

# Astronomy's fifth annual STAR PRODUCTS

by Phil Harrington

Once again, our equipment guru combed the marketplace to find the most useful and most ingenious products for the fifth incarnation of *Astronomy's* Star Products. The 35 items here, presented in alphabetical order by manufacturer, run the gamut. Some are perfect for visual observing, while others will help you excel at astroimaging. There's something for everyone — beginner to advanced amateur — and in a wide price range.

## 1 APOGEE IMAGING SYSTEMS ▶ Aspen CG16M CCD camera

With improved baffling to minimize internal reflections, a durable shutter, and advanced cooling to reduce image-distorting electronic noise, Apogee's line of Aspen imagers are ideal for serious astrophotographers. The Aspen CG16M contains the Kodak KAF-16803 full-frame CCD chip. The Aspen line has other models with a variety of monochromatic and color CCD chips. All come standard with two interfaces: a network interface with a built-in Web server and 1-to-16 MHz 16-bit digitization.



## 2 ASTRO HUTECH ▶ Flat-top Orthoscopic Eyepieces

Eyepiece design is one of the most fluid aspects of amateur astronomy. And while many come and go, one that has stood the test of time is the Abbe orthoscopic. Recently, Astro Hutech introduced a line of these eyepieces in eight focal lengths from 4mm to 25mm. Eye relief and apparent field of view may not be as great as some modern designs, but image sharpness is second to none. That's why orthoscopic eyepieces continue to be a favorite for lunar and planetary study.



## 3 ASTRONOMERS WITHOUT BORDERS ▶ OneSky tabletop Newtonian

Have you ever been asked to recommend a good starter telescope for a child? I have. Astronomers Without Borders' OneSky 5.1-inch f/5 tabletop Newtonian is one of the best sold today. No bells, whistles, or electronics. Just good optics in an easy-to-setup, user-friendly package. Place the telescope on a picnic table, extend the collapsible tube, and the one-armed, alt-azimuth-mounted instrument is ready to explore the sky.

## 4 ASTRO-TECH ▶ 12-inch truss-tube Ritchey-Chrétien optical tube

Ritchey-Chrétien (RC) Cassegrain reflectors rank among the finest instruments in their respective aperture classes. Perhaps the most important benefit of the RC design is its total freedom from image distortions, making these scopes an astrophotographer's favorite. But that advantage has always come at an astronomical price — until now. Astro-Tech's 12-inch f/8 truss-tube RC instrument offers many advanced features, such as carbon-fiber construction and a quartz mirror with enhanced coatings, at an unprecedented low price.



## 5 ASTRONOMY TECHNOLOGY TODAY ▶ Astronomy Technology Today



Each issue of *Astronomy Technology Today* features the best equipment that money can buy. But for hard-core equipment junkies, there is *Astronomy Technology Today*. Each bimonthly issue is singularly devoted to profiling the current state of the astronomical marketplace by surveying new equipment as well as product evaluations written by owners.

## 6 ASTROZAP ▶ Light Shrouds for Sky-Watcher Dobs

Open-tubed Newtonian reflectors are becoming more and more popular these days, and for good reasons. Not only does the design cut down on weight, but it also helps optics cool more quickly than solid-tube models. Still, light entering the optical path from the side can damage image contrast. To solve the problem, Astrozap sells a line of custom-fit cloth shrouds for 8- to 16-inch Sky-Watcher Dobsonian telescopes that prevent stray light from washing out the view.



## 7 AVALON INSTRUMENTS ▶ M-Zero Fast Reverse single-arm mount

Made from anodized aluminum with stainless steel hardware, the versatile M-Zero mount is an accessory you can set up in equatorial or alt-azimuth mode. It's light enough for easy transport, yet sturdy enough to allow guided photography through telescopes with apertures as large as 8 inches. In equatorial mode, the M-Zero doesn't require a meridian flip, so you can use a relatively long optical tube. In alt-azimuth mode, it is perfect for both telescopes and binoculars or to acquire automatic time-lapse sequences. Avalon's Bluetooth-enabled StarGo go-to system controls the M-Zero mount.



## 8 BAADER PLANETARIUM ▶ Q-Turret

No single eyepiece works for viewing everything. But sometimes switching eyepieces causes a telescope's aim to shift and a faint object to be lost. The Q-Turret makes changing eyepieces easy because you don't remove them. Instead, after inserting four 1 1/4" eyepieces of your choice in the turret, you simply dial between them. Although Baader makes the unit out of plastic, the quality construction ensures years of service while keeping weight to a minimum.



