Further Adventures with a Dwarf 3

George Buckberry

Dwarf 3 – George's Set up 1

- DWARF 3 is compatible with any tripod that has a standard **1/4"-20UNC thread**, which is common for most camera tripods.
- Here is my set up with the Dwarf 3 mounted on a Manfrotto 290 xtra carbon tripod with Manfrotto MHXPRO-3W Head.
- When I set up the tripod for stable position I adjust the horizontal control to level that axis using the incorporated bubble level. I can do the same for the Vertical control if daylight imaging.

Dwarf 3 – George's Set up 2

- Once levelled horizontally I use an inclinometer to set the Tilt to my latitude prior to achieving Polar Alignment in the Dwarf 3 EQ mode for tracking when imaging objects in the night sky.
- When I go through the EQ Polar Alignment mode I can make any rotational adjustments by loosening the head's Rotation Lock and adjusting the angle against the scale at the top of the rotational control and after adjustment simply tighten up and/or use the **Be More Precise** mode to repeat the PA process.

Dwarf 3 – George's Set up 3

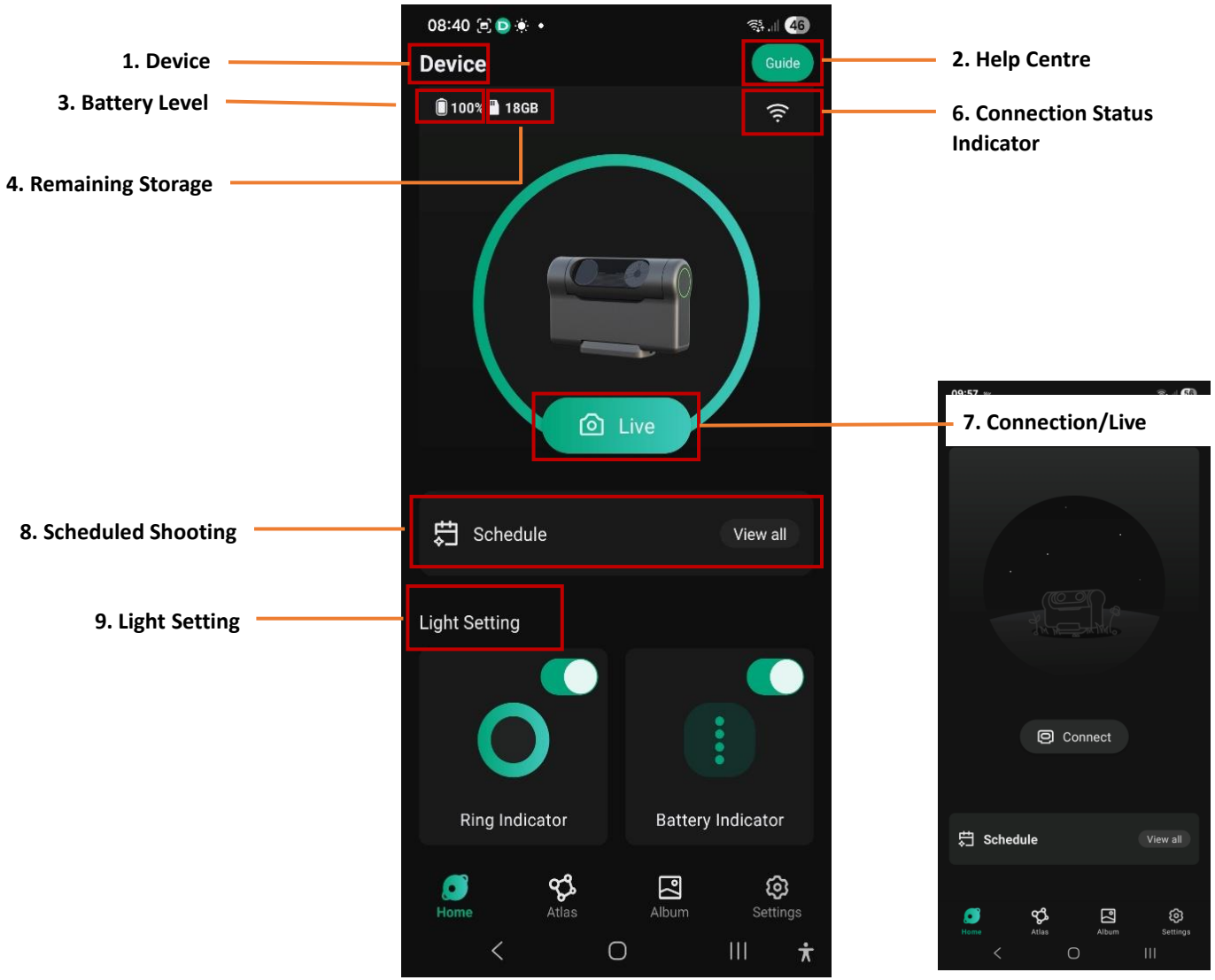
- This is a side view with the Dwarf 3 mounted. Though not exactly over the centre column but the unit is over what is my North facing tripod leg so well balanced.
- I have not found any instability in this arrangement but it is fair to state that in my location I usually only need to extend the bottom two sections of each tripod leg.

Dwarf 3 – Alternate Set up - Discounted

- This is the Dwarf 3 mounted on a Vixen Plate fixed high on an iOptron Wedge and more over the centre column.
- However, to level the assembly once the tripod legs have been set to required height requires adjustment of one or mor legs and once that is done the tricky part involves rotation of the rig by adjusting 6 bolts to achieve angle (2 bolts) and rotation when going through the PA process (4 bolts).
- I also found that the wedge was rather light and only had one securing bolt to hold the Dwarf 3 and plate in place.
- Daylight shooting requires plate to be lowered then the wedge adjusted for horizontal use.
- By comparison, the three-way head is heavier, contributing to stability and is quick to achieve horizontal level and vertical angle and when Polar Aligning the centre lock is the only bolt to loosen to rotate and then lock. Another benefit is that you do not need to adjust the length of tripod legs to achieve horizontal levelling or to use for daylight shooting.

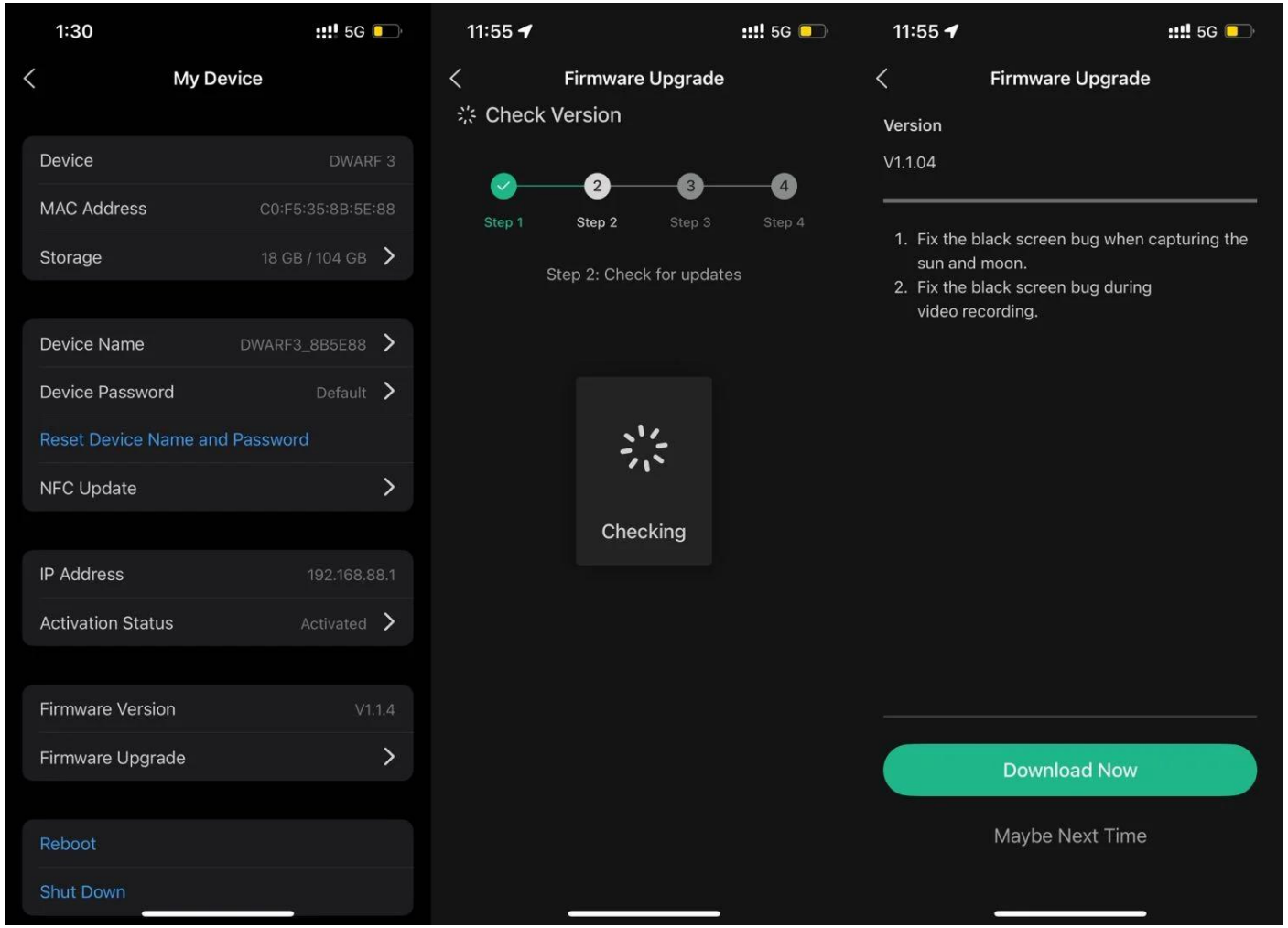
Dwarf 3 – New App controls

- Home Screen controls and information displays.
- When the App first opens the Photo(now renamed Live) and Dwarf 3 icon (7) is replaced by a Connect image and button.
- Pressing the Connect button(7) causes the App to search for the Dwarf 3 and when it recognises it you select the device name displayed in the connection screen. That name can also be viewed in the **Settings**, **My Device** screen,
- The Host and Node (5) is no longer available.



