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WILLIAM OPTICS ZENITHSTAR 61

EXQUISITE GRAB-AND-GO GOODNESS

Volume 12 • Issue 4
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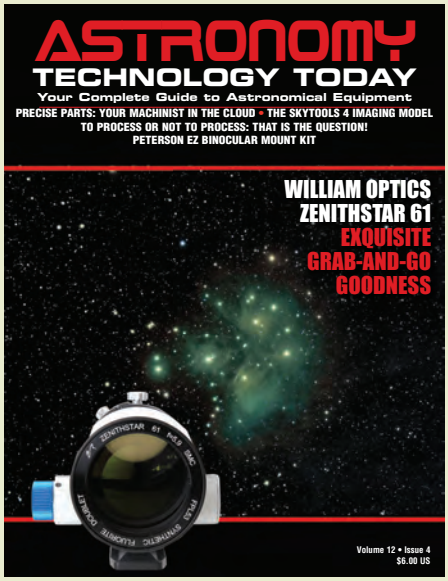
Cover Story: Pages 41-56

Our cover article offers Dr. James Dire's review of the William Optic's Zenithstar 61. As Dr. Dire demonstrates, this telescope is an extremely compact and portable instrument capable of very high performance. The image shown on the cover is, as Dr. Dire explains, "A 60-minute exposure captures the Pleaides (M45) in all their glory with the Zenithstar 61." The cover image of the scope offers the business end of the Zenithstar 61 showcasing its synthetic fluorite doublet objective lens.



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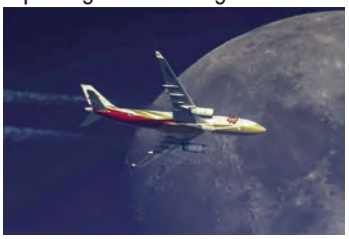
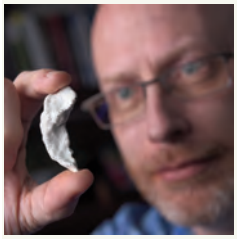


ATT Contributing Writers

Greg Crinklaw operates Skyhound and is the developer of SkyTools. He is a life-long amateur astronomer, who is also trained as a professional astronomer, holding a BS, MS in astronomy, and an MS in astrophysics. He also worked for NASA as a Software Engineer on a Mars orbital mission. Greg and his family live in the mountains of Cloudcroft, New Mexico.

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 is 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)

Matt Harmston is an educational researcher whose appetite for the heavens has been whetted by increasing aperture over the years. More recently, Matt has immersed himself in video astronomy - a means of probing deeper into the night sky while making astronomy accessible to all ages and abilities. With this technology readily available, Matt is considering a career as a sleep-deprivation research subject.Ritchey Chrétien Cassegrain.



Craig Stark is a Professor of Neurobiology and Behavior where he spends his days doing research into how memory works in the brain. He is well known in the astronomy community as the proprietor of Stark Labs, where he offers purpose-built software tools. These include Nebulosity, a cross-platform application for DSO image capture and processing used by amateur astronomers across the globe. As if that's not enough he has created several astronomy related projects such as the Lazy Laser Collimator, the LYBAR observing chair, and the Sphere-O-Scope.

George Stallings has been observing for more than 25 years, though he has only recently jumped into the world of lunar and planetary imaging. A career information analyst and lifelong science-hobbies enthusiast, he navigates the fine line between late nights imaging and early mornings consulting for the federal government in northern Virginia.

Erik Wilcox lives off the grid on the Big Island of Hawaii and has been observing for over 20 years. When he's not viewing from his dark backyard sky, he works for a natural foods chain and spends his spare time hiking, kayaking, snorkeling, and performing music.

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WILLIAM OPTICS ZENITHSTAR 61 APOCHROMATIC REFRACTOR

EXQUISITE GRAB-AND-GO GOODNESS

By Dr. James R. Dire

In 2017, I picked up two new William Optic telescopes: a Twentieth Anniversary Edition Fluorostar 132 (132-mm f/7 triplet Apo) and a Zenithstar 61. In a previous article, I reviewed the Fluorostar 132. Here, I will review the Zenithstar 61 (hereafter referred to as the Z61).

The Z61 is William Optics' newest and most compact apochromatic refractor. The telescope has a 61-mm f/5.9 objective, yielding a focal length of 360 mm. The doublet objective uses FPL53 glass (Image 1). This is one of the lowest indices of refraction glasses made and comes very close to fluorite in its optical dispersion properties. Using this synthetic fluorite glass allows the Z61 to achieve excellent color correction with just two objective elements.

