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# Class Glass

## The New Esprit 120 Refractor

Sky-Watcher's new apo refractor provides premium performance...at a premium price

by Alan Dyer

**W**HILE THE COST of colour-free apochromatic refractors has certainly dropped dramatically in recent years, there are a select number of brand names offering no-compromise first-class glass. These are the BMWs and Lamborghinis of the telescope world, commanding prices of \$1,000 to \$1,500 per inch of aperture.

A new entry at the high end is the Sky-Watcher Esprit 120ED Super Apo. The suggested retail price of \$4,000 for a 120mm (4.7-inch) telescope (optical-tube assembly only; you supply the mount) makes this a scope for the refractor devotee. Our test unit, on loan from Vancouver-based Pacific Telescope Corp., carried a serial number of 00026, suggesting the made-in-China Esprit apos (a 150mm model is also offered, at \$7,200) will remain limited-production models, adding to their prestige.

### OPTICS

Prestige alone won't justify price, however; performance is all-important. I'm pleased to report that the Esprit 120 really performed. I've been using top-end apos for many years and know what images are supposed to look like and how little false colour a top-end apo should exhibit, either in or out of focus—none!

**HEFTY APO** The new Sky-Watcher Esprit 120 tube, with rings and mounting plate, weighs a substantial 23 pounds, requiring a heavy-duty premium mount. With its self-storing dew shield slid down the tube, the scope compacts to 27.5 inches long. (For more details, go to: <http://ca.skywatcher.com>)



**GOOD-LOOKING GLASS** The Esprit's triplet objective was flawlessly multicoated, and the tube was well baffled, all to increase light transmission and minimize flare from stray light.

The Esprit 120 has a triplet objective with one element made of prized Ohara S-FPL53 glass. I compared its performance with high-end Officina Stellare and Astro-Physics 105mm and 130mm apos employing similar premium glass. Even at high magnification with a 3mm eyepiece, star images appeared just as sharp, aberration-free and colourless as the best. I was impressed.

On subzero (°C) nights once the telescope cooled down (after 30 to 45 minutes), it exhibited none of the aberration oddities I've seen in some test telescopes, effects created by cold temperatures pinching optics. This is evidence of the Esprit's excellent lens cell design, the area where aspiring apos sometimes fall short.



**TEST EXPOSURE** A single unprocessed 8-minute exposure of the Pleiades with a full-frame Canon 5D Mark II camera exhibits relatively little darkening of the corners from light falloff in the Esprit optics, while a blowup of the corner (left) demonstrates the pinpoint sharpness provided by the included field-flattener lens.

## MECHANICS

The Esprit's large 3-inch-diameter focuser exhibited no looseness, wobble or slipping. The fine motion of the focuser's dual-speed action made it easy to nail precise focus. A welcome feature is that the rear plate of the focuser can rotate for framing targets. Tightening its nylon tension screws eliminated any image or focus shift when the rear plate was unlocked and turned.

The focuser provides a generous 101 millimetres of travel, more than enough to accommodate every eyepiece I tried, from a 31mm Nagler to an 8mm Ethos, two eyepieces with extreme focus travel demands. The focuser should handle most CCD camera/filter wheel combos with no sag or shift. The field flattener has a back focus (distance from its rear element to the focal plane, where the sensor needs to sit) of 75 millimetres. The included camera adapter and T-ring provided the proper spacing when used with a

The Esprit's 840mm focal length and relatively fast focal ratio of  $f/7$  make it ideal for deep-sky imaging. Included with the Esprit 120 is an add-on field-flattener lens made specifically for the Esprit 120 and needed only for imaging. It did its job very well. Without it, star images recorded as progressively more elongated outside of a central 16mm-diameter image circle. With the field flattener, even when using a DSLR camera with a full-frame (24mm x 36mm) sensor, star images were absolutely pinpoint corner to corner, free of any coma, astigmatism or lateral colour dispersion. This matched or surpassed the effectiveness of other telescope/field-flattener combinations I've used. In short, the Esprit provided first-class optical performance visually and photographically.



**CASE STUDY** An excellent 41-inch-long case houses and protects the Sky-Watcher Esprit 120 telescope in its rings, along with its accessories and adapters, although the finderscope must be removed.



**VISUAL vs. PHOTO** For visual use, a step-down ring attaches to the 3-inch-diameter focuser, providing a standard 2-inch visual back. For photo use, seen here, another adapter ring allows the field flattener to attach to the focuser. This flattener has a camera adapter tube with T-threads for accepting DSLR T-rings or CCD camera heads. All adapters are included with the Esprit 120.

**FINE FITTINGS** The Esprit 120 comes with a Crayford-style focuser with a very fine dual-speed motion, a secure locking knob, seen here, and a graduated scale (on top). Included is an excellent 2-inch star diagonal and an erect-image, right-angle 8x50 finderscope.



or Losmandy mounting systems.

My criticisms are few: The Esprit line does not bedazzle with the carbon-fibre tubes or anodized colour trim of some “designer” apos. The Esprit’s included 28mm eyepiece is best described as “serviceable,” good for public star parties but not for discerning observers. A handy addition to the fittings would be a drilled plate bridging

the top of the tube rings to serve as a handle and as a mounting point for accessories such as auto-guiders or piggyback mounts.

Yes, its price is high, up there with the top names in refractors. But the Esprit 120’s performance matches the best in the business at a competitive price, especially considering the included field flattener. Assuming delivery from stock, and not after months of waiting, as with some brands, Sky-Watcher’s Esprit refractors become very attractive options for anyone looking for the best. ♦