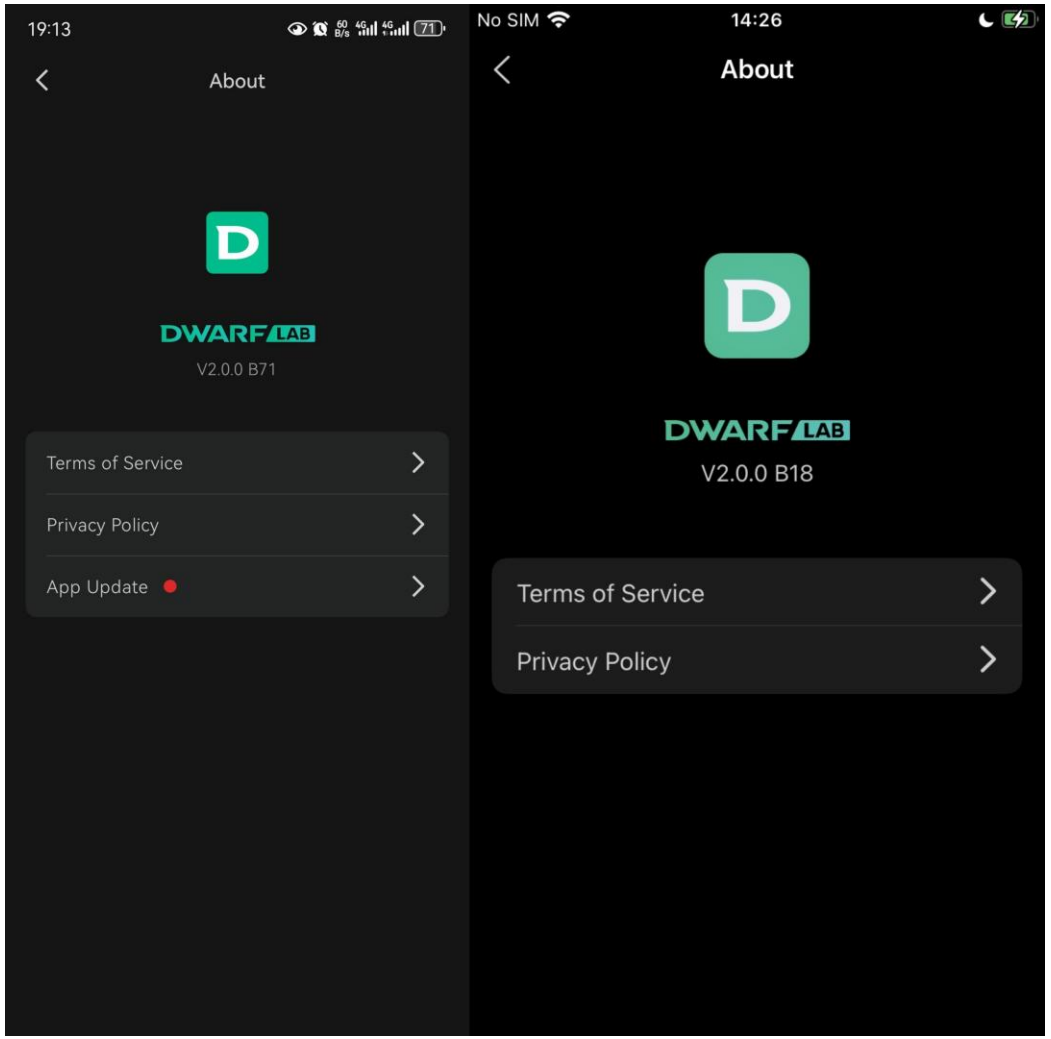
Dwarf 3 - Updating Firmware

- Power up your Dwarf 3 and open the Dwarf App on your controlling device.
- Once connected select the **Settings** icon and then **My Device** then **Firmware Upgrade**.
- If there is an upgrade available follow the prompts to download and install to the upgrade on the Dwarf 3.
- Version at time of writing was V1.4.11.10 (16/12/2025).



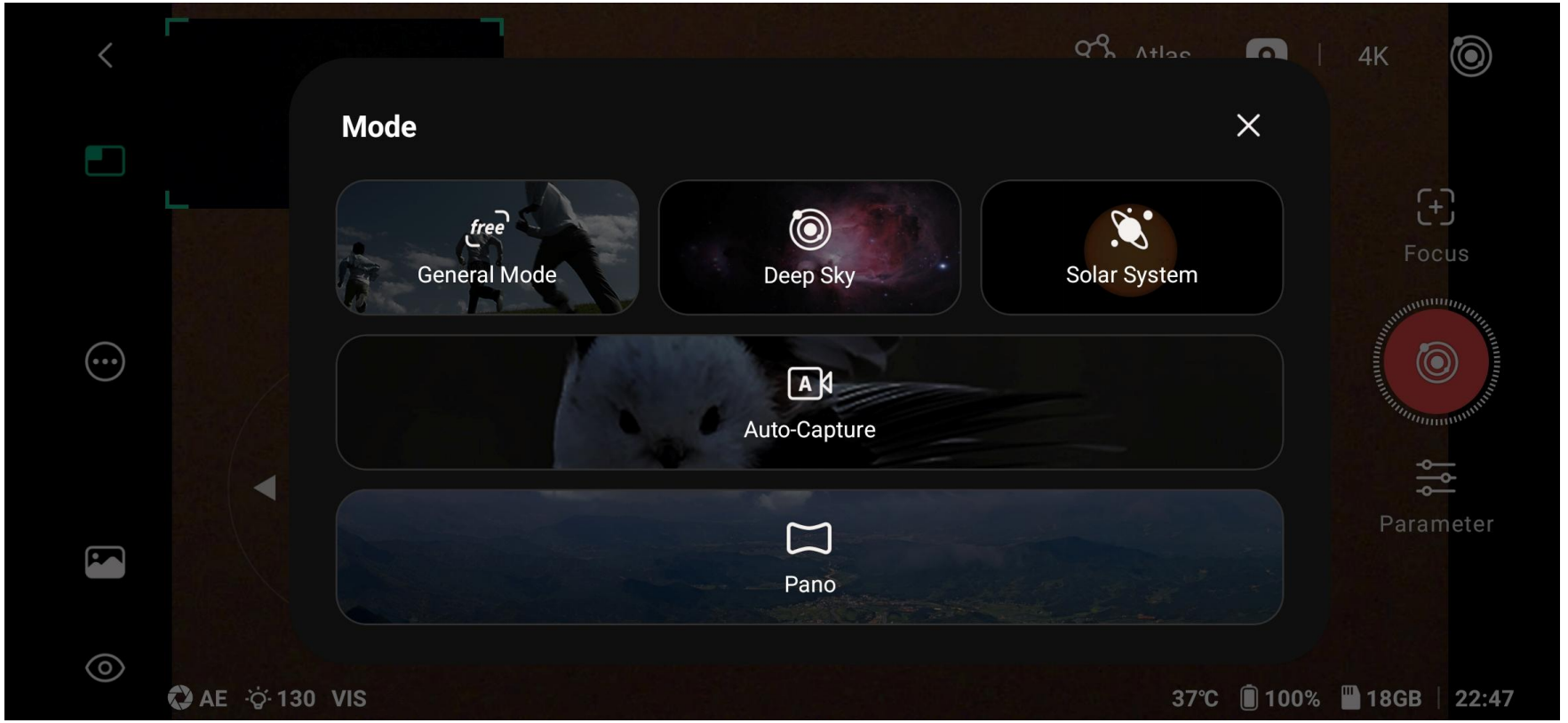
Dwarf 3 - Updating the Dwarf App

- Power up your Dwarf 3 and open the Dwarf App on your controlling device.
- Once connected select the **Settings** icon and then **About** then **App Update**.
- This opens your App playstore and if there is an update for the App follow the prompts to install it on your controlling device.
- Version at time of writing was V3.3.5 B565 (31/12/2025).



Dwarf 3 – Select Mode 1 – Main Screen

Mode selections have been rearranged. Shooting button centre displays mode selection. Click required button to choose different shooting modes.

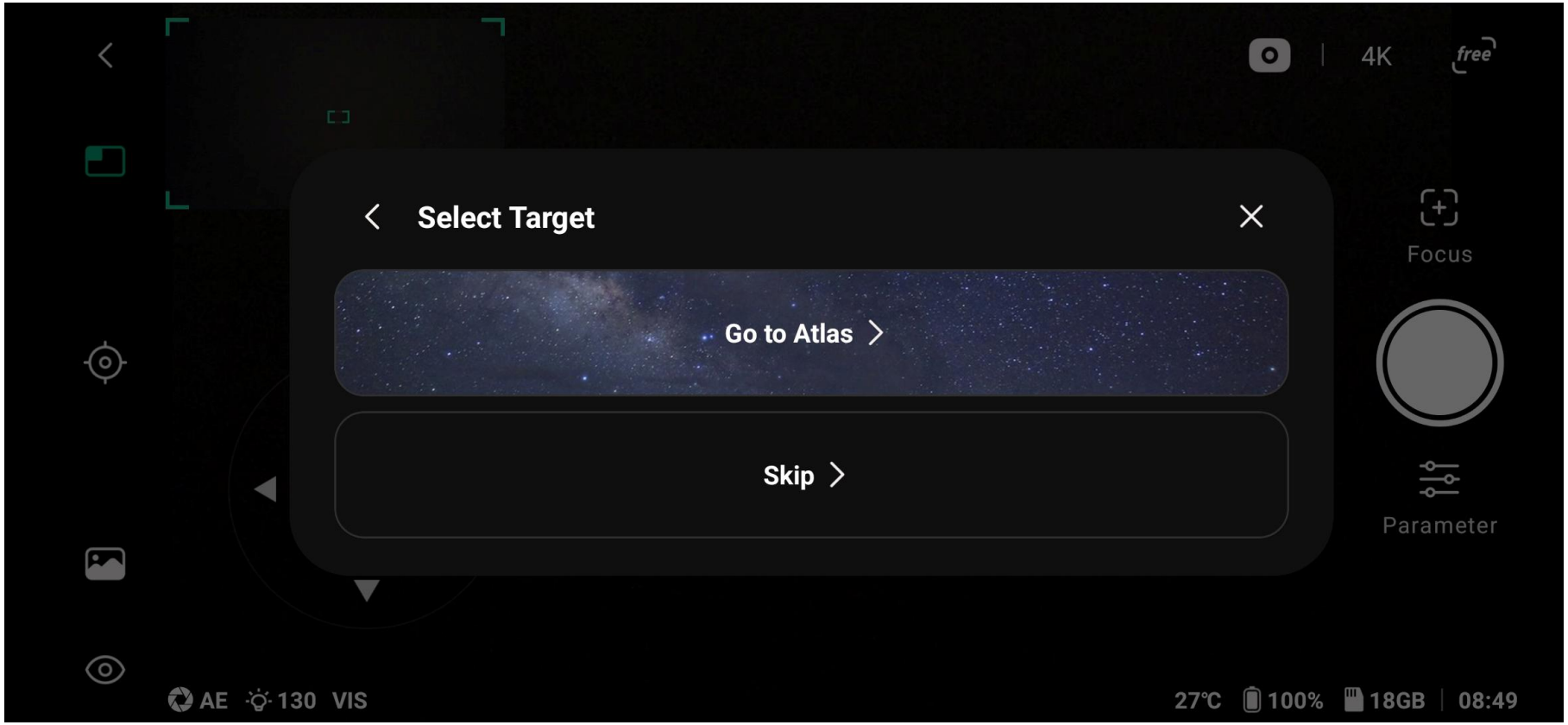


Dwarf 3 – Select Mode 2 – General Sub-Menu

Click required button to choose different shooting modes.

