EEN ASTROFOTO VAN ‘A’ TOT ‘O’

Maurice Toet

Oss, 11 mei 2019

A S T R O F O T O

De A van ...

A S T R O F O T O

Afvragen?



A S T R O F O T O

Afvragen?

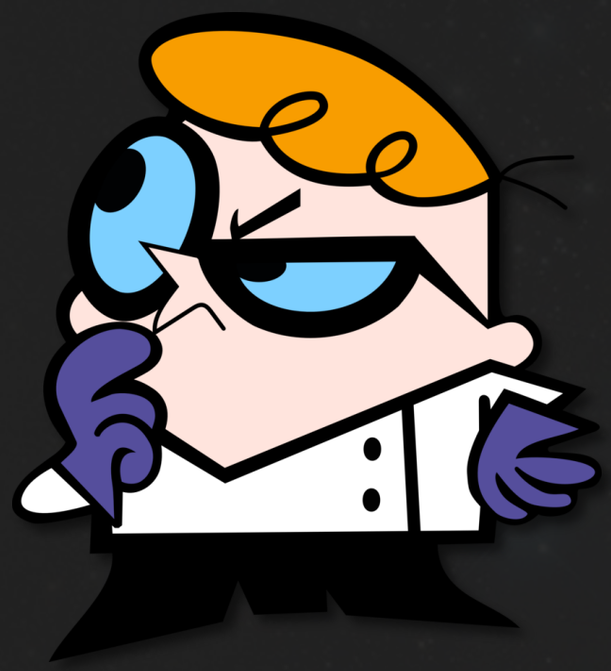


ASTROFOTO

Actieplan





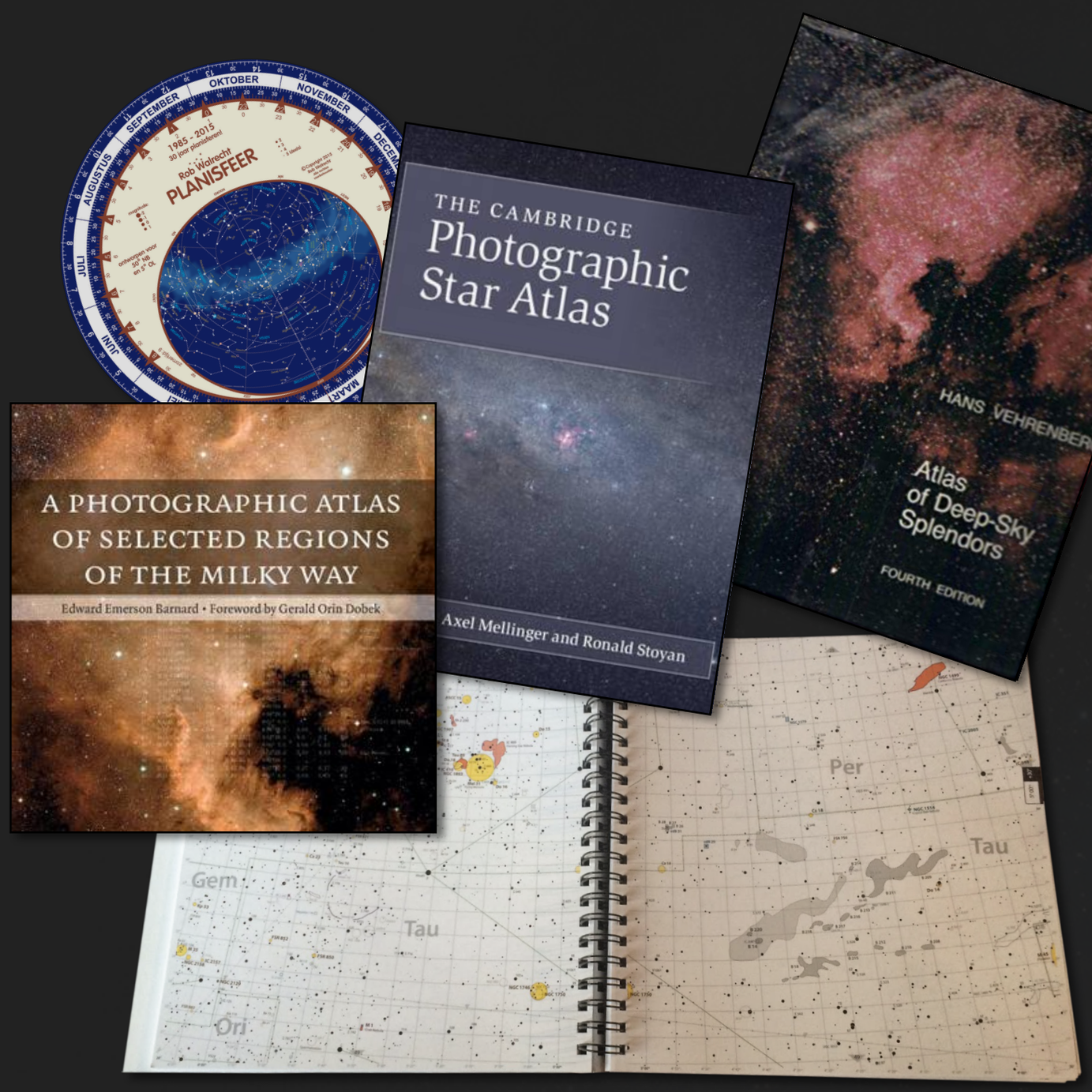




A S T R O F O T O

Actieplan

Wat is er te zien en wat wil je fotograferen?





A S T R O F O T O

Actieplan

Wat is er te zien en wat wil je fotograferen?

Stellarium stellarium.org

Cartes du Ciel ap-i.net/skychart

WIKISKY wikisky.org

Aladin Sky Atlas aladin.u-strasbg.fr/aladin.gml

SkySafari skysafariastronomy.com

Deep-Sky Planner http://knightware.biz

…



ASTROFOTO

Actieplan

Wat is er te zien en wat wil je fotograferen?



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Actieplan

Inspiratie opdoen

AstroBin astrobin.com

Astroforum astroforum.nl

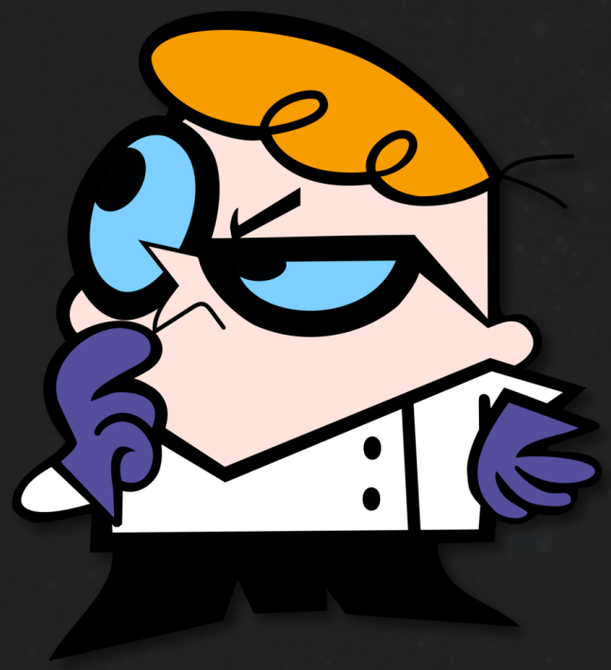
Cloudy Nights cloudynights.com

Personal websites

...





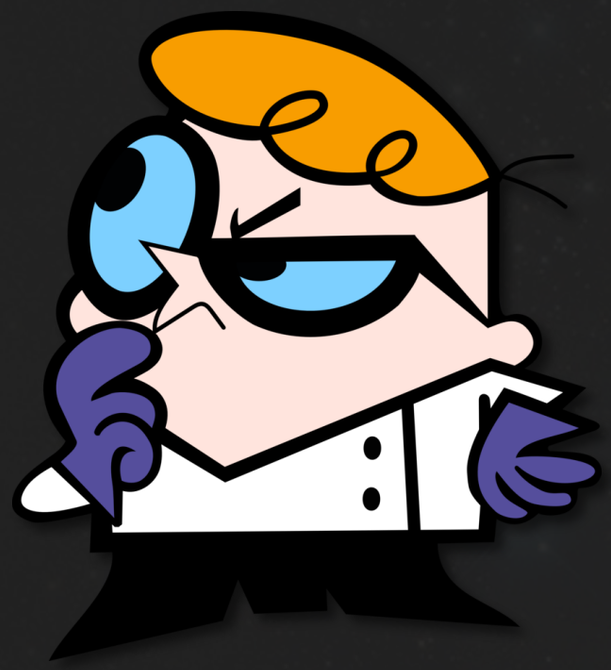


A S T R O F O T O

Actieplan

Inspiratie opdoen







A S T R O F O T O

Actieplan

Draaiboek samenstellen

Draaiboek Étoile-Saint-Cyrice – mei 2016

44°18'52,46" NB - 5°37'35,86" OL

Zon & maan:

datum	astronm.	nautisch	nautisch	astronm.	begin	eind	maanfase
07-05-16	04:25	05:11	22:04	22:51	22:51	04:25	0,01
08-05-16	04:23	05:09	22:06	22:52	22:52	04:23	0,05
09-05-16	04:21	05:08	22:07	22:54	23:52	04:21	0,11
10-05-16	04:19	05:06	22:09	22:56	-	04:19	0,20
11-05-16	04:17	05:05	22:10	22:58	00:46	04:17	0,29
12-05-16	04:15	05:03	22:12	23:00	01:32	04:15	0,40
13-05-16	04:13	05:02	22:13	23:02	02:11	04:13	0,50
14-05-16	04:11	05:00	22:15	23:04	02:46	04:11	0,61

Tijden in MEZT.

Planning:

datum	object	RA	DEC	start	einde	duur
07-05-16	NGC 4236 Rho Ophiuchus	12:18:55 16:26:28	+69:39:09 -24:57:34	22:51 01:00	01:00 04:25	02:09 03:25
08-05-16	NGC 4236 Cr 399 (boven)	12:18:55 19:27:24	+69:39:09 +20:18:09	22:52 02:00	02:00 04:23	03:08 02:23
09-05-16	NGC 4236 Sh2-82 (onder)	12:18:55 19:27:24	+69:39:09 +18:14:22	23:52 02:00	02:00 04:21	02:09 02:21
10-05-16	NGC 4236 Cr 399 (boven)	12:18:55 19:27:24	+69:39:09 +20:18:09	00:46 02:00	02:00 04:19	01:14 02:19
11-05-16	Sh2-82 (onder)	19:27:24	+18:14:22	01:32	04:17	02:45
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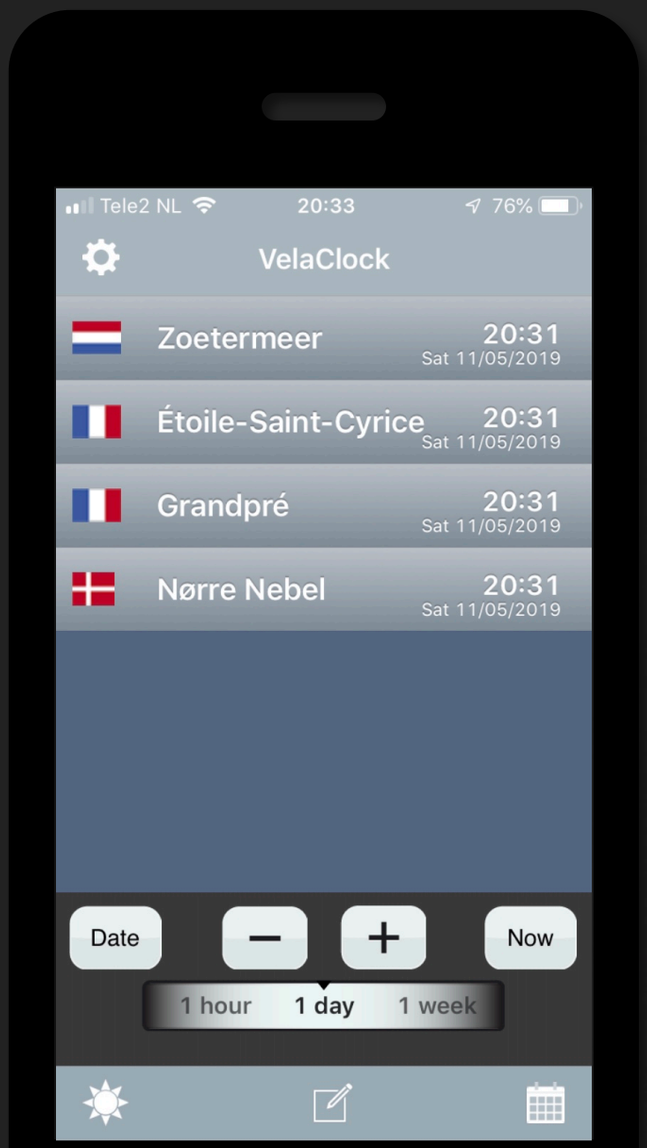
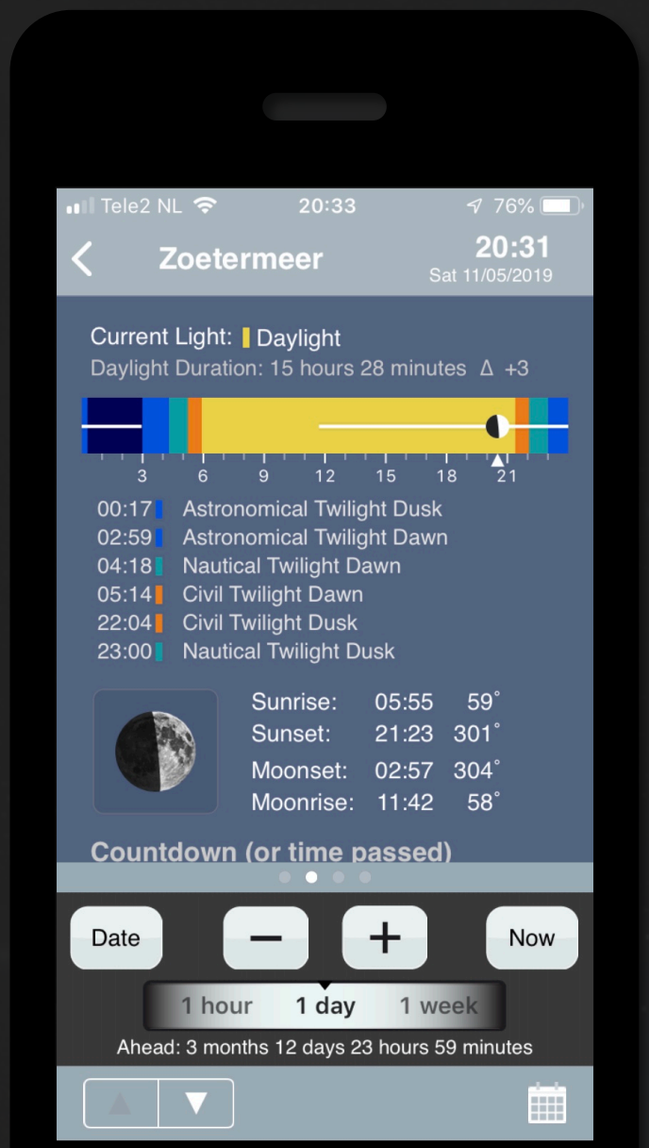
06-08-2015: hele nacht helder, SQM 21.4, rond 3.30 uur stroomstoring
07-08-2015: hele nacht helder, SQM 21.4
08-08-2015: - bewolkt
09-08-2015: - bewolkt, regen (onweer)
10-08-2015: hele nacht helder, SQM 21.6
11-08-2015: hele nacht helder, SQM 21.4
12-08-2015: hele nacht helder, SQM 21.4

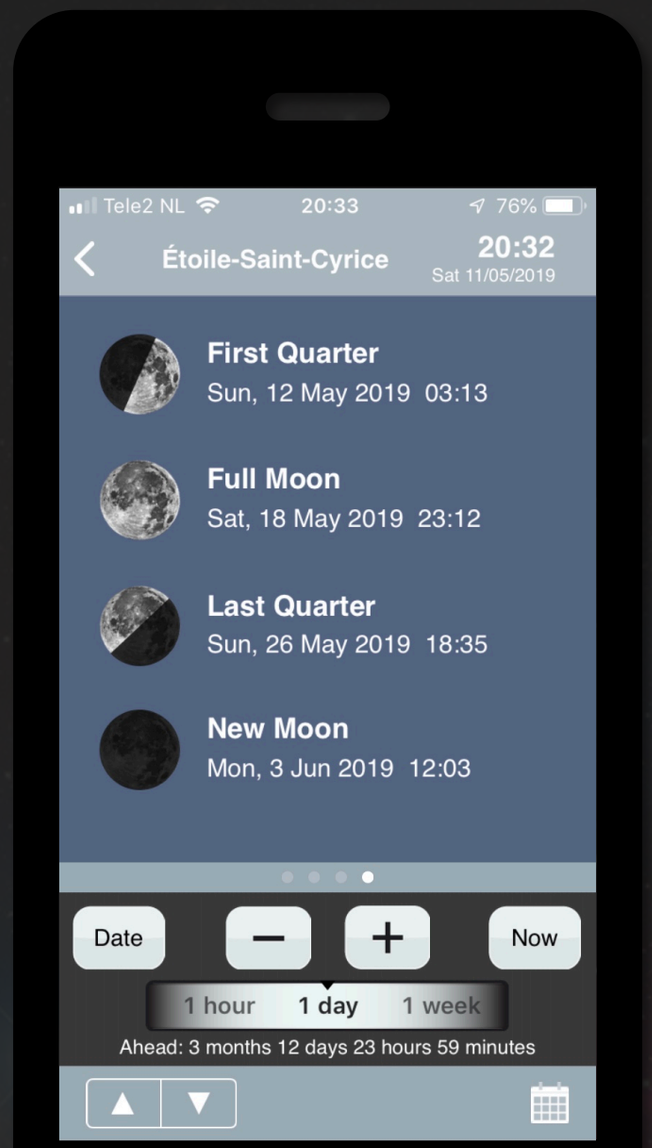
A S T R O F O T O

Actieplan

Duisternis & Maanfasen







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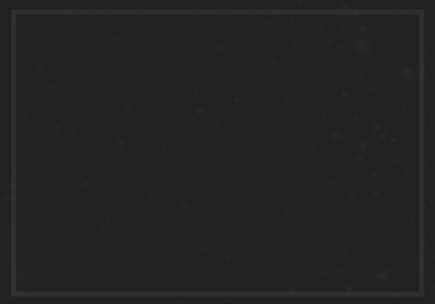
De F van ...



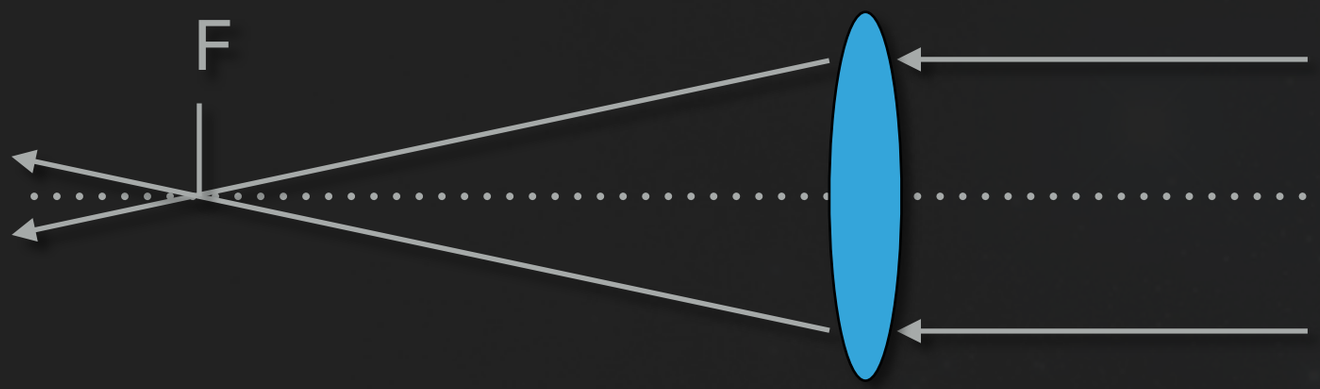






A S T R O F O T O

Brandpuntsafstand (*focal length*) & Beeldveld (*field of view*)









A S T R O F O T O

Brandpuntsafstand (*focal length*) & Beeldveld (*field of view*)

beeldhoek [*graden*] = afmeting sensor [*mm*] x 57,3 / F [*mm*]

Voorbeeld met kleinbeeld-sensor (36 x 24 mm) achter F = 500 mm telescoop:

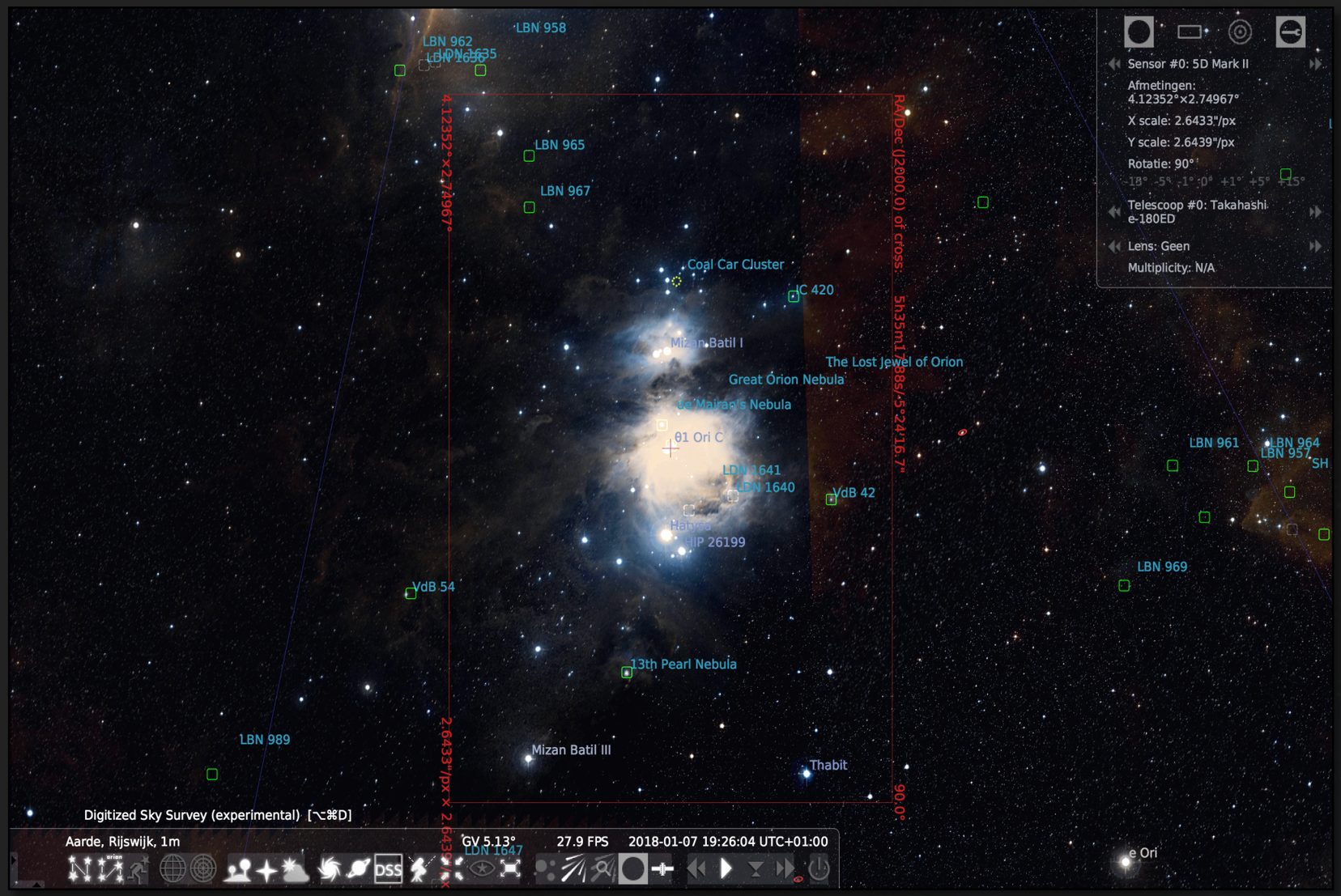
beeldhoek lange zijde = 36 x 57,3 / 500 = 4,13°

beeldhoek korte zijde = 24 x 57,3 / 500 = 2,75°



A S T R O F O T O

Brandpuntsafstand (*focal length*) & Beeldveld (*field of view*)



Planetarium software

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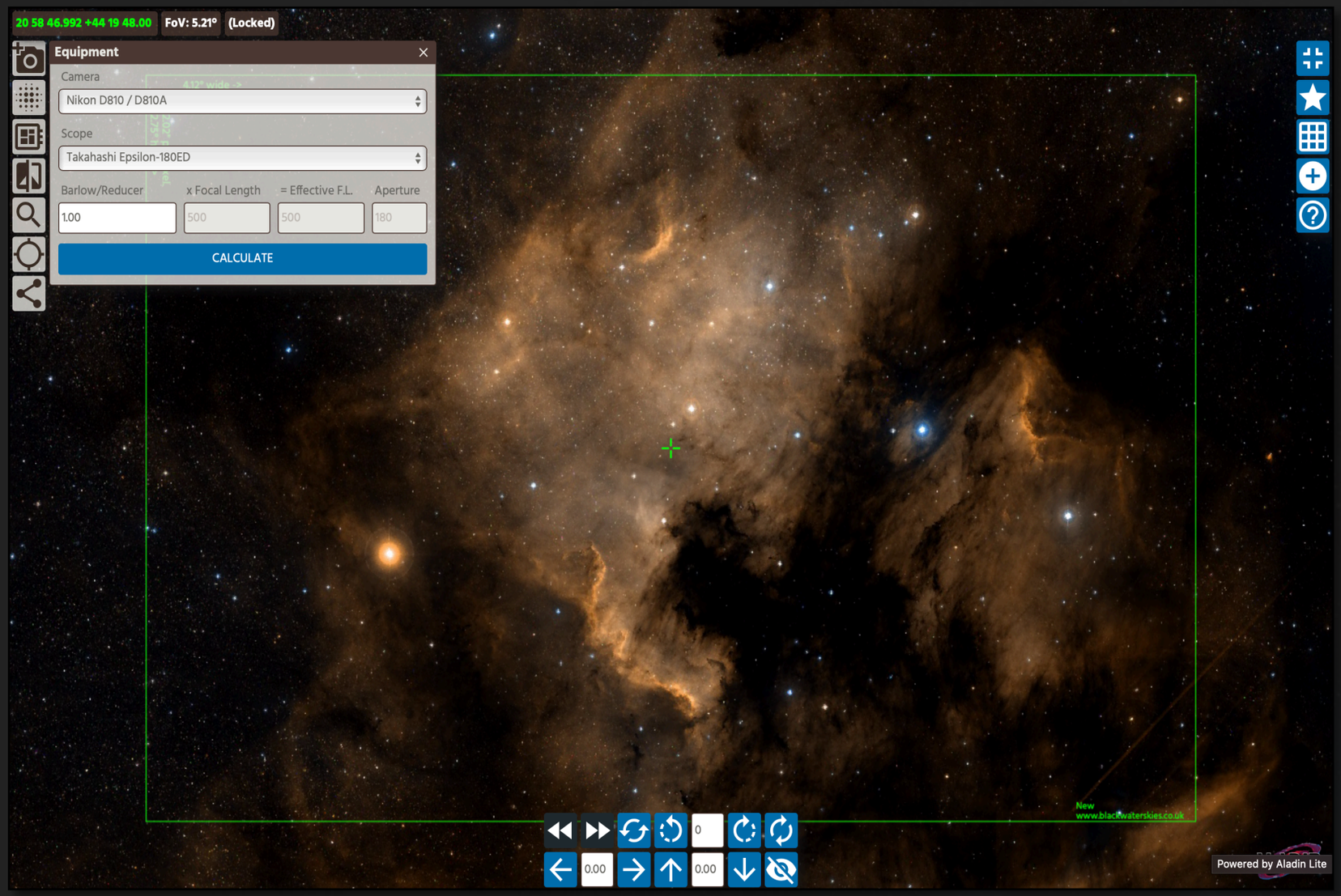
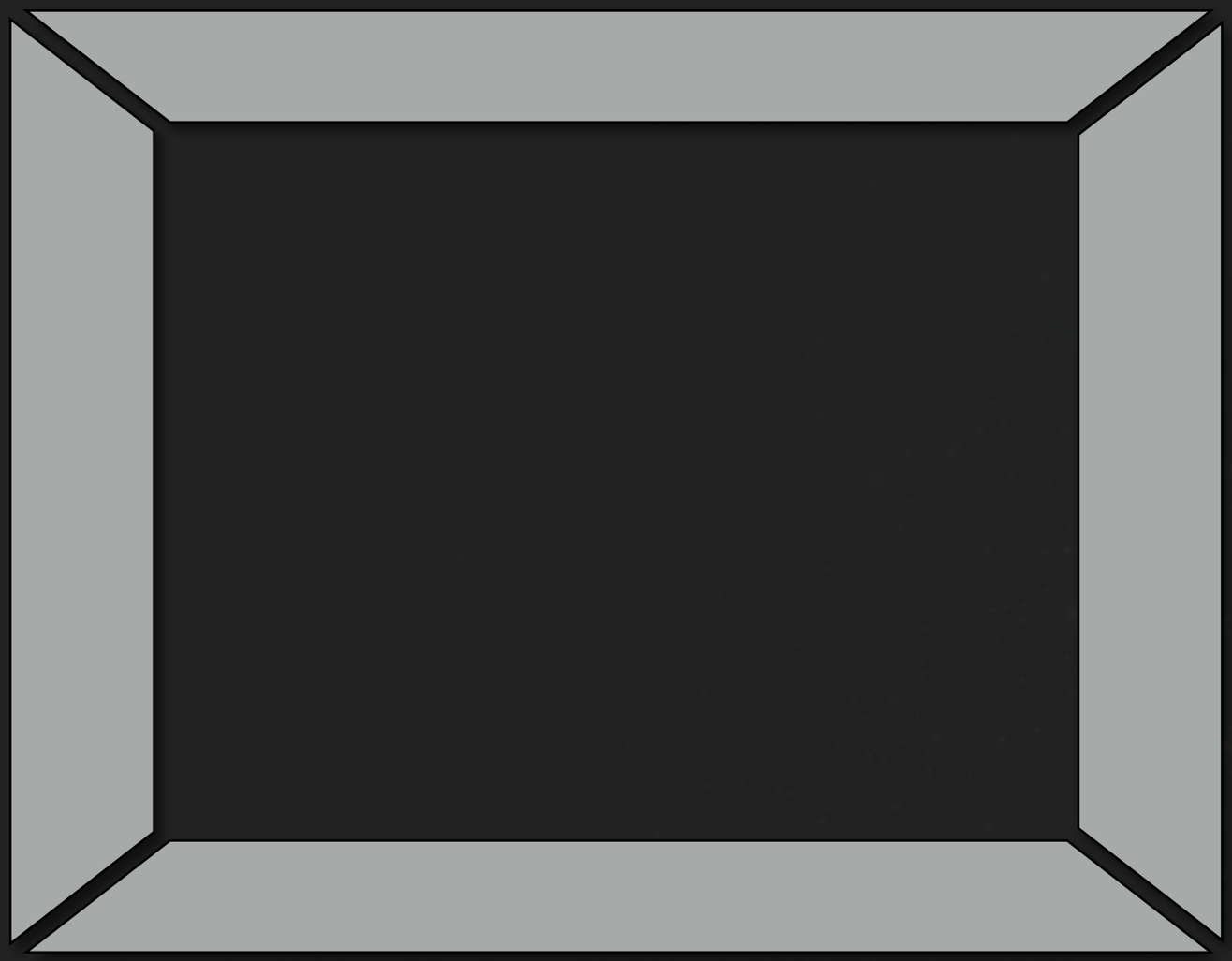


