

TRIED & tested

We review well-established equipment that's stood the test of time

VITAL STATS

- **Price** £5,995 telescope only, £7,870 including Losmandy G-11 mount
- **Aperture** 12 inches
- **Optical design** hand-figured primary mirror corrected to one-eighth of a wavelength, 4.5-inch secondary mirror
- **Focal length** 1,140mm (f/3.8)
- **Focuser** Crayford-style Baader Steeltrack with 1:10 microfocuser
- **Weight** 28.1kg
- **Extras** Tube-rings, mounting plate
- **Supplier** Orion Optics
- **www.orionoptics.co.uk**
- **Tel** 01782 614200

SKY SAYS...

The fidelity was very impressive, with sharp stars visible right across our camera's frame

PAUL WHITFIELD X 3, MICHAEL SIDONIO X 2

Orion Optics AG12 12-inch astrograph

The shots from this cannon-sized scope will blow you away

WORDS: PETE LAWRENCE

The AG12 is a Newtonian astrograph, an instrument designed specifically for imaging stars and deep-sky objects. It has a generous 12-inch aperture, making it a veritable light bucket, and a focal length of 1,140mm – this a fast scope with a focal ratio of f/3.8.

The full AG series includes models with apertures ranging from 8 inches to 16 inches. All come with hand-figured primary mirrors, corrected to one-eighth of a wavelength. The primary and secondary mirrors have Hilux-enhanced aluminium coatings, offering 97 per cent reflectivity across most of the visible spectrum.

Reflectors are ideal if you want a large aperture instrument at relatively low cost, but they can suffer from poor off-axis performance, resulting in badly shaped stars towards the edge of the field of view. Orion Optics address this issue in the AG12 with a custom field flattener, the design of which is based on what's known as a Wynne Corrector – named after the huge 200-inch reflector on Mount Palomar in California that used such a device to provide a corrected wide-field view.

The corrected field flattener supplied with the AG12 is 180mm long, 85mm in diameter and weighs 1.3kg. It slides into the supplied Baader Steeltrack focuser, screwing securely into position. A custom adaptor, also supplied, allows you to connect the field flattener to a DSLR or cooled CCD camera. The AG12 can also be used visually without it.

Weighty beast

The scope arrived in a deconstructed state, so we had to do a bit of simple assembly to connect the primary mirror cell, secondary mirror and focuser to the sturdy carbon-fibre optical tube. Assembly was pretty straightforward and we soon had the scope sitting on our own Losmandy G-11 mount, chosen because the AG12 is also available as a package including this accessory. The optical tube attaches to the mount using a tube-ring cradle, supplied as standard.

Collimating the reflector was a relatively easy task, although having a second pair of hands is a great help here. The secondary mirror is held in place by three adjustment screws and is simple to orientate. The primary mirror is supported by a nine-point suspension unit and adjusted using three pairs of lockable bolts. There did seem to be a minor issue with the paint on the ring holding the primary in place within its cell – several small black specks of it had fallen on the mirror surface.

Three 12V cooling fans on the base of the mirror cell help to rapidly bring the scope to observing temperature. A heating band is also built into the carbon-fibre tube to help keep dew from forming on the primary mirror. A 315mm extension tube is provided as well; it's fitted to ▶



OWNER'S OBSERVATIONS

Name Michael Sidonio
Location Canberra, Australia
Equipment Orion Optics AG12 Newtonian astrograph
Owner since March 2011

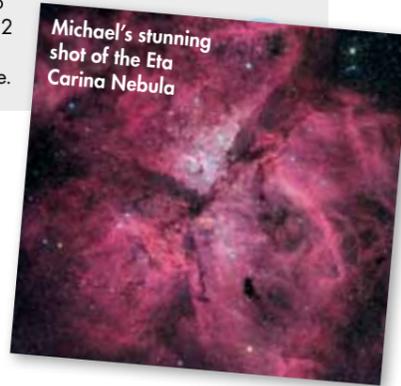
I like to be able to tackle wide fields to image larger nebulae and star clusters, but I also like to be able to capture fine details in galaxies and planetary nebulae if I choose.

