



# Data verwerking van kometen met Astro Pixel Processor (APP)

drs. M.Sc. E.M.W.P. Haverkamp (Mabula)

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Comet C/2021 A1 (Leonard) in R,G,B, Christian Sasse, iTelescope.net





## Data verwerking van kometen met Astro Pixel Processor

- Wie is Mabula ?
- Wat is Astro Pixel Processor of APP?
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## Wie is Mabula?

- Mabula?
- opleiding
- publicatie
- werk ervaring
- Aries Productions & APP

Mabula?

Mabula Haverkamp

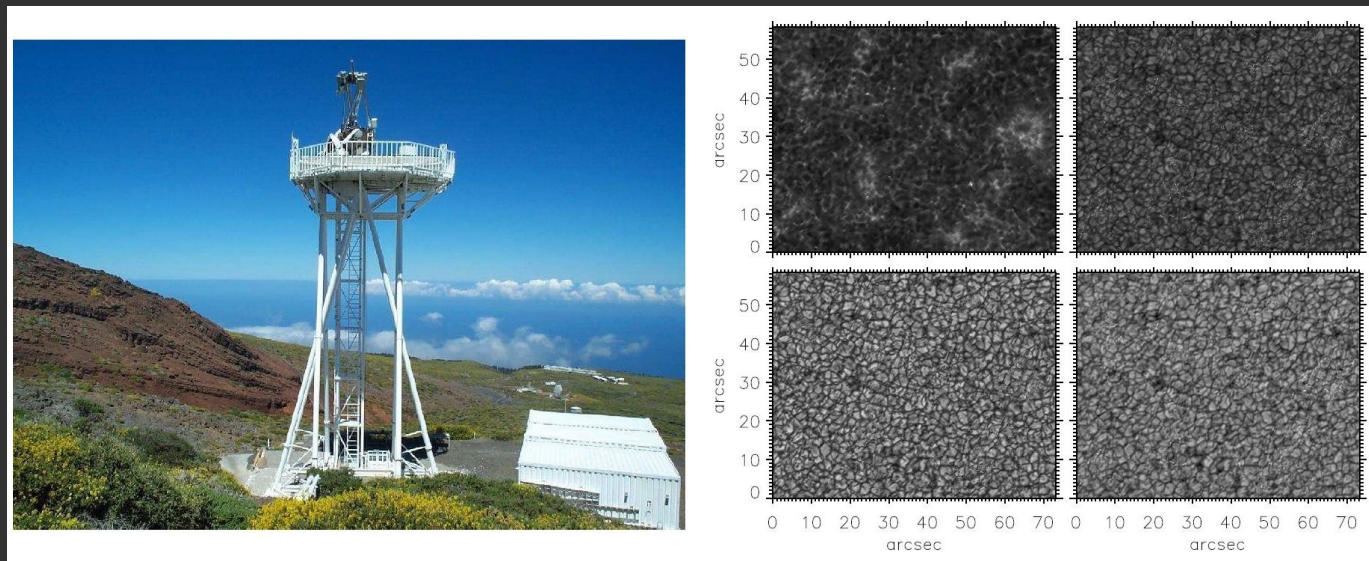
10 April 1977, Ndala (Tanzania)



opleiding

drs. M.Sc. Sterrenkunde, Universiteit Utrecht 2004

Solar magnetic fluxtubes diagnosed from isolated internetwork bright points -  
An analysis of Dutch Open Telescope observations





## publicatie

Astronomy &amp; Astrophysics, AA 441, 1183-1190 (2005)

A&amp;A 441, 1183-1190 (2005)

DOI: 10.1051/0004-6361:20053373

**DOT tomography of the solar atmosphere****IV. Magnetic patches in internetwork areas****A. G. de Wijn<sup>1</sup>, R. J. Rutten<sup>1, 2</sup>, E. M. W. P. Haverkamp<sup>1</sup> and P. Sütterlin<sup>1</sup>**<sup>1</sup> Sterrekundig Instituut, Utrecht University, Postbus 80 000, 3508 TA Utrecht, The Netherlands