The telescope was safely shipped in its case packed with bubble wrap in a

Image 1 – The business end of the Zenithstar 61 showing its synthetic fluorite doublet objective lens.

Image 2 – The Zenithstar 61 is shipped in a sturdy double-layer-cardboard box with bubble wrap.

double-layered cardboard box (Image 2). The storage case is made of hard plastic and has foam cut out perfectly in the shape of the telescope to protect it during transportation (Image 3).

Image 4 shows just how compact the Z61 is when the dew shield and focuser are both retracted. The telescope is approximate 10 inches (254 mm) in length. It's lightweight, too, weighing a mere 3.2 pounds (1.45 kilograms). With the dew shield fully extended and the focuser cranked out all the way (Image 5), the telescope (without any accessories attached) expands to nearly 15 inches (380 mm).

Besides the OTA and the case, the telescope comes with a rotating ring with a small dovetail bracket, a metal tube cover, a finderscope shoe, and a 2-inch to 1.25-inch RotoLock adapter for locking in 1.25-inch accessories. The telescope does not come with a mount, star

diagonal, finderscope, field flattener or eyepieces. Fortunately, I already have an inventory those accessories.

The Z61 comes with a rugged, two-speed focuser (Image 6). The silver knobs on each side provide the course focus, while the smaller blue knob on the right provides the 10:1 fine focus. The drawtube extended 75 mm and is graduated in millimeters with large ticks and numbers every 10 mm. Fully extended, the focuser is rigid with no flexure. The focuser turns very smoothly and there is a setscrew to lock the focuser in place.

Image 7 shows the Z61 along with the Fluorostar 132 on a Twilight II alt-azimuth mount. I have removed the RotoLock adapter and have inserted a 2-inch diagonal with a massive 2-inch eyepiece. The Z61 has three setscrews for securing the diagonal into the focuser. These models have blue trim. However, they can also be ordered with red or gold trim. Note the dial with a needle inside the left focus knob. This is a thermometer that reads in both Fahrenheit and Celsius.

For terrestrial viewing, the telescope can be attached to a standard camera tripod, since it has two 1/4-20 taps on the small dovetail bar (Image 8).

Image 3 – The telescope's hard plastic carrying case is foam-lined to protect the telescope during transport.

Image 4 – With the dew shield and focuser both fully retracted, the telescope is a mere 10 inches long.

For celestial use, the telescope is a perfect match for an iOptron Cube Pro mount (Image 9). The combination yields an extremely portable airline travel telescope and mount set. Image 9 shows the telescope with a 1.25-inch diagonal inserted into the RotoLock adapter with a 25-mm (14x) Plössl eyepiece. I also inserted a red-dot finder into the finderscope shoe. I should note the finderscope shoe can be attached onto the top right or top left side of the focuser. Everything shown in this image, including the tripod, fits into a standard carry-on bag, without exceeding allowable carry-on weight restrictions.

Out in the field, there is no need for any finderscope other than a red dot for general pointing. With a 25-mm, 50-degree Plössl eyepiece, the true field of view is 3.6 degrees, making it easy to center a target object. Most of my observing is done with a 13-mm Tele Vue Ethos eyepiece, which gives 28x and 3.6 degrees, and a 4.8-mm Tele Vue Nagler eyepiece yielding 75x with a 1.1-degree field.

The Z61 is great for viewing extended objects such as the Pleiades, M44 and Orion's Sword. The Andromeda Galaxy with satellite galaxies M32 and

M110 are easily captured. The telescope is excellent for exploring lunar craters, as the full aperture does not collect a blinding amount of lunar light unlike larger telescopes. At 75x with my 4.8-mm Nagler eyepiece, Jupiter's belts and zone, along with its Galilean moons, are clearly visible. So are Saturn's rings and its moon Titan. There was no hint of false color visible around the moon or planets, attesting to the excellent color correction of the telescope.

To test the telescopes astrophotography potential, I attached it piggyback atop the Fluorostar 132 on my Paramount MyT German equatorial mount in my club's observatory (Image 10). To secure the telescope to the blue plate, I used both 1/4-20 taps on the bottom of the telescopes rotating bracket. I attached a 0.8x focal reducer/field flattener with appropriate spacers to an SBIG-8300C CCD camera and inserted it into the Z61's focuser. Autoguiding was accomplished with the CCD camera attached to the larger refractor. The 0.8x focal reducer yielded a 288 mm focal length at f/4.7.

