

A Triple-Digit Field of View

Tele Vue's new 13-mm eyepiece is about to transform deep-sky observing.

IN LAST JULY'S REVIEW of the Dioptrix astigmatism correctors (page 69), I mentioned Tele Vue's long involvement with wide-field observing. And I mused that "knowing [company founder Al] Nagler and Tele Vue, I wouldn't bet we've heard the last word on this subject."

The ink was barely dry on those pages when Tele Vue pushed the envelope yet again, introducing the 13-mm Ethos eyepiece with a whopping 100° apparent field of view. Besting the fields of other astronomical eyepieces by more than 20% in diameter and more than 50% in area, Ethos is a stunning optical achievement.

Tele Vue showed preproduction models of the Ethos at amateur venues in New York, Texas, California, and Indiana. Bolstered by positive feedback from observers, and finding no need to tweak the design, Tele Vue put the Ethos into production with delivery due by October. The company also loaned *Sky & Telescope* the first Ethos available for independent review. It differs from production models only by the engraving on the barrel.

In 1981 Tele Vue achieved international recognition for its 13-mm Nagler eyepiece with an unprecedented 82° apparent field. Nagler dabbled with wider-field designs at the time, but only recently did his son (now Tele Vue president), David, revisit the idea. Together with the optical talents of Tele Vue's longtime employee Paul Dellechiaie, they created a 100° eyepiece "worthy," David says, "of the Tele Vue name."

The Naglers aren't willing to reveal anything about Ethos's internal construction. For now, they want the eyepiece judged only by the views people have through it.

One internal aspect of Ethos that they *will* acknowledge is evident the moment you pick it up: there's significant air space inside, since the eyepiece is unusually light for its size. Indeed, at 21 ounces (0.59 kg), the Ethos is only the sixth-heaviest eyepiece in the current Tele Vue lineup.

The first clear night after Ethos arrived, I began observing with a Tele Vue-NP127is (5-inch f/5.2) refractor before the brightest stars began peeking through the twilight. At a magnification of 50×, Venus's dazzling half-moon shape remained sharp, undistorted, and free



Tele Vue's 13-mm Ethos eyepiece

US price: Undetermined at presstime
Available from Tele Vue dealers worldwide

SPECIFICATIONS & MEASUREMENTS

Weight	21 oz (590 g)
Eye relief	15 mm
Field-stop diameter	22.3 mm

of color fringes as I swept it across the nearly 2°-wide true field. Furthermore, there was no sign of ghost images or reflections — even after the background sky grew dark.

Then it was on to the star-strewn sky of Gemini. The Ethos's field is so large that I had to roll my eye around to see it all, and my impression was that of pinpoint stars to the very edge. Even under the most critical examination, bright stars look sharp and round across the entire field.

I noted a very slight difference in focus between the

WHAT WE LIKE:

Unprecedented 100° apparent field

Excellent on- and off-axis images

WHAT WE DON'T LIKE:

Too large for many people to use in binocular viewers (minimum spacing 65 mm)

center and edge of the field, which is not surprising given the razor-sharp, extraordinarily flat, $f/5.2$ field of the TV-NP127is. This would be difficult to detect with younger eyes that have more focus accommodation than mine, or with a telescope having a curved field or longer focal ratio. Regardless, the view of a starry sky with the Ethos and TV-NP127is is nothing short of breathtaking.

Centered in the field, the waning gibbous Moon's limb was free of color fringes, and the lunar disk appeared even whiter than the view in my original 9-mm Nagler and 12-mm Nagler Type 2 eyepieces. When I pushed the Moon to the edge of the field, a thread of green sometimes appeared on the limb if my eye wasn't centered over the eyepiece. Sweeping the Moon out of the field, I could detect the very slight pincushion distortion inherent in the Ethos design — something I didn't perceive when sweeping across star fields. With 15 mm of eye relief and no hint of "kidney beans" (dark areas in the field that move as your eye changes position behind the eyepiece), the Ethos is a pleasure to look through night or day.

The Ethos hasn't sacrificed one bit of

S&T RATINGS	
Optical Performance	★★★★★
★★★★★	Sensibly perfect. No meaningful improvements possible.
★★★★	Any shortcomings will go unnoticed in normal use.
★★★	Problems noticeable but do not seriously affect performance.
★★	Problems noticeable during normal use — performance compromised.
★	Problems so severe that the equipment is virtually unusable.
Ratings are intended to convey performance compared with equivalent equipment and should not be used to predict the relative performance of instruments having markedly different optical designs.	

on-axis performance in achieving its 100° apparent field. I tried a handful of other high-quality eyepieces with about the same focal length, and none could offer even a hint of better on-axis performance. With its high-contrast, ghost-free performance, the Ethos makes a fine planetary eyepiece if you're willing to pay the premium price of a hyperwide-field design.

