



# STARDIS

The Newsletter of the Tiverton and Mid Devon Astronomy Society

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July 2015

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Welcome to the July issue of the Newsletter. The issue marks the end of our first year of production and what an exciting time the last couple of Months have been to mark the occasion.

First we had the very close conjunction of Venus and Jupiter, which unusually for a rare Astronomical event was mostly clear making it possible to follow the two Planets closing in on each other and passing close enough to both fit in the same Telescope field.

This was followed up by the fly-by of Pluto and its system of Moons by the New Horizons Spacecraft. Despite a last minute hitch when the craft went into safe mode. After a few hours contact was restored and a new set of instructions were uploaded and the fly-by appears to have gone by floorlessly. It will take many months for all of the captured data to be sent back to Earth.

Here's looking forwards to the next year of Stardis.



**Saturn**

2015 May 26 - 22:34UT

LX200 8" Classic - ASI120MM

Taken by: Keston Brill

## Editors Comment:

Well the first year of Newsletter production is over and what an exciting year it has been. We found a name, STARDIS, for our Newsletter and despite a slow start one or two members are starting to submit articles for inclusion. However more are required to enable us to continue to produce this bi-monthly Newsletter. Its your Newsletter so please contribute.

We have covered the Solar Eclipse, Comet Lovejoy, Jupiter and Saturn, we've had a few great reviews of new equipment and Astronomy courses and a number of members Images.

In this Newsletter we have articles on the societies visit to the Met office in Exeter to see what goes on there in the Space weather department. A great review by Pete Richardson reviewing his Solar imaging set up and in particular his first impressions of the Daystar Quark Chromosphere. Which is very timely as the society has recently purchased the same piece of equipment, which is available for Society members to use and will be great for outreach events in the future.



**M17 The Swan Nebula**  
2015 July 17 - 23:30UT  
LX200 8" Classic - EOS55D  
Taken by: Keston Brill

## Thoughts From The Chair

**Hi Everyone**

I hope you are all enjoying a good summer and making the most of the warmer days and lighter nights. I seem to be spending most of mine watering my garden. I am sure you have all been very excited about the data being sent from the New Horizons spacecraft. What great times we live in that we can experience such amazing images and new insights from the furthest reaches of our Solar System. I am very keen to see what's to follow.

I am sure you are all even more excited about the new 2015/16 TAMDAS Programme!! I hope you find plenty in there to interest you. Whilst I am looking forward to all of the talks I am very keen to hear the latest on the Rosetta Mission with Dr Andrew Morse.

Can I ask if you could please let me know ASAP if you would like to attend the Telescope work shop in September? Places will be limited to a first come first served basis and it will soon be opened up to non-members.

If you haven't already done so could I also ask you to let me know if you intend to come to the Annual Dinner in October. Also, if you have any items you can donate for our Astro-Auction please could you please bring them along to either the September or October meetings.

Finally, it will be great to see you at the Starbeque on 7<sup>th</sup> August. Please remember that it will be at Blundell's if we are blessed with dry weather or at Paul's if rain is forecast.

Wishing you all clear skies.

**Angela**

## Members Section:

### The Night Sky For August/September

#### **Moon phases:**

New Moon 7<sup>th</sup> August, First Quarter 14<sup>th</sup> August, Full Moon 29<sup>th</sup> August, Last Quarter 22<sup>nd</sup> August.

New Moon 13<sup>th</sup> Sept, First Quarter 5<sup>th</sup> Sept, Full Moon 28<sup>th</sup> Sept, Last Quarter 21<sup>st</sup> Sept.

#### **The Planets :**

Mercury remains close to the Sun in the Evening sky in August and September

Venus is visible in the western evening sky, it is still quite close to Jupiter at the start of August as it closes in and passes between Earth and the Sun. By months end it will be a Morning Object.

Mars will be rather close to the Sun at the start of our period but should very slowly become more visible.

Jupiter is close to the Sun at the start of our period and will move through conjunction into the morning sky by the end.

Saturn is still very low in the sky throughout. Telescopically the rings are tilted at 24 degrees now making up somewhat for the low altitude.

The summer constellations of Sagittarius, Scorpio and Ophiuchus are now due south with their abundance of nebula and clusters. The nights should start to get noticeable longer now, making observation possible again.

Don't forget the annual Perseid Meteor shower around the 12-13<sup>th</sup> August

Object of the Moment - 'The (Dwarf) Planet Pluto'



New Horizons spacecraft, took this on July 13, 2015 when the spacecraft was 476,000 miles (768,000 kilometers) from Pluto. This is the last and most detailed image sent to Earth before the spacecraft's closest approach to Pluto on July 14.

