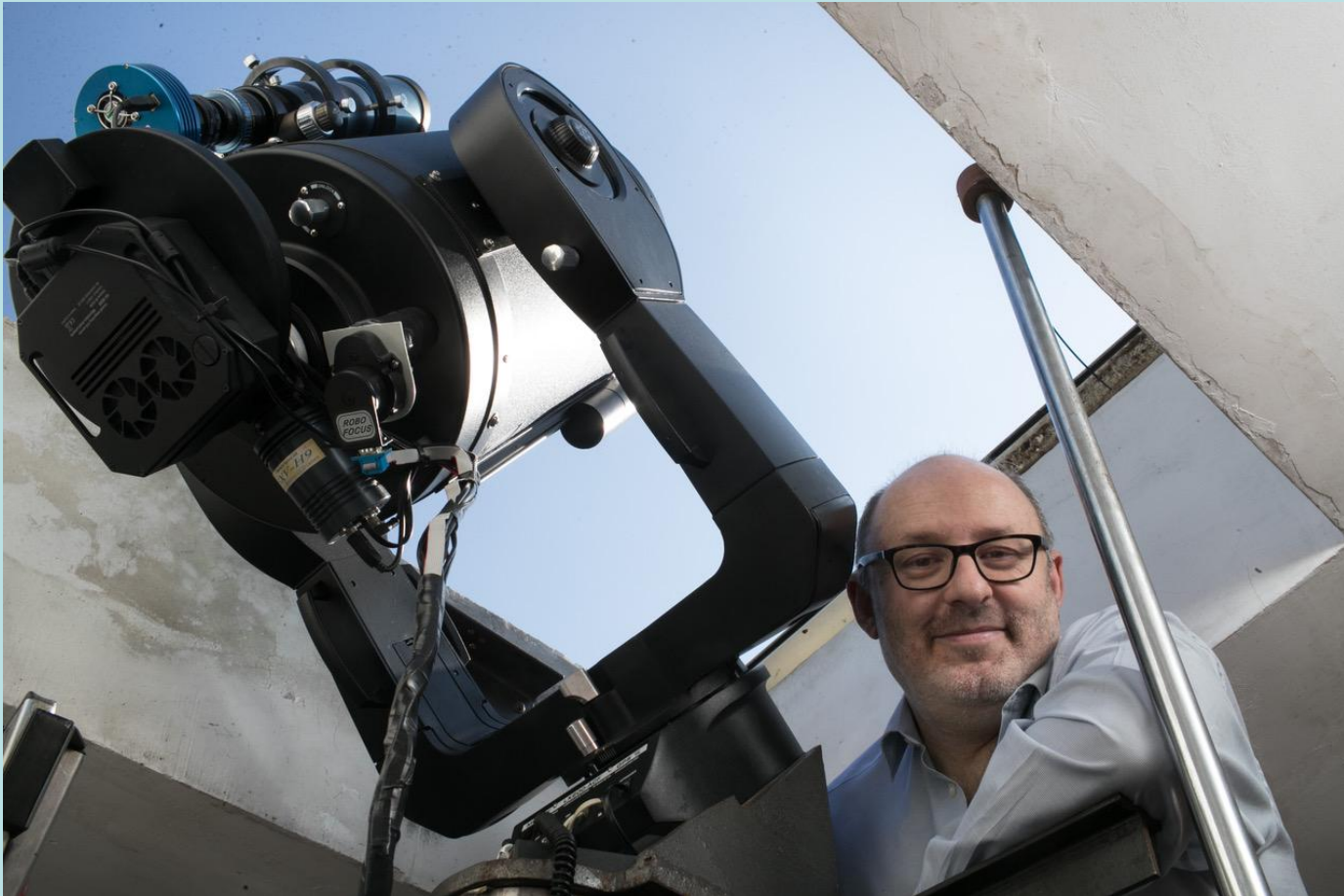
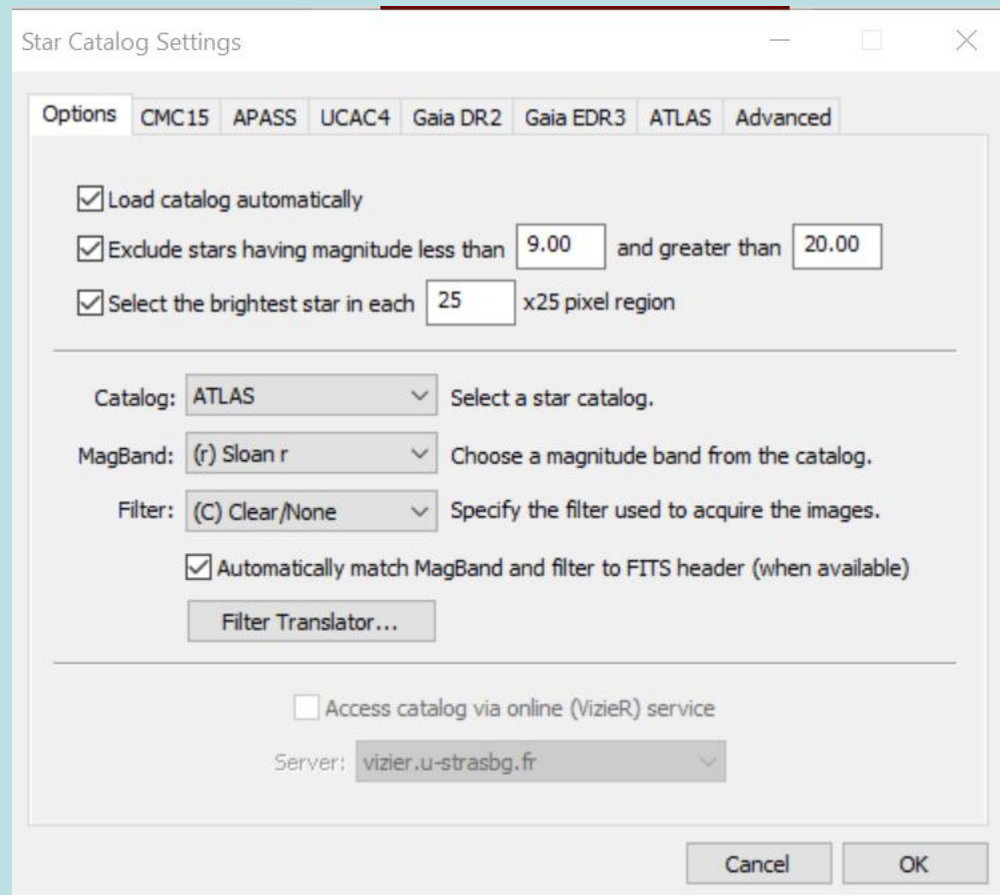
