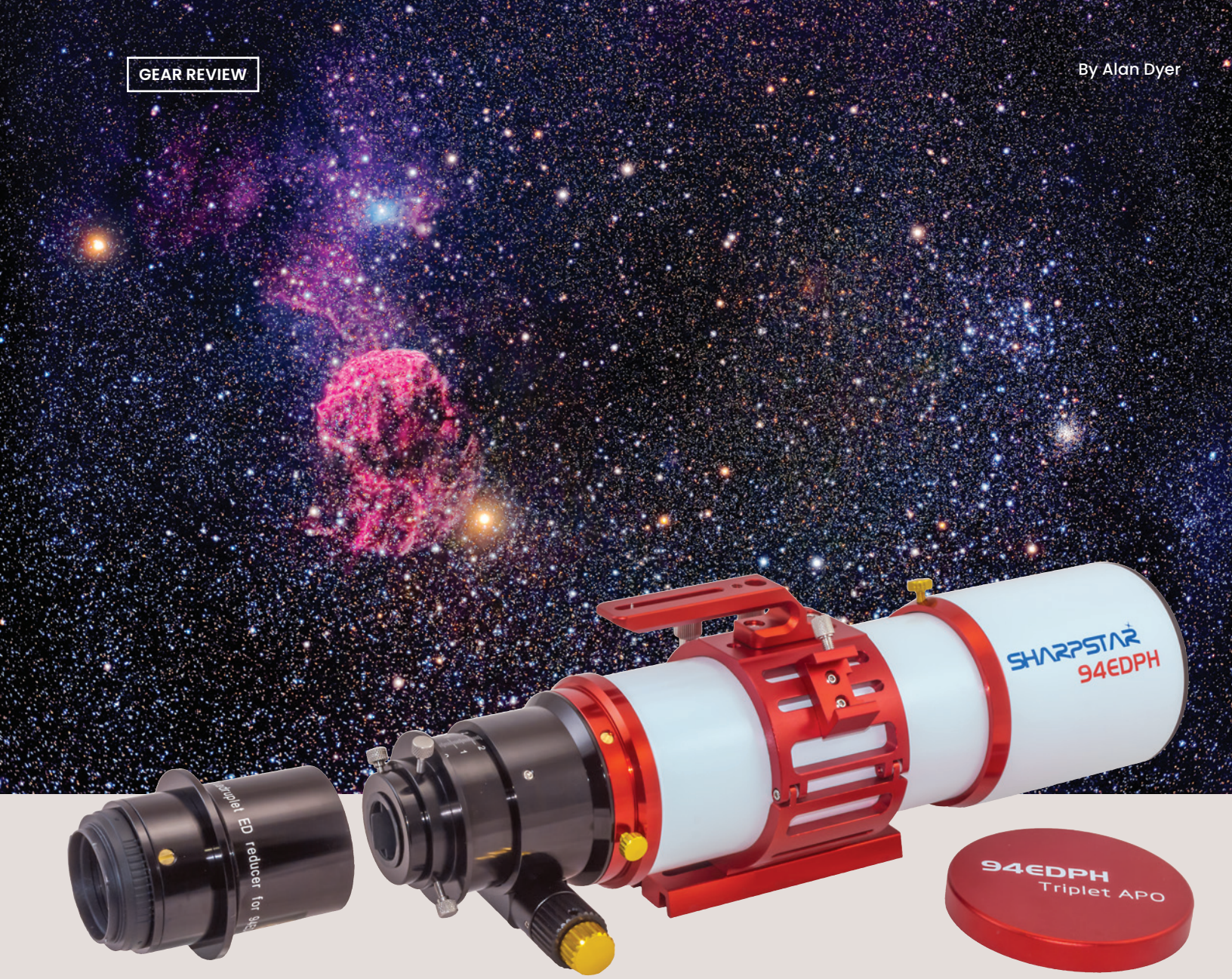
By Alan Dyer



REVIEWING A SHARPSTAR REFRACTOR

A new name in premium telescopes, SharpStar offers a range of refractors, with their new 94mm hitting a sweet spot for aperture, price and portability.

Above: The SharpStar 94EDPH can be used visually with the included 2-inch and 1.25-inch adapters. With the optional 0.8x reducer (above, left side of telescope) the telescope can take wide images of deep-sky fields, such as Messier 35 and IC 443 in Gemini shown here.

I'VE LONG MAINTAINED that a refractor with an apochromatic (colour-free) lens in the 4-inch (100mm) aperture class is the perfect portable telescope for both observing and imaging. If I were restricted to owning only one telescope (heaven forbid!), it would be such an instrument.

Nicely filling the bill is the SharpStar 94EDPH, a 94mm apochromatic refractor with a fast focal ratio of f/5.5. It is one of the newest models from SharpStar Optics based in Jia-Xing, China.