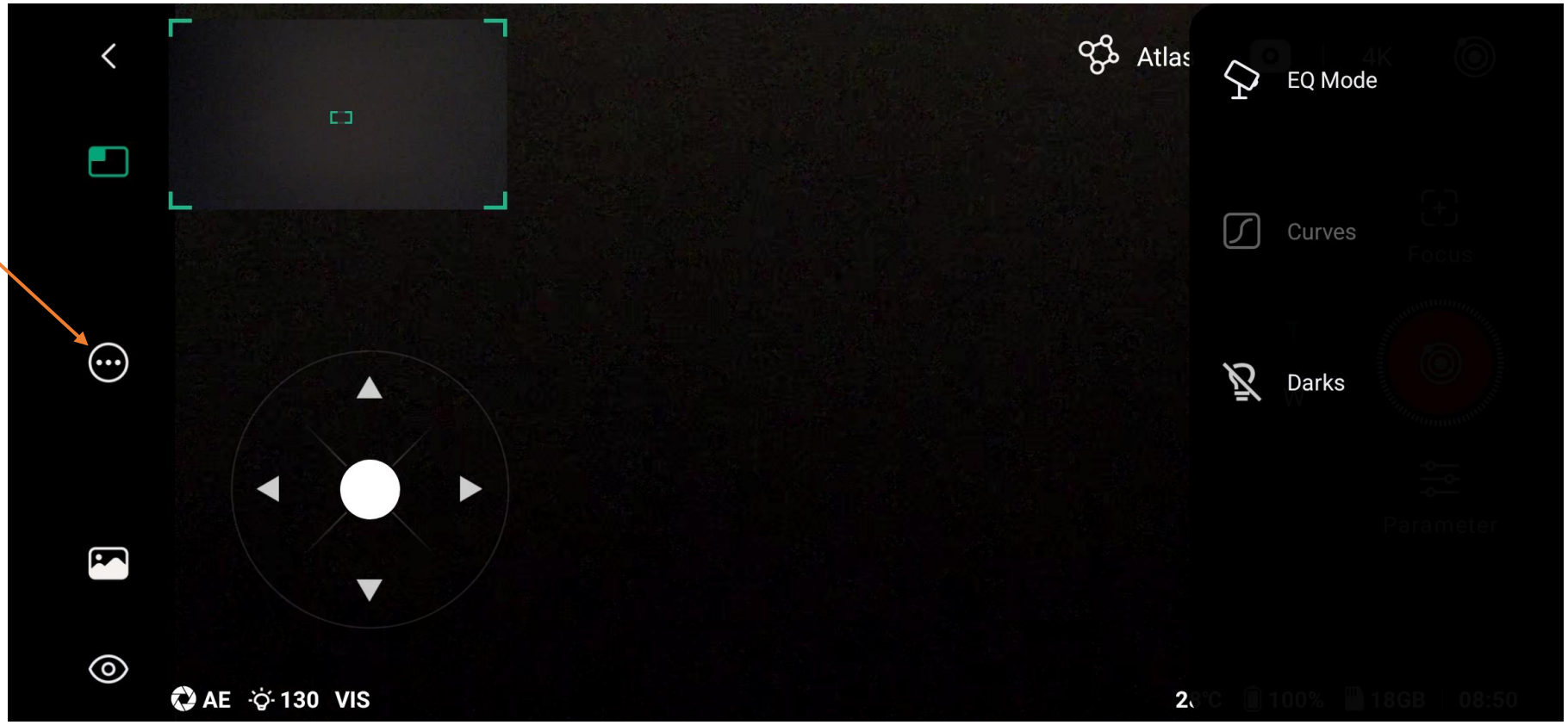
Dwarf 3 – Select Mode 3 – Deep Sky Screen

Select Target via Atlas or Skip if already done.



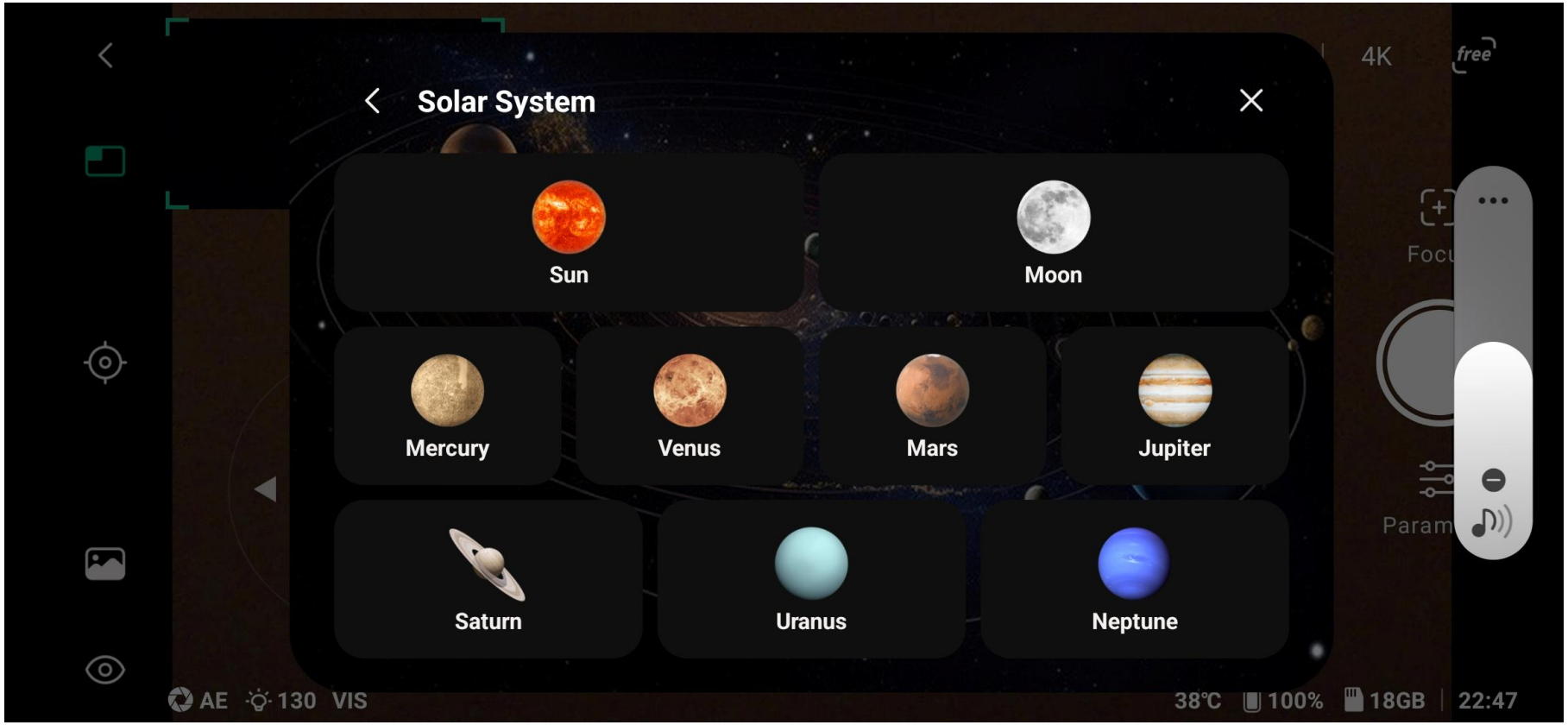
Dwarf 3 – Select Mode 4 – EQ Screen

Click the three dots in the circle and Follow EQ and Polar Alignment Process and take Darks if needed.



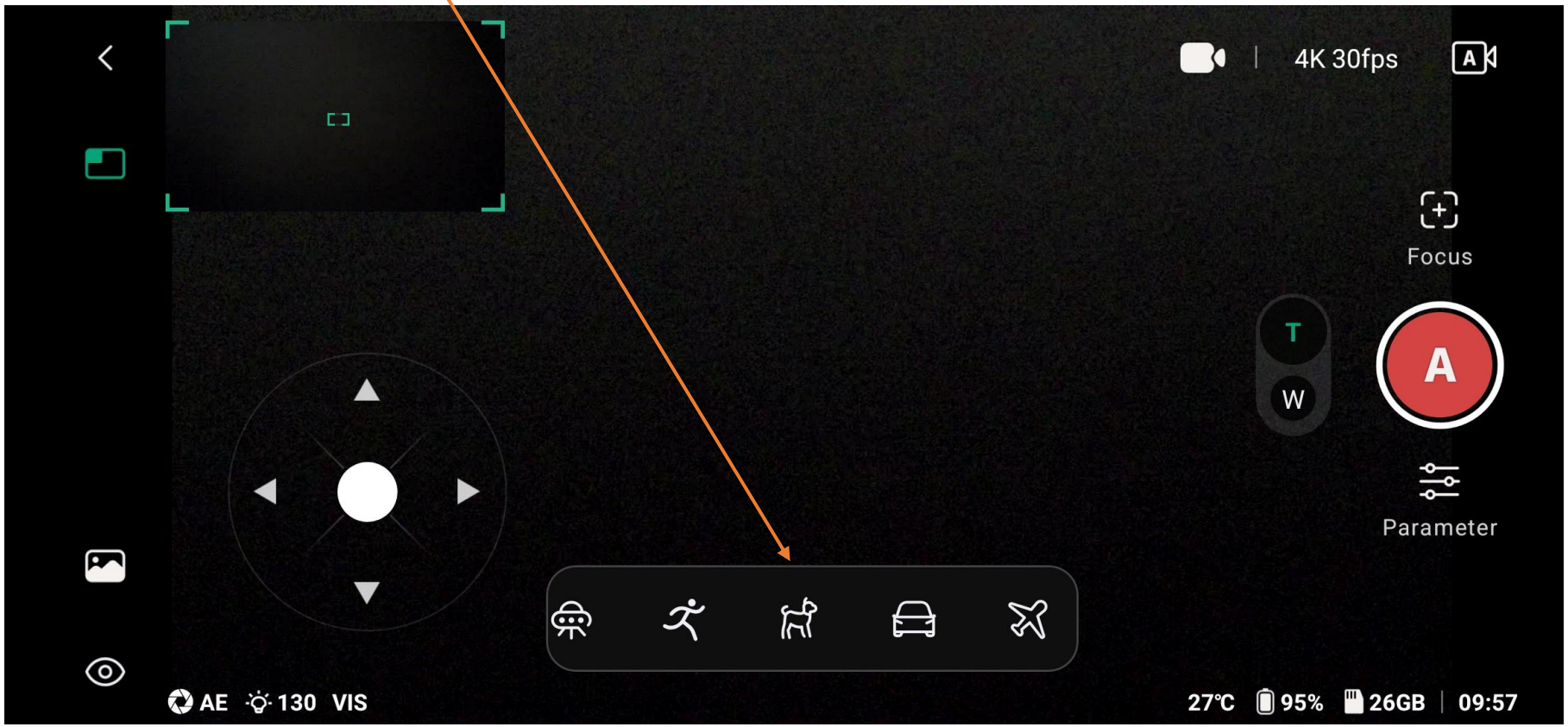
Dwarf 3 – Select Mode 5 – Solar System Screen

Click target button to choose required object.



Dwarf 3 – Select Mode 6 – Auto Capture Screen

Click the drop down button to reveal types of target to choose required object type - Bird and Sail boat also available.

