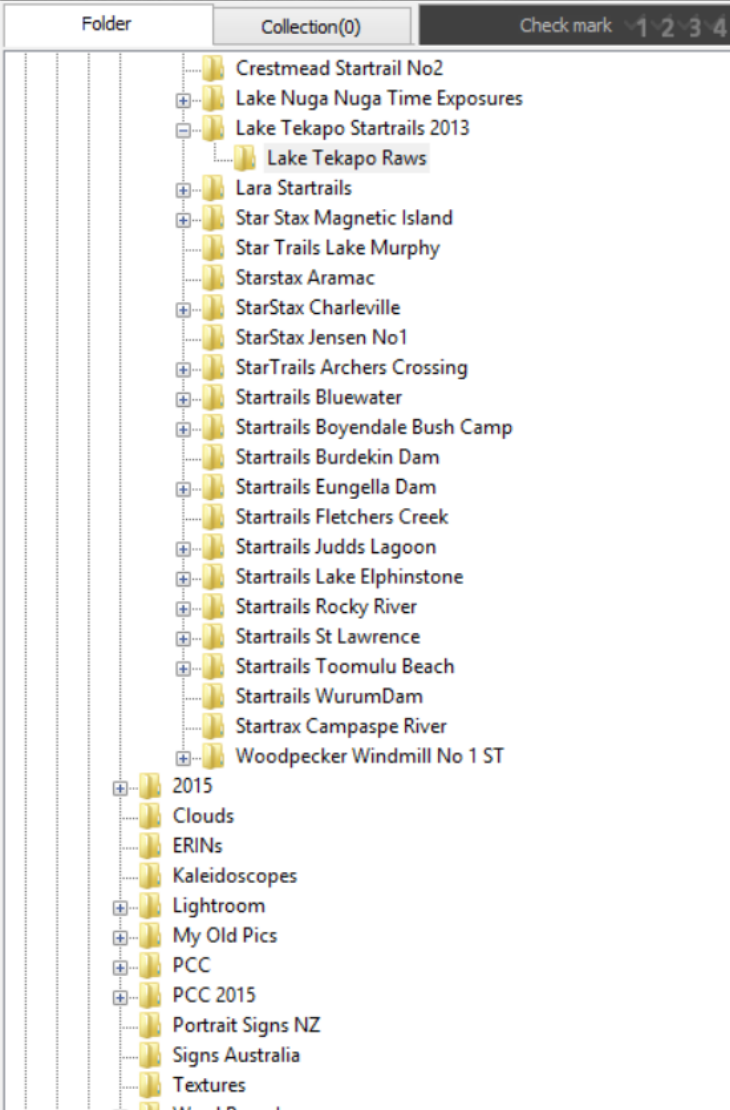
Resize setting
 Resize
Width: x Height: Unit: pixel
 Lock aspect ratio

File name
 Current file name
String:
 New file name
String: DPP_ Sequence number: 9782
 Save sequence number
Ex.: IMG_3956.TIF, IMG_3957.TIF...

Image transfer settings
 Open image using software
Browse...

Convert RAW images only Execute Cancel

Check output resolution is as required



Batch settings

Save folder
D:\My Pictures\2014\Star Trails\Lake Tekapo Startrails 2013\Lake Tekapo Raws

File format
Kind of file: Exif-TIFF 8bit
Image quality: 10

Output setting
Output resolution: 350 dpi
 Embed ICC profile

Resize setting
 Resize
Width: [] x Height: [] Unit: pixel
 Lock aspect ratio

File name
 Current file name
String: []
 New file name
String: DPP_ Sequence number: 9782
 Save sequence number
Ex.: IMG_3956.TIF, IMG_3957.TIF...

