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51 SKY-WATCHER EVOGUIDE 50ED



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In his article, Dr. James Dire uses the Sky-Watcher Evoguide 50ED as a guide scope as well as an imaging scope. The cover astro image of the Pickering Triangle, part of the Veil Nebula, is a combination of 33 five-minute exposures taken using the Evoguide 50ED with a ZWO camera guiding a William Optics 132mm Apo on a Celestron CGEM II mount.



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89 IMAGING WITH THE BAADER MPCC MARK III AND A TPO 10-INCH IMAGING NEWT

Baader Planetarium is renowned for its comprehensive line of connection components, and its ASTRO T-2 System offers a perfect solution for accommodating any of your favorite eyepieces. As for the fast TPO f/4 Imaging Newton, the same factors that make for excellent imaging also provide breathtaking rich-field view when combined with eyepieces that are specifically corrected for such fast scopes.
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Austin Grant is teacher and self-described perpetual hobbyist, experienced in such areas as building computers and repairing arcade equipment. Austin stumbled into astronomy several years ago and it soon became his primary interest. Being a child of the digital age, it didn't take long for him to find digital astro-imaging.



James Dire has an M.S. degree in physics from the University of Central Florida and M.A. and Ph.D. degrees from The Johns Hopkins University, both in planetary science. He has been a professor of physics astronomy at several colleges and universities. He most recently served as the president of Methodist College in Peoria, Illinois. He has played a key role in several observatory projects including the Powell Observatory in Louisburg, KS, which houses a 30-inch (0.75-m) Newtonian; the Naval Academy observatory with an 8-inch (0.20-m) Alvin Clark refractor; and he built the Coast Guard Academy Astronomical Observatory in Stonington, CT, which houses a 20-inch (0.51-m) Ritchey Chrétien Cassegrain.



Stuart Parkerson has been the publisher of Astronomy Technology Today since its inception in 2006. While working primarily in the background of the company's magazine and website business operations, he has recently taken a more active role in contributing content covering industry news and other company centric topics.



Mike Weasner started in astronomy at the age of six when his older brother, Paul, would show him the stars from their southern Indiana home. As a Christmas present in 1961, Mike's mother gave him an Edmund Scientific 3" Newtonian Telescope which he still uses today. When Mike was 14 Paul got him a subscription to Sky & Telescope which continues uninterrupted through today. He has a B.S. in Astrophysics from Indiana University and following college, he entered into the US Air Force, where he served as a fighter pilot, instructor, and a manager in the Air Force's Space Shuttle Program Office. He hosts the website "Cassiopeia Observatory" - www.weasner.com - where you can see reports of his sessions in his observatory, his astrophotography, and product reviews.



Erik Wiclox lives off the grid on the Big Island of Hawaii and has been observing for over 25 years. When he's not viewing from his dark backyard skies, he spends time hiking, kayaking, snorkeling and playing music.

Industry News/New Products

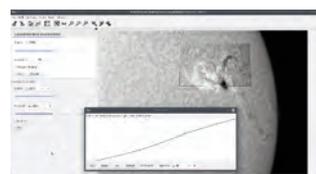
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THE SKY-WATCHER EVOGUIDE 50ED GUIDE SCOPE

By Dr. James R. Dire



The Sky-Watcher Evoguide 50ED is a 50mm $f/4.8$ doublet telescope with one extra-low dispersion (ED) element. The telescope has a 248mm focal length. While primarily designed to be used as an auto-guiding optical instrument, the telescope can also be used as a visual finderscope and as a wide-field, imaging instrument.

The Evoguide 50ED may be found as an Evoguide 50DX, which is essen-

tially the same instrument that I am reviewing here. The telescope comes with tube rings, a Vixen-style dovetail plate, two dust caps, and a finder stalk that fits many finderscope dovetail brackets on telescopes I currently own.

Image 1 shows the Evoguide 50ED right out of the box. The scope is nicely crafted with a black and white tube with green trim. The dovetail plate also has

the green color. The tube rings each have three adjustment screws with non-scratching tips. Each adjustment screw has a locking nut to keep the guide scope parallel to the main telescope.

The Evoguide 50ED has an easy to use helical focuser. There is a threaded extension tube attached to the back end of the focuser for use with an eyepiece. Everything on the back end connects with M42 T-threads (**Image 2**), so any accessories or cameras that have M42 threads can be firmly attached. The fo-

THE SKY-WATCHER EVOGUIDE 50ED GUIDE SCOPE



Image 1 - The Sky-Watcher Evoguide 50ED, a 50mm f/4.8 ED doublet telescope, comes with a Vixen-style dovetail plate, tube rings, extender tube that threads onto the back of the focuser, and dust caps.

