



Spring reflections – welcome to the 2nd Edition of the ASSA Observing Section Quarterly

Thank you for the excellent response to the first edition of the ASSA observing section Quarterly! Your support has convinced us there is need for a publication such as this and we are thus pleased to present the 2nd edition of the Quarterly in time for the Festive Season.

Having moved through Spring and now heading into Summer, many astronomers have been plagued with poor observing conditions caused by continuous cloud cover. Despite this, astronomers across South Africa were able to provide material for this publication as a record of what they observed over the last 3 months. In addition, we include a review of the Williams Optics RedCat51 telescope for those interested.



This stunning image of the planet Venus below the Milky Way was captured by Frank Barbato in October 2021 from Limpopo (more precisely at Edi tala Game farm in the Waterberg district). The equipment he used was a Canon EOS 550D DSLR and Tokina 11-16 2.8 Lens. The background was tracked with a SLIK ECH 630 Star Tracker. In total he captured 5 tracked images for the background,

90 seconds each @ iso 1600. the foreground is a single exposure of 180 seconds @ iso 1600. Well-done to Frank on an impressive image!

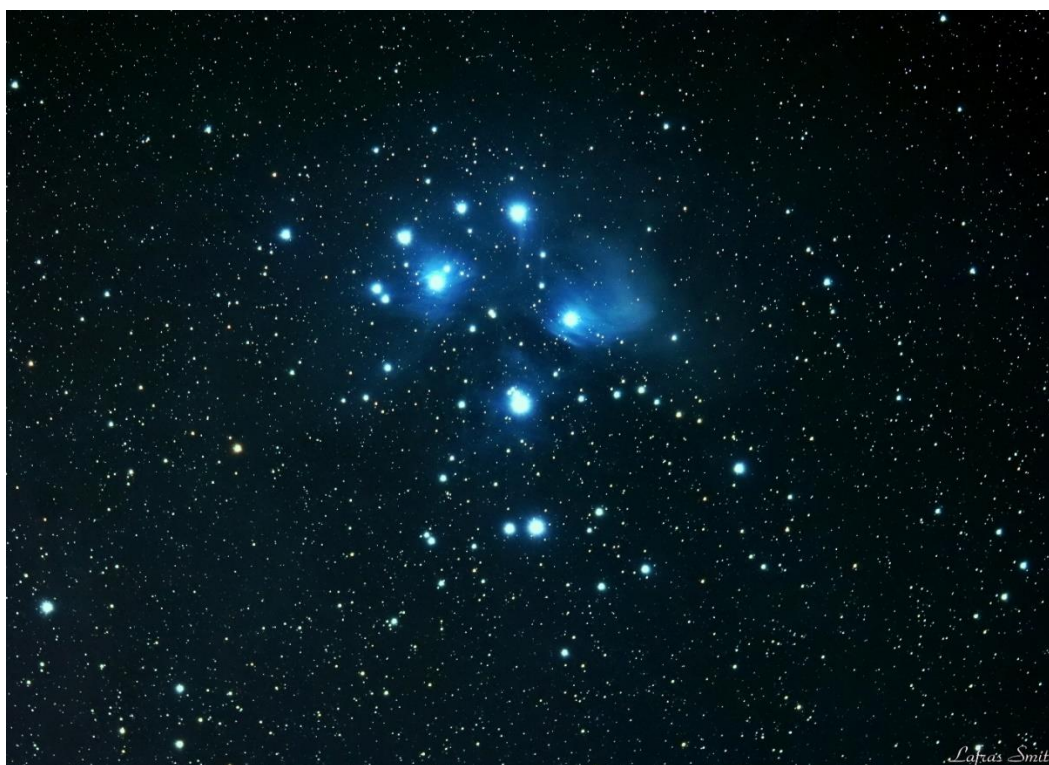
A reminder on the approach and how to contribute

Every 3 months the Quarterly will be published on the ASSA website and shared on various social media platforms. Members of ASSA and the general public can submit written observations, images, stories and questions by sending them to: Observing@assa.sao.ac.za They may then appear in future editions of this publication. There will also be fun competitions from time to time, reviews on telescopes (and other astronomy gear) and public events.

Please visit the ASSA website <https://assa.sao.ac.za/> to learn more about the society. More specifically, pay a visit to the observing section <https://assa.sao.ac.za/how-to-observe/> to discover how to observe the various wonders in our skies.

As with the last Quarterly, let's have a look at the previous 3 months in review. The following was submitted from around South Africa of various observations from September to early December 2021....