Imaging Toolbox

blackwaterskies.co.uk

Kadrering (*framing*)





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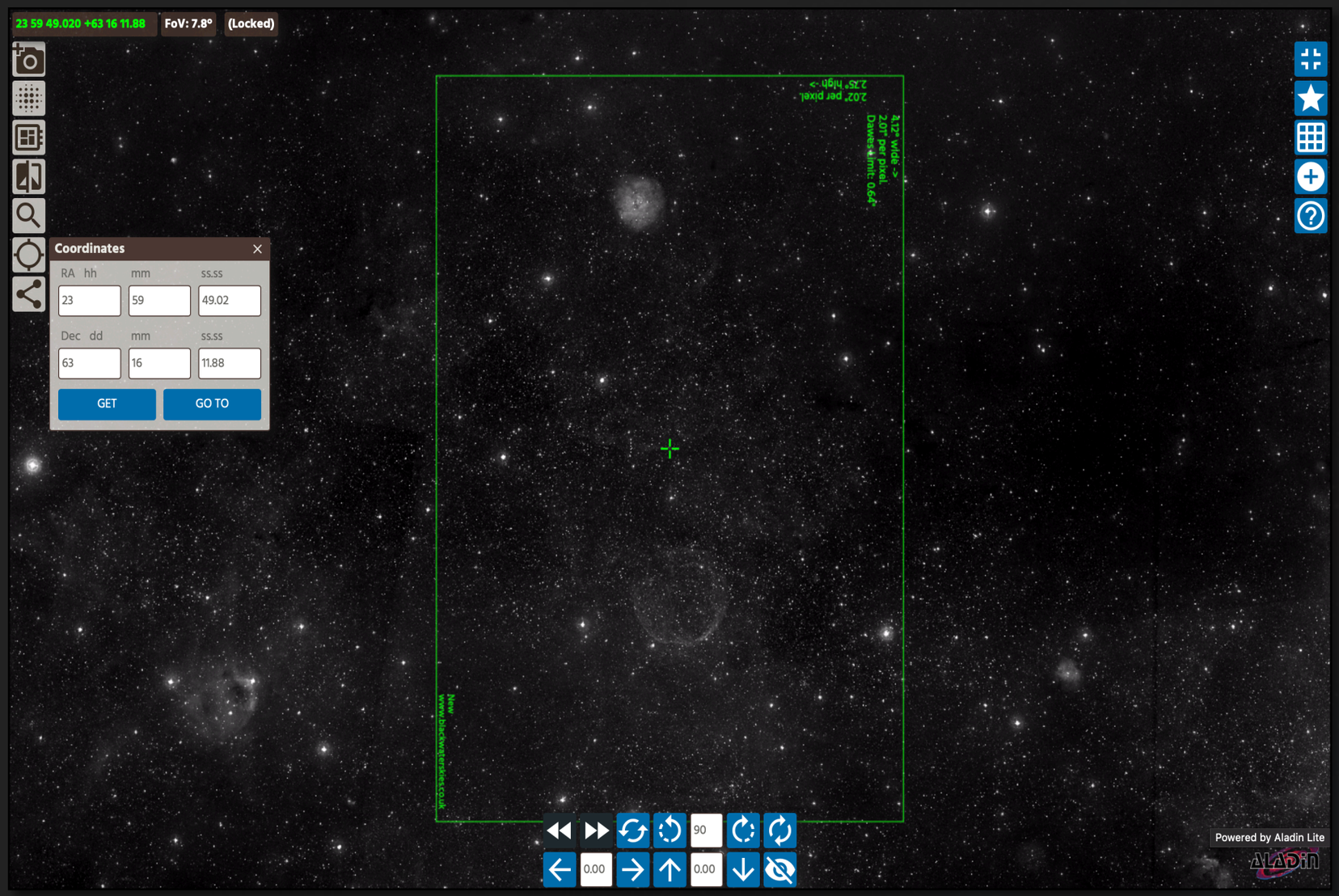



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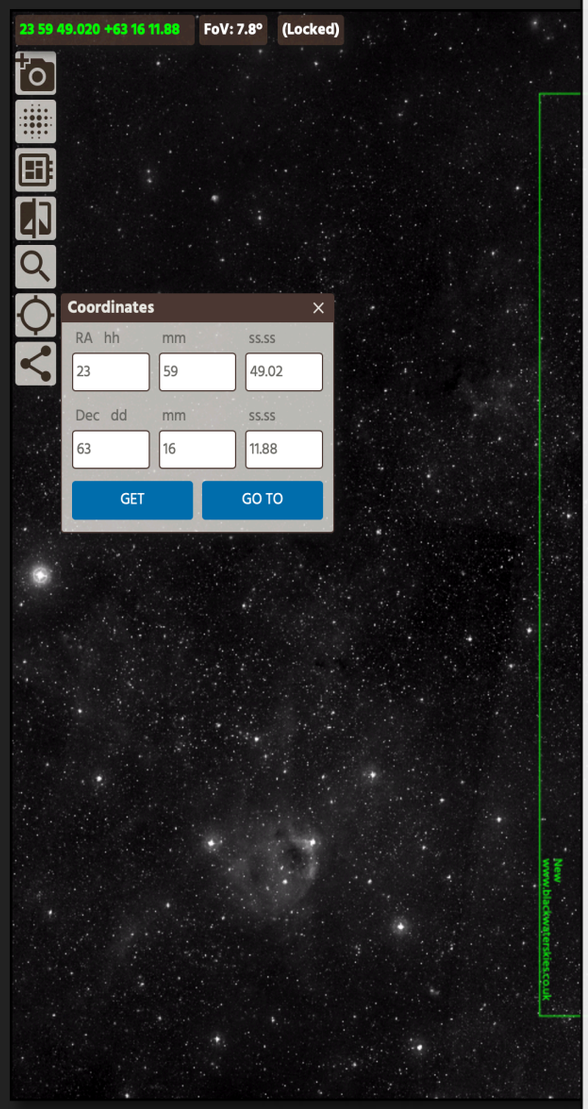

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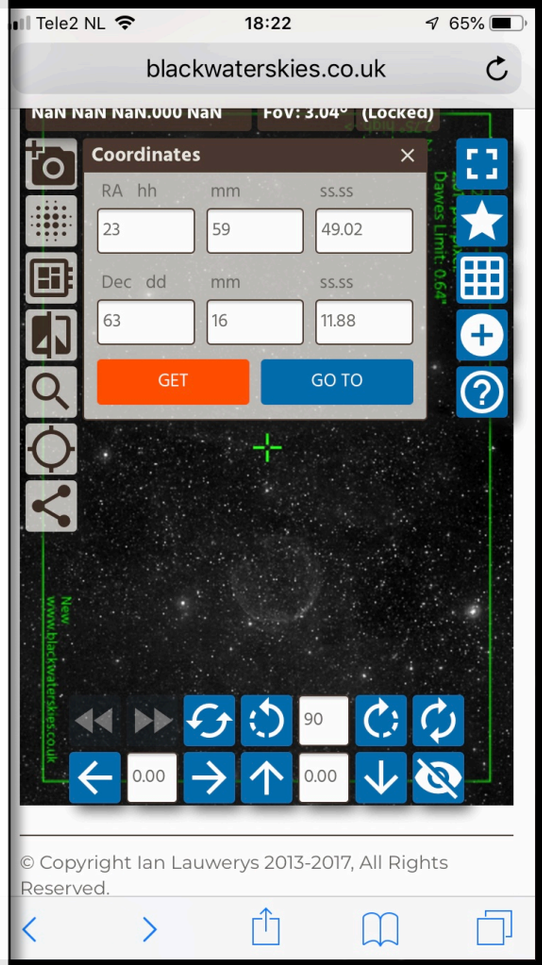

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A S T R O F O T O

Kadrering (*framing*)





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A S T R O F O T O

Kadrering (*framing*)



A S T R O F O T O

Kadrering (*framing*)



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Kadrering (*framing*)



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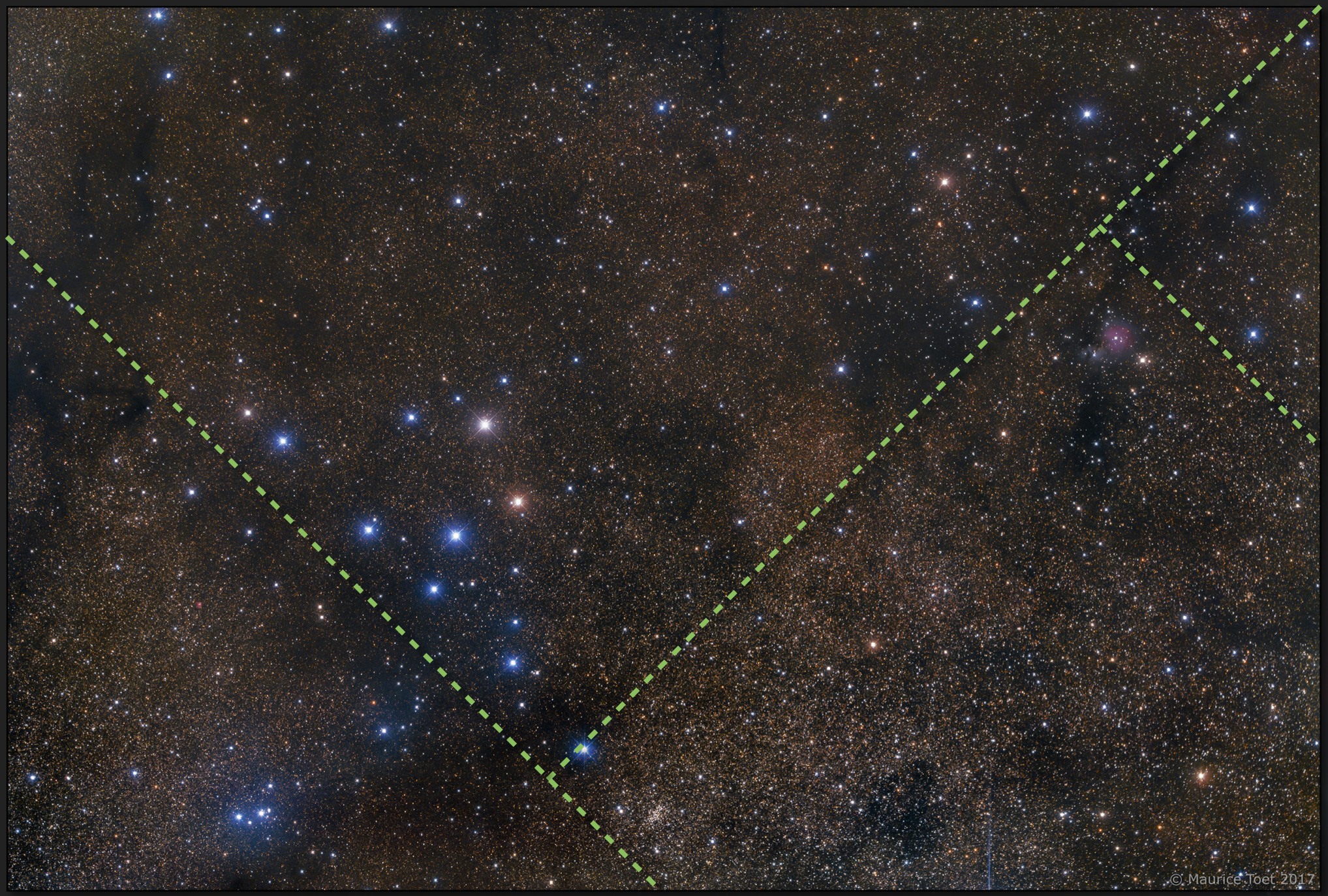


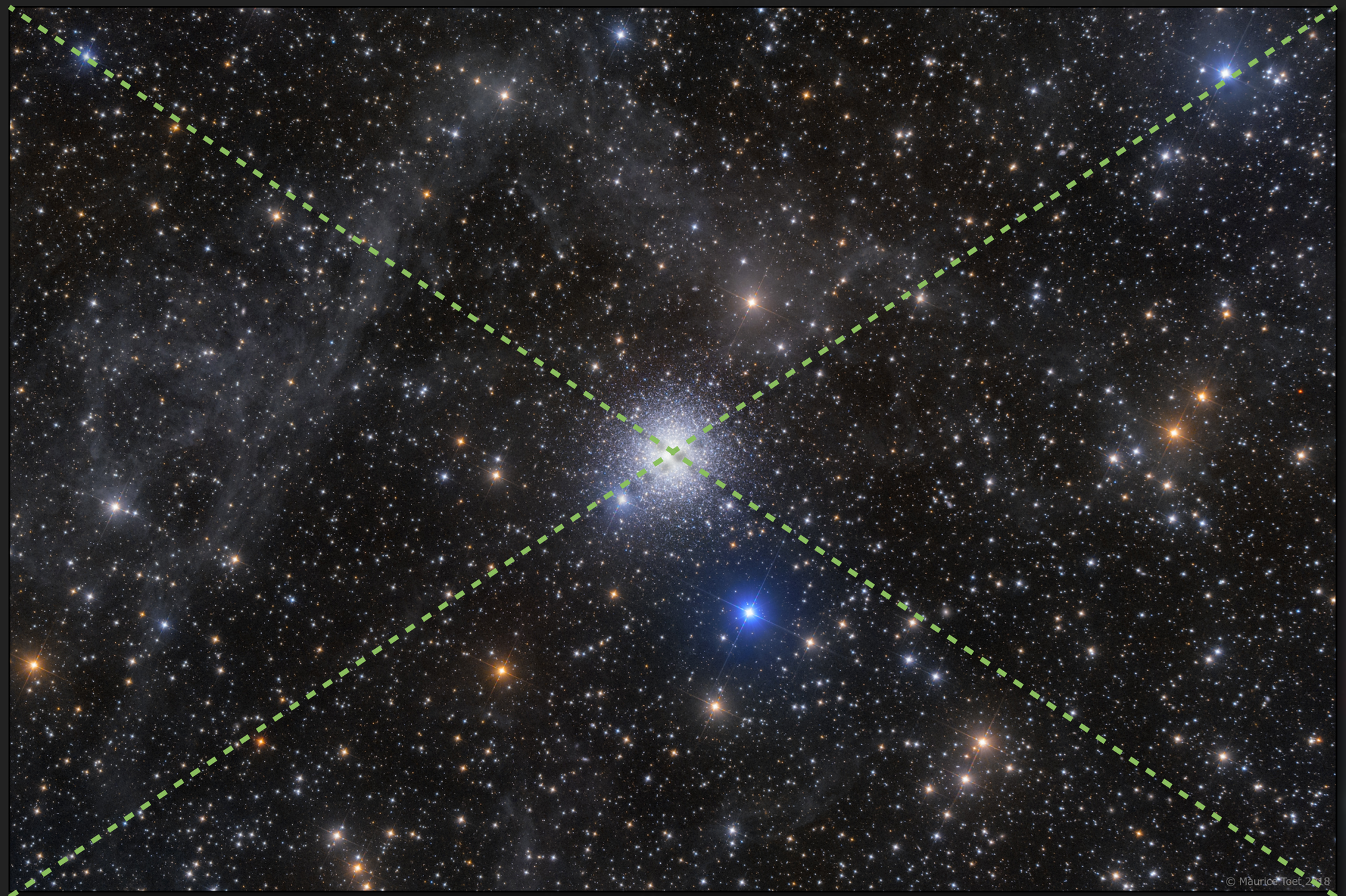
A S T R O F O T O

Kadrering (*framing*)

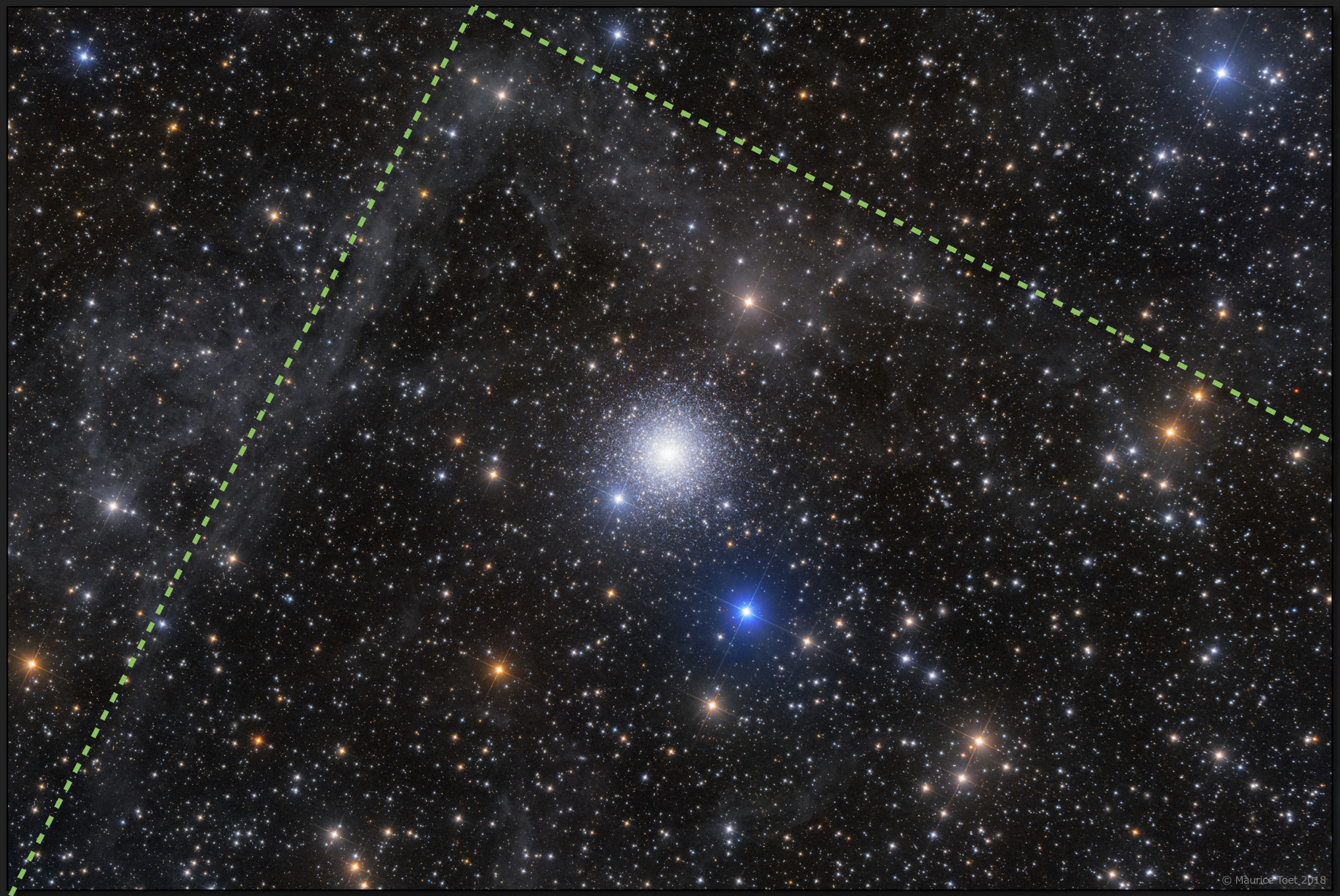


A S T R O F O T O

Kadrering (*framing*)



Kadrering (*framing*)



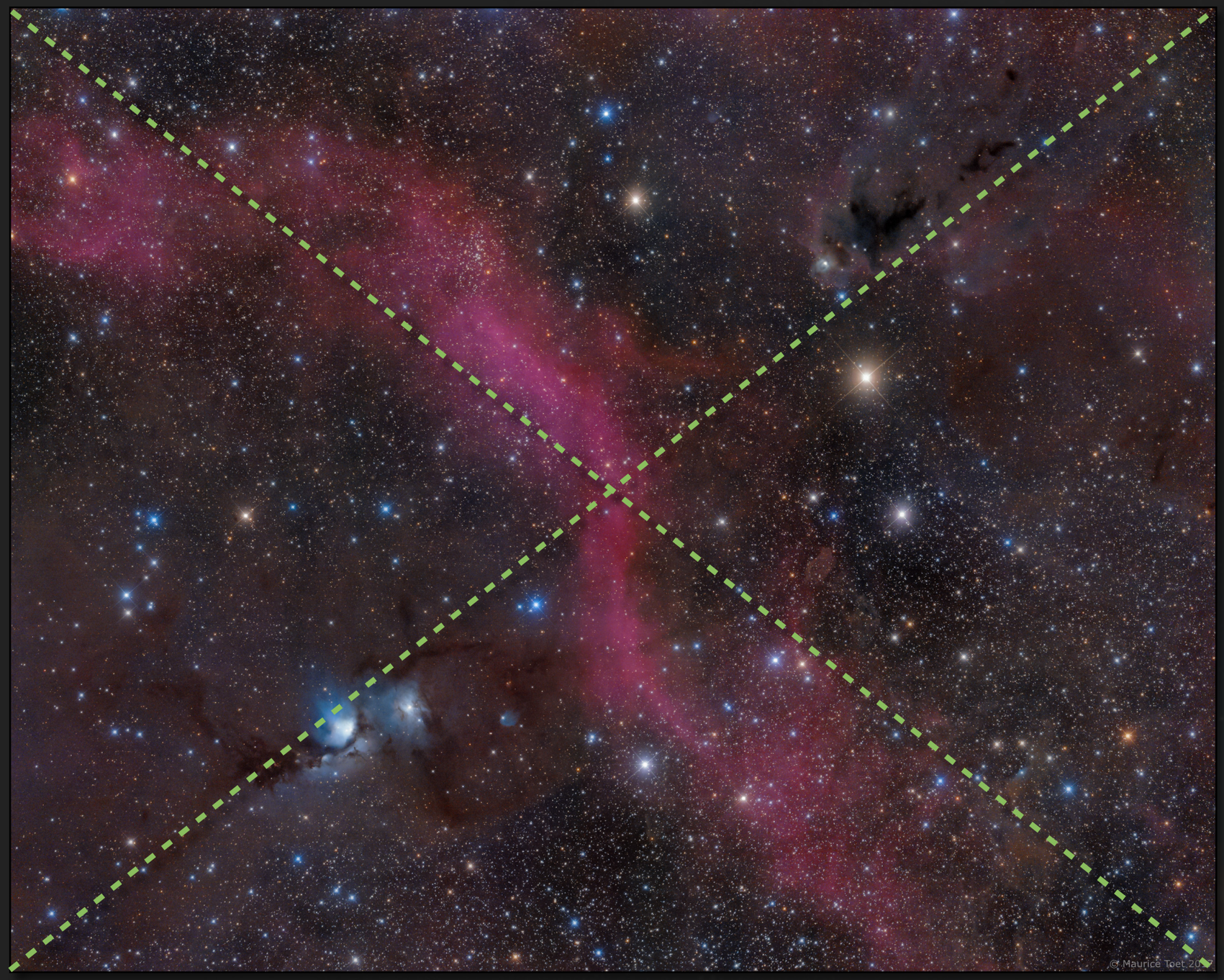
A S T R O F O T O

Kadrering (*framing*)



A S T R O F O T O

Kadrering (*framing*)



Kadrering (*framing*)

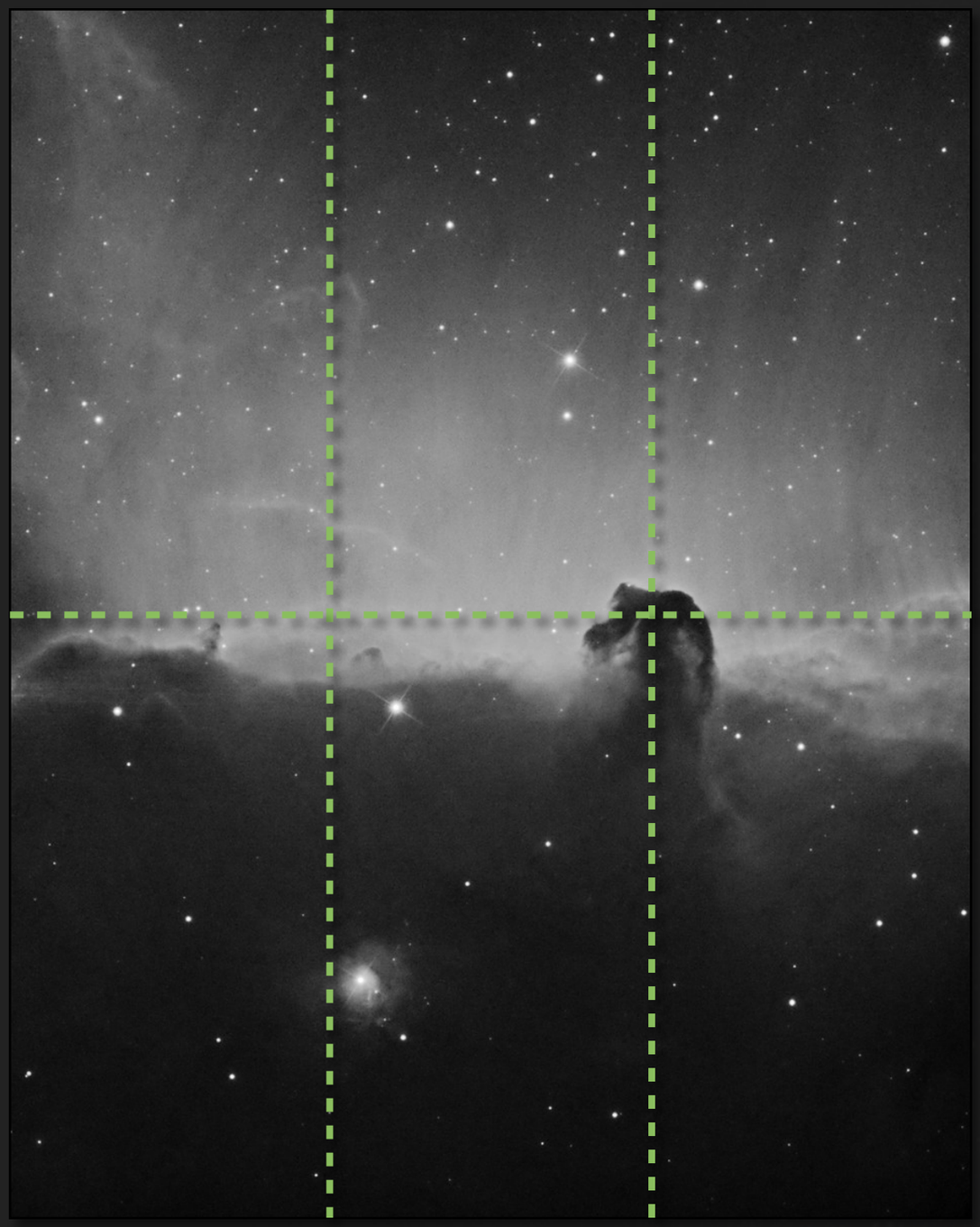


Kadrering (*framing*)



A S T R O F O T O

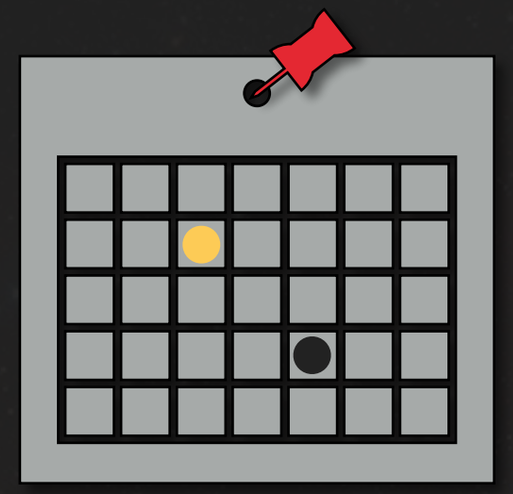
Kadrering (*framing*)



A S T R O F O T O

Actieplan (resumé)

Wat is er te zien (welke objecten staan gunstig)?



Wat is mijn beeldveld?

Wat wil / kan ik fotograferen?

Hoe kies ik de kadrering?

Wanneer begint en eindigt de astronomische duisternis?

Hoe verdeel ik mijn waarneemtijd?





A S T R O F O T O

Terug bij A ...



ASTROFOTO

Achtertuin









ASTROFOTO

Achtertuin









A S T R O F O T O

Afgelegen



A S T R O F O T O

Auto

A S T R O F O T O

Afgelegen

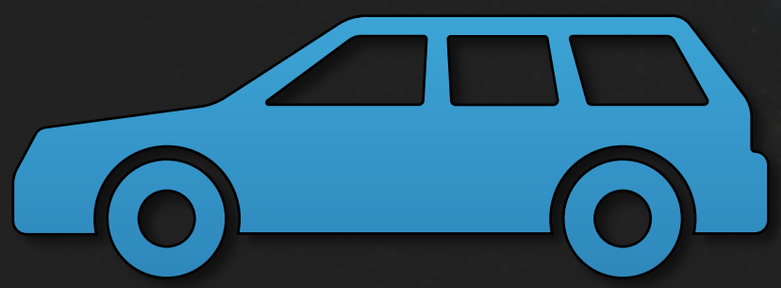
T O E T



A S T R O F O T O

Sterren(kijken)



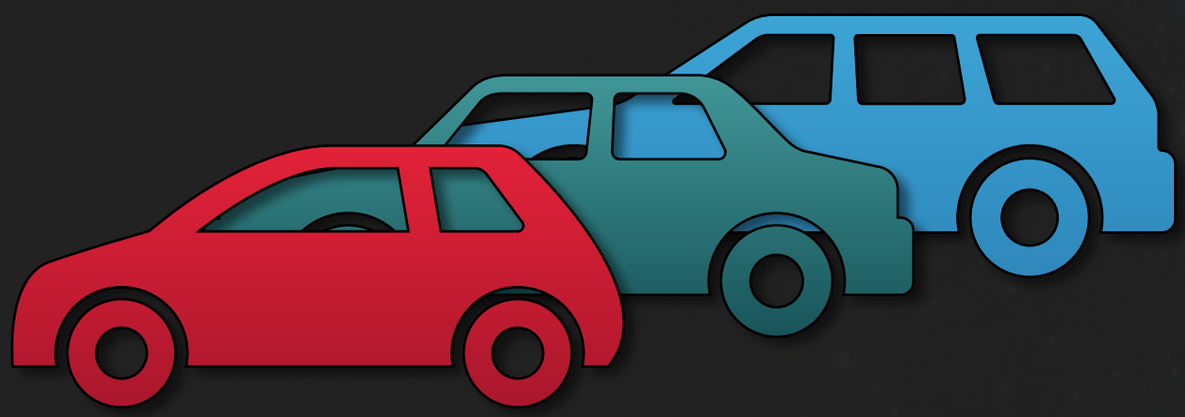




A S T R O F O T O

Starparty







A S T R O F O T O

Starparty

Saamhorigheid



A S T R O F O T O

Starparty



ASTROFOTO

Starparty

ASTROFOTO

Starparty

A S T R O F O T O

Star(after)party



A S T R O F O T O

AA-meeting



A S T R O F O T O

Amateur-Astronomen



A S T R O F O T O

De T van ...