Phil Harrington is an *Astronomy* contributing editor and author of *Cosmic Challenge: The Ultimate Observing List for Amateurs* (Cambridge University Press, 2010).

## 9 BAADER PLANETARIUM

▶ Steeltrack Crayford focusers



Often, the stock focusers that come with low-price telescopes leave something to be desired. Baader solves the problem with a line of Steeltrack Crayford-style focusers, available for telescopes as small as 2 inches. These focusers use internal ball bearings riding on hardened stainless steel inside an aluminum base for smooth operation. Both coarse and fine adjustments are standard on all models.

## 10 CELESTRON

▶ COSMOS 90GT WiFi Telescope

The COSMOS 90GT 90mm f/10 refractor is the first WiFi-enabled telescope for amateur astronomers. Rather than use a hand controller, the COSMOS 90GT's go-to function operates from your smartphone or tablet. The 3.5-inch telescope uses Celestron's free *Navigator* planetarium app. The link will work everywhere, even without WiFi or a cell signal.



## 11 CELESTRON

▶ Skyris CCD imagers

Designed with Germany's The Imaging Source, Celestron's line of Skyris solar/lunar/planetary video imagers combine popular CMOS and CCD chips used for planetary imaging with super-fast USB 3.0 connections for

rates up to 120 full-resolution frames per second. The Skyris lineup includes three models, each available as a monochrome or one-shot color system.



## 12 CELESTRON

▶ Off-Axis Guider

An off-axis guider is an accessory imagers use with long-focal-length telescopes because such instruments require the most accurate guiding. Celestron's Off-Axis Guider uses an adjustable, multicoated 12.5-millimeter prism that allows you to locate a guide star. The 48mm clear aperture supports full-frame cameras without vignetting. The guider comes with a fixed-orientation helical focuser and includes all needed spacers and adapters for most imaging configurations.



## 13 DENKMEIER

▶ Solar observing Optical Correctors



Observing the Sun in Hydrogen-alpha (H $\alpha$ ) light is always exciting. And viewing it with two eyes adds a dimension that one-eyed stargazing never achieves. Unfortunately, most H $\alpha$  telescopes don't have the added focusing distance needed by binoviewers.

To fix this, Denkmeier now offers Optical Correctors that let their binoviewers focus through all popular H $\alpha$  solar scopes. Prepare to be astonished.

## 14 EXPLORE SCIENTIFIC

▶ 152mm Achromatic Refractor

Explore Scientific built the largest member of its AR Doublet Series of achromatic refractors around an air-spaced, crown-and-flint, doublet objective lens, just like its 102mm and 127mm models. At f/6.5, this 6-inch scope shows some color fringing around bright objects, even with the fully multicoated optics. But given the high-end aluminum and stainless steel construction, as well as the price, which is a fraction of a similar apochromatic refractor, it's easy to forgive that flaw.



## 15 HOWIE GLATTER

▶ Parallizer

Many observers view through 1¼" eyepieces in 2" focusers by using a step-down adapter. But unless machining tolerances are strictly followed, the unit can sit badly in the focuser, and that will affect image quality. Howie Glatter's Parallizer step-down adapter prevents this by maintaining three equally distributed points of contact on the inside of the focuser's drawtube as well as on the eyepiece's barrel, keeping everything square.



## 16 ISTAR OPTICAL

▶ Phoenix WFT 204-6

From Czech telescope maker Istar Optical comes three refractors billed as "comet hunters." That's just one enticing aspect of these scopes. The largest, the 8-inch f/5.9 Phoenix WFT 204-6, offers wide fields of view that are ideal for studying expansive star clusters, glowing nebulae, and, yes, comets. Fully multicoated optics promise images with fine contrast that also are sharp thanks to an oversized rotatable focuser.



## 17 LOSMANDY

▶ StarLapse

You've probably seen online videos showing time-lapse views of the sky rotating above a striking terrestrial foreground. How do the videographers record such scenes? They use a tracking platform like the StarLapse from Losmandy. Based on the same right ascension drive system as the company's GM-8 equatorial mount, Losmandy's StarLapse tracks the sky at both sidereal and solar rates, and pans the camera at nine different speeds up to 240° per hour for the duration of the exposure.