Image transfer settings
 Open image using software

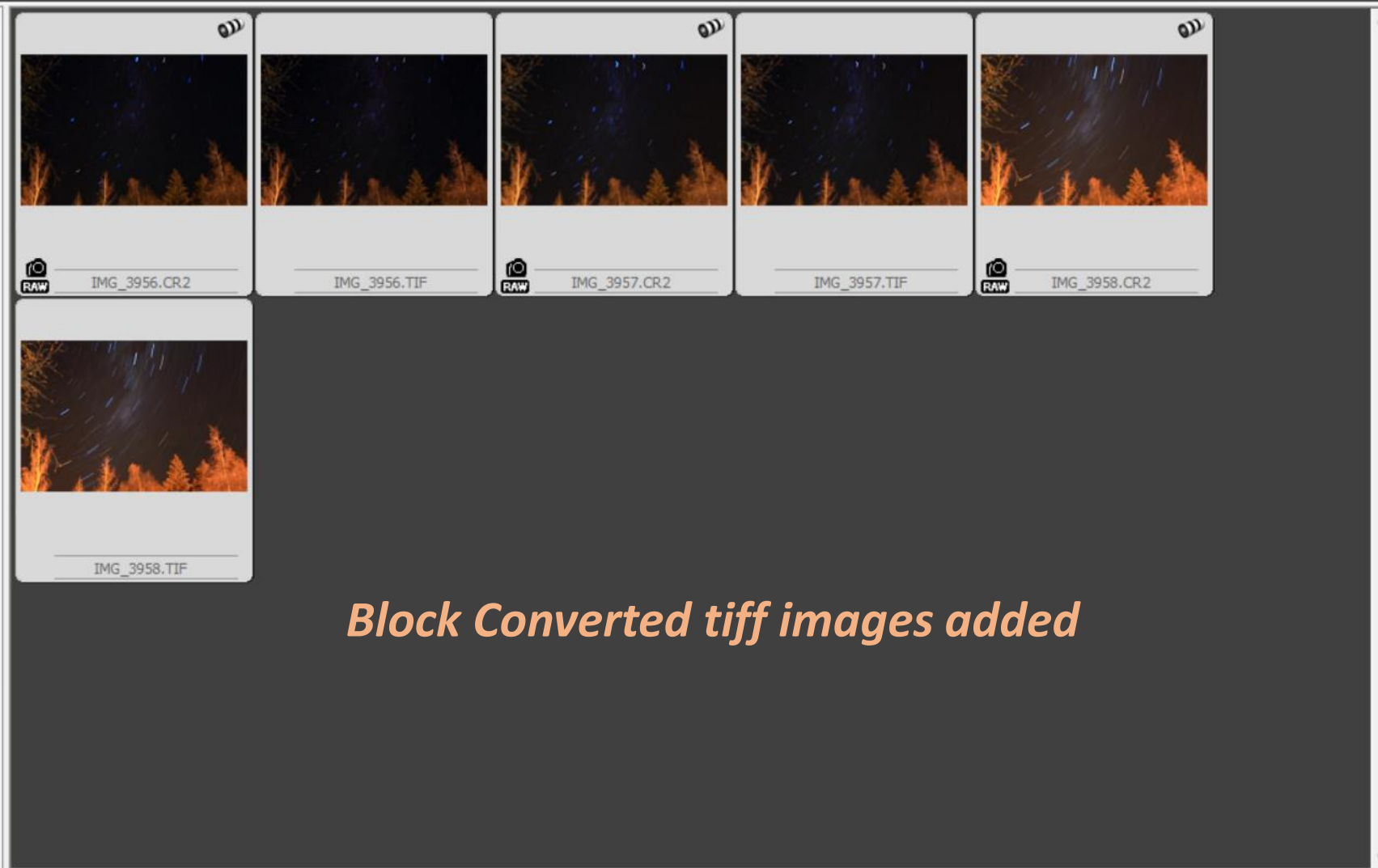
Convert RAW images only | **Execute** | Cancel

Click Execute to finalise batch process Raw to selected format



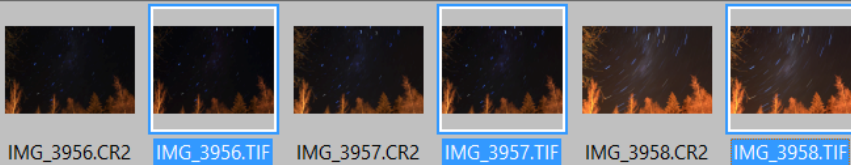
Folder Collection(0) Check mark 1 2 3 4 5 Rating

- Samarai Island 22062014
- Samarai Reunion 2014 Meet and Greet
- Star Trails
 - All Trails Completed Images
 - Caloundra 2506 2015
 - Caloundra No1
 - Crestmead Startrail No2
 - Lake Nuga Nuga Time Exposures
 - Lake Tekapo Startrails 2013
 - Final Image
 - Lake Tekapo Raws
 - Lara Startrails
 - Star Stax Magnetic Island
 - Star Trails Lake Murphy
 - Starstax Aramac
 - StarStax Charleville
 - StarStax Jensen No1
 - StarTrails Archers Crossing
 - Startrails Bluewater
 - Startrails Boyendale Bush Camp
 - Startrails Burdekin Dam
 - Startrails Eungella Dam
 - Startrails Fletchers Creek
 - Startrails Judds Lagoon
 - Startrails Lake Elphinstone
 - Startrails Rocky River
 - Startrails St Lawrence
 - Startrails Toomulu Beach
 - Startrails WorumDam
 - Startrax Campaspe River
 - Woodpecker Windmill No 1 ST
- 2015
- Clouds
- ERINs
- Kaleidoscopes



Block Converted tiff images added

- 2014_11_10Family History Smith
- 2014_11_18 Dry Yard
- 2014_11_19 Night shoot Scarboro
- 2014_11_21 Night shoot Backyard
- 2014_12_05
- 2014_12_07
- 2014_12_12 Withcott
- 2014_12_21 Rocky River Retreat N
- 2014_12_22 Rocky River Retreat
- 2014_12_23 Rocky River Retreat
- 2014_12_24 Rocky River Retreat
- 2014_12_25 Rocky River Retreat
- 2014_12_26 Rocky River Retreat
- 2014_12_27 Rocky River Retreat
- 2014_12_28 Rocky River Retreat
- 2014_12_29 Rocky River Retreat
- 2014_12_30 Rocky River Retreat
- 2014_12_31 Rocky River Retreat
- After Jack Left
- Birds at Gary and Vanessas'House
- Cub Fire Campaspe River
- dons nsw
- Dons Pics
- Fuji
- Hotels
- Judy
- Lara Birds
- Lara Google
- NEW HDR
- Night Photography
- Nomad Drover Images at Smugn
- Rocky River USB
- Ruth Nov 2014
- Samarai Island 22062014
- Samarai Reunion 2014 Meet and
- Star Trails
 - All Trails Completed Images
 - Caloundra 2506 2015
 - Caloundra No1
 - Crestmead Startrail No2
 - Lake Nuga Nuga Time Exposur
 - Lake Tekapo Startrails 2013