A S T R O F O T O

Tjeklist

- [ ] Telescoop
- [ ] Montering
- [x] Camera
- [ ] Oorwarmers
- [ ] Koek-en-zopy
- [ ] Hoofdlampje



A S T R O F O T O

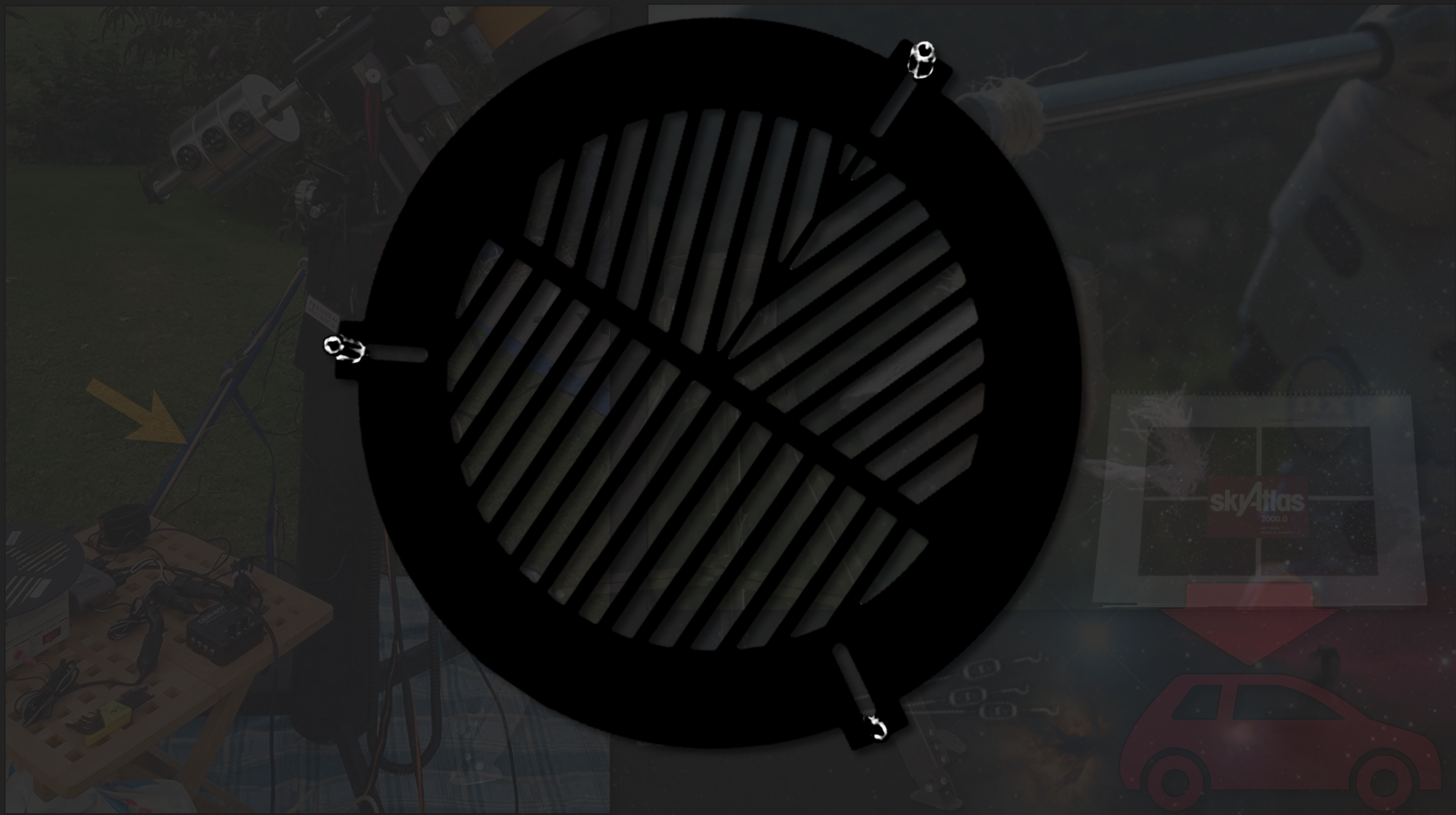
Oeps ... vergeten!





A S T R O F O T O

Oeps ... vergeten!



A S T R O F O T O

Oeps ... vergeten!



A S T R O F O T O

Opstelling, Optiek & Opnametechniek







A S T R O F O T O

Opstelling, Optiek & Opnametechniek

Telescoop







Lichtsterk

Vlak beeldveld

Geen (of weinig) kleurfout

Robuust (collimatievast, solide focuser)

A S T R O F O T O

Opstelling, Optiek & Opnametechniek

Opbouwen & uitlijnen





A S T R O F O T O

Opstelling, Optiek & Opnametechniek

Opbouwen & uitlijnen

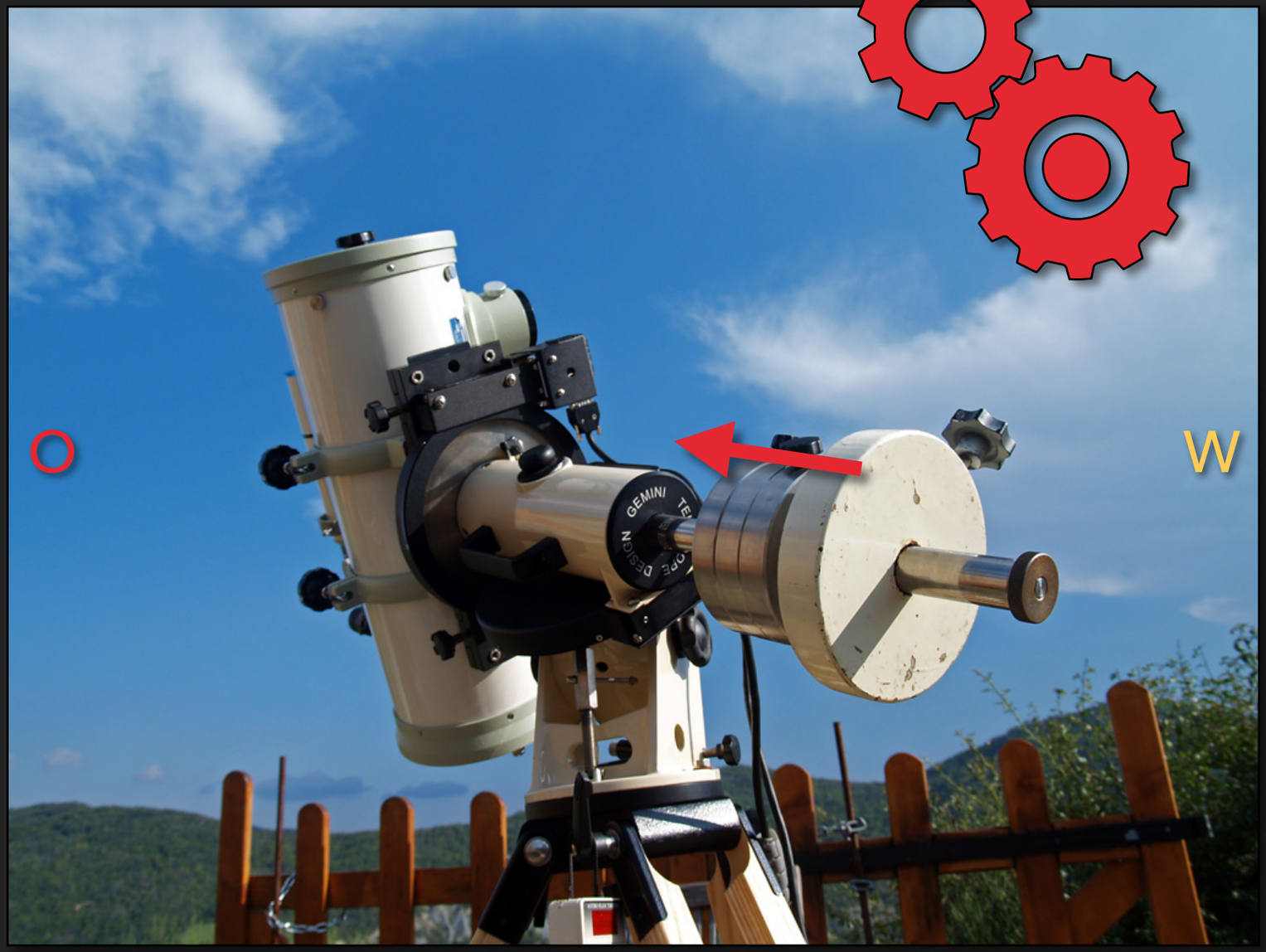




A S T R O F O T O

Opstelling, Optiek & Opnametechniek

Oost zwaarder





A S T R O F O T O

Opstelling, Optiek & Opnametechniek

Autoguiding



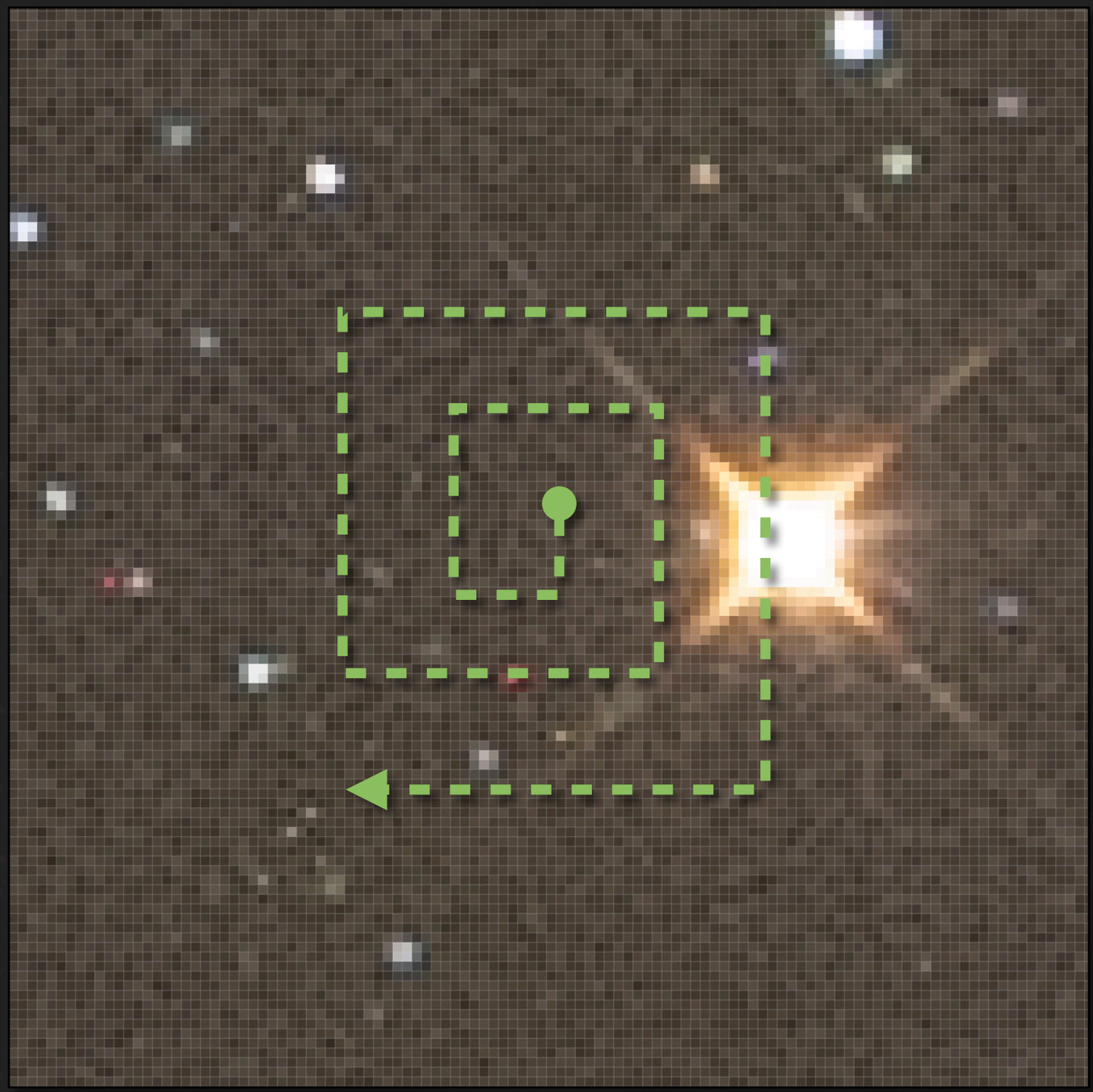


A S T R O F O T O

Opstelling, Optiek & Opnametechniek

Rasteren (dithering)





A S T R O F O T O

Opstelling, Optiek & Opnametechniek

Focusseren



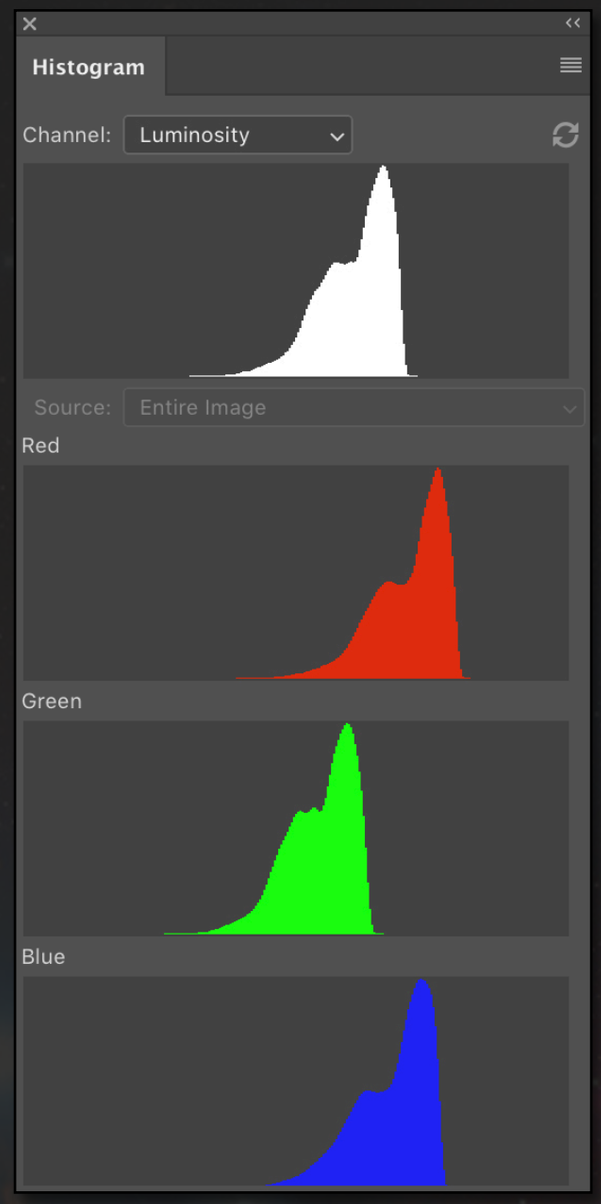


A S T R O F O T O

Opstelling, Optiek & Opnametechniek

Flat-fields



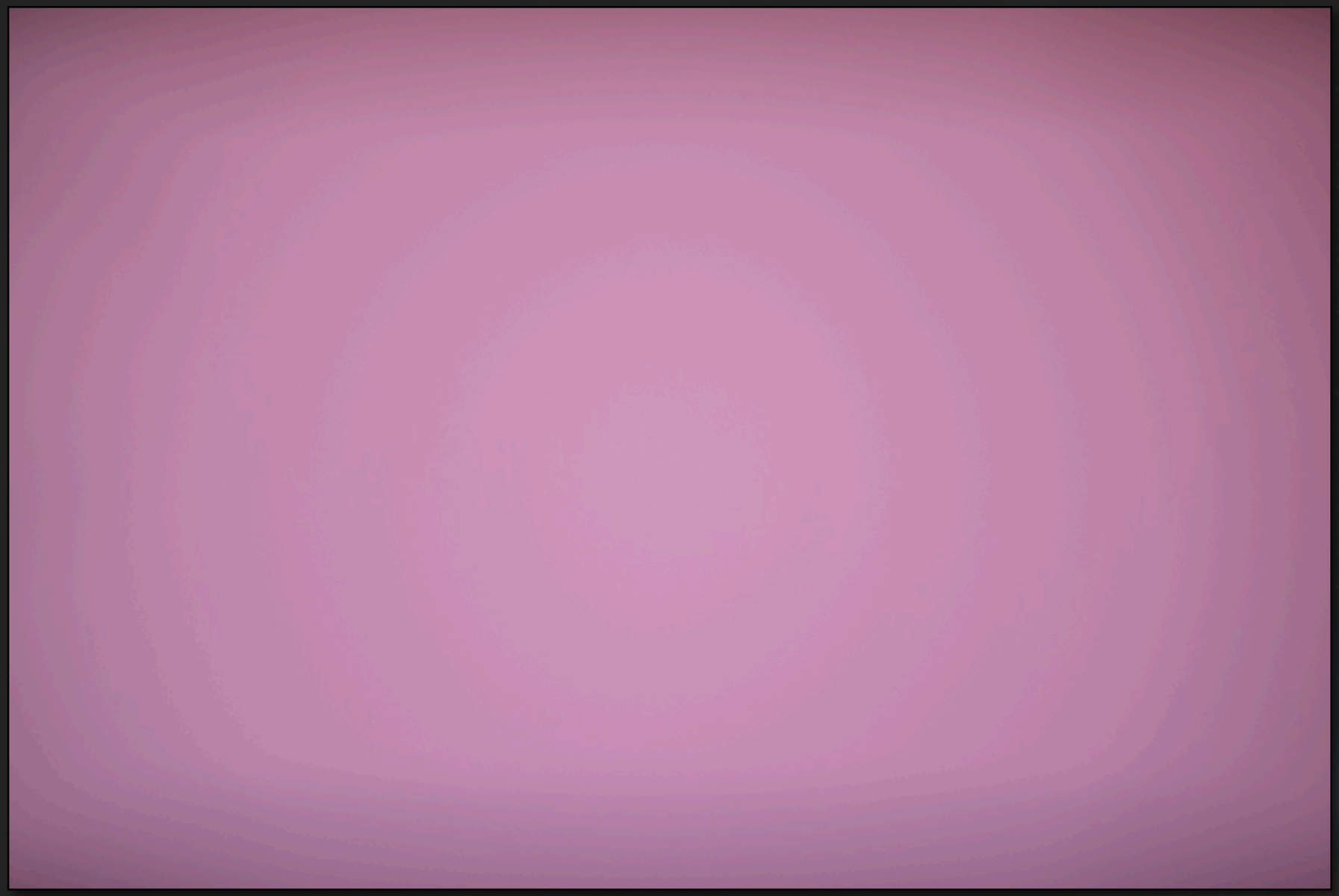


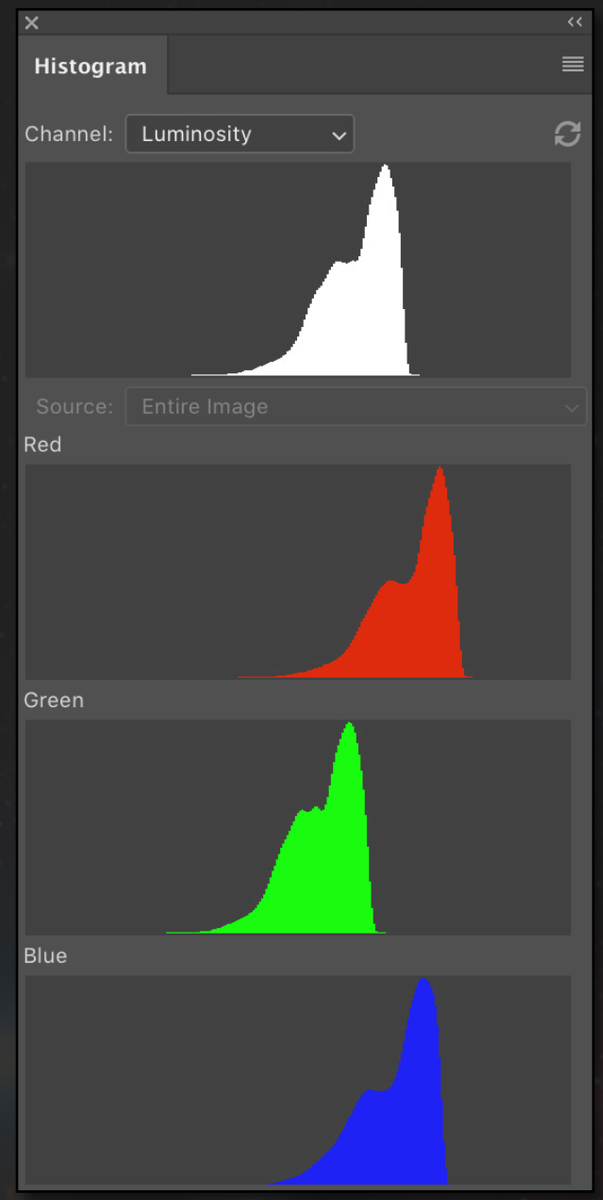
DSLR: automatisch belichtingstijd bepalen (AE); 1 à 2 stops overbelichten

A S T R O F O T O

Opstelling, Optiek & Opnametechniek

Flat-fields





DSLR: automatisch belichtingstijd bepalen (AE); 1 à 2 stops overbelichten

A S T R O F O T O

Nog meer A ...



Astro Pixel Processor



Adobe Photoshop

A S T R O F O T O

AstroPixelProcessor

78% Sun 19:59

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 7%

RAM APP 48/14336 OS 9306/16384

set work directory

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

Other/Processed | all | clean | 0

Multi-Channel/Filter processing

Multi-Session processing

auto-detect Masters & Integrations

Light | all | clean | 0

Flat | all | clean | 0

Dark | all | clean | 0

DarkFlat | all | clean | 0

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

Please select your working directory

Look In: 2018-09-07 M16 M17 & Barnard 10 SQM 21.2

FLATS 2018-09-07

LIGHTS Barnard 10

LIGHTS M16 & M17

Folder Name: ers/mauricetoet/Documents/Astrophotography/2018-09-07 M16 M17 & Barnard 10 SQM 21.2/LIGHTS M16 & M17

Files of Type:

Open | Cancel

stretch | save

neutralize-BG | invert data

000 B:000 016 3

239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

15% BG, 3 sigma, 2,5% base

239 ST:255 255 3

000 BA:000 016 3

select	frame	file name	ISO/gain	exposure (s)	time shot	#stars & star density	background & dispersion	SNR & noise	FWHM min, max (abs & rel)	quality score	Registration RMS - #stars	Instrument	color

AstroPixelProcessor 87% Sun 19:36

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 4%

RAM APP 66/14336 OS 4840/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

Bayer CFA

pattern: supported

algorithm: Adaptive Airy Disc

force Bayer CFA

camera White Balance

RGB multipliers

Red 1.000

Green 1.000

Blue 1.000

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

Choose the debayer algorithm

These algorithms have a big influence on your data which will translate into the quality of your integration results. For RGB data, the **Adaptive Airy Disc** (AAD) Algorithm is highly recommended. If you have used a narrowband filter with your One Shot Colour (OSC) camera, choose the appropriate algorithm for the filter that was used.

- no interpolation
This will show you the monochrome raw CFA data without interpolation.

- Bilinear
This is the most simple debayer algorithm. It gives artefacts, blurs details and injects a lot of chromatic noise in your data when compared to the other options.

- Adaptive Edge
This is an advanced debayer algorithm for processing of normal photography images. It gives the least artefacts along lines in your images, since it adapts to contrast edges.

- Adaptive Airy Disc
This is a very advanced debayer algorithm for processing of astrophotography images and therefor the default algorithm in APP. This algorithm is developed by Mabula, especially for astrophotography. It performs better than any other algorithm (like AHD, VNG). It gives the best resolution, least artefacts, least chromatic noise and the best colors, especially after background and star color calibration of your integration result.

- Super Pixel
Super Pixel modus will not debayer your data, instead each 2x2 CFA block on your sensor will be replaced by a 1x1 block. The R,G,B values will be the values that were recorded by your sensor in the original 2x2 block. For green, this means the average of the 2 green cfa pixels. Super Pixel modus will downscale your data by a factor of 2, so only use this setting if you have a clear reason to start with downscaling your data. A reason could be to make a downscaled integration as a preview of your data. Please realise, that the super pixel modus will have a big degrading effect on the registration quality of your results, since star lokation calculations will have much bigger uncertainty. Super Pixel modus immediately throws away valuable information.

- Hydrogen Alpha, Beta, Sulfur II, Oxygen III, Nitrogen II
You can directly debayer narrowband data, shot with your One Shot Colour (OSC) camera. If you choose any of these algorithms, you will directly have the monochrome narrowband exposure. There is no need to seperate the channels first. This method is superior to any other workflow used in processing narrowband data shot with an OSC camera. It preserves resolution, which also has the benefit that registration will not suffer. In other workflows, the integration result usually is upscaled again by using drizzle integration which will inject a lot of noise.

- Ha-OIII color, mono, extract Ha, extract OIII
These debayer algorithms are especially for so-called Multiple Narrowband filters (STC Astro DUO, OPT TRIAD Tri-Band Narrowband filters). These filters enable you to capture narrowband data from Hydrogen Alpha and from Oxygen III at the same time with a One Shot Color camera. Since you will capture data, shot with these filters, with your OSC camera in the Red, Green and Blue channels, there are different ways to process the data. You can simply interpret the data directly as it is recorded in RGB (**Ha-OIII color**). You can interpret it as luminance data, so monochrome (**Ha-OIII mono**). You can even directly extract the Hydrogen alpha (**Ha-OIII extract Ha**) and Oxygen III (**Ha-OIII extract OIII**) data directly from these exposures, which will give you much more control in post-processing.

The **Ha-OIII color** algorithm is an improvement of processing data shot with these kind of filters, over the default **Adaptive Airy Disc (AAD)** debayer algortihm. The OIII data quality and sharpness is the same, since the AAD algorithm is perfect for the OIII data that has data in both the green and blue channels. For the Hydrogen alpha data however, the AAD algorithm is not suitable. The HA-OIII color algorithm **will treat the Hydrogen alpha data totally separate from the OIII data and will therefore give a much better reconstruction of the Hydrogen alpha data versus the AAD algorithm**. The noise in your H-alpha data will be much lower so in integrations of several light frames, the Signal To Noise Ratio will be much higher as a consequence.

A S T R O F O T O

AstroPixelProcessor

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Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 7%

RAM APP 66/14336 OS 4894/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

Other/Processed | all | clean 0

Multi-Channel/Filter processing

Multi-Session processing

auto-detect Masters & Integr

Light | all | cl

Flat | all | cl

Dark | all | cl

DarkFlat | all | cl

Bias | all | clean 0

MasterFlat | all | clean 0

Enables Multi-Session processing.

Enable this if you need to calibrate, register, normalize and/or integrate data that was shot in different imaging sessions.

If you load light and/or calibration frames, you will be asked to which session the data belongs.

All data will be registered and normalized to the (automatically) chosen reference frame.

In 6) INTEGRATE, the separate sessions will be automatically integrated and will all have the same bitdepth and image dimensions.

The integrated sessions can be loaded directly into the 9) RGB Combine tool.

orientation scale to fit rectilinearProjection linear(l)

no image in image viewer

log colors

stretch save

neutralize-BG invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP auto saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

86% Sun 19:36

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 1%

RAM APP 66/14336 OS 5022/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

Other/Processed | all | clean | 0

Multi-Channel/Filter processing

Multi-Session processing

auto-detect Masters & Integrations

Light | all | clean | 0

Flat | all | clean | 0

Dark | all | clean | 0

DarkFlat | all | clean | 0

Bias | all | clean | 0

MasterFlat | all | clean | 0

orientation scale to fit rectilinearProjection linear(l)

no image in image viewer

log colors

Please select the light frames for your project

Look In: LIGHTS M16 & M17

_DSC4834.NEF _DSC4845.NEF _DSC4856.NEF
_DSC4835.NEF _DSC4846.NEF _DSC4857.NEF
_DSC4836.NEF _DSC4847.NEF _DSC4858.NEF
_DSC4837.NEF _DSC4848.NEF _DSC4859.NEF
_DSC4838.NEF _DSC4849.NEF _DSC4860.NEF
_DSC4839.NEF _DSC4850.NEF
_DSC4840.NEF _DSC4851.NEF
_DSC4841.NEF _DSC4852.NEF
_DSC4842.NEF _DSC4853.NEF
_DSC4843.NEF _DSC4854.NEF
_DSC4844.NEF _DSC4855.NEF

File Name: DSC4854.NEF" "_DSC4855.NEF" "_DSC4856.NEF" "_DSC4857.NEF" "_DSC4858.NEF" "_DSC4859.NEF" "_DSC4860.NEF"

Files of Type: Nikon NEF

Open Cancel

stretch save

neutralize-BG invert data

000 B:000 016 3

239 W:255 255 3

set 10.0 G:01.00 0.1

DDP auto saturation

15% BG, 3 sigma, 2,5% base

239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

Sun 19:36

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 6%

RAM APP 66/14336 OS 5054/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

Other/Processed | all | clean | 0

Multi-Channel/Filter processing

Multi-Session processing

auto-detect Masters & Integrations

Light	all	clean	0
Flat	all	clean	0
Dark	all	clean	0
DarkFlat	all	clean	0
Bias	all	clean	0
MasterFlat	all	clean	0

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

To which session do we need to assign the frame(s)?

To which session do we need to assign the frame(s)?

Please be aware, that you can assign light frames only to 1 session

Click on OK to confirm the chosen session.

Click on CANCEL, to abort adding the selected files to any session...

Choose the session for the frames:

- [x] session 1
- [ ] session 2
- [ ] session 3
- [ ] session 4
- [ ] session 5

provide a custom session:

Cancel | OK

log | colors

stretch | save

neutralize-BG | invert data

1 | 000 | B:000 | 016 | 3

1 | 239 | W:255 | 255 | 3

reset | 10.0 | G:01.00 | 0.1

DDP | auto | saturation

? | 15% BG, 3 sigma, 2,5% base

1 | 239 | ST:255 | 255 | 3

1 | 000 | BA:000 | 016 | 3

0 | HL:000 | 250

0.00 | SAT:0.15 | 0.50

0.00 | SAT TH:0.25 | 1.00

A S T R O F O T O

AstroPixelProcessor

86% Sun 19:37

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 3%

RAM APP 74/14336 OS 5093/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

Other/Processed | all | clean | 0

Multi-Channel/Filter processing

Multi-Session processing

auto-detect Masters & Integrations

Light | all | clean | 27

Flat | all | clean | 0

Dark | all | clean | 0

DarkFlat | all | clean | 0

Bias | all | clean | 0

MasterFlat | all | clean | 0

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

Please select the flat frames for your project

Look In: FLATS 2018-09-07

_DSC4800.NEF _DSC4811.NEF _DSC4822.NEF
_DSC4801.NEF _DSC4812.NEF _DSC4823.NEF
_DSC4802.NEF _DSC4813.NEF _DSC4824.NEF
_DSC4803.NEF _DSC4814.NEF _DSC4825.NEF
_DSC4804.NEF _DSC4815.NEF _DSC4826.NEF
_DSC4805.NEF _DSC4816.NEF _DSC4827.NEF
_DSC4806.NEF _DSC4817.NEF
_DSC4807.NEF _DSC4818.NEF
_DSC4808.NEF _DSC4819.NEF
_DSC4809.NEF _DSC4820.NEF
_DSC4810.NEF _DSC4821.NEF

File Name: DSC4821.NEF" "_DSC4822.NEF" "_DSC4823.NEF" "_DSC4824.NEF" "_DSC4825.NEF" "_DSC4826.NEF" "_DSC4827.NEF"

Files of Type: Nikon NEF

Open | Cancel

A S T R O F O T O

AstroPixelProcessor

Sun 19:37

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads

APP 1%

OS 2%

RAM APP 74/14336 OS 5095/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

Other/Processed | all | clean | 0

Multi-Channel/Filter processing

Multi-Session processing

auto-detect Masters & Integrations

Light	all	clean	27
Flat	all	clean	0
Dark	all	clean	0
DarkFlat	all	clean	0
Bias	all	clean	0
MasterFlat	all	clean	0

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

To which session do we need to assign the frame(s)?