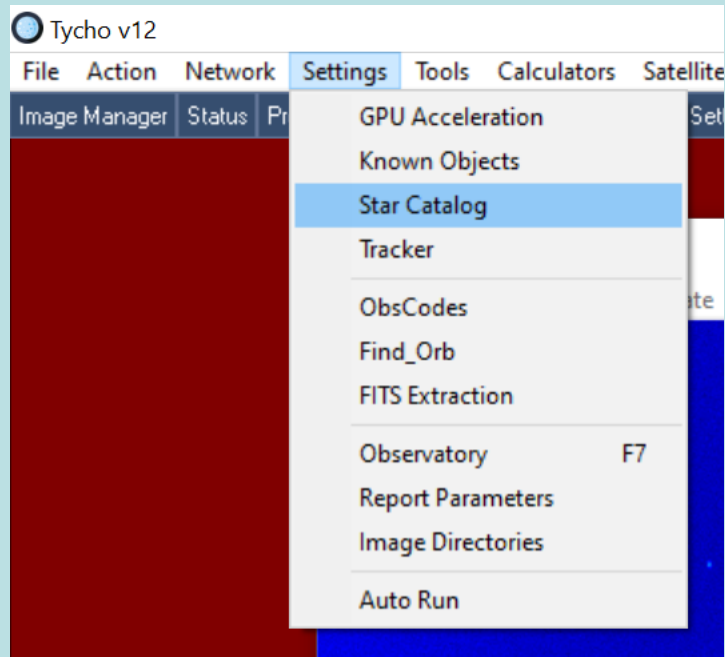
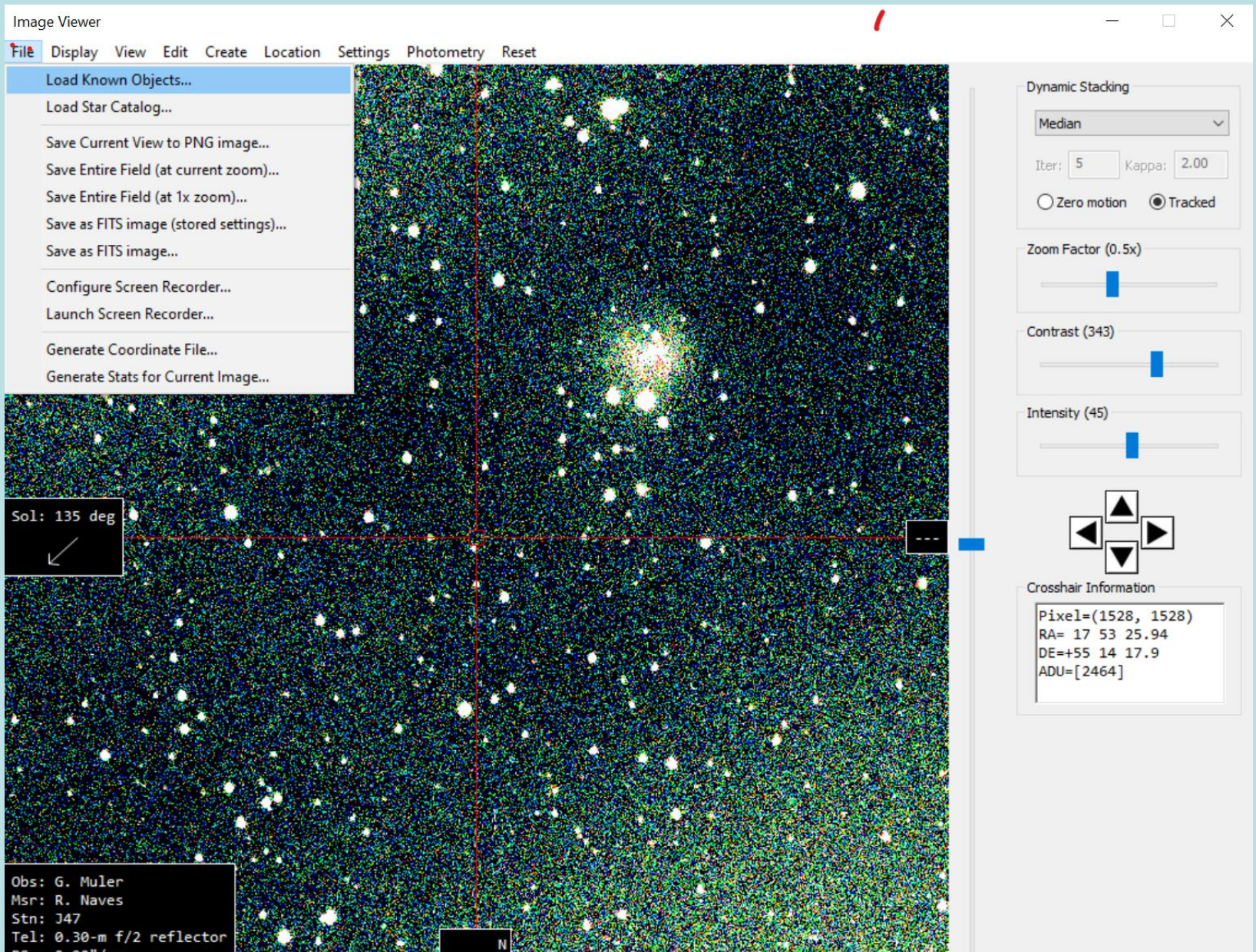