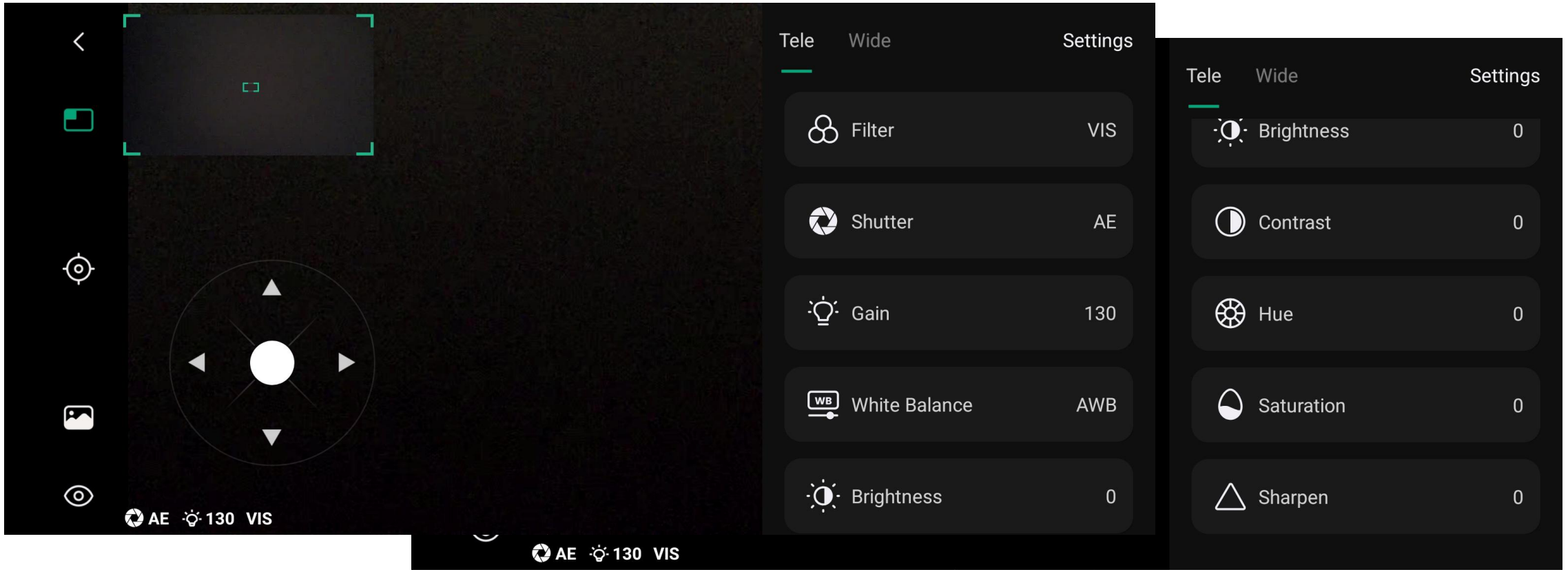


Dwarf 3 – Select Mode 7 – Panorama Screen

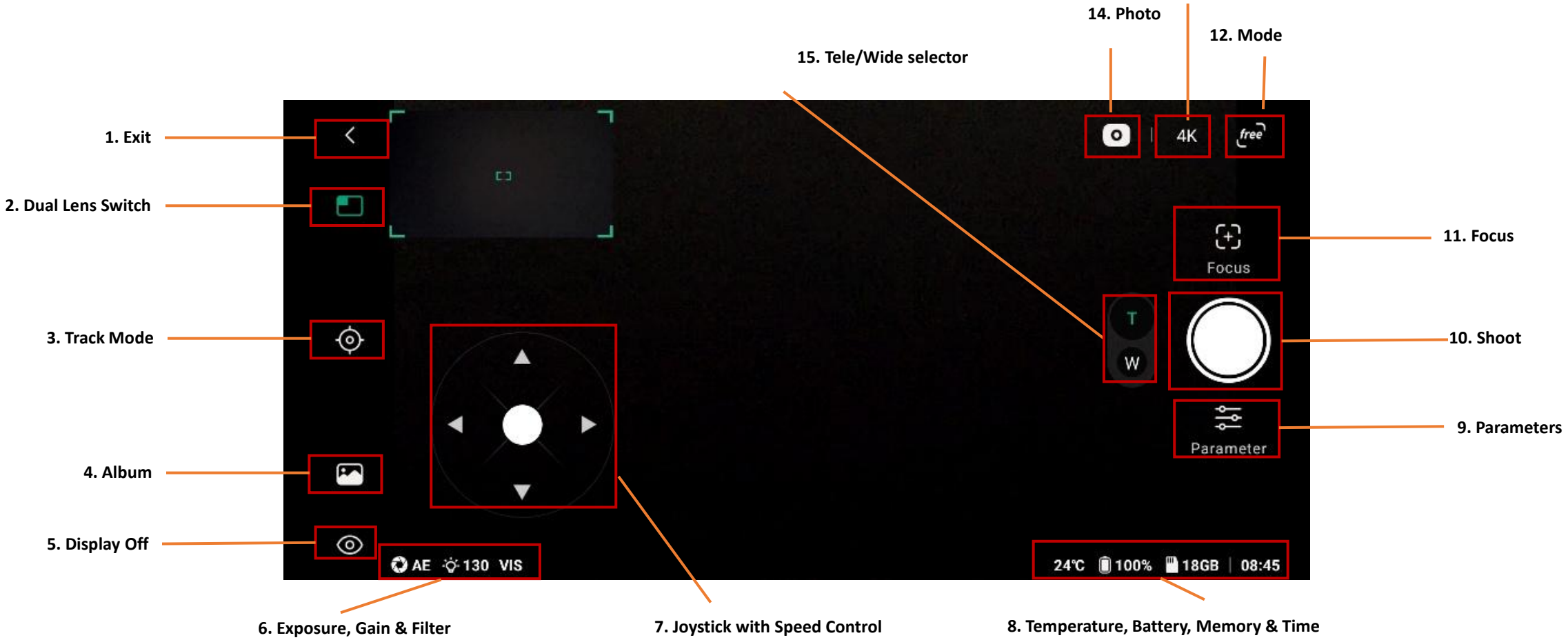
Click the Shooting button to capture the image.

Dwarf 3 – Select Mode 8 – Parameter Screens

Select the required parameter to be adjusted.



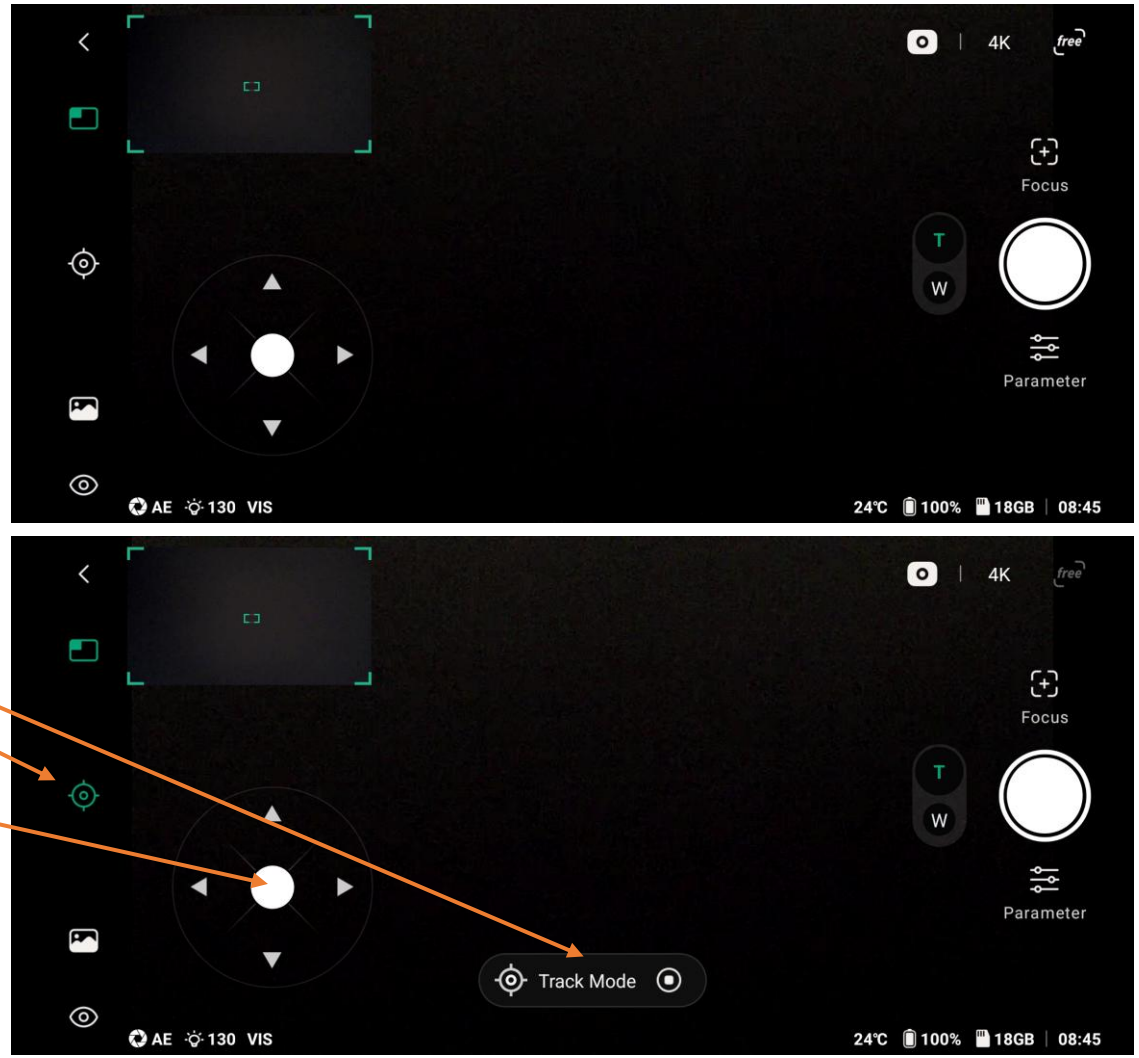
Dwarf 3 – New Shooting Interface



Dwarf 3 – Navigation Screen

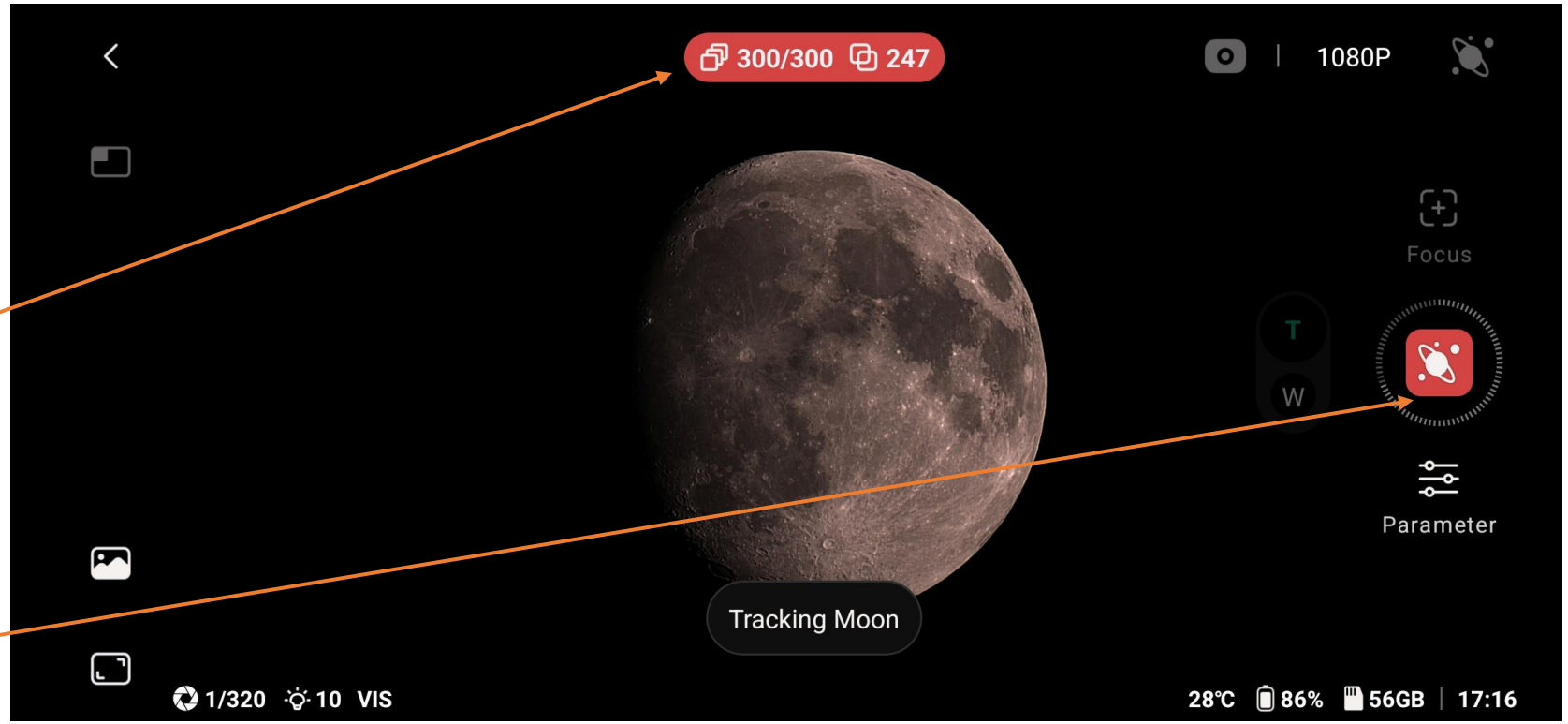
- Top - Navigation Screen with no target selected.
- Bottom - Navigation Screen with Track Mode selected.