Credits: NASA/APL/SwRI



**Pluto**  
2015 July 18 - 1:00UT  
LX200 8" Classic - EOS550D  
Taken by: Keston Brill



### Recent society visit to the Met Office - Exeter

On Friday 19<sup>th</sup> June around 30 members and families converged on the Metrological Office in Exeter where we were given a very warm welcome and treated to a very informative talk by Andrew Sibley on the Met offices increasing role in Space Weather forecasting. We were told about the various collaborations with other agencies and how all of the data is collated and monitored to give a near real time picture of what is happening on the Sun at any moment. After showing us a number of mini movie sequences in a variety of wave lengths and also graphical plots, the group was split up into two and given a tour of the operations room, where we saw the latest pictures from space showing the Sun as it was at that moment. The other half of the tour was a look around outside at the various satellite dishes and monitoring equipment that was being developed and tested for future deployment into the field to monitor Terrestrial weather. A big thank you goes out to Andrew and Caroline Jones for arranging the visit and also conducting the tour. Also a big thank you to Andrew Sibley for giving us his time and expert knowledge.



Around 30 Members, Family and Friends  
Attended the Metrological Offices



Our Hosts: Andrew Jones, Caroline Jones and Andrew Sibley

For info, here are a few relevant web links on space weather:

Met Office Space Weather page:

<http://www.metoffice.gov.uk/publicsector/emergencies/space-weather>

BGS Current Global Geomagnetic Activity:

[http://geomag.bgs.ac.uk/data\\_service/space\\_weather/Global\\_activity\\_now.html](http://geomag.bgs.ac.uk/data_service/space_weather/Global_activity_now.html)

NOAA SWPC 'dashboard':

<http://www.swpc.noaa.gov/communities/space-weather-enthusiasts>

### Review of the Daystar Quark Chromosphere Ha Solar Filter.

I acquired a Quark Chromosphere a few months ago when I decided that I wanted to delve into the one area of astrophotography I had yet to explore - solar imaging. I have now used it sufficiently to be able to write a review on its use and performance.

Daystar are an American company that has been around quite some time now and they are well known throughout the world for their production of solar filters. One of the major attractions of the Quark filter is that it fits into the eyepiece end of the telescope thereby allowing the use of an existing telescope in the F4 to F9 range that would normally be used for night time viewing or imaging. Also the relatively low price especially when comparing to dedicated solar telescopes of 40mm aperture and above make it a great way to get into solar imaging without breaking the bank. I now use the Quark with a 120mm aperture refractor and the price of a solar scope of this size would be many thousands of pounds!! The Quark comes in two distinct guises - the Chromosphere and Prominence versions. By far the most popular of the two is the Chromosphere version due to the fact it still captures Prominences nicely and also excels with capture of surface detail exhibited by the Sun's Chromosphere by way of it's hydrogen alpha filter system.

The filter can be used for both visual use and imaging and uses a standard 1.25" eyepiece barrel for the attachment of eyepieces or imaging camera.



**Figure 1 -**  
Daystar Quark  
Hydrogen  
Alpha Filter.



The Quark comes with a power supply and this is connected to the Quark with a micro USB cable. This is one area of the Quark that I think could be better as this is a small connector and the weight of the cable pulling down could over time lead to connection problems. With this in mind I decided to attach a rubber band around the body of the Quark which I use to hold the power cable close to the units body and significantly reducing the strain on the micro USB connector. The power is required to heat the filter to achieve a temperature at which it the filter comes 'on band', a point at which the best detail of the Chromosphere will be exhibited. This normally takes about 10 minutes to achieve this temperature set point and I find the best way is to plug in the Quark whilst setting up the other equipment so when I'm ready to start imaging the filter is ready to go. The temperature set point is indicated by a light on the side of the filter body. It shines amber when warming up and turns to green when at the correct temperature.

There is also a tuning knob on the side of the filter body and this is used to tweak the wavelength of the filter band-pass to achieve the best detail. It is a case of trying the various positions whilst keeping an eye on the on-screen image and looking for improvements in contrast and detail. Start with the tuning knob in the straight up position, then by turning the knob one way if the detail seems to worsen then switch direction and keep going segment by segment until the best onscreen image is achieved. Each segment of the tuning shifts the wavelength by 0.1A (Angstroms). This can take a bit of time due to each change of setting needing some minutes to settle the temperature but it is worth spending the time to get this part right as once done it should be set for future sessions. Another consideration is that if using a telescope 80mm aperture and above then Daystar recommend using an energy rejection filter (ERF) to prevent excessive temperature build up in the Quark. This can be an IR/UV cut filter and this basically reflects the unwanted wavelengths back out the front of the telescope. Anything above 120mm then a front mounted ERF is required. See figures 2 & 3.