## 18 MALLINCAM

▶ MallinCam Jr PRO

From Procom Electronics in Ottawa, Canada, comes this addition to the MallinCam line of video cameras. The MallinCam Jr PRO is similar to the company's more expensive MallinCam Xtreme, but without some of the fancier features. Junior's standard CCD chip, the Sony ICX418AKL, is the same, while a more sensitive EXview HAD chip is also available. You can order either as color or monochrome. Both feature exposures you can set to last anywhere from 1/12,000 second to 99 hours.



## 19 MYCASEBUILDER

▶ Custom cases

It's important to keep our precious eyepieces and accessories safe between observing sessions. MyCaseBuilder offers a variety of custom-made plastic and metal foam-lined cases that are perfect for the task. Their online designer lets you select cutout shapes based on the eyepieces and other products that you own. Move each shape around until the layout is just as you want it, and with the click of your mouse, your custom-cut case is ready to order.

## 20 NEW MOON TELESCOPES

### ▶ 12.5-inch f/5 Dobsonian

A comparative new kid on the block, New Moon Telescopes includes some novel design features not seen in other similar truss-tube scopes. My favorite innovation is how the eight truss tubes come pre-assembled. Then you can assemble and set the secondary cage and truss tubes on the mirror box as a single unit. This way, you don't have to climb up a ladder in the dark to place the secondary cage on top of the poles.



## 21 OLIVON

### ▶ 1.25" 5-Piece Filter Wheel with 5 Filters

Using filters can greatly enhance objects. But swapping filters in the dark, especially while wearing gloves, can be tedious at best. Olivon's all-metal 5-Piece Filter Wheel allows the observer to switch easily between up to five different filters — which Olivon provides — simply by rotating them in and out of the optical path. It's perfect for planetary and lunar observation with color filters or deep-sky viewing with light pollution filters.

## 22 OPTEC

### ▶ FocusLynx Focuser Hub

Advanced astrophotographers appreciate the precise focusing control offered by the FocusLynx Focuser Hub. With this product in place, you can adjust up to two Optec or Starlight focusers simultaneously and independently via a computer, smartphone, or optional hand controller.



## 23 ORION TELESCOPES & BINOCULARS

### ▶ Dob Pod

One of the most common complaints about 10-inch and smaller Dobsonian telescopes is the low height of the eyepiece, especially when aimed toward the horizon. Orion's solution to this dilemma is called the Dob Pod. Made of melamine-coated particle board, the Dob Pod has slots that match the locations of the small feet underneath the Orion telescope's base. Place the base of any compatible Dobsonian reflector onto the Dob Pod, and the unit will raise the entire telescope a foot (30 centimeters) higher off the ground.

## 24 ORION TELESCOPES & BINOCULARS

### ▶ Dob Dolly

Now that the eyepiece is at a more comfortable height, how about some help moving your Dobsonian reflector around? Orion designed its Dob Dolly to match the Dob Pod and made it compatible with many Dobsonians up to 10 inches in aperture. Three casters underneath the triangular unit let you roll your assembled telescope on pavement and other smooth surfaces. Once in position, raise the Dob Dolly off the ground with the three threaded levelers, and you are ready to observe.



## 25 PIER-TECH

### ▶ PT2 adjustable pier



Pier-Tech adjustable telescope piers make climbing a ladder to look through an eyepiece a thing of the past. With the push of a button, you can move an equatorially mounted telescope up and down a full 20 inches (51 centimeters), bringing the eyepiece to you, whether seated or standing. The company's smallest adjustable pier, the Pier-Tech 2, can carry a telescope weighing up to 215 pounds (98 kilograms). The larger Pier-Tech 3 can hold up to 1,100 pounds (500kg), while the Pier-Tech 4 can handle as much as 1,600 pounds (725kg).

## 26 PROTOSTAR

### ▶ Tube liners

Metal-tubed reflectors are convenient to set up because they usually hold collimation well. But unless the inside of the tube is coated flat black, internal reflections can spoil the view. Protostar tube liners eliminate the reflections. By sliding the liner into the tube, the textured black surface ensures complete suppression of stray light. The liner also insulates the tube from the optical path, creating an air gap between the two to improve image stability.