TYCHO Fotometria de cometes



- Ramon Naves & Montse Campàs
- Obs. Montcabrer – MPC 213
- Cabrils – Barcelona
- <http://cometas.fotografiaastronomica.com>





Known Objects

File Settings Display Filter Toggle Label Stack

Item	Speed	PA	Mag	Dist(AU)	Number	Name	X	Y	RA	DE
1	0.551089	251.04	11.1	3.443	12P	Pons-Brooks	1847	1261	17 52 53.22	+55 10 10

Known Objects

File Settings Display Filter Toggle Label Stack

Item	Speed	PA	Mag	Dist(AU)	Number	Name	X	Y	RA	DE
1	0.551089	251.04	11.1	3.443	12P	Pons-Brooke	1847	1261	17.53 53.23	+55.1

Toggle
View Stacked Image
Download Observations
Download Observations (NEOCP)
Apply Object Information
Add to Track Navigator

< >

Track - Navigator



File Find Object Actions Metadata

Num	calcSpeed	calcPA	ObjSpeed	ObjPA	ObjMag	ObjNum	ObjName	ObjDist	X	Y	Quality	Confidence
1	0.55	251.0	0.55	251.0	12.0	120	Pons-Brooks	0.000	1822	1252	0.00	---

Verify Track

Create Observations

Download Observations

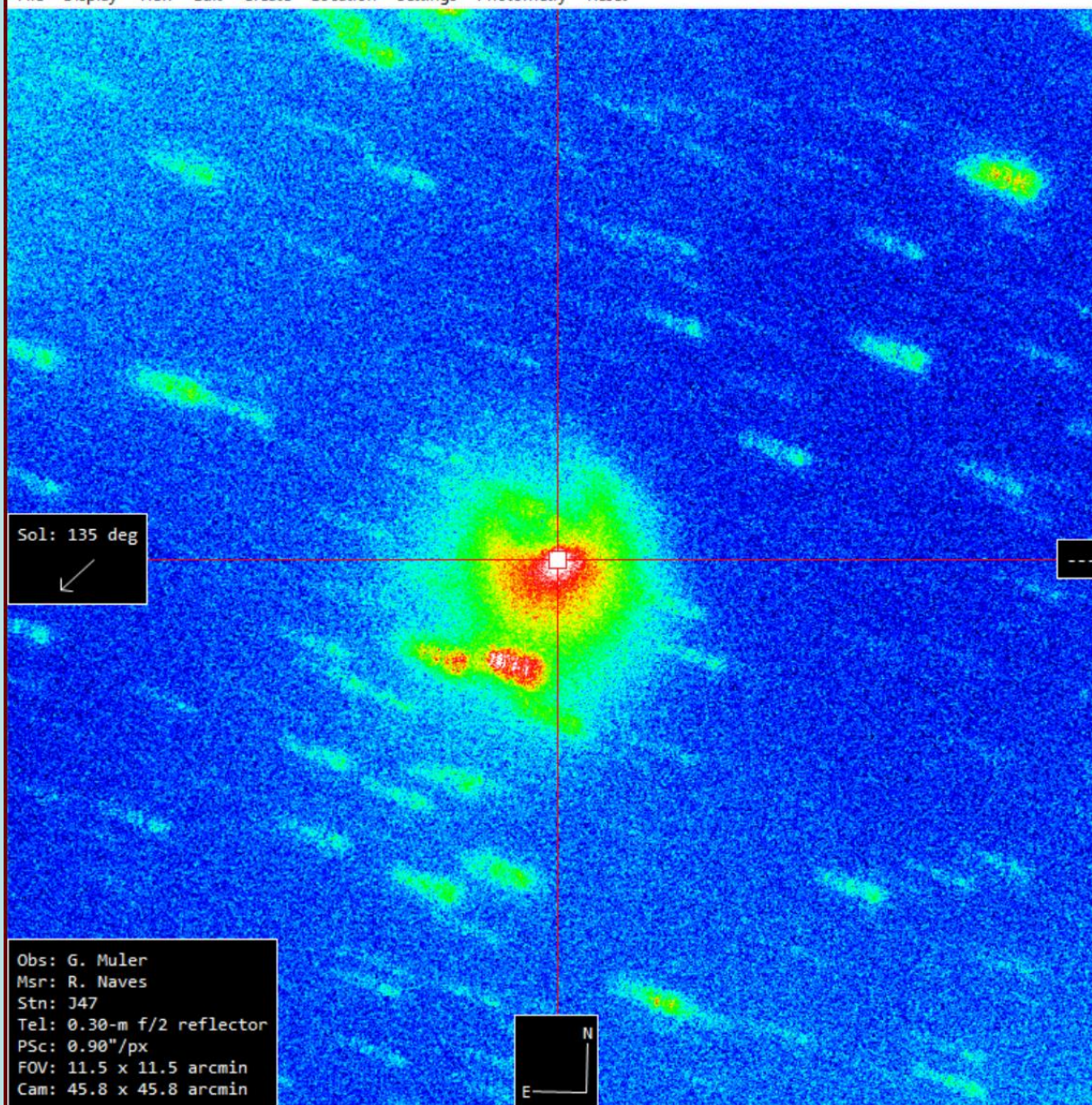
Delete Track



Track 1/1 (1 displayed, 0 filtered)

Image Viewer

File Display View Edit Create Location Settings Photometry Reset



Dynamic Stacking

Median

Iter: 5 Kappa: 2.00

☐ Zero motion ☒ Tracked

Zoom Factor (1x)

Contrast (239)

Intensity (209)



Crosshair Information

Pixel=(1838, 1233)
RA= 17 52 54.31
DE=+55 18 51.9
ADU=[2786]

Crosshairs: 13x13

(2219, 1274) (17 52 14.07, +55 18 25.2) adu=[2442]

View PSF...

Create observation...

Markers...

Overlay...

Transform...

Background level >

Display Stretch...

Channel Selector...

Color Calibration...

Sol: 135 deg
↙

Obs: G. Muler
Msr: R. Naves
Stn: J47
Tel: 0.30-m f/2 reflector
PSc: 0.90"/px
FOV: 11.5 x 11.5 arcmin
Cam: 45.8 x 45.8 arcmin



Dynamic Stacking

Median ▾

Iter: 5

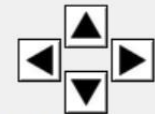
Kappa: 2.00

☐ Zero motion☒ Tracked

Zoom Factor (1x)

Contrast (239)

Intensity (209)



Crosshair Information

Pixel=(1838, 1233)
RA= 17 52 54.31
DE=+55 18 51.9
ADU=[2786]

Crosshairs: 13x13 ▾

(1779, 849) (17 53 01.79, +55 24 35.6) adu=[2450]

View PSF...

Create observation...

Overlay Settings

Overlay Boxes (when available)

☒ Track

☒ Observation

☒ Observer

☒ Object Info

☒ Compass

☒ Sun Vector

Overlay Text

Font: Consolas

Size: 10 pt

Compass

Position: Bottom Middle

Arrows: Show All

Magnifier

None

Track

☒ PermID

☒ ProvID

☒ TrkSub

☒ Speed

☒ Position angle

Observer

☒ Observer

☒ Measurer

☒ Station Code

☒ Telescope

☒ Plate scale

☒ Field of view (current)

☒ Field of view (camera)

☐ Image Orientation

Observation

☒ Date

☒ RA

☒ Dec

☒ Magnitude

☒ Exposure

Object Information

☒ Elong/Phase

☐ Alt/Az

☒ Distance

☐ PABL/PABB

☐ Speed/PA

☒ PsAng/PsAMV

Apply Object...

