

MLAstro SHG 700 Spectroheliograph | First Light Optics

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MLAstro SHG 700 Spectroheliograph £999

★★★★★ (1 Review)

✓ 2 year warranty

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MLAstro SHG 700 Spectroheliograph

Updated - any units supplied after 1st June 2025 now include a protective Aluminium case.

The Spectroheliograph isn't a new invention—it's one of the oldest methods of observing the Sun in narrow bands. George Ellery Hale and Henri-Alexandre Deslandres independently developed it in the 1890s, and Robert R. McMath improved it in 1932 to capture motion pictures. Thanks to recent advancements in software and hardware pioneered by Christian Buil, Valerie Desnoux, and others, the Spectroheliograph has now entered the digital era. Image acquisition and reconstruction are done digitally with the help of specialised software.

Here's how it works: A slit is used to capture a small slice of sunlight. This light passes through a collimator, which turns it into parallel rays. These rays then hit a diffraction grating, which spreads the light into a spectrum. A lens refocuses the spread beam onto a camera sensor. By adjusting the tilt of the grating, you can choose which part of the spectrum is focused on the sensor, allowing you to observe the Sun in different wavelengths (such as H-alpha, Sodium D, Helium D3, or Ca K).

The Sun's details and contrast are captured in slices, recorded as a video while the mount slowly slews, causing the Sun's image to "scan" through the slit. Specialised software then reconstructs the full image of the Sun from this video data.

Each kit comes fully assembled and calibrated, with all the necessary optical components, ready for immediate use with your telescope. However, there are two additional components you may need to complete your setup:

A T2 (M42) to 1.25" adapter connects the camera to the SHG.

A 1.25" to M42 nosepiece for attaching the SHG to your telescope.

Any standard accessories of these types will work, so if you already have them, there's no need to purchase more. We offer these accessories at a very reasonable price if you don't.

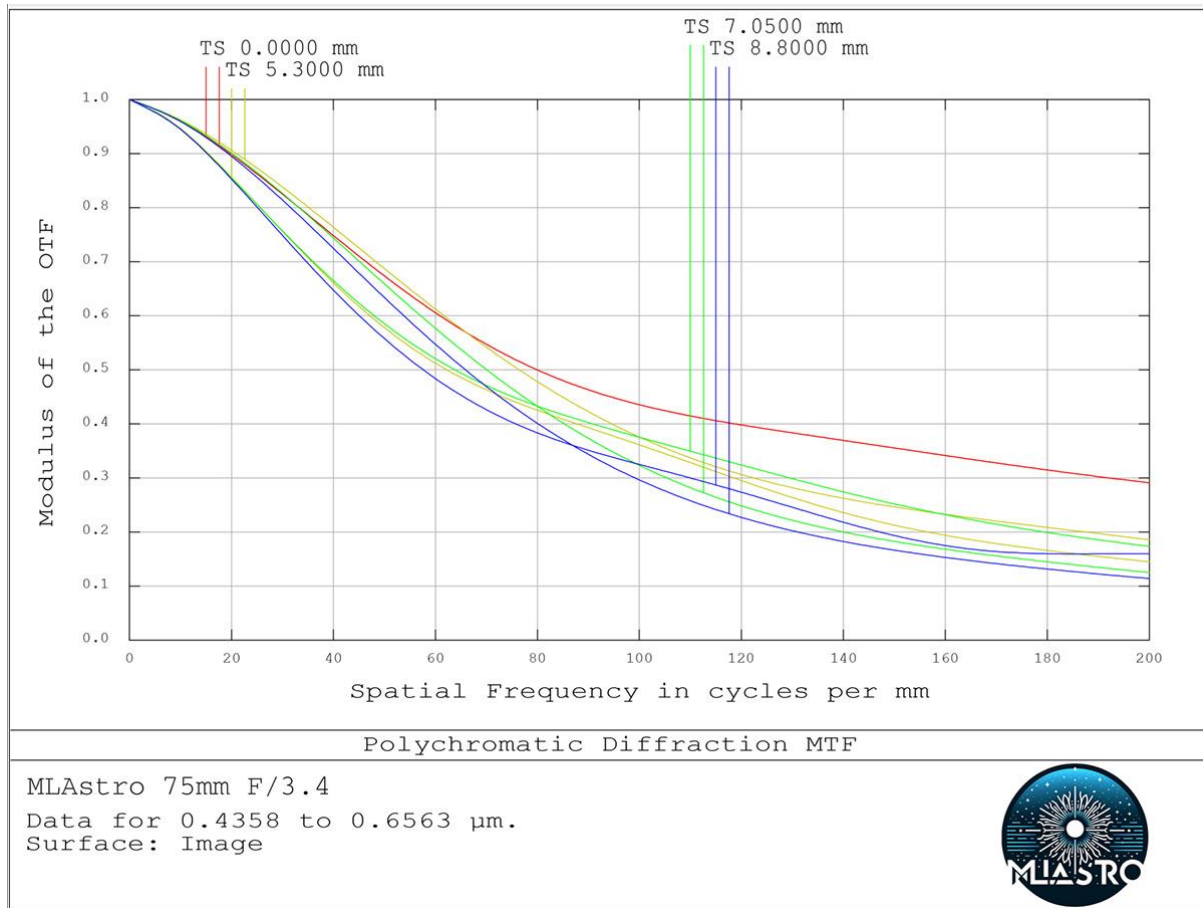
The detailed information for our SHG 700 is as follows (Click on the links below to learn more about the respective items/optical kit in detail):