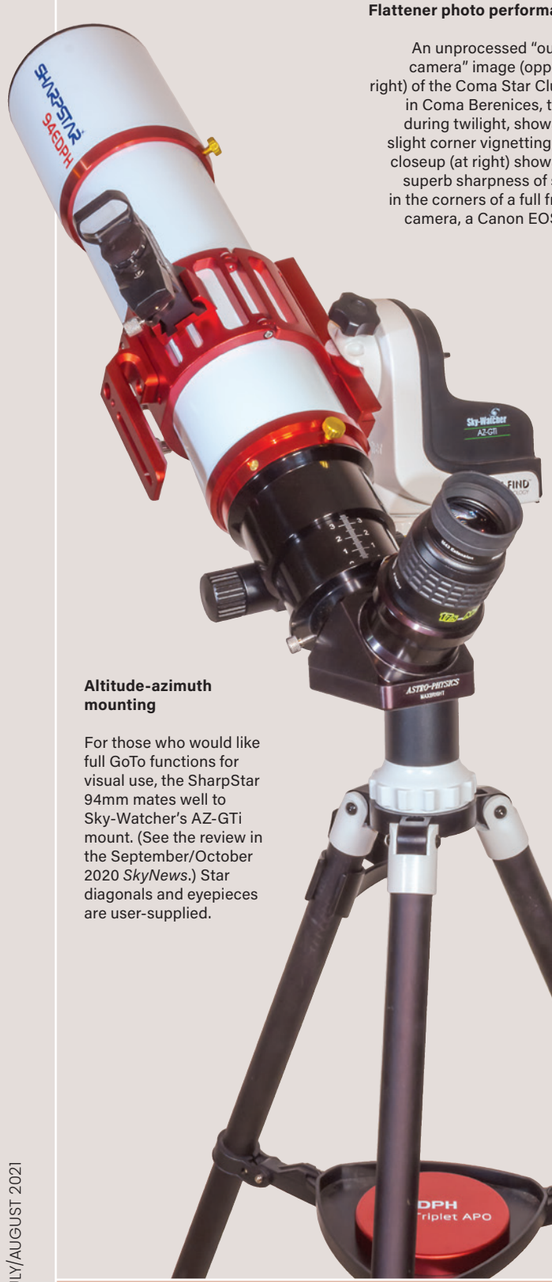
Mechanics

The SharpStar's included clamshell-style tube ring comes with a convenient carrying handle, slotted for bolting on other accessories. The ring also holds a small dovetail shoe compatible with the Sky-Watcher standard for finderscope brackets. No finder is included, so count on adding a red dot finder for using the telescope visually.

The 2-inch focuser is a very smooth rack and pinion unit with dual-speed action for both coarse and 10:1 fine focusing, →

SharpStar 94EDPH

sharpstar-optics.com/index.php/en

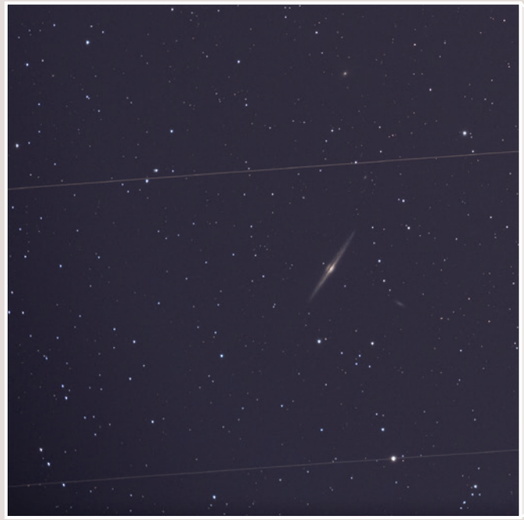


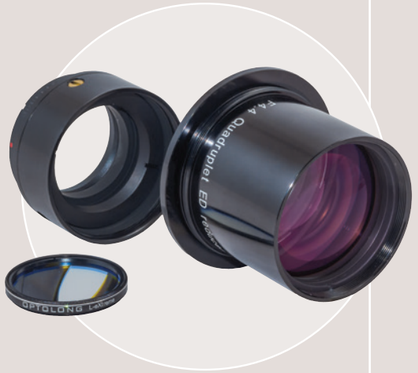
Altitude-azimuth mounting

For those who would like full GoTo functions for visual use, the SharpStar 94mm mates well to Sky-Watcher's AZ-GTi mount. (See the review in the September/October 2020 *SkyNews*.) Star diagonals and eyepieces are user-supplied.

Flattener photo performance

An unprocessed "out-of-camera" image (opposite right) of the Coma Star Cluster in Coma Berenices, taken during twilight, shows the slight corner vignetting. The closeup (at right) shows the superb sharpness of stars in the corners of a full frame camera, a Canon EOS Ra.





Field flattener and filter

The field flattener/reducer is a required option for imaging. Its tube separates to reveal internal threads that accept a 2-inch (48mm) filter. On the camera side, the reducer accepts T-rings with wide M48 threads.