Apply Object Data

Object Number: 12P

Search

Object Name: Pons-Brooks

Search

If the object has only a provisional designation (such as "2018 WJ"), use that as the name.

	Number	Name	e	i
1	(12)	Victoria	0.220	8.374
2	12P	Pons-Brooks	0.955	74.192

☒ Apply from selected object

☐ Apply from observations (if not found in list)

Cancel

OK

Pixel=(1838, 1233)
RA= 17 52 54.31
DE=+55 18 51.9

Show Photometry Stars
Load Variable Stars

☒ Calibrated Magnitudes
Show Active Comp Stars
Open Active Comp Stars
Find Comp Stars

Modify Aperture Settings
Modify Sky Computation

Comet Photometry

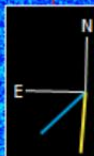
Compute MZERO

Download AAVSO chart...
Standard Fields...
Generate Transforms...

Sol: 135 deg

Elong: 97.5 deg
Phase: 15.7 deg
Earth: 3.443 AU
Sun: 3.715 AU
PsAng: 135.0 deg
PsAMV: 177.6 deg

Obs: G. Muler
Msr: R. Naves
Stn: J47
Tel: 0.30-m f/2 reflector
PSc: 0.90"/px
FOV: 11.5 x 11.5 arcmin
Cam: 45.8 x 45.8 arcmin



Dynamic Stacking

Median

Iter: 5

Kappa: 2.00

☐ Zero motion

☒ Tracked

Zoom Factor (1x)

Contrast (239)

Intensity (209)



Crosshair Information

Pixel=(1838, 1233)
RA= 17 52 54.31
DE=+55 18 51.9
ADU=[2786]

Crosshairs: 13x13

(1648, 850) (17 53 15.61, +55 24 31.0) adu=[2450]

View PSF...

Create observation...

Comet Photometry

Star Image: [Not Set]

Apply from Image Viewer

Comet Image: [Not Set]

Apply from Image Viewer

Origin: [Not Set]

Apply from Image Viewer

Comet name: 12P

Apply from Image Viewer

Comet-Earth distance (AU): 3.443

Apply from Image Viewer

Comet-Sun distance (AU): 3.715

Apply from Image Viewer

Extinction Correction: Below 10 deg

Coefficient: Average

Coma Aperture (Radius=0.70 arcmin)

Units:

Pixels

☒ Arcmin

km

 Format:

☒ Radius

☐ Diameter

Inner:

Middle:

Sky:

Scale Factor: 1

☐ Display Rings

☐ Display Text

Star Removal

Ignore radius: 7.0 (7)

Coefficient: 3.0 (3.0)

Update Comet Image

Sky Background

☒ Sky Annulus

☐ Drawn Region

Sky:

Update

Actions

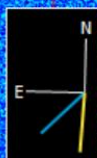
Update Comp Star Aperture...

Select Comparison Stars...

Measure Comet Tail...

Update ICQ Settings...

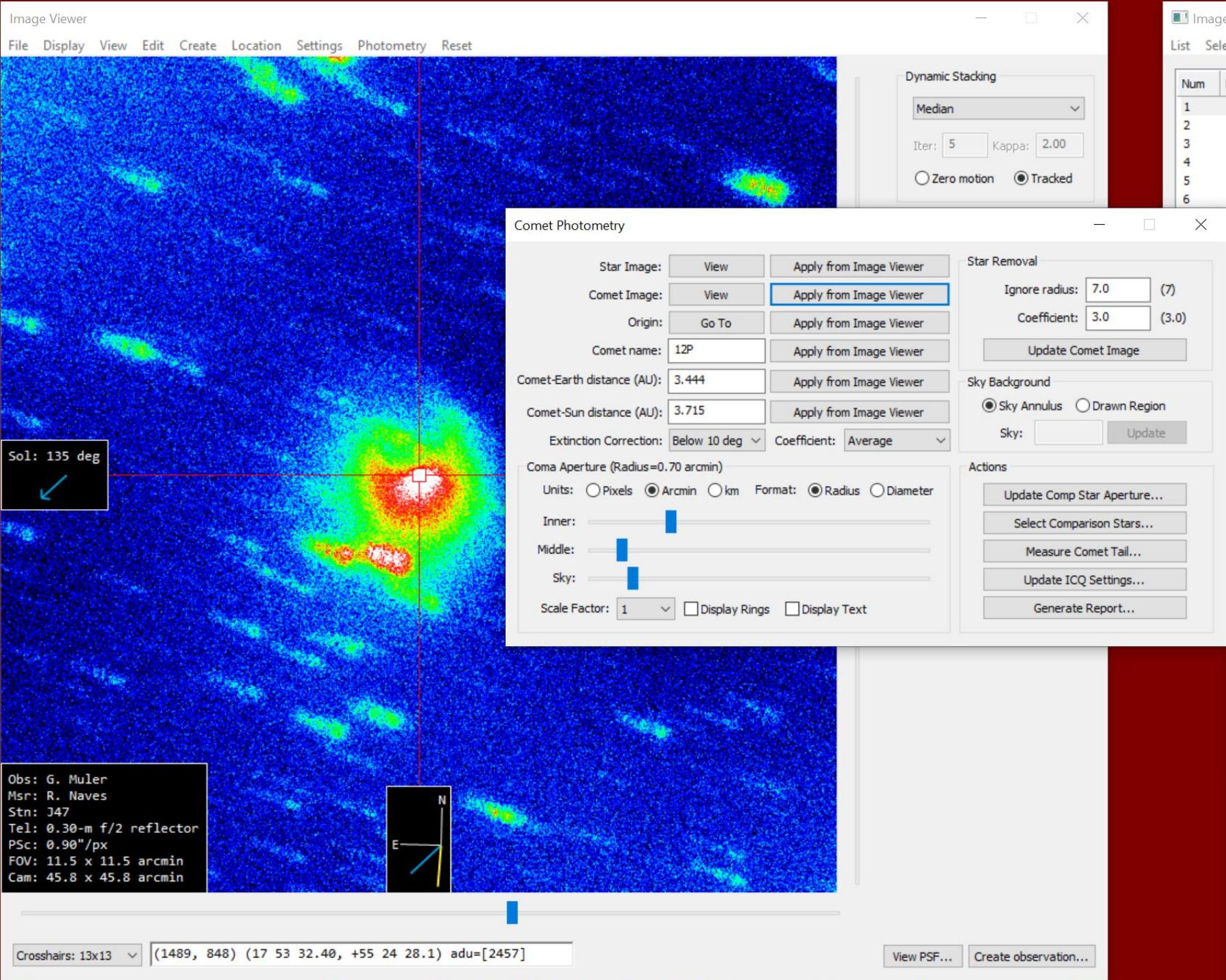
Generate Report...