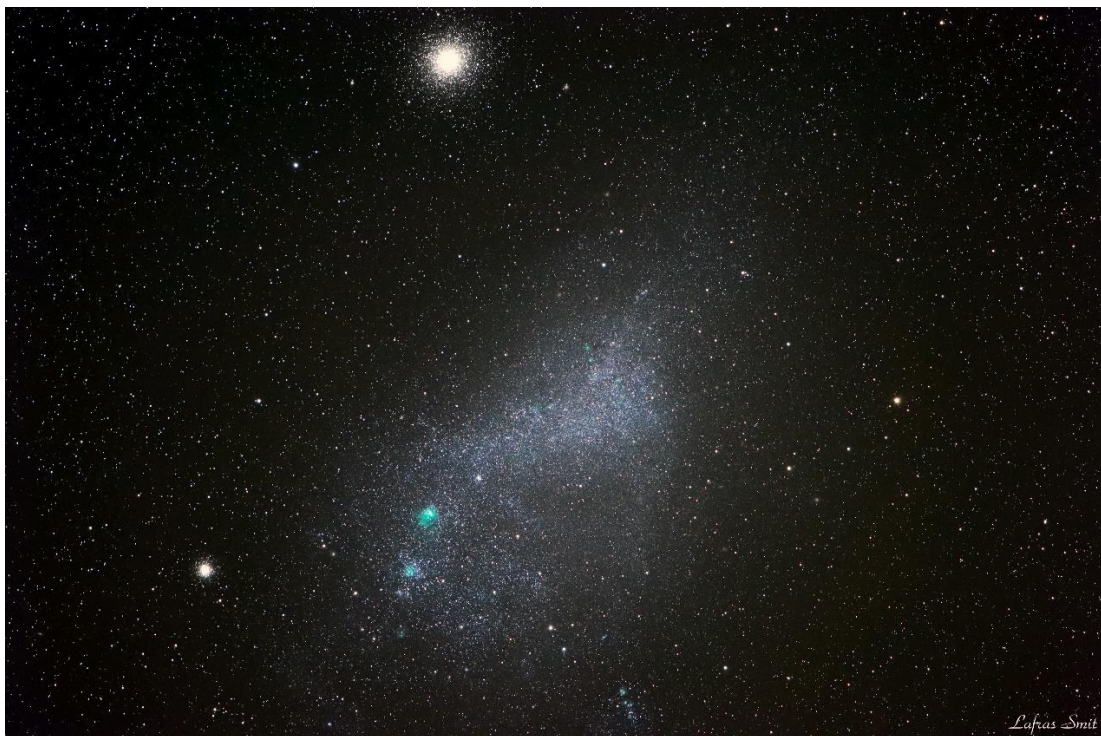
From The Free State



Lafras Smit from Heilbron in the Free State is a talented astrophotographer who regularly shares his observations and images on social media. He submitted this beautiful image of the Pleiades observed and captured from his farm in October 2021 with a Canon 90D and 70-200mm f2.8 lens on a Skywatcher mount. What a stunning image! The Pleiades is a cluster famous in various global mythologies / cultural belief systems. In South Africa it is referred to as "IsiLimela" or the "digging stars." Its appearance heralds the season to begin hoeing the ground to prepare for crops.



Using the same equipment (Canon 90D and 70-200mm f2.8 lens on a Skywatcher mount), Lafras captured these breathtaking images of the Large and Small Magellanic clouds during October 2021. The Large Magellanic cloud (above) has the famous Tarantula Nebula (NGC 2070) located within it.



The Small Magellanic Cloud is located in the constellations Tucana and Hydrus. In this image, you can also see the globular cluster 47 Tucanae above it and the globular cluster Melotte 4/NGC 362 to the left. Both the Large and Small Magellanic clouds are visible to the naked eye under dark skies and appear as “fuzzy patches” that resemble hazy clouds (hence their names)



Lafras also shared this beautiful image of the Andromeda Galaxy (M31/ NGC 224) captured with his Canon 90D and 70-200mm f2.8 lens on a Skywatcher mount during October 2021. Well-done to Lafras for a superb set of images and observations from the expansive skies of the Free State Province!

From KZN



Gerald De Beer sent us this fabulous image of the Helix Nebula (NGC 7293) that he captured from his home in Eshowe under Bortle 4/5 skies during September 2021. Gerald explained how this iconic

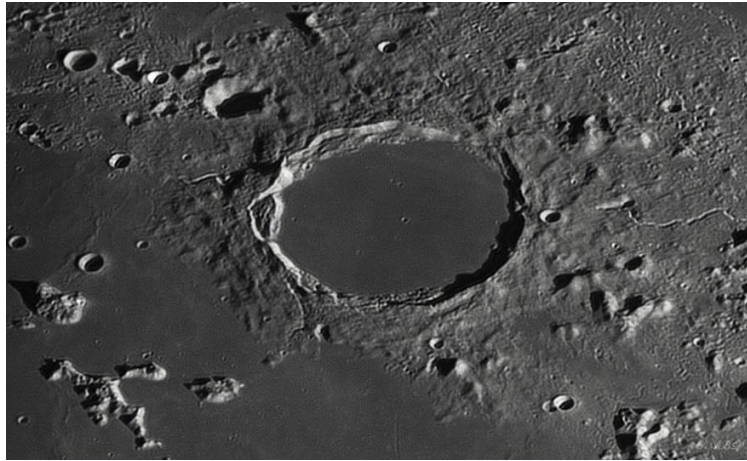
celestial object is an example of a planetary nebula, formed by an intermediate to low-mass star, which sheds its outer layers near the end of its evolution. The observed glow of the central star is so energetic that it causes the previously expelled gases to brightly fluoresce. The nebula is in the constellation of Aquarius, and lies about 650 light-years away, spanning about 0.8 parsecs (2.5 light-years).

Gerald processed the image in the HOO palette for a true colour representation. He used a ZWO ASI2600MM Pro Cooled camera with various filters combined with an AT 127EDT triplet refractor 950mm f7.5 mounted on Celestron CGEM Mk I. It took many hours of data collection and expert processing to arrive at this amazing result. Thank you to Gerald for this inspirational contribution!

Many readers may ask what a Bortle class sky is. Quite simply it is a numeric scale (numbered from 1-9) that provides a measure of the night sky brightness in any location. As a reference point, Bortle 1 is an “Excellent dark-sky” site and Bortle 9 is a typical “inner-city sky” with lots of light pollution and substantially reduced visibility. From an observing (and astrophotography perspective), it is ideal to work under darker skies (Bortle 1-3) because so much more is visible and easier to image



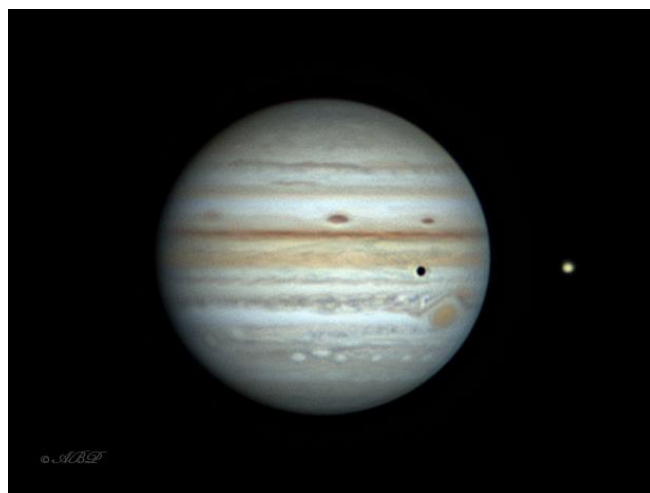
The September full moon – known as a “Spring Moon” in SA, was observed and photographed from Newcastle KZN by Angus Burns with a Canon 60Da through a Celestron SE8 telescope (the saturation was enhanced slightly to create a “mineral moon” effect). Visit <https://cfah.org.za/fullmoon/> to learn more about South African names for the various full moons throughout the year.



The crater Plato was observed and imaged during October 2021 by Angus Burns from Newcastle KZN with a ZWO290mc camera and Celestron 9.25" Edge HD telescope. Plato has a diameter of 101km and is located in Mare Imbrium near to the western edge of the Montes Alpes mountain range. It is a lava-filled lunar impact crater.



