

by Alan Dyer



Celestron's X-Cel eyepieces

Long-eye-relief eyepieces are now affordable, thanks to Celestron's new line of eyepieces

I LOVE EYEPIECES WITH LONG EYE RELIEF, and until I tested the new Celestron X-Cel line, I hadn't realized just how much I now depend on this style of eyepiece. In the process of testing, I dusted off some classic Plössl's of moderate to short focal length. With their eye relief of only a few millimetres, I had to place my eye uncomfortably close to the eyepiece, then squint through the tiny field lens. It has been years since I've used such an eye-straining model, despite the sharp images that standard Plössl eyepieces can deliver.

With the optics on long-eye-relief eyepieces, however, you can place your eye back from the top lens by a generous 15 to 20 millimetres and still see the entire field of view—even with ultra-high-power models, the ones that normally have the least eye relief. An eye relief of 15 millimetres or more is enough to allow you to look comfortably through a telescope while wearing eyeglasses.

Up to now, eyepieces with long eye relief have sold for a minimum of \$150 (Cdn.) and up to \$400 or more at the premium end. But thanks to sourcing from Chinese manufacturers, Celestron has broken that price range with its X-Cel line—each eyepiece typically sells for about \$90 at most dealers.

Regardless of focal length, the X-Cel eyepiece offers a wonderful 20 millimetres of eye relief in a nicely finished barrel with rubber grip ring and a rubber eyecup

that folds down for eyeglass use. And each provides the same apparent field of view of 55 degrees, making it slightly wider than standard Plössl-class eyepieces, but not in the realm of wide-field models, such as Celestron's own Axiom Series.

The X-Cel eyepieces are lightweight six-element designs with integrated internal Barlow lenses. The internal Barlow is the key design element that achieves the same eye relief over such a wide range of focal lengths. All have standard 1.25-inch barrels threaded for filters, and all are fitted with a safety undercut in the barrel to prevent the eyepiece from slipping out of the focuser should the retaining screw become slightly loose.

All models come with a dustcap and a plastic storage bottle, and their focal lengths are clearly marked in large, white letters to aid identification in the dark. However, I did find that the lettering scratched easily; after a few nights of heavy outdoor use, it was hard to tell the "18" from the "10."

OCULAR LINEUP: The Celestron X-Cel line features focal lengths of 25mm, 21mm, 18mm, 12.5mm, 10mm, 8mm, 5mm and 2.3mm, providing powers from low to ultrahigh magnifications. Owing to the optical configuration required for eyepieces with long-eye-relief design, the shortest-focal-length model (the 2.3mm) has the longest tube. This eyepiece—highly rated in our tests—produces such high power that in practical applications, it should be used on telescopes with focal lengths less than 900mm. An X-Cel model in the 3.5mm range would be a welcome addition to the line, as the jump from 5mm to 2.3mm represents more than a doubling of power.

I tested the full X-Cel line on a fast 5-inch f/6 refractor and a slower 8-inch f/10 Celestron Schmidt-Cassegrain. ("Fast" or "slow" in this context refers to small or large focal ratio. Fast focal-ratio telescopes of any design are usually less forgiving of optical flaws in eyepieces.)

Every X-Cel produced excellent images on-axis in the centre of the field in both scopes, but in the refractor, the images elongated and blurred in the outer 10 to 20 percent of the field, with the 10mm and 5mm being a little worse than the others and the 8mm and 2.3mm being the best. Images in the 2.3mm were particularly crisp, making this an excellent high-power choice

for owners of fast focal-ratio "short tube" refractors. As expected, performance was much improved in the Schmidt-Cassegrain (because of its more forgiving longer focal ratio), with all eyepieces beautifully crisp right to the edge of the field.

Despite good multi-coatings on all optical surfaces, a few models (the 12.5, 10, 8 and 5) exhibited a minor ghost image with the bright planets and stars. The shortest-focal-length eyepieces showed slight chromatic aberration

(colour fringing) on bright objects (the 5mm being the worst), but not to any objectionable level. A nice feature is that the entire line is parfocalized, so only minor refocusing is required when switching from one X-Cel to another. The tall tubes are also comfortable (CONTINUED ON PAGE 31)



EYE TO THE SKY: Each X-Cel eyepiece (2.3mm shown) has a wide-field lens with 20 millimetres of eye relief, making it easy to look through even the highest-power models. No squinting through these or brushing the eyepiece with your eyelashes and sneaking the lens. And no worries about getting too close to a metal eyepiece top on cold winter nights. Once you use long-eye-relief eyepieces like the X-Cels, you may never return to conventional models.

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1



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2

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Side two:
 The SkyNews Editors' Choice Photo of the Week Contest winners for 2003-04.

X-CEL EYEPIECES (CONTINUED FROM PAGE 29)

for use with Meade ETX Maksutovs, where stubby low-profile eyepieces cause your face to collide with the finderscope.

Are the X-Cels as good as the more expensive long-eye-relief models? I compared them with Orion and Vixen Lanthanums (perhaps the closest competitors) and with the highly regarded top-of-the-line Pentax XLs and Tele Vue Radians. The top-end-model star images were absolutely crisp to the edge of the field, even on the fast focal-ratio refractor, with no ghosting or false colour. But through the Schmidt-Cassegrain, the differences were less marked. Considering that even the 50-degree-field Orion and Vixen Lanthanums sell for \$150 and the others start at \$350, the X-Cels are a bargain, especially for owners of f/8 and slower (longer) focal-ratio telescopes, where they perform well. The breakthrough here is that Celestron has at last brought the comfort of long eye relief within reach of modest budgets. ■