

Our 12th annual

STAR PRODUCTS

BY PHIL HARRINGTON

Welcome to the 12th annual Star Products awards. This year, as in the past, we scoured the market in search of the 35 best new and unique astro products. Our winners this year, presented in no particular order, offer a mix for newbie and veteran hobbyists alike.

Phil Harrington is a contributing editor of Astronomy and a dedicated equipment collector.

1 Baader Semi APO Filter

Apochromatic refractors erase the chromatic aberration that plagues conventional achromats by either using exotic glass in the objectives or incorporating three or more objective elements, or both. But APOs can cost many times more than a comparably sized achromat. If you long for that level of performance but don't have the budget, Baader offers a cost-effective solution. Their "semi-apochromatic" filters simply screw into the barrel of any 1.25" or 2" eyepiece or star diagonal. Results are immediately obvious, even around unforgiving targets like the Moon and Venus.

75.63 euros (1.25"); 136.97 euros (2") • www.baader-planetarium.com



2 Baader SunDancer II H-alpha Filter

Baader's SunDancer II can turn any telescope into a hydrogen-alpha (H α) solar scope. With it in place, observers will enjoy ever-changing views of prominences and other details on the solar surface. For telescopes smaller than 3.1 inches (8 centimeters) in aperture, no further accessories are required. For larger telescopes, an additional D-ERF energy protection filter is needed, unless the scope is stopped down to 3.1 inches (8 cm). Once connected to power, the SunDancer II automatically heats up to the optimum operating temperature for safe solar viewing and photography.

2,978.99 euros • www.baader-planetarium.com



3 Canon EOS R6 Mirrorless Camera Body

Conventional digital single lens reflex (DSLR) cameras use a mirror to divert light to the viewfinder. The downside is that when the mirror flips up as the shutter is triggered, vibrations from mirror slap can blur the image. Canon's EOS R6 mirrorless camera uses a small LCD display in the viewfinder to show exactly what is in view, eliminating the mirror and any vibration. The 20-megapixel sensor has an ISO range between 100 and 102,400 (expandable to 204,800). Digital noise, akin to grain in film, is low even into mid- to high-speed settings.

\$2,499 • www.usa.canon.com



4 Buckeyestargazer Duncan Mask for SCT Collimation

Telescope optics must be properly collimated for best performance. To help owners of Schmidt-Cassegrains achieve this goal quickly, Buckeyestargazer offers a Duncan mask that fits in front of a scope's corrector plate. Once it is at ambient temperature, aim your telescope at a bright star high in the sky. Place the mask onto your scope and excessively defocus the image; you should see three arcs that match the mask's three cutouts. Now, slowly bring the star into focus, and its image will be split into three lines. Use your scope's three collimation screws until the lines form a perfect Y, touching in the center.

**\$23 to \$27 (5-inch to 8-inch);
\$25 to \$34 (9.25-inch to 11-inch);
\$36 to \$47 (12-inch to 16-inch) • www.buckeyestargazer.net**



5 Avalon Instruments T-Pod Max

Tripods have it tough. They must bear the weight of a telescope, its mount, and various accessories, all without flexing under the load. Avalon Instruments' T-Pod Max tripod is designed to do all that with style. Made of anodized aluminum, the T-Pod Max weighs only 26.5 pounds (12 kilograms), yet can support up to a stated 440 pounds (200 kg). The extendable legs raise the tripod's base from 33 to 51 inches (85 to 130 cm), while the entire tripod collapses to 39 inches (99 cm) for easy carrying. The T-Pod Max comes in red or black and is compatible with mounts from Losmandy, iOptron, Vixen, Celestron, Sky-Watcher, and others.

1,382.40 euros • www.avalon-instruments.com



6 APM EMS SD-Apo Bino 140mm F/7 Telescope

If you believe, like me, that "two eyes are better than one" and you want to take that to the nth degree, then APM's EMS SD-Apo Bino 140mm F/7 Telescope is for you. A matched pair of 5.5-inch (14 cm) apochromatic refractors are teamed to produce unparalleled true-binocular views. The APM binoscope is outfitted with matching oversized 3.7" focusers and an image-erecting prism system, all mounted on a nicely crafted wooden fork mount.