Also observed and imaged from Newcastle KZN by Angus Burns during late August/early September was the Rho Ophiuchi cloud Complex (IC 4603) and the Trifid Nebula (NGC 6514). Both images were captured with a ZWO294 mc Pro camera through a Redcat 51 telescope and Celestron 9.25" Edge HD telescope respectively.



The transit of Jupiters Moon Io imaged on the 15th October 2021 from Newcastle KZN by Angus Burns (with a ZWO290mc through a Celestron 9.25" Edge HD).

An educational outreach took place for Grade 6 learners at St Dominics Newcastle KZN in October 2021. The purpose of the lecture delivered by Angus Burns was to enrich the curriculum for learners who are studying the solar system. The talk was well attended with great enthusiasm from the children. Detailed information was shared on Venus, Mars, Jupiter and Saturn. The lecture also included discussions about the Sun and Moon, measurements of distance in the universe, space exploration and general astronomy. Well done to St Dominics for hosting such an excellent educational event.

From Mpumalanga



Hendrik Le Roux submitted these crisp images of Jupiter and Saturn captured on the 4th September 2021. He used an 8" Newtonian + 3x Barlow with a ASI290MC planetary camera to produce them.



Hendrik also imaged the Helix nebula using his 8" Newtonian and ASI1600MM camera. He used a set of Astronomik Filters to produce a true colour version of this well known planetary nebula on the 5th September 2021.



Ernst Marais from Middleberg Mpumalanga shared his outreach experiences with us:

“Once a month or so, weather permitting, I set up my telescope in front of a restaurant in Middelberg.

It’s called Sidewalk Astronomy, and not an ideal location to do astronomical observations from, (due to light pollution) but this is where the people congregate.

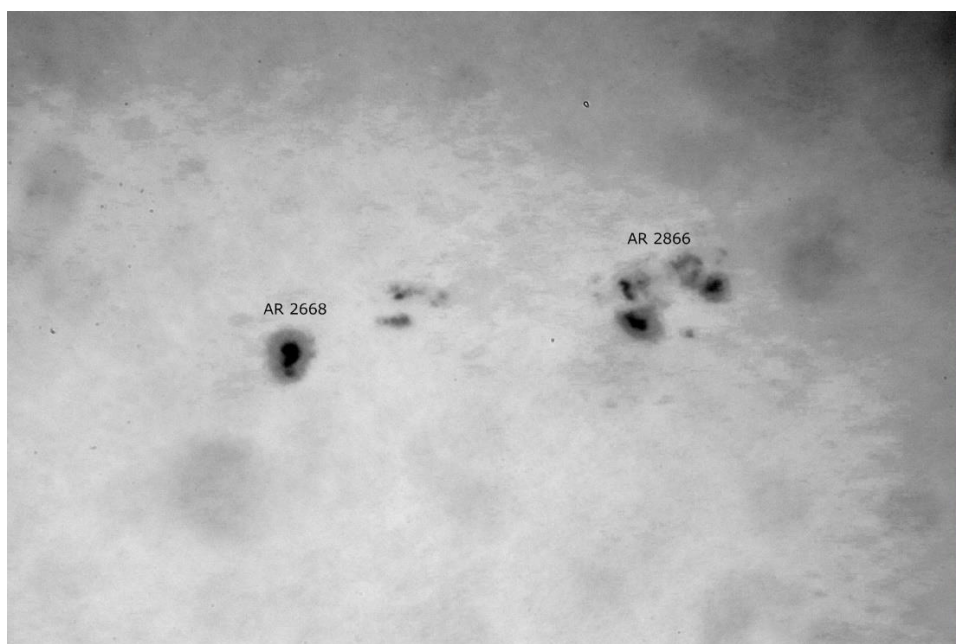
Most people have never looked through a telescope at the Moon, planets and one or two bright Deep Sky objects.

This is one way to reach people, especially children, and show them the wonders up there.

Other scope owners, believe me, this is very rewarding.”

Thank you Ernst for sharing this with us – its inspirational to see astronomers introducing members of the public to astronomy and the wonders above that await enquiring minds.

From the Western Cape



Richard Ford shared his observations of various active Sunspot Groups on the Surface of The Sun (observed and imaged on 7th September 2021):

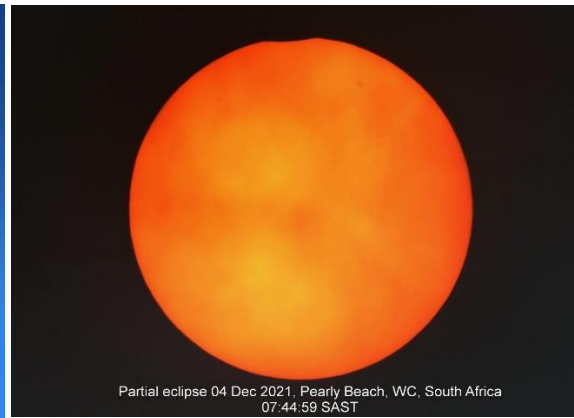
“On Tuesday morning at 10am on the 7th September 2021 I set up my 12-inch Dobsonian Telescope on my Equatorial Platform to image a group of active sunspots on the surface of the Sun- namely sunspot AR 2866 and AR 2868 by making use of a Baader Solar Filter placed in front of the telescope tube with my Canon 800DSLR Camera. Sunspot AR 2868 was enormous and sprawled more than 100,000km from end to end.

On the same day other sunspots were also observed (AR 2864 and AR 2863).

When I imaged the Sun I noticed a dark umbra, the filamentary penumbra, a crack in the sunspot known as a “light bridge”, dark pores, and boiling granules (which is equivalent to the size of North America). These active sunspot groups AR 2866 and AR 2868 were crackling with minor B-class solar flares.”



Thank you to Richard for sharing this experience with us as well the excellent images he captured of his observations from the Western Cape.



Kos Coronaio observed and imaged the partial Solar eclipse on the 4th Dec 2021 from Pearly Beach in the Western Cape and shared his observations and insights on the event:

“The total solar eclipse on the 4th December 2021, was seen as a partial one from our part of the world. Cape Town and surrounds witnessed 11.5% of the solar disk obscured by the moon. Some parts of the country did not see anything (Durban), and some as little as 0.1% (Bloemfontein).

