Celestron EdgeHD 11 & Optec Lepus 0.62x Telecompressor

A Top-Notch Imaging Combo

By Klaus Brasch

Two years ago when Celestron first announced it had modified and improved its now-classic Schmidt-Cassegrain telescope (SCT) design, I was intrigued. As a long-time SCT enthusiast, I had learned to appreciate both its strengths and limitations. On the plus side, you had a long-focal length telescope in a compact format that provided sharp, color-free images, and was suitable for both visual work and astrophotography. Moreover, while not inexpensive, SCTs were affordable and came in easy-to-manage portable packages. In many ways this design was the perfect compromise between classic Newtonian reflectors and traditional achromatic refractors. On the down side, the design suffered from mild field curvature and coma, as well as somewhat reduced image contrast due to its fairly large central obstruction.

In order to meet today's stringent optical requirements for digital imaging, the new Celestron EdgeHD series was designed to eliminate or reduce those optical aberrations and also improve image contrast and brightness. This was achieved by converting the classic Schmidt-Cassegrain configuration into an "aplanatic" Schmidt through insertion of a set of field-flattening lenses into the optical path. In addition, all HD telescopes have enhanced Starbright XLT coatings, are equipped with passive air vents for faster thermal equilibration and have a novel locking mechanism to minimize mirror flop, a perennial SCT design problem.

Image 1 - M-27, the Dumbbell Nebula, imaged at f/10. Stack of two 10-minute exposures at ISO 800 with a spectrum enhanced Canon 50D.

I purchased an EdgeHD 11 optical tube assembly a year ago, along with an important imaging accessory, a dedicated Lepus 0.62x telecompressor from Optec. The telescope came equipped with a standard Celestron 9x50 finder and an outstanding 23-mm 2-inch Axiom eyepiece with an 82-degree apparent field of view. I have since thoroughly tested this system both visually and by imaging with a modified Canon 50D DSLR from my observatory near Flagstaff, Arizona.

Visual Assessment

I can say without hesitation that the 23-mm Axiom eyepiece is a perfect match for this telescope for both deep-sky objects and lunar and planetary viewing. With a magnification of 122x and an actual field of view around 0.67 degrees, it provides

Image 2 - M-33, the Pinwheel galaxy, imaged at f/6.2. Stack of five 6-minute exposures at ISO 1600, all taken with a spectrum enhanced Canon 50D.

Image 3- M-5, Globular cluster in Serpens, imaged at f/6.2. Cumulative exposure of 10 minutes at ISO 800.

stunning views of Messier and other deep-sky objects. Prominent globular clusters like M2, 5, 13, 15, and 22 are resolved to the core with pin-point stars across the entire field of view. Defocusing the eyepiece showed concentric donuts to the edge of field. Nebulae like M8, 16, 17 and 20 appeared very contrasty both with and without light pollution filters, as did galaxies like M51, 81 and 82. As expected, M42 was stunning, with hints of magenta hues under really transparent skies.

Higher magnification showed nice, concentric diffraction patterns on bright stars. Likewise the Moon, Saturn and Jupiter showed contrasty, subtle detail under good seeing conditions, more like a large-aperture apochromatic refractor than a classic SCT. When seeing warranted it, Jupiter's moons were clearly resolved into distinct little disks with magnifica-

tions of 280 or higher. In sum, compared to older Celestron SCTs I have owned, including a classic 1970s vintage C-10, a fine C-11 and a C-14, the HD 11 provided visibly better, more contrasty, totally color-free views of all test object examined.

Imaging

The main reason for switching to an EdgeHD telescope, however, was for imaging. My older SCTs worked well enough with film photography years ago, and were also satisfactorily with an APS size DSLR sensor. Although stars looked sharp and round at the center of the images, slight field curvature was apparent in the corners even at prime focus. This was even more pronounced with standard focal reducers, in addition to exhibiting mild coma at the edge of field. Obviously, such defects are not acceptable with full-frame DSLRs or larger CCD sensors.

Prime Focus Imaging

As expected, images were sharp, contrasty and flat across the entire field at f/10. With an effective focal length of 2800 mm, image scale was large, especially with the APS-size sensor, but stars were pin-points under steady seeing conditions (**Image 1**). Since f/10 is a comparatively slow optical system, camera ISO settings were generally high (1600) in order to capture sufficient signal with relatively dim objects.

Imaging at f/6.2

The dedicated Lepus 0.62x telecompressor from Optec must be ordered with a T-ring adapter specific to your astrocamera. It cannot be used visually or with an off-axis guider. Standard SCT reducer/correctors do not work with the EdgeHD optical configuration. The Lepus telecompressor is light weight, well made and yielded pin-point stars across the entire image. With an effective focal length a shade over 1700 mm, the combination proved ideal for prominent galaxies and also neatly frames many larger emission nebulae (**Images 2, 3** and **4**). Many objects were bright enough for smooth imaging at ISO 400. The only omission in this otherwise fine accessory is the absence of threads for 2-inch filters. In order to use external light-pollution or narrow band-pass filters with the Lepus, you must therefore place them loose in the optical pass and hopefully not drop them when the unit is disassembled again.

Image 4 - The Lagoon Nebula, M-8, imaged at f/6.2. Stack of 3-, 5- and 8-minute exposures at ISO 800.

Conclusion

The Celestron C-11 Edge HD lived up to its billing as a top notch imaging telescope. In fact, I would rate it equal to comparable aperture Ritchie-Chrétien designs costing two to three times as much, with the added bonus that it is also a first-rate visual instrument and much lighter in weight (27.5 pounds). The latter is a definite plus for field trips and in terms of mount stability. Other novel and very useful features include the passive vents that really expedite thermal equilibration and the easy to use mirror locks which almost completely eliminate mirror flop with attendant focus shift, so characteristic of older SCTs. The only complaint I had is that the OTA is not supplied with a rigid 2-inch visual adapter or star diagonal. ATT