

It's a great device to have in your imaging toolbox and – with its 150° CCTV lens – it's a lot of fun to use too

FIRST **light**

ZWO ASI120MM monochrome camera

A Solar System sleuth, deep-sky surveyor and all-sky monitor rolled into one

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VITAL STATS

- **Price** €299
- **Sensor** 0.33-inch CMOS MT9M034, 1280x960 useable 3.75µm pixels, 12-bit ADC output
- **Exposure** 64 microseconds to 1,000 seconds
- **Size** 62x28mm
- **Weight** 100g
- **Supplier** Teleskop Service
- **www**.teleskop-express.de
- **Tel** +49 (0)89 1892870

The ZWO ASI120MM is a high frame rate monochrome camera, one of a growing band that permits both Solar System and deep-sky astrophotography. With it you can image the Sun, the Moon and bright planets as well as nebulae, galaxies and clusters. It is based around a 0.33-inch CMOS MT9M034 sensor, which has a native chip resolution of 1280x960 pixels (1.2 megapixels). For Solar System work, the camera can operate at up to 215 frames per second (fps), albeit at the significantly reduced resolution setting of 320x240 pixels. At full-resolution, the frame rate drops to 35fps.

The camera can be set to deliver images at many different resolutions. It does this by defining a 'region of interest' rectangle on the main sensor. Pixels outside of the rectangle are ignored and the camera's data transfer requirements are lessened. Using a region of interest means that a smaller than maximum view is captured.

To set up the camera, you'll need to visit the ZWO website – the ASI120MM ships without control software or drivers. The software download also includes a rudimentary capture program, which we found a bit primitive for serious imaging. However, the camera supports third-party programs including the excellent freeware FireCapture and SharpCap. Both are very competent, but we did encounter some freezing issues using the ASI120MM with FireCapture. Our main tests were carried out using SharpCap.

Ready to go

So long as you have internet access, setup is pretty painless and we were up and running in no time. After connecting the camera to our laptop for the first time we were startled to see ourselves on the computer screen – the ASI120MM comes with its own wide-angle (150°), 2.1mm focal length CCTV lens pre-fitted. The excellent camera sensitivity is a ▶

A CAMERA FOR MANY OCCASIONS

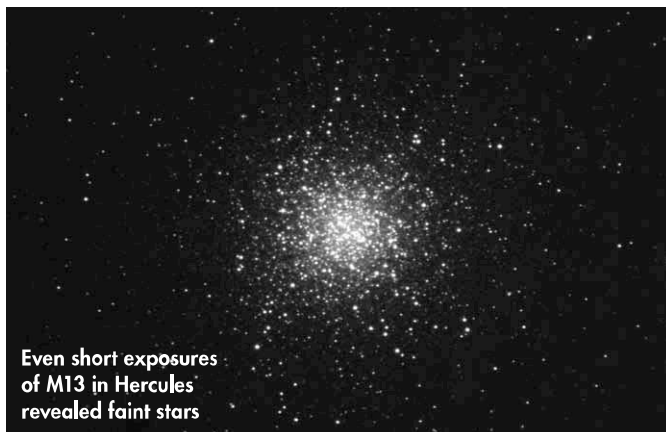
What really impressed us about this camera was its flexibility. It is able to make excellent Solar System captures and head off into deep space to collect shots of all manner of deep-sky objects as well. Being able to do this without having to swap cameras is fantastic.

Then there's the array of capture resolutions, which range from 1280x960 down to 320x240.

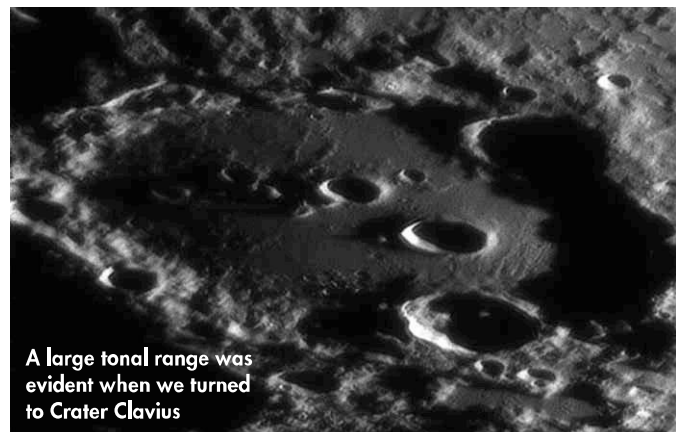
The full resolution can even be 2x2 'binned' to effectively quadruple the sensitivity of the camera, albeit by reducing the resolution to 640x480. More data is generated at higher resolutions, so higher frame rates are only achievable when the resolution is lowered.