12,596.64 euros • www.apm-telescopes.net



7 Astro-Tech 10.5mm 1.25" PF Eyepiece

Astro-Tech offers its Premium Flat Field (PF) line of eyepieces in five different focal lengths ranging from 5.5mm to 25mm. All fit standard 1.25" focusers. The 10.5mm PF eyepiece is a sweet spot in the lineup; it has a 60° field of view and produces excellent magnification in most instruments for lunar and planetary viewing. Its five-lens/four-group design delivers views that are flat across the field and free of aberrations with a comfortable 16mm of eye relief.

\$55 • www.astronomics.com



8 ↻ ↺ Celestron Dew Prevention Line

Celestron recently introduced an integrated system of tools to combat the age-old problem of nighttime dew accumulating on your optics. First, they offer a series of aluminum dew shields customized to fit their 6-inch to 14-inch Schmidt-Cassegrain instruments. These reduce radiative cooling of the SCT corrector plate, while also blocking stray



light. Next, Celestron's dedicated Dew Heater Ring — available for 5-inch to 14-inch SCTs — permanently replaces the original factory retaining ring around the corrector, making it one less thing to forget when heading out



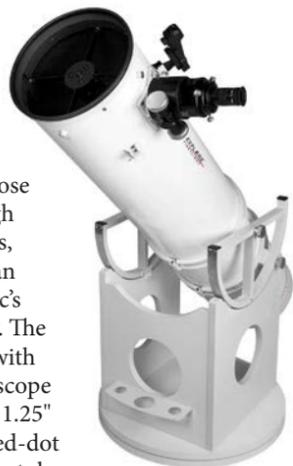
at night. The heater rings are specifically designed to be paired with Celestron's Smart DewHeater Controller, which automatically senses environmental conditions and provides just enough heat to keep dew at bay.

\$109.95 to \$299.95 (6-inch to 14-inch dew shield); \$39.95 to \$159.95 (5-inch to 14-inch heater ring); \$259.95 (Smart DewHeater Controller 2x) • www.celestron.com

9 ↻ ↺ Explore Scientific FirstLight 8" Dobsonian Telescope

To me, an 8-inch (20 cm) reflector is close to the perfect telescope. It's large enough to pull in thousands of deep-sky objects, yet small enough to set up quickly for an impromptu night out. Explore Scientific's FirstLight 8" embodies that philosophy. The Dobsonian mount is easy to assemble with a few tools and even easier to use. The scope comes with a focuser that accepts both 1.25" and 2" eyepieces, a 25mm eyepiece, a red-dot viewfinder, an accessory tray, and a smartphone adapter for photos.

\$699.99 • www.explorescientificusa.com



11 ↻ ↺ Celestron Elements ThermoTorch 3 Astro Red

If you, like me, enjoy traveling out to dark skies as often as time permits, you will appreciate Celestron's 3-in-1 ThermoTorch 3. As the name implies, it's three essential tools in one: a red flashlight, a hand warmer, and a USB power bank. The flashlight has three brightness levels. At maximum, it's perfect for looking for a tool you've accidentally dropped, while at its lowest level, it will illuminate charts without affecting night vision. The hand warmer provides up to a stated four hours of warmth, or two hours while using the flashlight function.

\$67.95 • www.celestron.com



10 ↻ ↺ CATSEYE BLACKCAT XLV-WIFI Cheshire

Anyone who is familiar with collimating a Newtonian knows that it often requires multiple trips between the collimation tool in the focuser and the adjustment screws at the back of the mirror cell. CATSEYE has come up with an ingenious solution to eliminate that back-and-forth process by coupling a small Wi-Fi camera with their BLACKCAT XL-ATM Cheshire eyepiece. The camera sends an image you can view on the included app, allowing you to tweak the primary's collimation while seeing the Cheshire's ring/center spot reflections directly on your iOS or Android smartphone's screen. Note: The app is not compatible with Android version 12.

\$126 • www.catseyecollimation.com



12 ↻ ↺ Founder Optics FOT106

Founder Optics' 106mm f/6 triplet refractor is unique both inside and out. The multicoated objective consists of three fully gapped elements. Two are made of extra-low dispersion (ED) glasses (S-FPL 53 and S-FPL 51), while the third is made of lanthanum. The glossy black tube and green anodized rings, carrying handle, and 2.7" focuser really stand out. Also included are a field flattener for photography and an aluminum carrying case.

