DAYSTAR QUARK CHROMOSPHERE "EYEPIECE" FILTER

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Daystar Quark "eyepieces" are designed for use on F/4 to F/9 refractors. An integrated 4.3X telecentric Barlow results in a F/17 to F/38 focal ratio (respectively). Quark Filters must use a power supply that heats the etalon to regulate the wavelength output[1].

Figure 1- Daystar Quark "eyepieces".

When the etalon reaches the appropriate temperature (5 to 15 min) the Led light turns green. The filter wavelength can be adjusted by turning a knob clockwise or counter clockwise. If the knob is turned counter clockwise the wavelength varies 0.5 Å[2] towards the blue wing, it turned clockwise it varies 0.5 Å towards the red wing[3].

Daystar "eyepiece" filters can be used with refractors up to 80 mm aperture without any further filtration. For refractors up to 120 mm aperture a UV/IR filter must be used in front of the diagonal[4].

For better performance an Energy rejection filter (ERF) must be used in front of the main objective. This prevents heat from entering the telescope and it is the safest option (Figure 5).

[1] The USB power source must be rated for 1.5 amps at 5 volts. Cell phone power banks can also be used.
[2] Each click of the knob corresponds to 0.1 Å.
[3] For Every adjustment of the knob the filter must settle in temperature for approximately 5-10 minutes.
[4] The UV/IR cut filter reflects UV and IR light back out the front of the telescope, reducing temperature inside the filter. Telescopes with dedicated field-flatteners or Petzval lenses can be used with the Daystar Quark only when a ERF is fitted in front of the objective.

Daystar Quark “eyepiece” filter specifications (Quark Chromosphere model)[5]:

- Best performance with F/4 - F/8 refractors
- 1.25" or 2.0" combo eyepiece snouts with safety indent slot directly into your diagonal
- Standard 1.25 eyepiece drawtube output with optional 2" and SCT accessories available
- Brass compression ring
- USB power, 5 V 1.5 A (Includes 90-240 V AC wall adapter with international plug adapters)
- Tuning knob allows wing shifting +/- 0.5 Å (each click of the knob 0.1 Å)
- LED indicator for power, warming, ready, fault
- Optional 8-hour battery pack available
- Integrated, fully baffled 2 element telecentric 4.3X Barlow optimized for 656 nm
- Integrated 12 mm blocking filter
- 21 mm clear filter aperture
- Full disk viewing possible on refractors up to ~450 mm focal length refractors
- No aperture limitations. May be used on larger refractors for higher magnification views (needs ERF filter in front of lens)
- The 2" adapter on the telescope side can be removed. than you have a female M48x0.75 thread
- Not suited for off-axis application
- 5-year warranty from Daystar

DAYSTAR QUARK types (Figure 1):

- Original Hydrogen Alpha “eyepiece” filter (Chromosphere and Prominence) (Figures 2, 3 & 4)
- Combo Quark (best performance with F/15 to F/30 refractors)
- Questar Quark
- Camera Quark
- Spotting Scope Quark
- Sodium D-line Quark
- Magnesium I Quark
- Calcium Quark

Solar Herschel wedges or frontal white light filters should not be used with the Quark filters[6].

Using the Daystar Quark is very simple (Figure 2). The light enters the blocking filter first. A telecentric Barlow lens produces a parallel light beam. Light then reaches the Etalon that should be heated to 100-150 ^{o}F (37 to 66 ^{o}C) for optimal performance.

When using the Daystar Quark visually, Plössl eyepieces are the best option. Best results were obtained with 32 to 40 mm Plössls. Zoom eyepieces, TV Naglers , Radians, Ethos, Panoptic do not perform well with the Quark.

For imaging any CCD or CMOS camera can be used. A focal reducer can also be used in front of the camera 1.25” adapter[7].