As if being able to switch between Solar System and deep-sky imaging wasn't enough,

whipping the camera out of the telescope and fitting it with the supplied 150° lens turns it into a very effective all-sky camera. So, if you fancy videoing a meteor shower, or the ISS travelling across the sky, the ASI120MM can do that too. If you have an observatory, this also gives you an excellent way to monitor sky conditions.



Even short exposures of M13 in Hercules revealed faint stars



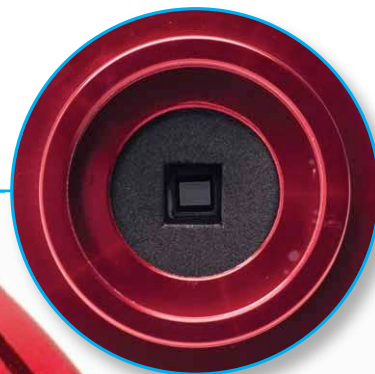
A large tonal range was evident when we turned to Crater Clavius

BODY AND TRIPOD THREAD

The camera body is made of aluminium. The front opening is 2 inches in diameter and allows direct coupling to a 2-inch eyepiece holder, while a female T-thread lets you screw in components such as the supplied 2.1mm wide-angle lens or 1.25-inch eyepiece adaptor. The rear of the body has a 0.25-inch standard tripod thread and four M4 female threads.

SENSOR

The CMOS MT9M034 sensor has excellent quantum efficiency (the percentage of incoming photons recorded) across visual wavelengths. An impressive peak quantum efficiency of 75 per cent at 520nm (green) drops off to just over 50 per cent at the hydrogen-alpha wavelength, the predominant light given off by emission nebulae.



USB PORT

The camera operates off a standard USB 2.0 port. This is the only connection that has to be made, as operating power is drawn directly from the port itself. A 1.8m USB cable is included in the box. The camera can also be used for autoguiding, but lacks a dedicated port for this.



FIRST light



2.1MM LENS

A simple yet very effective addition to the camera package is the 2.1mm focal length, wide-angle CCTV lens. It has a T-threaded body, which screws directly into the front opening of the camera. The lens gives a 150° view, great for meteor showers.

► good match for this lens, and even with a bright Moon in the sky we could see many stars and follow faint satellites with ease. The camera body is T-threaded and it's a simple job to swap the pre-fitted lens for the telescope adaptor or to leave the front aperture open. The external diameter of the aperture barrel is 2 inches, allowing it to be slid directly into a standard 2-inch fit eyepiece holder.

Fighting weeks of cloud, our clear test nights suffered from generally poor seeing. However, the purpose of a high frame rate camera is to try and overcome such issues, so we aimed our scope at the Moon nevertheless. The camera actually did a very good job both at 1280x960-35fps and the faster 640x480-113fps setting. Fine detail was visible in Crater Alphonsus under high illumination. The dark pyroclastic fire-fountain markings stood out well, as did a thin sinuous rille running close to the crater rim. Our shot of dark and moody Crater Clavius, meanwhile, was full of fine detail and good tonal variation. Overall we were very impressed with the camera's Solar System imaging capabilities.

The ASI120MM has an exposure range from 64 microseconds up to 1,000 seconds (16.67 minutes), opening up the possibility of deep-sky imaging. Now, this isn't going to compete with a dedicated 16-bit-plus cooled astronomical CCD camera, but the ASI120MM didn't do a bad job here either. It was also pretty simple to set up and operate. We gave it a trial run on several enduring favourites, including globular cluster M13 in Hercules. The results were



SKY SAYS...
Now add these:

1. RegiStax stacking software
2. FireCapture image acquisition software
3. SharpCap image acquisition software

INFRARED BLOCKING FILTER

ZWO has included everything you need to get you imaging, except a computer and control software. A nice touch is the inclusion of a separate infrared blocking filter, designed to screw into the front of the 1.25-inch adaptor barrel. A filter like this can, in some circumstances, improve the fidelity of a capture.

crisp and revealed plenty of faint stars even when using relatively short exposures. A degree of noise was evident from the non-actively cooled sensor, but this was easy to calibrate out during image processing using a dark frame.

The ASI120MM is a very sensitive, flexible and capable camera. It's an ideal beginner camera, whether you are interested in Solar System or deep-sky imaging, as it allows you to test the water in both camps. For seasoned imagers, it's a great device to have in your imaging toolbox and – with its 150° CCTV lens – it's a lot of fun to use too. For the price, it is an absolute bargain. 📸

VERDICT

BUILD AND DESIGN	★★★★★
CONNECTIVITY	★★★★★
EASE OF USE	★★★★★
FEATURES	★★★★★
IMAGING QUALITY	★★★★★
OVERALL	★★★★★



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