

# Astronomy tests William Optics' new refractor

Superb craftsmanship and high-quality optics make this a 4-inch telescope you'll be proud to own. **by Tom Trusock**

**T**o an amateur astronomer, nothing says flexibility like a good refractor. That's why I jumped at the chance to review the William Optics GT102 102mm f/6.9 Apo Refractor. Perfect for grab-and-go observing, lens-type telescopes are capable of stunning wide-field views, high-power double star splits, and excellent lunar and planetary images. And that's not even mentioning astromaging.

The design has other benefits as well. Such scopes are essentially maintenance free, lightweight, and portable. The biggest drawbacks have typically been cost per inch of aperture and that bugaboo of the refractor design — false color (fringes around bright objects like the Moon and planets).

While there are many refractor designs, for most observers it boils down to just two: achromatic and apochromatic. In their day,

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achromats brought all wavelengths of light to focus in a much smaller circle than their predecessors. This dramatically reduced false color at the eyepiece. Typically having lenses that combine two types of glass, they remain popular today.

If you're looking for a faster (i.e., wider field) telescope, however, color error begins to rear its ugly head. In the 1980s, designers realized that they could combine glass with rare elements to bring colors to an even tighter focus. Thus, the apochromat now generally available was born.

## Optics and mechanics

William Optics' GT102 has a three-element front lens design that uses FPL-53 and other unspecified extra-low dispersion glass. The scope has a 4-inch aperture with a stated focal length of 703mm.

The first thing I noticed was the scope's high-quality exterior. The optical tube assembly (OTA) has a white matte finish with anodized orange and gold accents.



The manufacturer incorporated a thermometer into one side of the focuser.

The lens shade/dew guard locks with a single screw, and the felt-lined lens cap is press fit. Four knife-edge baffles lie within the OTA to assist in light control and increase contrast.

The 2" Crayford-style focuser is sturdy and one of the nicer ones I've seen. While you won't be positioning the telescope by dragging on the star diagonal, there was no tendency for the focuser to slip on its own, even when I inserted my heaviest eyepieces. One of the focus knobs contains a thermometer (that's right!), while the other side has a pair of concentric knobs. It's a typical arrangement with the smaller knob providing the fine focus.

In the past, I've seen issues with this setup, where the fine-focus knob has gotten smacked in transit, which can mess up the focuser. William Optics has solved this problem by providing a metallic end cap that screws around the knob and protects it when you travel. The drawtube has marks to help astromagers return to previous



William Optics' GT102 102mm f/6.9 Apo Refractor weighs just 11 pounds (5 kilograms), so it's great for grab-and-go astronomy. ALL IMAGES: ASTRONOMY: WILLIAM ZUBACK

focus positions, and the focuser rotates 360°. The tube rings that the company provides are high quality. The included Vixen-style dovetail is nice, if a bit short and lacking a safety-catch on the front.

Collapsed, the OTA measures 27 inches long (69 centimeters) and weighs 11 pounds (5 kilograms). There is no case included, but the company offers a padded soft case on its website for \$99.

## Evaluation

Star testing showed the scope to be in excellent optical alignment and well corrected, with similar star image patterns on both sides of focus. I did note a tiny bit of astigmatism (unfocused images) during cool down, but that's not uncommon. It was only visible at the highest powers, and then only if I looked for it.

I've observed through countless samples of apochromatic telescopes over the years and have a pretty good handle on my tolerances for visual color error. Seeing this defect is subjective; tiny amounts bother some people, while others I know can't see it at all. That said, the GT102 has minimal in-focus color error. In fact, often what I may have been seeing could have been more of a focusing problem.

Move the focus slightly to one side, and the result is a purple haze. A yellow-green fringe appears on the other side of focus, exactly as you would expect with a telescope of this design. Visually, the field of view is fairly flat, but I suspect you'd want to pick up the optional field flattener if you intend to use this telescope to image with a large chip. All daytime objects I viewed appeared clean and crisp.

A telescope with this focal length is ideal for wide-field views, yet it's fully capable of high powers when matched with the appropriate eyepiece. Coupled with a 41mm 68° field of view eyepiece, the true field was



The objective in the GT102 is a triplet with a 703mm focal length. At least one of the lens elements is FPL-53 glass.



The refractor features a 2" two-speed Crayford-style focuser. The black extension tube has a scale on it for repeatable focus settings.

almost 4° even though the magnification was a mere 17x. Yet the telescope easily yielded 234x (with a 3mm eyepiece) on bright targets like Saturn.

## Under the stars

As is common with refractors, the scope took a while to cool down, but once cool, the views were — simply put — stellar. The summer showpiece Albireo (Beta [β] Cygni) was gorgeous at low power. At moderate magnification, I could resolve all four components of the Double Double (Epsilon [ε] Lyrae). At 234x, I observed Saturn's Cassini Division easily as well as some banding on the planet itself. The moons Rhea and Titan were easy catches, but Tethys was lost in the planet's glare.

This size telescope is extremely portable, but its small size doesn't limit you to just the Moon and planets. There are many deep-sky objects that are absolutely wonderful, and summer was a great time to start searching for them.

First up was the Ring Nebula (M57) in Lyra. It appeared as a dim doughnut with a dark center. It was easily visible at low power as a fat star, and a wide-field eyepiece showed it just off-center between Sheliak and Sulaphat (Beta and Gamma [γ] Lyrae).

The Dumbbell Nebula (M27) was an obvious apple core. The Coathanger (Collinder 399) filled the field of a low-power eyepiece. At 54x, globular cluster M71 showed good resolution with averted

vision. And another globular, M56, pushed the edge of resolution.

## A great choice

Overall, I was pleased with the William Optics GT102 102mm f/6.9 Apo Refractor. Optically and mechanically, the telescope presents a significant value for your dollar. If you're in the market for a high-quality apochromatic refractor but can't afford to mortgage your home, this one should be on your short list. ☺

## PRODUCT INFORMATION

### William Optics GT102 102mm f/6.9 Apo Refractor

**Type:** Apochromatic refractor  
**Aperture:** 4 inches (102 millimeters)  
**Objective:** Three-element lens  
**Focal length:** 703mm  
**Focal ratio:** f/6.9  
**Weight:** 11 pounds (5 kilograms)  
**Price:** \$1,498

**Also comes with:** Tube rings, Vixen-style dovetail plate, retractable dew shield, dust cap, 2" two-speed focuser

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