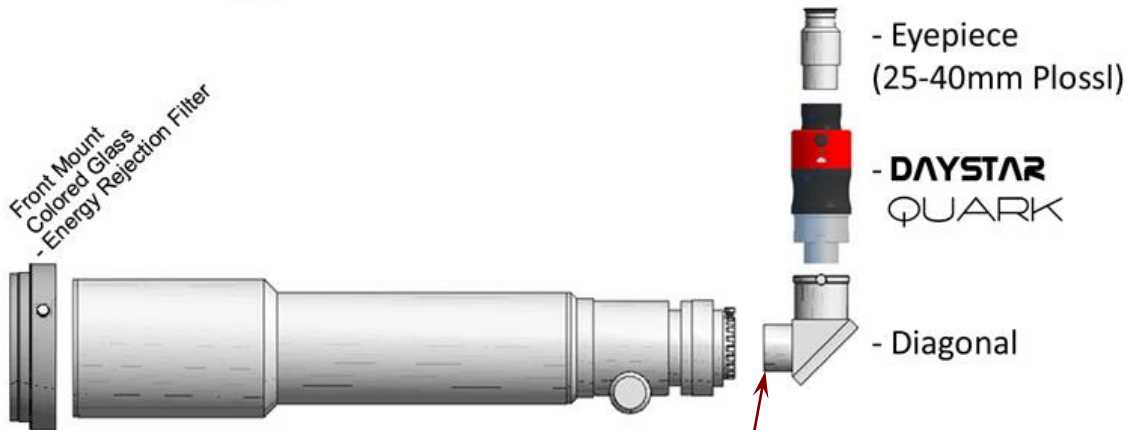
2459210A

**Figure 2 -  
IR/UV Cut  
Filter**



**Figure 3 -  
Energy  
Rejection  
Filters.**

## Daystar Quark Configuration II



UV/IR cut filter placed in front of the diagonal for apertures up to 120mm.  
(Front mounted ERF required for apertures above 120 mm)