- Note the Joystick has changed and gives much better control to locate target, the further away from the centre the faster the slewing movement.



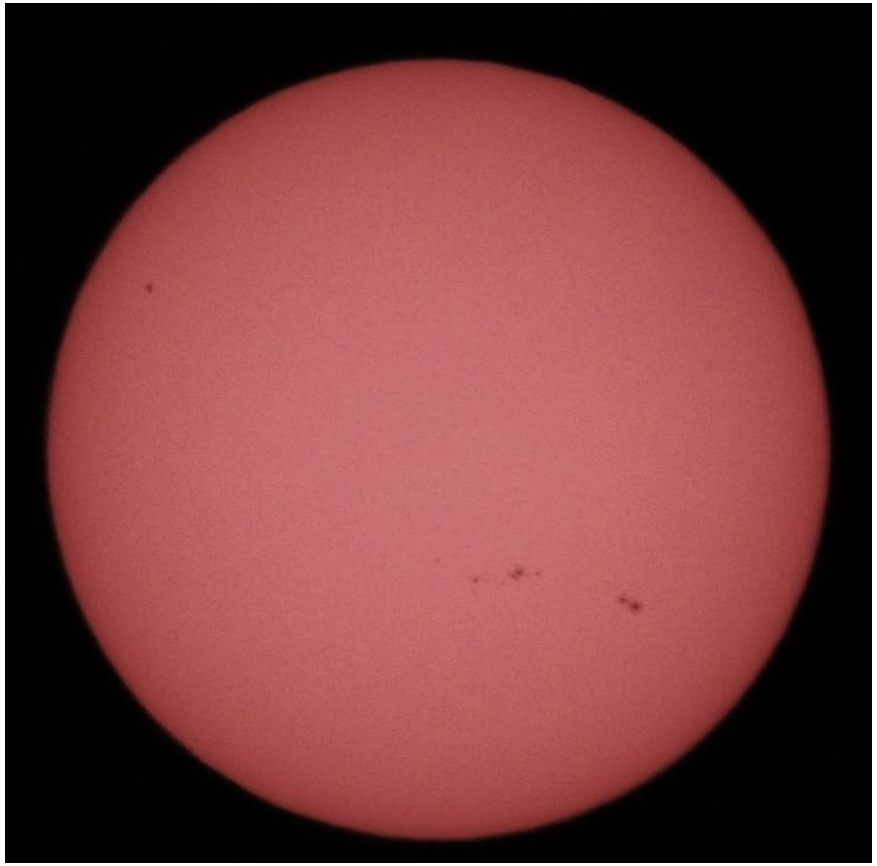
Dwarf 3 – Image Capturing Screen

Example of screen during image capture, The repositioned image count and stacked subs at the top and the shooting button displaying the mode – in this case Solar System.

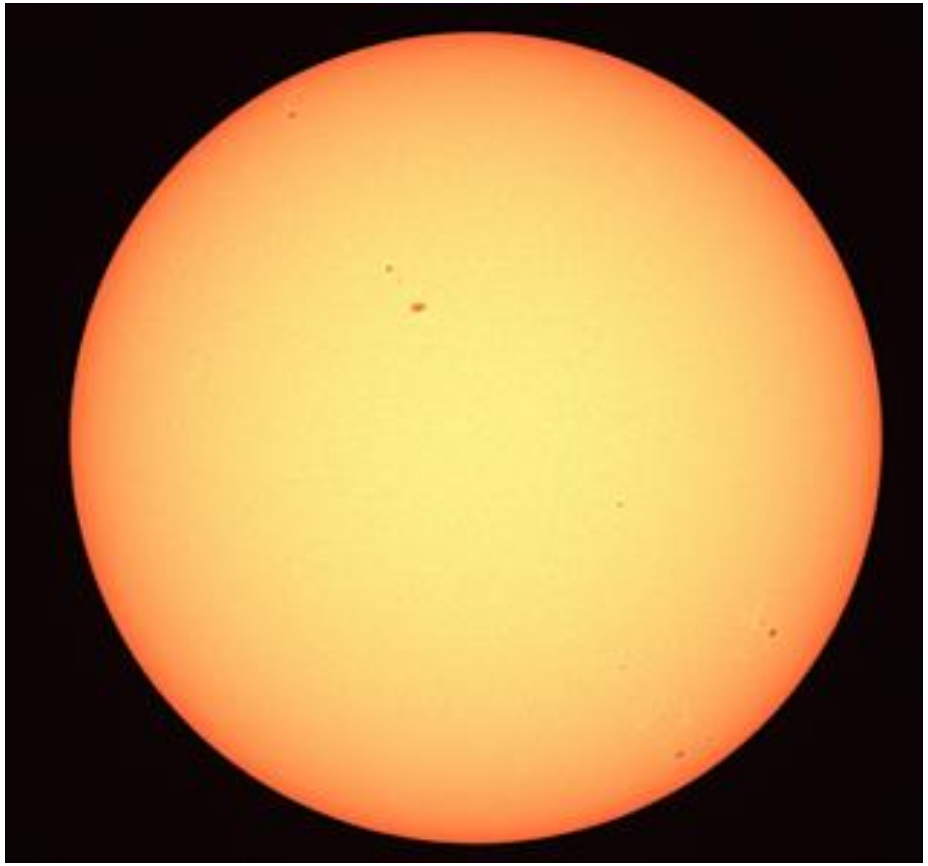


Dwarf 3 – George's Images 1

Sun 10/6/25



Sun 28/6/25



Dwarf 3 – George's Images 2

Top: Moon taken on 10/8/25 at 03:57

- Exp 1/200S, Gain 20, Filter Vis, 20 stacked subs
- This was after a four-object schedule and when the battery level on the Dwarf 3 was down to 14%.

Bottom: Moon taken on 1/9/25 at 21:35

- Exp 1/100S, Gain 2, Filter Vis, 20 stacked subs

Dwarf 3 – George's Images 3

Moon 2/7/25

112 x 1/320 Gain0

Moon 2/11/25

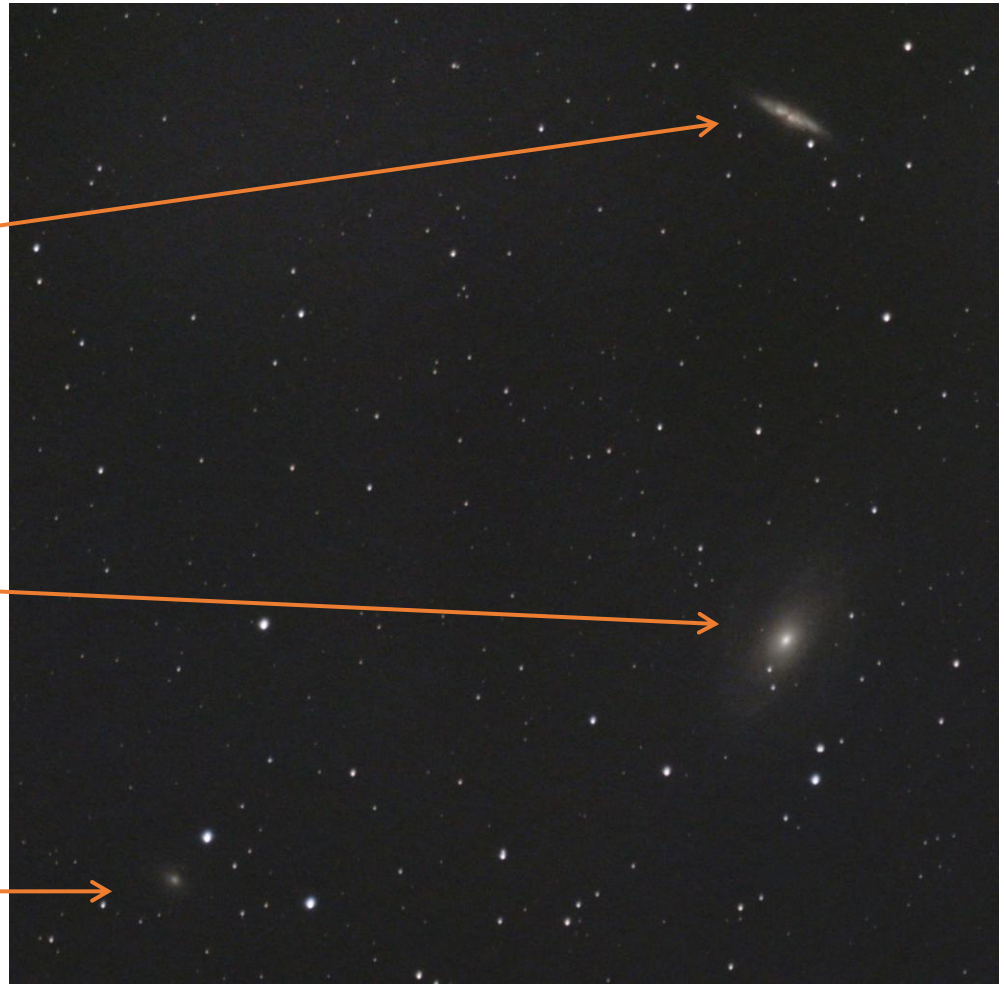
300 x 1/320 Gain0

Moon 9/11/25

64 x 1/400 Gain0

Dwarf 3 – George's Images 4

- M81 group in Ursa Major taken 28/6/25
  - 15s, Gain 60 Astro filter only 25 subs.
- M82 Cigar Galaxy
- M81 Bodes Galaxy
- NGC3077 Garland Galaxy



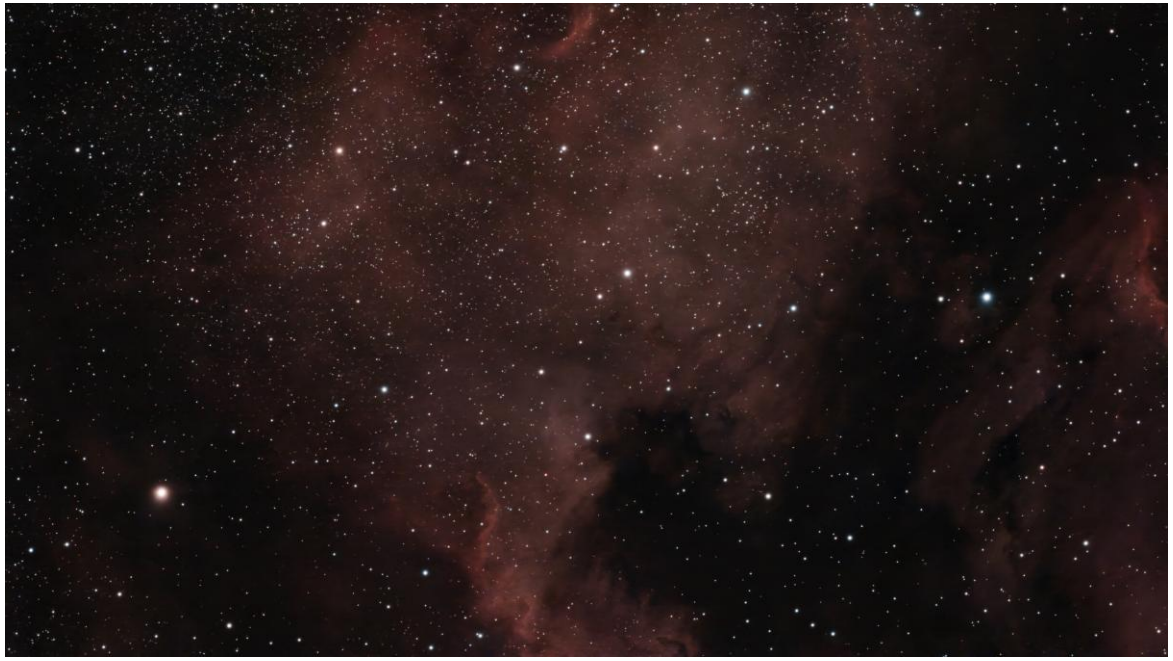
Dwarf 3 – George's Images 5

C20 – North America Nebula 29/6/25 with Auto settings for image at Exposure 15S Gain 60 Filter Astro of 39 subs, tweaked in GIMP (left), with Starless version from same data set from Dwarf 3.