To which session do we need to assign the frame(s)?

Click on OK to confirm the chosen session.

Click on CANCEL, to abort adding the selected files to any session...

all sessions

Choose the session for the frames:

session 1

session 2

session 3

session 4

session 5

provide a custom session:

Cancel | OK

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

85% Sun 19:40

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 7%

RAM APP 74/14336 OS 6276/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

Dark	all	clean	0
DarkFlat	all	clean	0
Bias	all	clean	0
MasterFlat	all	clean	0
MasterDark	all	clean	0
MasterDarkFlat	all	clean	0
MasterBias	none	clean	0
BadPixelMap	all	clean	0

sort | time shot | flip

clear

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

Please select the MasterBias for your project

Look In: BIAS

MB-ISO_gain_400.0-exp_1.25E-4s-200subs-NIKON_D810A-7380x4928-WC_1_3.0-avg.fits

File Name: MB-ISO_gain_400.0-exp_1.25E-4s-200subs-NIKON_D810A-7380x4928-WC_1_3.0-avg.fits

Files of Type: FITS, CR2, NEF, TIFF, JPEG

Open | Cancel

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

85% Sun 19:40

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 7%

RAM APP 74/14336 OS 6307/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

Dark	all	clean	0
DarkFlat	all	clean	0
Bias	all	clean	0
MasterFlat	all	clean	0
MasterDark	all	clean	0
MasterDarkFlat	all	clean	0
MasterBias	none	clean	0
BadPixelMap	all	clean	0

sort | time shot | flip

clear

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

To which session do we need to assign the frame(s)?

To which session do we need to assign the frame(s)?

Click on OK to confirm the chosen session.

Click on CANCEL, to abort adding the selected files to any session...

all sessions

Choose the session for the frames:

session 1

session 2

session 3

session 4

session 5

provide a custom session:

Cancel | OK

log | colors

stretch | save

neutralize-BG | invert data

1 | 000 | B:000 | 016 | 3

1 | 239 | W:255 | 255 | 3

reset | 10.0 | G:01.00 | 0.1

DDP | auto | saturation

? | 15% BG, 3 sigma, 2,5% base

1 | 239 | ST:255 | 255 | 3

1 | 000 | BA:000 | 016 | 3

0 | HL:000 | 250

0.00 | SAT:0.15 | 0.50

0.00 | SAT TH:0.25 | 1.00

A S T R O F O T O

AstroPixelProcessor

Sun 19:41

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 1%

RAM APP 74/14336 OS 6231/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

MasterBias

integrate: average

outlier rejection: no rejection

kappa: 3.0

iterations: 1

create rejection map

MasterDarkFlat

integrate: average

outlier rejection: no rejection

kappa: 3.0

iterations: 1

create rejection map

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

Choose the outlier rejection filter.

Such a filter will remove remaining bad pixels, satellite/airplane stripes and cosmic rays in your data.

Which filter do I need to use? – For outlier rejection on your calibration frames, it's best to use the regular sigma or winsor clip filters. The MAD filters are probably too aggresive in this case and therefore will reject too much good data.

no rejection – no outlier rejection is applied.

sigma clip – this is an outlier rejection filter which uses the median as the central value and the standard deviation (square root of the variance) relative to the central value for outlier rejection.

winsor sigma clip – uses a winsorized median and standard deviation to perform outlier rejection.

MAD sigma clip – this is an outlier rejection filter which uses the **median** as the central value and the **Weighted Median Absolute Deviation** relative to the central value for outlier rejection.

MAD winsor sigma clip – uses a **winsorized median** and **Weighted Median Absolute Deviation** to perform outlier rejection.

Be carefull with outlier rejection! setting the parameters to aggresively, will remove the outliers, but also a lot of good data, so it will hurt the Signal to Noise Ratio significantly. If you have more than 40 frames to integrate, all you would need is 1 iteration with kappa 3 to remove almost all outliers without harming the good data. Increase iterations first, and only lower the kappa if more iterations don't remove all outliers.

Because of the potential harmfull effects of outlier rejection, it's always best to try to get rid of all outliers before integration, for instance, remove all bad pixels with a Bad Pixel Map (BPM) to begin with. A BPM will never harm your data and you can get rid of a lot off unwanted noise to start with.

A S T R O F O T O

AstroPixelProcessor

84% Sun 19:42

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 1%

RAM APP 74/14336 OS 6219/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

MasterBias

integrate: average

outlier rejection: MAD winsor clip

kappa: 3.0

iterations: 1

create rejection map

MasterDarkFlat

integrate: average

outlier rejection: no rejection

kappa: 3.0

iterations: 1

create rejection map

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

84% Sun 19:42

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 3%

RAM APP 74/14336 OS 6231/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

scale MasterDark

MasterFlat

integrate: average

outlier rejection: no rejection

kappa: 3.0

iterations: 1

create rejection map

normalize: multiply-scale

blur: no blur

BadPixelMap

hot pixels kappa: 3.0

cold pixels %: 25

detect bad columns

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

Choose an integration method to create the master flat frames.

Use **median** with less than 20 frames, this will remove outliers as well, so you can disable the use of an outlier rejection filter or relax it's settings.

If you have more than 20 frames, use **average** integration combined with outlier rejection, this will be superior in most cases.

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

84% Sun 19:43

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 4%

RAM APP 74/14336 OS 6195/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

scale MasterDark

MasterFlat

integrate: average

outlier rejection: MAD winsor clip

kappa: 3.0

iterations: 1

create rejection map

normalize: multiply-scale

blur: no blur

BadPixelMap

hot pixels kappa: 3.0

cold pixels %: 25

detect bad columns

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

84% Sun 19:43

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 0%

RAM APP 74/14336 OS 6208/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

scale MasterDark

MasterFlat

integrate: average

outlier rejection: MAD winsor clip

kappa: 3.0

iterations: 1

create rejection map

normalize: multiply-scale

blur: no blur

BadPixelMap

hot pixels kappa: 3.0

cold pixels %: 25

detect bad columns

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

Choose the normalization method for flats

multiply-scale is the default setting and should always be used for normalization of flat frames. All flats will be normalized such that the peak illumination and the vignetting profiles match of all flats before integration.

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

84% Sun 19:43

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 2%

RAM APP 74/14336 OS 6189/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

- [ ] create Bad Pixel Map
- [x] create 32-bit Masters
- [x] create MasterBias, -Dark, -Flat
- [ ] adaptive pedestal/reduce Amp-Glow
- [x] calibration warnings

create Masters & assign to Lights

(re-)assign Masters to Lights

- [ ] align channels
- [ ] split channels
- [ ] remove light pollution

save calibrated frames

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT TH:0.25 1.00

A S T R O F O T O

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OS 2%

RAM APP 74/14336 OS 6197/16384

/Us...QM 21.2/LIGHTS M16 & M17

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

star detection

☑ automatic #stars target:

analyse stars

☐ orientation ☐ scale to fit rectilinearProjection linear(l)

no image in image viewer

☑ log ☑ colors

☑ stretch save

☐ neutralize-BG ☐ invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

☑ DDP ☑ auto ☐ saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

Enable/disable **automatic #stars target**

This setting will set an upper limit to the amount of detected stars in your images.

This setting is very usefull to limit the amount of stars detected in your images and will therefore make registration more robust and faster. Only the brightest stars will survive this limitation which is vital for robust registration as well.

For regular (non-mosaic) integrations, a number of 500-1000 stars per frame is desired. For mosaics, it's better to increase the desired amount of detected stars to at least 2500, especially if your mosaic frames have little overlap, i.e. less than 10%.

Only disable this setting if registration fails and you have already tried to increase the #stars target to a higher value.

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#CPU 8 using 07 threads APP 1%

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RAM APP 74/14336 OS 6179/16384

/Us...QM 21.2/LIGHTS M16 & M17

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

set reference

pattern recognition descriptors

quadrilaterals

scale start 1

scale stop 5

flip descriptors in X/

dynamic distortion correct

use dynamic distortion

same camera and optics

choose saved camera profi

no distortion model

distortion margin 0.05

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

Set the scale start.

This is the scale of the patterns that are created for pattern recognition.

For **normal** registration mode, scale start at 1 and scale stop at 5 is fine.

For **mosaic mode**, you will need to increase the scale stop usually to at least 10. This will correspond roughly with having a 10% overlap between the mosaic panels. If you have a bigger overlap between the panels, for instance 15%, than the scale stop can be relaxed to 7 or 8.

Only increase the scale stop if some frame(s) couldn't be registered which do have overlap and be aware that increasing the scale stop will slow down the registration in the case of high star counts in the frames.

For mosaics that are composed regularly, like a 4x4 mosaic, where all panels overlap for about 10-20%, then the scale start can be set higher, usually a value of 5 is fine.

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#CPU 8 using 07 threads APP 1%

OS 2%

RAM APP 74/14336 OS 6206/16384

/Us...QM 21.2/LIGHTS M16 & M17

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

save distortion model

registration mode

normal

registration model

projective

start registration

save registered frames:

projection method:

rectilinearProjection

scale 1.0

interpolation method:

lanczos-3

orientation scale to fit rectilinearProjection linear(l)

no image in image viewer

log colors

stretch save

neutralize-BG invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP auto saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT TH:0.25 1.00

Choose a registration mode.

Choose **normal** for regular registration with a selected reference frame. In this case all frames must overlap with the reference frame.

If you have frames that don't have overlap with your reference frames, you will need to choose the **mosaic** mode.

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#CPU 8 using 07 threads APP 1%

OS 2%

RAM APP 74/14336 OS 6159/16384

/Us...QM 21.2/LIGHTS M16 & M17

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

registration model

projective

start registration

save registered frames:

projection method:

rectilinearProjection

scale 1.0

interpolation method:

lanczos-3

no under/overshoot

save registered frames

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

Choose a registration model.

This is the coordinate transformation type that is needed to register the images.

With a **projective** model, the parameters are calculated using regular projective transformations, also called homographies, without any restrictions on the parameters.

With a **calibrated projective** registration model, the parameters are again calculated using projective transformations, but now with restrictions on the parameters.

The calibrated projective model is required if your Field Of View (FOV) of your data is larger than 120 degrees, especially in the mosaic mode!

The restrictions on the parameters are such that the homography is now calculated from a camera matrix and a rotation matrix. These 2 matrices are found to be able to compose the homography.

The 3x3 camera matrix consists of the focal length (in number of pixels of your camera's sensor) in the x- and y-directions and the principal point (the location where the optical axis hits your sensor).

The 3x3 rotation matrix is a regular 3D rotation matrix composed of 3 rotations around the x-,y- and z-axis.

So, with the **calibrated projective** model, each homography will be described by a camera matrix + rotation matrix. In this formulation, no actual coordinate translation (move in x- and y-direction) is needed as part of the registration parameters, since the stars in our images are assumed to be at infinity in this case.

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT TH:0.25 1.00

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LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 9%

RAM APP 74/14336 OS 6213/16384

/Us...QM 21.2/LIGHTS M16 & M17

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

registration model

projective

start registration

save registered frames:

projection method:

rectilinearProjection

scale 1.0

interpolation method:

lanczos-3

no under/overshoot

save registered frames

Choose a projection type. Default is rectilinear. Other projections are only possible if you use a calibrated projective registration model

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

83% Sun 19:46

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LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 12%

RAM APP 74/14336 OS 6197/16384

/Us...QM 21.2/LIGHTS M16 & M17

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

registration model

projective

start registration

save registered frames:

projection method:

rectilinearProjection

scale 1.0

interpolation method:

lanczos-3

no under/overshoot

save registere

Keep this enabled to prevent artefacts around star borders.

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT TH:0.25 1.00

A S T R O F O T O

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LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 2%

RAM APP 74/14336 OS 6226/16384

/Us...QM 21.2/LIGHTS M16 & M17

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

mode: regular

projection: rectilinearProjection

method: add-scale

scale: BWMV

neutralize background

normalize lights

save normalized frames:

projection method: rectilinearProjection

scale: 1.0

Choose the normalization mode.

If all light frames are of the same image scale and have nearly identical field of view, choose the **regular** mode. Otherwise choose the **advanced** mode.

For mosaic integrations, usually, the **advanced** mode gives far better normalization results.

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT TH:0.25 1.00

A S T R O F O T O

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LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 5%

RAM APP 74/14336 OS 6212/16384

/Us...QM 21.2/LIGHTS M16 & M17

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

mode: regular

projection

rectilinearProjection

method: add-scale

scale: BWMV

neutralize background

normalize lights

save normalized frames:

projection method:

rectilinearProjection

scale: 1.0

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

Choose the normalization method

For well and flat illuminated lights of the same exposure and ISO/gain settings, choose **add-scale**.

Otherwise **multiply-scale** is recommended.

The methods without scale, only normalize for the lokation (the background) of the data. The methods with scale normalize the data for both lokation and scale/dispersion of the data. If you combine data of different sources and or sessions it's essential to normalize for both location and scale.

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LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 3%

RAM APP 74/14336 OS 6270/16384

/Us...QM 21.2/LIGHTS M16 & M17

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

mode regular

projection

rectilinearProjection

method add-scale

scale BWMV

neutralize background

normalize lights

save normalized frames:

projection method:

rectilinearProjection

scale 1.0

orientation scale to fit rectilinearProjection linear(l)

no image in image viewer

log colors

stretch save

neutralize-BG invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP auto saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

Choose the method of calculation for the scale(dispersion) of the light frames.

MAD = Median Absolute Deviation

BWMV = Biweight Midvariance

BWMV is the default because it is the most robust for most datasets. Both MAD & BWMV scale parameters are calculated relative to the lokation of the data. The lokation (the background of the sky or roughly the peak of the histogram) is calculated using robust statistics with several outlier rejection iterations.

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#CPU 8 using 07 threads APP 1%

OS 3%

RAM APP 74/14336 OS 6229/16384

/Us...QM 21.2/LIGHTS M16 & M17

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

Multi-Channel/Filter options

integrate per channel

Multi-Session options

integrate all

lights to stack 100% 27 of 27

weights: equal

integrate

composition

mode

local normalization correction

LNC degree: no LNC

LNC iterations: 3

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

Set the weight of the frames for stacking.

This setting can have clear impact on the integration result, so you will need to choose the weights that best match what you are trying to accomplish.

equal – this will give you a result which will be subtoptimal in SNR, and suboptimal in sharpness, because all frames are weighted equally. Bad frames will have a big impact on the integration result.

exposure – this setting can be chosen if you combine exposures of different exposure times. The frames with longest exposures will have higher weights which scale as the square root of the exposure. This setting will then give more weight to the frames with higher SNR usually, resulting in an integration with a better SNR, but also less sharp in most cases.

quality – this will use the quality score shown in the **quality score** column in the bottom frame list panel. The quality parameter is based on noise, star density, star size and star shape. This usually gives the best integration result for noise and sharpness combined.

SNR – the weights are now based on the Signal to Noise Ratio of the frames. This is a really dangerous method. Any deviating gradients between the frames will make the SNR metric totally unreliable. From all the settings, this is the least attractive one so it's not recommended. Bad frames with guiding errors, or which are out of focus, or have some clouds, or shot with bad transparancy, could give higher SNR values, strongly reducing the integration result.

noise – use this if you aim for the lowest noise in the end result. The weights calculated by APP are based on the noise values after having applied normalization to the frames, so these are normalized noise values. This is important, because normalization for scale/dispersion will impact the initial noise values of the frames.

star shape – use this if you want to have the smallest and roundest stars in your integration result. It will give weights to the frames based on the star shape of the stars in the frame (star shape means both roundness and size). Frames that have stars that are not round are punished a lot, so these frames will have little weight. This is a very nice integration setting if you have some frames without perfect guiding but still want those frames to help reduce the noise in the data without impacting the star shapes in the integration.

Scale Independent quality parameters.

APP has the parameters star density & relative FWHM which are very helpfull if you combine data of different scales. APP calculates the star size/shape and star density relative to the scale differences between the frames. The scale differences are calculated using the homographies (projective transformations) between the frames.

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#CPU 8 using 07 threads APP 1%

OS 0%

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/Us...QM 21.2/LIGHTS M16 & M17

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

weights: quality

integrate: average

composition

mode: full

local normalization correction

LNC degree: no LNC

LNC iterations: 3

multi-band blending

enable MBB 5 %

outlier rejection

filter: no rejection

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT TH:0.25 1.00

Choose the composition of the integration.

full – which is the default, will make a field of view for the integration such that all pixels of all frames that could be registered will be shown in the integration.

reference – will make a field of view that matches the field of view of the registration frame.

crop – will allow you to draw a crop of the reference frame which will be the field of view of the integration. Usefull to only integrate a part of the reference frame's field of view.

Click on the **apply mode** button to apply a different composition.

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#CPU 8 using 07 threads APP 1%

OS 3%

RAM APP 74/14336 OS 6211/16384

/Us...QM 21.2/LIGHTS M16 & M17

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

composition

mode: full

local normalization correction

LNC degree: 1st degree LNC

LNC iterations: 3

multi-band blending

enable MBB 5 %

outlier rejection

filter: no rejection

kappa: 3.0

iterations: 1

diffraction protection: none

integration output maps

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

Choose the degree of Local Normalization Correction (LNC)

LNC will correct the illumination in your frames in such a manner that the illumination differences of the separate frames in your stack will be matched locally instead of globally.

Normally, normalization is only calculated globally per frame. With LNC, the gradients in your data will be matched per frame while maintaining a solution for all frames at once that is stable and as flat as possible.

If you are combining data shot at 1 single night then LNC will still help, but the improvement will probably be very little and visually hard to see, because locally, the frames already match pretty well.

If you are combining data with deviating gradients (multiple imaging sessions, data from different setups and/or photographers) then LNC should give a very clear improvement.

For regular integrations (i.e. not a mosaic), start with 1st degree and 1 iteration. Then improve from there if needed. First increase iterations to 3. If that doesn't change the outcome, increase the degree. For regular integrations normally 2nd or 4th degree with 3 iterations gives a very nice improvement.

For mosaics, it really depends on the data which degree and the amount of iterations that are needed. The user should experiment, but just like for regular integrations, start with 1st degree and 1 iteration and then improve from there.

A S T R O F O T O

AstroPixelProcessor

83% Sun 19:48

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#CPU 8 using 07 threads APP 4%

OS 6%

RAM APP 74/14336 OS 6220/16384

/Us...QM 21.2/LIGHTS M16 & M17

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

composition

mode: full

local normalization correction

LNC degree: 1st degree LNC

LNC iterations: 3

multi-band blending

enable MBB 5 %

Choose to enable Multi-Band Blending (MBB).

Multi-Band Blending is a tool to blend images into each other. It will reduce stack artefacts at the borders of regular integrations and will remove seams in mosaics.

In most cases a value of 5-15% is fine. For regular integrations, usually 5-10% is fine. For mosaics, it really depends on the amount of overlap between the mosaic panels. If the amount of overlap is about 10%, setting MBB at 10% will work very nicely.

diffraction protection: none

integration output maps

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

Sun 19:49

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LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 1%

RAM APP 74/14336 OS 6194/16384

/Us...QM 21.2/LIGHTS M16 & M17

3) ANALYSE STARS | 4) REGISTE

0) RAW/FITS | 1) LOAD | 2) CALIBRA

5) NORMALIZE | 6) INTEGRATE | 9) TO

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

composition

mode full

local normalization correction

LNC degree 1st degree LNC

LNC iterations 3

multi-band blending

enable MBB 5 %

outlier rejection

filter LN MAD sigma clip

kappa

iteration

diffracti

integrati

sigma clip
winsor clip
LN sigma clip
LN winsor clip
MAD sigma clip
MAD winsor clip
LN MAD sigma clip
LN MAD winsor clip

Choose the outlier rejection filter.

Such a filter will remove remaining bad pixels, satellite/airplane stripes and cosmic rays in your data

Which filter do I need to use? – If you have less than 50 frames, the MAD filters are much more robust in rejecting real outliers. If you have more than 50 frames, differences will become less. Only if you integrate several 100s of frames, the filters without MAD could gain the advantage.

Winsor clipping in combination with diffraction protection (if needed) is preferred over sigma clipping in almost all cases.

Use a LN filter if you have varying illumination in your frames for more reliable rejection over the whole filed of view.

no rejection – no outlier rejection is applied.

sigma clip – this is an outlier rejection filter which uses the **median** as the central value and the **Weighted Standard Deviation** (square root of the variance) relative to the central value for outlier rejection.

winsor sigma clip – uses a **winsorized median** and **Weighted Standard Deviation** (square root of the variance) to perform outlier rejection.

LN sigma clip – local normalization sigma clip rejection is a new and advanced form of regular sigma clip rejection. See **LN rejection filter** below for additional information.

LN winsor sigma clip – local normalization winsor sigma clip rejection is a new and advanced form of regular winsor sigma clip rejection. See **LN rejection filter** below for additional information.

MAD sigma clip – this is an outlier rejection filter which uses the **median** as the central value and the **Weighted Median Absolute Deviation** relative to the central value for outlier rejection.

MAD winsor sigma clip – uses a **winsorized median** and **Weighted Median Absolute Deviation** to perform outlier rejection.

LN MAD sigma clip – local normalization MAD sigma clip rejection is a new and advanced form of regular MAD sigma clip rejection. See **LN rejection filter** below for additional information.

LN MAD winsor sigma clip – local normalization MAD winsor sigma clip rejection is a new and advanced form of regular MAD winsor sigma clip rejection. See **LN rejection filter** below for additional information.

LN rejection filter – a local normalization rejection filter is an additional technique to improve both **sigma** and **winsor sigma** clipping using either the standard deviation or Median Absolute Deviation (MAD) for rejection. Locally, in your integration, all data will be corrected when fed to the outlier rejection filter for more efficient and robust rejection by calculating the local median value of each layer in the stack in a radius of 32 pixels. The pixel values in each pixel stack are corrected using these median values and will therefore correct each pixel for local deviations in intensity over the whole field of view. The pixels that survive the rejection filter will be used uncorrected for the actual integration. **This technique makes linear fit clipping obsolete by correctly solving the root problem of local intensity differences between the layers/lights of the stack to be integrated.** Since no fitting needs to be done anymore, it is much faster as well. The result is that you will get very uniform, and robust rejection over the entire field of view.

diffraction protection – all 4 filters can be used with diffraction protection to prevent artefacts at the star borders. Please read the tooltip for diffraction protection for more information on this new feauture.

If you have data of the same source (same camera and optics) then winsorized sigma clipping is the recommended outlier rejection filter. Otherwise use the sigma clip filter to prevent artefacts created by the winsor process. These artefacts are usually visible at the star border due to differences in diffraction patterns between the frames.

Be carefull with outlier rejection! setting the parameters to aggresively, will remove the outliers, but also a lot of good data, so it will hurt the Signal to Noise Ratio significantly. If you have more than 40 frames to integrate, all you would need is 1 iteration with kappa 3 to remove almost all outliers without harming the good data. Increase iterations first, and only lower the kappa if more iterations don't remove all outliers.

Because of the potential harmfull effects of outlier rejection, it's always best to try to get rid of all outliers before integration, for instance, remove all bad pixels with a Bad Pixel Map (BPM) to begin with. A BPM will never harm your data and you can get rid of a lot off unwanted noise to start with.

A S T R O F O T O

AstroPixelProcessor

Sun 19:51

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 7%

RAM APP 74/14336 OS 6187/16384

/Us...QM 21.2/LIGHTS M16 & M17

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

composition

mode: full

local normalization correction

LNC degree: 1st degree LNC

LNC iterations: 3

multi-band blending

enable MBB 5 %

outlier rejection

filter: LN MAD sigma clip

kappa: 3.0

iterations: 1

diffraction protection: none

integration output maps

orientation | scale to fit | rectilinearProjection | linear(l)

no image in image viewer

log | colors

stretch | save

neutralize-BG | invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

diffraction protection – this is a new concept with the purpose to prevent rejection artefacts at the star borders.

Rejection artefacts will occur if you integrate data with varying star sizes and/or different diffraction patterns. For instance if you want to combine data of separate nights with big differences in atmospheric seeing or if you want to combine data shot with different telescopes like an APO and a Newton telescope.

You can leave this function disabled by setting it to none. Any other setting will enable this feauture on all 4 filters.

If enabled, you can prevent artefacts at star borders by choosing a suitable value. The value correspons to how many pixels are allowed to be rejected in a pixelstack. Realize, that zero pixel values in each pixel stack are not part of pixel stacks. These are removed earlier.

An example, I am going to integrate 20 frames of night 1 and 30 frames of night 2. Normally, each pixel stack will consist of 50 pixels. And out of those 50 pixels, normally only a couple of pixels will be real outliers. It's very reasonable to assume that if more than 10% of the pixels are rejected we are not simply rejecting real outliers. In that case we are probably rejecting pixels at star borders, introducing possible ugly artefacts. In this instance, setting the diffraction protection at 5-10 pixels will now start to prevent a lot of artefacts around star borders.

An extra benefit is that this feature compensates for the well-known artefacts of winsor sigma clipping. So with diffraction protection enabled, winsor sigma clipping can be used perfectly if you want to combine data of different telescopes with different diffraction patterns. Depending on the amount of frames used in the integration, artefacts can become non-existent while achieving very optimal outlier rejection in pixel stacks where it's really needed.

A S T R O F O T O

AstroPixelProcessor

82% Sun 19:52

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 35GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 3%

RAM APP 74/14336 OS 6194/16384

/Us...QM 21.2/LIGHTS M16 & M17

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

create normalization map

pixel interpolation

filter lanczos-3

no under/overshoot

drizzle integration

kernel topHatKernel

droplet size 1.0

INTEGRATE

mode no drizzle

scale 1.0

projection

rectilinearProjection

integrate

orientation scale to fit rectilinearProjection linear(l)

no image in image viewer

log colors

stretch save

neutralize-BG invert data

1 000 B:000 016 3

1 239 W:255 255 3

reset 10.0 G:01.00 0.1

DDP auto saturation

? 15% BG, 3 sigma, 2,5% base

1 239 ST:255 255 3

1 000 BA:000 016 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

82% Sun 19:52

Astro Pixel Processor version 1.071 by Aries Productions

INFO CFG HDD 894GB OpenGL

#CPU 8 using 07 threads APP 87%

OS 100%

RAM APP 14336/14336 OS 16213/16384

/Volumes/Freecom/MBM 165

3) ANALYSE STARS 4) REGISTER

0) RAW/FITS 1) LOAD 2) CALIBRATE

5) NORMALIZE 6) INTEGRATE 9) TOOLS

no under/overshoot

drizzle integration

kernel topHatKernel

droplet size 1.0

INTEGRATE

mode no drizzle

scale 1.0

projection

rectilinearProjection

integrate

orientation scale to fit rectilinearProjection linear(l)

Integration task requires 210.1 GBs of free harddisk space

6) INTEGRATE: integrate light .....n-session 1_session 2_session 3_session 4_session 5_session 6 ...