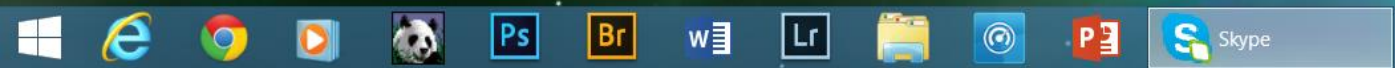


Check original folder to see tiffs/jpegs have been saved

Stack Images using StarStax



Select Program for stacking





Select Blending Mode



Drop
Images
Here

Clear images

Rendering

Software
Quartz
OpenGL

CPU

MMX
SSE 4.2
8 Cores

Preferences

Blending Images General

Blending Mode

Gap Filling

Select blending mode:

- Lighten:** Retains the lightest pixel in the stack.
- Gap Filling:** Create star trail images with minimal gaps.
- Darken:** Retains the darkest pixel in the stack.
- Add:** Adds the pixels in the stack.
- Subtract:** Subtracts the pixels in the stack.
- Multiply:** Multiply the pixels in the stack.
- Average:** Averages the pixels in the stack.
- Average + Increase Exposure:** Averages the pixels in the stack and increases exposure.
- Average + Decrease Exposure:** Averages the pixels in the stack and decreases exposure.



Select files for stacking

Drop Images Here



Clear images

Rendering	CPU
Software	MMX
Quartz	SSE 4.2
OpenGL	8 Cores

Preferences

Blending Images General

Blending Mode

Gap Filling

Comet Mode

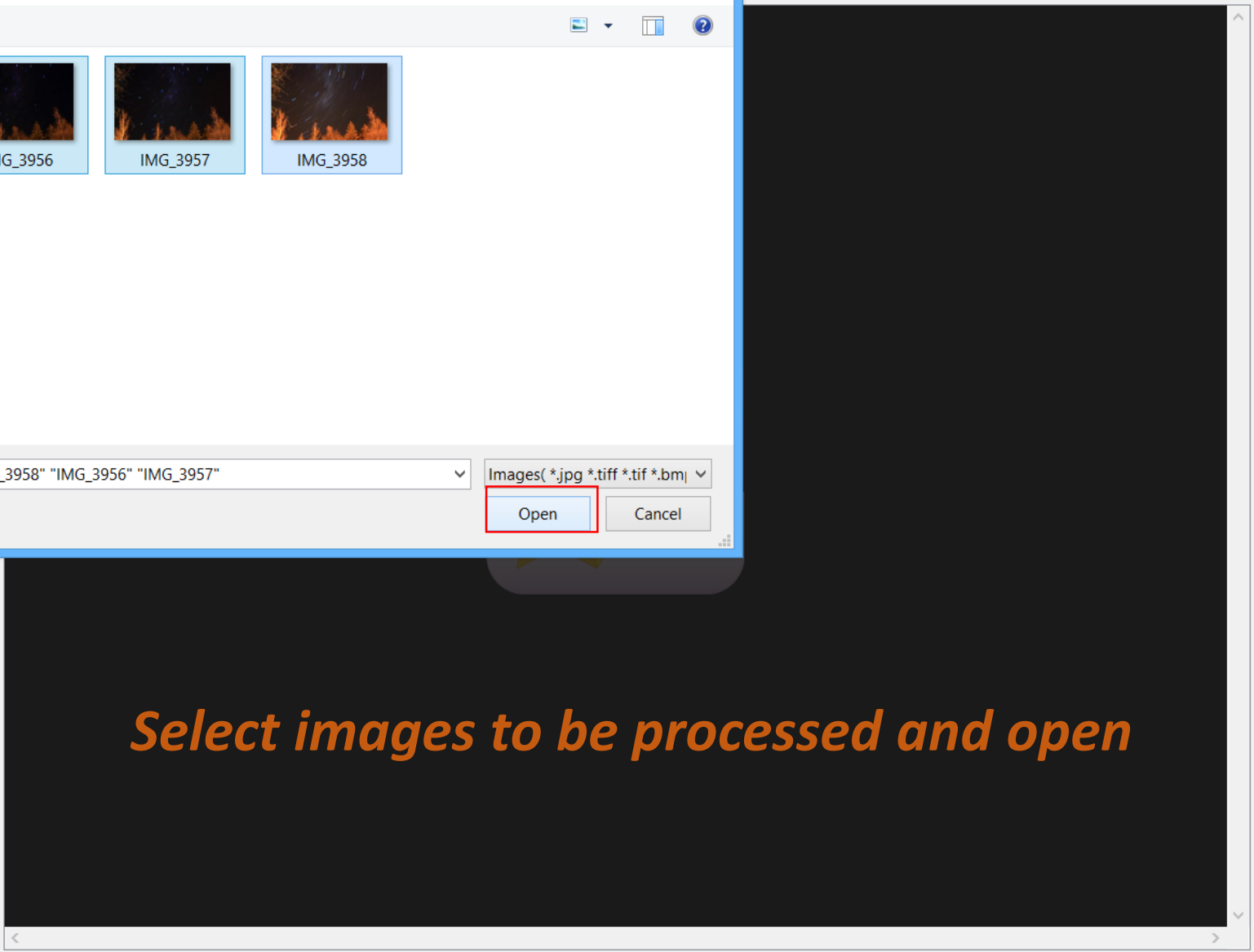
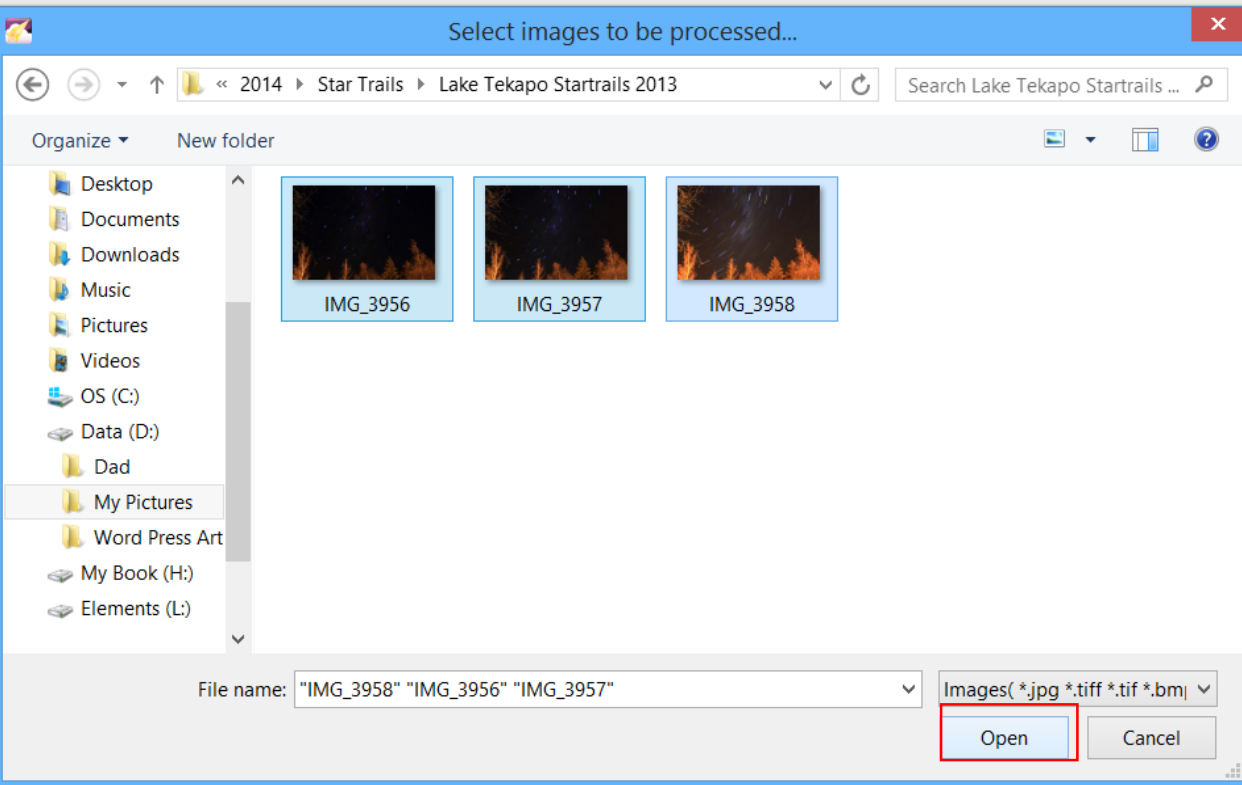
Process images in reverse order