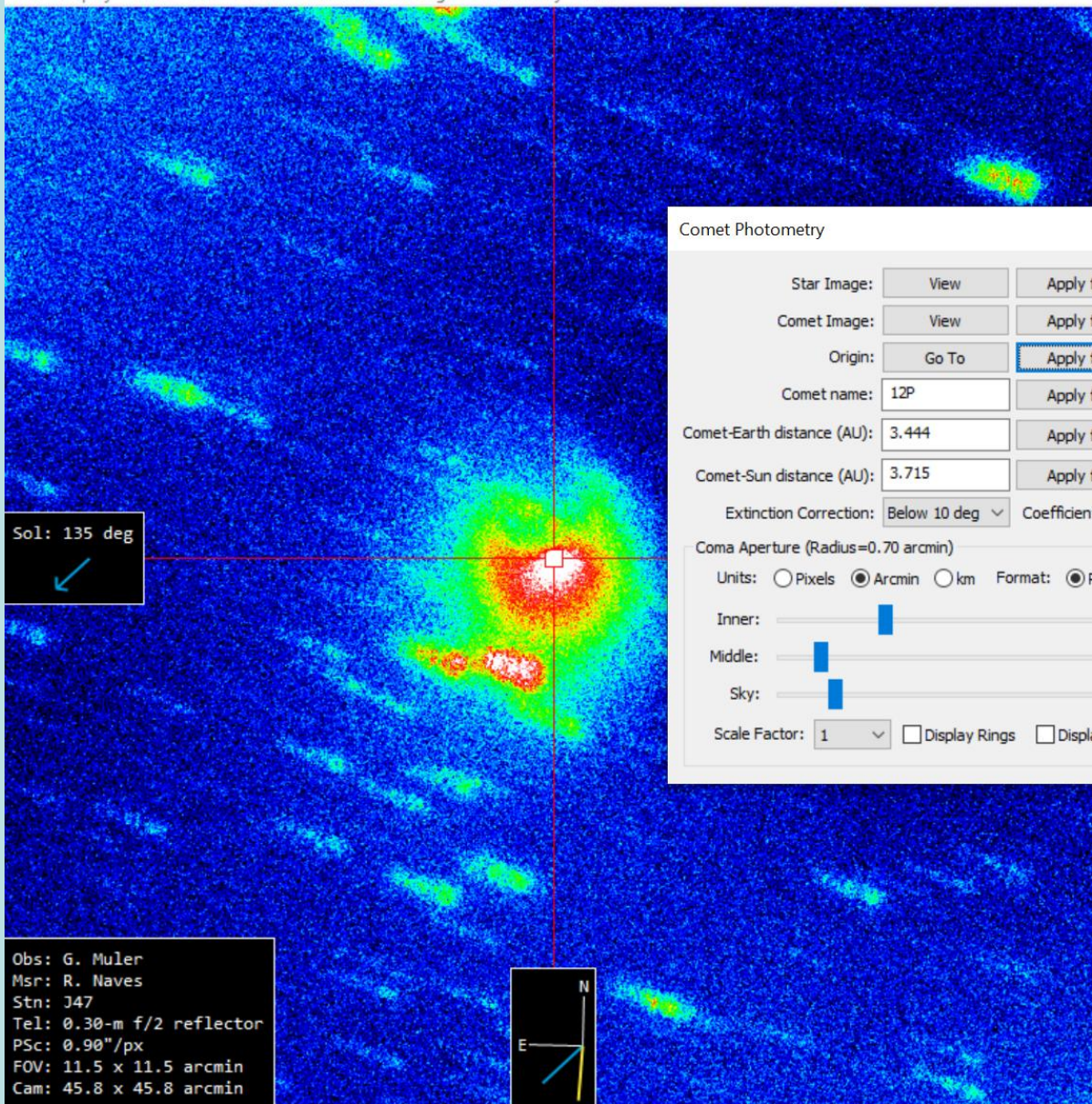


Actions

- Update Comp Star Aperture...
- Select Comparison Stars...
- Measure Comet Tail...
- Update ICQ Settings...
- Generate Report...

Img	X
1	182
2	182
3	182
4	182
5	183
6	183





Dynamic Stacking

Median

Iter: 5 Kappa: 2.00

☐ Zero motion ☒ Tracked

Comet Photometry

Star Image: View Apply from Image Viewer

Comet Image: View Apply from Image Viewer

Origin: Go To Apply from Image Viewer

Comet name: 12P Apply from Image Viewer

Comet-Earth distance (AU): 3.444 Apply from Image Viewer

Comet-Sun distance (AU): 3.715 Apply from Image Viewer

Extinction Correction: Below 10 deg Coefficient: Average

Coma Aperture (Radius=0.70 arcmin)

Units: ☐ Pixels ☒ Arcmin ☐ km Format: ☒ Radius ☐ DiameterInner: Middle: Sky: Scale Factor: 1 ☐ Display Rings ☐ Display Text

Star Removal

Ignore radius: 7.0 (7)

Coefficient: 3.0 (3.0)

Update Comet Image

Sky Background

☒ Sky Annulus ☐ Drawn Region

Sky: Update

Actions

Update Comp Star Aperture...

Select Comparison Stars...

Measure Comet Tail...