17:28:54 - 6) INTEGRATE: integrate light frames: wrote weights of frame: 50 to file mapper
17:28:55 - 6) INTEGRATE: integrate light frames: loaded frame 51 of 318 frames
17:28:55 - 6) INTEGRATE: integrate light frames: LNC: got center coordinates and area of frame 51 in integration composit
17:29:08 - 6) INTEGRATE: integrate light frames: wrote frame: 51 to file mapper
17:29:15 - 6) INTEGRATE: integrate light frames: wrote weights of frame: 51 to file mapper
17:29:15 - 6) INTEGRATE: integrate light frames: loaded frame 52 of 318 frames
17:29:15 - 6) INTEGRATE: integrate light frames: LNC: got center coordinates and area of frame 52 in integration composit
17:29:28 - 6) INTEGRATE: integrate light frames: wrote frame: 52 to file mapper
17:29:36 - 6) INTEGRATE: integrate light frames: wrote weights of frame: 52 to file mapper
17:29:37 - 6) INTEGRATE: integrate light frames: loaded frame 53 of 318 frames
17:29:37 - 6) INTEGRATE: integrate light frames: LNC: got center coordinates and area of frame 53 in integration composit
17:29:55 - 6) INTEGRATE: integrate light frames: wrote frame: 53 to file mapper
17:30:03 - 6) INTEGRATE: integrate light frames: wrote weights of frame: 53 to file mapper
17:30:03 - 6) INTEGRATE: integrate light frames: loaded frame 54 of 318 frames
17:30:03 - 6) INTEGRATE: integrate light frames: LNC: got center coordinates and ar
17:30:16 - 6) INTEGRATE: integrate light frames: wrote frame: 54 to file mapper
17:30:23 - 6) INTEGRATE: integrate light frames: wrote weights of frame: 54 to
17:30:24 - 6) INTEGRATE: integrate light frames: loaded frame 55 of 318 fra
17:30:24 - 6) INTEGRATE: integrate light frames: LNC: got center coordinate
17:30:40 - 6) INTEGRATE: integrate light frames: wrote frame: 55 to file m
17:30:45 - 6) INTEGRATE: integrate light frames: wrote weights of fram
17:30:45 - 6) INTEGRATE: integrate light frames: loaded frame 56 of
17:30:46 - 6) INTEGRATE: integrate light frames: LNC: got center c
17:31:03 - 6) INTEGRATE: integrate light frames: wrote frame: 56
17:31:11 - 6) INTEGRATE: integrate light frames: wrote weights
17:31:11 - 6) INTEGRATE: integrate light frames: loaded frame
17:31:11 - 6) INTEGRATE: integrate light frames: LNC: got cen

cancel 6) INT

log colors

stretch save

neutralize-BG invert data

B:000 016 3

W:255 255 3

G:01.00 0.1

saturation

2,5% base

255 3

000 016 3

select	frame	file name
☑	Light 001 session 1 MB-1 all sessions MF-1 session 1 CA STAR REG NORM	/Users/mauricetoet/Documents/Astrophotography/20
☑	Light 002 session 1 MB-1 all sessions MF-1 session 1 CA STAR REG NORM	/Users/mauricetoet/Documents/Astrophotography/2018-08
☑	Light 003 session 1 MB-1 all sessions MF-1 session 1 CA STAR REG NORM	/Users/mauricetoet/Documents/Astrophotography/2018-08-06 M
☑	Light 004 session 1 MB-1 all sessions MF-1 session 1 CA STAR REG NORM	/Users/mauricetoet/Documents/Astrophotography/2018-08-06 MBM 165
☑	Light 005 session 1 MB-1 all sessions MF-1 session 1 CA STAR REG NORM	/Users/mauricetoet/Documents/Astrophotography/2018-08-06 MBM 165 SQM 21.6/LIGHTS 2018-08-06/_DSC3516.NEF
☑	Light 006 session 1 MB-1 all sessions MF-1 session 1 CA STAR REG NORM	/Users/mauricetoet/Documents/Astrophotography/2018-08-06 MBM 165 SQM 21.6/LIGHTS 2018-08-06/_DSC3517.NEF
☑	Light 007 session 1 MB-1 all sessions MF-1 session 1 CA STAR REG NORM	/Users/mauricetoet/Documents/Astrophotography/2018-08-06 MBM 165 SQM 21.6/LIGHTS 2018-08-06/_DSC3518.NEF



A S T R O F O T O

AstroPixelProcessor

Sat 09:49

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 26GB | OpenGL

#CPU 8 using 07 threads APP 0%

OS 0%

RAM APP 2746/14336 OS 15879/16384

/Us...QM 21.2/LIGHTS M16 & M17

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

Other/Processed | all | clean | 0

Multi-Channel/Filter processing

Multi-Session processing

auto-detect Masters & Integrations

Light | all | clean | 0

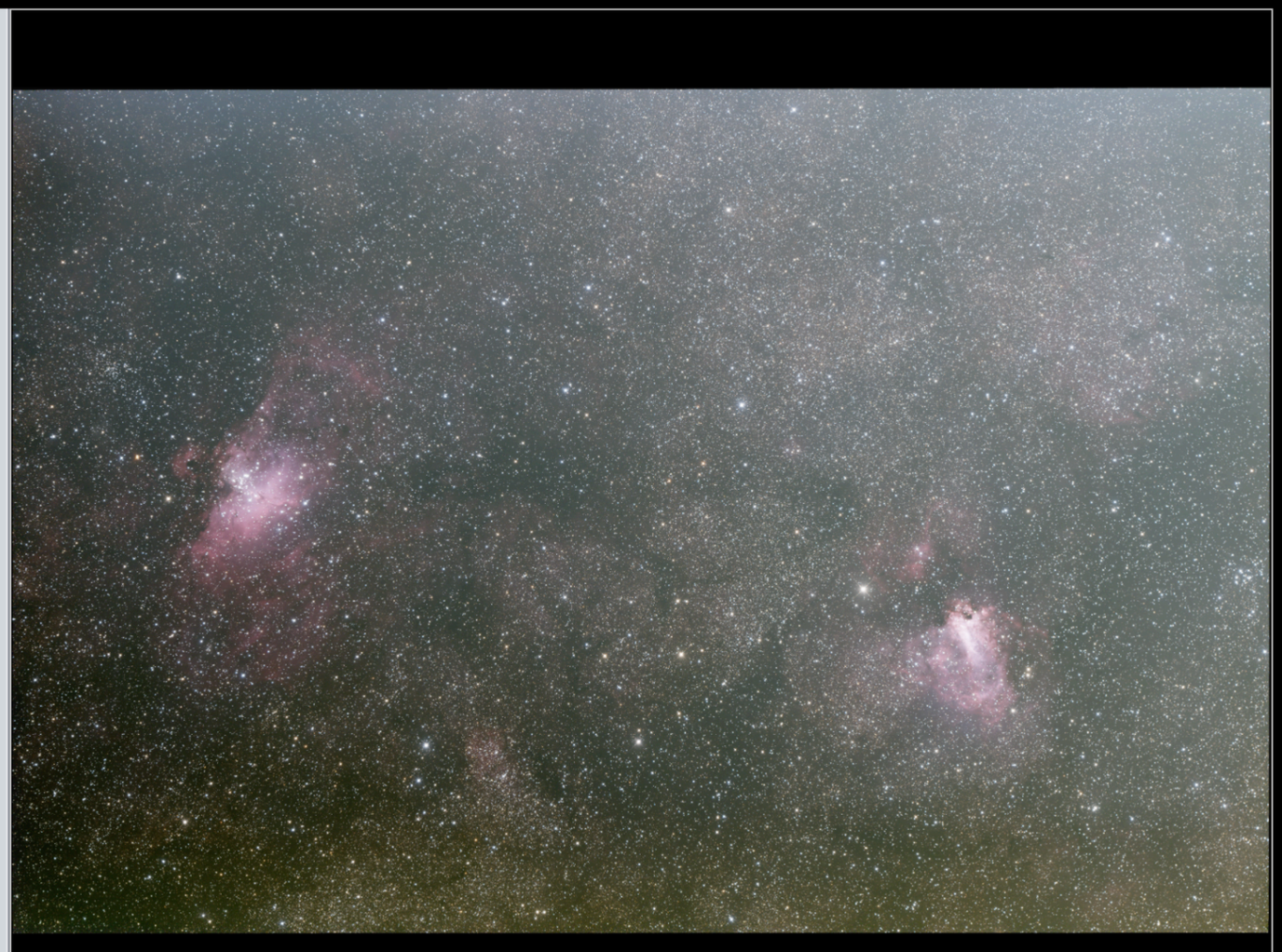
Flat | all | clean | 0

Dark | all | clean | 0

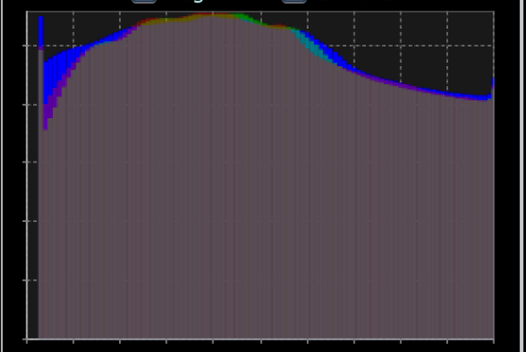
DarkFlat | all | clean | 0

orientation | scale to fit | rectilinearProjection | linear(l)

1_3.0_none-x_1.0_LZ3-NS-full-qua-add-sc_BWMV_nor-AA-RL-MBB5_2ndLNC_it1.fits



log | colors



stretch | save

neutralize-BG | invert data

1 | 0.000 | B:0.02674 | 0.062 | 3

1 | 0.938 | W:1.00000 | 1.000 | 3

reset | 10.0 | G:01.00 | 0.1

DDP | auto | saturation

? | 15% BG, 3 sigma, 2,5% base

1 | 0.000 | ST:0.01026 | 0.062 | 3

1 | 0.000 | BA:0.02500 | 0.062 | 3

select	frame	file name	ISO/g
☑	Integration 1	/Users/mauricetoet/Documents/Astrophotography/2018-09-07 M16 M17 & Barnard 10 SQM 21.2/LIGHTS M16 & M17/St-avg-8073.0s-LNMSC_1_3.0_none-x_1.0_LZ3-NS-full-qua-add-sc_BWMV_nor-AA-RL-MBB5_2ndLNC_it1.fits	0.

A S T R O F O T O

AstroPixelProcessor

44% Sat 09:49

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 26GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 2%

RAM APP 2746/14336 OS 15943/16384

/Us...QM 21.2/LIGHTS M16 & M17

3) ANALYSE STARS | 4) REGISTER

0) RAW/FITS | 1) LOAD | 2) CALIBRATE

5) NORMALIZE | 6) INTEGRATE | 9) TOOLS

- batch modify
- batch rotate/resize
- correct vignetting
- remove light pollution
- calibrate background
- calibrate star colors
- combine RGB
- HSL selective color

This will start an interactive light pollution modeller so you can effectively remove light pollution from your lights and or stacks

orientation | scale to fit | rectilinearProjection | linear(l)

1_3.0_none-x_1.0_LZ3-NS-full-qua-add-sc_BWMV_nor-AA-RL-MBB5_2ndLNC_it1.fits

log | colors

stretch | save

neutralize-BG | invert data

1 0.000 B:0.02674 0.062 3

1 0.938 W:1.00000 1.000 3

reset 10.0 G:01.00 0.1

DDP | auto | saturation

? 15% BG, 3 sigma, 2,5% base

1 0.000 ST:0.01026 0.062 3

1 0.000 BA:0.02500 0.062 3

select	frame	file name	ISO/g
☑	Integration 1	/Users/mauricetoet/Documents/Astrophotography/2018-09-07 M16 M17 & Barnard 10 SQM 21.2/LIGHTS M16 & M17/St-avg-8073.0s-LNMSC_1_3.0_none-x_1.0_LZ3-NS-full-qua-add-sc_BWMV_nor-AA-RL-MBB5_2ndLNC_it1.fits	0.

A S T R O F O T O

AstroPixelProcessor

46% Sat 09:52

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 26GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 13%

RAM APP 3030/14336 OS 16183/16384

/Us...QM 21.2/LIGHTS M16 & M17

Creating light pollution model

59 area select boxes created

CALCULATE

UNDO AREA SELECTBOX

CANCEL

OK & SAVE

0%

SHOW CORRECTED IMAGE

REMOVE YELLOW

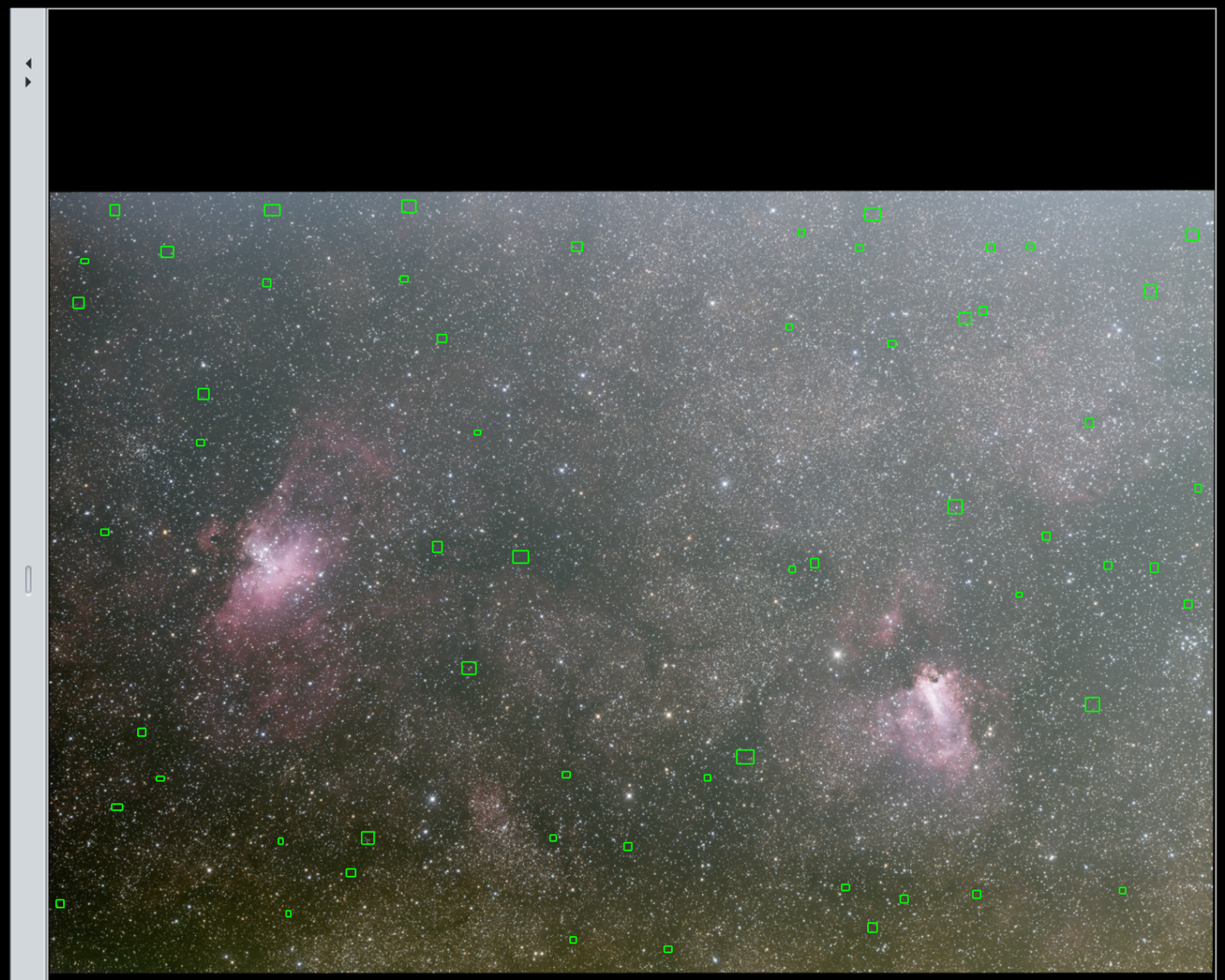
REMOVE RED

FLEXIBILITY : 01

neutralizing background of image
St-avg-8073.0s-LNMSC_1_3.0_none-x_1.0_LZ3
and forwarding to image viewer...
starting interactive background selector.

orientation scale to fit rectilinearProjection linear(l)

ZOOM: 10.15% - 7446x5003 32bits - X:05644 Y:05003 R:0.025000 G:0.025000 B:0.025000



log colors

stretch save

neutralize-BG invert data

1 0.000 B:0.02675 0.062 3

1 0.938 W:1.00000 1.000 3

reset 10.0 G:01.00 0.1

DDP auto saturation

? 15% BG, 3 sigma, 2,5% base

1 0.000 ST:0.01026 0.062 3

1 0.000 BA:0.02500 0.062 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

47% Sat 09:53

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 26GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 5%

RAM APP 3310/14336 OS 16233/16384

/Us...QM 21.2/LIGHTS M16 & M17

Creating light pollution model

59 area select boxes created

CALCULATE

UNDO AREA SELECTBOX

CANCEL

OK & SAVE

100%

SHOW CORRECTED IMAGE

REMOVE YELLOW

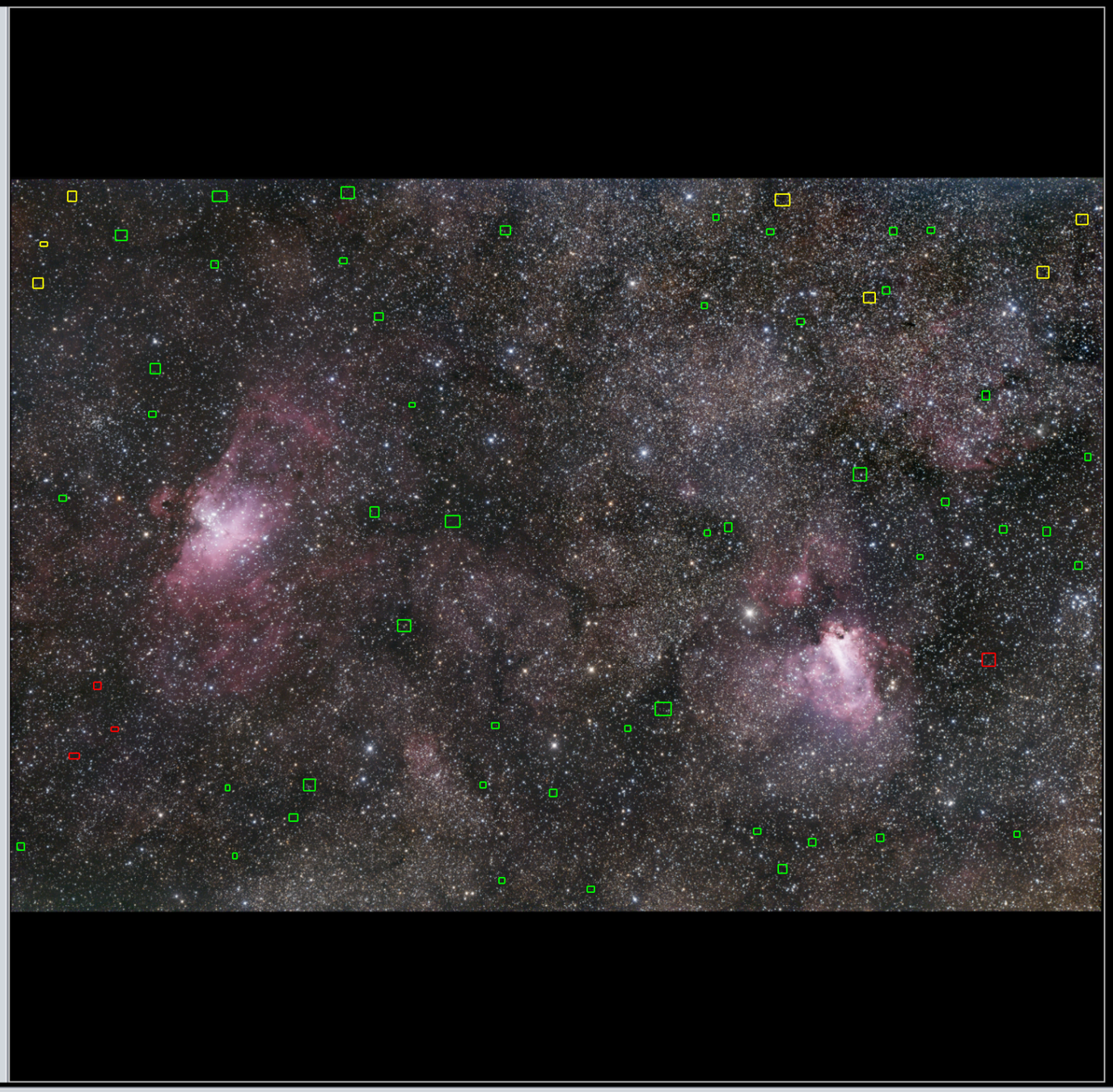
REMOVE RED

FLEXIBILITY : 01

neutralizing background of image
St-avg-8073.0s-LNMSC_1_3.0_none-x_1.0_LZ3
and forwarding to image viewer...
starting interactive background selector.
getting background data from current area

orientation scale to fit rectilinearProjection linear(l)

ZOOM: 10.15% - 7446x5003 32bits - X:03339 Y:05003 R:0.025000 G:0.025000 B:0.025000



log colors

stretch save

neutralize-BG invert data

1 0.000 B:0.02638 0.062 3

1 0.938 W:1.00000 1.000 3

reset 10.0 G:01.00 0.1

DDP auto saturation

? 15% BG, 3 sigma, 2,5% base

1 0.000 ST:0.00834 0.062 3

1 0.000 BA:0.02500 0.062 3

0 HL:000 250

0.00 SAT:0.15 0.50

0.00 SAT_TH:0.25 1.00

A S T R O F O T O

AstroPixelProcessor

51% Sat 09:59

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 26GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 0%

RAM APP 4508/14336 OS 16287/16384

/Us...QM 21.2/LIGHTS M16 & M17

Creating light pollution model

59 area select boxes created

CALCULATE

UNDO AREA SELECTBOX

CANCEL

OK & SAVE

100%

SHOW CORRECTED IMAGE

REMOVE YELLOW

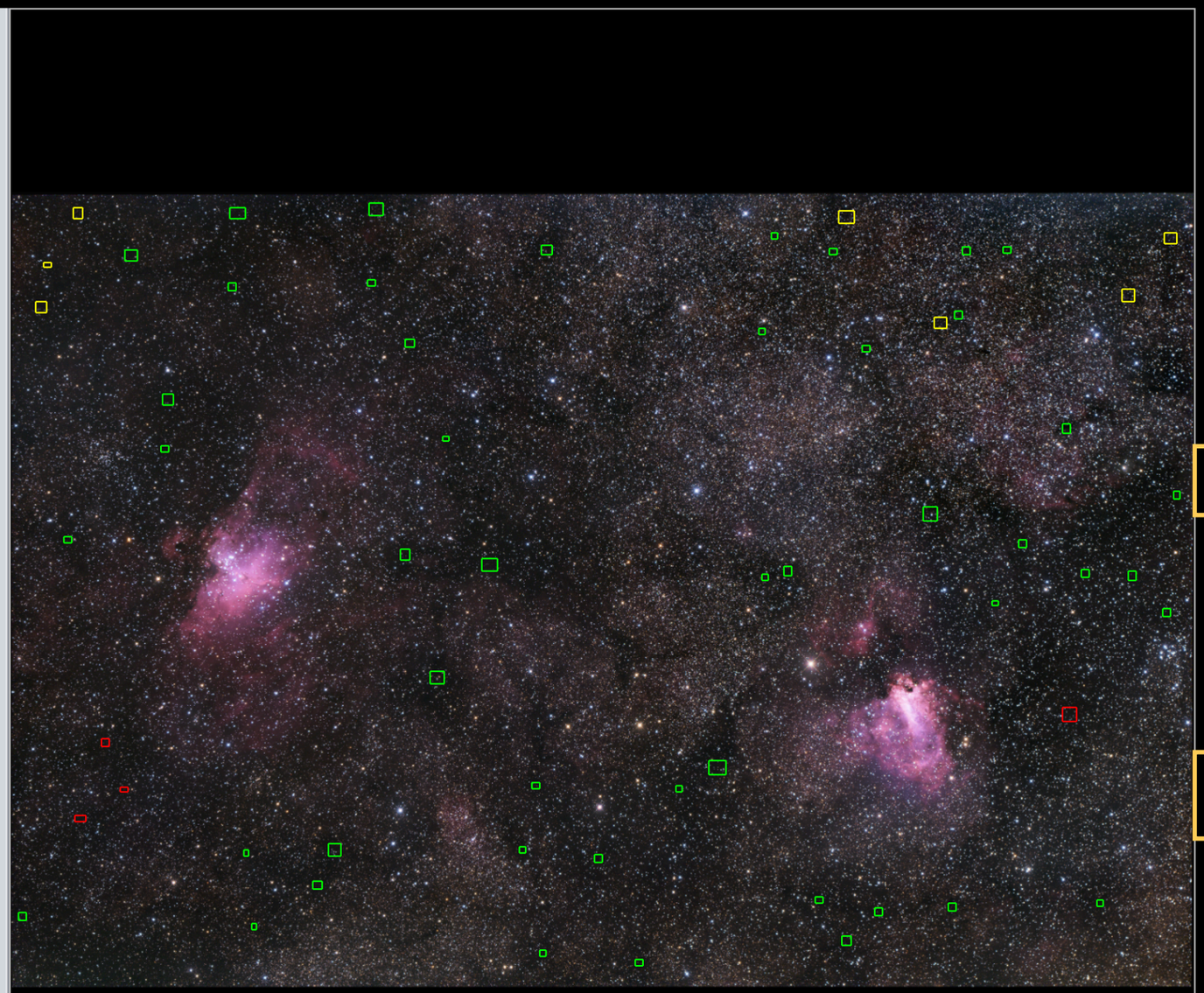
REMOVE RED

FLEXIBILITY : 01

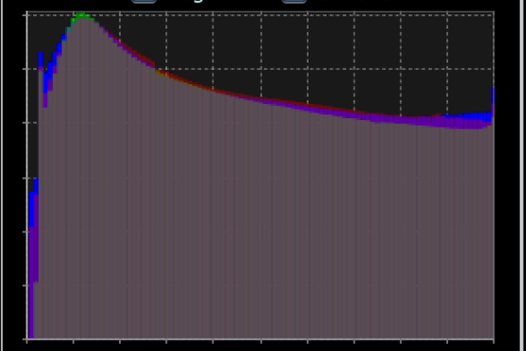
neutralizing background of image
St-avg-8073.0s-LNMSC_1_3.0_none-x_1.0_LZ3
and forwarding to image viewer...
starting interactive background selector.
getting background data from current area

orientation | scale to fit | rectilinearProjection | linear(l)

1_3.0_none-x_1.0_LZ3-NS-full-qua-add-sc_BWMV_nor-AA-RL-MBB5_2ndLNC_it1.fits



log | colors



stretch | save

neutralize-BG | invert data

DDP | auto | saturation

? | 10% BG, 3 sigma, 2,5% base

1 — 0.000 ST:0.01482 0.062 — 3

1 — 0.000 BA:0.02500 0.062 — 3

0 HL:000 250

0.00 SAT:0.20 0.50

0.00 SAT.TH:0.25 1.00

1 — 0.000 CON:0.00000 0.062 — 3

0.0 SHARP:00.0 20.0

00.0 PROTECT:05.0 25.0

A S T R O F O T O

AstroPixelProcessor

53% Sun 21:31

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 34GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 3%

RAM APP 3770/14336 OS 16263/16384

/Us...QM 21.2/LIGHTS M16 & M17

Creating light pollution model

Please make at least 5 area select boxes

5 still needed

CALCULATE

UNDO AREA SELECTBOX

CANCEL

OK & SAVE

0%

SHOW CORRECTED IMAGE

REMOVE YELLOW

REMOVE RED

FLEXIBILITY : 01

neutralizing background of image
St-avg-8073.0s-LNMSC_1_3.0_none-x_1.0_LZ3
and forwarding to image viewer...
starting interactive background selector.

orientation scale to fit rectilinearProjection linear(l)

provide file name

Please provide the file name

St-avg-8073.0s-LNMSC_1_3.0_none-x_1.0_LZ3-NS-full-qua-add-sc_BWMV_nor-AA-RL-MBB5_2ndLNC_it1-lpc-cbg-St

cancel

Ok

log colors

stretch save

neutralize-BG invert data

DDP auto saturation

? 10% BG, 3 sigma, 2,5% base

1 0.000 ST:0.01545 0.062 3

1 0.000 BA:0.02500 0.062 3

0 HL:000 250

0.00 SAT:0.20 0.50

0.00 SAT.TH:0.25 1.00

1 0.000 CON:0.00000 0.062 3

0.0 SHARP:00.0 20.0

00.0 PROTECT:05.0 25.0

A S T R O F O T O

AstroPixelProcessor 53% Sun 21:31

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 34GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 3%

RAM APP 3770/14336 OS 16247/16384

/Us...QM 21.2/LIGHTS M16 & M17

Creating light pollution model

Please make at least 5 area select boxes

5 still needed

CALCULATE

UNDO AREA SELECTBOX

CANCEL

OK & SAVE

0%

SHOW CORRECTED IMAGE

REMOVE YELLOW

REMOVE RED

FLEXIBILITY : 01

neutralizing background of image
St-avg-8073.0s-LNMSC_1_3.0_none-x_1.0_LZ3
and forwarding to image viewer...
starting interactive background selector.

orientation scale to fit rectilinearProjection linear(l)

provide file name

Please provide the file type

TIFF

FITS

TIFF

JPEG

Ok

log colors

stretch save

neutralize-BG invert data

DDP auto saturation

? 10% BG, 3 sigma, 2,5% base

1 0.000 ST:0.01545 0.062 3

1 0.000 BA:0.02500 0.062 3

0 HL:000 250

0.00 SAT:0.20 0.50

0.00 SAT.TH:0.25 1.00

1 0.000 CON:0.00000 0.062 3

0.0 SHARP:00.0 20.0

00.0 PROTECT:05.0 25.0

A S T R O F O T O

AstroPixelProcessor

53% Sun 21:31

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 34GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 7%

RAM APP 3770/14336 OS 16249/16384

/Us...QM 21.2/LIGHTS M16 & M17

Creating light pollution model

Please make at least 5 area select boxes

5 still needed

CALCULATE

UNDO AREA SELECTBOX

CANCEL

OK & SAVE

0%

SHOW CORRECTED IMAGE

REMOVE YELLOW

REMOVE RED

FLEXIBILITY : 01

neutralizing background of image
St-avg-8073.0s-LNMSC_1_3.0_none-x_1.0_LZ3
and forwarding to image viewer...
starting interactive background selector.

orientation scale to fit rectilinearProjection linear(l)

provide ICC profile

Please select an ICC-profile:

sRGB v2.1

sRGB v2.1
sRGB v4.0
Adobe RGB 1998

Ok

log colors

stretch save

neutralize-BG invert data

DDP auto saturation

? 10% BG, 3 sigma, 2,5% base

1 0.000 ST:0.01545 0.062 3

1 0.000 BA:0.02500 0.062 3

0 HL:000 250

0.00 SAT:0.20 0.50

0.00 SAT.TH:0.25 1.00

1 0.000 CON:0.00000 0.062 3

0.0 SHARP:00.0 20.0

00.0 PROTECT:05.0 25.0

A S T R O F O T O

AstroPixelProcessor

53% Sun 21:31

Astro Pixel Processor version 1.071 by Aries Productions

LICENSE | CFG | HDD 34GB | OpenGL

#CPU 8 using 07 threads APP 1%

OS 0%

RAM APP 3770/14336 OS 16307/16384

/Us...QM 21.2/LIGHTS M16 & M17

Creating light pollution model

Please make at least 5 area select boxes

5 still needed

CALCULATE

UNDO AREA SELECTBOX

CANCEL

OK & SAVE

0%

SHOW CORRECTED IMAGE

REMOVE YELLOW

REMOVE RED

FLEXIBILITY : 01

neutralizing background of image
St-avg-8073.0s-LNMSC_1_3.0_none-x_1.0_LZ3
and forwarding to image viewer...
starting interactive background selector.

orientation scale to fit rectilinearProjection linear(l)

log colors

stretch save

neutralize-BG invert data

DDP auto saturation

0% BG, 3 sigma, 2,5% base

000 ST:0.01545 0.062 3

000 BA:0.02500 0.062 3

0 HL:000 250

0.00 SAT:0.20 0.50

0.00 SAT.TH:0.25 1.00

1 0.000 CON:0.00000 0.062 3

0.0 SHARP:00.0 20.0

00.0 PROTECT:05.0 25.0

SAVING FRAME: S

cancel SAVING FRAME

2ndLNC_it1-lpc-cbg-St

_it1-lpc-cbg-St

dLNC_it1-lpc-cbg-St

TIFF Bit Depth

TIFF image bitdepth

8 bits integers

8 bits integers
16 bits integers
32 bits floats

cancel

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

53% Sat 10:01

Adobe Photoshop CC 2018

Auto-Select: Layer Show Transform Controls 3D Mode:

M16_M17_Oss_2019-05-11.tiff @ 25% (RGB/16)



Layers
Channels
History
Actions
Swatches
Learn
Libraries
Adjustments
Styles
Paths
Properties
Info
Character
Paragraph
Navigator

