The Celestron Astromaster 76 Telescope

An Outstanding Value in an Entry-Level Telescope

By James R. Dire, Ph.D.

This past spring I was visiting my son in Las Vegas where he is a student at Touro University. Coming out of the Las Vegas airport I happened to spot one of those mega electronics stores the like of which we don't have in Hawaii where I live. Being the techno-geek that I am, I couldn't resist stopping in to look around for an hour or two. After only a few minutes, I spied an aisle across the store with a row of telescopes assembled and sitting on the top shelf. I immediately plotted a vector in that direction.

There were a dozen display telescopes in that aisle, ranging from 2-inch spotting scopes to 4-inch refractors. Most of them were very dismal instruments that were poorly constructed, made of inferior plastic tubes and components with inadequate optics, and on flimsy tripods or mounts. I was quite disappointed at the selection until I spotted one scope in particular, the Celestron Astromaster 76 telescope.

This 3-inch reflecting telescope was packaged with a Celestron CG-2 German equatorial mount, a couple of eyepieces and a red-dot finderscope, all on sale for only $99 at this particular store! My immediate impression was that this was an exceptional value (even at Celestron's list price of $169, I think it would have been). That night, I told a friend of mine living in Las Vegas about my find. He was looking for something like that. He picked one up the next day, and when I returned to Las Vegas the following month, we took it for a test drive in a dark state park 125 miles north of the city.

The CG-2 German-Equatorial Mount

Image 1 shows the complete assembled Astromaster 76. The telescope is a Newtonian with 76-mm f/9.2 objective. More on that later after I discuss the mount. The CG-2 mount is updated and much

Image 1

improved from the previous generation. The mount (**Image 2**) accepts Vixen-style dovetail plates (a new feature from the last generation) and has hand control knobs for both the right ascension (RA.) and declination (Dec) axes (**Image 3**). There are locking bolts for both axes. An RA motor drive for this mount is also available from Celestron.

The mount comes with not one, but two adjustable counterweights and a remov-


Image 2


Image 3

able counterweight shaft. The counterweights are sleekly shaped and textured for easy griping. All knobs, including on the dovetail plate, counterweight, RA, Dec and tripod leg locks have generous-sized handles and are easy to tighten and loosen. The mount comes with setting circles and a latitude indicator (**Image 4**). Latitude adjustments are easy to make with hand-operated screws.

The previous generation of this mount had three rectangular aluminum pieces on each tripod leg where the middle piece slid in and out between the other two. But this version's tripod legs are 1.5-inch diameter round legs that are telescopic (sorry about the pun) and sport an accessory tray in the middle.

All in all, the mount is exceptionally sturdy for its weight and there was no wobble at all. Both axes turned very smoothly! This mount can easily hold a much heavier telescope than the Astromaster 76. As you can see in Image 1, when balanced the counterweights are not at the end of the shaft. I think the mount alone is worth the purchase price!

The Astromaster 76 OTA

Now on to the optical tube assembly (OTA): the optics are housed in a generous-

ly-sized metal tube with a nice metallic-blue finish (Image 2). The secondary has a three-vane spider and has three collimation screws requiring an Allen wrench. The primary-mirror collimation requires loosening three hand-turned locking bolts, and then tilting the mirror with three screws that require a small Phillips screwdriver. I used a standard Newtonian laser tool to collimate the optics and then star-tested to confirm their alignment.

The focuser is a simple rack-in-pinion design with single-speed knobs on both sides (**Image 5**). It accepts only 1.25-inch eyepieces. The knobs have a rubber griping surface and the focuser turns quite smoothly. It was very easy to achieve a crisp focus. Like most Newtonians, there is insufficient back focus to do prime focus photography.

The telescope comes with a basic 1X, battery-operated red-dot finder (battery included). The finder has an on/off switch and the brightness in not adjustable. This finder has transparent plates on the front and back with sighting circles and dots in the center for daytime use (**Image 6**). Two set-screws are used to align the finder parallel to the main scope. While crude, the finder does the job of getting objects into the telescopes field of view. Removing two screws allows the finder to be removed should you want to mount a third-party finder to the OTA.


Image 4

The telescope comes with two eyepieces, a 20-mm (35x) image-erecting eyepiece and a 10-mm (70x). You might wonder at the quality of eyepieces that come with a $100 telescope, when most decent eyepieces cost a


Image 5

major fraction of this value, or more. Let's just say, I took one look through the 20-mm eyepiece and substituted one of my stock 26-mm Plössls (27x). Now the 10-mm eyepiece was another story. It actually performed quite well, although not as good as my standard 1.25-inch Plössls.

The OTA's focal length is 700 mm, which is quite long for a 76-mm telescope. But this has some advantages. With only 3 inches of aperture, this telescope is not for viewing galaxies, nebulas or faint star clusters. But it is perfect for viewing the Moon, Venus, Jupiter and Saturn, as well as bright star clusters and binary stars. For these applications, the 700-mm focal length allows for higher magnification than you typically can produce with a 3-inch telescope.

A Shootout

I decided to compare this telescope side-by-side with my 70-mm f/6 achromatic refractor (420-mm focal length). Although the aperture was smaller, the refractor actually has about the same light gathering power since, unlike the Astromaster 76, it has no central obstruction. My targets were the Moon, Saturn and the globular cluster M13.

On the Moon, both telescopes provided excellent view of craters, especially near the terminator. There was slight chromatic aberration in the refractor, but none in the Newtonian, as expected. On Saturn, both scopes provided great views of Saturn's rings, but with the 10-mm eyepiece I could see the Cassini division better in the Astromaster 76 (76x versus 42x). Saturn's magnitude-8 moon Titan was also eas-

ily visible, but not Saturn's smaller moons.

M13's million stars are impressive in any telescope, but neither of these two telescopes are capable of resolving many, especially near the cluster center. However, I noted that the Astromaster's stars were pinpoint through the entire field of view. As expected, an f/9 Newtonian has no noticeable coma!

Conclusion

I only had one difficulty with the Astromaster 76. With a fixed dovetail plate mounted directly to the OTA, the eyepiece cannot be rotated to a convenient viewing position for many mount orientations. The dovetail plate has a ¼-20 threaded hole for mounting the OTA to a standard camera tripod for terrestrial viewing. The location of the focuser requires sitting, rather than standing for terrestrial viewing. A pair of tube rings would allow the eyepiece to be rotated to convenient viewing angles, making this telescope more versatile when mated to the CG-2.

Image 6

However, overall, this entry-level telescope is inexpensive, an outstanding value for the price, and offers numerous features not found on many more expensive telescopes. ATT