\$2,499 • www.founderoptics.com



14 ↻ ↺ Great American Eclipse 2024 Commemorative Coin

Many of you are probably already planning to view the 2024 total solar eclipse as the Moon's shadow races across North America. To celebrate the event, GreatAmericanEclipse.com has issued a commemorative coin for collectors. One side of the 2-inch (5 cm) coin shows the path of totality across a map of the U.S., while the other portrays the Moon over North America as the lunar shadow pinpoints the location of greatest eclipse near the town of Nazas, Mexico. Each coin comes in a clear protective case and weighs about 2 ounces (57 grams).

\$12 • www.greatamericaneclipse.com



15 ↻ ↺ Meade StarPro AZ 102mm Refracting Telescope

For those who enjoy the pleasures of observing the Moon, planets, and double stars, a refractor is the best telescope design. And for a telescope that offers great bang for your buck, look no further than Meade's StarPro AZ 102mm. For under \$300, you get everything you need to begin your journey: a 102mm f/6.5 achromatic refractor on a tripod-mounted, single-arm alt-azimuth mount with slow-motion controls; three 1.25" eyepieces (26mm, 9mm, 6.3mm); a 2x Barlow; a red-dot finder; and a smartphone adapter for photographing the Moon and bright planets.

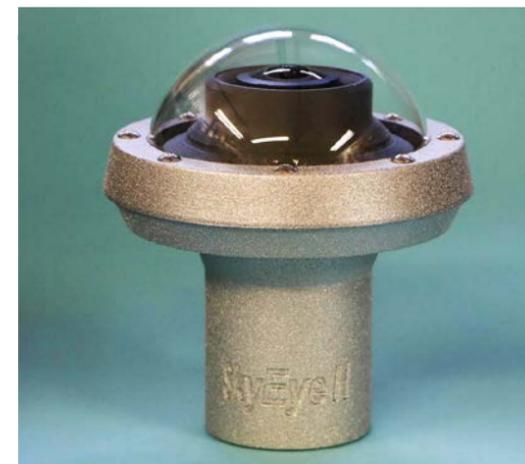
\$269 • www.meade.com



13 ↻ ↺ Interactive Astronomy SkyEye2

The SkyEye2 all-sky camera gives a full-color horizon-to-horizon view of the sky. View the ever-changing scene in real time or create time-lapse videos of satellite transits, meteor showers, aurorae, and more. Users can adjust the exposure time to between 1 second and 60 seconds, or the device can set it automatically. The camera's 6.3-megapixel color Sony STARVIS CMOS sensor is housed under a transparent dome atop a 3D-printed, weatherproofed resin body. Images can be shared to the web with the included software.

\$1,399 • www.interactiveastronomy.com



16 ↻ ↺ Software Bisque Paramount Apollo 600/800 Mount

Software Bisque offers some of the most advanced observatory-class telescope mounts around for serious amateurs, universities, and public facilities. Their Paramount Apollo 600 robotically driven alt-azimuth mount is designed to support telescopes weighing up to 400 pounds (180 kg), while the Apollo 800 can carry as much as 800 pounds (360 kg). Both rely on Software Bisque's industry-leading control software to ensure extremely accurate pointing and tracking. The software is available for macOS, Windows, and Linux operating systems.

\$59,500 (Apollo 600); \$79,500 (Apollo 800) • www.bisque.com



17 ↻ ↺ Good Directions Crescent Moon Bird Feeder

Many amateur astronomers by night are birding enthusiasts by day. The Crescent Moon Bird Feeder from Good Directions is a stylish way of melding the two interests together. With a copper finish front and back and transparent side-walls, the Crescent Moon Feeder measures 11 inches (28 cm) long by 3.75 inches (9.5 cm) wide by 17 inches (43 cm) tall and can hold up to 4 pounds (1.8 kg) of birdseed. The bird feeder pole is sold separately.