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cuser and the extension tube both have three locking screws for attaching 1.25-inch eyepieces or a camera noseplug onto the telescope.

Although the focuser has plenty of travel, I found that the extension tube was not quite long enough for my eyepieces to come to focus. Likewise, the extension tube was too long for prime focus photography. When I removed it, the focuser was not long enough to focus my cameras without an extension tube.

All of these problem were trivial because I happen to own a M42 extension ring kit containing 20mm, 15mm, 10mm and 5mm rings, which allowed me to achieve the desired focus for any of cameras or eyepieces in conjunction with or without the supplied Sky-Watcher extension tube (**Image 3**). M42 extension ring kits cost around \$20-40 and are great to have for a variety of instruments.

I decided to test all of the capabilities of the Evoguide 50ED with it attached to my William Optics 132mm Apo on a Celestron CGEM II mount. I took the tube rings off the dovetail plate and attached them to the finder stalk (**Images 4 and 5**). The swap out required a Phillips screwdriver. After it got dark with the appropriate rings from my M42 ring kit, I was able to focus the Evoguide 50ED using a 25mm Plössl eyepiece. I then aligned the finderscope parallel to my 132mm Apo using the six adjustment screws (**Image 6**).

Unfortunately, a diagonal cannot be used with the Evoguide 50ED. Its tube length is too long to achieve focus with the optical path of a typical 1.25-inch diagonal. So in the configuration seen in Images 4 and 5, the Evoguide 50ED served as a straight through finderscope.



Image 2 - The extender tube has T-threads (M42), male on one and end female on the other end, to securely attach accessories to the telescope.



Image 3 - The author found an inexpensive T-thread kit, containing 20mm, 15mm, 10mm and 5mm long rings, to be useful for obtaining focus with the Evoguide 50ED for various eyepieces and cameras.

It might be overkill to use a just under \$300 50mm finderscope when a right angle 50mm finder scope would cost half that amount. But having one instrument like the Evoguide 50ED that can also be used for imaging and autoguiding makes this instrument more versatile than a cheaper finderscope.

On the second night of testing, I attached a CCD camera to my 132mm

Apo and a ZWO guide camera on the Evoguide 50ED (**Image 7**). Image 7 was taken before it was dark enough to focus the Evoguide 50ED and determine what length ring from my M42 extension kit I needed in place the extension tube to achieve focus with my autoguider camera. I eventually found the 20mm ring did the trick.

During the course of the evening,

THE SKY-WATCHER EVOGUIDE 50ED GUIDE SCOPE



Image 4 - The Evoguide 50ED was tested on the author's 132mm Apo, attached to the Apo using the Evoguide 50ED finder stalk.

the Evoguide 50ED performed flawlessly with my ZWO camera guiding the 132mm Apo as I imaged Pickering Triangle, part of the Veil Nebula. **Image 8** shows the results of the night's work. This image is the combination of 33 five-minute exposures with the CCD camera.

I next decided to do some imaging using the Evoguide 50ED. Since the Evoguide 50ED is a fast $f/4.8$ telescope, it suffers from field curvature like any other fast refractor. I would recommend using a field flattener with it. Sky-Watcher makes a T-threaded field flattener for the Evoguide 50ED that sells for around \$90. Unfortunately, one was not available to me for this review.

I removed the guider camera from the Evoguide 50ED and moved the CCD camera over to it (**Image 9**). My CCD camera has a built-in guide chip, so I did not have to move my ZWO camera to the 132mm Apo for guiding the Evoguide 50ED. To test its imaging capabilities, I took a series of 5-minute exposures of M31, the Andromeda Galaxy. **Image 10** shows the results of 25 minutes of total exposure time with the Evoguide 50ED. I would have shot longer, but clouds moved in limiting my imaging session.

Near the center of **Image 10**, the stars are pinpoint. But near the corners, the stars are radially elongated as typically seen with field curvature. **Image 11** is a cropped enlargement of the upper right corner of **Image 10** showing this effect. I am convinced the Sky-Watcher Evoguide 50ED field flattener would yield pinpoint stars across the field of view for CCD imaging.

