

REVIEWED

StellaLyra 250mm, f/5 Dobsonian

The light-bucket with a touch of class

First Light Optics' StellaLyra-branded fleet of Dobsonian telescopes combine high-performance with some excellent accessories, writes **Ade Ashford**.

◀ First Light Optics' StellaLyra 250mm, f/5 Dobsonian, in its gorgeous black finish, tips the scales at 29 kilograms. Image: FLO.



At a glance

Model: StellaLyra 250mm, f/5 Dobsonian

Optical design: Newtonian reflector

Clear aperture: 246mm (measured)

Focal length: 1,250mm

Focal ratio: f/5

Focuser: 2-inch dual-speed Crayford, 42mm travel

Mount: Dobsonian with dual-axis tension clutch control

Finderscope: Right-angled, erect image 8 × 50

Eyepiece 1: 9mm, 1.25-inch 52-degree Super-Plössl, 6mm eye-relief

Eyepiece 2: 30mm, 2-inch 68-degree Superview, 22mm eye-relief

Accessories: 35mm, 2-inch extension tube; 2-inch to 1.25-inch eyepiece adaptor; 12V battery holder for the primary mirror's cooling fan

Tube dimensions: 303mm by 1,210mm (measured)

Mount dimensions: 640mm by 560mm (measured)

Tube weight: 16kg

Base weight: 13kg

Price: £649

Details: firstlightoptics.com/stellalyra-telescopes/

Based in Exeter, First Light Optics (FLO) sells an impressive range of reflecting telescopes under its own StellaLyra brand. Encompassing Newtonian, classical Cassegrain and Ritchey–Chrétien optical configurations, these instruments are designed and manufactured for FLO by Guan Sheng Optical (GSO) in Taiwan – a company with a long-standing reputation for high-quality workmanship and innovative design.

For the most part, FLO's StellaLyra telescopes are sold as optical tubes and accessories but without mounts. The exception is their suite of 150 to 400mm (6- to 16-inch) Dobsonians, which contain everything that you need to observe straight out of the box. For the purposes of this evaluation we chose the model that sits squarely in the middle of the range, the ever-popular 250mm (10-inch), f/5.

With the exception of the largest StellaLyra Dobsonian, which is a 400mm truss-tube design, the range possesses one-piece rolled steel tubes. While this does mean that they may be a little heavier and more cumbersome than competing flex-tube or truss-type implementations, many people prefer the optical protection and rigidity afforded by a solid optical tube assembly that reduces the accumulation of dust on the mirrors (since the tube is sealed when not in use), improves contrast in heavily light-polluted environments, and helps keep dew at bay.

All StellaLyra Dobsonians of 200mm aperture and larger come with two fully multi-coated eyepieces and a large-aperture, right-angled, correct-image finderscope to save you from getting a cricked neck. Furthermore, the mounts of all but the 150mm aperture model possess deluxe altitude-axis bearings with tension and balance adjusters, plus a roller-bearing azimuth system, also with tension adjustment. These advanced features put the StellaLyra instruments squarely in premium-class Dobsonian territory.

Delivery and assembly

The StellaLyra 250mm model is couriered to your door in not one, but two boxes. The largest, containing the optical tube and accessories, is 49 × 50 × 141 centimetres in size, grossing 20 kilograms. The smaller box containing the Dobsonian mount in flatpack form is 64 × 64 × 14 centimetres and tips the scales at 15 kilograms. So it pays to have

▲ A closer look at the Crayford focuser. Image: FLO.

▼ The excellent 8 × 50, right-angled, right-way-up finderscope. Image: FLO.

an extra pair of hands to help you unpack and assemble the telescope. That said, the only part of the instrument requiring a modicum of DIY is the Dobsonian altazimuth base; the optical tube is pre-assembled with the exception of the altitude bearings, which I'll return to presently.

The review unit didn't come with any assembly instructions, but a quick check of the relevant page of First Light Optics' website revealed a downloadable PDF. If you're not prepared to consult the five-page PDF on your smartphone, it might be a good idea to ask FLO to ensure a paper copy is included. Fortunately, the assembly instructions are clear and easy to understand. Most of the mount itself is fairly standard Dobsonian fare in terms of construction materials, namely plastic-coated particleboard.

Owing to Mrs A's penchant for Scandinavian flat-pack furniture, I consider myself something of a wizard with an Allen key (supplied, though you'll need a cross-head screwdriver too). According

The StellaLyra suite of 150 to 400mm (6- to 16-inch) Dobsonians contains everything that you need to observe straight out of the box



to the stopwatch, I built the altazimuth base in 17 minutes and completed assembly in 25 minutes overall. Having built numerous Dobsonian bases over the years, I may have a bit of an advantage, so I would clear a large space in the living room and set aside at least 45 minutes to complete the task.