Over the past 18 months the AG12 has proved to be a reliable and versatile instrument. With my large FLI PL16803 CCD chip I have a whopping 2.6° diagonal field of view at an ideal image scale of 1.6 inches per pixel, so I can take both wide-field and

high-resolution images. Because this is a fast astrograph, I have found that in exposures collected in half a single clear night I can go as deep as the largest Schmidt-Cassegrain telescopes at professional observatories did just a generation ago, while the focal length and resulting resolution is more than sufficient to reveal fine details in distant galaxies. This versatility has revolutionised my imaging and has made me very happy.

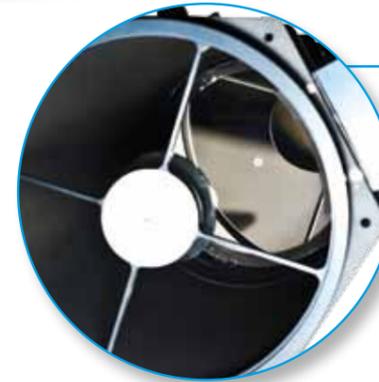
The scope is beautifully constructed, easy to collimate and considering its aperture is very portable. To me the AG12 truly is a dream scope.

Michael's stunning shot of the Eta Carina Nebula



PRIMARY MIRROR

The 12-inch parabolic primary mirror is hand-figured to an accuracy of one-eighth of a wavelength or better. As is the case with the flat secondary mirror, this mirror is Hilux-coated to give up to 25 per cent better reflectivity than conventional coatings.



MIRROR CELL

The primary mirror cell provides a strong, adjustable support for the main mirror. The mirror itself is held in place by a nine-point suspension cell, which balances the weight of the mirror better than a conventional three-point cell, providing results that are better defined. Collimation is performed using three pairs of adjustment screws at the rear of the cell.



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FOCUSER

The mechanism of the supplied Baader Steeltrack focuser is based on the Crayford design and provides smooth focusing action throughout its 115mm of travel. A 1:10 fine-focus mechanism is provided, as well as a locking screw.

TELESCOPE TUBE

The AG12's optical tube is made from a carbon-fibre sandwiched material and provides a strong support for the telescope's optical components. This choice of material removes focus problems caused by thermal expansion and is virtually flex free. The inside of the tube is matt black, reducing internal reflections.



The AG12 captured the majesty of the Orion Nebula in a single shot exposed for the core only



CORRECTED FIELD FLATTENER

The corrected field flattener is an optical device designed to compensate for the aberrations inherent in the reflector design. It works with both DSLRs and cooled astronomical CCD cameras.

With its 12-inch aperture, the AG12 can really pull in a lot of light quickly. We couldn't resist using it on a couple of popular nebulae, including the Orion Nebula and its close neighbour, the delightful Running Man Nebula. These bright objects pose no problem for the AG12, but we were nonetheless impressed by the amazing amount of peripheral nebulosity brought out from a single 18-second DSLR exposure originally set to record just the core of the Orion Nebula.

With rich star colours in the heart of clusters like M35, the superb corrected field flattener appears to produce no noticeable chromatic aberration. Weighty though it is, the AG12 is a superb deep-sky imaging platform with impressive optical performance. On a heavy-duty permanent observatory mount, it represents a tough act to follow. **S**

SKY SAYS...

Now add these:

1. Dew shield
2. FLI Atlas digital focuser
3. FLI ProLine cooled CCD camera

► the main tube to further reduce the likelihood of internal dewing. The scope is heavy – it appears to be fractionally over the limit of the Losmandy G-11's 27.2kg stated instrument weight capacity. Our measurements put the assembled telescope, including tube rings and the corrected field flattener, at 28.1kg. Attaching a camera, guide scope and finder would all add additional weight. After some careful balancing to secure our own DSLR and guide scope, we focused the AG12 and started imaging. The field around open cluster M35 in Gemini gave us a good spread of stars right to the corner of our DSLR's sensor. The fidelity was also very impressive, with sharp stars visible right across the frame.

VERDICT	
BUILD AND DESIGN	★★★★★
EASE OF USE	★★★★★
FEATURES	★★★★★
IMAGING QUALITY	★★★★★
OPTICS	★★★★★
OVERALL	★★★★★