

The ES80

Explore Scientific's ED Triplet Apochromatic Refractor

By James R. Dire, Ph.D.



Image 1 - The authors set up the Explore Scientific Essential Series 80-mm Apo to visually test the instrument's capabilities.

Explore Scientific is known for refracting telescopes, quality eyepieces, the David H. Levy Comet Hunter Maksutov-Newtonian telescope, and Twilight I and II alt-azimuth mounts. I own a Twilight II mount and enjoy using it with various small refractors and my 6-inch $f/4$ Newtonian reflector. However, prior to

beginning this project, I had never used an Explore Scientific telescope.

Explore Scientific carries three series of refracting telescopes: the AR Doublet Series (102-mm, 127-mm and 152-mm doublets), the ED Triplet Carbon Fiber Series (80-mm, 102-mm, 127-mm and 152-mm Apos) and the ED Triplet Es-

sential Series (80-mm, 102-mm and 127-mm Apos). In this article, I am focusing (pardon the pun) on the 80-mm apochromatic refractor (hereafter called the ES80), the smallest telescope in the ED Triplet Essential Series (see **Image 1**).

The telescope arrived packed in a double cardboard box (**Image 2**). Im-



Image 2 - The ES80 is superbly packed for carefree shipping.

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pressively, the optical tube assembly (OTA) was housed in a third rugged cardboard box with Styrofoam padding. The diagonal was contained in another padded box with cool star charts on the outside and inside, also packed in Styrofoam. **Image 3** shows everything unpacked. The telescope comes with a quality 2-inch carbon-fiber diagonal, a 2-inch-to-1.25-inch adapter, a Vixen-style dovetail plate (see Image 1), two focus extension tubes required for straight through photography, a two-speed focuser with locking nut, and a finder scope mounting bracket. Fortunately, I have a 9x50 right-angle erect-image finder with a mounting rings that fit the bracket perfectly.

If you look at this model on the Explore Scientific website, you notice slight differences in the ES80 model shipped to me compared to the version pictured there. Mine came with a larger diameter dew shield with the logo on the dew

shield. The version pictured on the website has a smaller diameter dew shield with the logo on the tube. The dew shield slides in and out making the telescope more compact for transport. The OTA cap fits over the objective lens inside of the dew shield and not on the dew shield itself, like other-make refractors. So, taking off or replacing the cover requires reaching inside the dew shield or sliding the dew shield all the way back.

The ES80 contains an air-spaced triplet combining genuine HOYA extra-low-dispersion (ED) glass and proprietary EMD enhanced multi-layer coatings on all optical surfaces. This apochromatic lens virtually eliminates all chromatic aberration. The $f/6$ focal ratio yields a 480-mm focal length. **Image 4** shows the telescope with the focuser fully extended. Note the graduated focuser shaft, useful for recording focal points for various eyepieces or cameras.

The views through this telescope were quite nice. My 22-mm Tele Vue Nagler eyepiece yielded 21x. I scanned the summer Milky Way from Scorpius to Aquila, stopping at numerous star clusters, bright nebulae and dark nebulae. The color and contrast were great, and visually, the stars looked sharp throughout the field of view. My 5-mm Nagler gave 96x, sufficient to view Saturn and its splendid rings. Titan and two minor Saturnian moons were clearly visible. During moments of exceptional seeing, the Cassini gap in Saturn's rings was visible.

I always like to test the imaging capabilities of any telescope I review. Therefore, I mounted the telescope piggyback to the main scope in my observatory (**Image 5**). Note in the image I attached a 9x50 finder scope, the two focuser extension tubes and an SBIG ST-8300C CCD camera. In this configuration, the ES80 could serve as a guide scope for imaging with the main telescope. But for the purposes of testing, I guided with a 10-inch Newtonian astrograph, and imaged with the ES80.



Image 3 - The ES80 comes with a 2-inch diagonal, two focuser extension tubes for astrophotography, a 2-inch-1.25-inch eyepiece adapter, and a Vixen-style dovetail plate.

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Image 4 - Graduations on the focuser shaft allow quick return to focusing when changing eyepieces. The right-hand focusing knob has two speeds for adjusting the focus.



Image 5 - The author installed the ES80 in his observatory for CCD imaging.

Image 6 displays a 30-minute exposure taken of the Dumbbell Nebula (M27). The stars and the nebula show good color and are sharp through the center portion of the image. Unfortunately, all triplet Apos suffer from field curvature, the effect being greater with smaller focal ratios. Fortunately, I happen to have a third party field flattener made for CCD imaging similar to the one sold by Explore Scientific. **Image 7** shows the Dumbbell Nebula again exposed for 30 minutes, but this time with the field flat-

tener in use. In this image, the stars are pinpoint throughout the entire field of view!

To show the benefit of using a field flattener, I have enlarged the upper right hand corner of both Image 6 and Image 7 and placed them side-by-side in **Image 8**. On the left side of Image 8 (without the field flattener), the stars are elongated radially outward from the center of the image and blurry looking. However, with the field flattener (right side of Image 8)

the stars are all round and sharp down to the faintest star!

For my final test image with the ES80, I took a 30-minute exposure of the Wild Duck Cluster, M11, in the constellation Scutum (**Image 9**). The image spans 2.2 degrees east to west. The brightest star in the field is the yellow star R Scuti, magnitude 5.4. The dimmest stars are fainter than magnitude 15. The bright Milky Way star field covers the lowest right quarter of the image, while dark molecular clouds are scattered about the other three quadrants.

Overall the Explore Scientific ED Triplet Essential Series 80-mm refractor is a great grab-and-go telescope that will provide sharp, color-corrected views of celestial objects. The telescope can also double as a guide scope piggybacked on larger refractors or reflectors. With a field flattener, the telescope has excellent potential for wide field-of-view CCD or DSLR imaging. **AT**

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Image 6 - A 30-minute exposure of the Dumbbell Nebula (M27).



Image 7 - A second 30-minute exposure of M27, this time using a 1.0X field flattener.

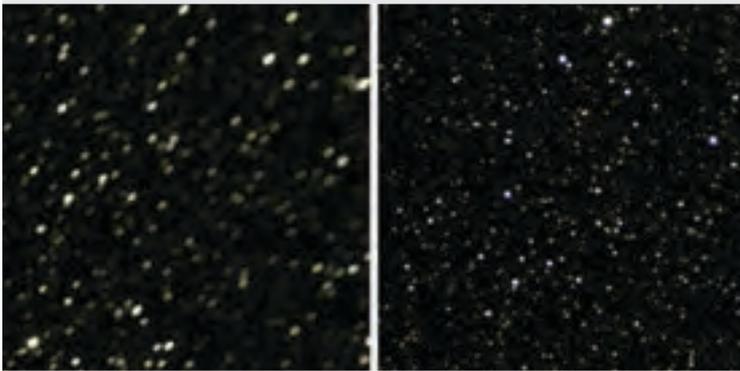


Image 8 - Enlarged images of the right-hand corners of Image 6 (left) and Image 7 shows the effects of field curvature present in all triplet Apos and the great correction available using a field flattener



Image 9 - A 30-minute exposure centered on M11 displays rich Milky Way star clouds interspersed with dark nebulae.

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