Dwarf 3 – George's Images 6

C20 – North America Nebula with Auto settings for image at Exposure 15S Gain 60 Duo Band Filter, **Mega Stacked** (left) and then processed in **Stellar Studio** only (right) from three sets of data taken on:

29/6/25 – two captures with 39 subs and 2/8/25 – one capture with 194 subs, Total stacked subs = 233

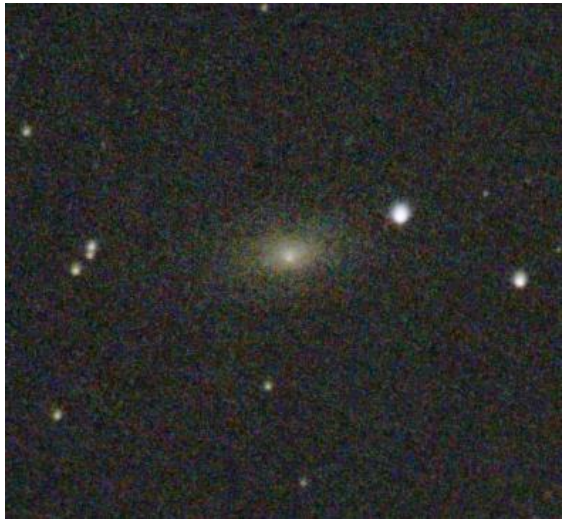


Dwarf 3 – George's Images 7

M51

120 subs

M63



35 subs

M94

20 subs

M106

21 subs

taken 30/6/25, Auto settings for all images at Exposure 15S Gain 60 Filter Astro

Dwarf 3 – George's Images 8

M51 – Whirlpool Galaxy **Mega Stacked** from two sets of data (centre) and then processed in **Stellar Studio** only (right) taken on:

- 30/6/25 – (left) Auto settings for all images at Exp 15S Gain 60 Filter Astro, 23 subs.
- 2/8/25 – Manual setting at Exp 60S Gain 60 Filter Astro, 120 subs, stacked subs = 143.

30/6/25

2/8/25 Mega Stacked

2/8/25 Stellar Studio

Dwarf 3 – George's Images 9

These are three data sets of NGC 281 – Pacman Nebula, mag 7.4, 9.5 ly

- First was taken over 10/8/25 Exp 15S Gain 60 Filter Duo Band, 197 subs.
- Second was taken on 1/9/25 Exp 30S Gain 60 Filter Duo Band, 98 subs.
- Third was taken on 2/11/25 Exp 15S Gain 60 Filter Duo Band, 429 subs
- Fourth - all data sets Mega Stacked totalling 710 subs and processed in **Stellar Studio** then cropped.

Dwarf 3 – George's Images 10

These are two data sets of M31 – Andromeda Galaxy, mag 3.1, 2.54 Mly

- First was taken on 24/10/25, Exp 15S Gain 60 Filter Astro, 21 subs.
- Second was taken on 1/9/25, Exp 15S Gain 60 Filter Astro, 105 subs.
- Third was taken on 10/8/25, Exp 15S Gain 60 Filter Astro, 199 subs.
- Fourth - all data sets Mega Stacked totalling 480 subs and processed in **Stellar Studio** then cropped.

Dwarf 3 – George's Images 11

- NGC6802 and Brocchi's Cluster(Coathanger asterism), taken on 1/9/25 Exp 15S Gain 60 Filter Astro, 25 subs.
- M101 – Pinwheel Galaxy, Exp 15S Gain 60 Filter Astro, 163 subs.
- NGC7380 – The Wizard Nebula, Exp 15S Gain 60 Filter Duo Band, 25 subs.

NGC 6802 & Coathanger, mag 8.8, 3700ly

M101, mag 7.9, 20.87 Mly

NGC7380, mag 7.2, 5545.4ly

Dwarf 3 – George's Images 12

These are progressive images of M33Triangulum Galaxy, mag 5.7, 2.73 Mly, all processed in **Stellar Studio** then cropped.

- First was taken on 9/8/25, Exp 15S Gain 60 Filter Astro, 194 subs.
- Second was taken on 8/11/25, Exp 15S Gain 60 Filter Astro, 399 subs.
- Third - both data sets Mega Stacked on 9/11/25 totalling 595 subs.
- Fourth – Additional 109 subs on 17/11/25, Exp 30S Gain 60 Astro, totalling 676 subs.

Dwarf 3 – George's Images 13

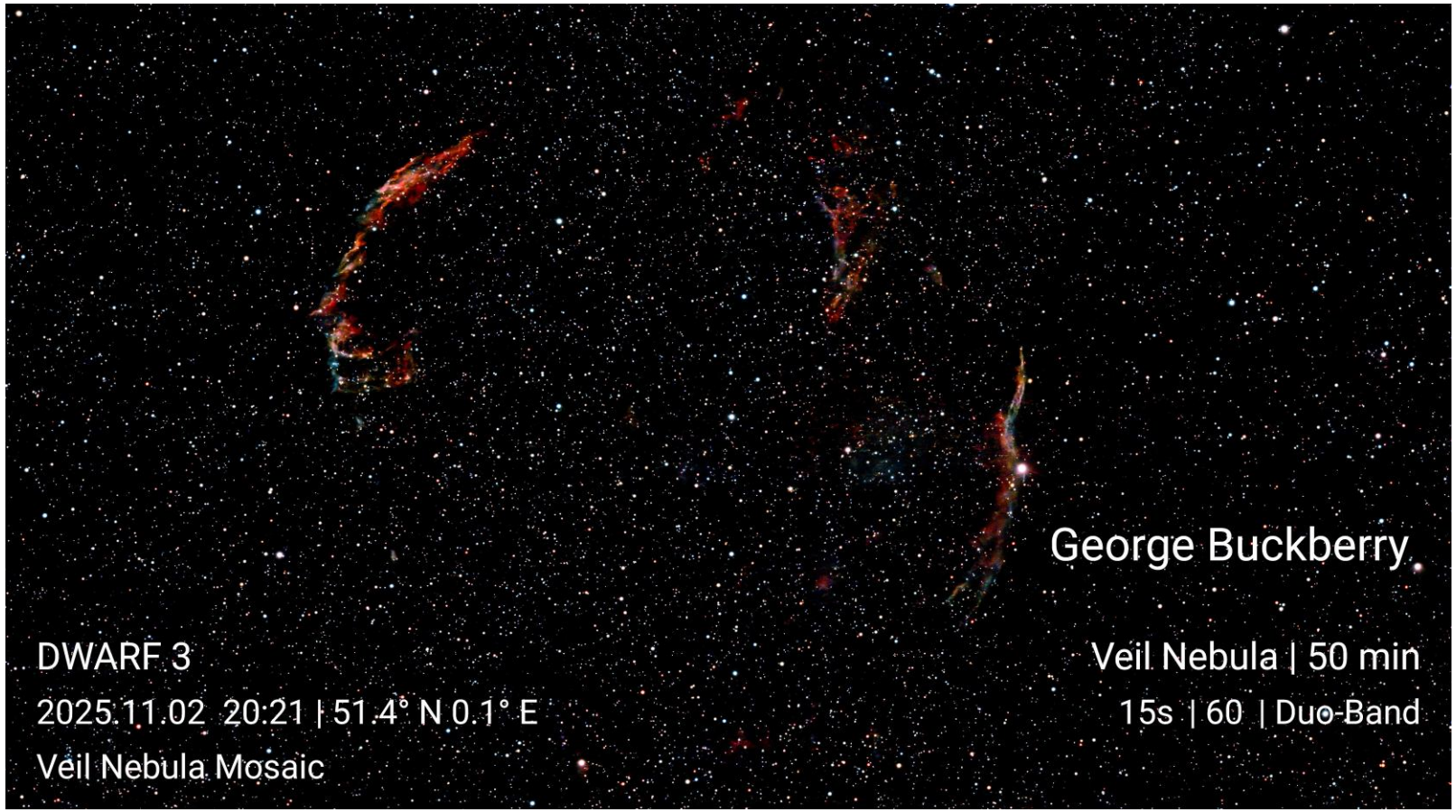
Images taken on 9/11/25 and processed in **Stellar Studio** and cropped.

- Flame & Horse Head Nebulae in Orion Exp 15S Gain 60 Filter Astro, 100 subs.
- M42 – Great Orion Nebula & Running Man, Exp 15S Gain 60 Filter Astro, 110 subs.

Dwarf 3 – George’s Images 14

Images taken on 9/11/25 and processed in **Stellar Studio**.

- Mosaic of Veil Nebula Exp 15S Gain 60 Filter Duo Band, 200 subs.



Dwarf 3 – George's Images 15

M45 – Pleiades images and processed in **Mega Stack** and **Stellar Studio** and cropped.

- Left taken on 9/11/25, 15S Exp Gain 60 Filter Astro, 110 subs.
- Right taken on 17/11/25, 90 more subs 30S Exp Gain 60 Filter Astro, totalling 170 subs.

Dwarf 3 – George's Images 16

Images taken on 9/11/25 and processed in **Stellar Studio** and cropped.

- IC1805 Heart Nebula, Exp 15S Gain 60 Filter Duo Band, 326 subs.
- IC1848 Soul Nebula, Exp 15S Gain 60 Filter Duo Band, 329 subs.