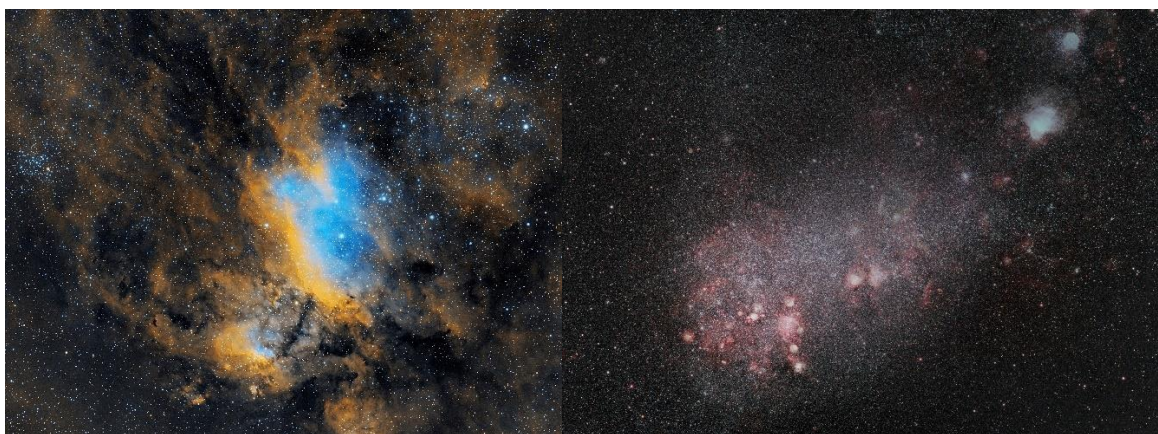
We had overcast conditions predicted for the morning in Pearly Beach, but it dawned nice and clear. With first contact due in half an hour or so the clouds started rolling in from the north-east. By mid eclipse the haze was so bad that it was forming a blurred halo around the solar disk.

I missed the first contact by a couple of minutes as well as mid-eclipse due to cloud/haze. Please note the time stamps on the images above.”

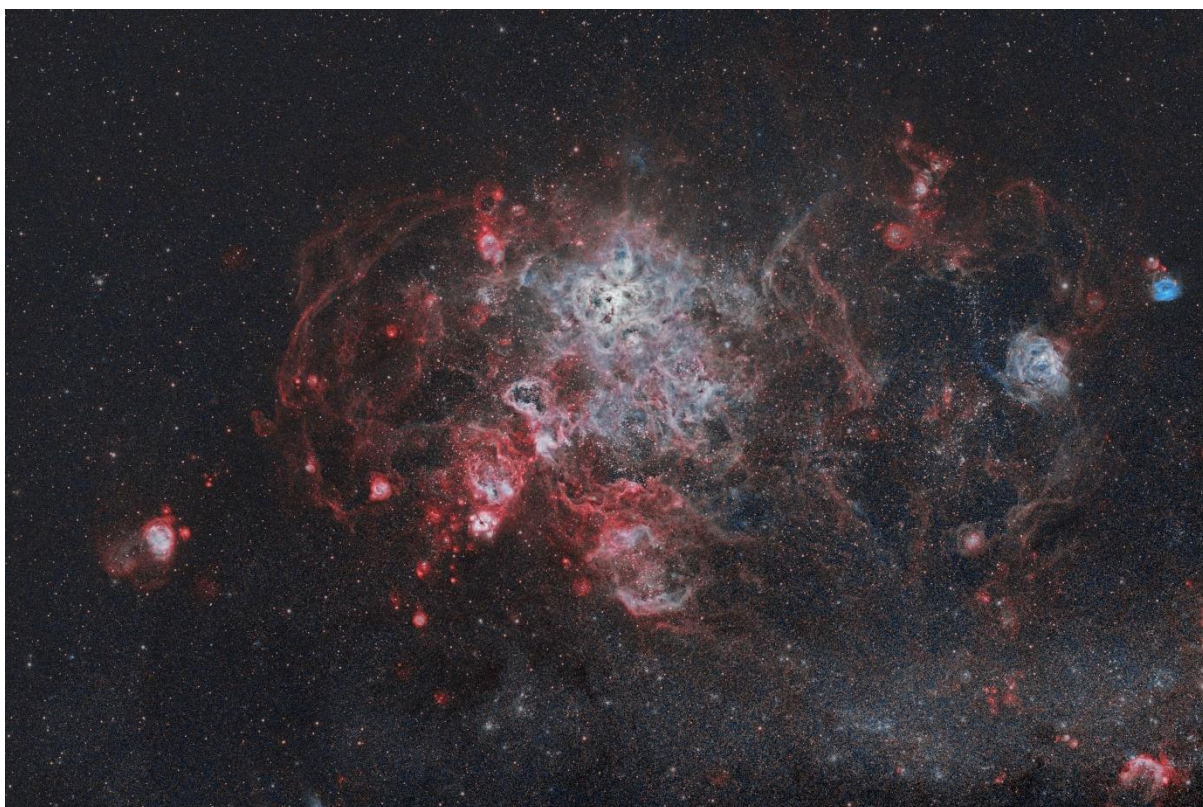
Kos used a Canon 60D at prime focus on a Skywatcher 8" f4, mounted on a EQ6 to produce this valuable record of the event.



Peter Dunsby is Professor of Cosmology at UCT and a highly skilled astrophotographer based in Newlands Cape Town. Using his state-of-the-art equipment and abilities in this field, he successfully observed and imaged a number of celestial objects from September to end November 2021. Above is the Globular Cluster 47 Tucanae (NGC 104) and Lobster Nebula (NGC 6357) using a RASA 8 / EDPH94 and various cameras to capture these breath-taking images.



Peter also imaged the Prawn Nebula (IC 4628) and Small Magellanic Cloud (NGC 292) with his RASA 8 and various cameras and filters. Amazing images from Newlands!



This particularly eye-catching wide field image of the Tarantula Nebula (NGC 2070) was imaged by Peter using a EDPH94 telescope on a Skywatcher NEQ6 Pro mount with an ASI 2600MC Pro camera. Definitely one of the more detailed images of this well-known celestial object to have been produced in recent years. The Tarantula nebula is located inside the Large Magellanic Cloud (NGC 2070). Many thanks to Peter for submitting these inspirational images!



An amazing photograph by Eric Tollner from Cape Town of the International Space Station transiting the moon. He captured this from Prince Albert in the Karoo (about 4 hours drive from Cape Town). Eric provided a detailed narrative of the process that allowed to plan and capture the transit:

“The International Space Station, captured in flight as it passes in front of the moon, photographed from the Karoo, about 4hrs drive from Cape Town, South Africa. This is where maths, art, and never-ending curiosity all collide into one beautiful moment!