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**Abstract**

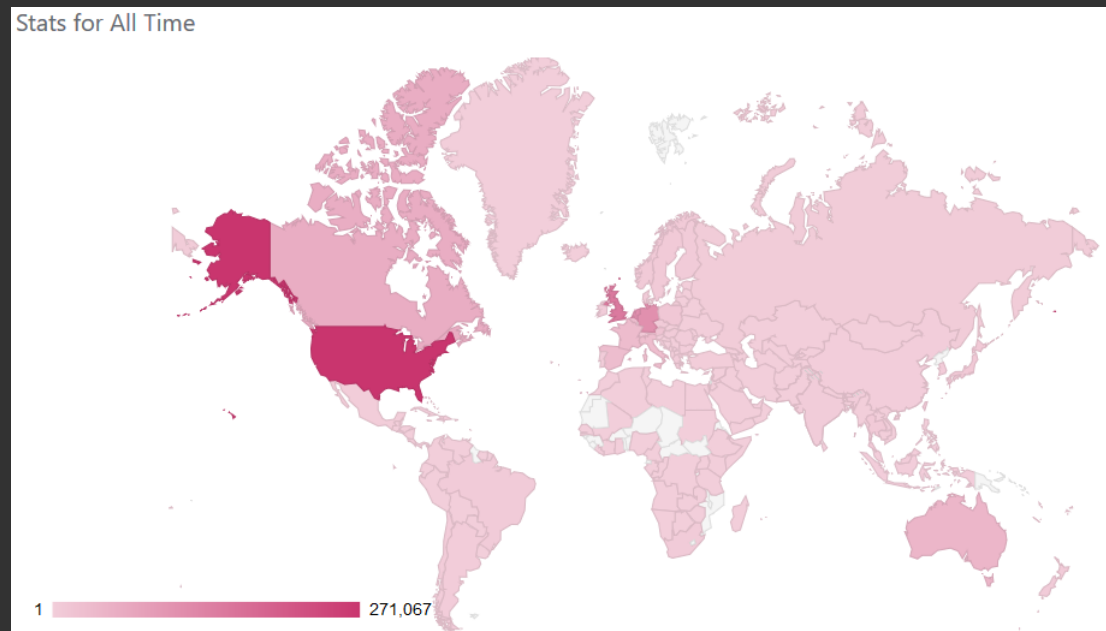
We use G-band and Ca II H image sequences from the Dutch Open Telescope (DOT) to study magnetic elements that appear as bright points in internetwork parts of the quiet solar photosphere and chromosphere. We find that many of these bright points appear recurrently with varying intensity and horizontal motion within longer-lived magnetic patches. We develop an algorithm for detection of the patches and find that all patches identified last much longer than the granulation. The patches outline cell patterns on mesogranular scales, indicating that magnetic flux tubes are advected by granular flows to mesogranular boundaries. Statistical analysis of the emergence and disappearance of the patches points to an average patch lifetime as long as  $530 \pm 50$  min (about nine hours), which suggests that the magnetic elements constituting strong internetwork fields are not generated by a local turbulent dynamo.

werk ervaring

- Market Maker/liquiditeits verschafter, Curvalue
- Middleware/ICT specialist/consultant, Axxius BV
- Start ontwikkeling van APP 2015 - nu
- Lancering van Aries Productions & APP op 2 Juni 2017