Dark Images

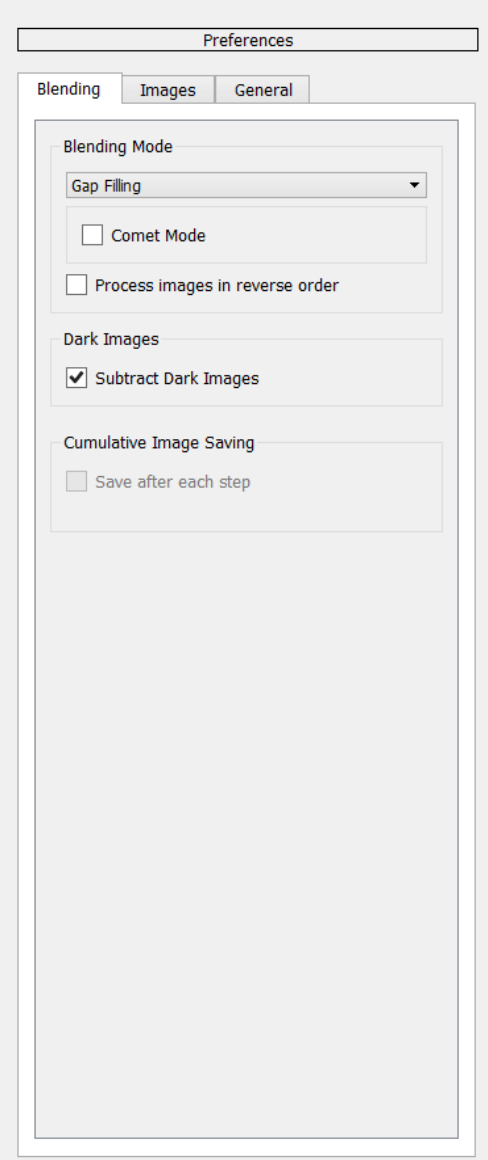
Subtract Dark Images

Cumulative Image Saving

Save after each step



Select images to be processed and open



Rendering

- Software
- Quartz
- OpenGL

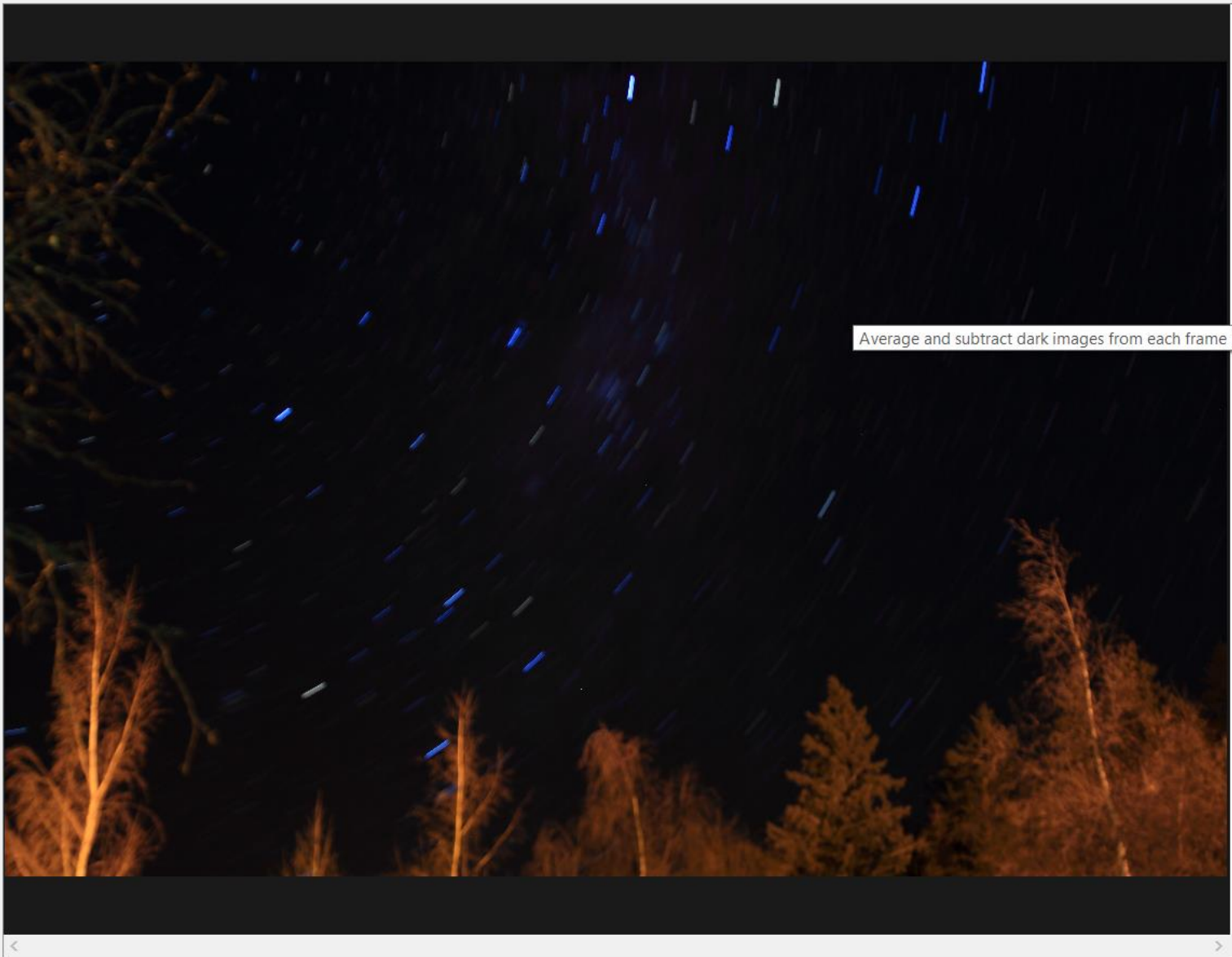
CPU

- MMX
- SSE 4.2
- 8 Cores

Click to process images



- Input Images
 - IMG_3956.TIF
 - IMG_3957.TIF
 - IMG_3958.TIF



Average and subtract dark images from each frame before processing.