I finally got it! The long awaited moment of photographing the International Space Station in flight as it passes in front of the moon. This has been a long-time dream of mine to capture this moment, we have stood under many night skies watching as it streaks it's way across the night sky, we have watched videos of space capsules docking, and learnt about astronauts living on board. I have followed their amazing footage as they fly over our cities, and above storm clouds and over the northern lights. But capturing it in flight, in a single photo, as it passes the moon is by far the most technically challenging project I've tried.

To give some perspective, you are photographing an object 550kms away moving at 25 000 km/hr.

And this is where the technical stuff really gets ramped up a few notches. The attention to detail that goes into the timing of the shot, and where you perch the tripod, is mind blowing. To put it in context, the ISS orbits the earth roughly every 90 minutes, give or take a few while dodging meteors and a field of satellite debris. At that speed it takes about half a second to pass in front of the moon. If you shoot just a fraction of a second too early or too late, or if you are a few hundred meters away from the precise location to view it aligned with the moon, you will miss it completely. It is pin-point accuracy on a whole new level.

There is more than a years' worth of research and planning, thousands of kilometres driven, many (many!) failed attempts, endless frustrations at having the weather ruin one opportunity after another (the joys of living in the Cape!), ceaseless hours spent practising under the night skies, a lot of money invested in a passion, (even learning how to use CAD to draw and 3D print a mount to fit the camera onto the telescope!) and a ton of learning that happened in-between, until the stars finally aligned to get that shot.

Between all the learning and practising, I would be a regular visitor to an amazing website called transit-finder.com, that provides highly detailed information on the transits.

This particular image is one of a sequence of 16 images captured as it moved across in front of the moon. To get this photo I took a burst of 20 frames, taken over 2.8 seconds, meticulously timed to allow a buffer of 0.9 seconds before and after the transit in front of the moon. Of the 20 shots, I managed to capture the ISS in 16 of the images, which I was thrilled with, especially considering the previous failed attempts with nothing at all to show for my efforts other than a steep petrol bill!

This was taken on Friday 12th Nov, at a specific GPS location in the veld outside Prince Albert in the Karoo, where the path of the ISS would line up with crossing in front of the moon.

There is a lot still to learn and perfect here, the rumour is true - once you buy your first telescope, you'll soon find that you want a bigger, more powerful one! But this was undoubtedly a defining moment of seeing a small dream unfold and come true.

Some additional info for the stats geeks out there is that the ISS passed the moon in 0.87 seconds that evening. The shutter speed has to be high enough to capture that without blurring, while still allowing enough light in.

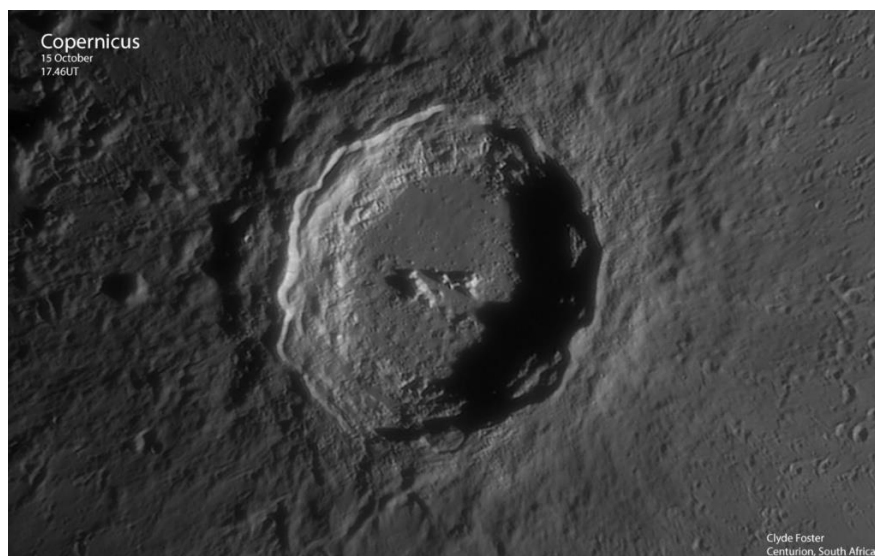
This was shot on 1/3200, ISO 1600, at 16:45(16:44:23.4 to be precise!), on a Canon 6D Mark II, mounted on a Skywatcher 114/500 telescope and Celestron Nexstar mount, using a T-ring adapter which I 3D printed at home.

I had two smartphones with me – one connected to the camera via wi-fi to operate the shutter release in order to avoid touching or having any contact at all with the camera. And on the second phone I ran an app that displays the time of day, down to the tenth of a second, as defined by the international standard atomic clock.”