At the end of twilight, a small crescent moon was still high in the west. With a one second exposure, I captured the Earthshine visible in Image 11. After moonset, I decided to try some deep-sky imaging.

My first deep-sky target was M31, the Andromeda Galaxy. This size refractor perfectly frames M31 on the camera's CCD. I intended to image M31 for 120 minutes with 10-minute subframes, but clouds kept interfering, and I only managed to get four good 10-minute images. To my surprise, the combined 40-minute exposure resulted in an excellent picture of M31 (Image 12). The telescope captured Andromeda's spiral arm structure and dust lanes quite thoroughly. M32 and M110 are also suffi-

Image 5 – Even with the dew and focuser fully extended, the telescope is only about 15 inches in length.

Image 6 – The telescope comes with a sturdy, two-speed focuser that extends 75 mm. The drawtube is graduated and three setscrews secure 2-inch barrels. It comes with a RotoLock 1.25-inch adapter.

ciently present. M31 star cloud known as NGC206 is also clearly visible halfway between the galaxy's core and lower right (southwest) edge!

After shooting M31, I turned the telescope on M45, the Pleiades. Again, this size telescope is perfect for framing the M45. Image 13 is a result of a 60-minute exposure. The Z61 beautifully captured the seven sisters, their scores of cousins, and the swirling clouds of gas out of which they all formed.

The Zenithstar 61 is a beautifully-crafted telescope that can be used as a grab-and-go instrument for local star parties or intercontinental travel. Views at the eyepiece are superb. In addition, the telescope is excellent for imaging large field-of-view celestial objects. Its fast optical system captures faint objects with relatively short exposure times. ATT

Image 7 – This photo shows the ZenithStar 61 with a 2-inch diagonal and eyepiece on a an Explore Scientific Twilight II mount with the larger matching William Optics Fluorostar 132.

Image 8 – The Zenithstar 61 can be attached to a standard camera tripod for terrestrial use.

Image 9 – Using lighter weight 1.25-inch diagonal and eyepieces, the ZenithStar 61 works perfect with an iOptron Cube Pro mount. Combined this is an extremely portable telescope system for airline travel.

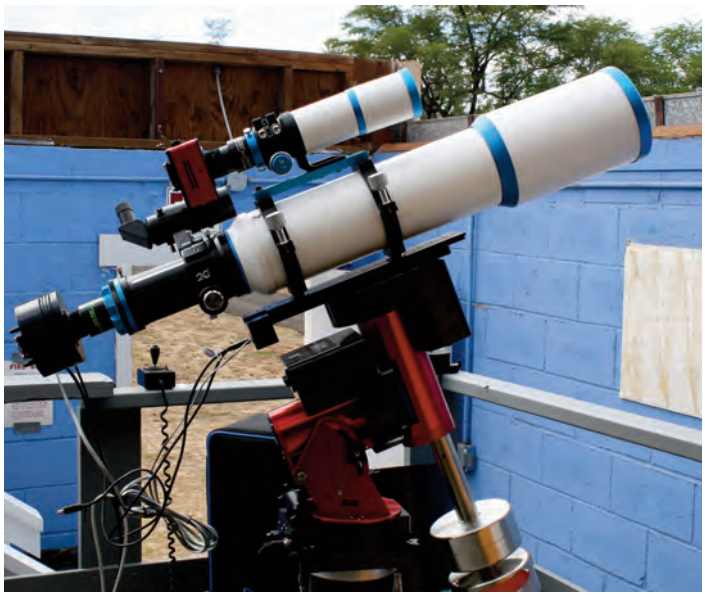

Image 10 – The author tested the imaging capabilities of the Z61 in his club's roll-off-roof observatory atop the Fluorostar 132 and a Paramount MyT German equatorial mount.

Image 11 – Earthshine on the Moon captured with an SBIG ST-8300C CCD camera with a one-second exposure.

Image 12 – The Andromeda Galaxy (M31) with satellite galaxies M32 and M110 captured with a 40-minute exposure with the SBIG ST-8300C CCD camera.

Image 13 – A 60-minute exposure captures the Pleaides (M45) in all their glory with the Zenithstar 61.