Preferences

Blending Images General

Blending Mode

Gap Filling

Comet Mode

Process images in reverse order

Dark Images

Subtract Dark Images

Cumulative Image Saving

Save after each step

Rendering

- Software
- Quartz
- OpenGL

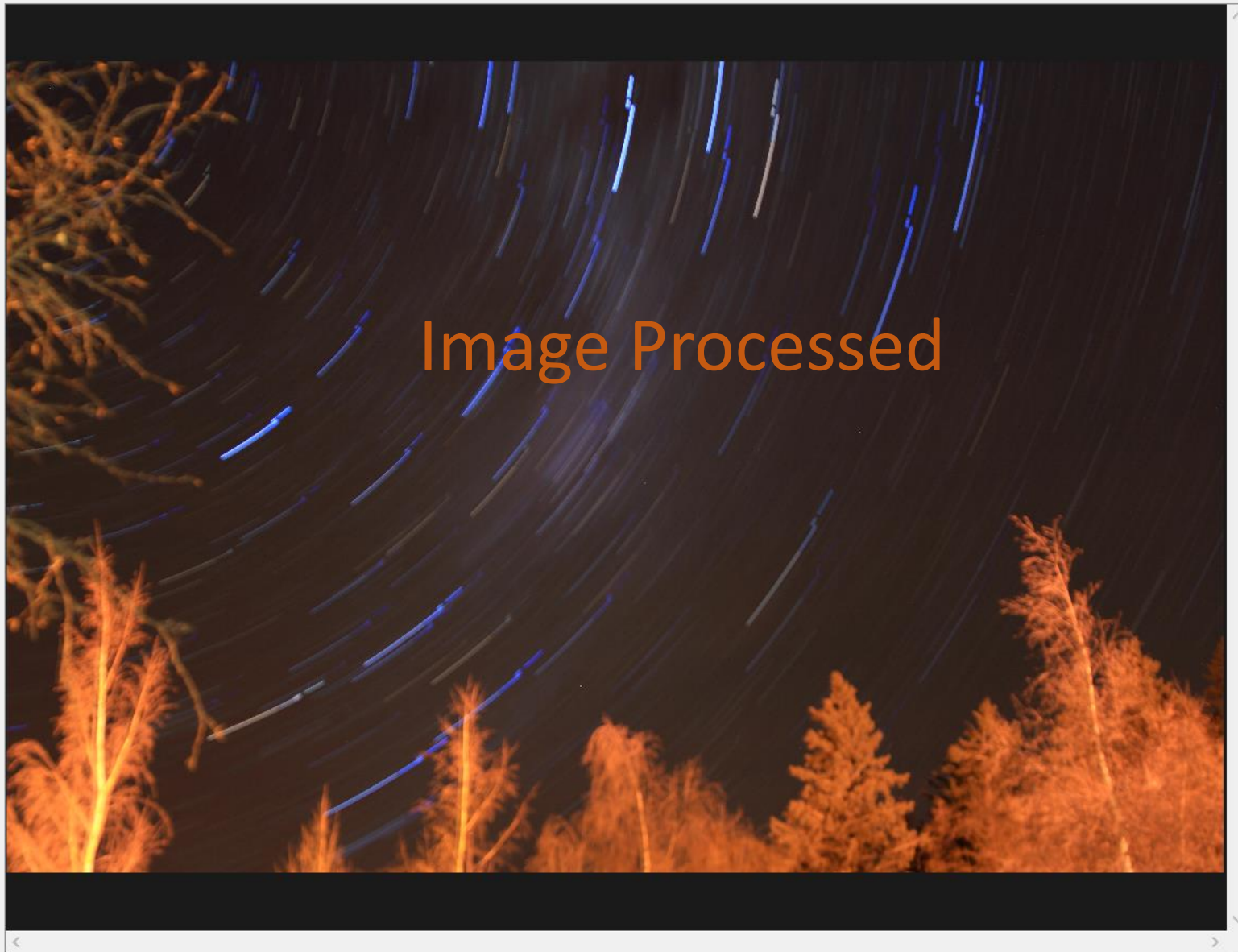
CPU

- MMX
- SSE 4.2
- 8 Cores

Image info: 5184 x 3456 pixels, 32-bits per pixel



- Input Images
 - IMG_3956.TIF
 - IMG_3957.TIF
 - IMG_3958.TIF
- Output Image



Tools

Gap Filling

Show Threshold Overlay

Threshold



Amount



Clear images