From Gauteng

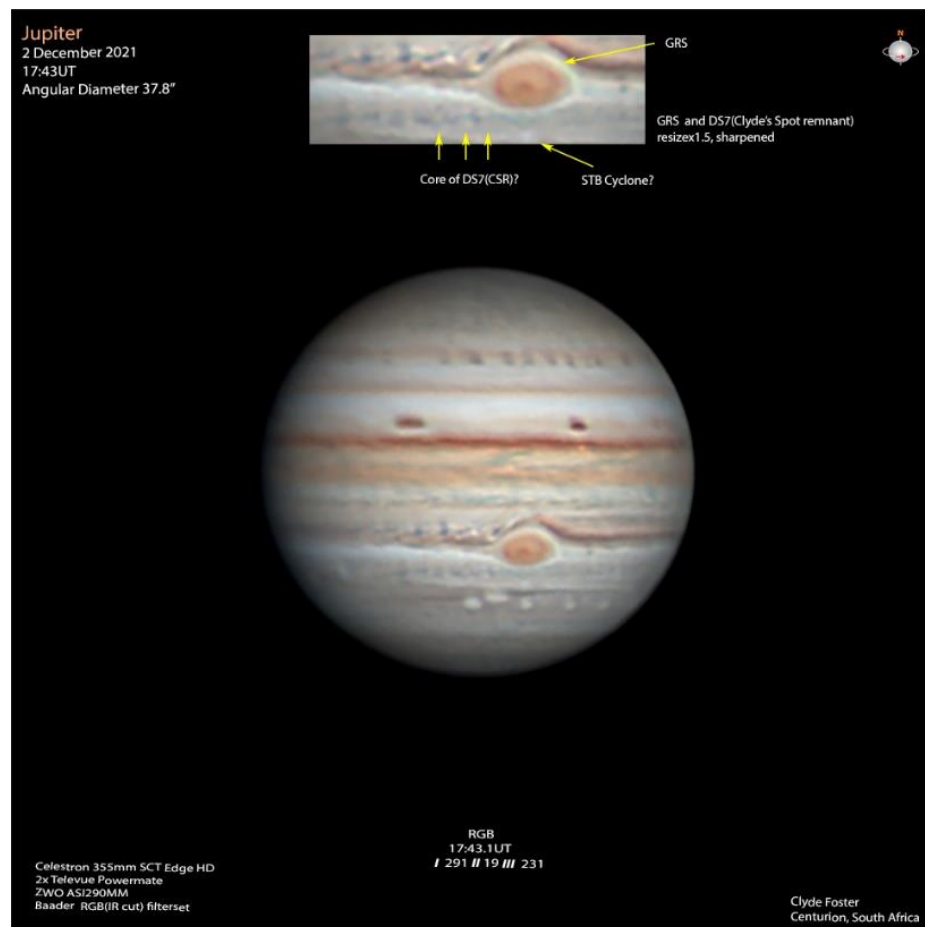


Clifford De Wet sent us this beautiful image of NGC 6334 – also known as the Cats Paw Nebula/Bear Claw Nebula or Gum 64. He successfully imaged this well-known celestial object from his home in Johannesburg under Bortle Class 7 skies. He used a mono camera and set of Ha, SII and OIII filters to produce this detailed false color image. Congratulations to Clifford on producing an excellent image under Bortle 7 skies.



Clyde Foster captured this outstanding image of the crater Copernicus on the 17th October 2021. This was done with his Celestron 14” Edge HD telescope and was part of an initiative to assist a young student in Switzerland who was undertaking a project to calculate the Earth’s mass. One

element of this was to calculate the distance to the Moon, using parallax observations of the Moon from the northern and southern hemispheres. To assist her, they both captured an altitude measurement of the Moon at the time of culmination (meridian crossing) using the crater Copernicus as a particular reference point to ensure maximum accuracy and uniformity in approach



The following is an update on Clydes Spot kindly provided by the discoverer of this now famous feature:

Clyde's Spot is an intense convective storm outbreak in the South Temperate Belt region of Jupiter discovered by ASSA Planetary specialist Clyde Foster on 31 May 2020 and imaged by the NASA Juno spacecraft two days later. The subsequent NASA press release ("[Clyde's Spot" on Jupiter | NASA](#)), generated wide media attention. Its development has been tracked by both amateur planetary imagers and the professional planetary science community ever since.

The quality of Jupiter images is generally reducing as the planet moves closer to solar conjunction and is dropping in altitude in the evenings. Clyde did however manage these captures in colour and Infra-Red on 2 December. The remnant of Clyde's Spot (now also referred to as DS7) has, over the last year and 5 months, remained active, has circumnavigated Jupiter relative to the Great Red Spot, and is now beginning to sweep across below the GRS. It will be interesting to see if there is any interaction. The remnant has become a highly elongated feature, with ongoing dynamic changes, and various spin-off spots extending ahead of the GRS and behind the core of the storm system.



This emotive photograph of the Waning Crescent Moon near to the planet Venus was sent to us by Carmel Ives. The nearby clouds illuminated by lightning makes this a “one in a million” photo. Carmel observed and photographed this on the 6th of December 2021 with a Nikon Z6 from Bryanston Johannesburg.

To learn more about astrophotography, please visit the astrophotography section of the ASSA website: <https://assa.sao.ac.za/sections/astrophotography/> In addition, please visit <https://assa.sao.ac.za/sections/deep-sky/nightfall/> to read ASSA's Nightfall publications – this detailed and professional resource provides a wealth of information.

Also please do consider ASSA's publication of record, MNRAS which is a registered, peer-reviewed journal, with an ISSN number, and is referenced by and searchable in various academic databases.

It is an excellent place for publishing ASSA's work, which can then be properly cited in subsequent publications.

The link on the ASSA website is <https://assa.sao.ac.za/about/publications/mnassa/> and provides more info about back copies and where to send contributions to.

National News – The Geminid Meteor Shower

Tim Cooper our comet, asteroid and meteor expert provided this detailed information about the upcoming Geminid meteor shower

Note: Best time to observe the shower is after midnight from December 12-16

While most meteors are the debris left behind by comets as they orbit the sun, a few appear to have asteroids as parent bodies. One such meteor shower is the Geminids, visible every year in December as Earth crosses the path of asteroid 3200 Phaethon. Despite their northerly declination, the Geminids produce the most reliable meteor activity each year, even as seen from southern Africa. The radiant rises to a respectable altitude in the early morning hours as seen from Johannesburg and the observer is rewarded by good rates of graceful meteors. The Geminids are medium speed, entering the atmosphere at 35 km/s, mainly white, but to me often display a sparkling appearance with yellowish core. That fact and their graceful speed makes them a joy to watch.

Rates begin about December 7, building slowly until about December 12, and then more rapidly to maximum, normally on the night of December 13/14. The activity profile is skewed, and the drop after maximum is quite rapid, with rates on December 15 perceptibly lower. The stream is mass sorted, and meteors on December 14 are noticeably brighter on average than the night before.

While the radiant rises shortly after 9pm local time, it needs to rise well above the horizon to be seen at its best. Before that time meteors from the shower will not be visible, but by midnight the radiant will be 24 degrees high in the north-east. It reaches its maximum altitude of 31 degrees at 2am local time, and it is at this time when your chances of seeing highest rates. The bright moon sets around 2am on the night of maximum this year so the shower can be observed at its best without hindrance. The radiant is close to the bright star Castor in Gemini. While most meteors you see will be Geminids, not all will be, and there are several other meteor showers active in the vicinity. These include the Monocerotids, 11 Canis Minorids, sigma Hydrids and chi Orionids. If you can't trace the meteor back to the position shown in the diagram, then chances are it's not a Geminid.

Activity from meteor showers is measured by the Zenithal Hourly Rate (ZHR) which is the number of meteors which would be seen if the radiant was overhead, and with magnitude 6.5 stars visible to the naked eye. When the radiant is lower or under urban skies, you can expect to see far fewer meteors. At maximum activity the Geminids normally peak around ZHR 120 per hour. As a guide, with the radiant at 30 degrees above the horizon and with stars of 5.5 visible to the naked eye you can expect to see about 20-25 Geminids per hour. Plan to observe and concentrate for a full hour and remember meteors will not be equally distributed throughout the hour. There will be quiet periods in which no meteors are seen, followed by several visible in a short period, depending on how active the parent body was when it distributed its dust.