MLAstro SHG with SHG 700 Optical Kit

This option includes:

2x MLastrO 75mm flat-field compound lenses

The state-of-the-art compound lens has been meticulously engineered for spectroheliographs, ensuring optimal performance in solar observation. Featuring precisely crafted six elements, this lens achieves an ideal flat field, significantly reducing optical aberrations and minimising field curvature on a field up to 16mm in diameter, more than enough to accommodate the 12mm long slit and support scope up to 1300mm in focal length.



1x 2400 l/mm, 25x25x6mm holographic grating

The grating is carefully crafted to ensure the best possible performance over the visible range.

Important Notice:

Do not touch the grating's coated surface. Any fingerprints on the surface will render it unusable, and the grating will be discarded. The coated surface is extremely fragile and can be damaged literally by blowing on it the wrong way. To remove dust, use only a bulb blower—do not blow directly on the surface or use any other cleaning methods. Small dust particles will not affect the grating's performance.

Always handle the grating by the edges and place it with the coated surface facing up. For extended storage, it is highly recommended that you use the original case and keep it in a humidity-controlled environment (under 60% RH).

1x 7mm long, 7-micron wide Quartz slit

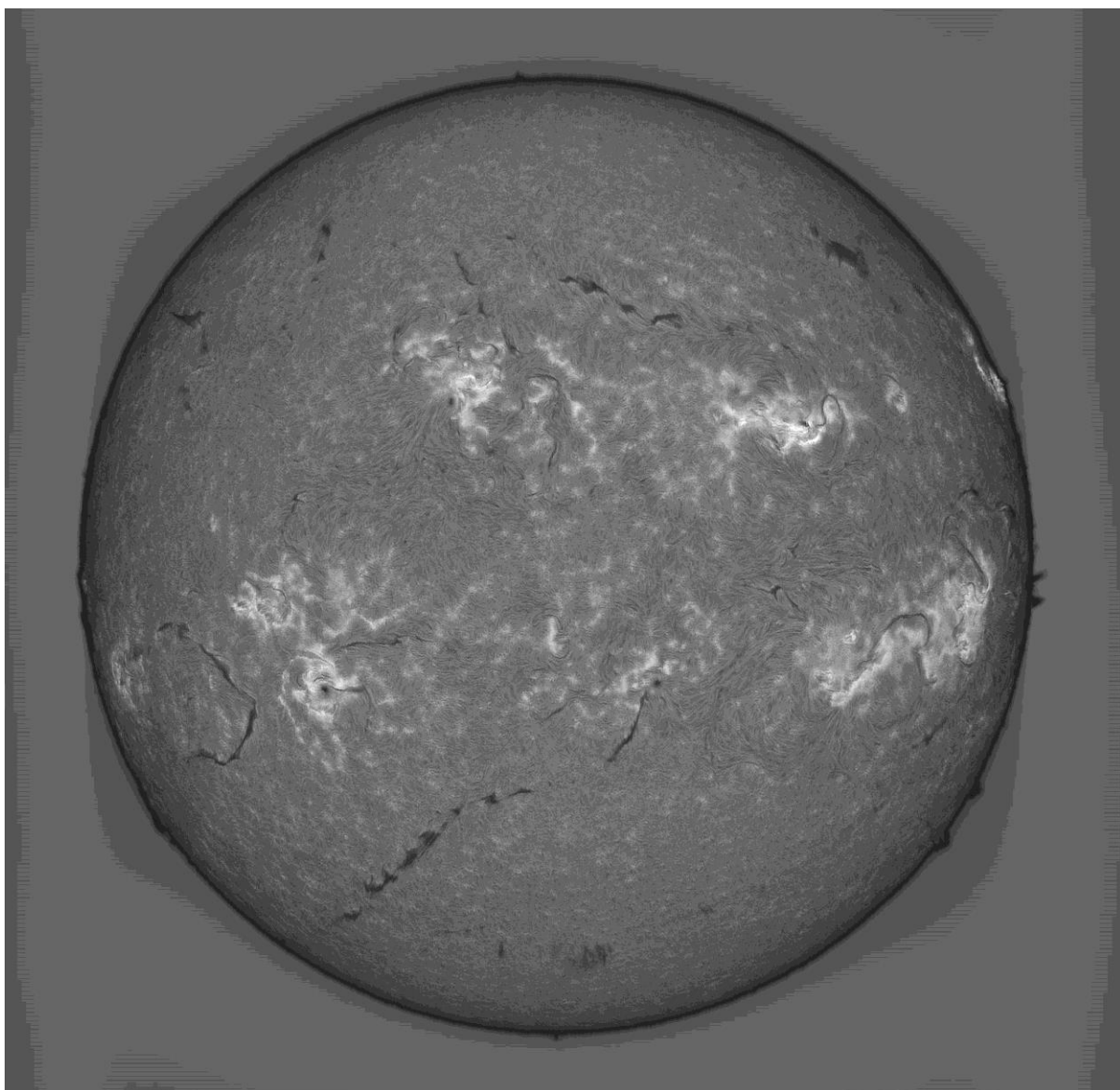
One of the most critical factors for slits used in an SHG (Spectroheliograph) is edge smoothness. Even the smallest edge defect or dust particle on the slit can manifest as a vertical transverse line in the spectral spread, becoming highly visible despite the defect being extremely small—sometimes just a few percent of the slit width and sub-micron in size. This makes producing a high-quality slit an exceptionally challenging process.