Dwarf 3 – George's Images 17

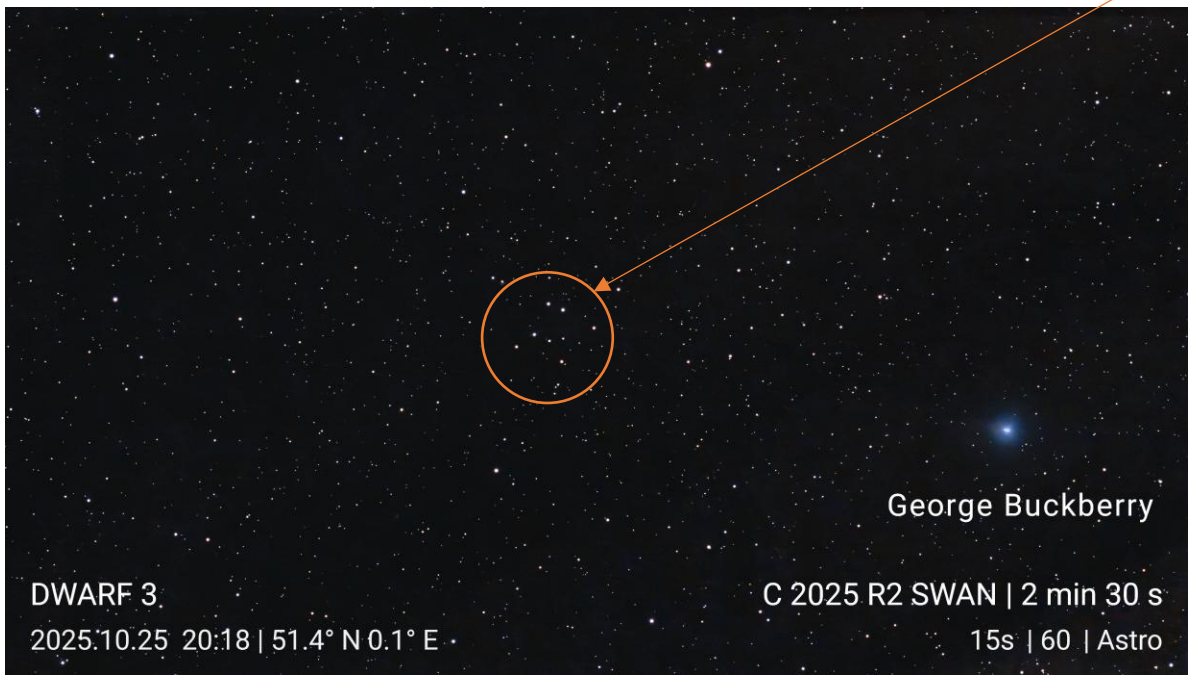
Comet C/2025 A6 Lemmon taken on 25/10/25 and processed in **Stellar Studio**.

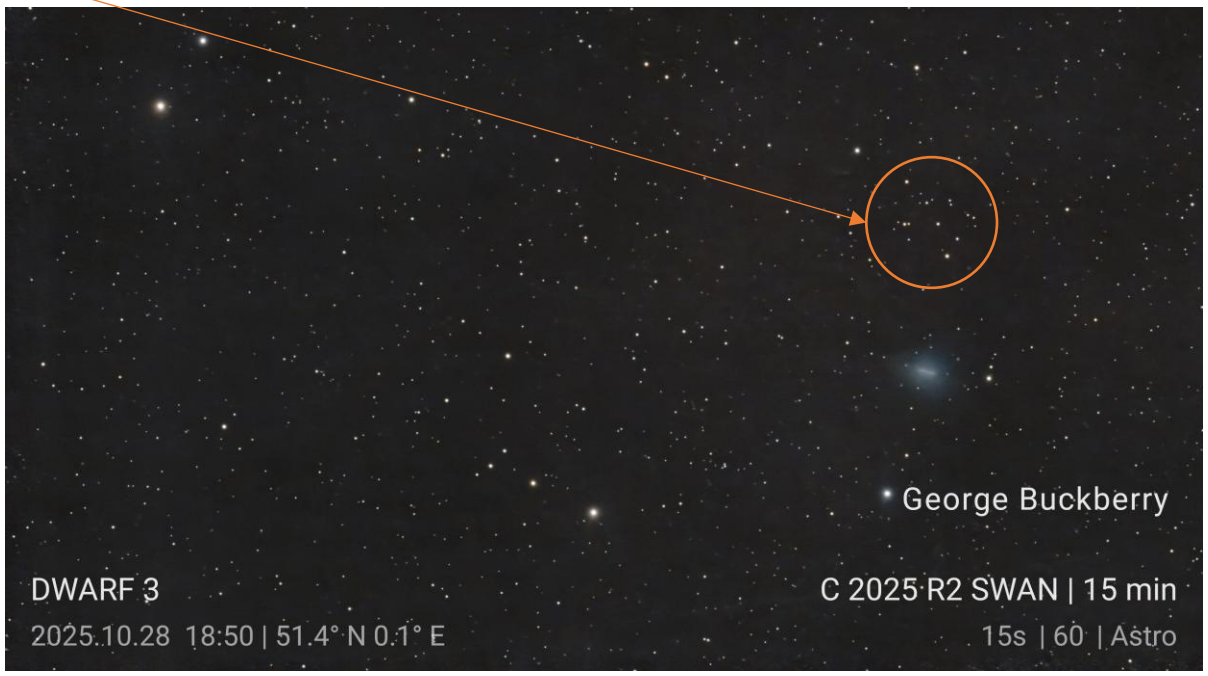
- Left, Exp 15S Gain 60 Filter Astro, 20 subs.
- Right, Exp 15S Gain 60 Filter Astro, 60 subs.

Dwarf 3 – George's Images 18

Comet C/2025 R2 SWAN Images and processed in **Stellar Studio**.

- Top Right taken on 17/11/25, Exp 15S Gain 60 Filter Astro, 160 subs.
- Left taken on 25/10/25, Exp 15S Gain 60 Filter Astro, 10 subs.
- Right taken on 28/10/25, Exp 15S Gain 60 Filter Astro, 61 subs.
- Note the movement relative to the circled cluster.





Dwarf 3 – George's Images 19

Comet C/2025 K1 (ATLAS) taken on 23/11/25 and processed in **Stellar Studio**.

- First, Exp 30S Gain 60 Filter Astro, 16 subs.
- Second, Exp 10S Gain 60 Filter Astro, 43 subs.
- Third, Exp 15S Gain 60 Filter Astro, 24 subs (Zoom bottom right – four fragments).
- Fourth, Exp 30S Gain 60 Filter Astro, 31 subs.
- Fifth – GIF animation file of these four to show movement through the sky.
- Due to the low angle of the object at 14 degrees the whole set of frames was flipped horizontally.

Dwarf 3 – George's Images 20

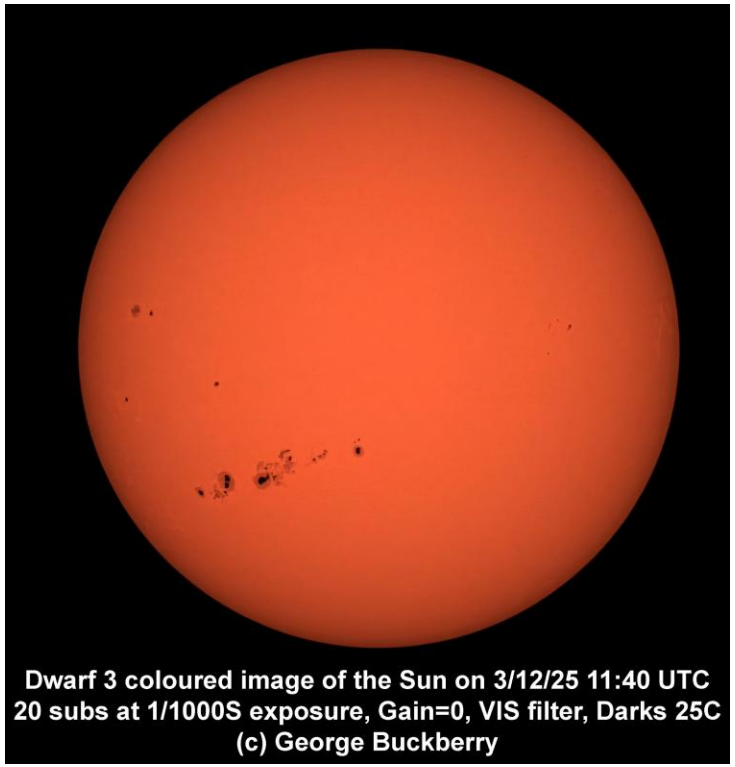
Comet C/2025 K1 (ATLAS) taken on 26/11/25 and processed in **Stellar Studio** taken as previous slide of longer captures indicates multiple overlaid comet images during stacking and all flipped horizontally.

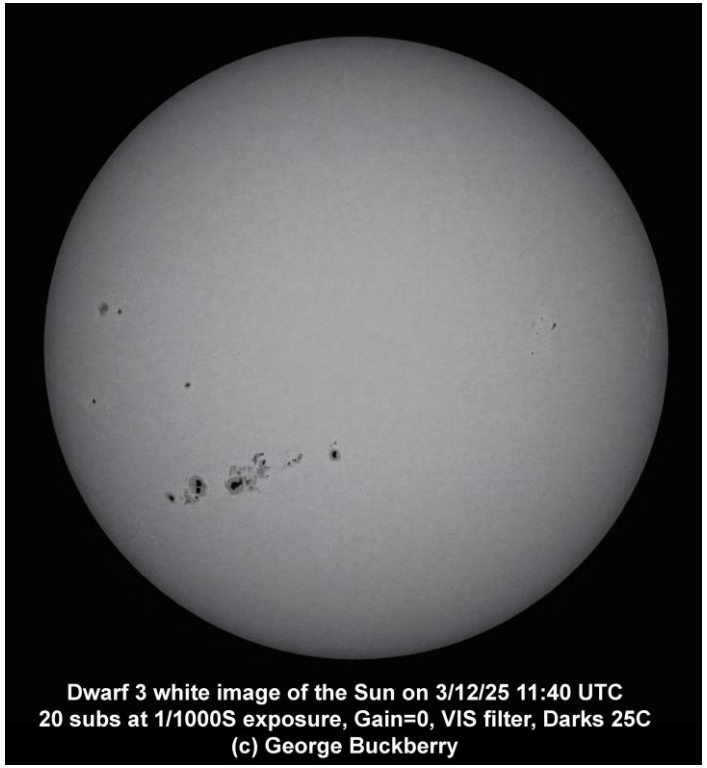
- First, Exp 15S Gain 60 Filter Astro, 12 subs.
- Second, Exp 15S Gain 60 Filter VIS, 12 subs.
- Third, Crop of the first image showing evidence of fragmentation.
- Due to the much higher elevation of the object the whole image is correctly oriented.

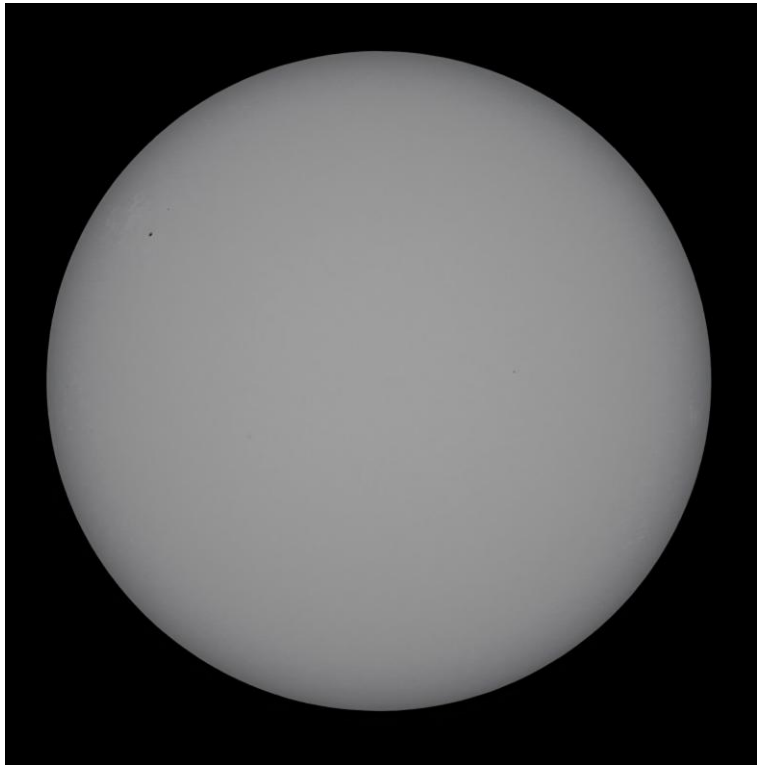
Dwarf 3 – George's Images 21

Sun captured on Dwarf 3.