What's up for the next 3 months

Observing highlights to look out for over the next 3 months include:

December 2021

- 12th-16th Dec 2021: Geminid Meteor Shower (best time to observe is after midnight over these dates)
- Mid Dec onwards: watch out for newcomer Comet Leonard (C/2021 A1) nearby Venus in the West after Sunset
- 19th Dec 2021: Full Moon (at 61h36)
- 21st Dec 2021: Summer Solstice (at 17h59)

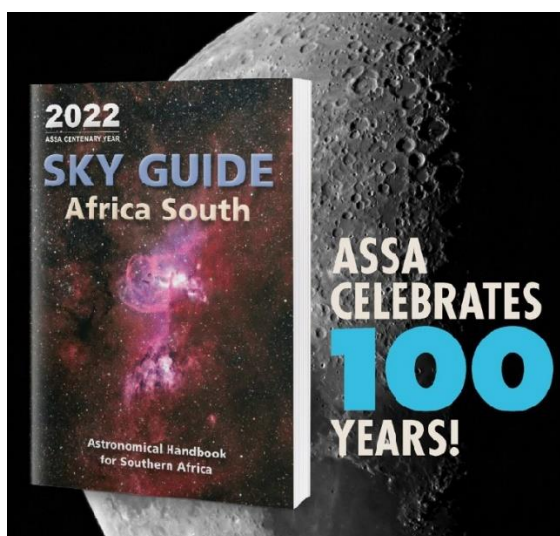
January 2022

- 6th Jan 2022: Moon near Jupiter
- 18th Jan 2021: Full Moon (at 01h48)

February 2022

- 8th Feb 2022: First Quarter Moon (at 15h50) and Venus at greatest brilliancy
- 16th Feb 2022: Full Moon (at 18h56)

Now that we are into the Summer months, the constellations Taurus and Orion are very prominent again. The Pleiades are rising earlier and Canis Major with the bright star Sirius is up early in the East. Please consider purchasing a SKY GUIDE 2022 which is now available! The 2022 Sky Guide is an ASSA centenary edition and is packed with useful information for astronomers.



Visit <https://assa.sao.ac.za/about/publications/sky-guide/> to learn more about this indispensable publication.

Show us your setup

We would love to see what you use to observe the night sky. Please send us a photo of your astronomy setup and a short explanation. You can send them to: Observing@assa.saao.ac.za
In addition, please send any questions / observations and comments to the same email address.



Hendrik Le Roux who shared these photos of his astronomy setup had the following to say: "This is a picture of my Observatory. I called her Wendy, for obvious reasons. It's a Wendy House I bought and then Modified so that the roof Slides Open. It's 1.8m x 1.8m in size." Hendrik added, "Here is a look inside Wendy. Inside you will find a 200mm Celestron Newtonian Telescope (F5) as well as a Skywatcher 72ED lens telescope. All mounted on a Celestron AVX mount. The Camera I am using at the moment is a ZWO ASI1600MM with 6nm Astronomik Filters. I also have a ASI290MC for Planetary work."



Hendrik mentioned that as he had overloaded the AVX mount by adding the Skywatcher Scope, he needed some extra weight for balance. A 2.5kg Gym weight worked well, but he needed a little more. A bottle of roof nails did the trick!

Thank you to Hendrik for this insight into his setup at home. Its wonderful to see his passion for astronomy and no wonder that Hendrik is producing such excellent images of the night sky.



Telescope review

If any reader would like to submit a review on a particular astronomy related product, please do contact us with your review for inclusion in the next Quarterly. Below is a detailed review of the RedCat 51 Petzval APO by Angus Burns.

Williams Optics Redcat 51 Petzval APO Review



The Redcat 51 first appeared on the global market in 2019 and as expected Williams Optics produced a high quality, well-engineered telescope. GLA Agencies in South Africa are now the local distributors for this (and other) quality Williams Optics products.

I was privileged to review a Redcat 51 over the course of July/August 2021. I have always been interested in this telescope because of its striking design and the many excellent reviews it has received from other Astro-photographers around the world. So, what has all the fuss been about? Is this little APO everything it is claimed to be?

The answer is a resounding YES! Read more to find out why...



RedCat 51 Technical Specs

In summary the Redcat 51 is a highly portable apochromatic refractor with a flat field from edge to edge therefore removing the need for any field flatteners. As an additional bonus, the scope is designed to accommodate a full frame sensor and doubles up as an excellent wildlife / portrait / landscape lens when used with a DSLR. Here are the basic specifications:

- **Scope Design:** Petzval Apochromatic Refractor (4 element prime lens)
- **Diameter:** 51mm
- **Focal Length:** 250mm
- **F-Ratio:** F/4.9
- **Focuser:** Calibrated Helical
- **OTA Length:** Retracted – 210mm
- **Mounting Style:** Vixen/Arca-Swiss
- **Weight:** 1.45kgs
- **Image Circle Size:** 44mm

Unboxing

The unboxing process was a delight – everything beautifully (and logically) laid out. One can tell that a lot of effort was applied to the design of the Redcat 51 and the packaging was made to compliment the quality one expects from Williams Optics telescopes.

I particularly liked the quirky cat design on the soft carrying case and the accompanying stickers added a nice touch too.

The first impression when you lift the scope out of its case is its tiny size. This truly is a portable and versatile telescope. Made of a strong aluminium alloy that is anodized a striking red colour, the Redcat 51 has an accompanying dew shield (which inverts to protect the lens when the scope is not in use and for ease of transport).

The box contains the following:

- Williams Optics 51mm Petzval APO Refractor Telescope (Redcat 51)
- Focuser with focusing index
- Aluminium dust caps (front and rear)
- Bahtinov mask
- CAT series mounting ring and Plate
- Field Rotator
- Soft Carrying Case



Great design features

The Redcat 51 telescope has a 48mm thread at the rear making it compatible with a wide range of DSLR cameras. Note: the M48mm T-Ring (to attach a DSLR to the scope) is sold separately. A wide range of other Williams Optics accessories are also available via GLA Agencies and select suppliers in South Africa. Likewise, a diagonal (and relevant eyepiece) can be acquired locally and attached for superb observational astronomy / wildlife spotting.