My final testing of the Evoguide 50ED consisted of photographing the

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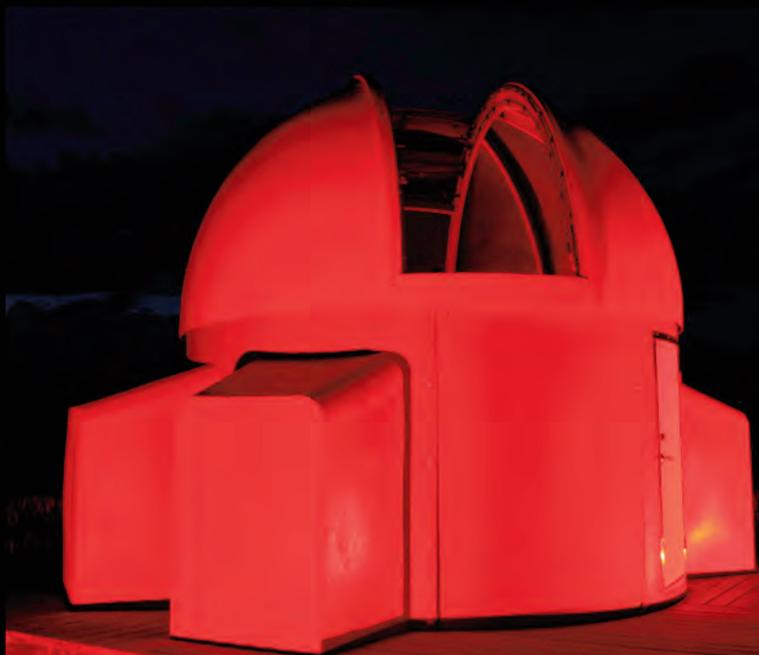
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THE SKY-WATCHER EVOGUIDE 50ED GUIDE SCOPE



Image 5 - The Evoguide 50ED finder stalk fit perfectly in to the Apo's finder dovetail bracket. With a 25mm Plössl eyepiece made for an excellent straight through finderscope. The eyepiece provided a magnification of 9.9x with a 5° field of view.

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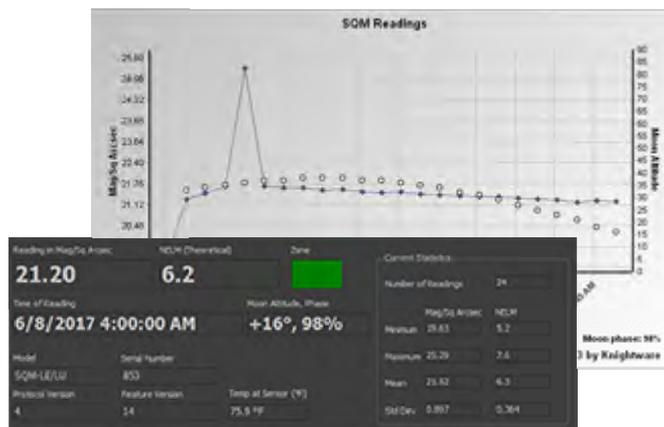
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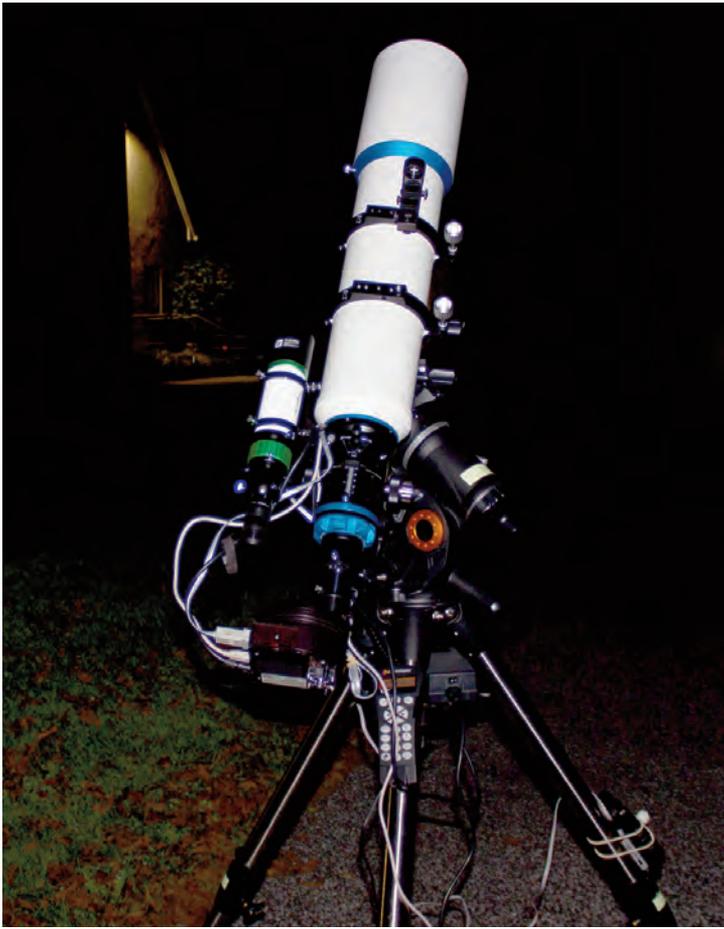


