In the past decade, astrophotography has changed radically. The renaissance in this field is due to the widespread use of digital imaging, including affordable charge-coupled device (CCD) and digital single-lens reflex (DSLR) cameras. In the past few years, a mismatch has developed between these modern imaging devices and telescopes designed primarily for visual use. Such instruments are either too slow optically, too expensive, or lack the precision necessary for sharp images of celestial portraits.

Recently, Orion Telescopes and Binoculars introduced a high-speed imaging telescope — the 8-inch f/4.0 Newtonian Astrograph Reflector — at the almost unbelievable price of $449.95. Would this potentially groundbreaking instrument live up to its billing? I decided to put it to the test and find out.

Technical details
Most experienced astroimagers would agree that a fast, large-aperture instrument with a moderate focal length is best for general imaging of deep-sky objects. An inexpensive, high-quality optical system that is daringly fast would ideally suit today’s sophisticated cameras. Such a scope would need to produce a high level of sharpness and also be easy to use.

In January, the astrograph arrived from Orion Telescopes. Unpacking the telescope was a pleasant surprise when I discovered the box contained a lot more than just the optical tube assembly. The black glossy finish on the 16-pound (7.3 kilograms) tube is simply breathtaking. Equally stunning is the superb machining on the focuser, a dual-speed 2” Crayford-style unit. It comes black-anodized with a white scale silk-screened on the drawtube. It also has finely finished knobs and 10-to-1 speed reduction for the fine-focuser. The rigid focuser displays excellent craftsmanship.

The straight-through 8x50mm finder scope also is of high quality. It mounts via a machined dovetail slot on the tube for an easy and quick disconnect. Two black tube mounting rings come with the scope, and each has a variety of ¼” mounting holes on its base.

More nice surprises include the tool-free collimation knobs in two colors for easy identification under low light levels, and a full-aperture front cover for the optical tube assembly. Orion also designed a small cooling fan mounted on the back of the mirror cell. This nice accessory has a plug for an external battery pack, which Orion provides.

The package includes a 1¼” optical peep sight for coarse collimation, a light

The Pleiades (M45) in Taurus is a favorite target of astroimagers. The author combined ten 5-minute exposures through the Orion 8-inch Astrograph to bring out the gas in the area of the star cluster.
version of Starry Night software, and a printed manual. A bonus is the beautifully machined 2” extension tube complete with a black-anodized 1¼” adapter for visual use. This compensates for the extended photographic back focus Orion had to build into the optical design.

And speaking of optics, the company coated the BK-7 glass primary and secondary mirrors with aluminum having a reflectance of 91 percent. What more could an astroimager ask for?

Methodology

For my evaluation of this instrument, I mounted it on a homemade cradle on an Astro-Physics AP1200 mount in my northern Arizona observatory. A stout set of mounting rings on the top of the cradle carried a 90mm refractor guide scope. For imaging, I used a Hutech-modified Canon XTi DSLR with a Baader Multi-Purpose Coma Corrector.

I used a small laptop computer running Images Plus software for extremely accurate focusing of the camera. I sequenced the many exposures I took with a Canon remote timer. To guide the setup, I used a Meade DSI III Pro CCD camera with my laptop running PHD Guiding. Controlling the focus and tracking with the laptop computer ensured consistent, repeatable testing of this instrument, critical for an accurate evaluation.

Your next telescope?

I found this telescope a total pleasure to use. The precise mechanical operation of its focuser made all the difference in the world. Sharp arcsecond-sized star images filled the field of view on successive 5-minute exposures with an absolutely stunning amount of nebulosity visible on my DSLR's screen.

A comparison of images of a dense Milky Way star field with and without the Baader coma corrector revealed that — even without the additional optical correction — the instrument performed well with small CCD chips (those that did not exceed about half the size of a DSLR frame). For larger chips, like those in DSLRs, I recommend the coma corrector, which produced sharp, full-frame images with pinpoint stars right to the corners.

Orion's 8-inch f/4.0 Newtonian Astrograph Reflector allows budget-minded sky shooters access to a new level of high-quality imaging. The combination of large aperture, blazing speed, and crisp resolution makes it a scope to consider for wide-field imaging.

Contact information

Orion Telescopes and Binoculars
89 Hangar Way
Watsonville, California 95076
[t] 800.447.1001
[w] www.oriontelescopes.com

The Jellyfish Nebula (IC 433) in Gemini resulted from a star exploding several thousand years ago. The author captured this deep-sky object by stacking seventeen 5-minute exposures taken through Orion's 8-inch f/4.0 Newtonian Astrograph Reflector. Chris Schur

See more of Schur's images through this scope at www.Astronomy.com/toc.
Keep your eyes on the sky and renew your ASTRONOMY subscription

Don’t break your link to the leading astronomy magazine on the market. Renew your subscription and continue to receive the insightful astronomical information that fills every issue:

- New-product listings
- Expert observing tips
- Field tests: telescopes, cameras, binoculars, eyepieces, accessories
- Monthly pullout star maps
- And exclusive online access to Star Atlas, Star Dome Plus, The Sky this Month, Ask Astro archives, videos, image galleries, product information, and more!

RENEW TODAY!

www.Astronomy.com/ASYRENEW

Plus, why not share your enthusiasm? It’s easy to send someone a gift subscription today!

Give a gift today at www.Astronomy.com/ASYGIFT