\$89 • www.gooddirections.com



18 ⤵ Scopetech Mount ZERO

If you are looking for a small alt-azimuth mount that combines the ultimate in portability while supporting instruments up to 15 pounds (7 kg), then the Scopetech Mount ZERO is perfect. What looks like a simple design is actually an engineering marvel that incorporates a worm gear and wheel on each axis to eliminate the need to tighten and loosen the axis once friction is set. The mount weighs 3 pounds (1.4 kg) and measures 9.4 inches by 4 inches by 4.3 inches (24 cm by 10 cm by 11 cm) when folded flat.



\$375 •
www.astrohutech.store

19 ⤵ Oberwerk BT-127XL-SD Binocular Telescope

Oberwerk recently introduced the BT-127XL-SD, the largest member of its binocular telescope family. The glossy white binoscope pairs two identical 127mm apochromatic refractors. Each has a fully coated three-element objective lens made of FCD100 and FK-61 glass to eliminate false color. Despite the size of the

large objectives and prism assemblies, the BT-127XL-SD weighs only 24.5 pounds (11 kg). It comes with two 14mm eyepieces and a heavy-duty case with wheels for easy transport. A mount is sold separately.

\$5,695 •
www.oberwerk.com



20 ⤵ Orion SkyScanner BL135mm Dobsonian Reflector Telescope

If you are looking for a low-cost starter scope, whether for a child or an adult, Orion's SkyScanner BL135mm Dobsonian is a good choice. This no-frills reflector features a 135mm f/8.1 spherical primary mirror that promises to deliver great views of the Moon, the planets, and hundreds of deep-sky objects. The steel telescope tube sits on a basic Dobsonian mount and comes with two 1.25" eyepieces, a 3x Barlow lens, a 2" rack-and-pinion focuser, and a red-dot finder scope.

\$379.99 • www.telescope.com



21 ⤵ My Science Shop Iron Meteorite 50mm Lucite Cube

Collecting meteorites is a side hobby that many amateur astronomers enjoy. Now, you can buy a piece of the famous Campo del Cielo iron meteorite, handsomely preserved in a 2-inch (5 cm) museum-grade Lucite block for display. The Campo del Cielo meteorite slammed into Earth around 5,000 years ago, in a remote area of Argentina 620 miles (1,000 kilometers) northwest of Buenos Aires. Encased in optical-clarity resin that will not yellow or degrade with time, this 1-ounce (28 g) fragment displays the rugged shape that makes iron meteorites famous.

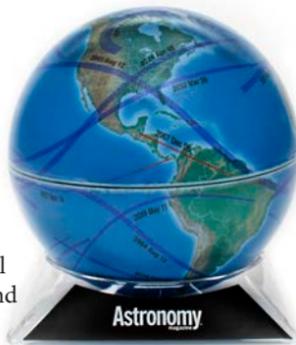
\$150 • www.myscienceshop.com



22 ⤴ ⤵ My Science Shop 6" Saturn and Eclipse Globes

Two new globes have been added to My Science Shop recently: The Saturn Globe consists of a 6-inch (15.2 cm) injection-molded globe that identifies 17 planetary features. The detachable acrylic rings are labeled with seven regions. The 6-inch (15.2 cm) Eclipse Globe shows the paths of all total solar eclipses between 2021 and 2070. Both include acrylic display bases and informational guides.

\$34.95 (eclipse globe);
\$49.95 (Saturn globe) •
www.myscienceshop.com



23 ⤵ Taurus T300 Dobsonian Telescope

From Myslenice, Poland, comes this line of state-of-the-art Dobsonians.

Ranging in aperture from 12 to 24 inches, Taurus Telescopes are designed to deliver the ultimate in performance and portability. The 12-inch f/5 T300 measures 59.5 inches (151 cm) high when set up, yet folds into a nested pack that easily fits into the trunk of a car. It weighs 35 pounds (15.9 kg), so it can be set up quickly by one person. The instrument is sold with a made-in-house primary, a selection of focusers, truss poles, a light-blocking shroud, and mirror covers.

starting at 1,495 euros • www.taurustelescopes.com



24 ⤵ QHY QHY411 CMOS Camera

If you are looking for the ultimate camera and money is no object, the QHY411 is it. QHY boasts that their QHY411 is the largest-resolution cooled CMOS camera in the world. Available in both monochrome and color versions, the QHY411 camera is built around Sony's 150-megapixel IMX411 BSI CMOS sensor. The back-illuminated IMX411 BSI measures 4.2 inches (10.6 cm) and has a resolution of 14304x10748 with 3.76-micron pixels for incredible images. The Sony chip makes the QHY411 the first scientific CMOS camera with native 16-bit A/D on-chip, with 65,536 levels.