Image 6 - Once the stars came out, the author was able to align the Evoguide 50ED parallel to the main telescope using the easy to turn and lock thumbscrews on the Evoguide 50ED's tube rings.

Moon. This test would show how well the telescopes optics handles chromatic aberration. I used a Canon 600D camera (**Image 12**) with a 1.25 inch noseplug attached to the Evoguide 50ED to image the Moon.

Image 13 shows a full frame picture of the waning gibbous Moon. This color image has no hint of chromatic aberration! This is more apparent in **Image 14**, which is cropped and zoomed in on the center of Image 13. This doublet refractor comes as close to a perfect Apo as any doublet I have used in the past!

In conclusion, the Evoguide 50ED with a field flattener may very well be the most affordable 50mm Apo-quality imaging system on the market. The setup provides wide-field imaging capabilities for extended celestial objects or groups of celestial objects. The telescope also performs superbly as an autoguiding instrument and can be used as a straight through finderscope or visual telescope. 



Image 7 - On a subsequent night, the author attached a lightweight ZWO camera to the Evoguide 50ED to guide the main telescope for a CCD imaging session.

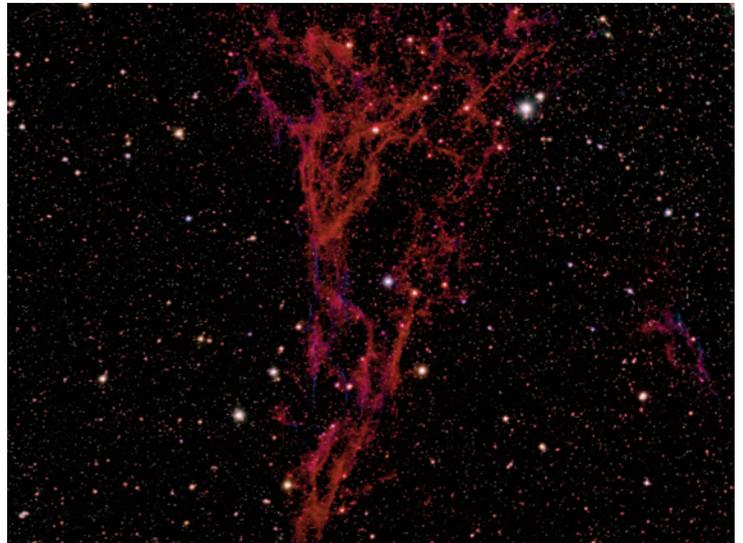


Image 8 - Using the Evoguide 50ED for guiding, this image of Picketing's Triangle was obtained from 33 five-minute exposures.

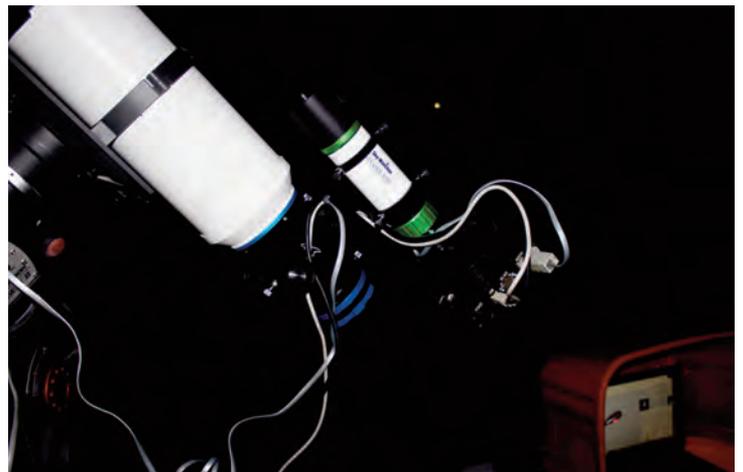


Image 9 - Moving the CCD camera over to the Evoguide 50ED, its imaging capabilities were tested.