25% Doc: 213,2M/213,2M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

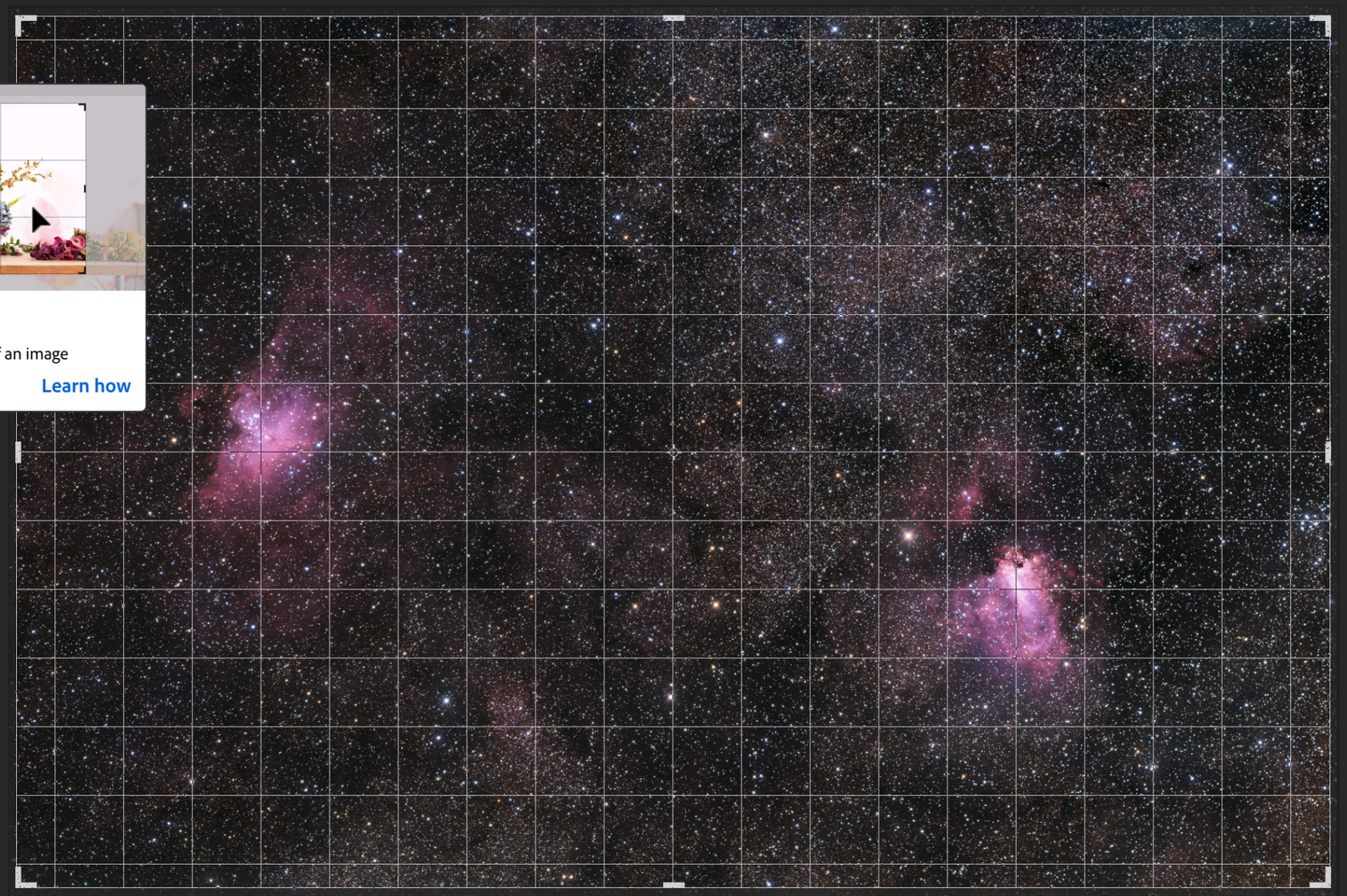
53% Sat 10:02

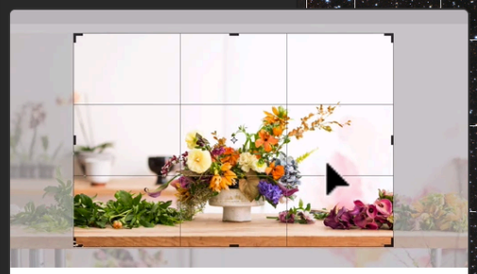
Adobe Photoshop CC 2018

Ratio Clear Straighten Delete Cropped Pixels Content-Aware

M16_M17_Oss_2019-05-11.tiff @ 25% (Crop Preview, RGB/8)

Uitsnede maken (zwarte randen verwijderen): Crop tool





Crop tool (C)

Trims or expands the edges of an image

Learn how

Layers
Channels
History
Actions
Swatches
Learn
Libraries
Adjustments
Styles
Paths
Properties
Info
Character
Paragraph
Navigator

25% Doc: 106,6M/0 bytes

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

54% Sat 10:02

Adobe Photoshop CC 2018

Ratio Clear Straighten Delete Cropped Pixels Content-Aware

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy, RGB/16) *

Kleuren versterken: laag dupliceren > blending mode: Color



Layers Channels

Kind

Color Opacity: 100%

Set the blending mode for the layer

Lock:

Background copy

Background

Layers

Channels

History

Actions

Swatches

Learn

Libraries

Adjustments

Styles

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Properties

Info

Character

Paragraph

Navigator

25% Doc: 205,5M/410,9M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help — 54% — Sat 10:02

Adobe Photoshop CC 2018

Ratio — Content-Aware

M16_M17_Oss_2019-05-11.tiff

Image

- Mode ▶
- Adjustments ▶
- Auto Tone ⇧⌘L
- Auto Contrast ⌥⇧⌘L
- Auto Color ⇧⌘B
- Image Size... ⌥⌘I
- Canvas Size... ⌥⌘C
- Image Rotation ▶
- Crop
- Trim...
- Reveal All
- Duplicate...
- Apply Image...
- Calculations...
- Variables ▶
- Apply Data Set...
- Trap...
- Analysis ▶

Adjustments

- Brightness/Contrast...
- Levels... ⌘L
- Curves... ⌘M
- Exposure...
- Vibrance...
- Hue/Saturation... ⌘U
- Color Balance... ⌘B
- Black & White... ⌥⇧⌘B
- Photo Filter...
- Channel Mixer...
- Color Lookup...
- Invert ⌘I
- Posterize...
- Threshold...
- Gradient Map...
- Selective Color...
- Shadows/Highlights...
- HDR Toning...
- Desaturate ⇧⌘U
- Match Color...
- Replace Color...
- Equalize

Layers | Channels

Kind — Color — Opacity: 100% — Lock: — Fill: 100%

Background copy

Background

Layers | Channels

History | Actions | Swatches | Learn | Libraries | Adjustments | Styles | Paths | Properties | Info | Character | Paragraph | Navigator

25% Doc: 205,5M/410,9M

A S T R O F O T O

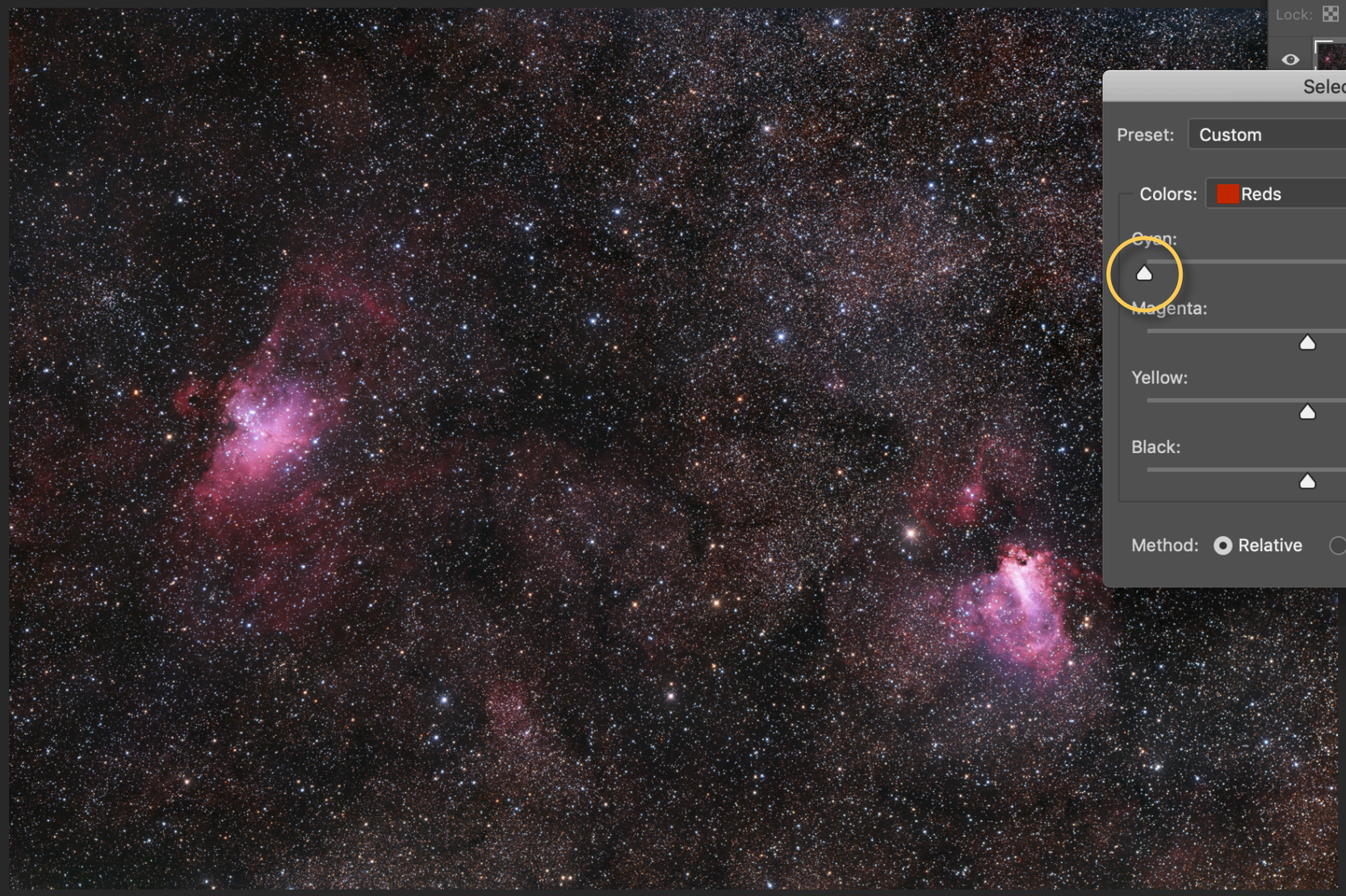
Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help 54% Sat 10:03

Adobe Photoshop CC 2018

Sample Size: Point Sample Sample: All Layers Show Sampling Ring

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy, RGB/16) *

Kleuren versterken: selective color > Cyan slider: -100% (rood-versterking)



Layers Channels

Kind

Color Opacity: 100%

Lock: Fill: 100%

Background copy

Selective Color

Preset: Custom OK Cancel

Colors: Reds

Cyan: -100 %

Magenta: 0 %

Yellow: 0 %

Black: 0 %

Preview

Method: Relative Absolute

Layers Channels History Actions Swatches Learn Libraries Adjustments Styles Paths Properties Info Character Paragraph Navigator

25% Doc: 205,5M/410,9M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

55% Sat 10:03

Adobe Photoshop CC 2018

Ratio Clear Straighten Delete Cropped Pixels Content-Aware

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy 2, RGB/16) *

Kleuren versterken: laag 2x dupliceren > bovenste laag: Luminosity



Layers Channels

Kind

Luminosity Opacity: 100%

Lock: Fill: 100%

Background copy 2

Background copy

Background

Layers

Channels

History

Actions

Swatches

Learn

Libraries

Adjustments

Styles

Paths

Properties

Info

Character

Paragraph

Navigator

25% Doc: 205,5M/616,4M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help 56% Sat 10:04

Adobe Photoshop CC 2018

Ratio Clear Straighten Delete Cropped Pixels Content-Aware

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy, RGB/16) *

Kleuren versterken: laag 2x dupliceren > middelste laag: Soft Light



Layers Channels

Kind

Soft Light Opacity: 100%

Lock: Fill: 100%

Background copy 2

Background copy

Background

Layers

Channels

History

Actions

Swatches

Learn

Libraries

Adjustments

Styles

Paths

Properties

Info

Character

Paragraph

Navigator

25% Doc: 205,5M/616,4M

A S T R O F O T O

Kleuren versterken: Filter > Camera Raw Filter … > Vibrance slider: +20 tot +40%

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

57% Sat 10:06

Camera Raw (M16_M17_Oss_2019-05-11.tiff)

Before After

R: ---
G: ---
B: ---

Basic

Treatment: Color Black & White

Profile: Color

White Balance: As Shot

Temperature 0

Tint 0

Auto Default

Exposure 0,00

Contrast 0

Highlights 0

Shadows 0

Whites 0

Blacks 0

Clarity 0

Dehaze 0

Vibrance +40

Saturation 0

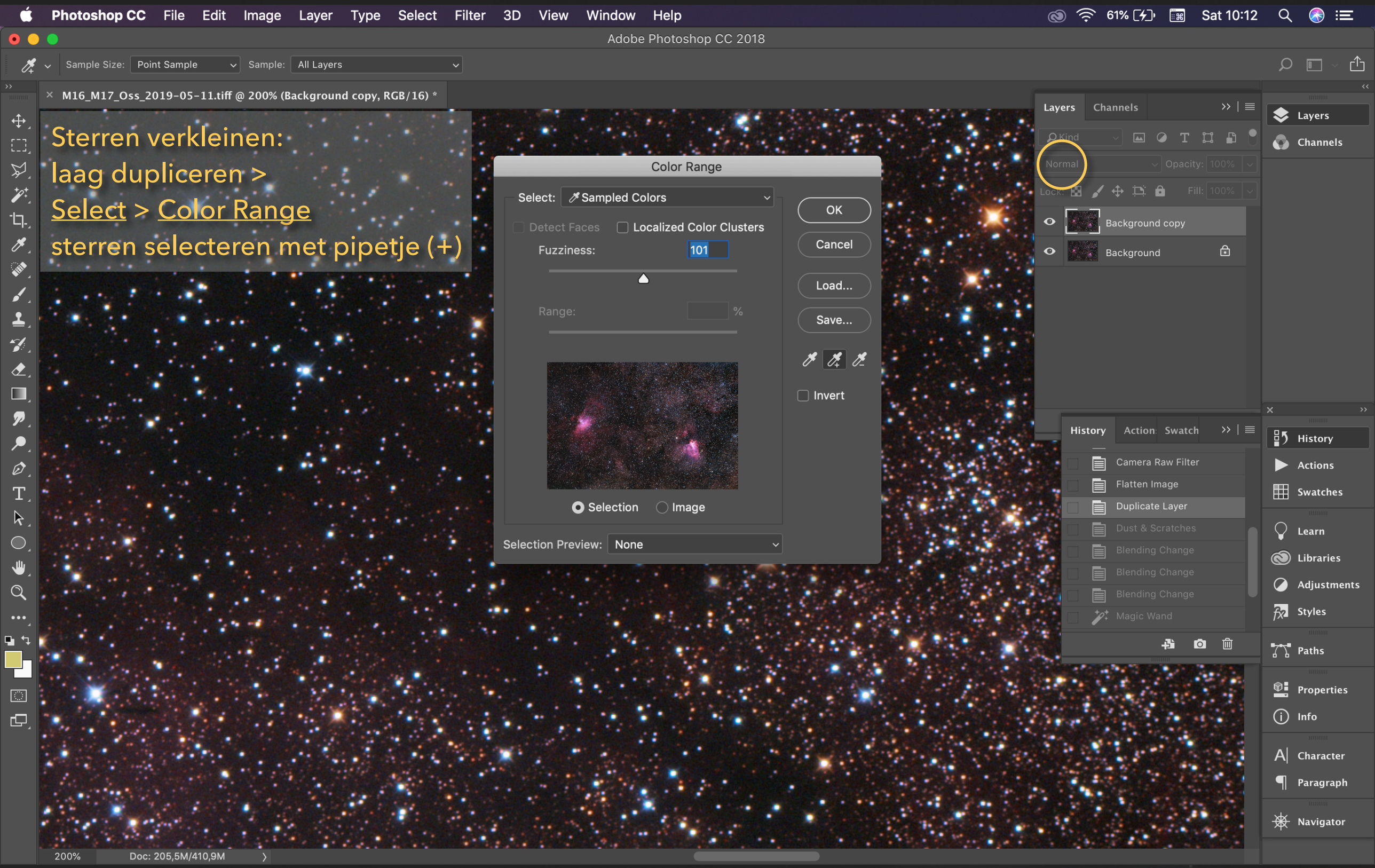
66,7%

Cancel OK

Layers Channels History Actions Swatches Learn Libraries Adjustments Styles Paths Properties Info Character Paragraph Navigator

25% Doc:

A S T R O F O T O


Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help
61% Sat 10:12
Adobe Photoshop CC 2018
Sample Size: Point Sample
Sample: All Layers
M16_M17_Oss_2019-05-11.tiff @ 200% (Background copy, RGB/16) *
Sterren verkleinen:
laag dupliceren >
Select > Color Range
sterren selecteren met pipetje (+)
Color Range
Select: Sampled Colors
Detect Faces
Localized Color Clusters
Fuzziness: 101
Range:
%
OK
Cancel
Load...
Save...
Invert
Selection
Image
Selection Preview: None
Layers
Channels
Kind
Normal
Opacity: 100%
Lock:
Fill: 100%
Background copy
Background
History
Action
Swatch
Camera Raw Filter
Flatten Image
Duplicate Layer
Dust & Scratches
Blending Change
Blending Change
Blending Change
Magic Wand
Layers
Channels
History
Actions
Swatches
Learn
Libraries
Adjustments
Styles
Paths
Properties
Info
Character
Paragraph
Navigator
200%
Doc: 205,5M/410,9M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help — 62% — Sat 10:12

Sterren verkleinen:
selectie vergroten

Select
- All ⌘A
- Deselect ⌘D
- Reselect ⇧⌘D
- Inverse ⇧⌘I
- All Layers ⌥⌘A
- Deselect Layers
- Find Layers ⌥⇧⌘F
- Isolate Layers
- Color Range...
- Focus Area...
- Subject
- Select and Mask... ⌥⌘R
- Modify ▶
- Grow
- Similar
- Transform Selection
- Edit in Quick Mask Mode
- Load Selection...
- Save Selection...
- New 3D Extrusion

Modify
- Border...
- Smooth...
- Expand...
- Contract...
- Feather... ⇧F6

Layers | Channels
Background copy
Background

History | Action | Swatch
Selective Color
Flatten Image
Duplicate Layer
Blending Change
Camera Raw Filter
Flatten Image
Duplicate Layer
Color Range

Layers · Channels · History · Actions · Swatches · Learn · Libraries · Adjustments · Styles · Paths · Properties · Info · Character · Paragraph · Navigator

200% Doc: 205,5M/410,9M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help — 62% — Sat 10:12

Adobe Photoshop CC 2018

Sample Size: Point Sample | Tolerance: 30 | Anti-alias | Contiguous | Sample All Layers | Select Subject | Select and Mask...

M16_M17_Oss_2019-05-11.tiff @ 200% (Background copy, RGB/16) *

Sterren verkleinen:
selectie vergroten: 5 - 10 px

Expand Selection

Expand By: 5 pixels

Apply effect at canvas bounds

OK

Cancel

Layers | Channels

Kind

Normal | Opacity: 100%

Lock: | Fill: 100%

Background copy

Background

History | Action | Swatch

Selective Color
Flatten Image
Duplicate Layer
Blending Change
Camera Raw Filter
Flatten Image
Duplicate Layer
Color Range

Layers
Channels
History
Actions
Swatches
Learn
Libraries
Adjustments
Styles
Paths
Properties
Info
Character
Paragraph
Navigator

200% Doc: 205,5M/410,9M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help — 62% — Sat 10:12

Adobe Photoshop CC 2018

Sample Size: Point Sample | Tolerance: 30 | Anti-alias | Contiguous | Sample All Layers | Select Subject | Select and Mask...

M16_M17_Oss_2019-05-11.tiff @ 200% (Background copy, RGB/16) *

Sterren verkleinen:
selectie verzachten: 3 - 8 px

Feather Selection

Feather Radius: 3 pixels

Apply effect at canvas bounds

OK

Cancel

Layers | Channels

Kind

Normal | Opacity: 100%

Lock: | Fill: 100%

Background copy

Background

History | Action | Swatch

Flatten Image
Duplicate Layer
Blending Change
Camera Raw Filter
Flatten Image
Duplicate Layer
Color Range
Expand

Layers
Channels
History
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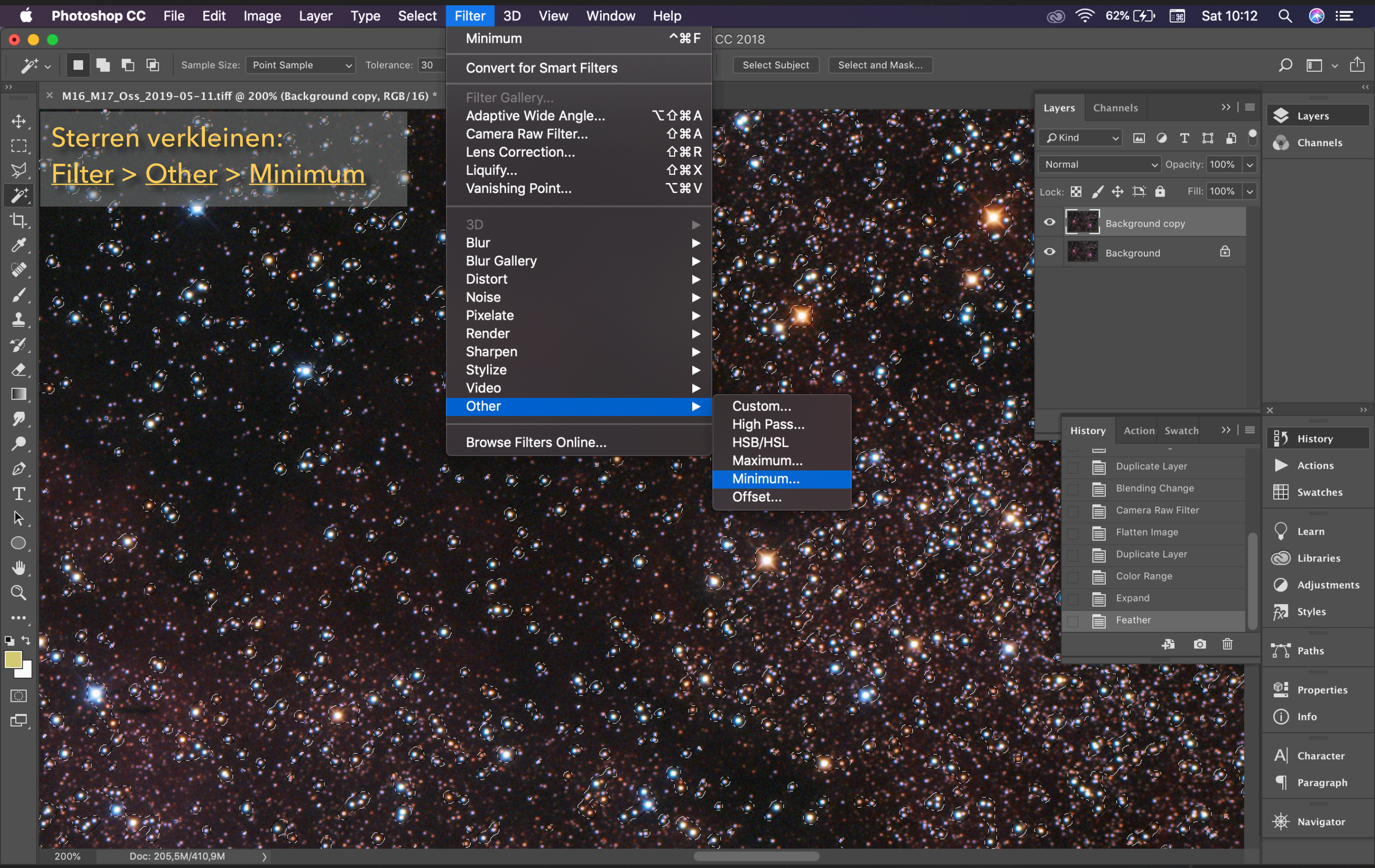
Learn
Libraries
Adjustments
Styles
Paths
Properties
Info
Character
Paragraph
Navigator

200% Doc: 205,5M/410,9M

A S T R O F O T O



Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help
62% Sat 10:12
Sample Size: Point Sample Tolerance: 30
M16_M17_Oss_2019-05-11.tiff @ 200% (Background copy, RGB/16) *
Sterren verkleinen:
Filter > Other > Minimum
Minimum ^⌘F
Convert for Smart Filters
Filter Gallery...
Adaptive Wide Angle... ⌥⇧⌘A
Camera Raw Filter... ⇧⌘A
Lens Correction... ⇧⌘R
Liquify... ⇧⌘X
Vanishing Point... ⌥⌘V
3D
Blur
Blur Gallery
Distort
Noise
Pixelate
Render
Sharpen
Stylize
Video
Other
Browse Filters Online...
Custom...
High Pass...
HSB/HSL
Maximum...
Minimum...
Offset...
CC 2018
Select Subject
Select and Mask...
Layers
Channels
Kind
Normal
Opacity: 100%
Lock:
Fill: 100%
Background copy
Background
History
Action
Swatch
Duplicate Layer
Blending Change
Camera Raw Filter
Flatten Image
Duplicate Layer
Color Range
Expand
Feather
Layers
Channels
History
Actions
Swatches
Learn
Libraries
Adjustments
Styles
Paths
Properties
Info
Character
Paragraph
Navigator
200%
Doc: 205,5M/410,9M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help — 63% — Sat 10:13

Adobe Photoshop CC 2018

Scroll All Windows | 100% | Fit Screen | Fill Screen

M16_M17_Oss_2019-05-11.tiff @ 200% (Background copy, RGB/16) *

Sterren verkleinen:
Filter > Other > Minimum
Radius aanpassen: 0,3 - 1,5

Selectie onzichtbaar maken:
Cmd+H (OSX)
Ctrl+H (Windows)

Minimum

OK
Cancel
Preview

100%

Radius: 0,8 Pixels

Preserve: Roundness

Layers | Channels

Kind

Normal | Opacity: 100%

Lock: | Fill: 100%

Background copy
Background

History | Action | Swatch

Duplicate Layer
Blending Change
Camera Raw Filter
Flatten Image
Duplicate Layer
Color Range
Expand
Feather

Layers
Channels
History
Actions
Swatches
Learn
Libraries
Adjustments
Styles
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Properties
Info
Character
Paragraph
Navigator

200% Doc: 205,5M/410,9M

A S T R O F O T O

Sterren verkleinen:
resultaat beoordelen met
Preview button

Minimum

OK

Cancel

Preview

100%

Radius: 0,8 Pixels

Preserve: Roundness

Layers Channels

Kind

Normal Opacity: 100%

Lock: Fill: 100%

Background copy

Background

History Action Swatch

Duplicate Layer

Blending Change

Camera Raw Filter

Flatten Image

Duplicate Layer

Color Range

Expand

Feather

Layers

Channels

History

Actions

Swatches

Learn

Libraries

Adjustments

Styles

Paths

Properties

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Character

Paragraph

Navigator

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

63% Sat 10:13

Adobe Photoshop CC 2018

Scroll All Windows 100% Fit Screen Fill Screen

M16_M17_Oss_2019-05-11.tiff @ 200% (Background copy, RGB/16) *

200% Doc: 205,5M/410,9M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help 63% Sat 10:13

Adobe Photoshop CC 2018

Sample Size: Point Sample Tolerance: 30 Anti-alias Contiguous Sample All Layers Select Subject Select and Mask...

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy, RGB/16) *

Sterren verkleinen: vóór ...



Layers Channels

Kind

Normal Opacity: 100%

Lock: Fill: 100%

Background copy

Background

Layers Channels History Actions Swatches Learn Libraries Adjustments Styles Paths Properties Info Character Paragraph Navigator

25% Doc: 205,5M/410,9M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help 63% Sat 10:13

Adobe Photoshop CC 2018

Sample Size: Point Sample Tolerance: 30 Anti-alias Contiguous Sample All Layers Select Subject Select and Mask...

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy, RGB/16) *

Sterren verkleinen: na ...



Layers Channels

Kind

Normal Opacity: 100%

Lock: Fill: 100%

Background copy

Background

Layers Channels

History Actions Swatches Learn Libraries Adjustments Styles Paths Properties Info Character Paragraph Navigator

25% Doc: 205,5M/410,9M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help 64% Sat 10:14

Adobe Photoshop CC 2018

Sample Size: Point Sample Tolerance: 30 Anti-alias Contiguous Sample All Layers Select Subject Select and Mask...