\$50,000 • www.qhyccd.com



25 ⤴ Schalck Observatory Plaques

Amateur astronomer Bob Schalck offers customized plaques that are perfect for adorning any backyard or club observatory. Each plaque is custom made from rough-cut Oregon cedar to match the owner's specific telescope, with the engraved side slightly smoothed. The wood will slowly turn a light gray color as it ages, but will remain resistant to weathering, insects, and mold. Plaques measure approximately 8 inches (20.3 cm) long by 5.25 inches (13.3 cm) wide.

\$25 •
oceanicclaserworks@gmail.com



26 ⤴ Player One Apollo-M Solar Cameras

With solar activity on the uptick, more people are becoming daytime astronomers. To help safely capture the exciting views through Ha solar scopes, Player One offers the Apollo-M Solar Camera series. All feature Sony monochrome CMOS sensors. The Max uses the 1.1-inch (2.8 cm) IMX432 sensor, while the lower cost Apollo-Solar contains the 0.83-inch (2.1 cm) IMX174 sensor and the Mini features the 0.67-inch (1.7 cm) IMX429. All are USB 3.0 compatible. Each includes DPS (Dead Pixel Suppression) technology to prevent hot and cold pixels from spoiling the image. They also use a DDR3 cache to stabilize and secure data transmission.

\$499 (Apollo-M Mini); \$599 (Apollo-M); \$699 (Apollo-M Max) •
www.player-one-astronomy.com



27 ⤵ Player One Astronomy Mars Cameras

For those who prefer photographing planets, Player One offers the Mars-M monochrome and the Mars-C and Mars-C II color cameras. The Mars-M uses Sony's IMX290 CMOS sensor, while the Mars-C has the IMX462 color chip and the Mars-C II the new IMX662. The original M and C cameras feature a

1944x1096 array of 2.9-micron pixels, while the Mars-C II has a 1936x1100 array of 2.9-micron pixels. All can also function as autoguiders via a standard ST-4 port and can transform into all-day cameras with an optional all-sky kit.

\$249 (Mars-C); \$299 (Mars-M); \$299 (Mars-C II) •
www.player-one-astronomy.com





28 Photon Express Bahtinov Masks

One of the most common problems astrophotographers face is achieving a sharp focus. To solve that problem, many use Bahtinov focusing masks that fit in front of their telescope or camera lens. Once aimed at a star, the mask's three separate grids produce three angled diffraction spikes on the star. You then adjust your focus until the middle spike is centered between the other two. Photon Express offers 3D-printed Bahtinov masks made of a durable thermoplastic polyester known as PETG. Masks are available in a wide variety of sizes to fit over camera lenses and can be custom made up to 8 inches (20 cm), with plans to expand to larger scopes in the near future.

\$15 (up to 60mm); \$18.50 (65mm to 81mm); \$21.50 (85mm to 105mm); \$26.50 (106mm to 152mm) • www.jwbozeman.com

29 TS-Optics 2" LED Collimator

Let's get one thing straight: Unless a telescope's optics are properly collimated, image quality will suffer. The 2-inch (5 cm) LED Collimator from TS-Optics is designed specifically for Ritchey-Chrétien reflectors, but can also be used for other optical designs. To use it, aim your telescope horizontally toward a uniformly painted wall, insert the battery-powered collimator into the telescope's 2" focuser, and follow the included instructions for spot-on collimation. An instructional video is also available on the company's website.

142.02 euros • www.teleskop-express.de



30 Revolution Imager SkyRaider 80mm ED APO Refractor Long Perng

This 80mm f/6.25 refractor from Revolution Imager promises great visual and photographic results, thanks to its fully multicoated FPL53 extra-low dispersion (ED) doublet objective. The SkyRaider weighs just 6 pounds (2.7 kg) and includes a 2" rotatable, dual-speed Crayford focuser and a 2"-to-1.25" eyepiece adapter. The telescope does not include any diagonal or eyepieces.