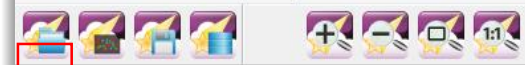
Rendering

- Software
- Quartz
- OpenGL

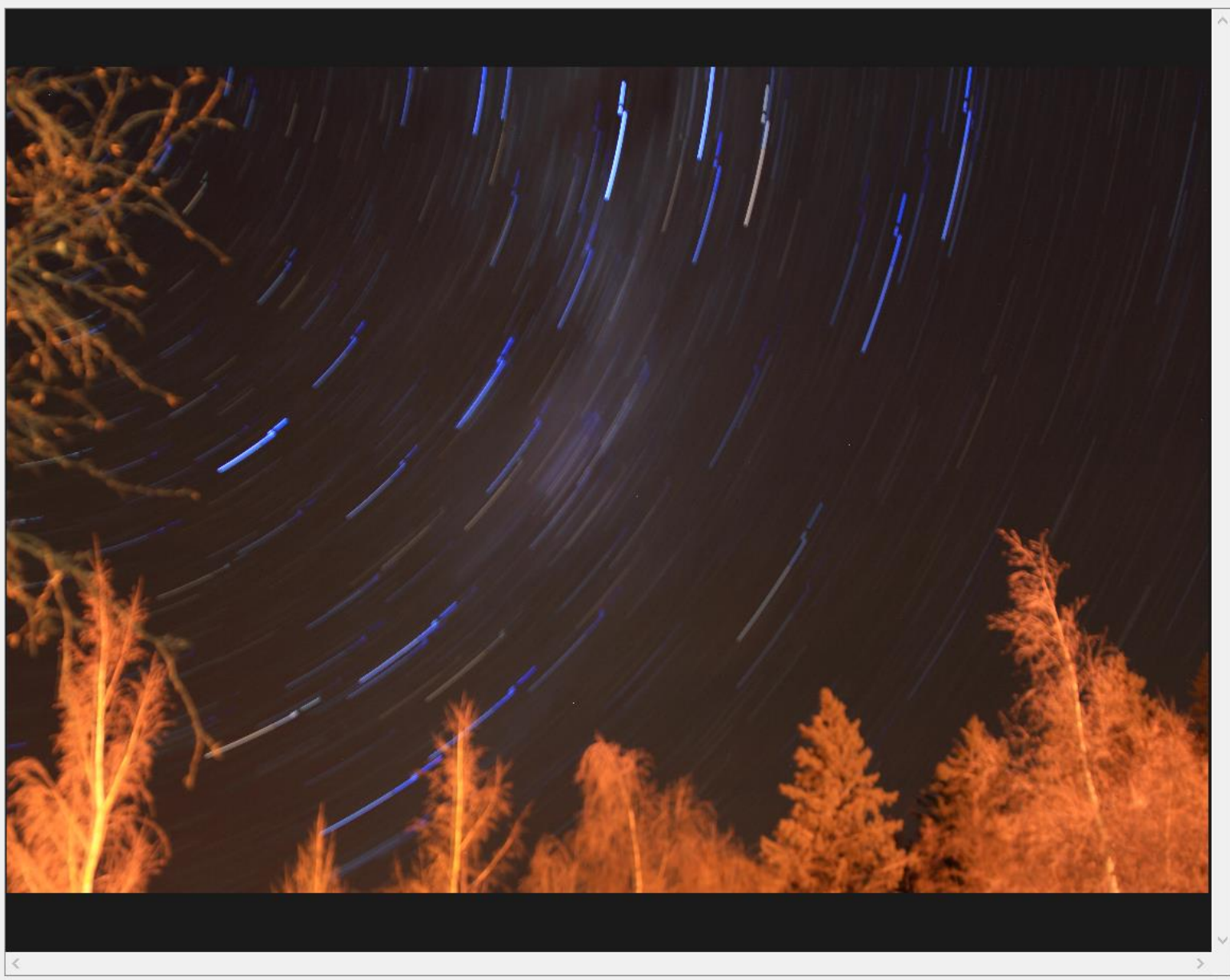
CPU

- MMX
- SSE 4.2
- 8 Cores





- Input Images
 - IMG_3956.TIF
 - IMG_3957.TIF
 - IMG_3958.TIF
- Output Image



Tools

Gap Filling

Show Threshold Overlay

Threshold

Low High

Amount

Less More

*Click File /Save as
Save to original
folder*

Clear images

Rendering

- Software
- Quartz
- OpenGL

CPU

- MMX
- SSE 4.2
- 8 Cores

Blending done!

Save As... (image format is guessed from the extension)