## Aries Productions & APP

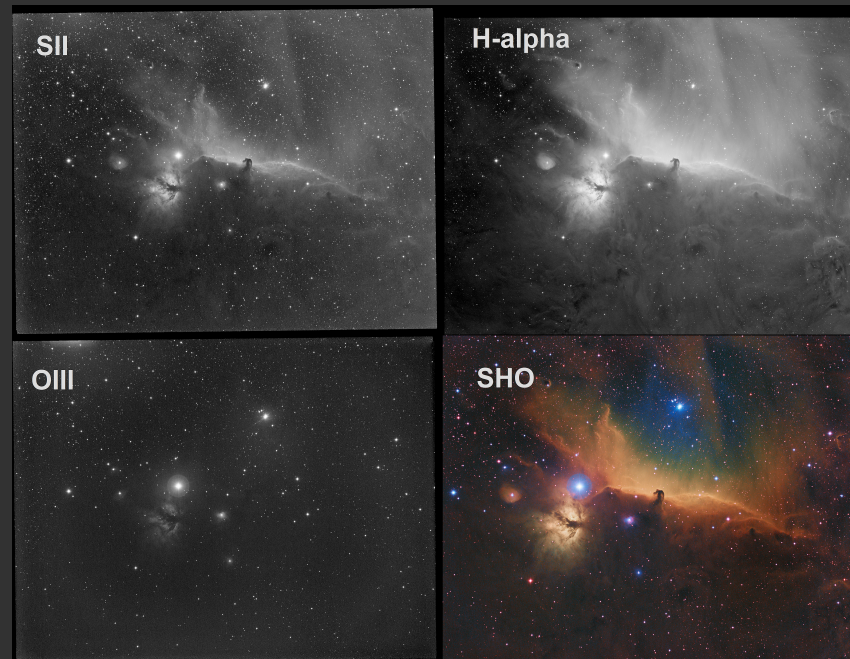
APP wordt inmiddels wereldwijd gebruikt door meer dan 10.000 astronomen, van beginners tot wetenschappers.



## Wat is Astro Pixel Processor of APP?

complete applicatie voor voor- & nabewerking van deepsky en komeet opnames, van data calibratie tot foto geschikt voor publicatie

data eigendom van Sara Wager, Spanje





## Wat is Astro Pixel Processor of APP?

Hoofd doelen ontwikkeling:

- focus op gebruiksgemak !
- levert top resultaten met standaard settings
- volwassen van calibratie tot en met integratie (stacken)
- meer en meer focus nu op nabewerkings opties