\$849.95 • www.revolutionimager.com



31 New Moon Telescopes Detachable Tablet Stalk and Eyepiece Tray

New Moon Telescopes offers a customizable tablet shelf and eyepiece tray (available separately) that can be attached to most Dobsonian mounts. As with their telescopes, New Moon's tray and shelf are finely crafted from several hardwoods, including mahogany, maple, cherry, and walnut. The tablet tray is also available in plexiglass. Each attaches to the mount's rocker box with a supplied 26-inch (66 cm) anodized aluminum tube. The platform's angle can be adjusted once installed. The eyepiece tray is available with either four 2-inch holes, or three 2-inch and two 1.25-inch holes. Each is sold separately.

\$78 (plexiglass tablet stalk); \$148 (hardwood tablet stalk); \$98 (hardwood eyepiece tray) • www.newmoontelescopes.com



32 Sky-Watcher Flextube 400P SynScan GoTo Collapsible Dobsonian

Of the five models in Sky-Watcher's Flextube SynScan GoTo Collapsible Dobsonian lineup, the 406mm f/4.4 is the largest. Rather than using a traditional truss open-tube design, Sky-Watcher went with three tubes that slide straight up and down. This allows the optical tube assembly to collapse when stowed without major disassembly. The Dobsonian mount includes go-to control and tracking, but also lets you move the scope manually while still retaining alignment with the sky. Also included are a 2" dual-speed Crayford focuser with 1.25" adapter, a 9x50 straight-through finder scope, and two 1.25" Plössl eyepieces.

\$4,680 • www.skywatcherusa.com

33 Stellarvue SVX140T Refractor

Stellarvue is famous among amateurs for its outstanding apochromatic refractors.

The 140mm f/6.7 SVX140T is the newest member of Stellarvue's SVX line. The heart of the SVX140T — its fully multicoated triplet objective — uses an Ohara S-FPL-53 extra-low dispersion (ED) center element and a Lanthanum rear element for superior color correction. It is housed inside a fully baffled aluminum tube painted "instrument white." The retractable dew shield extends 12 inches (30.5 cm) in front of the instrument. The SVX140T weighs 22 pounds (9.9 kg) without the rings attached and measures 31 inches (79 cm) with the dew shield retracted. Buyers may choose from two different 3.5" focusers and a selection of flatteners with adapters. Also included are a pair of mounting rings, dust caps, and a heavy-duty carrying case.

starting at \$7,395 • www.stellarvue.com



34 TPO 8" Carbon Fiber f/8 Ritchey-Chretien Reflecting OTA Telescope

Ritchey-Chretien (RC) reflectors have been favorites among professional observatories for decades, thanks to their freedom from the coma, chromatic aberration, and spherical aberration that plague other optical designs. Today, many amateurs share that same opinion of the RC design. The TPO 8-inch f/8 RC telescope from Oceanside Photo and Telescope (OPT) takes this design and packages it in a strong carbon-fiber tube that weighs only 16.4 pounds (7.4 kg). Both the concave hyperbolic primary and convex hyperbolic secondary mirrors are made from low-expansion quartz and layered with 99-percent dielectric coatings. The scope also includes a 2" dual-speed Crayford focuser, as well as both Vixen and Losmandy dovetail plates to secure it to today's most popular mounts.

\$1,449 • www.optcorp.com



35 Sightron Nano Tracker

Many photographers enjoy taking breathtaking panoramic time-lapse images of the night sky. While some use elaborate equipment for those results, Sightron offers a solution that is both small and affordable. The Sightron Nano Tracker measures just 2.4 inches by 3.9 inches by 1.7 inches (6 cm by 9.8 cm by 4.4 cm) and weighs less than a pound (400 g). The Nano Tracker can hold cameras and lenses weighing more than 4 pounds (1.8 kg) while following the sky either at full- or half-sidereal rate. The latter is great for dramatic time-lapse shots of rising and setting stars. The device is powered by either three AA batteries or an external USB source, sold separately.

\$315 • available in the U.S. at www.starfieldoptics.com