[5] http://daystarfilters.com/
[6] The use of Herschel wedges and frontal filters will result in a very dark solar image.
[7] Youtube videos: https://youtu.be/K4ftWrJtZec https://youtu.be/fALzPorP1uY

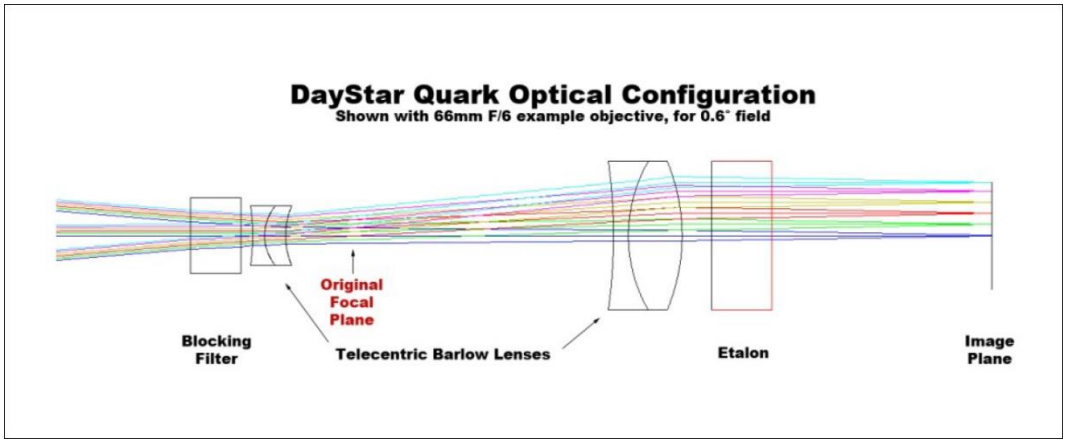

Figure 2- Daystar Quark Optical configuration.

Figure 3- Daystar Quark Chromosphere “eyepiece” filter.

Figure 4- Daystar Quark Prominence “eyepiece” filter.

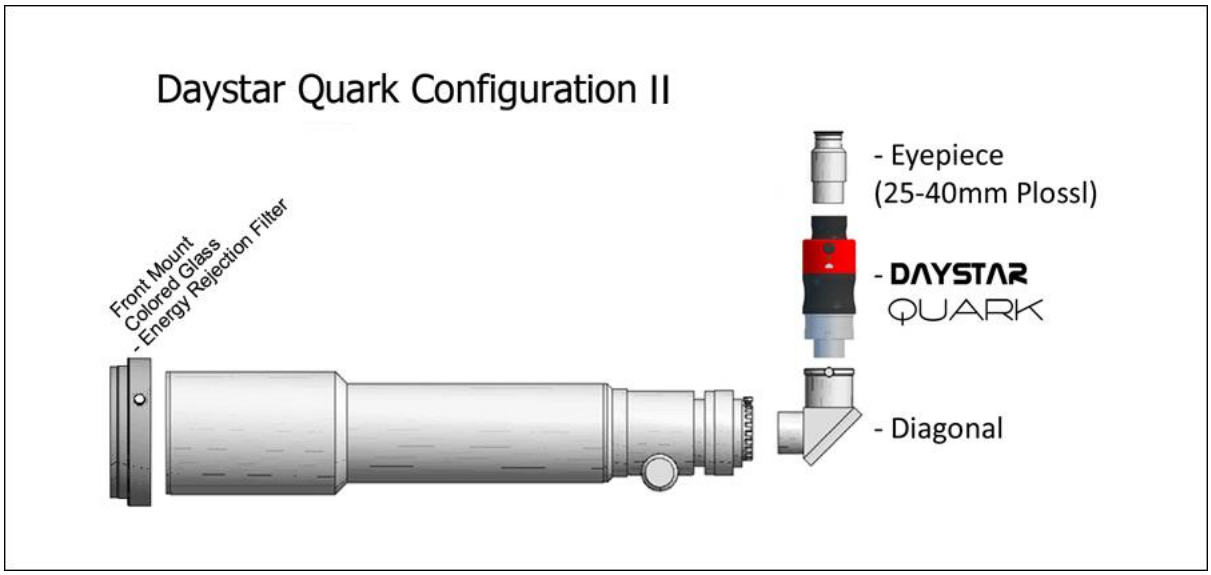

Figure 5- Daystar Quark Configuration for visual observation (>120 mm refractors).