- First, Coloured light – 3/12/25 at 11:40 UTC 20 x Exp 1/1000S, Gain 0, VIS filter Darks 25C.
- Second, Colour removed – 3/12/25 at 11:40 UTC 20 x Exp 1/1000S, Gain 0, VIS filter Darks 25C.
- Third captured 19/12/25 – 20 x Exp 1/667S Gain 0, Vis filter Darks 22C.



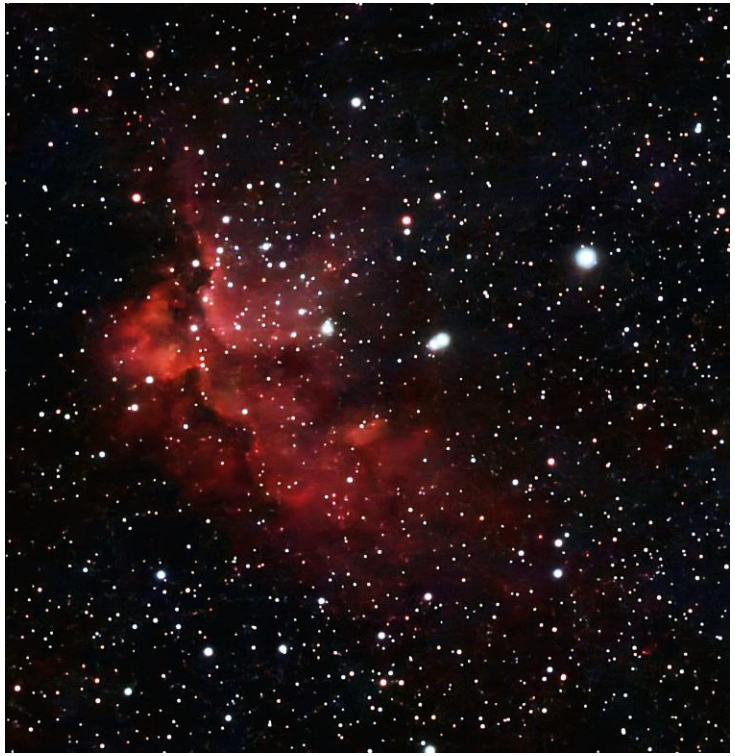


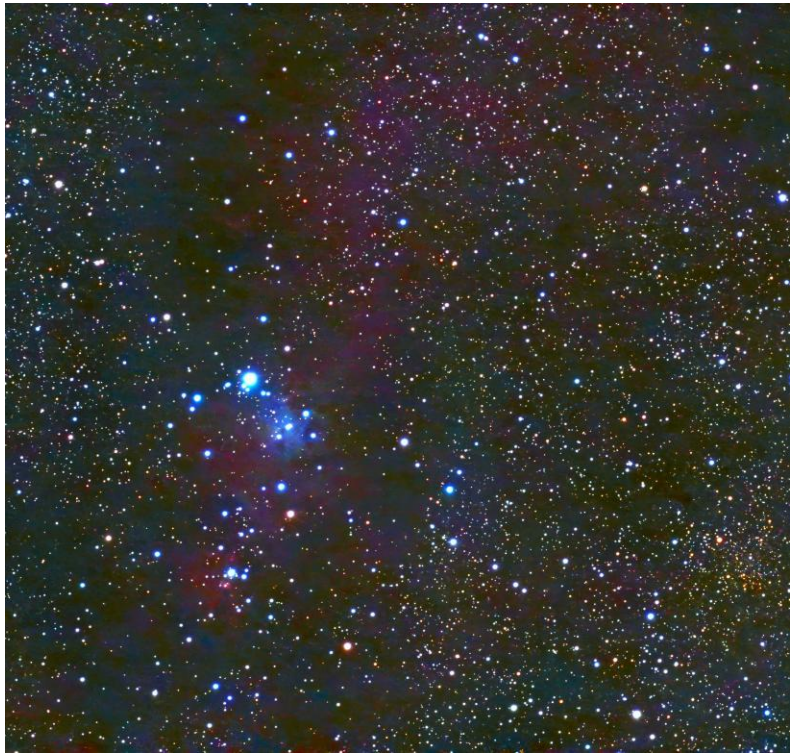


Dwarf 3 – George's Images 22

Images captured on Dwarf 3 schedule Plan 19/12/2025.

- NGC 7380 Wizard Nebula 253 x Exp 15S, Gain 60, Duo Band filter.
- NGC 1499 California Nebula 2 panel Mosaic 484 x Exp 15S, Gain 60, Duo Band filter.
- NGC 2264 Christmas Tree Cluster 253 x Exp 15S Gain 60, Astro filter.





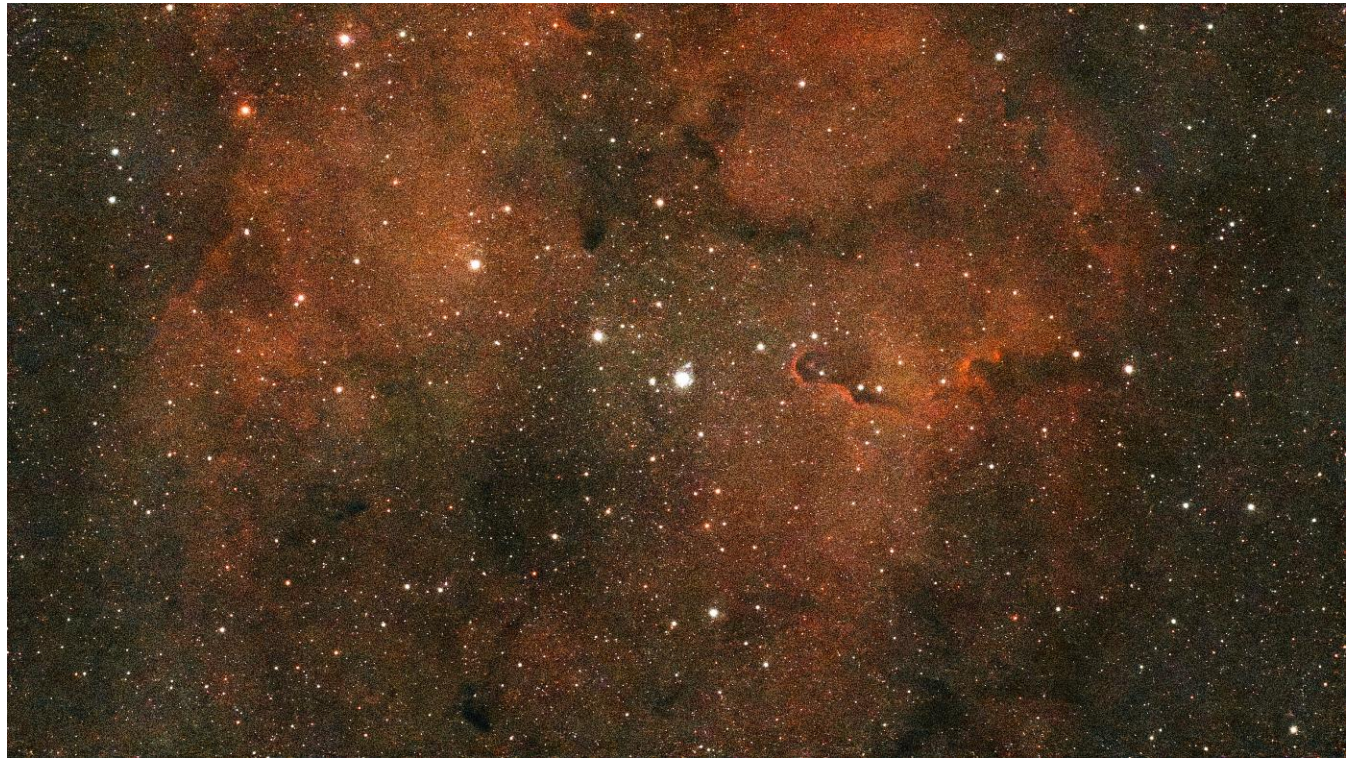
Dwarf 3 – George's Images 23

- First, M1 Crab Nebula 807 x 15S Gain60 Duo Band filter Cropped 3Jan26
- Second, Full Moon 500 x 1/500S Gain0 VIS filter 3Jan26
- Third Orion Wide Angle 20 x 15S Gain60 No Filter 5Jan26

Dwarf 3 – George's Images 24

Images taken on 5/1/26 and processed in **Stellar Studio**

- First, IC 1396 Elephants Trunk Nebula 200 x Exp 30S Gain 60 Filter Duo Band.
- Second, NGC 2237 (Caldwell 49) Rosette Nebula 120 x Exp 30S Gain 60 Filter Duo Band.



2400 ly away in Cepheus Mag3.5, covers an apparent width of over 10 full moons

5219 ly away in Monoceros Mag9 65 ly diameter

Dwarf 3 – Personal Observations - Positives

- The App and unit are fairly intuitive to use. Portability is excellent.
- The variety of shooting modes for daylight and nighttime makes it a versatile unit.
- Polar Alignment and use of "**Be more precise**" option with the EQ tool and plate solving was easy to use and quite quick to complete to get properly set up for equatorial mode tracked imaging and Polar Alignment.
- Object selection (e.g. Sun and Moon) and then focussing and tracking the object is now quicker to achieve.
- More options added for Auto Capture feature.
- Ability to view Image development as images captured and stacking progresses is good.
- Ability to set up scheduled plans is a great feature.
- Ability to Mega Stack multiple data sets is excellent for building better detailed images.
- DwarfLab support has been excellent and responsive to user input. Regular bug fixes and improvements in firmware and App to constantly improve features which the latest firmware and App versions have shown especially the Joystick functionality.

Dwarf 3 – Personal Observations – Negatives

- Some manual settings used to be tricky:
  - Needed to check settings as required if changing from Auto to Manual as I found that in some cases the parameters changed and Auto focus did not always achieve a clean focus but the latest App and firmware updates have greatly improved this.
- Unit gets very hot when taking Solar images and in the hot weather the unit shuts down to protect itself from damage.
- Focussing to auto capture Birds or UFOs was awkward, needing time to auto focus on the object before capturing. Needs some practice to get it right. Not tried recently but some posts of following a landing plane have been excellent.
- Documentation: There is an updated version of the User Guide to cover the more recent changes to display screens and functions but this is accessible via the **Guide** function. Copies can now also be downloaded from DwarfLabs.

Dwarf 3 – Overall Conclusion - Unchanged

- This is a fantastic versatile unit with many excellent features and more development being planned, many from user suggestions.
- There are some issues but much of that is due to the learning curve needed to develop skill in using the device and none that have not been able to be resolved.
- Am I still happy with the purchase and use so far – ABSOLUTELY!
- Would I recommend people to buy it – ABSOLUTELY!


End of Presentation