Equatorial mounting

For those who wish to explore astrophotography, the Sky-Watcher EQM-35 equatorial mount would be a solid, yet light and portable choice. It is shown here with an autoguider and Wi-Fi controller from ZWO.

Available at select dealers in Canada and the U.S.

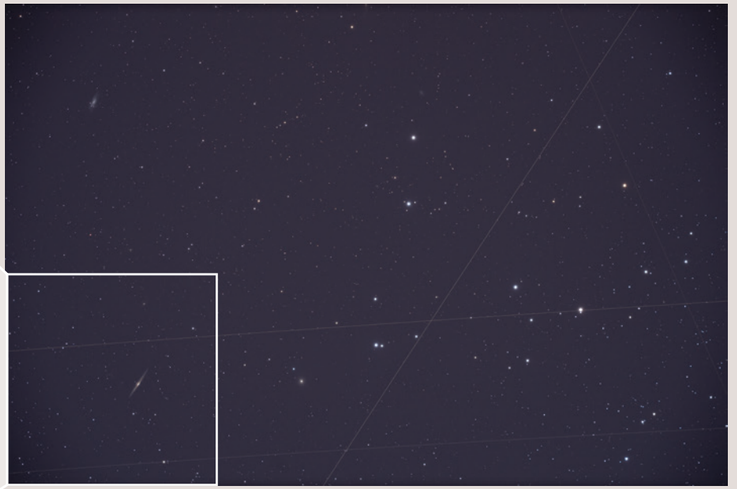
CAN $1,700 for optical tube assembly with case
CAN $420 for optional 0.8x flattener/reducer

PLUSES

Excellent optics and mechanics

MINUSES

Very slight residual false colour



I judged the SharpStar's colour correction, while very good, a notch down from the best. But keep in mind, the best costs two to three times what the SharpStar 94EDPH does.

On cool spring nights, the same star tests revealed no sign of astigmatism, and just a trace of spherical aberration. Stars snapped into sharp focus with near textbook-perfect Airy disk patterns. At low power with a premium Tele Vue 41mm Panoptic eyepiece, stars were tack sharp across an impressive 5.4-degree field of view.

I consider the SharpStar a terrific value in an apo refractor that will provide great views of the Moon, planets, double stars and deep-sky objects.

the latter perfect for precisely focusing cameras. The focuser can be locked down when heavy eyepieces or cameras are attached.

The entire focuser can be rotated to place the focus knobs at a convenient angle. The back of the focuser is also equipped with a camera angle adjuster for framing photographic fields. Rotating the camera does not shift focus.

The locking dew cap extends seven centimetres to protect the main lens, but retracts to make the tube 44 centimetres long for transport. The 94EDPH comes with an aluminum case just big enough for the telescope, but with no room for visual or astrophotography accessories.

Optics

The 94mm uses a triplet objective lens with two elements made of low-dispersion ED glass. However, the exact grade of glass — as spec refractor aficionados like to know — is not disclosed. Under demanding star tests, bright stars and the Moon's limb showed negligible false colour when in focus; there were no blue halos as there are on achromatic refractors or even some doublet apos.

When racking through focus, the diffraction patterns of bright stars showed a magenta rim inside focus and a cyan tint outside focus. In side-by-side tests with my classic 105mm f/6 Astro-Physics Traveler and the original Astro-Tech TMB f/5.5 92mm from Astronomics, the SharpStar ranked third for colour correction, with the other two apos showing very little — if any — colour in their defocused diffraction disks.

Such perfection, requiring the use of the most premium glass, yields excellent depth of field — as star images shift in and out of focus with the seeing conditions, no colour appears. With the SharpStar, I did see flashes of false colour under wobbly seeing conditions.

Astrophotography

The beauty of most refractors is that they work equally well for photography. Reflectors often need to be optimized just for imaging, with features such as oversized secondary mirrors that compromise their visual use.

However, with a few exceptions, most refractors do require the addition of an accessory field flattener lens to ensure stars record as pinpoints across the camera frame.

The 94mm is complemented by an optional four-element flattener, which also reduces the focal ratio by 0.8x to a fast f/4.4. This produces an equivalent focal length of 414mm and a generous field of 5 by 3.3 degrees with a full-frame camera.

The combination worked very well. While not perfect, edge sharpness was certainly better than I see with many of my refractor/reducer combinations. This is a telescope ideal for deep-sky imaging, but you can also enjoy just looking through it.

Recommendations

As do most apo refractors, the SharpStars come only as tube assemblies, but with Vixen dovetail plates compatible with most mounts. For grab-and-go visual use, you could mate the 94mm to an altitude-azimuth mount such as Sky-Watcher's manual AZ5.

For astrophotography use, the SharpStar 94EDPH could form the core of a deep-sky imaging rig, with an equatorial mount, autoguider and accessories, for about CAN $4,000, not including the all-important camera.

In all, if I had to give up all my scopes but one, I think I could be very happy living with the 94mm SharpStar to serve all my telescopic needs. ✶