Figure 6- Takahashi FS60C F/5.9, Sky-Watcher SolarQuest Mount | Daystar Quark Chromosphere, 32 mm Plössl eyepiece (Setup for visual observation).

Figure 7- Takahashi FS60C F/5.9, Sky-Watcher SolarQuest Mount | Daystar Quark Chromosphere (cell-phone powerbank), 32 mm Plössl eyepiece (Setup for visual observation).

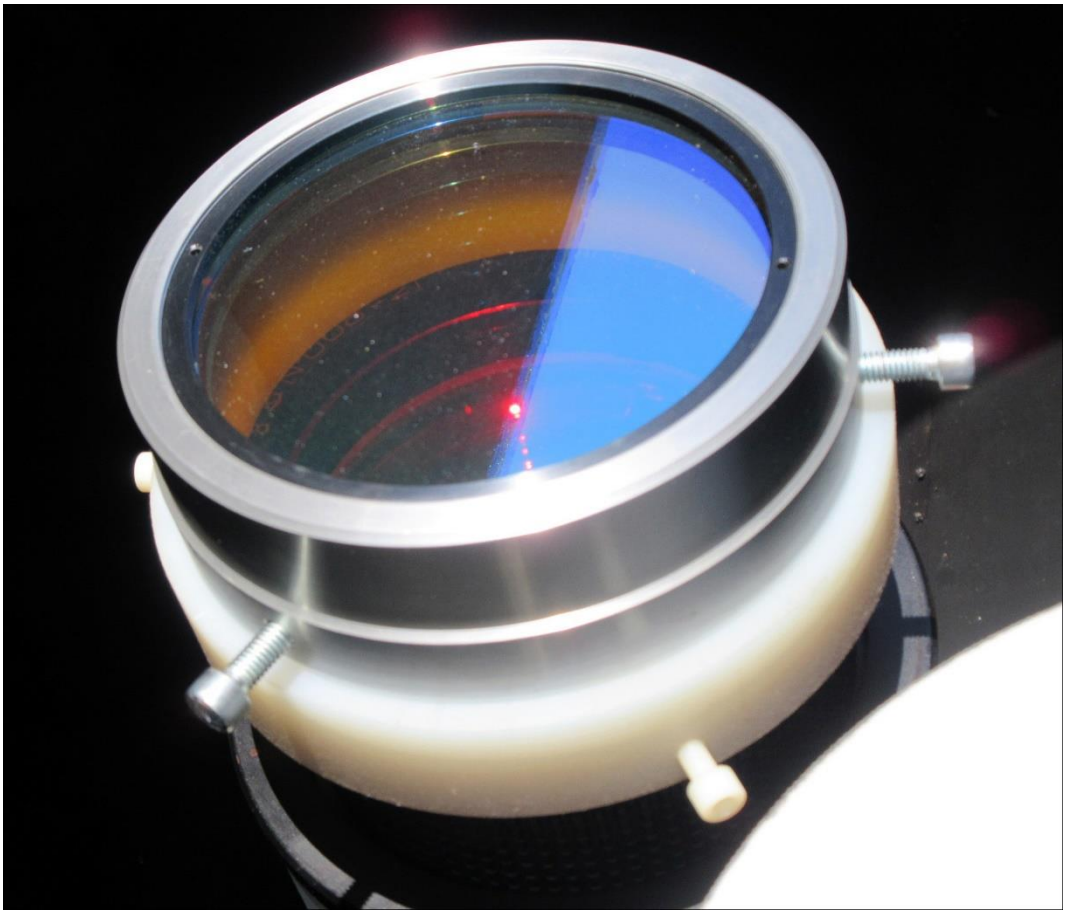

Figure 8- Baader 110 mm ERF | TMB100 mm F/8.