## 27 SKY-WATCHER USA

### ▶ Esprit ED Triplet APO Refractors

All four Esprit APO refractors, from the 80mm f/5 to the 150mm f/7, feature objective lenses with three elements — including one of O'Hara FPL-53 glass — for superior false-color suppression. Each Esprit also comes nicely equipped with a thread-on doublet field flattener for photography, an oversized focuser with micro-focus, a 2" dielectrically coated star diagonal, an 8x50 right-angle finder scope, and an aluminum carrying case.



## 28 SOFTWARE BISQUE

### ▶ Paramount ME II Robotic Telescope Mount

Software Bisque took its already successful Paramount ME German equatorial mount and made it even better. The ME II features a more robust frame that can carry up to 240 pounds (110 kilograms) while only weighing 84 pounds (38kg) itself. Massive 8-inch right ascension and declination bearings coupled to belt-driven gears promise spot-on tracking accuracy. Equipment cables run through the mount for a clean appearance, while a pair of USB ports on the control panel makes it easy to connect to a computer or guiding accessories.



## 29 SOFTWARE BISQUE

### ▶ TheSKY HD

TheSKY was one of the first personal planetarium software packages sold, and it just keeps getting better. Now, more than three decades later, you can download the latest incarnation, TheSKY HD, onto your iPad. With it, you can identify constellations, stars, planets, and thousands of other celestial objects, including satellites, comets, asteroids, and even Iridium flares, from your observing site.



## 30 STELLARVUE

### ▶ SVQ 100 Quad Astrograph

Looking for a super-portable refractor that is perfect for astrophotography as well as for visual observing? The Stellarvue SVQ 100 should be on your short list. The SVQ 100 measures only 19.25 inches (48.9 centimeters) long with dew shield retracted and weighs just 10.8 pounds (4.9 kilograms). But it packs a punch thanks to its four-element 100mm f/5.8 apochromatic objective. Making a good thing even better, the telescope also comes standard with a 3" Feather Touch focuser.



# Astronomy's Star Products



#	COMPANY	PRODUCT	PRICE	WEBSITE
1	Apogee Imaging Systems	Aspen CG16M CCD camera	\$11,875	www.ccd.com
2	Astro Hutech	Flat-top Orthoscopic Eyepieces	\$99 to \$119	www.hutech.com
3	Astronomers Without Borders	OneSky tabletop Newtonian	\$199.99	http://store.astronomerswithoutborders.org
4	Astro-Tech	12-inch truss-tube Ritchey-Chrétien optical tube	\$4,495	www.astronomytechnologies.com
5	Astronomy Technology Today	Astronomy Technology Today	\$18 print; \$10 digital	www.astronomytechnologytoday.com
6	Astrozap	Light Shrouds for Sky-Watcher Dobs	\$69 to \$109	www.astrozap.com
7	Avalon Instruments	M-Zero Fast-Reverse single-arm mount	\$4,800	www.avalon-instruments.com
8	Baader Planetarium	Q-Turret	\$85	www.alpineastro.com
9	Baader Planetarium	Steeltrack Crayford focusers	\$294 to \$467	www.alpineastro.com
10	Celestron	COSMOS 90GT WiFi Telescope	\$399.95	www.celestron.com
11	Celestron	Skyris CCD imagers	\$449.95 to \$899.95	www.celestron.com
12	Celestron	Off-Axis Guider	\$249.95	www.celestron.com
13	Denkmeier	Solar observing Optical Correctors	\$199 to \$299	www.denkmeier.com
14	Explore Scientific	152mm Achromatic Refractor	\$849.99	www.explorescientific.com
15	Howie Glatter	Parallizer	\$45	www.collimator.com
16	Istar Optical	Phoenix WFT 204-6	\$3,499	www.istar-optical.com
17	Losmandy	StarLapse	\$575	www.losmandy.com
18	MallinCam	MallinCam Jr PRO	\$599.99	www.mallincam.net
19	MyCaseBuilder	Custom cases	\$20 to \$1,238	www.mycasebuilder.com
20	New Moon Telescopes	12.5-inch f/5 Dobsonian	\$3,898	www.newmoontelescopes.com
21	Olivon	1.25" 5-Piece Filter Wheel with 5 Filters	\$99	www.olivonusa.com
22	Optec	FocusLynx Focuser Hub	\$295	www.optecinc.com
23	Orion Telescopes & Binoculars	Dob Pod	\$129.99	www.telescope.com
24	Orion Telescopes & Binoculars	Dob Dolly	\$129.99	www.telescope.com
25	Pier-Tech	PT2 adjustable pier	\$2,500	www.pier-tech.com
26	Protostar	Tube liners	\$48 to \$64	www.fpi-protostar.com
27	Sky-Watcher USA	Esprit ED Triplet APO Refractors	\$1,649 to \$6,399	www.skywatcherusa.com
28	Software Bisque	Paramount ME II Robotic Telescope Mount	\$15,000	www.bisque.com
29	Software Bisque	TheSky HD	\$29.99	www.bisque.com
30	Stellarvue	SVQ 100 Quad Astrograph	\$3,800	www.stellarvue.com
31	Teeter's Telescopes	TT/Sub4 22-inch Dob	\$11,250	www.teeterstelescopes.com
32	Vixen Optics	R130Sf Newtonian Reflector with Porta II Mount	\$399	www.vixenoptics.com
33	Vixen Optics	SLV Series Eyepieces	\$169	www.vixenoptics.com
34	Walt's Observing Chairs	Observing chairs	\$185 to \$225	www.waltsobservingchairs.com
35	West Virginia University Press	21st Century Atlas of the Moon	\$29.99	www.wvupressonline.com