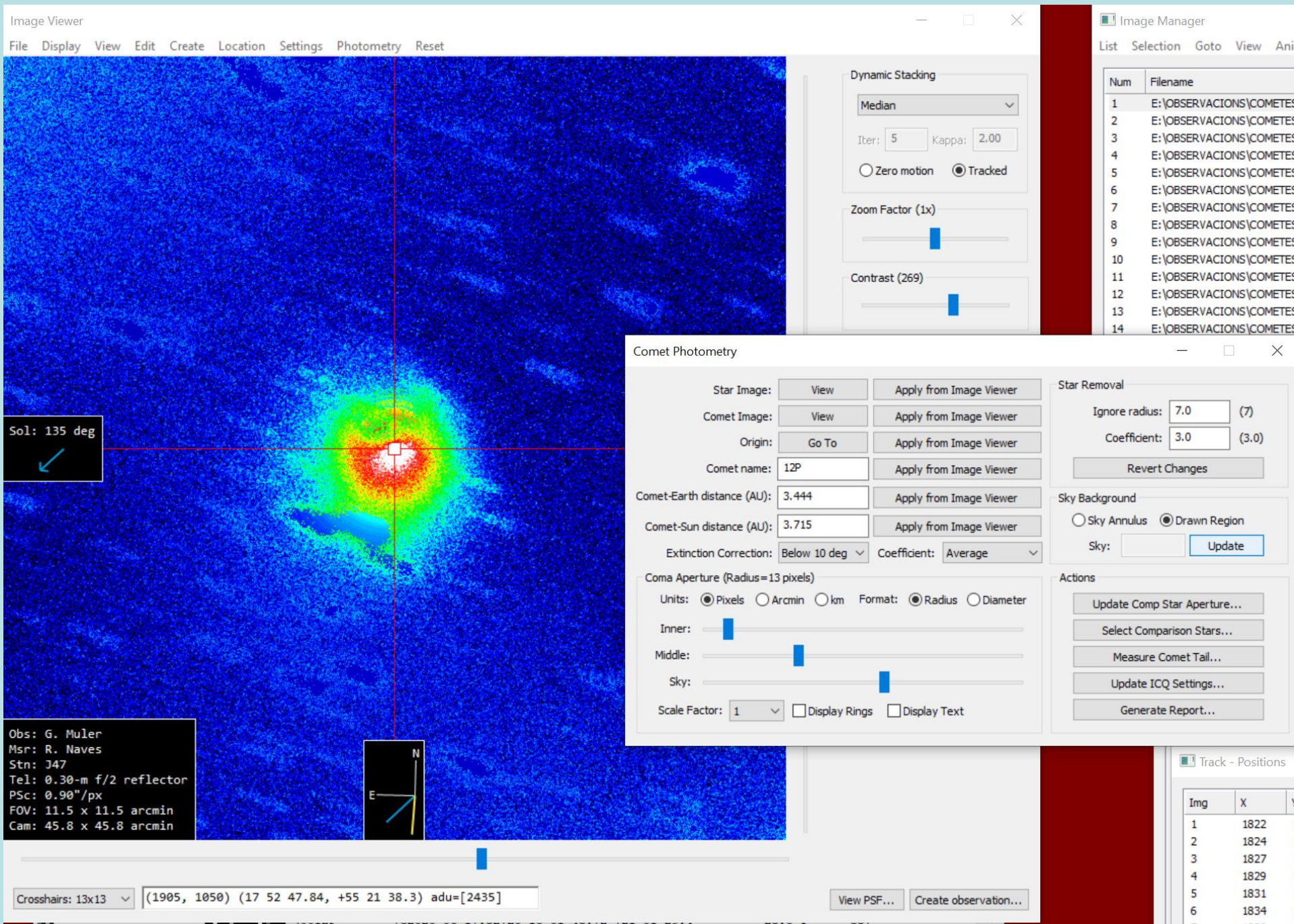
Update ICQ Settings...

Generate Report...

Crosshairs: 13x13 (1458, 919) (17 53 35.43, +55 23 23.4) adu=[2448]

View PSF...

Create observation...



En un origen (Astroart y Fase 3), usábamos un box fotométrico cuadrado de 10 x 10 segundos, es decir de 100 segundos cuadrados.

Posteriormente aunque le seguimos llamando 10 x 10 en realidad en Focas ya usabamos un box circular de 100 segundos cuadrados de superficie.

Aquí haremos lo mismo y para ello usaremos box circulares de 100 segundos de arco cuadrados.

100 segundos cuadrados es equivalente a un box circular de 5,64 segundos de arco de radio. Ver formula $\text{radio} = (100 / 3,1415927)^{0,5}$

Ahora bien en Tycho hay que poner en radio en pixels por lo que tendremos que dividir 5,64 por la resolución por pixel a la que trabajamos con nuestra CCD

En este caso es 0,9 segundos de arco por pixel

El cálculo a realizar es muy simple $5,64 / \text{resolución por pixel} = \text{radio en pixels}$ para TYCHO

Calculamos $5,64 / 0,9 = 6,26$

Siendo en este caso 6,26 el valor que elegiremos para todos los box

Comet Photometry

Star Image: View Apply from Image Viewer

Comet Image: View Apply from Image Viewer

Origin: Go To Apply from Image Viewer

Comet name: 12P Apply from Image Viewer

Comet-Earth distance (AU): 3.444 Apply from Image Viewer

Comet-Sun distance (AU): 3.715 Apply from Image Viewer

Extinction Correction: Below 10 deg Coefficient: Average

Coma Aperture (Radius=13 pixels)

Units: Pixels Arcmin km Format: Radius Diameter

Inner: Middle: Sky: Scale Factor: 1 Display Rings Display Text

Star Removal

Ignore radius: 7.0 (7)

Coefficient: 3.0 (3.0)

Revert Changes

Sky Background

Sky Annulus Drawn Region

Sky: Update

Actions

Update Comp Star Aperture...

Select Comparison Stars...

Measure Comet Tail...

Update ICQ Settings...

Generate Report...