To achieve the necessary precision, we utilise a lithography process, the same technology used in microchip manufacturing, to etch the slit on a specially coated surface. The result is an ultra-high-quality slit with unparalleled edge smoothness, ensuring minimal visual artefacts in your spectral data.

The MLAstro slit is crafted with a special Quartz substrate and a unique coating process explicitly designed for solar use. Unlike competitors' slits—repurposed from nighttime astronomy and made with lime-soda glass that expands and cracks under heat—our Quartz slit has a much lower expansion coefficient, making it highly resistant to the Sun's heat. The thick coating also provides a higher OD7 blocking rating, offering 100 times better blocking than the competitor's offer.

The MLAstro Quartz slit is precision-engineered, with a surface figure polished to $\lambda/4$ or better. This stringent specification is essential to preserve the integrity of the wavefront passing through the slit, minimising distortions that could degrade image sharpness and resolution. Unlike slits commonly used in spectrographs or laser systems, which often lack this level of precision, our design ensures optimal performance in solar imaging applications, where any deviation in wavefront accuracy can significantly impact the final image quality.

This configuration enables full disk scans with telescopes of up to 730mm focal length in one pass, providing sharp images from pole to pole across the entire field of view.



A 4 subs stack from a 600mm FL scope taken with MLAstro SHG 700

Quick Start Guide - <https://www.youtube.com/watch?v=PzNdYl6nqho&t=2s>

Fine Tuning Guide - <https://youtu.be/pjHjXsvTSSI?si=29QdSltpgTd5Ux9W>

Image Processing Tutorial - <https://www.youtube.com/watch?v=7ulsH6fF1EM>

MLAstro SHG 700 Spectroheliograph

22 May 2025 | **Robert**

This SHG is an absolutely fantastic little device. Inexpensive in Solar terms, it punches way above its weight in terms of the images it can produce. I have been imaging the Sun for over 10 years, but this is my first time with a Spectroheliograph. It took a couple of sessions for me to dial in the focus (x3) to my satisfaction and now I am producing some of the best full disk images of my life.

The instrument is very well built, and the micrometres are exceptionally smooth to adjust. The SHG700 comes pre-calibrated so you are close to focus from the start (don't move any settings until you are using it)

The ultranarrowband images it produces (I use JSol'ex software for this) have incredible contrast and put my Lunt 60mm to shame 😊 It's a full disc device so you are not going to get the Hi-Res close ups that you get from larger Ha scopes and you need decent seeing to get the best out of it.

I am using mine with a Skywatcher ED80 and a ZWO ASI678MM camera.

MLAstro have some great videos to get you up and running and I thoroughly recommend watching them a few times before your first session. I had some queries after my first attempts and MLAstro were very quick and helpful to answer me, Minh's tech support is 2nd to none