## 31 TEETER'S TELESCOPES

▶ TT/Sub4 22-inch Dob



If you have true aperture fever but prefer to keep your feet on the ground rather than scale the heights to the eyepiece, Teeter's Telescopes may be your salvation. The company's line of Sub4 reflectors, each with focal ratios less than f/4, do just that. Its latest and largest addition, the 22-inch f/3.3, puts a monstrous primary mirror into a tele-

scope that stands less than 70 inches (178 centimeters) off the ground. And as with all Teeter's scopes, craftsmanship and standard equipment combine to make it one of the best on the market today.

## 32 VIXEN

▶ R130Sf Newtonian Reflector with Porta II Mount

Vixen's R130Sf 5-inch Newtonian telescope is a great medium-aperture instrument in a portable package. The Porta II Mount is a high-quality alt-azimuth unit whose mount damps vibrations from bumps, wind, and even focusing better than many other similar telescope mounts. In addition to the optical tube and the mount, Vixen includes a 6x30 finder scope, a 1¼" adapter, 6.3mm and 20mm eyepieces, tube rings, and a dovetail plate.



## 33 VIXEN

▶ SLV Series Eyepieces

This line continues the company's tradition that began with its Lanthanum LV eyepieces a decade ago, while taking them to the next level. All 11 eyepieces in the SLV series, which range in focal length from 2.5mm to 25mm (plus a zoom), offer a comfortably long 20mm of eye relief, twist-up eyecups, and flat spots around the housing's circumference to keep the eyepieces from rolling away in the dark. Best of all, each has fully multi-coated Lanthanum glass for sharp, high-contrast views.



## 34 WALT'S OBSERVING CHAIRS

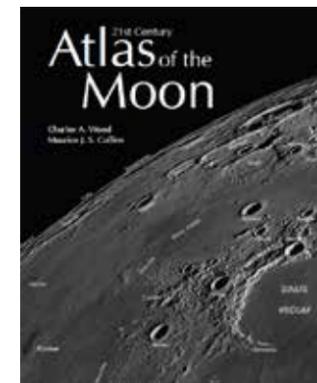
▶ Observing chairs



Observing chairs help relieve the stress and strain associated with hours of concentrated effort at the telescope. But to be effective, they need to be widely adjustable in height. Walt's Observing Chairs are just that. Made of wood, each has a comfortable seat and an adjustable footrest. The height ranges from nearly ground level to about 40 inches (1 meter) above the ground. A shorter version, sans footrest, is also available.

## 35 WEST VIRGINIA UNIVERSITY PRESS

▶ 21st Century Atlas of the Moon



As light pollution swallows up more of our night sky, many deep-sky observers are turning their telescopes toward the Moon for in-depth study. This high-resolution visual guide, created by lunar scientist Charles Wood and amateur astronomer Maurice Collins, is the perfect companion for anyone wanting to get more out of our nearest space neighbor. Images from NASA's

Lunar Reconnaissance Orbiter show the Moon's Earth-facing side in exquisite detail, and you also will find maps showing details along the limb as well as on the farside. These make this book as visually interesting to enjoy inside as our nearest celestial neighbor is through the eyepiece. ☾