Mount refinements

As mentioned earlier, there are some refined features of the mount worthy of note. Unlike most budget Dobsonians, the azimuth bearing is not simply a base board with a central bolt and three pieces of slippery Teflon gliding against the underside of the mount. Rather, the 200mm-aperture-and-larger StellaLyra Dobsonians use a needle roller-bearing sandwiched between two 32-centimetre-diameter metal-bearing plates.

A tensioning knob (with its own small thrust bearing) threaded through a centre bushing joins the top baseplate, azimuth roller-bearing and ground baseplate. Hence, rather like a clutch, the tensioning knob can adjust the stiffness and freedom of motion left to right, which is a good thing as without it the azimuth axis is almost too smooth and the telescope revolves at the slightest touch!

On either side of the optical tube lie two lozenge-shaped face plates, each with graduated scales and milled channels containing captive bolts designed to accept the left and right altitude-bearing assemblies. Each bearing has a beefy clutch knob to adjust the freedom of motion and two

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bolts that, when unlocked with the supplied Allen key, permit the bearings to move towards or away from the primary mirror over a 63.5mm range.

By moving the altitude bearings fore or aft you can precisely balance the tube according to the weight of the eyepiece and accessories in use, the graduated scales on either side ensuring that the altitude axis is perpendicular to the tube. This is really important if you wish to use digital setting circles at a later date (see the end of this review for more about this). Each bearing assembly has a U-shaped alloy casting that merely slots into the top of the mount's side panels for quick deployment.

Despite the commendable altitude- and azimuth-axis enhancements, there are minor niggles. Since the size of the azimuth needle roller-bearing is 32 centimetres in diameter, why make the mount's baseplate 56 centimetres in diameter, which is harder to manoeuvre between door frames? Granted, the mount's side panels need to be braced and 36 centimetres apart to accommodate the tube and side bearings, but slimmer profile side panels would result in a more compact mount.

Without the azimuth-axis tensioning knob locked down firmly to prevent the tube spinning away from the object you're viewing at the slightest touch, there is some flexure here. That said, vibrations from a sharp rap to the tube dampened in two seconds with the mount standing on patio slabs. And while it's possible to balance the tube perfectly when horizontal, the tube pitches back when viewing at high altitudes owing to the relatively heavy finderscope; splitting the difference in the balance point and clamping the clutches alleviates this, but at the expense of some smoothness in altitude motion.

Impressions

If there's any truth to his "any colour – so long as it's black" quote, then American industrialist Henry Ford would've loved this telescope. Its 30.3-centimetre diameter, 1.21-metre long steel tube has an unobtrusive seam underneath and a gorgeous gloss powder coat finish (albeit something of a fingerprint magnet), with charcoal grey, Hammerite-finish, rounded end-rings both

▼ Looking down the tube of the 250mm StellaLyra Dobsonian, at the primary mirror and the four-vane support of the secondary mirror. Image: FLO.



top and bottom. The plastic coating of the mount's particleboard panels has a textured satin finish, with a carrying handle on the front brace and a metal holder for one 2-inch and three 1.25-inch eyepieces on the side.

The assembled telescope tips the scales at close to 29 kilograms, 16 kilograms of that being the tube assembly alone. Its length means that it can comfortably lie across the back seat of most cars, though the mount may prove to be the most awkward component when transporting it to a dark-sky site. Thankfully, the Dobsonian is very tolerant of being moved. In fact, the instrument was almost perfectly collimated straight out of the box, which speaks volumes for GSO's quality control and fine mirror-cell design.

The primary mirror consists of a BK7 glass mirror blank, 250mm in diameter with a clear aperture of 246mm, allowing for the chamfered edge. The primary is permanently centre-marked and sits on cork shims in the cell, with rubber grommets preventing any lateral or front-to-back flop. Around the circumference of the primary cell you find three spring-loaded, black hand-knobs for collimation, and three white hand-knobs to lock down the mirror after alignment is achieved. A mirror cooling fan operates from the 12V battery pack provided (AA cells extra).

At the other end of the tube, the four metal vanes of the secondary support are nicely tensioned and very thin (approximately 0.7mm) to minimise diffraction effects. The elliptical secondary mirror is also cemented to its holder to avoid any diffraction-inducing clips around its periphery.



▲ The StellaLyra's left altitude axis clutch and adjusters. By moving the altitude bearings fore or aft you can precisely balance the telescope. Image: Ade Ashford.

▼ On either side of the tube are lozenge-shaped face plates, each with graduated scales and milled channels containing captive bolts designed to accept the left and right altitude bearing assemblies. Each bearing has a beefy clutch knob to adjust the freedom of motion. Image: FLO.

However, GSO chose not to offset the secondary mirror to accommodate the relatively steep f/5 light cone from the primary mirror – not that it really makes any noticeable difference in a visual instrument such as this. Secondary collimation requires a Phillips screwdriver.