Observing with the Ethos and TV-NP127is refractor was extremely enjoyable, but it's a good bet that most amateurs interested in wide-field eyepieces are observing with moderate- to large-aperture reflectors. My next tests were with a 12-inch $f/5$ Newtonian, which has a focal length of 1,533 mm. On paper the numbers are impressive: $118\times$ with a remarkable 0.84° true field — large enough to hold the entire Moon with plenty of surrounding sky.

As expected, this magnification easily showed star aberrations due to the coma

Bottom-line summary:

As revolutionary today as the original 13-mm Nagler eyepiece was when it was introduced in 1981, the 13-mm Ethos sets a new standard for wide-field observing. The on-axis performance is second to none, while the 100° apparent field is unprecedented for an astronomical eyepiece.

inherent in an $f/5$ Newtonian. Adding a Tele Vue Paracorr returned the stars to pinpoints across the field, but the Paracorr's $1.15\times$ magnification factor trimmed the true field to 0.72° and increased the power to $136\times$. It was a coin flip as to which I liked best, and I spent equal time observing with and without the Paracorr.

Observing with the 12-inch scope, I typically bounce between a wide-field eyepiece for star-hopping and a high-power one for detailed views. But the Ethos gave me both. The field was large enough to star-hop, and the magnification was high enough to bring out faint stars and resolve details in galaxies and star clusters.

Some of the views were simply stunning. The globular cluster Messier 13 in Hercules appeared as a sprawling sphere with thousands of resolved stars, many sweeping outward in sinuous arcs. M13 was suspended in a field large enough to easily show the two 7th-magnitude stars that shepherd the globular across the sky.

Long stretches would pass without me swapping the Ethos for another eyepiece. Indeed, if I were dropped on a desert island tomorrow with the 12-inch scope and only one eyepiece, I'd want it to be the Ethos.

Just as the original 13-mm Nagler set a new standard for deep-sky observing in 1981, the Ethos sets a new standard today. Owning one will guarantee long lines at your telescope during any star party.

By the way, this month marks the 50th anniversary of Al Nagler's introduction to *Sky & Telescope* readers. Our October 1957 issue, page 590, showed his homemade 8-inch reflector exhibited at the Stellafane telescope makers gathering in Vermont. It wouldn't surprise me if Nagler's name still pops up in *S&T* 50 years from now. ♦

Even before senior editor Dennis di Cicco finished this review, his colleagues were lining up for their night of observing with the Ethos.

OVERVIEW The circles on this 1.8° -wide photograph of the Double Cluster in Perseus represent the true field seen with a 10-inch $f/5$ telescope and the 100° apparent field of the 13-mm Ethos as well as the fields of the original 13-mm Nagler (82°) and a Plössl (50°) of the same focal length.

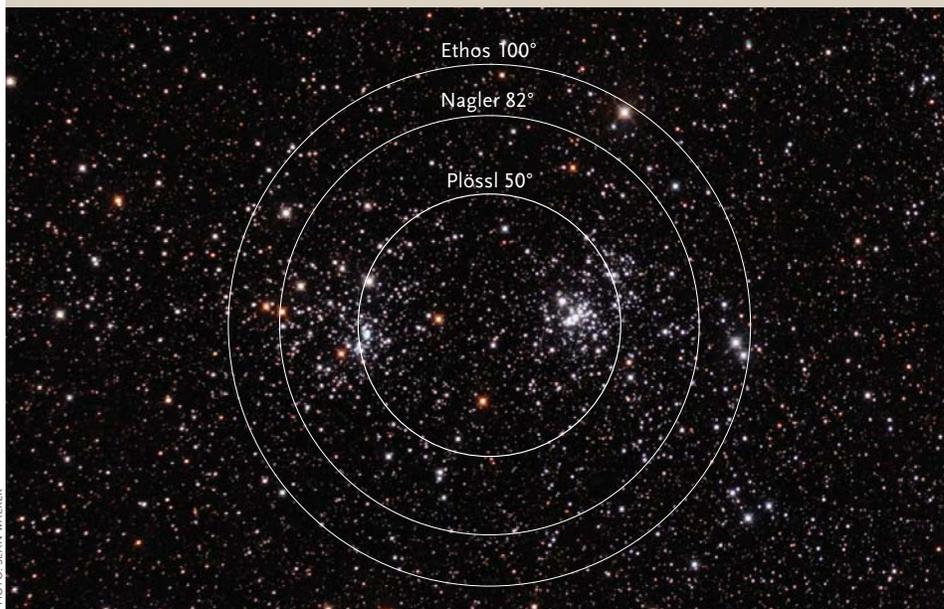


PHOTO: SEAN WALKER