

EQUIPMENT REVIEW

Don't let this scope's compact size fool you — it's a high-quality workhorse. /// BY PHIL HARRINGTON

Celestron's Onyx 80EDF

Each decade brings new telescopes or mounts, usually with one particular design dominating the market. In the 1970s, everyone wanted to own a Schmidt-Cassegrain telescope. In the 1980s, it was large, Dobsonian-mounted reflectors. Today's trendsetting design is small

“grab-and-go” refractors characterized by apertures of 4 inches (102 millimeters) or less and focal ratios in the $f/5$ to $f/7$ range.

What makes this niche so hot is more and more mid-range models offer a compromise between price and quality. The latest entry into this burgeoning market is Celestron's Onyx 80EDF.

Onyx specifications

The Onyx 80EDF is a compact 3.1-inch (80mm) $f/6.25$ telescope that comes in a padded aluminum case. The glossy black aluminum tube, with its orange inlaid logos and accent ring around the base of the sliding dew cap, has a rich luster that belies this scope's moderate price.

Other desirable features include a sliding dew shield, rotatable Crayford-style

focuser, dovetail mounting block, lens caps, and a side-mounted aiming tube. Eyepieces and a star diagonal are sold separately. Celestron covers the Onyx 80EDF with a 2-year factory warranty.

Small refractors have been around for years, but a huge gap in price and quality has existed among models. Some cost less than \$200, but, with lenses having only simple color correction, they have distracting purple halos around bright objects. Called residual chromatic aberration, such a halo results from different wavelengths of light coming to focus at various distances from the objective (front lens). Manufacturers eliminate this problem in expensive apochromatic refractors. Despite its lower price, the Onyx 80EDF rivals some aspects of the high-end models.

To reduce chromatic aberration, the Onyx's objective combines a lens made of Fluoro-crown glass (technically specified as O'Hara FPL-53) with another of high-

SPECIFICATIONS

CELESTRON ONYX 80EDF

Type: Two-element refractor

Aperture: 3.1" (80mm)

Focal ratio: 6.25

Focal length: 500mm

Length: 16" (406mm)

Weight: 6.1 pounds (2.77 kg)

Also: Celestron StarBright XLT coatings, 2" Crayford-style rotatable focuser, built-on metal sight scope, extendable dew shield, integrated dovetail, foam-lined aluminum carrying case.

Street price: \$649

density crown glass. FPL-53 is the most advanced extra-low dispersion glass available. Lens designers use it to shrink focal ratio while maintaining color correction.

To enhance image contrast, Celestron also vacuum-coats the objective's elements with Celestron's StarBright XLT coatings. The coatings appear uniformly dark-green in daylight.

The single-speed Crayford-style focuser supplied with the Onyx accepts either 1¼" or 2" eyepieces, thanks to the included adapter. Turning the focuser's locking thumbscrew presses a compression ring evenly against the eyepiece barrel. That's a good way to keep eyepiece barrels from being marred, as they would be if a thumbscrew pressed against them directly. High-end telescopes have used this technique for years, but it's nice to see it filter down to more moderately priced instruments.

The Onyx 80EDF's focuser also can be rotated 360° by loosening a second



THE ONYX 80EDF packs a lot of optical punch in a small package. Measuring only 16" (406mm) long and weighing 6.1 pounds (2.77 kg), the 80EDF features Celestron's StarBright XLT coatings on all optical surfaces. ALL PHOTOS: ASTRONOMY: JAMES FORBES

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thumbscrew. Rotating the focuser does not cause the telescope's optics to lose their collimation (alignment).

With the dew shield collapsed, the Onyx measures only 16 inches (406mm) long. Its 6-pound (2.7 kilograms) weight is light enough for any reasonably sturdy camera tripod. A mounting block affixed permanently to the telescope tube includes a 1/4"-20 threaded hole for camera-tripod mounting. Celestron cleverly designed the mounting block's profile to match the dovetail plate used on many of today's popular equatorial mounts. The plate attaches without additional rings or adapters.

I used the Onyx on my own Celestron CG-5GT go-to mount for this review. Because the CG-5GT is designed to support far heavier telescopes than the Onyx, the combination made for one of the steadiest platforms I've seen. Any vibrations settled out in less than a second.

Throughout these tests, I used a Celestron 2" StarBright XLT mirror star diagonal, which is sold separately. Retailing for around \$140, the StarBright diagonal is well matched to the Onyx. Inside, the optically flat mirror is coated with 96-percent enhanced aluminizing to produce bright, sharp images. The diagonal's mechanical quality also is exceptional, with a tapered barrel, a compression-style eyepiece ring, and a glossy black finish.

The Onyx does not include a finder scope or single-power finder. Instead, it comes with a small, hollow sight tube permanently mounted to the telescope tube.

The sight tube rides only 5/8" (1.6 centimeters) off the telescope, which made access difficult at times, depending on where I pointed the scope. The sight would have been more useful on the focuser's rotatable housing, so it could be spun around as needed. Its black color makes it difficult to find at night, even with light pollution. I found it much easier to sight along the telescope's tube and then use a low-power eyepiece to center the target in the field of view.

Testing under the stars

Aiming toward 2nd-magnitude Kochab (Beta [β] Ursae Majoris), I began star-testing the Onyx using a 5mm eyepiece, which yielded a magnification of 100x. Turning the focuser in and out, the star expanded smoothly in both directions. The out-of-focus rings appeared concentric,

confirming that the Onyx's optical system was properly collimated.