Aperture -- Target

Aperture Type: Target Comp Stars Force comp stars to use same aperture as target

Aperture Shape: Circle Ellipse Rectangle Large Aperture Mode

Radius 1: 6.260000

Radius 2: 6.260000

Rotation (degrees): 0.000000

Dead zone: 6.260000

Sky annulus: 6.260000

Defaults Copy Target to Comp Star Copy Comp Star to Target Close

Star Image:

Comet Image:

Origin:

Comet name:

Comet-Earth distance (AU):

Comet-Sun distance (AU):

Extinction Correction: Coefficient:

Coma Aperture (Radius=13 pixels)

Units: ☒ Pixels ☐ Arcmin ☐ km Format: ☒ Radius ☐ Diameter

Inner:

Middle:

Sky:

Scale Factor: ☐ Display Rings ☐ Display Text

Star Removal

Ignore radius: (7)

Coefficient: (3.0)

Sky Background

☐ Sky Annulus ☒ Drawn Region

Sky:

Actions

Comp Star Finder

Num	RA	DE	Mag	(B-V)	(V-R)	V
114	267.759655	55.232507	14.183	0.565	0.338	
115	267.753400	55.009083	14.460	0.664	0.400	
116	267.750130	55.454766	12.451	0.635	0.380	
117	267.742912	55.183072	13.941	0.625	0.375	
118	267.735741	55.299980	13.949	0.568	0.342	
119	267.713489	54.962906	12.901	0.818	0.488	
120	267.717472	55.193877	12.918	0.646	0.388	
121	267.707077	55.313803	13.670	0.837	0.500	
122	267.702971	55.255505	14.043	0.692	0.411	

Min magnitude: ☒ Max magnitude: ☒

Min ADU: ☐ Max ADU: ☐

Min (B-V): ☒ Max (B-V): ☒

Min (V-R): ☐ Max (V-R): ☐

Min visibility: ☒ Max visibility: ☒

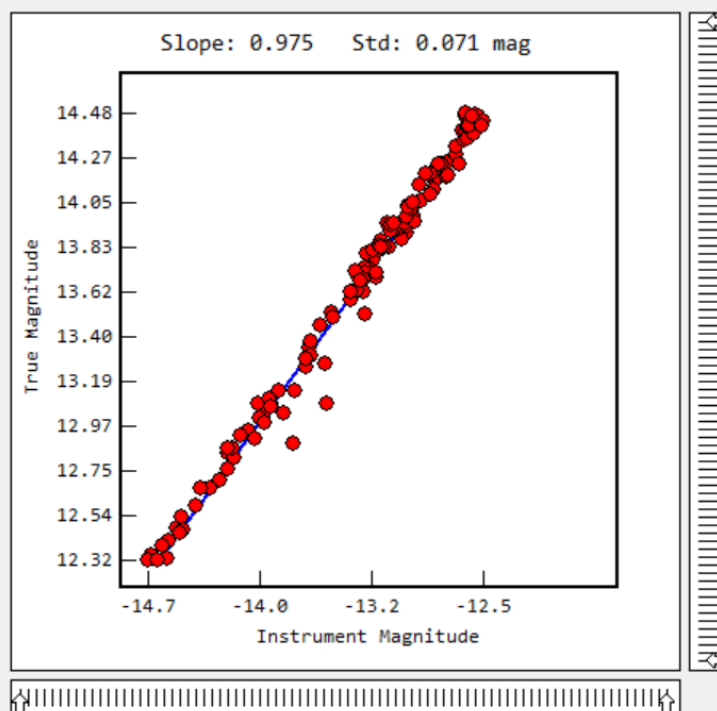
Min SNR: ☒ Max SNR: ☐

☐ Radius: 15.0 arcmin from markers

Defaults

☒ Apply Filter

Refresh



Num	RA	DE	Mag	(B-V)	(V-R)	V ^
114	267.759655	55.232507	14.183	0.565	0.338	
115	267.753400	55.009083	14.460	0.664	0.400	
116	267.750130	55.454766	12.451	0.635	0.380	
117	267.742912	55.183072	13.941	0.625	0.375	
118	267.735741	55.299980	13.949	0.568	0.342	
119	267.713489	54.962906	12.901	0.818	0.488	
120	267.717472	55.193877				
121	267.707077	55.313803				
122	267.702971	55.255505	14.043	0.692	0.411	

Add to Active Comp Stars

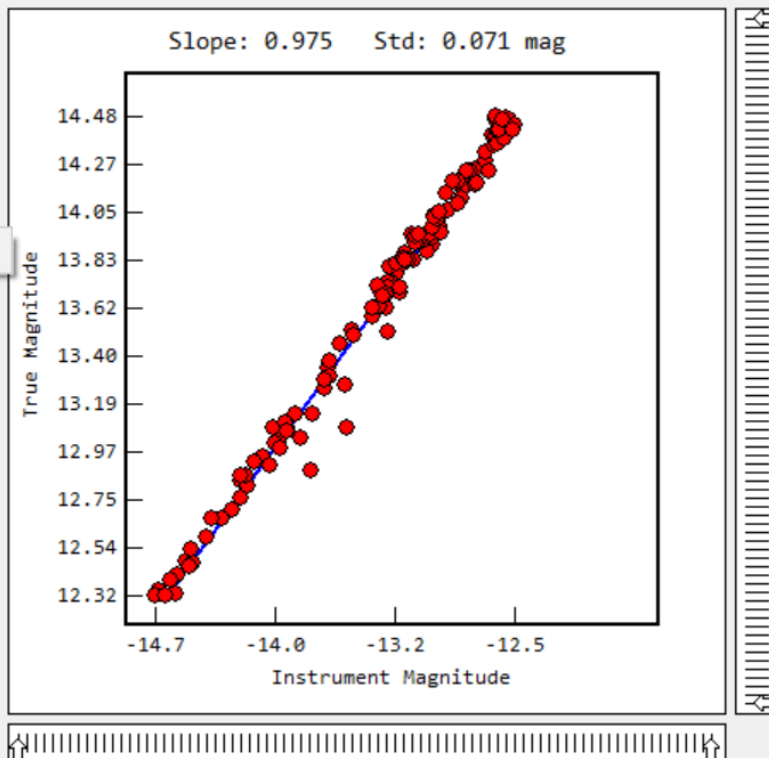
Min magnitude:	12.3	☒	Max magnitude:	14.5	☒
Min ADU:	0	☐	Max ADU:	65535	☐
Min (B-V):	0.50	☒	Max (B-V):	0.90	☒
Min (V-R):	0.00	☐	Max (V-R):	0.00	☐
Min visibility:	100.0	☒	Max visibility:	100.0	☒
Min SNR:	100.00	☒	Max SNR:	300.00	☐