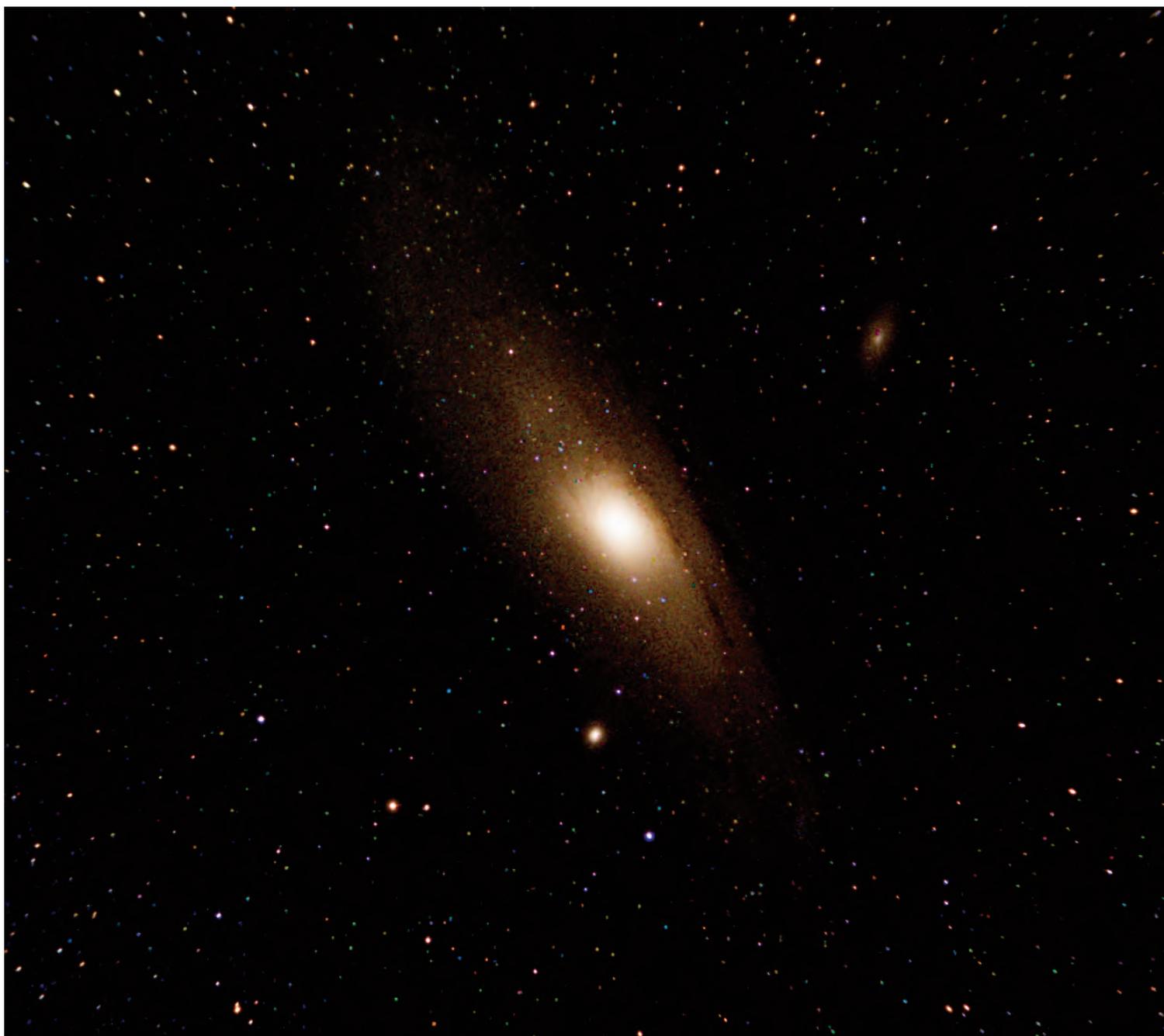


Image 10 - Five 5-minute exposures of M31 through the Evoguide 50ED were used to create this image.



Image 11 - A cropped and enlarged image from the Andromeda galaxy picture shown in Image 10 is presented here to show the effects of field curvature from the 50mm f/4.8 Evoguide 50ED. The Sky-Watcher field flattener made for the Evoguide 50ED should totally eliminate the field curvature and provide pinpoint stars down to the edge of the CCD's field of view.