The built-in field rotator with clearly marked degree graduations is a fantastic design inclusion for accurately framing celestial objects without affecting your focus and the filter slot just after the rotator accepts 48mm filters.

Focusing the Redcat 51 is simple with the helical focuser – the tension ring allows you to lock the focus or adjust the tension/drag to meet whatever your requirements might be. The focusing index is also a great practical addition to the design.

Attaching a CMOS camera and achieving correct back focus for my ZWO294MC Pro was easy. Likewise attaching a DSLR camera was just as straightforward.

The cleverly designed ring mount has a flat section on top with well positioned holes for attaching a finderscope, guide-scope or another relevant accessory.

The included Bahtinov mask is a useful addition when aiming for pinpoint focusing accuracy with astrophotography - in this regard a really nice touch to the threaded telescope cap is that the illustration of the Redcat “cats whiskers” on the front of the cap illustrates the diffraction spike pattern you should strive for with the Bahtinov mask to achieve perfect focus.



What about the optics?

The telescope is fitted with Ohara FPL53 and FPL51 synthetic fluorite glass optics that produce high contrast, superbly sharp results in both photographic and visual observational contexts. Additionally, being an apochromatic refractor means almost zero chromatic aberration which make this scope ideal for high quality astrophotography endeavors.

The Petzval design which consists of 4 elements in 3 groups renders a full frame flat field with an accompanying image circle of 44mm accommodating full frame sensors and smaller.

How does the scope perform under night skies?

Setting everything up for the Redcat to operate was quick and within minutes the camera was attached and everything correctly balanced. I opted to primarily use my ZWO 294mc Pro to do a few test runs on various celestial objects but also attached my Canon 60Da DSLR for a quick moon shot.

From an Astrophotography perspective the Redcat 51 is a fast-little telescope and provides for wide field images of expansive nebulae. I did a series of imaging sessions under less than ideal seeing conditions (Bortle 7/8 skies) but wanted to see how the scope would perform with an Optolong-L-extreme filter inserted and my ZWO camera attached.

I targeted a few well known and some lesser-known Nebulae and also created a composite moon shot with the DSLR for this review. Here are the results...



Cropped image of the Fighting Dragons of Ara (NGC 6188) – 5 hours total integration captured with a ZWO ASI294mc Pro camera through the Redcat 51 (calibrated and stacked in APP and finalized in Light Room/CC2019/Astropanel)



The Cats Paw (NGC 6334) and Lobster Nebula (NGC 6357) – 2.5 hours total integration captured with a ZWO ASI294mc Pro camera through the Redcat 51 (calibrated and stacked in APP and finalized in Light Room/CC2019/Astropanel)



First Quarter “Mineral Moon” Composite image – single shot with a Canon 60da through the Redcat 51 and then cropped/combined with a starfield to produce a composite image (Note: the Optolong L-Extreme filter was removed for this capture).



Wide field image of the Eta Carina nebula (NGC 3372) and Gabriela Mistral Nebula (NGC 3324) – 2 hours total integration captured with a ZWO ASI294mc Pro camera through the Redcat 51 (calibrated and stacked in APP and finalized in Light Room/CC2019/Astropanel)



Lagoon Nebula (NGC 6523) and Trifid Nebula (NGC 6514) - 2 hours total integration captured with a ZWO ASI294mc Pro camera through the Redcat 51 (calibrated and stacked in APP and finalized in Light Room/CC2019/Astropanel)



Running Chicken Nebula (IC 2944) - 2 hours total integration captured with a ZWO ASI294mc Pro camera through the Redcat 51 (calibrated and stacked in APP and finalized in Light Room/CC2019/Astropanel).

The Verdict for Astrophotography?

A truly superb astrophotography telescope that produces pinpoint, aberration free stars and captures faint Nebulae with ease. Note that I captured these objects under extremely challenging conditions – Bortle 7/8 skies caused by grassland fires which resulted in moisture laden, fine haze. In addition, several of the images were captured through bright moon light to add to the difficulty. Despite this, the scope performed beautifully and combined with the L-Extreme filter to cut through a lot of the light pollution, I was able to produce pleasing images.

Focusing was easy, the field of view impressive and optics mind blowing. I cannot wait to use this impressive telescope under dark skies.

What about daytime photography?

The Redcat 51 is promoted as also being a great wildlife lens and spotting scope. I attached my Canon 5d Mark IV DSLR to it with a M48mm adapter and chose a few subjects to photograph. I used a tripod for stability and obviously manually focused the lens using the helical focuser. It was easy to capture great shots of birds, insects and flowers. Here are a few examples...



There was no discernable chromatic aberration or image distortion. There was also no vignetting of the image proving that the Redcat 51 is built to accommodate full frame sensors.

I also wanted to test how the bokeh looked by comparison to other high-end photographic lenses. I chose a well illuminated flower with a sparkly background and include the shot below clearly showing the pleasing, creamy background bokeh produced by the amazing optics at F/4.9

I think this lens will have even wider application as a prime lens for portrait and landscape photography. In summary The Redcat 51 is basically a high-end photographic lens at a very affordable price.



I love the bokeh in this image – The Redcat 51 is clearly an extremely versatile lens

The Verdict for daytime photography?

The Redcat 51 is a very welcome addition to any photographer's lens collection. I was impressed with the clarity of images produced by it as well as the zero distortion and chromatic aberration free photos. Focusing was easy and results impressive. I read that with an extension tube, the lens can be converted to a Macro lens. I shall have to test this on another occasion but have no doubt it will produce excellent results.

In Conclusion

This is a "must have" telescope. It is incredibly versatile, well priced, and wonderfully engineered/constructed. I love the look of it, the results speak for themselves, and the field of view is impressive. It can accommodate a wide range of cameras, is brilliant for observational astronomy, daytime general photography and is very portable. It also makes a great spotting scope.

An additional bonus is that GLA Agencies have imported a wide range of Williams Optics telescopes and Accessories. The complete list of what is available in South Africa is at the end of this review.

I was so impressed by the Redcat 51 that I decided to purchase one for myself so if that is anything to go by, it should convince you of just how amazing this little powerhouse APO is!

In closing, my advice is as follows:

GO GET YOURSELF A REDCAT 51 – YOU WON'T REGRET IT!

Until next time

We hope you enjoyed the 2nd edition of the Southern Skies Quarterly. We wish all readers a wonderful Festive Season and amazing New Year filled with good health, clear skies, and much observing!

Angus Burns

Director observing section (Deep and Shallow Sky)