Voorbeeld: Widefield Mosaic

Melkweg & Rho Ophiuchi Mosaic

Stefan Lenz & Mabula

Kiripotib, Namibia

Nikon D810a, Nikon VR 400mm f/2.8G, Sigma Art 135mm f/1.8

Melkweg & Rho Ophiuchi Mosaic, Stefan Lenz & Mabula

Live demo: data verwerking van Comet Leonard

Comet C/2021 A1 (Leonard) in R,G,B, Christian Sasse, iTelescope.net





# Live demo: data verwerking van Comet Leonard

## APP 2.0.0-beta18 met vernieuwde interface

frame 8 of 18 : COMET: X:2996,0 Y:3231,0 dX:-10,0 dY:-5,0

frame	file name	ISO/gain	exposure(s)	time shot	#stars & star density	star FWHM min, max (abs -- rel)	star shape (abs -- rel)	select	quality score
Light 01 Blue CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_002Blue-Blue-cal.fits	1,31	120	2022-01-02T10:41:23	223	7,56 10,54	0,24	<input checked="" type="checkbox"/>	53,01 INTEGRATE
Light 02 Blue CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_003Blue-Blue-cal.fits	1,31	120	2022-01-02T10:48:18	249	8,58 9,25	0,31	<input checked="" type="checkbox"/>	77,75 INTEGRATE
Light 03 Blue CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_004Blue-Blue-cal.fits	1,31	120	2022-01-02T10:55:13	179	7,67 8,07	0,36	<input checked="" type="checkbox"/>	64,86 INTEGRATE
Light 04 Blue CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_005Blue-Blue-cal.fits	1,31	120	2022-01-02T11:02:09	192	8,61 9,07	0,32	<input checked="" type="checkbox"/>	61,87 INTEGRATE
Light 05 Blue CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_006Blue-Blue-cal.fits	1,31	120	2022-01-02T11:09:04	225	7,86 9,63	0,28	<input checked="" type="checkbox"/>	63,01 INTEGRATE
Light 06 Blue CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_007Blue-Blue-cal.fits	1,31	120	2022-01-02T11:15:59	204	7,45 8,91	0,31	<input checked="" type="checkbox"/>	62,56 INTEGRATE
Light 07 Green CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_002Green-Green-cal.fits	1,31	120	2022-01-02T10:39:09	299	6,78 7,73	0,36	<input checked="" type="checkbox"/>	104,83 INTEGRATE
Light 08 Green CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_003Green-Green-cal.fits	1,31	120	2022-01-02T10:46:04	230	7,76 10,52	0,24	<input checked="" type="checkbox"/>	55,71 INTEGRATE
Light 09 Green CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_004Green-Green-cal.fits	1,31	120	2022-01-02T10:52:59	268	6,83 7,94	0,35	<input checked="" type="checkbox"/>	93,71 INTEGRATE
Light 10 Green CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_005Green-Green-cal.fits	1,31	120	2022-01-02T10:59:54	264	7,84 9,97	0,31	<input checked="" type="checkbox"/>	82,40 INTEGRATE
Light 11 Green CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_006Green-Green-cal.fits	1,31	120	2022-01-02T11:06:50	251	7,80 9,35	0,29	<input checked="" type="checkbox"/>	73,20 INTEGRATE
Light 12 Green CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_007Green-Green-cal.fits	1,31	120	2022-01-02T11:13:45	169	8,99 9,06	0,33	<input checked="" type="checkbox"/>	58,78 INTEGRATE
Light 13 Red CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_002Red-Red-cal.fits	1,31	120	2022-01-02T10:36:54	254	7,29 8,03	0,36	<input checked="" type="checkbox"/>	90,39 INTEGRATE
Light 14 Red CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_003Red-Red-cal.fits	1,31	120	2022-01-02T10:43:49	282	6,95 8,27	0,33	<input checked="" type="checkbox"/>	83,43 INTEGRATE
Light 15 Red CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_004Red-Red-cal.fits	1,31	120	2022-01-02T10:50:45	218	8,62 8,68	0,34	<input checked="" type="checkbox"/>	75,09 INTEGRATE
Light 16 Red CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_005Red-Red-cal.fits	1,31	120	2022-01-02T10:57:40	218	8,21 8,88	0,32	<input checked="" type="checkbox"/>	70,74 INTEGRATE
Light 17 Red CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_006Red-Red-cal.fits	1,31	120	2022-01-02T11:04:35	233	7,80 9,35	0,29	<input checked="" type="checkbox"/>	65,02 INTEGRATE
Light 18 Red CA STAR	..\ChristianSasse-iTelescope-Comet Leonard\Comet_Leonard_007Red-Red-cal.fits	1,31	120	2022-01-02T11:11:31	232	7,57 9,26	0,29	<input checked="" type="checkbox"/>	67,60 INTEGRATE

Live demo: data verwerking van Comet Leonard

Comet C/2021 A1 (Leonard) in R,G,B, Christian Sasse, iTelescope.net

[klik hier voor download van demo data](#)

ToDo voor komeet processing... ?

Live Demo met APP 2.0.0-beta18:

- handmatige komeet kern selectie nu mogelijk
- verschillende bugs opgelost
- betere interface

ToDo voor komeet processing... ?

na versie 2.0.0-beta18:

- scherpe komeet en scherpe sterren!
- verdere verbetering auto detectie van komeet
- suggesties ???



Vraag en antwoord

Bekijk oude presentaties!

<https://www.astropixelprocessor.com/presentations/>

Vraag en antwoord

Trial, Renter's, of Owner's license

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support@astropixelprocessor.com

<https://www.astropixelprocessor.com/community/>



Hartelijk dank!

Zijn er vragen?