**Figure 4 - Typical Set up.**

### In Use.

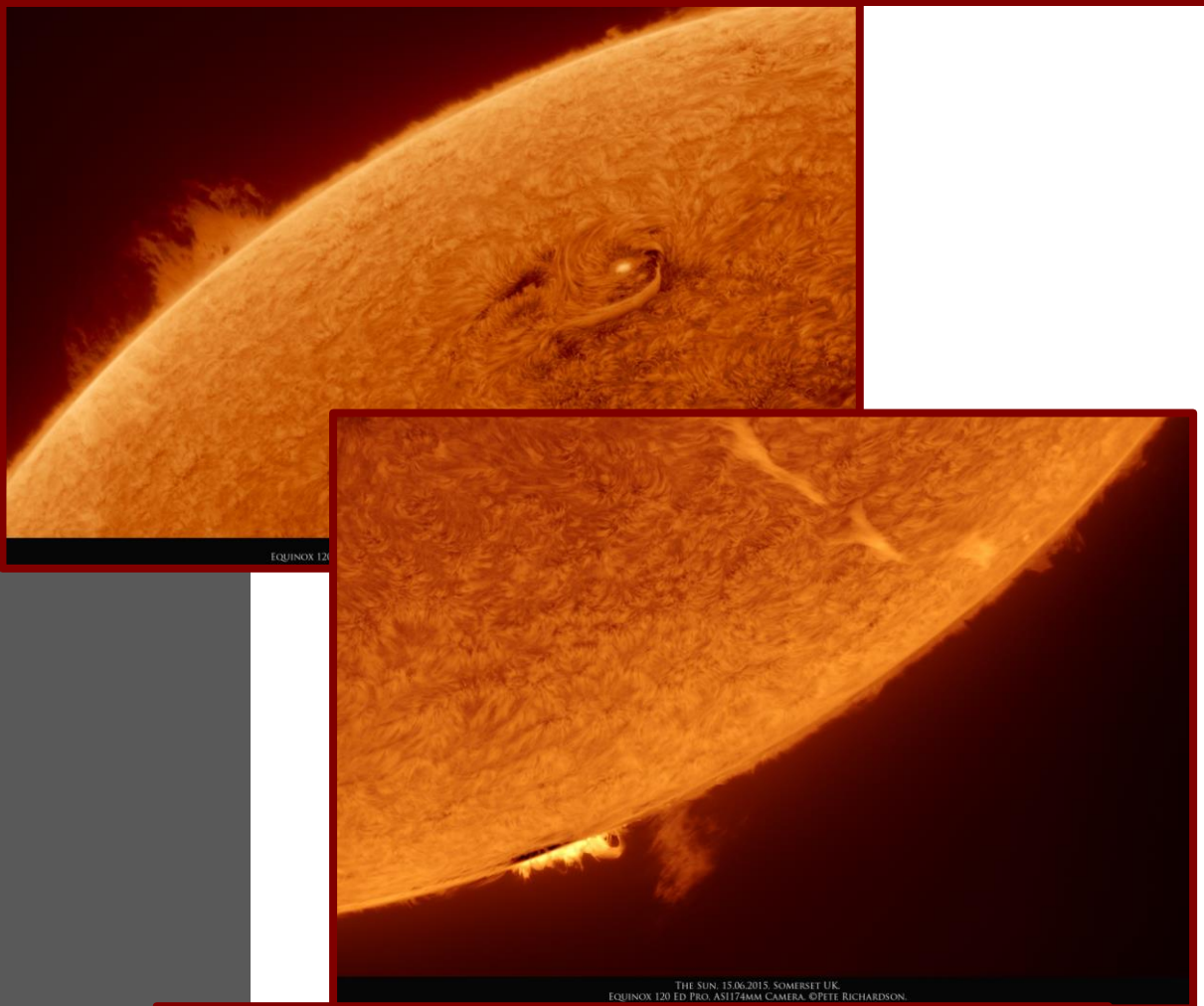
Once the above set up has been performed then the imaging process is similar to what would be used for capturing the planets. i.e., acquire target on sensor, focus, set gain and exposure to achieve an onscreen image which is neither too bright (over-exposed) or too dim. Capture AVI or SER files approx. 1 - 2 minutes in length. One area the capture process does differ to planetary imaging though is that no other filters are used to achieve colour images. The hydrogen alpha filter in the Quark negates the use of RGB filters as would be used in planetary imaging with a mono camera. Instead colour is applied at the image processing stage. I use Firecapture for image acquisition and currently an ASI174mm mono camera from ZW Optical. It is worth noting that the Quark has a built in 4.3 x telecentric Barlow and this can produce a small high magnification image if used with a higher focal length scope. In this instance it is worth using a focal reducer between the Quark and camera to reduce the focal length and increase the field of view.

The ASI174 fortunately has a large sensor for a planetary camera so this is a benefit when using in conjunction with the Quark as when combined with my refractor (900mm FL) it can still achieve a nice field of view without the need of the reducer.

Also, as for planetary imaging, the astronomical seeing conditions play a vital role in achieving sharp views, so looking for signs which favour better seeing is a key part to achieving the best images.

Overall my impressions of this filter are very favourable. I believe the quality to be outstanding for the money and the images it can produce are easily as good as dedicated hydrogen alpha scopes in my opinion, all for a fraction of the cost. I would thoroughly recommend the Daystar Quark for anyone interested in imaging or viewing the sun.

The images below are recent captures and provide the viewer with some idea of the sort of images that can be obtained with the Quark Chromosphere.



**Figure 5** - Images taken with the Daystar Quark Chromosphere.



**Venus and Jupiter Conjunction**  
2015 June 29, 30 and 2015 July 1  
Canon EOS 550D  
Taken by: Keston Brill



## Monthly Meetings and Forthcoming Events:

- 7<sup>th</sup> August 2015  
Annual Starbeque - Please bring Food and Drink.
- 4th September 2015  
To The Stars and Sun & Let's Talk Telescope - Alex Richardson will give a short talk followed by a talk by John Parratt.
- 11<sup>th</sup> September 2015 - Workshop - How to use your Telescope  
Call Angela on 01884 243186 to book your place.
- 2<sup>nd</sup> October 2015 - Meteorites and Us - Ron Westmass  
A Brief look at the History, Nature and effects of Rocks from Space.

Reminder that Subs will be due on your return after the summer break.

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Submissions for the next newsletter to be received by 31<sup>st</sup> March 2015 to either of the editors email address.

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