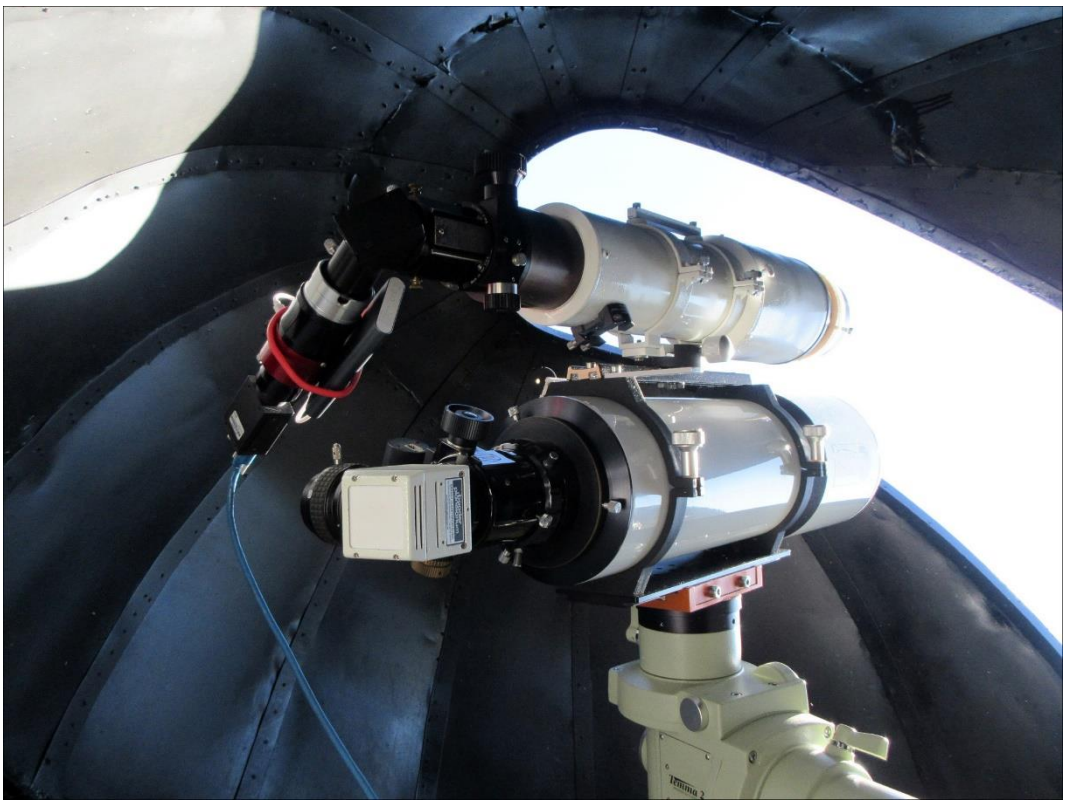

Figure 9- TMB100 mm F/8, Daystar Quark Chromosphere.

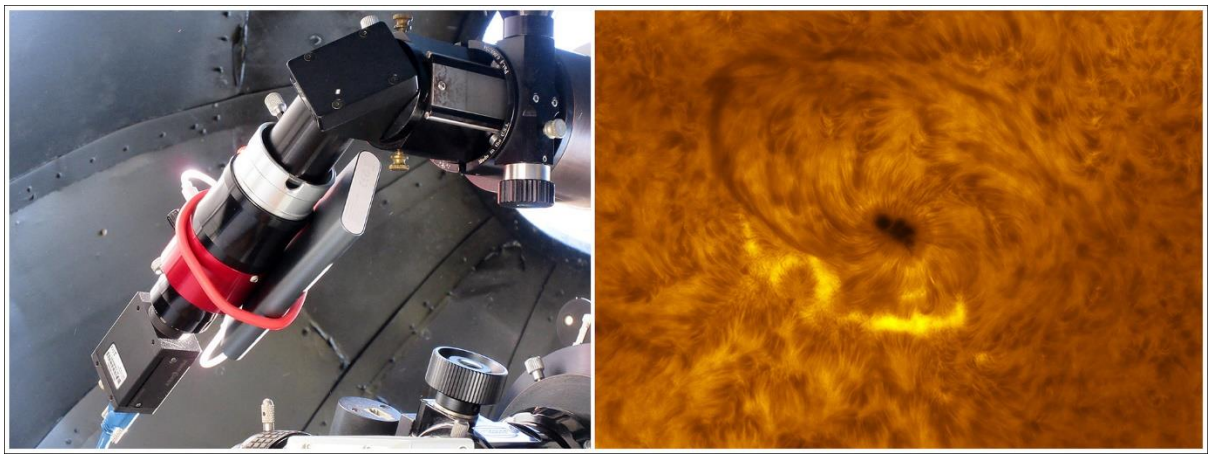

Figure 10- TMB100 mm F/8, Daystar Quark Chromosphere.