M16_M17_Oss_2019-05-11.tiff @ 100% (Background copy, RGB/16) *

Sterren verkleinen: doorzichtigheid van de laag (Opacity) naar smaak reduceren



Layers Channels

Kind

Normal Opacity: 80%

Lock: Fill: 100%

Background copy

Background

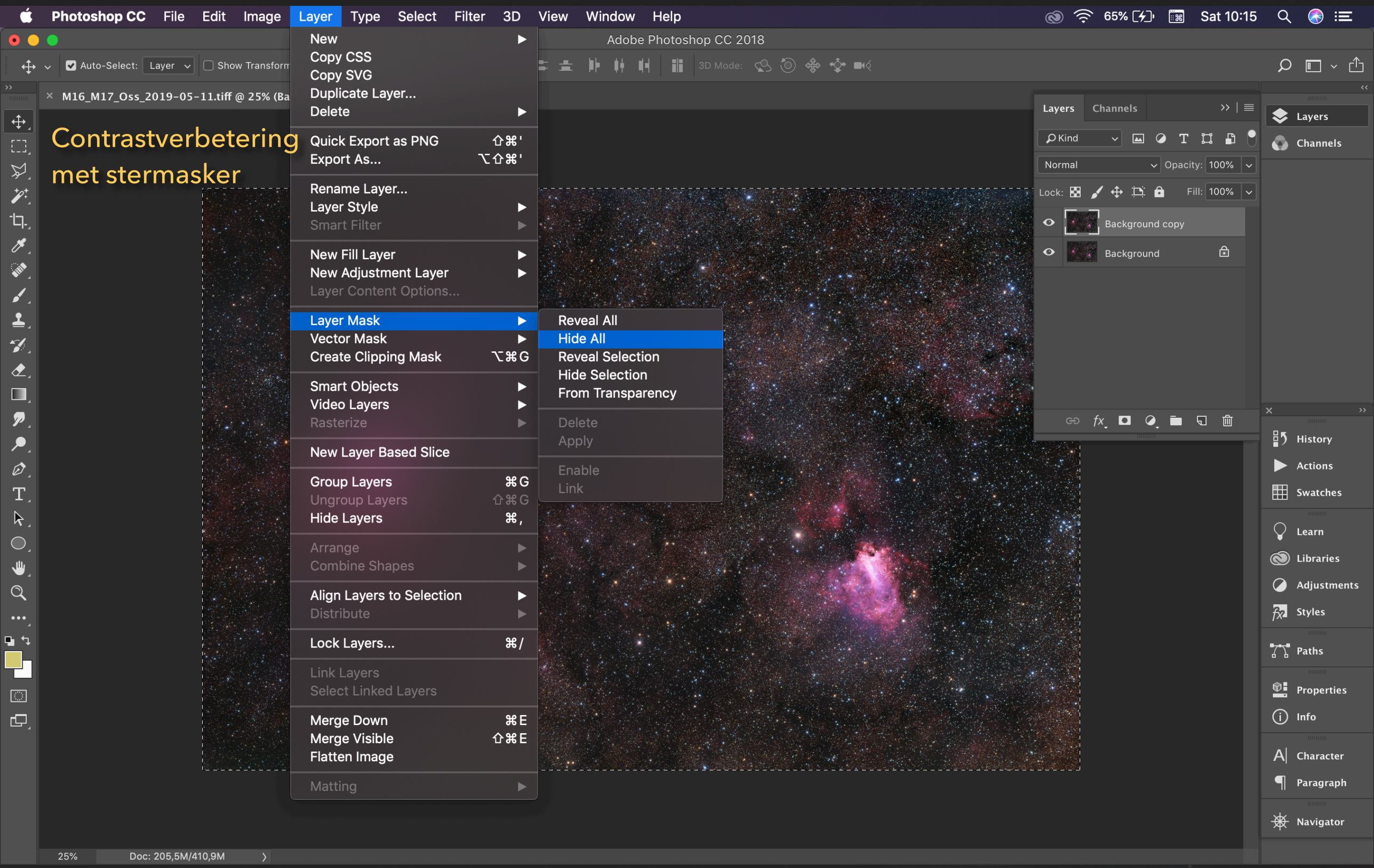
Layers Channels

History Actions Swatches Learn Libraries Adjustments Styles Paths Properties Info Character Paragraph Navigator

100% Doc: 205,5M/410,9M

ASTROFOTO

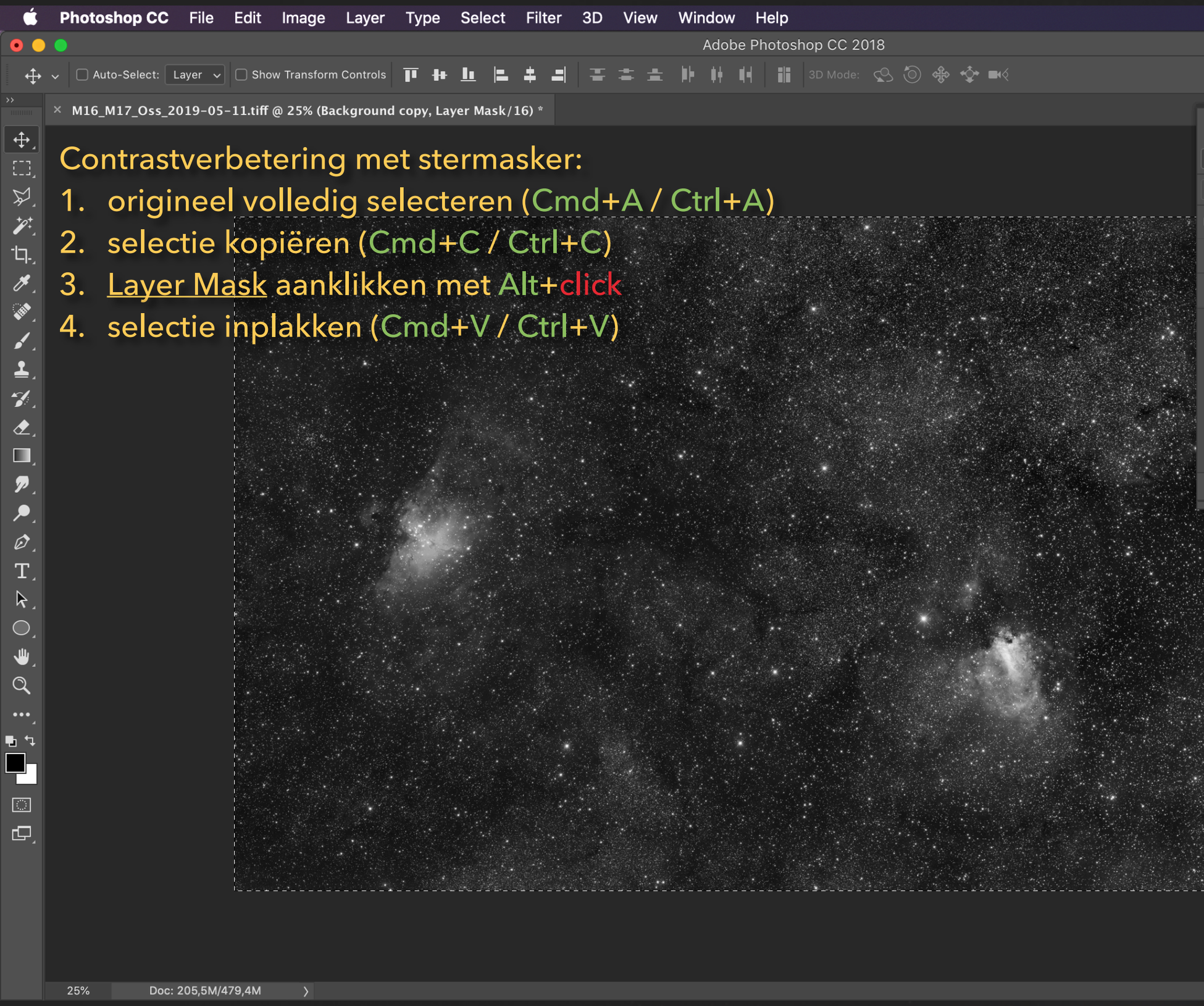
Contrastverbetering
met stermasker



A S T R O F O T O

Contrastverbetering met stermasker:

1. origineel volledig selecteren (Cmd+A / Ctrl+A)
2. selectie kopiëren (Cmd+C / Ctrl+C)
3. Layer Mask aanklikken met Alt+click
4. selectie inplakken (Cmd+V / Ctrl+V)



A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

66% Sat 10:16

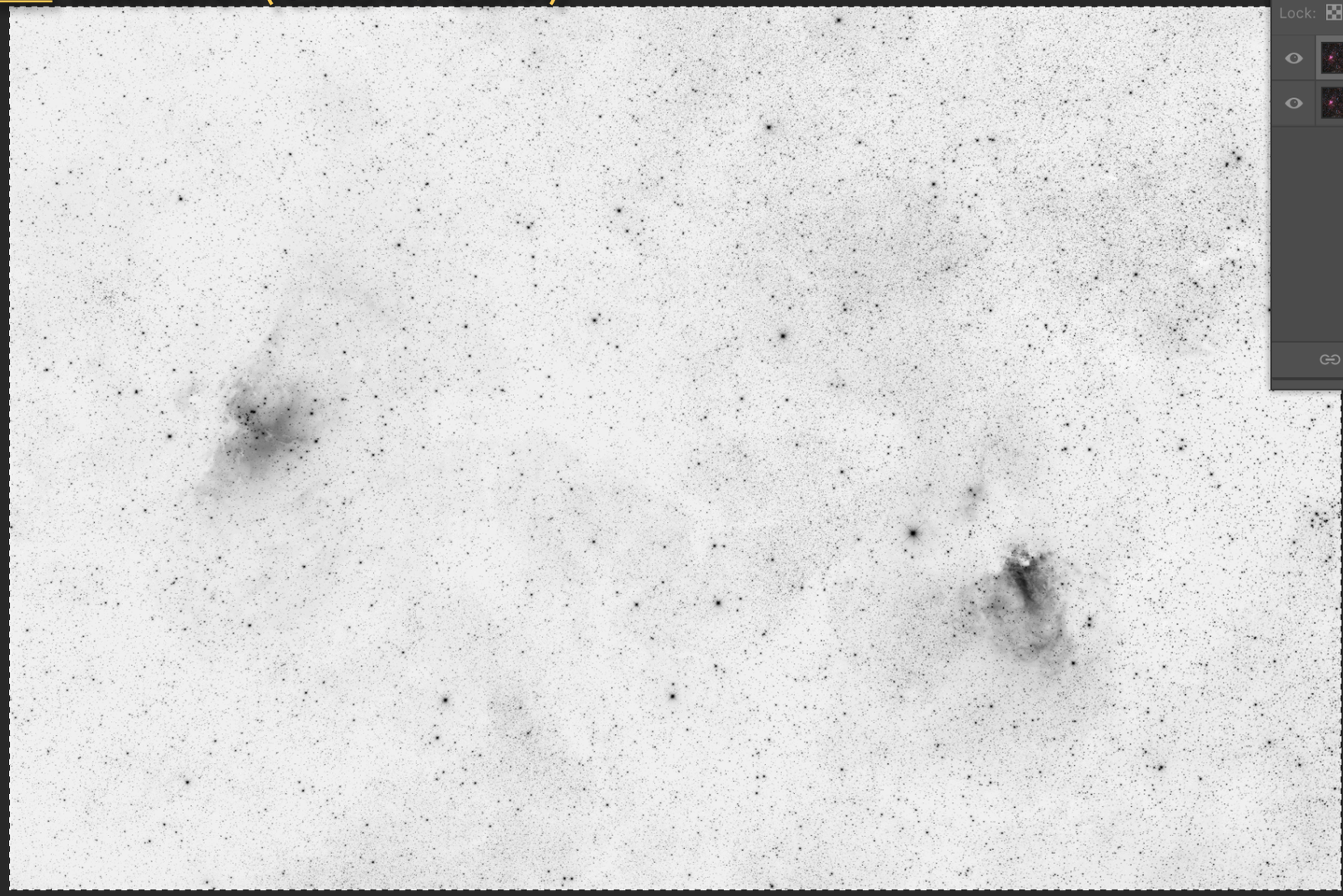
Adobe Photoshop CC 2018

Auto-Select: Layer Show Transform Controls 3D Mode:

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy, Layer Mask/16) *

Contrastverbetering met stermasker:

5. Layer Mask inverteren (Cmd+I / Ctrl+I)



Layers Channels

Kind

Normal Opacity: 100%

Lock: Fill: 100%

Background copy

Background

Layers

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Adjustments

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Navigator

25% Doc: 205,5M/479,4M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

66% Sat 10:16

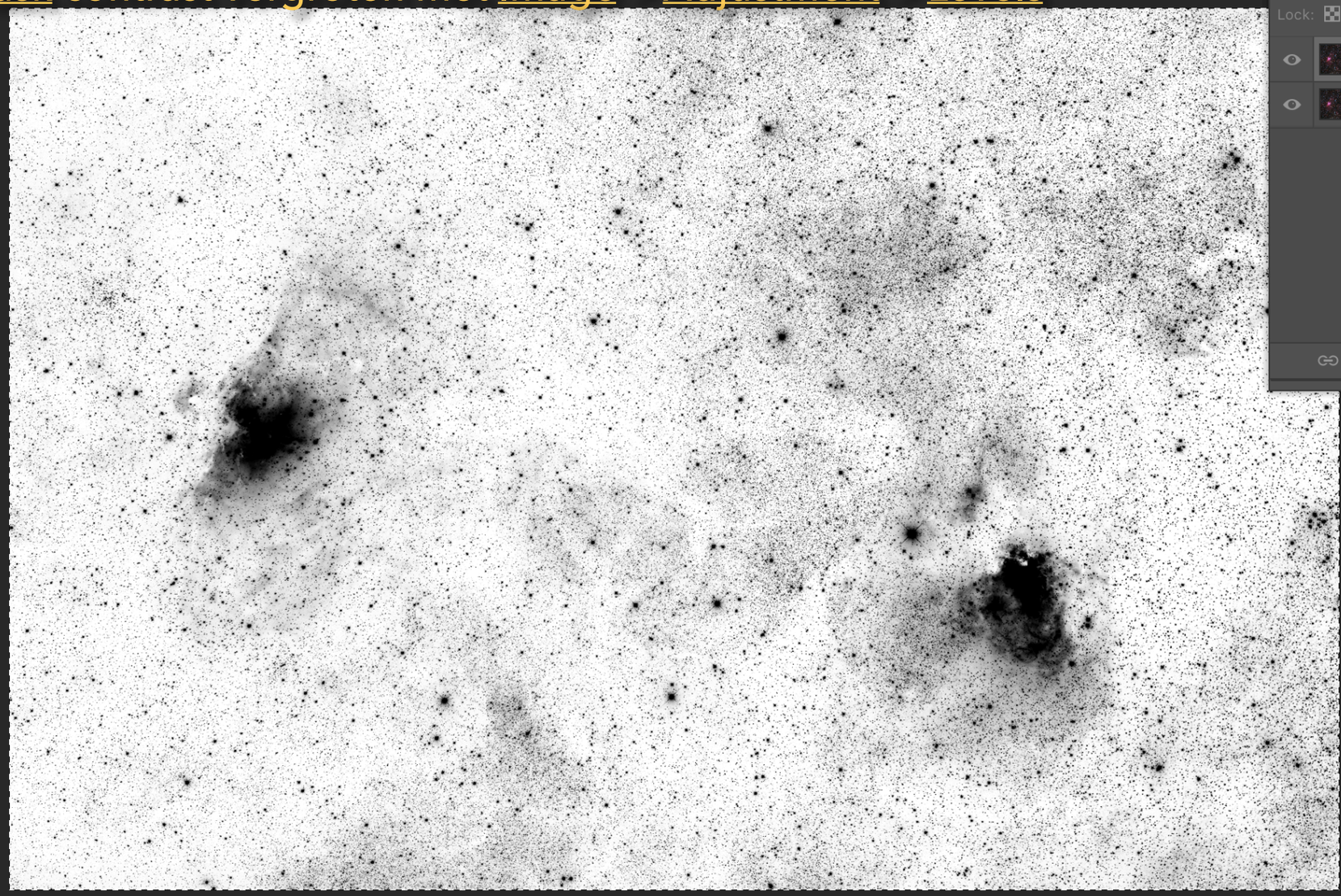
Adobe Photoshop CC 2018

Auto-Select: Layer Show Transform Controls 3D Mode:

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy, Layer Mask/16) *

Contrastverbetering met stermasker:

6. Layer Mask contrast vergroten met Image > Adjustment > Levels



Layers Channels

Kind

Normal Opacity: 100%

Lock: Fill: 100%

Background copy

Background

Layers

Channels

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Learn

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Paragraph

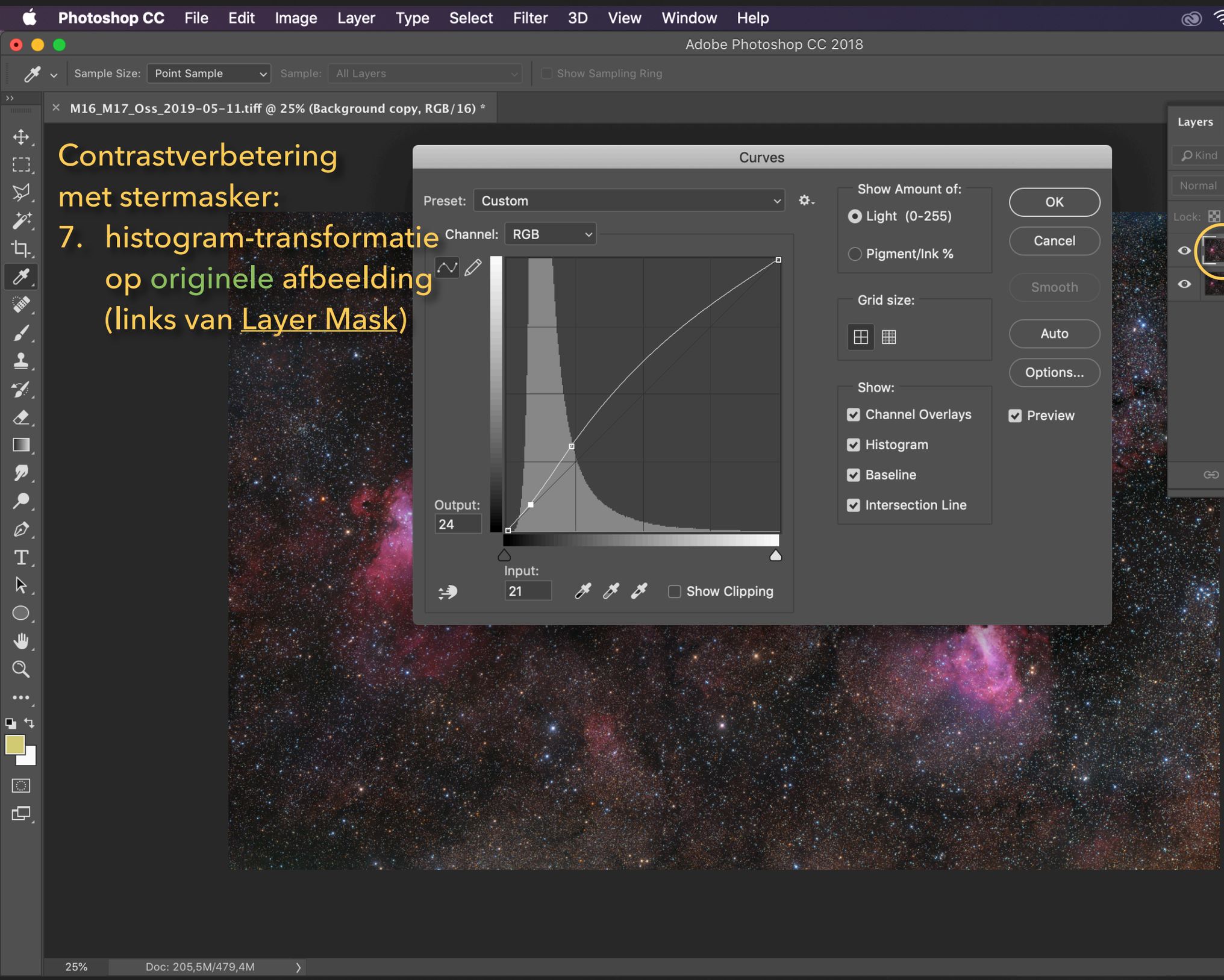
Navigator

25% Doc: 205,5M/479,4M

A S T R O F O T O

Contrastverbetering
met stermasker:

7. histogram-transformatie op originele afbeelding (links van Layer Mask)



A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help 63% Sat 10:13

Adobe Photoshop CC 2018

Sample Size: Point Sample Tolerance: 30 Anti-alias Contiguous Sample All Layers Select Subject Select and Mask...

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy, RGB/16) *

Contrastverbetering met stermasker: vóór ...



Layers Channels

Kind

Normal Opacity: 100%

Lock: Fill: 100%

Background copy

Background

Layers Channels

History Actions Swatches Learn Libraries Adjustments Styles Paths Properties Info Character Paragraph Navigator

25% Doc: 205,5M/410,9M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

67% Sat 10:17

Adobe Photoshop CC 2018

Auto-Select: Layer Show Transform Controls 3D Mode:

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy, RGB/16) *

Contrastverbetering met stermasker: na …



Layers Channels

Kind

Normal Opacity: 100%

Lock: Fill: 100%

Background copy

Background

Layers

Channels

History

Actions

Swatches

Learn

Libraries

Adjustments

Styles

Paths

Properties

Info

Character

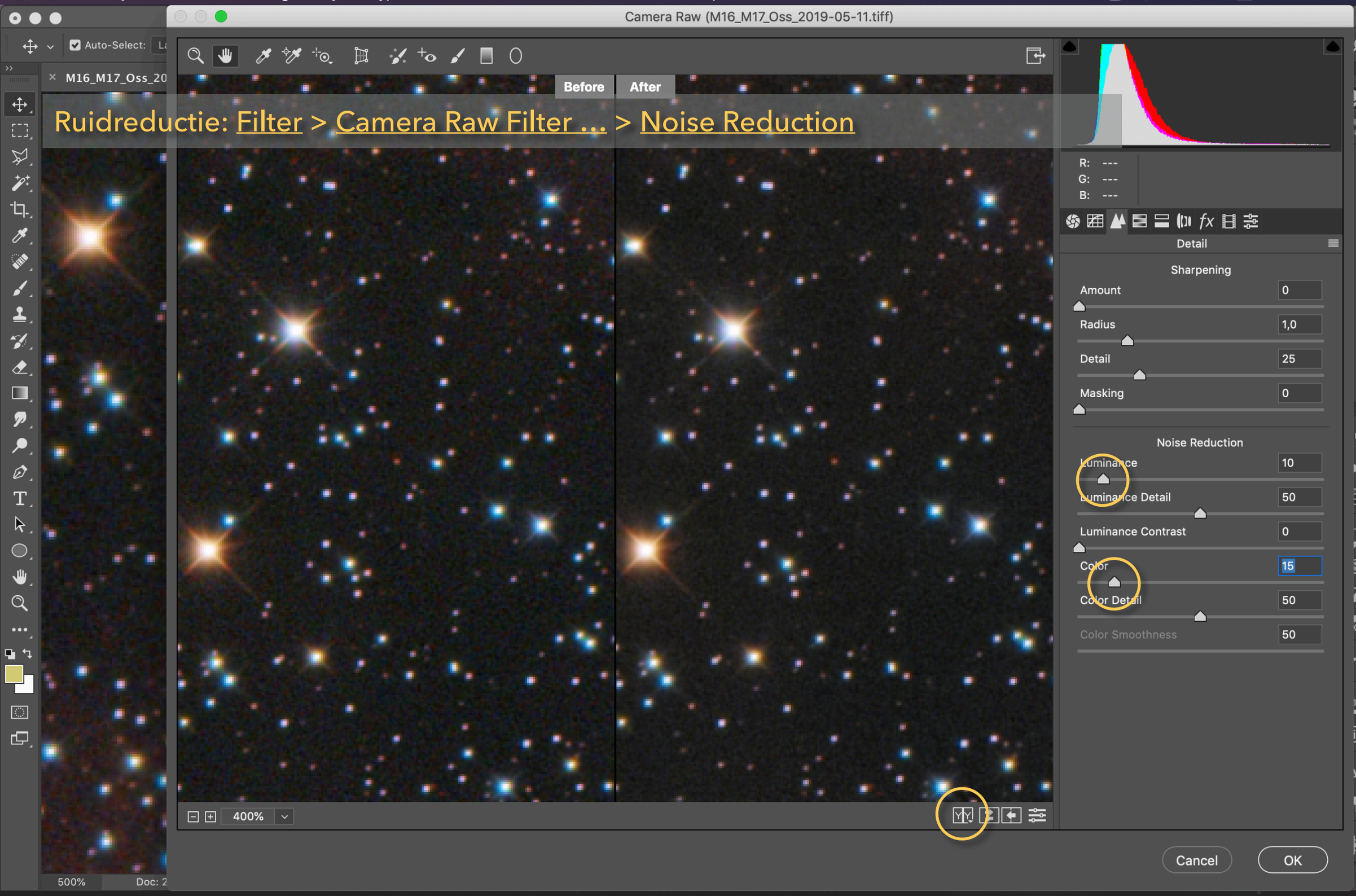
Paragraph

Navigator

25% Doc: 205,5M/479,4M

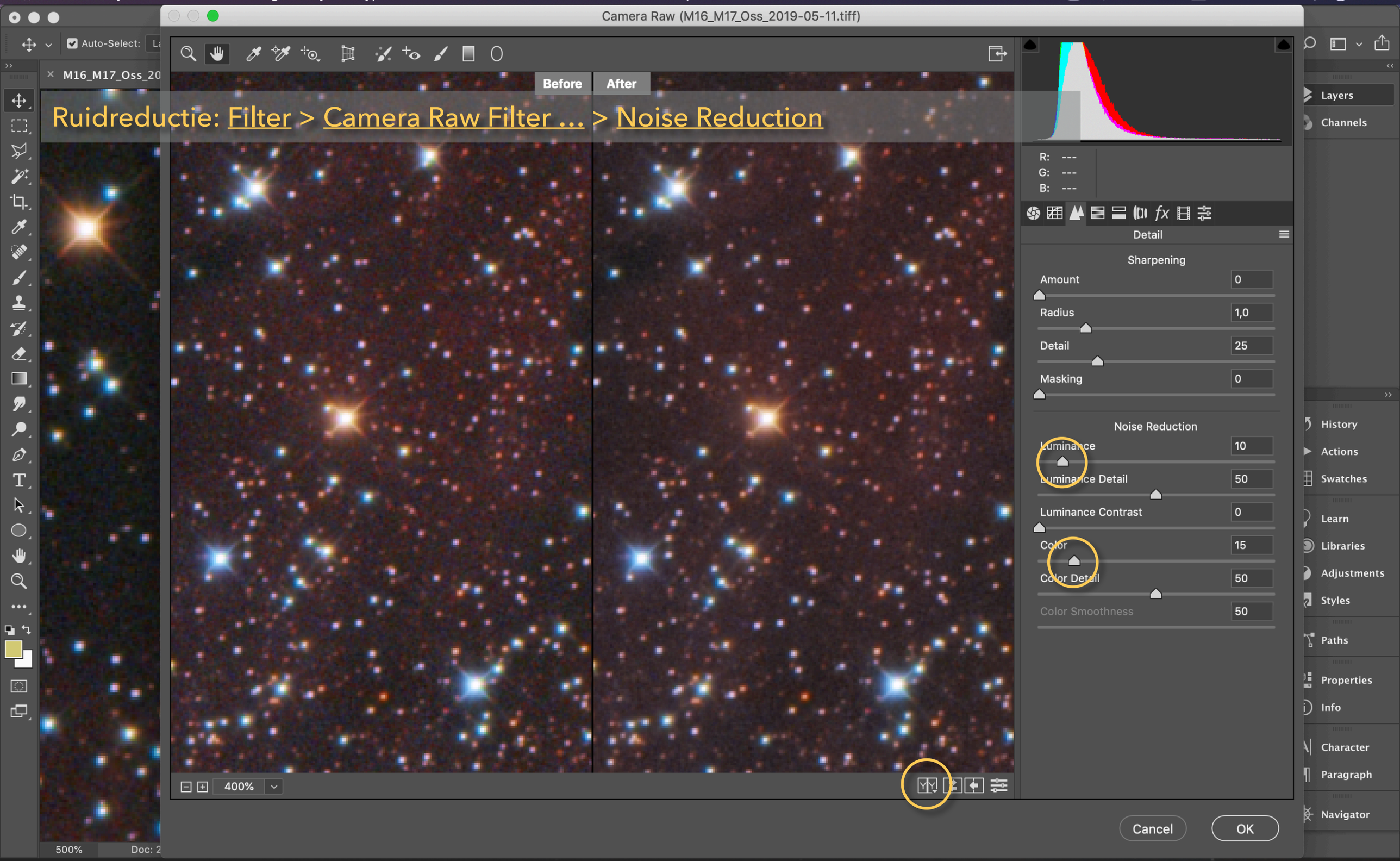
A S T R O F O T O

Ruidreductie: Filter > Camera Raw Filter … > Noise Reduction

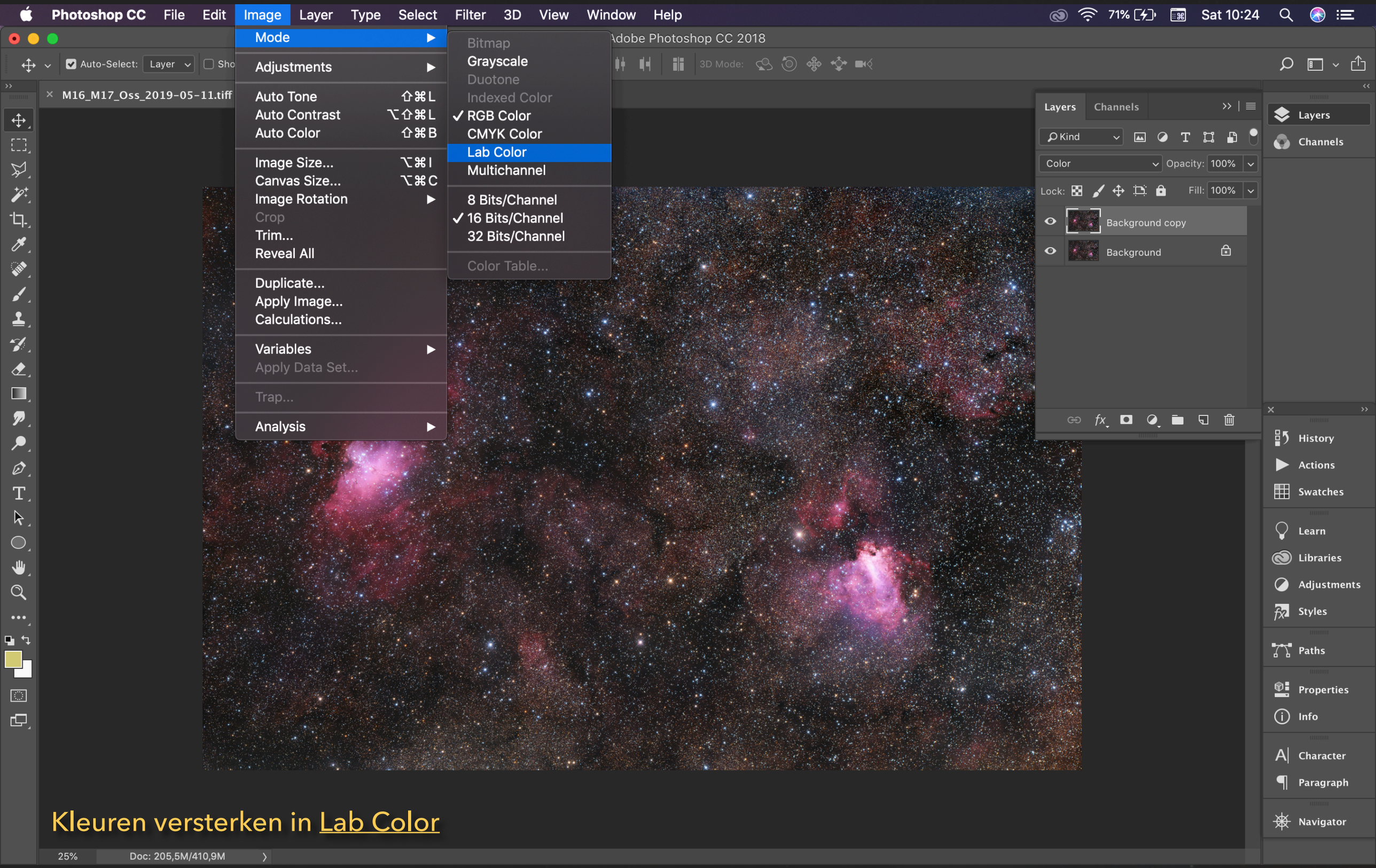


A S T R O F O T O

Ruidreductie: Filter > Camera Raw Filter … > Noise Reduction

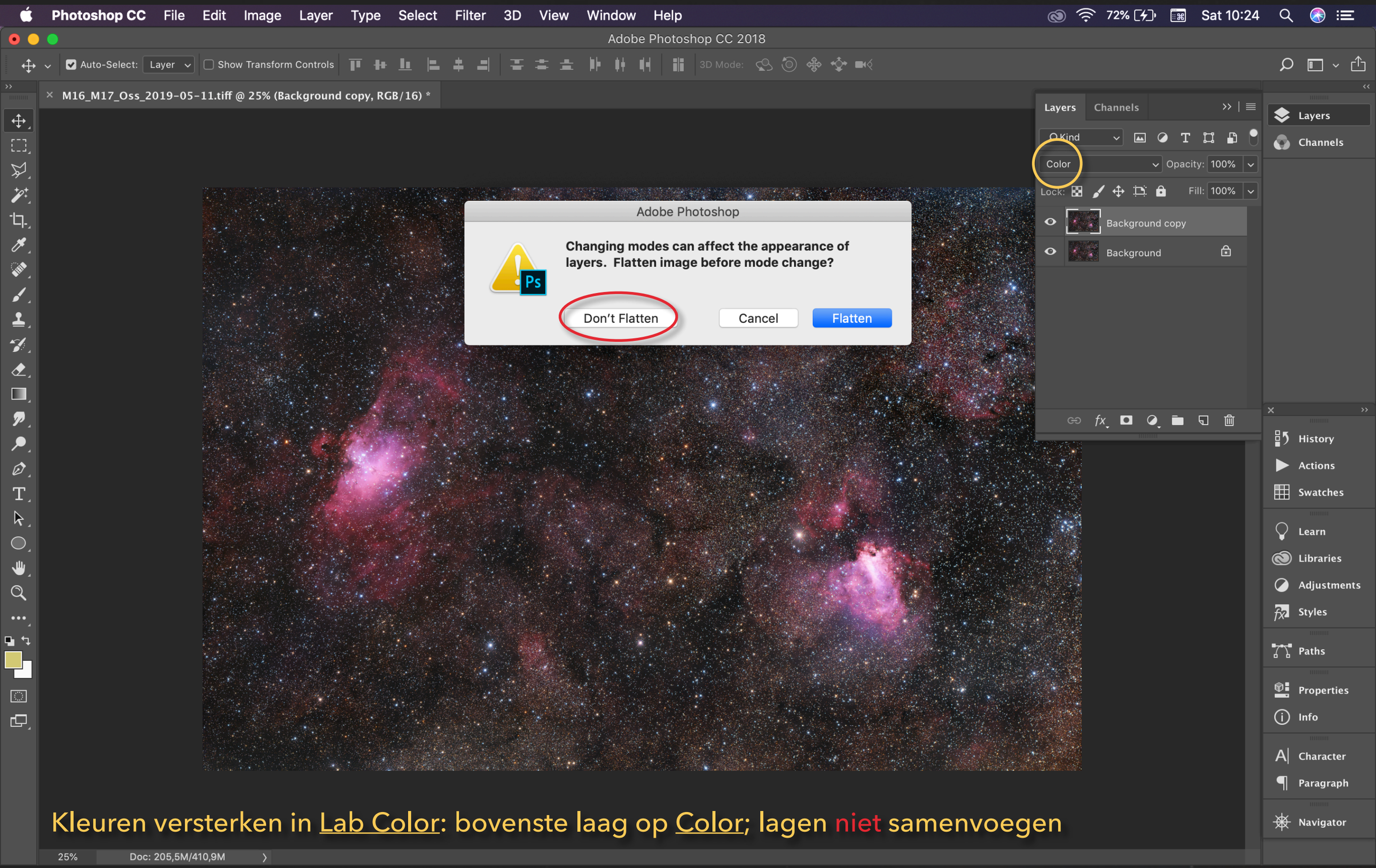


A S T R O F O T O



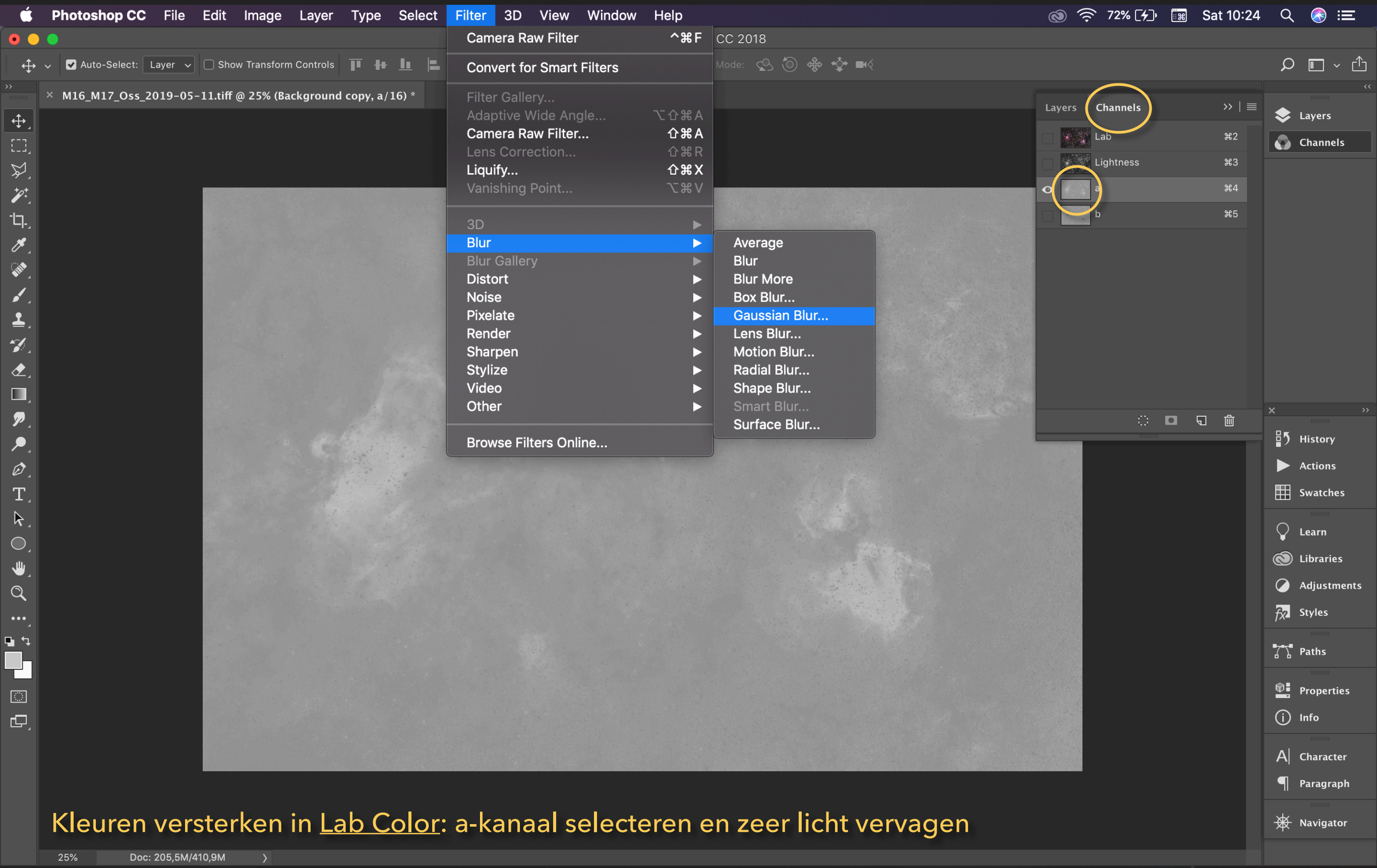
Kleuren versterken in Lab Color

A S T R O F O T O



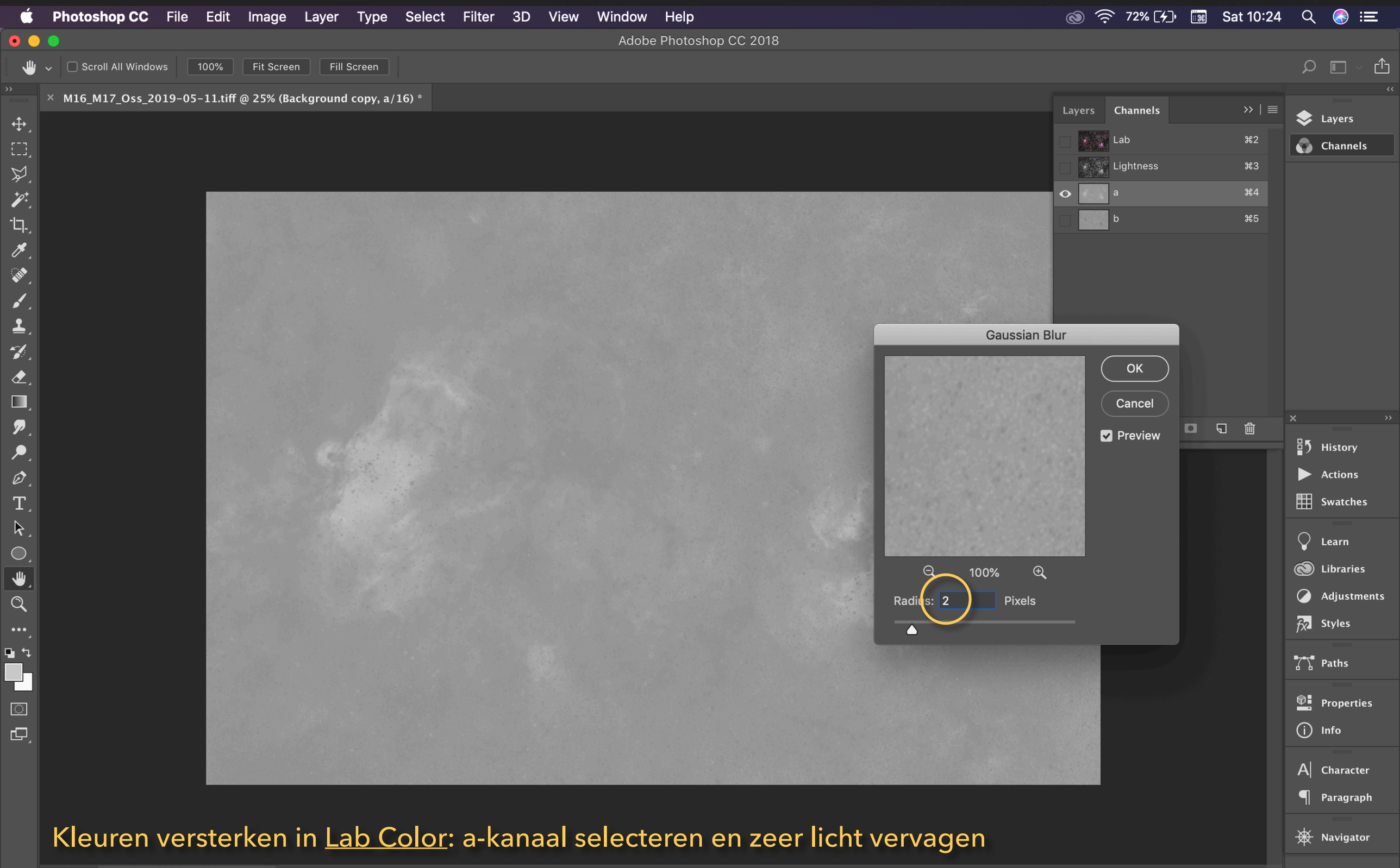
Kleuren versterken in Lab Color: bovenste laag op Color; lagen niet samenvoegen

A S T R O F O T O



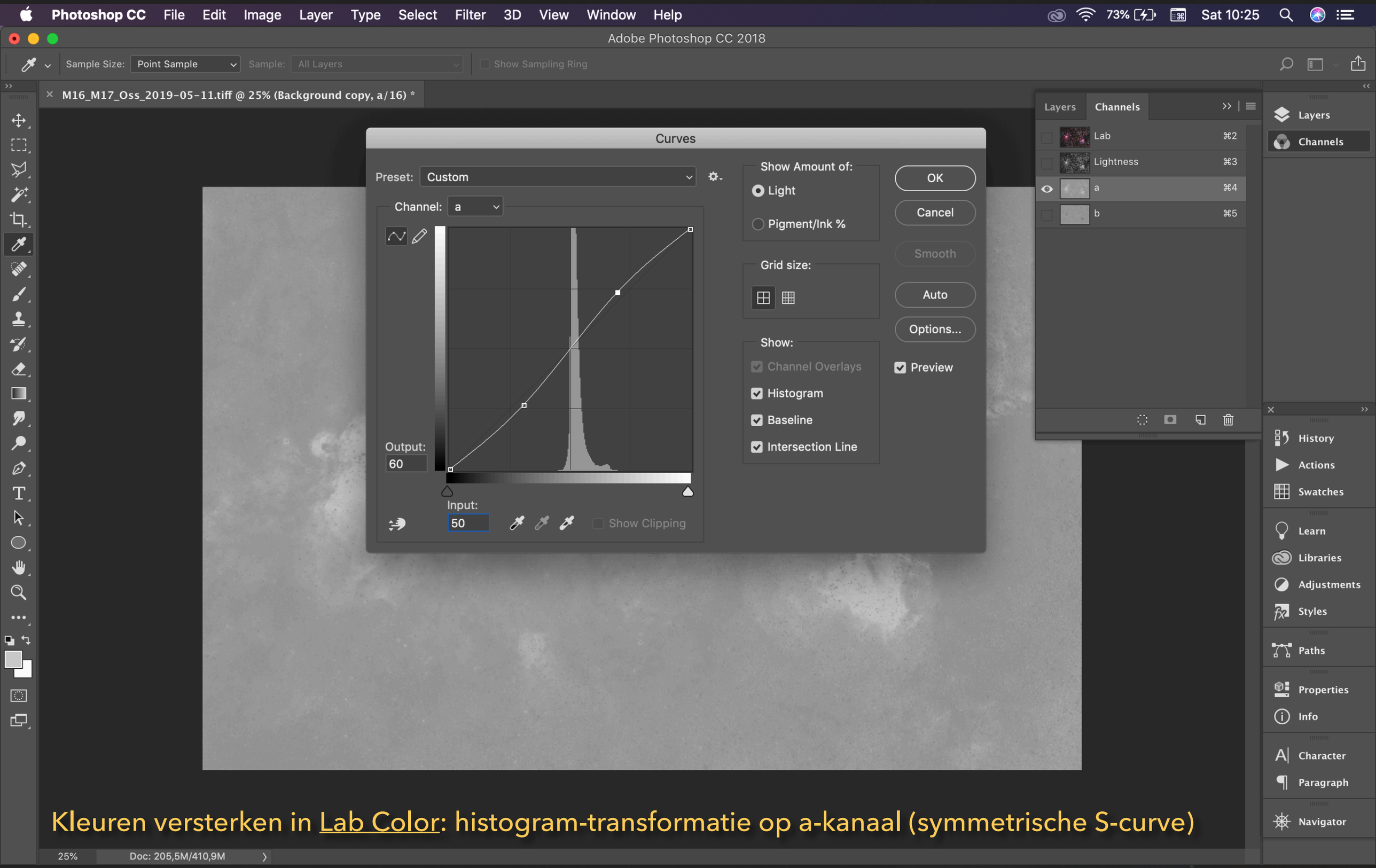
Kleuren versterken in Lab Color: a-kanaal selecteren en zeer licht vervagen

A S T R O F O T O



Kleuren versterken in Lab Color: a-kanaal selecteren en zeer licht vervagen

A S T R O F O T O



Kleuren versterken in Lab Color: histogram-transformatie op a-kanaal (symmetrische S-curve)

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

74% Sat 10:26

Adobe Photoshop CC 2018

Auto-Select: Layer Show Transform Controls 3D Mode:

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy, b/16) *



Layers Channels

Lab ⌘2
Lightness ⌘3
a ⌘4
b ⌘5

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Kleuren versterken in Lab Color: proces herhalingen op b-kanaal met idem aanpassingen

25% Doc: 205,5M/410,9M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

75% Sat 10:27

Adobe Photoshop CC 2018

Auto-Select: Layer Show Transform Controls 3D Mode:

M16_M17_Oss_2019-05-11.tiff @ 25% (Background copy, RGB/16) *



Layers Channels

Kind

Color Opacity: 100%

Lock: Fill: 100%

Background copy

Background

Layers Channels

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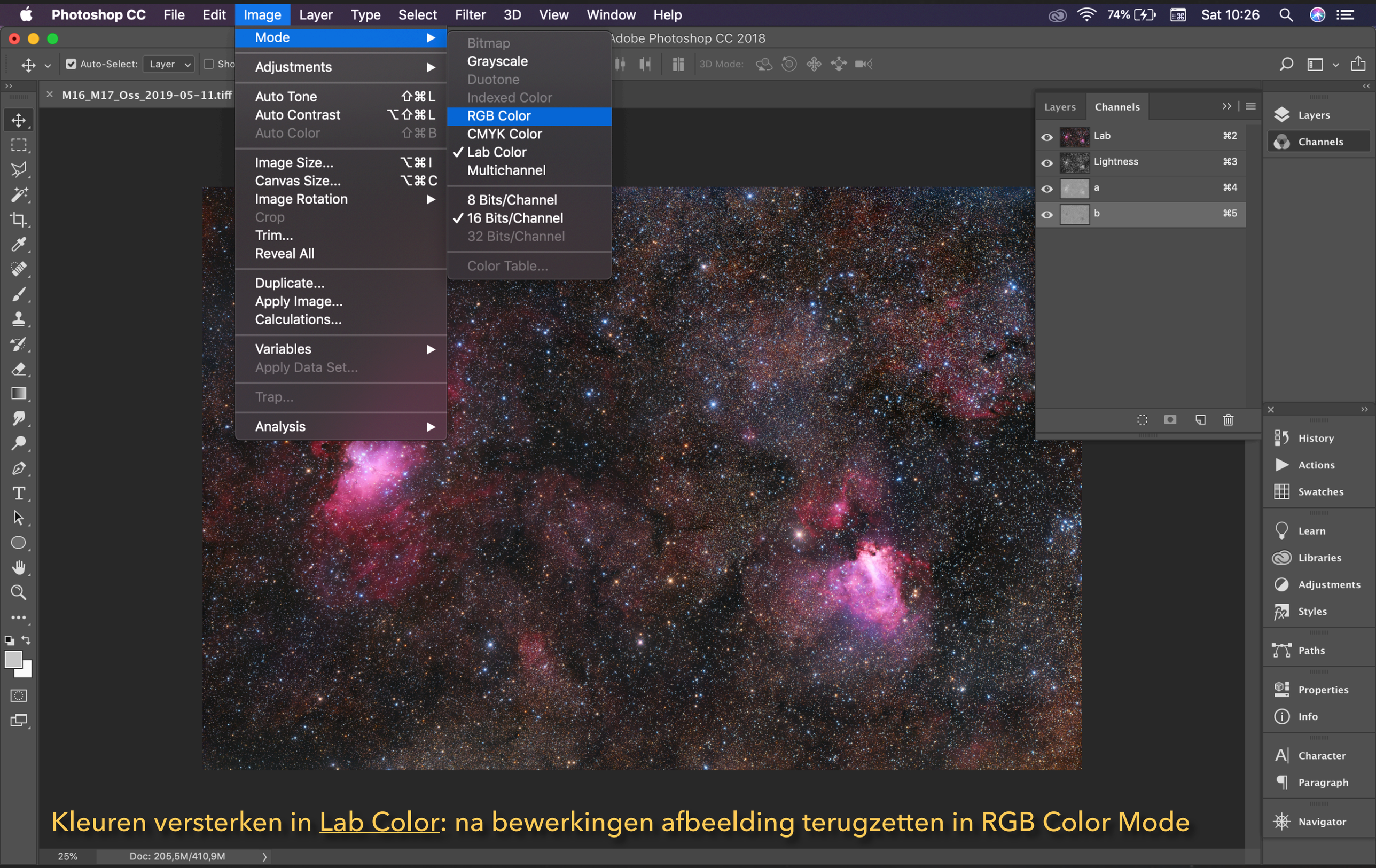
Kleuren versterken in Lab Color: desgewenst doorzichtigheid (Opacity) reduceren

25% Doc: 205,5M/410,9M

A S T R O F O T O



Kleuren versterken in Lab Color: na bewerkingen afbeelding terugzetten in RGB Color Mode

A S T R O F O T O

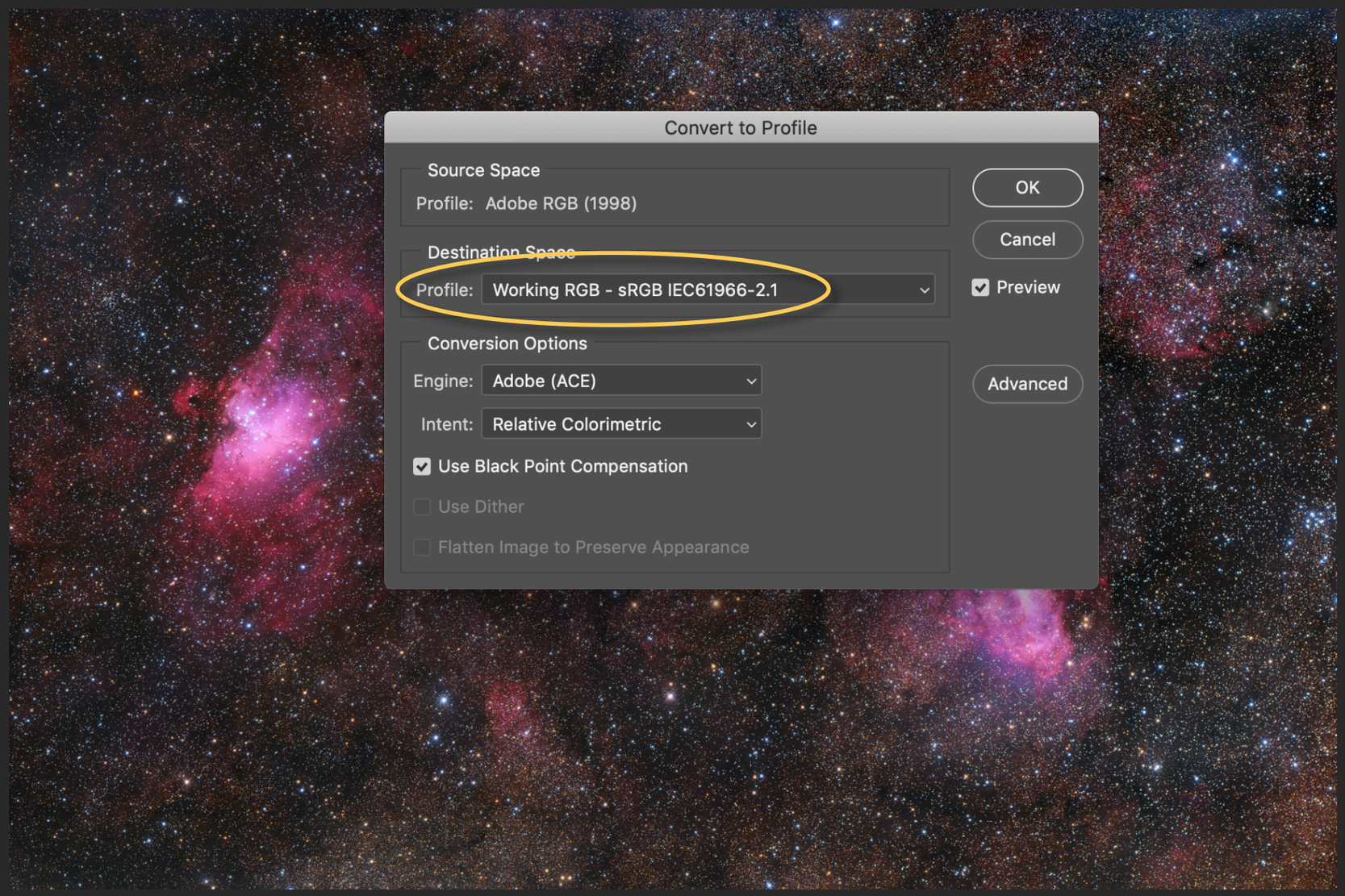
Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help 75% Sat 10:28

Adobe Photoshop CC 2018

Sample Size: Point Sample Sample: All Layers Show Sampling Ring

M16_M17_Oss_2019-05-11.tiff @ 25% (RGB/16*/Preview) *

Werk opslaan voor (web)publicatie / afdrukken: Edit > Convert to Prolile



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25% Doc: 205,5M/205,5M

A S T R O F O T O

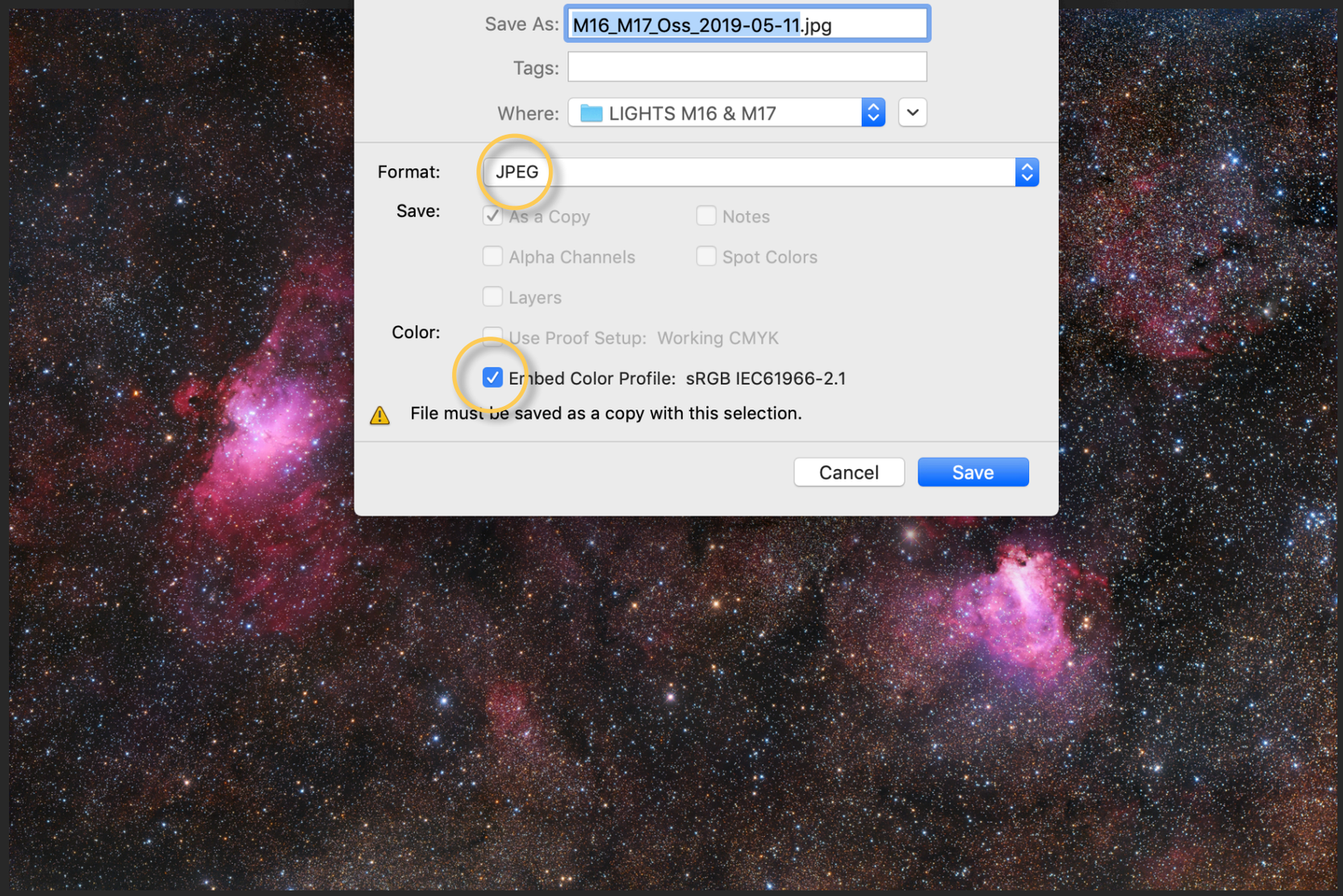
Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help 76% Sat 10:29

Adobe Photoshop CC 2018

Auto-Select: Layer Show Transform Controls 3D Mode:

M16_M17_Oss_2019-05-11.tiff @ 25% (RGB/16) *

Werk opslaan voor (web)publicatie / afdrukken: JPEG > Embed Color Profile



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25% Doc: 205,5M/205,5M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help 43% Sun 21:59

Adobe Photoshop CC 2018

Feather: 0 px Anti-alias Style: Normal Width: Height: Select and Mask...

M16_M17_Oss_2019-05-11_bewerkt.tif @ 25% (RGB/16) *

Groene zweem? Kleurbalans niet in orde?



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25% Doc: 205,5M/205,5M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help 43% Sun 21:59

Adobe Photoshop CC 2018

Sample Size: 5 by 5 Average

M16_M17_Oss_2019-05-11_bewerkt.tif @ 25% (RGB/16) *

Image > Adjustment > Levels: middelste pipetje selecteren ...



Levels

Preset: Default

Channel: RGB

Input Levels:

0

Output Levels:

0 255

OK

Cancel

Auto

Options...

Preview

Sample in image to set gray point

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25% Doc: 205,5M/205,5M

A S T R O F O T O

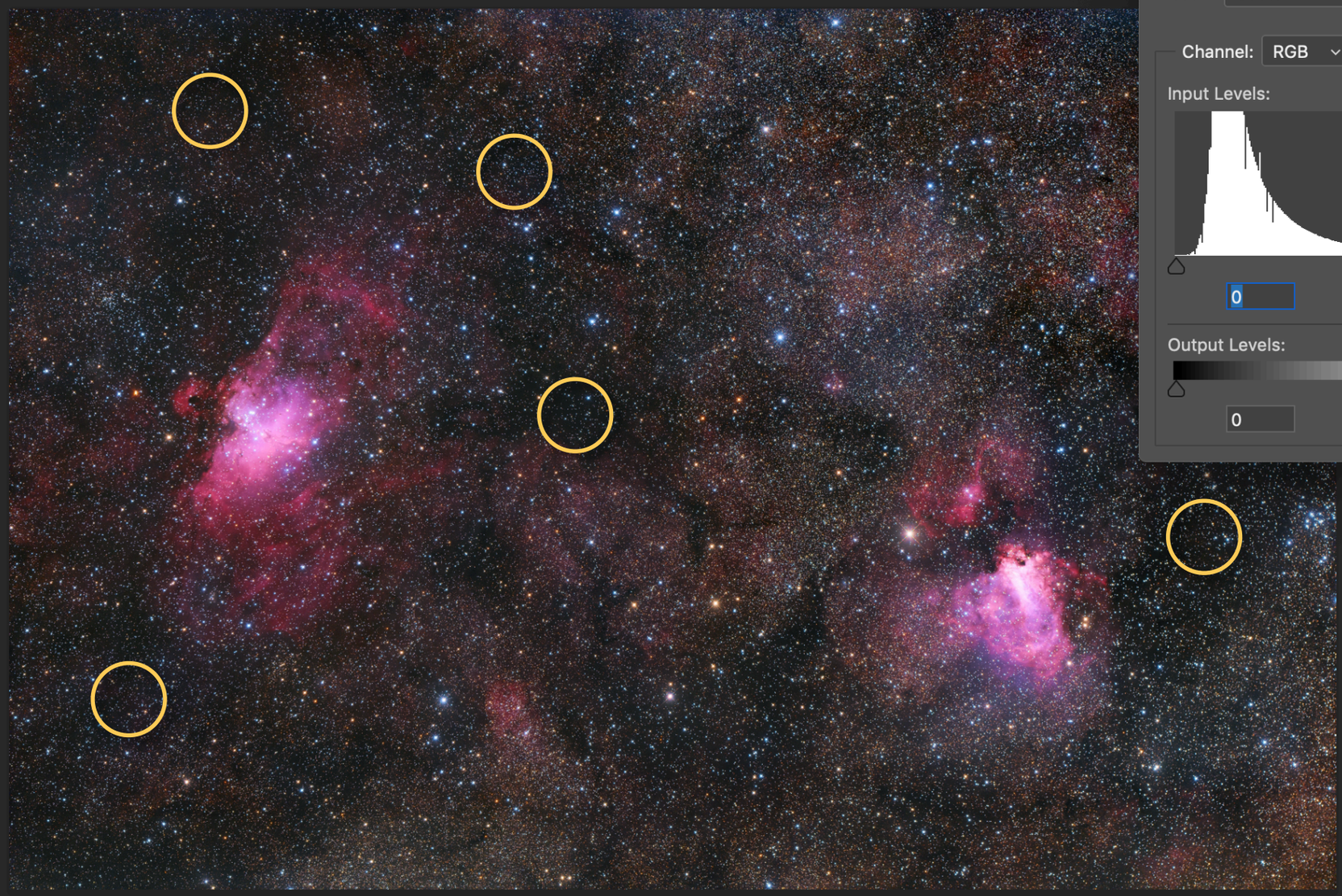
Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help 42% Sun 21:59

Adobe Photoshop CC 2018

Sample Size: 5 by 5 Average

M16_M17_Oss_2019-05-11_bewerkt.tif @ 25% (RGB/16) *

... en 'willekeurig' op de achtergrond klikken tot kleurbalans naar wens is



Levels

Preset: Custom

Channel: RGB

Input Levels: 0 1,00 255

Output Levels: 0 255

OK Cancel Auto Options... Preview

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25% Doc: 205,5M/205,5M

A S T R O F O T O

Photoshop CC File Edit Image Layer Type Select Filter 3D View Window Help

78% Sat 10:32

Adobe Photoshop CC 2018

Auto-Select: Layer Show Transform Controls 3D Mode:

M16_M17_Oss_2019-05-11.tiff @ 16,7% (RGB/16)

Start: 10:01

16,67% Doc: 213,2M/213,2M

M16_M17_Oss_2019-05-11_bewerkt.tif @ 16,7% (RGB/16)

Einde: 10:32

16,67% Doc: 205,5M/205,5M

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A S T R O F O T O

Er is nog één aspect met een A overgebleven ...

A S T R O F O T O

Afdrukken



Aan de muur

A S T R O F O T O



A S T R O F O T O