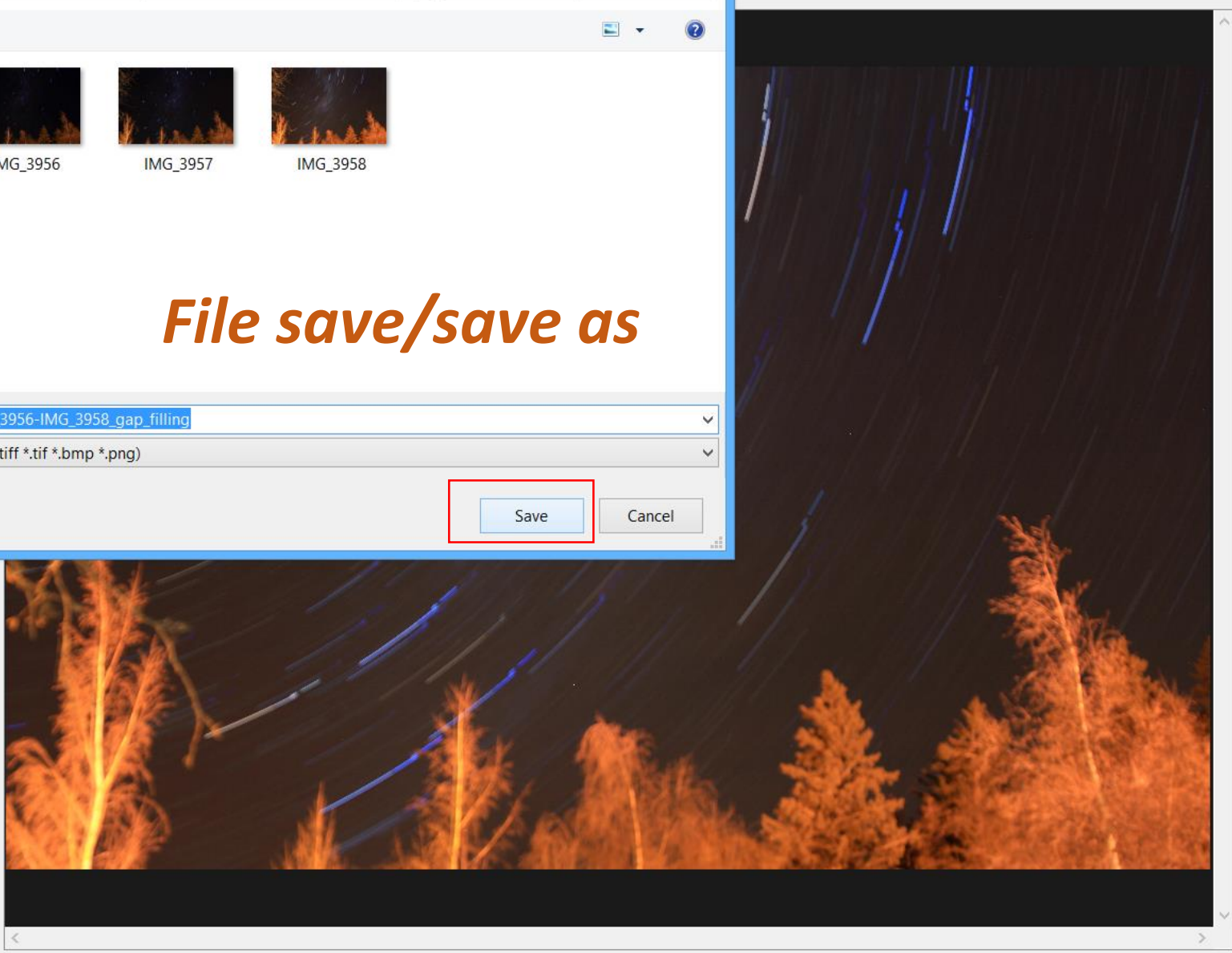
Organize New folder

File name: StarStaX_IMG_3956-IMG_3958_gap_filling

Save as type: Images(*.jpg *.tiff *.tif *.bmp *.png)

Save Cancel

File save/save as



Tools

Gap Filling

Show Threshold Overlay

Threshold

Low High

Amount

Less More

Clear images

Rendering

- Software
- Quartz
- OpenGL

CPU

- MMX
- SSE 4.2
- 8 Cores

Select normal file organiser

The desktop contains the following application icons:

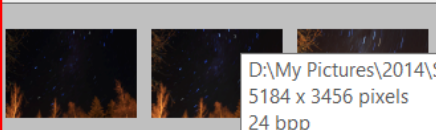
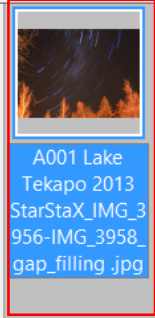
- Recycle Bin
- My LastPass Vault
- Digital Photo Professional
- Adobe
- My Pictures - Shortcut
- International... (partially visible)
- ASUS
- HN Explorer 2013
- WebStorage
- Photomatix Pro 5.0.4 (...)
- PhotoEchoes
- PrimoPDF - Drop File...
- Nero Kwik Media
- Adobe Creati...
- Dad - Shortcut (2)
- ZoomBrow... EX
- PicturesToExe 8
- Skype
- Waves MAXXAudio
- Nero Video 11
- AVG 2015
- Google Chrome
- Dropbox
- Free WMA MP3 Con...
- audacity - Shortcut
- ASUS Tutor
- ASUS Console
- Google Earth
- IrfanView Thumbnails** (highlighted)
- Spyder3Exp... 4.0
- Nero Burning ROM 11
- CCleaner
- Picasa 3
- Microsoft Office 15...
- IrfanView
- ASUSDVD
- Dad - Shortcut
- Startrails - Shortcut
- GeForce Experience
- Lightroom 5.7 64-bit
- StarStaX - Shortcut
- Canon MG8200...
- Adobe Reader X
- AVG PC TuneUp 2015
- Western Railway N...
- 3Planesoft Screensav...
- The Lost Watch II N...
- Deep Space 3D Screen...
- Stellarium
- AVG 1-Click Maintenance



- dons nsw
- + Dons Pics
- Fuji
- Hotels
- Judy
- Lara Birds
- Lara Google
- NEW HDR
- + Night Photography
- Nomad Drover Images at Sm
- + Rocky River USB
- Ruth Nov 2014
- Samarai Island 22062014
- Samarai Reunion 2014 Meet a
- Star Trails
 - + All Trails Completed Imag
 - + Caloundra 2506 2015
 - Caloundra No1
 - Crestmead Startrail No2
 - + Lake Nuqa Nuqa Time Exp
 - Lake Tekapo Startrails 2013
 - + Lara Startrails
 - + Star Stax Magnetic Island
 - Star Trails Lake Murphy
 - Starstax
 - Starstax Aramac
 - + StarStax Charleville
 - StarStax Jensen No1
 - + StarTrails Archers Crossing
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 - Startrails Burdekin Dam
 - + Startrails Eungella Dam
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 - Startrails Judds Lagoon
 - + Startrails Lake Elphinstone
 - + Startrails Rocky River
 - + Startrails St Lawrence
 - + Startrails Toomulu Beach
 - Startrails WurumDam
 - Startrax Campaspe River
 - + Woodpecker Windmill No

Open folder

- dons nsw
- Dons Pics
- Fuji
- Hotels
- Judy
- Lara Birds
- Lara Google
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 - Startrails Judds Lagoon
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 - Startrails Rocky River
 - Startrails St Lawrence
 - Startrails Toomulu Beach
 - Startrails WurumDam
 - Startrax Campaspe River



D:\My Pictures\2014\Star Trails\Lake Tekapo Startrails 2013\IMG_3957.TIF [3/4]
 5184 x 3456 pixels
 24 bpp
 51.39 MB
 22/02/2015 / 15:30:02
 2012:08:06 18:42:44

Check Starstax image has been saved

Final Processing

- ❖ *Open required program and do final processing as required*
- ❖ *Save processed file*
- ❖ *Review finished image are you happy with your image*
- ❖ *If NO enjoy your night out next time you go Startrail Hunting*

References

Starcircle academy

<http://starcircleacademy.com/startrails/>

Sydney Observatory

Australian Army

Cosmos Centre Charleville