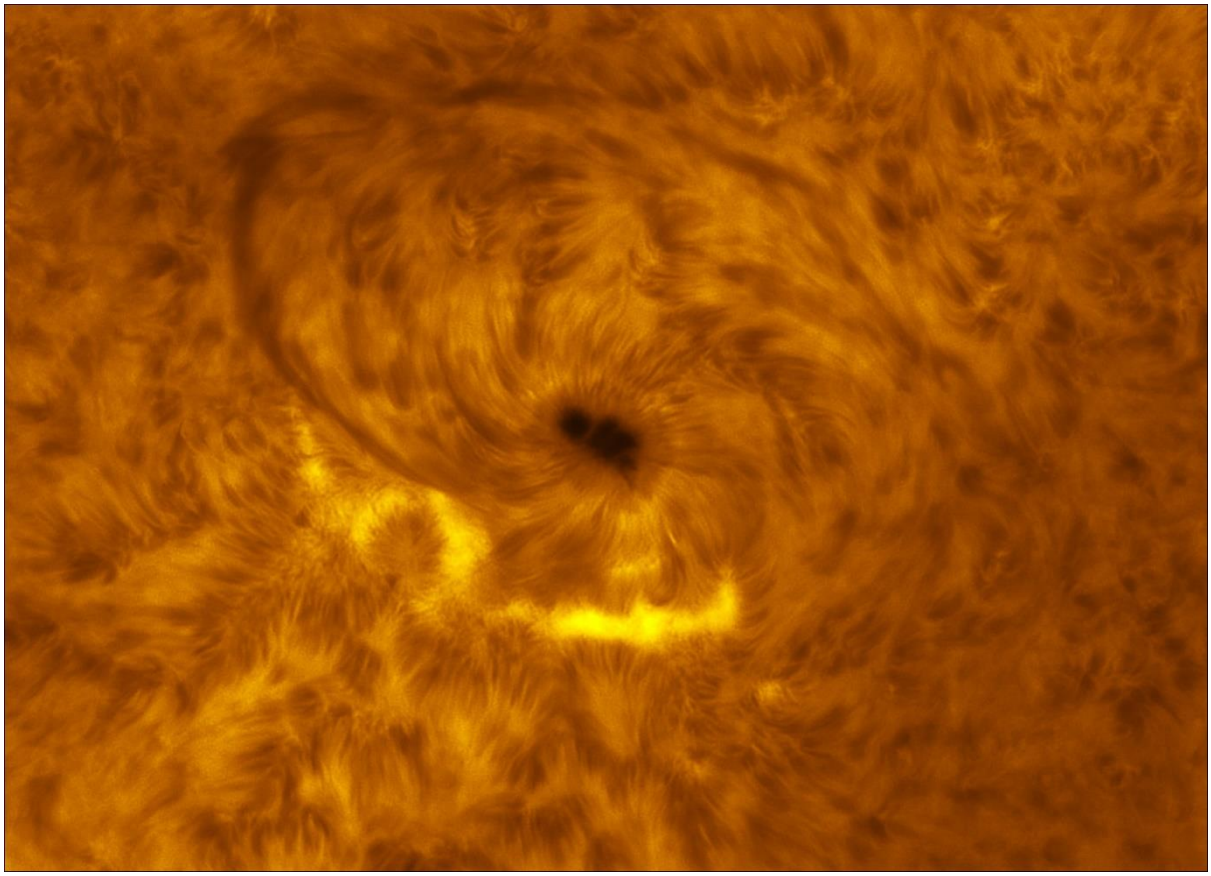

Figure 11- SUN (20190511) HR H-alpha. TMB100 F/8. Quark Chromosphere (first light). PGR GRASSHOPPER 3 GS3-U3-28S4M.