☐ Radius: 15.0 arcmin from markers

Defaults

☒ Apply Filter

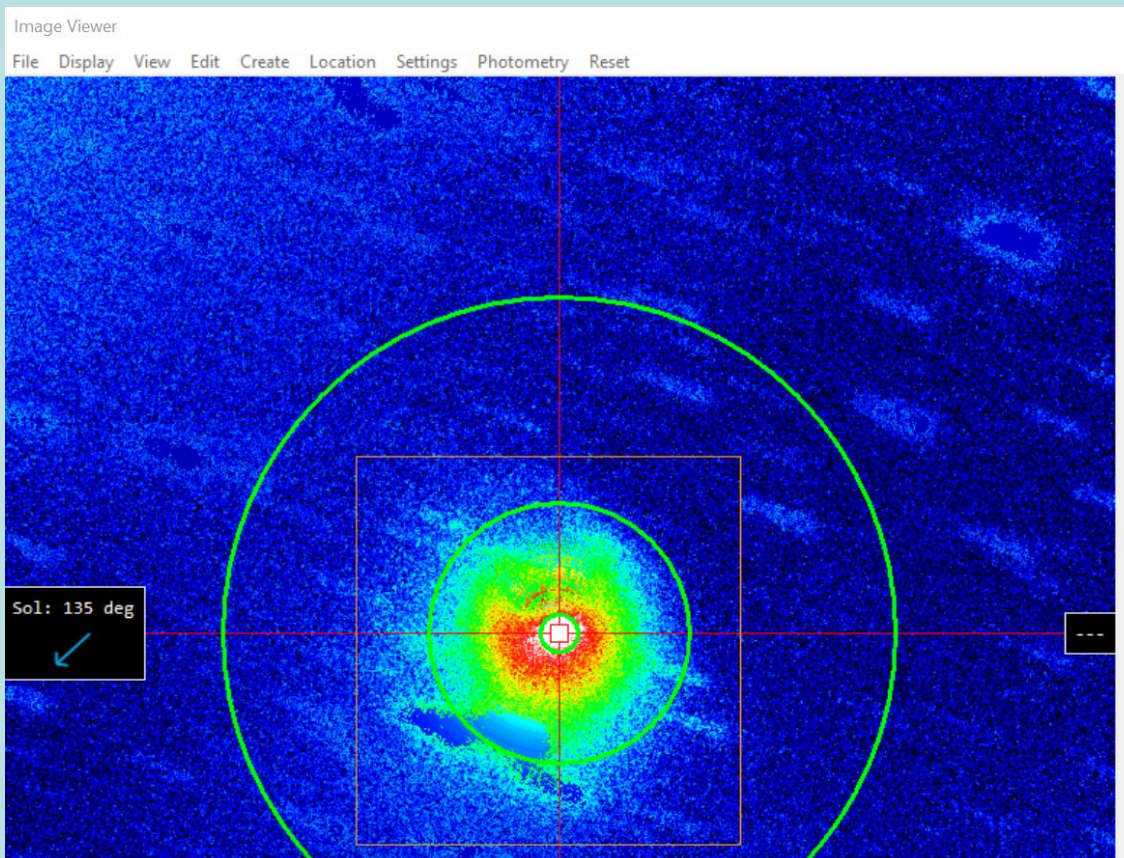
Refresh



Track - Positions

Img	X	Y	MPC DATE	RA	Dec	DeltaT(min)
1	1822	1252	2023 08 05.87233	17 52 55.94	+55 18 34.4	0.000000
2	1824	1253	2023 08 05.87515	17 52 55.72	+55 18 33.6	4.058417
3	1827	1254	2023 08 05.87798	17 52 55.40	+55 18 32.8	4.082267
4	1829	1255	2023 08 05.88079	17 52 55.19	+55 18 31.9	4.047833
5	1831	1256	2023 08 05.88360	17 52 54.98	+55 18 31.1	4.044367
6	1834	1256	2023 08 05.88642	17 52 54.66	+55 18 31.2	4.058883
7	1836	1257	2023 08 05.88923	17 52 54.45	+55 18 30.3	4.044433
8	1839	1258	2023 08 05.89244	17 52 54.13	+55 18 29.5	4.622817
9	1841	1259	2023 08 05.89526	17 52 53.91	+55 18 28.7	4.064167
10	1844	1260	2023 08 05.89865	17 52 53.59	+55 18 27.8	4.880900
11	1846	1261	2023 08 05.90148	17 52 53.38	+55 18 27.0	4.075550
12	1848	1262	2023 08 05.90428	17 52 53.17	+55 18 26.2	4.024733
13	1851	1263	2023 08 05.90710	17 52 52.85	+55 18 25.3	4.050500

Add Animation Stack



Comet Photometry

Star Image: View Apply from Image Viewer

Comet Image: View Apply from Image Viewer

Origin: Go To Apply from Image Viewer

Comet name: 12P Apply from Image Viewer

Comet-Earth distance (AU): 3.443 Apply from Image Viewer

Comet-Sun distance (AU): 3.715 Apply from Image Viewer

Extinction Correction: Below 10 deg Coefficient: Average

Coma Aperture (Radius=13 pixels)

Units: ☒ Pixels ☐ Arcmin ☐ km Format: ☒ Radius ☐ Diameter

Inner:

Middle:

Star Removal

Ignore radius: 7.0 (7)

Coefficient: 3.0 (3.0)

Revert Changes

Sky Background

☐ Sky Annulus ☒ Drawn Region

Sky: 2452 Update

Actions

Update Comp Star Aperture...

Select Comparison Stars...

Measure Comet Tail...

Obs: G.
Msr: R.
Stn: J4
Tel: 0.
PSc: 0.
FOV: 11
Cam: 45

Crosshair

```
COD J47
OBS
CATALOG: ATLAS2 - BAND: r

COMET          UTC          10x10  20x20  30x30  40x40  50x50  60x60  RSR  FC  COD
                        +/-      +/-      +/-      +/-      +/-      +/-      N  FWHM CAT
-----
12P      05/08/2023 20:54:18 16.33 15.48 14.97 14.50 14.32 13.85 51.4 18.3 J47
12P      05/08/2023 20:54:18* 0.04  0.04  0.04  0.03  0.03  0.03  22   5.0 ATL

COMET          UTC          DELTA    r    AP "    MAG    RSR    AFRHO  +/-  LOG
                        -----
12P      05/08/2023 20:54:18    3.44    3.71    8.01   16.62    51    482    33   2.683 J47

ICQ line:
IIIIYYMMnL YYYY MM DD.DD eM/mm.m:r AAA.ATF/xxxx /dd.ddnDC /t.ttmANG ICQ XX*OBSxxf InT APERTURcamchip SFW C ## u.uu xx.x PIXELSIZE
12      2023 08 05.87  C 14.8 AR 30.0C 2D862  0.39    1.1m334 ICQ XX SMI  I    C 0.39mMG4 K6M TYT 5 U9*0.03 14.5  0.9s 0.9
```