Smooth, precise and fully adjustable, the dual-speed CNC-machined Crayford focuser's drawtube has 42mm of travel and an etched millimetre scale for reproducing approximate focus on changing eyepieces. The 2-inch and 1.25-inch eyepiece adaptors have brass compression rings to securely hold your eyepieces without marring their barrels. Neither of the supplied oculars required the supplied 35mm extension tube to reach focus, although it will be useful for third-party eyepiece and Barlow combinations.

The bundled 1.25-inch format, 9mm Super-Plössl and 2-inch, 30mm Superview eyepieces are of surprisingly good quality. Both are multi-coated, threaded for filters and equipped with rubber eyecups; the 9mm delivers 139x magnification over a one-third of a degree field, while the 30mm provides a 1.6-degree field of view at 42x. Since the latter delivers a 5.9mm exit pupil, middle-aged and older observers might not see the full benefit of the aperture because of restricted pupil size, but the views will be as bright as they can possibly be. A wise future investment is a 2-inch, 2x Barlow lens to double-up the magnification of both eyepieces.

The dimensions of the StellaLyra 250mm Dobsonian mean that it's well suited to seated observation. With the tube horizontal, the eyepiece lies some 80 centimetres from the ground in an ergonomic 45-degree viewing orientation, rising to an eyepiece height of 1.23 metres when the telescope is pointed at the zenith. By turning the eyepiece of the 8x50 right-angled correct-image finderscope (which, incidentally, is of superb quality, delivering wide, sharp and contrasty views) such that it's parallel to the telescope's focuser, means that it's very convenient to move one's head the 20 centimetres between them.





Optical performance

I tested the StellaLyra 250mm Dobsonian on the Moon and Jupiter, plus a number of double stars and deep-sky objects from a suburban back garden where light pollution permits views of the Milky Way's brighter portions on moonless nights of good transparency. The telescope cooled down quite quickly, though mild night-time temperatures didn't warrant using the primary cooling fan. I found that I could get decent images 40 minutes after taking the instrument out of the house.

Jupiter, despite its current low altitude from the UK, revealed considerable detail when seeing conditions permitted. On 21 October 2021 at 10:50pm BST, I watched the close appulse of Jovian moons Ganymede and Callisto, while the Great Red Spot approached the planet's central meridian. Later that same night, the Moon was one day past full and presented a wealth of crisp, fine detail along the waning terminator. I noted a string of mountain peaks in the heart of 177-kilometre-wide crater Gauss catching the last rays of sunlight. They looked like a string of beads at the limit of the instrument's resolution, something I had not seen in this region before during four-and-a-half decades of observing.

The instrument star-tested very well too. There was a high degree of symmetry, both intra- and extra-focally, with the merest hint of spherical under-correction. Equally important, the optical surfaces exhibited a smooth polish without any troublesome zones. Vega was a dazzling steely blue in the supplied 139x eyepiece, with delicate diffraction spikes from the thin secondary-holder vanes, while epsilon Lyrae, the unmissable Double-Double, clearly revealed both pairs of stars at such a modest magnification.

▲ The supplied 30mm SuperView eyepiece didn't require the bundled 35mm extension tube to come to focus, but third-party oculars might. Both of the supplied eyepieces and accessories are of surprisingly good quality." Image: Ade Ashford.

▼ The 9mm Plössl eyepiece affixed to the Dobsonian's Crayford focuser, the drawtube of which has 42mm of travel and an etched millimetre scale. Image: Ade Ashford.

Final thoughts

The StellaLyra 250mm, f/5 Dobsonian is clearly an instrument that lives up to GSO's reputation for fine optical performance, bundled with good quality eyepieces and a superior 8 × 50 right-angled, correct-image finderscope, but it is still a push-to alt-azimuth telescope that requires you to star-hop across the sky when seeking objects. While I would always encourage new users to learn the sky this way, FLO offers a couple of add-ons for users wishing to get the most out of their investment.

Priced at £259, the Asterion Push-To Kit for GSO Deluxe Dobsonians contains easy-to-attach hardware in the form of optical encoders to both the StellaLyra's altitude and azimuth axes. After a simple alignment procedure, the unit transmits the telescope's position wirelessly to Simulation Curriculum's *Sky Safari* or Orion's *Star Seek* apps (Android or iOS). Thereafter, the system can guide you around the sky to locate planets, asteroids, nebulae and galaxies, double/variable stars and more, via an interactive digital star chart on your smartphone or tablet.

If continually nudging your telescope to follow objects becomes a chore, FLO can upgrade it to automatically track objects too. Priced at £269, the Asterion Ecliptica Light Tracking Platform sits under the instrument's mount, carrying the entire telescope for up to one hour of uninterrupted tracking time before needing to be reset. Hence the StellaLyra 250mm Dobsonian can be regarded as a modular system to expand as finances and/or changing interests permit.

Ade Ashford has travelled the globe writing about astronomy and telescopes, serving on the staff of astronomy magazines on both sides of the Atlantic. His first *Astronomy Now* review appeared over a quarter of a century ago.