Repeating the process several times revealed the Onyx's objective lens to be well-figured but with a hint of spherical aberration. I also noted a minuscule amount of astigmatism in the system, as evidenced by a slight ellipticity to the rings when passing from one side of focus to the other. Both of these minor flaws could have been caused by a too-tight lens cell warping the objective. Under the stars, however, neither flaw diminished the view of any of my chosen targets.

Because of its short focal ratio, most observers would claim the Onyx's strong suit is not as a planetary telescope. Still, I couldn't resist the lure of Jupiter hanging high in the southwest. A 10mm eyepiece (50x) easily showed the jovian atmosphere's main belts, while the 5mm (100x) resolved the Great Red Spot's "hollow" as well as a pair of satellite shadows transiting the planet's disk. Jupiter appeared sharp and clear, with a slight purplish halo of false color encircling its limb. I also saw purple fringing around the Moon's limb.

Swinging over to everyone's favorite colorful double star, Albireo (Beta [β] Cygni), I found both the primary's yellowish color and its companion's bluish hue coming through vividly. I next made my way to the Double Double (Epsilon [ε] Lyrae) quadruple star system in neighboring Lyra. With the 5mm eyepiece still in place, the Onyx cleanly resolved all four components.

Image quality held up well even as I inserted a 2.5x Barlow lens into the system, raising the magnification to 250x. That combination also split the challenging double stars Alrisha (Alpha [α] Piscium) as well as Delta (δ) Cygni. Not bad for a 3.1-inch scope, especially because splitting the latter star usually is considered a good test for a 4-inch aperture.

I switched back and forth between the 5mm and 10mm eyepieces when I examined the Hercules Cluster (M13) and the Ring Nebula (M57). M13 appeared at the Onyx 80EDF's resolution limit, while the scope easily showed M57's characteristic smoke-ring shape at 100x.

This telescope's real strength lies in its superb low-power, rich-field views. When I popped a 22mm wide-field eyepiece into the focuser, the Onyx created a 23x, 3° field of view. When I scanned the Milky Way



THE ONYX comes with a foam-lined aluminum case, excellent protection for transporting the scope. In addition to the telescope, the case can hold several eyepieces and a star diagonal.

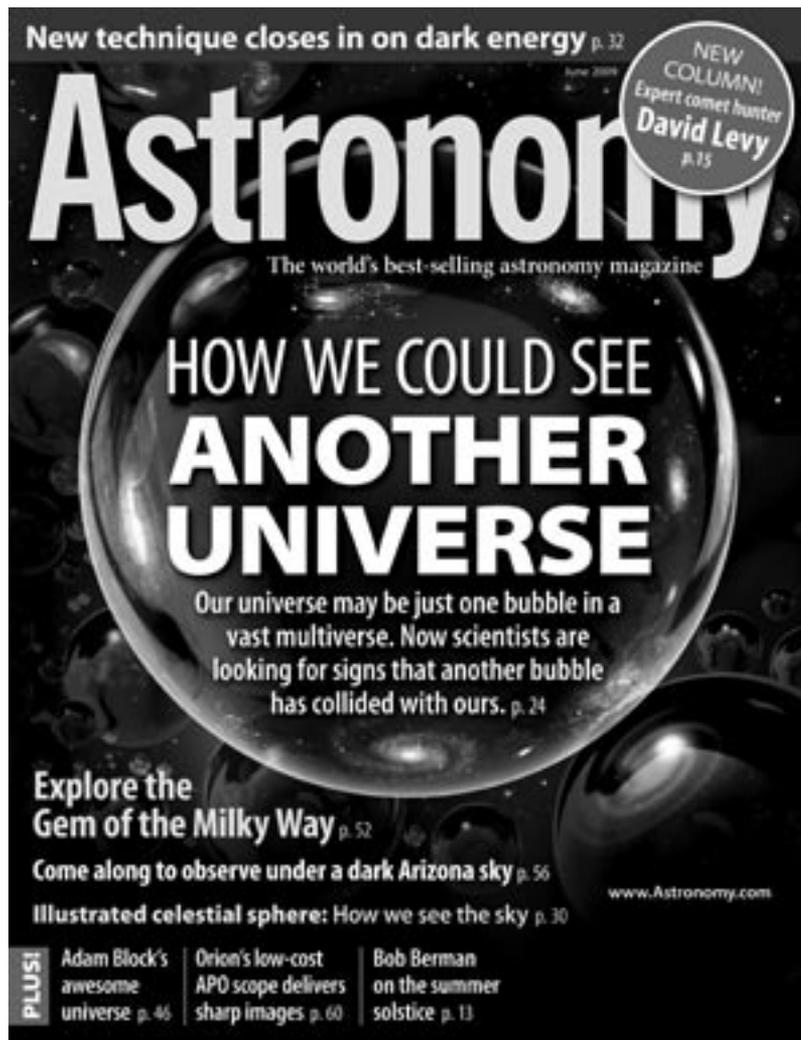


A 2" CRAYFORD-STYLE rotatable focuser (with its own padded aluminum case) is part of the standard Onyx 80EDF package. For 1 1/4" eyepieces, just insert the included adapter.

from Cygnus southward to Sagittarius, I was treated repeatedly to magnificent views of such diverse targets as the dark rifts in Cygnus, the open star clusters M6 and M7 in Scorpius, and the Lagoon (M8) and Trifid (M20) nebulae in Sagittarius.

Working with the Onyx 80EDF was an enjoyable experience. Is it a pure apochromat? No, given the purple fringing that I saw around the Moon and Jupiter. But given that it costs only a third of the price of a top-end refractor, Celestron's Onyx 80EDF represents a good value. ■

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